CAMBRIDGE SYSTEMATICS

Central Coast California Commercial Flows Study

final

report

prepared for

Association of Monterey Bay Area Governments (AMBAG)

In association with

Caltrans District 5
Council of San Benito County Governments (SBCOG)
Santa Barbara County Association of Governments (SBCAG)
San Luis Obispo Council of Governments (SLOCOG)
Santa Cruz County Regional Transportation Commission (SCCRTC)
Transportation Agency for Monterey County (TAMC)

prepared by

Cambridge Systematics, Inc.

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prepared by

Cambridge Systematics, Inc.
555 12th Street, Suite 1600
Oakland, CA 94607

date

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Executive Summary

BACKGROUND AND PURPOSE

Over the next several decades, the Central Coast region can expect to see significant increases in freight movement due to both population increases and a continued expansion of the region's agricultural production. As a result of this demand for freight by both the local population and industries, a focus on enhancing the efficiency and safety of the region's goods movement system is critical to supporting the economic health of the region and the quality of life for its residents. To respond to this challenge, six major agencies across the five counties – comprising the California Central Coast region, from Santa Cruz County in the north to Santa Barbara County in the south – have partnered with the California Department of Transportation (Caltrans) District 5 to sponsor this study of freight flows, issues, needs, and deficiencies in the region. Moreover, this study provides findings and recommendations, which can assist these agencies in proactively responding to the future freight challenges.

REGIONAL POPULATION AND ECONOMIC TRENDS

Population trends are a key driver of freight demand in a region, since the rate of growth or decline of the population impacts the volume of goods shipments required for consumption by local residents. The population of the five-county Central Coast region of California was approximately 1.4 million in 2010.[1] In total, the population of the five-county region grew by 5.1 percent from 2000 to 2010, or by nearly 70,000 people, which is about one-half the rate of the State's overall population growth. By 2040, the population of the region is expected to grow approximately 30 percent above 2010's levels, which will increase the number of trucks on the roads.

Table ES.1 below highlights the gross regional product (GRP) by county. GRP is one way to measure the size of regional economic production, as it takes regional production, investment, and spending into account.[2] Santa Barbara and Monterey Counties are the largest economic engines in the Central Coast region

[1] 2010 Census.

[2] More specifically, GRP is defined as the market value of all final goods and services produced in a region in a given year, equal to total consumer, investment, and government spending, plus the value of exports minus the value of imports.

at about $17.7 billion and $16.0 billion, respectively. The five-county Central Coast regional GRP was nearly $54 billion in 2009.

Table ES.1 Gross Regional Product by County
2009, Billions of $

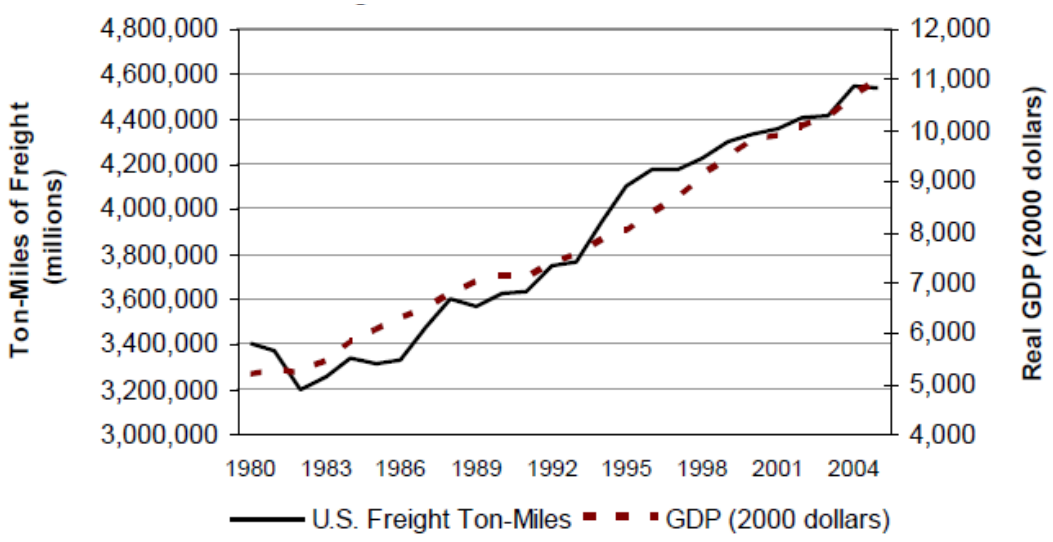
County	GRP
Santa Barbara	$17.7
Monterey	$16.0
San Luis Obispo	$9.6
Santa Cruz	$9.1
San Benito	$1.4
Total	$53.8

Sources: Bureau of Economic Analysis, IMPLAN (for San Benito County).

Overall, the region experienced a positive growth trajectory from 2001 to 2009, expanding from about $48 billion in 2001 to $53.8 billion in 2009.

The region's population and economic trends will impact freight demand in several ways. For example, there is a connection between GRP and freight volumes on regional roads. As depicted in Figure ES.1 below, freight volumes have followed GRP growth in the U.S., at least from 1980 through 2004. As a result of this expected increase in regional GRP, additional freight tonnage moving to, from, and within the Central Coast region is expected. It is important for Central Coast policy-makers and agency planners to be responsive to this expected growth, and to proactively address regional transportation challenges that will result from this growth.

Figure ES.1 Relationship between U.S. Freight Volumes and Gross Domestic Product (GDP)



Source: Massachusetts Department of Transportation Freight Plan.

Assuming projected population growth materializes, and assuming the economy recovers and continues moderate growth similar to levels seen between 2001 and 2008, exports and imports to and from the region will continue to increase. It is important for policy-makers and planners to be aware of such potential growth and to address regional challenges that may be a result of growth. Chapter 3 highlights key regional industries that will be primary drivers of freight demand.

Regional Industries and Freight Movement

The region's key freight-dependent industries, *Agriculture*, *Manufacturing*, and *Truck Transportation/Warehousing*, are critical to the region in terms of jobs and contribution to the regional economy. They also are critical to one another. Without a strong agricultural crop, it would be difficult for regional truckers and food processors to make a living. Without local carriers to move goods, it may become more expensive to ship goods from the region to outside producers, making the region's products less competitive.

Agriculture

The Central Coast is known both for the volume and the variety of agricultural products grown here. The Salinas Valley, for example, is known as "America's Salad Bowl" due to the amount of produce grown here and exported to other regions. Another major cluster is located around Santa Maria. In addition, some relatively major crop production locations are located east of Paso Robles near SR 46 and east of U.S. 101 near Hollister.

Table ES.2 below highlights the top three crops produced by each county in the study area. Strawberries and other berries are key crops throughout the region, and are the number one crops by value in Monterey, Santa Barbara, and Santa Cruz Counties. Lettuce, wine grapes, broccoli, and nursery products also are important agricultural products for the Central Coast.

The region also is a key producer of wine. Monterey County, for example, produced grapes for wine valued at $238 million in 2008.[3] Both Monterey and San Benito Counties are major producers of field crops, fruits and nuts, vegetable/row crops, and livestock, as are the other counties in the study area.[4]

---

[3] Monterey County Agricultural Commissioner's Office, *Monterey County Crop Report 2008*.

[4] Cambridge Systematics developed a freight flows tool for this effort that will help planners understand the freight impacts that changes in industry output will have. For more information about this tool, see **Appendix B**.

Table ES.2 Top Three Agricultural Products by County
2009, Gross Value of Agricultural Production by Crop

County	Top Crops (Millions $)
Monterey	Berries, Strawberries, Fresh Market ($746.1) Lettuce, Romaine ($483.3) Lettuce, Head ($436.0)
San Benito	Vegetables, Unspecified ($39.9) Lettuce, Bulk Salad Products ($21.1) Nursery Products, Misc ($20.4)
San Luis Obispo	Grapes, Wine ($166.4) Berries, Strawberries, Fresh Market ($63.6) Broccoli, Unspecified ($60.2)
Santa Barbara	Berries, Strawberries, Fresh Market ($299.4) Broccoli, Unspecified ($149.9) Grapes, Wine ($137.4)
Santa Cruz	Berries, Strawberries, Fresh Market ($172.6) Berries, Raspberries ($104.3) Flowers Cut, Unspecified ($60.0)

Source: California Agricultural Resource Directory, 2010 to 2011.

A key component to the success of both small and large farmers in the region is the connectivity and condition of railways and local roads that connect crop production locations with major state routes and U.S. 101. Therefore, it is necessary that all the major arteries carrying goods to and from crop production locations (such as U.S. 101, SR 46, SR 129, SR 152, and SR 156) and the last-mile roads and railways are maintained to support efficient delivery and shipment of goods.

Manufacturing

Manufacturing also is a key and diverse industry in the region. Food manufacturing is a particularly important component of manufacturing in the region, given that it is a major region for crop production. Figure ES.2 below highlights key food manufacturing locations. The food manufacturing locations are generally in the same regions as the crop production locations: in the Salinas Valley, along the northern U.S. 101 corridor, near Santa Maria, and in eastern Santa Barbara County (near the City of Santa Barbara).

Figure ES.2 Food Manufacturing Locations

Source: ESRI Business Analyst Data, mapped by Cambridge Systematics.

In Monterey County, manufacturing activity is concentrated in nondurable goods, specifically food manufacturing and beverage/tobacco product manufacturing (a category that includes wine production). When taken together, in 2009 these two industries produced $209 million in earnings in Monterey County, or about one-half the total manufacturing industry earnings for the County. By contrast, in Santa Barbara and Santa Cruz Counties, manufacturing earnings are associated with the production of durable goods, especially

computer and electronic products. This sector accounted for $415 million in earnings for Santa Barbara County (40 percent of total manufacturing earnings), and nearly $146 million for Santa Cruz County in 2009 (40 percent of the total). In San Luis Obispo County, manufacturing makes up 6 percent of total economic activity, which makes it a significant contributor to the local economy.

A key component of the truck transportation and warehousing industry in this agricultural region are coolers, an example of which is shown in Figure ES.3. These coolers store farm-fresh produce until truck operators from clients pick up the loads and deliver them to grocery stores and other outlets throughout the country and the world. Coolers are located throughout the region, but are clustered in and around the Salinas Valley, San Luis Obispo region, and the Santa Maria region. A key concern raised in interviews for some coolers was the lack of adequate truck parking (both at the coolers and in the region as a whole), especially during harvest season.

Figure ES.3 Ocean Mist Cooler Production Line, Castroville, California

Truck Transportation and Warehousing

Transportation and Warehousing is also a key freight industry in the region, as it is responsible for moving goods for a variety of industries. This industry is responsible for the many steps of moving goods to and from retailers, and from farm to market. For example, some trucks are required to bring goods to coolers. Larger trucking firms pick up goods from coolers and ship them to a variety of destinations. For the retail industry, trucks bring goods to the region from major ports or from major urban centers where warehouses are located.

Truck transportation and warehousing facilities are concentrated near cities and near key crop production and food manufacturing locations. Key clusters are in the Salinas Valley, near Hollister, around Santa Cruz, along U.S. 101 in Monterey

County, near Paso Robles, near San Luis Obispo, near Santa Maria, and near Santa Barbara.

Regional Freight System and Commodity Flow Overview

There are several critical U.S. and state highways that provide connectivity from the study region to the rest of the State and nation. The primary artery running north-south through the region is U.S. 101, which provides direct connectivity to major markets and intermodal facilities in the Los Angeles and San Francisco Bay Area regions. Interviews with truck operators in the region revealed that congestion and other issues on U.S. 101, especially in the Santa Barbara, Atascadero, and Prunedale regions, are some of the region's most pressing concerns.

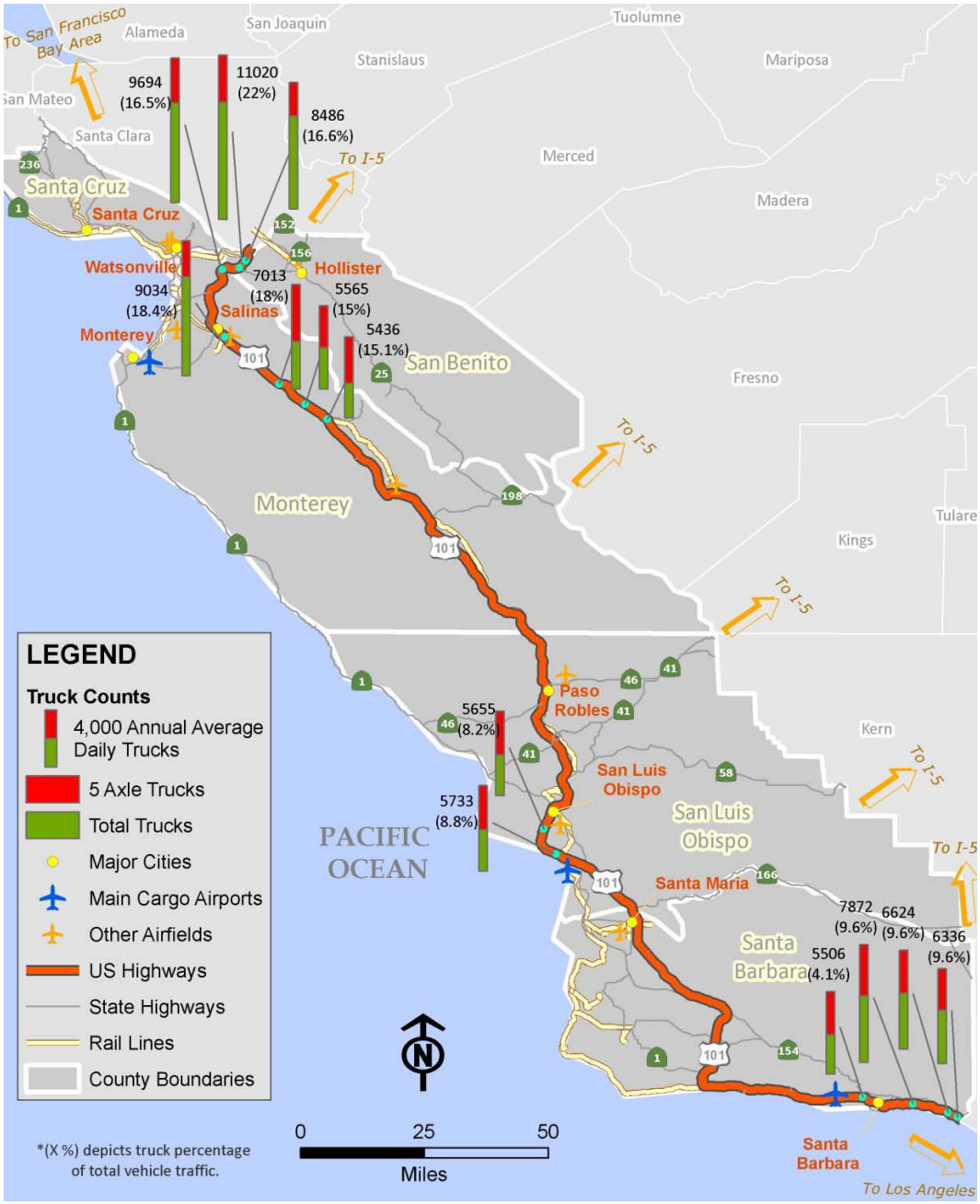
When reviewing truck count information, as shown below in Figure ES.4, it is easy to see why U.S. 101 is so important – it carries, by far, the most traffic of any freeway in the region. All of the truck count locations in the figure have at least 5,500 total trucks per day, of which an average of 8 to 15 percent are heavy-duty trucks (five-axles or more). The peak truck location is just north of Salinas on U.S. 101, which sees 11,020 trucks per day – of which 22 percent are heavy-duty trucks. Appendix D provides further county-by-county mapping of truck counts data.

The Salinas, Atascadero/San Luis Obispo, and City of Santa Barbara portions of U.S. 101 are seeing increases in traffic as population grows. As a result, congestion mitigation strategies for this key corridor should focus on urban areas and strategies to reduce congestion after accidents and peak harvest season.

In addition, a variety of critical east-west highways (such as SR 156/152, SR 41/46, SR 1, SR 129, SR 58, and SR 166) connect the region with Interstate 5 in California's Central Valley, which is a key highway in the national freight network. Currently, connections to the Central Valley mainly consist of two-lane highways, such as SR 41, SR 46, SR 166, and others. Considering the importance of the Central Valley as a trading partner for the region and the potential of increased freight traffic, east-west corridor capacity expansion is recommended.

The Central Coast region also is served by one Class I railroad, Union Pacific (UP), and by the shortline Santa Maria Valley Railroad (SMVRR). Railroads in the region tend to move goods, such as lumber, coal, construction materials, fertilizer, and steel, as well as a variety of other goods. The UP Class I line also is used as a place for UP to store boxcars. Amtrak shares the track with UP for its Coast Starlight service, which connects California with Washington State.

Figure ES.4 Top 10 Regional Truck Count Locations
2009; Five-Axle Trucks, All Truck Types



Source: Caltrans 2009 Truck Counts, Caltrans web site: http://traffic-counts.dot.ca.gov/index.htm; map prepared by Cambridge Systematics.

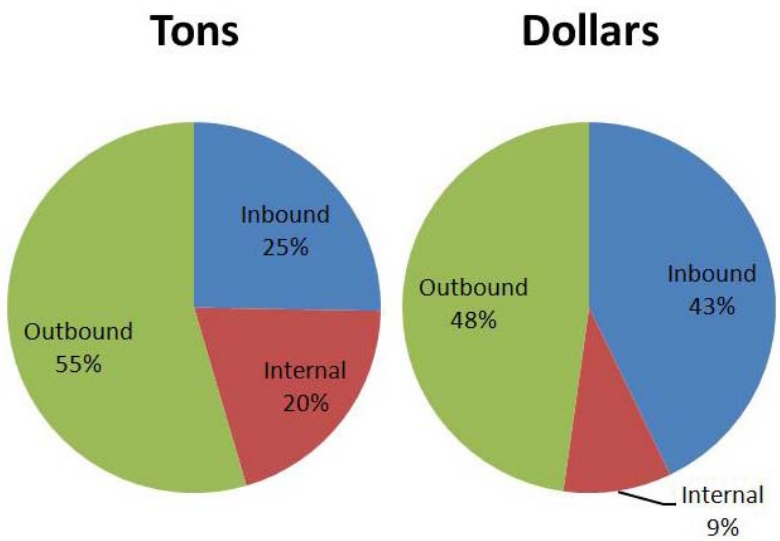
Airfreight is a small component of regional freight movement, with less than one percent of total regional tonnage and approximately two percent of total regional value of freight moving by air. Freight moving by air tends to be focused on time-sensitive, high-value freight, such as specialized fruits, vegetables and machinery.

Commodity Flows

In 2007, more than 63 million tons of freight, worth approximately $50 billion, was transported into, out of, and within the Central Coast region. The majority of these goods, in terms of total tonnage, were moved by trucks (82 percent), followed by pipeline (14 percent), and rail (4 percent). Air and marine movements made up less than 1 percent each of total regional freight tonnage. As the regional, domestic, and national economies begin to recover, exports will continue to grow, while moderate growth of the local population also should create increased local freight demand.

Figure ES.5 highlights the shares of regional freight by movement type – inbound, outbound, or internal. As these pie charts demonstrate, the Central Coast region is a net exporter of goods, particularly as measured by weight. Outbound shipments (i.e., the products of local industry) accounted for 55 percent of total freight volume (about 33 million tons) and 48 percent of total value ($21 billion) in 2007. Inbound shipments accounted for one-quarter of total freight by weight (about 15 million tons) and 43 percent by value ($19 billion). The remaining freight was moving within the five-county area; these shipments totaled 12.1 million tons with a value of about $4.2 billion.

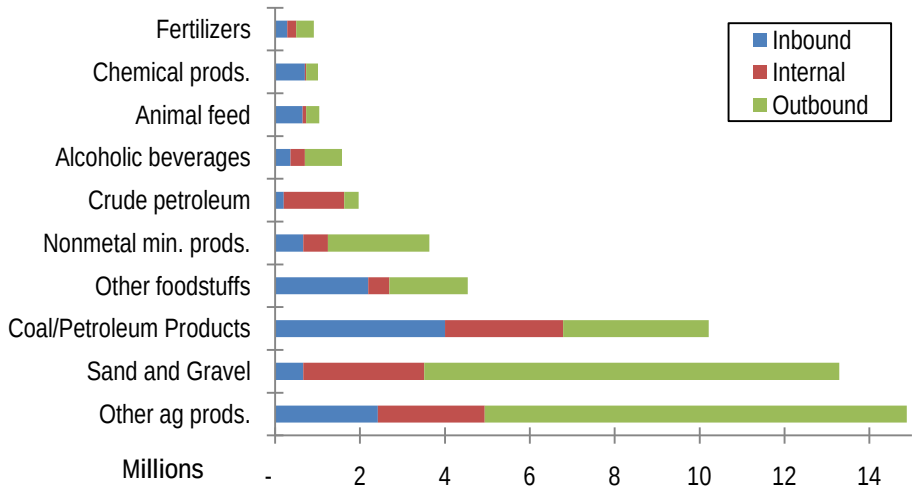
Figure ES.5 Total Freight Flows by Type of Movement
2007



Source: Cambridge Systematics analysis of Freight Analysis Framework (FAF) 2 and IMPLAN data.

The mix of commodities moving to, from, and within the Central Coast region is dominated by products that reflect the region's industry makeup. Figure ES.6 shows the top 10 commodities by weight and movement type for the five-county area. 'Other agricultural product' (a category that includes all fruits, vegetables, and field crops) is the largest commodity group by shipment weight, accounting for 14.9 million tons in 2007, or one-quarter of the total. It also is noteworthy that most of these shipments are outbound, which reflects the region's importance as a food provider for California and the U.S. In fact, the products associated with the region's agricultural sector – including other agricultural products, foodstuffs, alcoholic beverages, and animal feed – account for 38 percent of total freight volume. Employment and earnings in farming, manufacturing, and wholesale trade are all driven to some extent by the Central Coast region's agriculture sector.

Figure ES.6 Top 10 Domestic Commodities by Movement Type
2007; In Millions of Tons



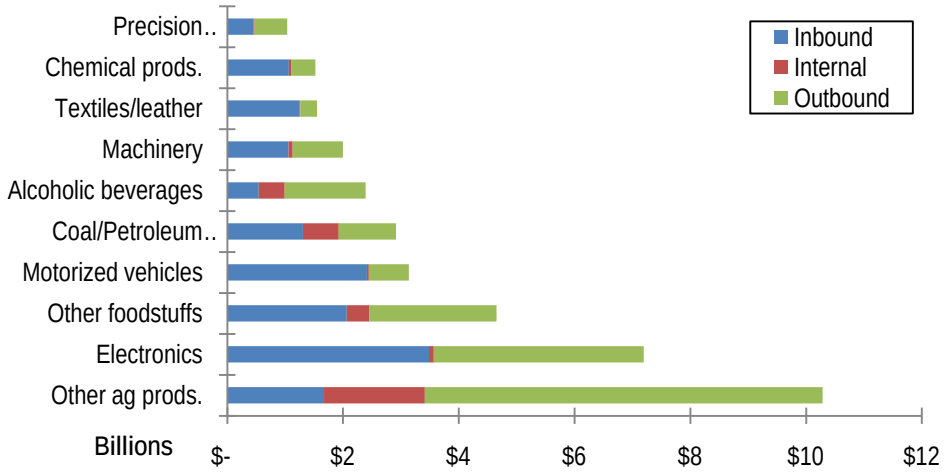
Source: Cambridge Systematics analysis of FAF2 and IMPLAN data.

Other important commodities include construction-related materials, such as sand and gravel (13.3 million tons, or 22 percent of the total) and nonmetallic mineral products (3.6 million tons, or 6 percent of the total). Like agricultural products, these commodities tend to be exported from the region. This highlights the fact that although sand/gravel and mineral products do not account for a large share of the region's employment or earnings, they are a significant generator of freight on area roads and railways. Energy-related commodities, such as crude petroleum and coal and petroleum products (most of which move by pipeline or rail), make up much of the rest of the area's freight volume.

As highlighted in Figure ES.7, the commodity mix is more diverse when measured by value. Agricultural products are still the dominant commodity group by value – they totaled $10.3 billion in 2007, of which more than $6 billion

was outbound from the region. Other foodstuffs and alcoholic beverages – both of which are closely related to agriculture – totaled $4.7 billion and $2.4 billion, respectively. If all of the typical agriculture, farm, and food-related products in the region are combined, such as livestock, cereal grains, and milled grain that are not present in the top 10, they comprise 42 percent of total shipment value.

Figure ES.7 Top 10 Domestic Commodities by Movement Type
2007; In Billions of Dollars



Source: Cambridge Systematics analysis of FAF2 and IMPLAN data.

Electronics are the second largest commodity by value at $7.2 billion (16 percent of the total). These are fairly balanced between inbound and outbound shipments. Motorized vehicles ($3.1 billion), machinery ($2 billion), and precision instruments ($1 billion) also are examples of high-value commodities moving to, from, and within the Central Coast region. The region does have some specialized production in computer and electronics, especially in Santa Barbara and Santa Cruz Counties. Almost 5,000 people were employed in computer and electronics manufacturing in these two counties in 2009.[5] In 2008, this industry accounted for more than one-third of total manufacturing earnings for the two counties.

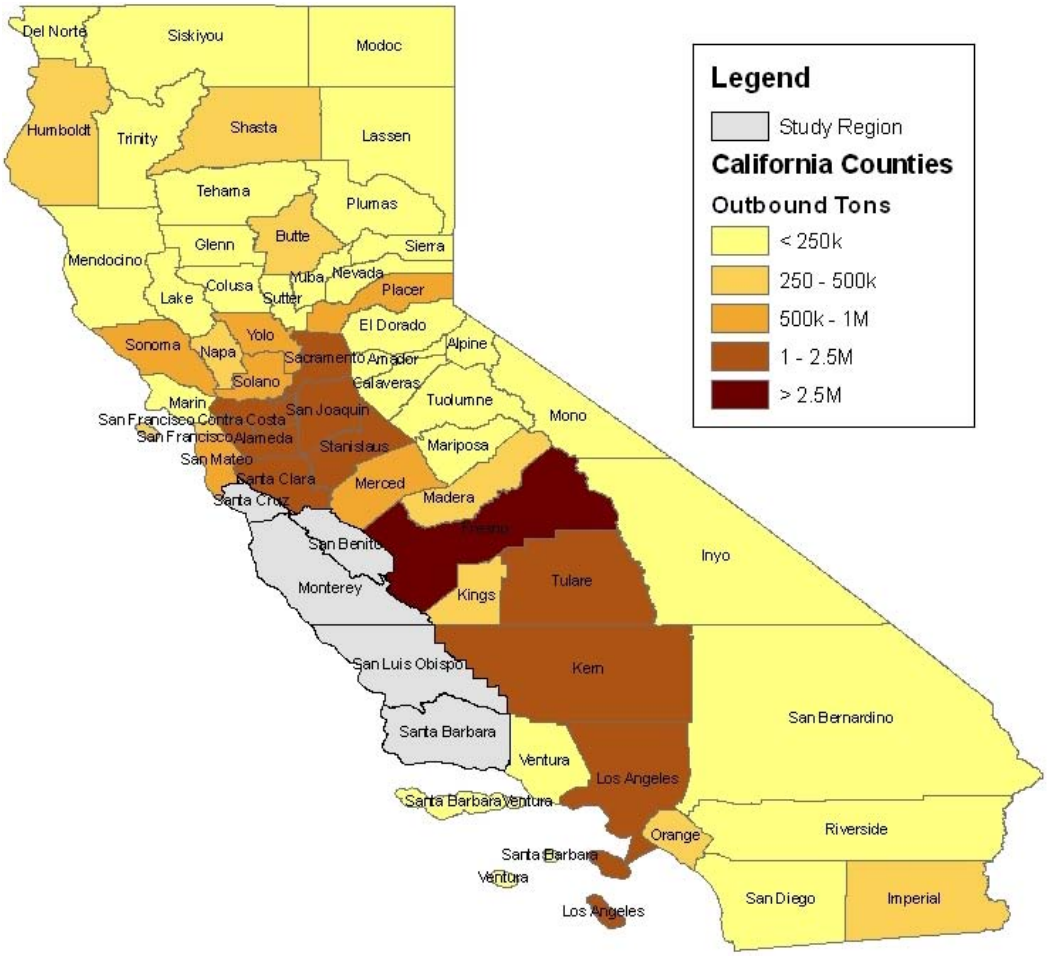
The bulk of the Central Coast region's freight is either coming from or heading to other parts of California.[6] In 2007, 78 percent (by weight) and 62 percent (by value) of shipments to and from the area originated or terminated in other

[5] U.S. Department of Labor, Bureau of Labor Statistics, Quarterly Census of Employment and Wages.

[6] The next top five trading partners after California are Asia (3.0 percent), Oregon (2.7 percent), Canada (1.1 percent), Arizona (1.0 percent), and Texas (0.9 percent).

California counties. This amounted to more than 37 million tons valued at about $25 billion. The primary drivers of these shipments are agriculture/farm/food products; construction materials (sand/gravel and nonmetallic minerals); energy products (coal/petroleum products, crude petroleum, and natural gas); electronics; and motorized vehicles. Figure ES.8 shows the outbound freight moved from the Central Coast region to other counties in California in 2007.

Figure ES.8 Outbound Shipments to the Rest of California
2007; In Tons



Source: Cambridge Systematics analysis of FAF2 and IMPLAN data.

When looking at inbound (see Appendix C, Figure C.11) and outbound (Figure ES.8) shipment destinations within California, it becomes evident that counties in the Central Valley are very significant trading partners. Fresno, Kern, Tulare, and Merced Counties are all major trading partners for both imports and exports.

This review of key trading partners highlights the importance of the region's main east-west connectors, including SR 156, SR 46/41, and SR 58. In addition, since Oregon and Arizona are key out-of-state trading partners, it is critical for

the region to have access to major interstates such as I-5. The east-west connectors above, as well as U.S. 101, provide this access.

Recommendations to Improve the Effectiveness of the Freight System

There are several strategies/actions that the study team recommends based on the feedback received through private and public sector interviews; analysis of the Central Coast goods movement system; and through discussions with the Freight Action Strategy Taskforce (FAST). These overarching actions are highlighted below.

Develop a Prioritized List of Freight Projects

The FAST group should conduct a regular assessment (perhaps every two years) of "Priority Freight Projects" for the region. Taking proactive steps to define freight priorities and develop project concepts and cost estimates will provide the region with an advantage when applying for funding opportunities. In addition, being able to highlight that a proactive, regionwide effort was undertaken to prioritize freight projects also may increase chances for funding when applying for Federal or state monies.

During this study, the process in Figure ES.9 was fully implemented, starting with 70 stakeholder interviews involving 48 private sector and 22 public sector stakeholders across the Central Coast region. The study team received detailed input from various sources regarding key problem areas on the regional freight network, key policy issues at the state or regional level, and key improvements necessary, as well as other items of note.

In Chapter 5 of this report, Table 5.1 highlights key issues by county on the freight system.

Through the ranking of the issues, further analysis by the study team, and through final consideration at the public FAST workshop in June 2011, projects were outlined at a high level to address the highest priority issues. Table ES.3 below summarizes the prioritized issues and projects that resulted from this process.

Figure ES.9 Process Used to Develop List of Prioritized Unfunded Freight Projects

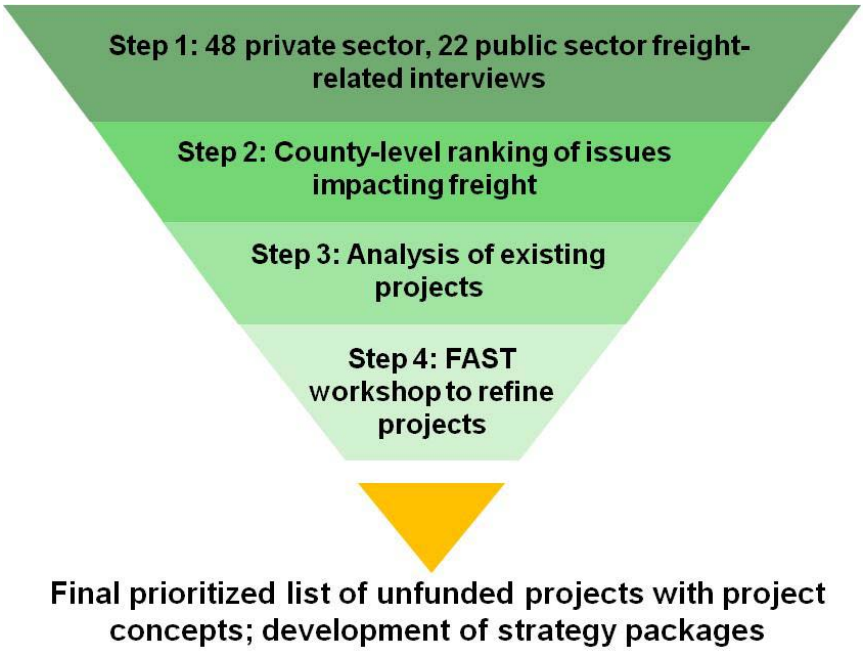


Table ES.3 Prioritized Issues/Projects without Funding Allocated

County	Top Prioritized Freight Issues/Projects by County
Monterey	• San Juan Interchange Project on U.S. 101. • Artichoke Avenue Improvements (SR 1/183 IC specifically). • SR 156 West Widening.
San Benito	• SR 152 Corridor Improvements (pending study completion). • SR 25 Widening project. • SR 156 Improvement project.
San Luis Obispo	• SR 46 East – Airport Rd Intersection experiences congestion – interchange improvements required. • SR 1 through Oceano congestion; SR 1 from Pismo to SB County line congestion – road/operational improvements required.
Santa Barbara	• U.S. 101 peak-period traffic congestion from Carpinteria through Goleta. • Recommended Los Angeles to San Diego (LOSSAN) rail improvement projects to UP line (see Chapter 4). • Main Street in Santa Maria experiences congestion – spot improvements to alleviate this congestion possible. • Overnight truck parking facility in SB County.

County	Top Prioritized Freight Issues/Projects by County
Santa Cruz	• SR 1 between Santa Cruz and Aptos experiences congestion. SR 1 high-occupancy vehicle (HOV) lanes project is proposed, but $500 million in construction costs not funded. • SR 17 north of Santa Cruz experiences congestion and has been designated a safety corridor. Truck climbing lane has been determined infeasible, but issues persist. • SR 129 between U.S. 101 and SR 1 experiences congestion; effort to designate this as a safety corridor.

Enhanced Connections to the California Central Valley

Moreover, based on the above process, there was significant support by the FAST participants to support future enhancements to the connections between U.S. 101 and the California Central Valley. In the north region, this includes support for the SR 152 Trade Corridor Project and tracking user satisfaction (shippers/ carriers in the Central Coast region) with the eventual improvements. In the south, for SR 46, it is recommended that expansion to a four-lane highway for the full route from U.S. 101 to I-5 be considered to support the efficient movement of freight to and from the Central Coast and Central Valley. The long-term goal here is to create two near-interstate quality, four-lane divided highways to serve the region:

- Enhanced SR 152 for connecting the North Central Coast to the North Central Valley/I-5; and
- Enhanced SR 46 (with potential expansion of four lanes to the SR 41/I-5 segment) for connecting the South Central Coast to the South Central Valley/ I-5.

Efforts are underway to make both of these recommendations reality.

New Thinking on Truck Parking Solutions

To counteract these truck parking-related issues, the following items are recommended for the Central Coast region:

- Two truck parking facilities are recommended (one in western Santa Barbara County to alleviate truck parking needs, and one just south of Salinas), which could be used by agriculture shippers waiting for their orders to be ready for pickup at coolers.
- Major freight locations, such as coolers, should be equipped with appointment systems. From the interviews, several cooling facilities mentioned that they were able to mitigate the truck parking issue near their facilities by requiring carriers to schedule time in advance to pick up their goods.

- To mitigate emissions and noise pollution, it is suggested that truck operators acquire auxiliary power units to use while at truck parking facilities. This has both positive economic benefits for truck operators (reduced fuel consumption since no idling will be required) and for the surrounding environment (reduced emissions and noise).

Improved Intermodal Rail Opportunities

The *Salinas Valley Truck to Rail Intermodal Facility Feasibility Study* recommends construction of a truck to rail intermodal facility in the Salinas Valley, either in Gonzales or Chualar. Such a facility would make it possible to ship agricultural products (and other products) from the Salinas Valley to destinations on the East Coast. Currently, most agricultural goods and manufactured food products leave the Salinas Valley by truck, creating high levels of congestion on local roads in and around Salinas and on U.S. 101. Moving some of these goods out of the region by train would reduce congestion on local roads by at least 10 percent. In turn, other goods that are imported by truck from the East Coast could be brought directly to the region by rail.

Maintain Focus on Improving/Maintaining U.S. 101 For Freight Movements

Data and interviews presented in this document highlight the importance of U.S. 101 to regional businesses. Truck counts on U.S. 101 exceed all the other highways by far, and it connects the region to two major metropolitan markets (Southern California and San Francisco Bay regions). In short, U.S. 101 is the region's single most valuable goods movement asset. Already, the region has prioritized U.S. 101 through the creation of the *U.S. 101 Central Coast Coalition*. It is important to continue to prioritize U.S. 101 as the key regional route, while also improving other connections (such as the east-west connections).

Develop and Implement a Framework to Evaluate Regional Freight Issues/Projects Objectively

One of the key tasks that the FAST can do to help secure funding for key freight projects is prioritization of regional issues and projects. In this study, a framework is suggested for evaluation of regional freight projects.

Recommendations for Potential Freight System Performance Metrics

Along with understanding key issues in the region, it is also important that the FAST and regional freight stakeholders are aware of ongoing performance of the regional freight system. Measurement of freight system performance over time will allow stakeholders to become aware of trends that may require action. Freight performance measurement also will help stakeholders understand where the greatest investment needs are. This report provides a starter list of

performance metrics that could be tracked in a more rural region such as the Central Coast.

Recommendation for a Regionwide Truck Count and Classification Program

One of the key data deficiencies is a comprehensive, regionwide truck count program that makes it possible to determine key local and regional truck routes. Some physical truck count locations exist on key highways, such as U.S. 101 and SR 46, but it is important to get additional data about truck counts and classification on local and other less traveled roads. These counts are required in order to help the region prioritize freight investments.

It is recommended that the FAST move forward to pursue a regionwide truck count and classification program. It is recommended that the FAST and the region pursue such a strategy to get a better understanding about what roads are critical to goods movement and local industries. This would require truck count measurement around key freight drivers, such as coolers, distribution centers, retail hubs, and other areas. Decisions about how to manage the program, how often to count, and what technology to use are important questions that the FAST group will need to come to a consensus on.

Reformulate the Structure and Objectives of the FAST

The Central Coast region has already taken steps to organize itself through development of the FAST group. This group brings together key private and public sector stakeholders in the region to address regional freight issues. Members include representatives from local and regional government agencies, carriers, shippers, and other interest groups in the freight community. The FAST group should be considered by all participating agencies and counties as the primary freight transportation public-private advisory group in the Central Coast region.

The study team conducted a series of case studies of several freight partnerships analogous to the FAST, including the International Mobility and Trade Corridor (Whatcom County, Washington, and Surrey, British Columbia); the Coast Rail Coordinating Council (Central Coast, California); and the Delaware Valley Goods Movement Task Force (Eastern Pennsylvania). In addition, the new U.S. 101 Central Coast Coalition also was considered.

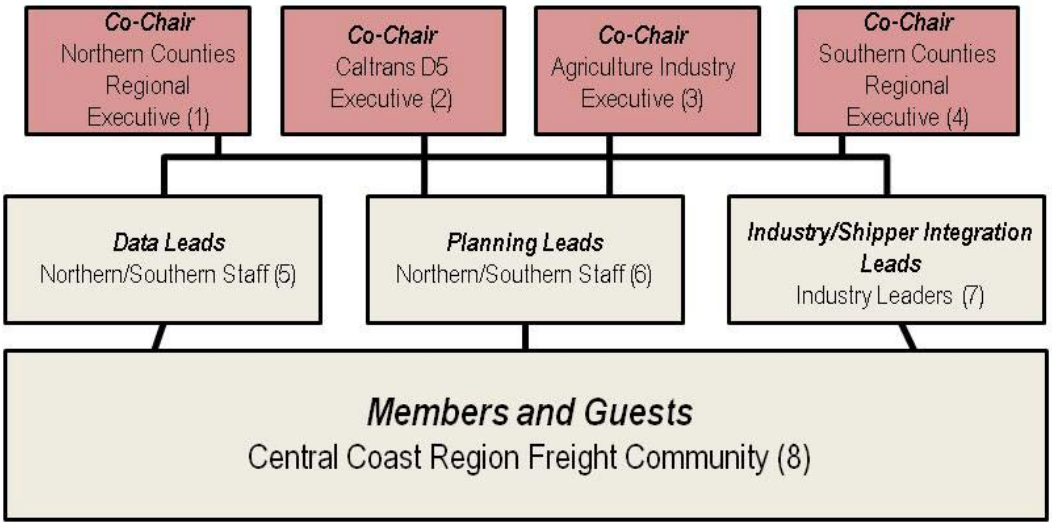
The results of these assessments guided the development of the following recommendations:

- The first step that should be taken is to develop a clear purpose and definition of the FAST group. For example, what are the goals of the FAST group, taking into account regional freight needs, deficiencies, and potential improvements?

- Secondly, a freight program should be developed to guide the activities of the FAST group. Based on the case studies developed in this report, the study team recommends the following three areas for this program: 1) a regional "Freight Planning Process", 2) "Education and Outreach" program, and 3) development of "Quick Start Action Items."
- Thirdly, it is recommended that the FAST group adapt an organizational structure similar to the one utilized by the Delaware Valley Goods Movement Task Force. However, there should be one additional geographical division between the north (Monterey, San Benito, and Santa Cruz Counties) and the south (San Luis Obispo and Santa Barbara Counties).

Figure ES.10 depicts our suggested organizational structure.

Figure ES.10Suggested FAST Organizational Structure



Given the size of the region, it is suggested that the group be broken into two areas: north (Monterey, San Benito, and Santa Cruz) and south (San Luis Obispo and Santa Barbara). There should be a total of approximately four meetings a year, with one annual meeting bringing together both the north and south groups, and three separate meetings each per year for both the north the south groups. A FAST web site should be developed and maintained to facilitate communications and outreach.

Develop Strategic Partnerships with Regional Trading Partners

Considering that the Central Valley and the Central Coast regions trade heavily with one another, the need for better infrastructure to connect the regions, and the Central Coast's need to get goods effectively to Interstate 5 for out-of-state trading, it is recommended that the FAST seek strategic partnerships with government agencies in the Central Valley to promote projects of mutual interest. One example of an existing partnership like this is the Memorandum of

Understanding (MOU) between San Luis Obispo Council of Governments (SLOCOG) and Kern COG, which has supported the prioritization of widening SR 46.

Future Funding Opportunities

The Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users (SAFETEA-LU) is currently operating on a short-term extension. This was initially scheduled to operate between fiscal years 2005 to 2009, but has been operating on short-term extensions since 2009. As of early November 2011, the Senate Environment and Public Works Committee released a 600-page bill for markup, titled MAP-21, "Moving Ahead for the 21st Century", to start the process to put in place long-term surface transportation reauthorization. Given the lame-duck nature of SAFETEA-LU, and the uncertainty over the status of reauthorization, there is significant uncertainty regarding the nature of future Federal funding programs that may be available to fund new freight transportation projects in the Central Coast region.

In terms of local and regional funding options, the study team has assessed a number of revenue-generating strategies that might be considered to support freight projects in the Central Coast region. Highlights include the following:

- **Self-Help Counties (Sales Tax).** Self-help counties passed local transportation sales tax measures to help fund critical regional transportation projects. Passage of this measure requires two-thirds of voters in the county to approve.
- **Special Districts or Assessment Districts.** Assessment districts can be formed in a county or city to help fund specific transportation projects. For example, the City of Salinas could be a part of an assessment district to help pay for intermodal access improvements in the City.
- **Cooling Facility Truck Trip Tax.** Considering that agricultural truck movements make up a large proportion of the region's truck trips, which contribute significantly to local and regional road wear and tear, one option is to require trucks to pay a fee when delivering and/or picking up goods from cooling facilities. For example, the fee could be levied on the coolers, which could pass the tax on to shippers/carriers. Proceeds from the fee could be used for maintaining and upgrading highway and local roads that are critical to the agriculture industry.
- **Industry Harvest Tax.** The industry harvest tax would levy a tax on the sales of harvested goods, such as agricultural crops in the region. It can be argued that these industries are heavy users of the road network, and additional maintenance or improvements to support freight would benefit the agriculture industry as a whole.
- **Public-Private Partnerships.** In a public-private partnership, the public and private sectors work cooperatively in the planning, financing, and construction of development projects adjacent to and integrated with

transportation facilities. There are many types of public-private partnerships that could be pursued to provide benefits to both the public and private sector. Most of the successful attempts are focused on rail projects, considering that the railroads are private entities.

1.0 Introduction

The economy and quality of life in the Central Coast region of California (including Santa Cruz, Monterey, San Benito, San Luis Obispo, and Santa Barbara Counties) are highly dependent on the ability of shippers to move goods in a safe, efficient, and cost-effective manner. Whether it is the regionally dominant agriculture sector requiring efficient routes and intermodal connections to move goods to coolers and out of State; or whether it is the tourism industry's need for goods to satisfy customers, major regional industries rely on timely and effective delivery of goods on the freight system.

In 2008, regional freight-dependent industries, such as farming, retail trade, manufacturing, and construction alone, provided 25 percent of total regional jobs and contributed significantly to regional earnings.[7] In addition, the local population of the region is expected to grow at approximately 28 percent between 2010 and 2040, which should result in a corresponding increase in goods movement to support the needs of the regional population. Moreover, as outlined in Table 1.1, significant issues in freight movement in this region have been identified by stakeholders.

As a result of this demand for freight by both the local population and industries, a focus on enhancing the efficiency and safety of the region's goods movement system is critical to supporting the economic health of the region and the quality of life for its residents. To respond to this challenge, six major agencies across the five counties, comprising the California Central Coast region, have partnered with Caltrans to sponsor this study of freight flows, issues, and opportunities. The study region is highlighted in Figure 1.1. More specifically, this Central Coast Commercial Flows Study, which is a Caltrans Partnership Planning Grant, completes a freight movement picture for the five-county region. The study also highlights freight needs and deficiencies in the region, as well as recommendations to help the region address freight issues.

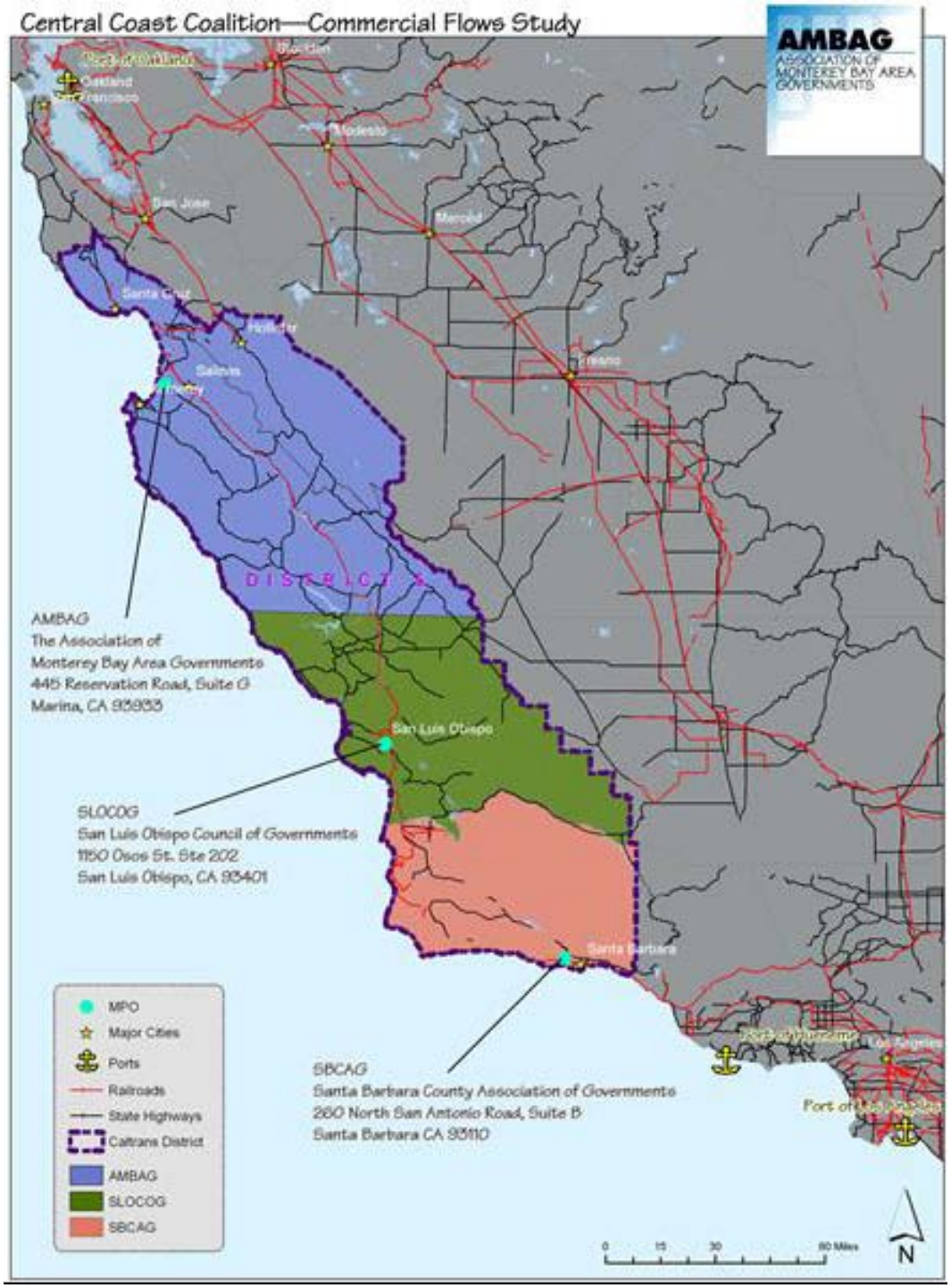
[7] Bureau of Economic Analysis.

Table 1.1 Selection of Key Freight Issues from Central Coast Stakeholders Prior to this Study[a]

Topics, Issues, and/or Needs
• Need to establish an analysis framework and a public-private task force to support the development of multimodal distribution centers and supporting infrastructure improvements.
• Need to establish a foundation of transportation and economic data to support development of goods movement strategies.
• Freight mobility concerns due to traffic congestion on Highway 101; multiple freight congestion issues in Watsonville and Salinas.
• Desire for increased use of rail to support exports of agricultural and other regional goods.
• Negative impacts on agricultural goods movements due to substantial congestion issues on Highways 1, 17, 29, 156, 152, and 25 (and including U.S. Highway 101).
• Interest in freight logistics facilities and infrastructure.
• Freight congestion concerns regarding agricultural movements (e.g., wineries in Paso Robles/Highway 46; Oceano region produce/Highway 1).
• Truck safety concerns regarding the Highway 46-41 connections to I-5 and Highway 99 in the Central Valley.
• Truck route congestion impacted by growth of Santa Maria region.
• Framework needed to support coordination of central coast goods movement strategies among the five Central Coast counties and various planning organizations.
• Need for improved truck parking facilities, both for long haul truckers and near coolers
• Need for improved connections between the Central Coast region and the Central Valley (U.S. 101 to I-5)

[a] There is a variety of freight-related issues that this study seeks to address and help mitigate. Several key issues were identified by regional stakeholders at the outset of this study, which helped initiate this study. There were 70 stakeholder interviews conducted by the study team to get a more comprehensive understanding of freight issues in the region. Key issues that were identified are highlighted in Table 1.1.

Figure 1.1 Central Coast Coalition – Goods Movement Study



In support of this study and to further address regional freight issues over the long term, Freight Action Strategy Taskforce (FAST) was created. The FAST partnership, which includes both public and private participants, has been critical in providing the study team with information and contacts to better understand freight movement in the region. Moving forward, the FAST will be critical in advocating and analyzing improvements to the regional freight system. Overseeing the FAST is a Steering Committee consisting of representatives from the following regional organizations:

- Association of Monterey Bay Area Governments (AMBAG);
- Caltrans District 5;
- Santa Cruz County Regional Transportation Commission (SCCRTC);
- Council of San Benito County Governments (SBCOG);
- Transportation Agency for Monterey County (TAMC);
- San Luis Obispo Council of Governments (SLOCOG); and
- Santa Barbara County Association of Governments (SBCAG).

This Steering Committee also has provided oversight and guidance for this study. The study is organized into the following sections:

- **Chapter 2** presents overview of regional high-level population and economic trends that impact freight flows. Further county-specific discussion can be found in **Appendix A**.
- **Chapter 3** highlights the economy of the region from the perspective of key freight-dependent industries, and highlights the importance of an effective freight system to these industries.
- **Chapter 4** presents an overview of the regional freight system by mode. In addition, this chapter presents an overview of commodity flows in the region. A more comprehensive overview of commodity flows and background information on the data can be found in **Appendices A and C**.
- **Chapter 5** highlights key freight issues in the Central Coast region, as determined through interviews of stakeholders. This chapter also includes key regional concerns that negatively impact freight.
- **Chapter 6** offers key recommendations to help the region plan for a more effective freight system. This includes recommendations of key projects to pursue to improve how freight moves through the region, both through system/infrastructure improvements, improved data collection/analysis, as well as through recommended organizational changes.
- **Appendix A** provides an overview of economic and commodity flow data, and an overview of the freight system at the county level.

- **Appendix B** presents an overview of a tool that was developed for this project, which allows planners to estimate additional freight trips as a result of new development.
- **Appendix C** is a technical memorandum prepared for this study to explain the freight flow data, and to provide further commodity flow analysis.
- **Appendix D** presents the county-level truck count maps.

2.0 Regional Population and Economic Trends

Freight movements in the California Central Coast region are shaped by a variety of factors, including population, demographic and economic trends, and the characteristics of the region's multimodal freight infrastructure. This section provides a brief overview of the Central Coast's population growth and economic trends.

Note: Appendix A provides further detail on these topics at the county level.

2.1 POPULATION TRENDS

Population is a key driver of freight demand in a region, since the rate of growth or decline of the population (as well as socioeconomic characteristics, which will be described in the next section) impacts the volume of goods shipments required for consumption by local residents. The population of the five-county Central Coast region of California was approximately 1.4 million in 2010.[8] This is approximately the same population as the City of Sacramento. It is important to note that while population characteristics are one driver of freight demand in the Central Coast region, there are other forces that shape the region's freight demand. Foremost among these is the external demand of products produced in the region, such as shipments of a wide variety of agricultural products to other regions of California and the rest of the nation.

Population Growth: 2000 to 2010

Table 2.1 shows the Central Coast region's population by county in 2000 and 2010, with absolute and percentage changes for each county, the five-county region, and California as a whole.

[8] California Department of Finance, California State Data Center.

Table 2.1 Central Coast California Population by County
2000 and 2010

County	Population 2000	Population 2010	Absolute Change	Percent Change
Monterey County	401,762	415,057	13,295	3.3%
San Benito County	53,234	55,269	2,035	3.8%
San Luis Obispo County	246,681	269,637	22,956	9.3%
Santa Barbara County	399,347	423,895	24,548	6.1%
Santa Cruz County	255,602	262,382	6,780	2.7%
Total	1,356,626	1,426,240	69,614	5.1%
California Statewide	33,871,653	37,253,956	3,382,303	10.0%

Source: California Department of Finance, California State Data Center and the 2010 Census.

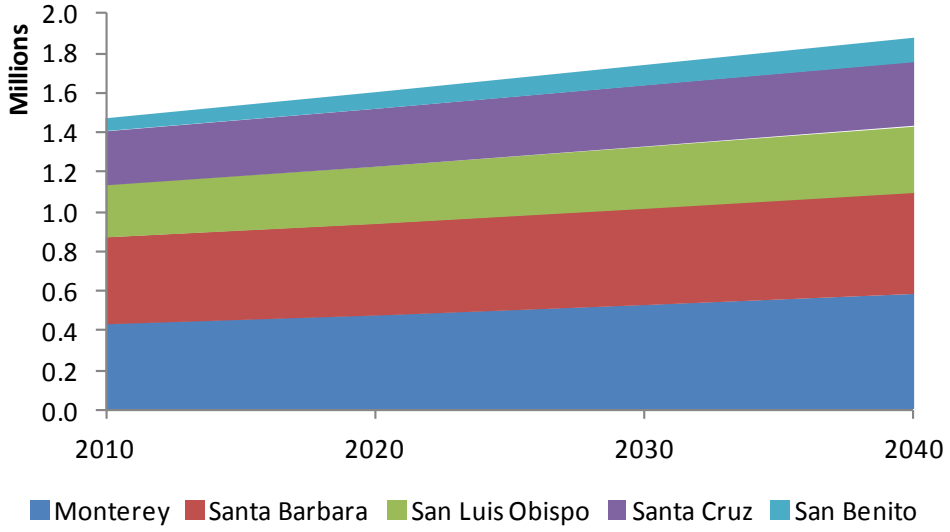
In total, the population of the five-county region grew by 5.1 percent from 2000 to 2010, or by nearly 70,000 people. This is somewhat slower than the State's overall population growth, which was 10 percent over the last decade (nearly 3.4 million people). From 2000 to 2010, much of California's growth was concentrated in the large coastal cities, the Inland Empire, and the Central Valley. Nonetheless, the Central Coast counties have exhibited steady growth in the last 10 years, a leading factor that is contributing to growth in regional freight demand. Other key takeaways include:

- In 2010, the largest counties in the study region by population were Santa Barbara and Monterey, followed by San Luis Obispo and Santa Cruz;
- Santa Barbara County's population grew quite rapidly over the last decade, expanding by 6.1 percent and surpassing Monterey County; and
- San Luis Obispo County's population grew by 9.3 percent from 2000 to 2010, the fastest growth of any county in the study region.

Population Growth: 2010 to 2040

Demographers from the California Department of Finance expect continued population growth in the region over the next few decades. As shown in Figure 2.1, the total population for the five counties is expected to reach about 1.9 million by 2040, an increase of nearly 30 percent from 2010. However, it needs to be noted that the projections in Figure 2.1 do not incorporate 2010 Census data into its projections.

Figure 2.1 Central Coast Population Growth Forecast by County
2010 to 2040



Source: California Department of Finance, California State Data Center.

Note: The forecast does not take into account 2010 actual Census figures, as it relies on the 2000 Census baseline for projections.

Through 2040, the following key population trends are expected:

- San Benito County is expected to grow the fastest, followed by Monterey and San Luis Obispo;
- Monterey County is expected to become the county with the highest population in the study area by 2040; and
- California's total population is expected to grow by 39 percent, to about 54 million people.

Although the Central Coast region is not expected to grow as fast as the rest of the State, it will still add approximately 400,000 new residents over the next three decades. This population growth will lead directly to more freight demand, more regional freight movement, and increasing numbers of trucks on regional roads.

2.2 REGIONAL ECONOMIC CHARACTERISTICS

Regional economic characteristics are another important driver of freight demand. A growing economy means growing incomes, which will lead to a greater demand for consumer goods and services. Therefore, the demand for freight transportation (and the modes that are used) is driven partially by the characteristics of the regional economy.

Employment Trends

Table 2.2 shows total employment for each county in the study region in 2009. Businesses in the Central Coast region provided a total of 782,000 jobs for area residents in 2009, many of which are logistics dependent:

Table 2.2 Total Employment by County *2009*

Monterey	219,364
San Benito	21,287
San Luis Obispo	149,430
Santa Barbara	252,803
Santa Cruz	139,279
Total	782,163

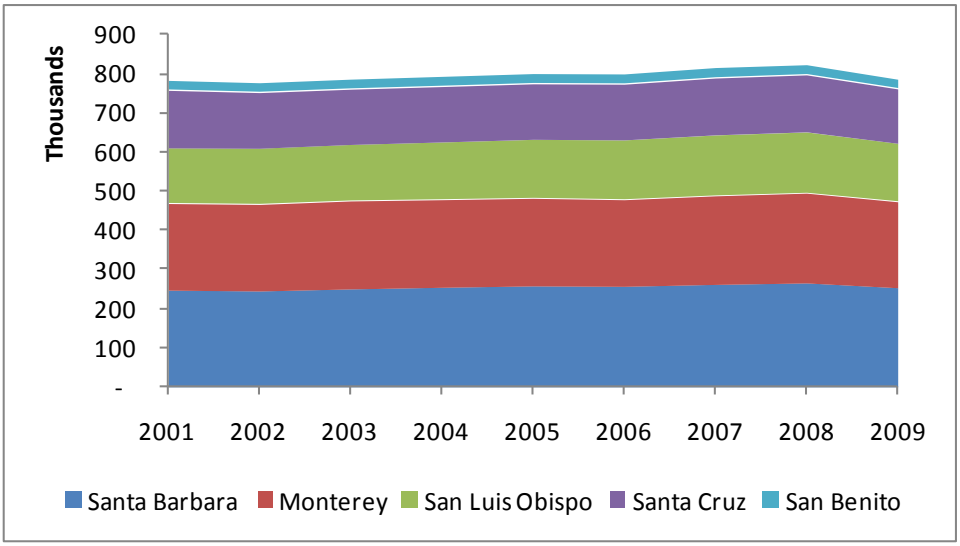
Source: Bureau of Economic Analysis.

Employment levels reflect population patterns, with Monterey and Santa Barbara Counties having the largest employment bases in 2009, followed by San Luis Obispo, Santa Cruz, and San Benito Counties.

As shown in Figure 2.2, total employment in the Central Coast region remained relatively stable during much of the last decade, but dropped slightly in 2009 as a direct result of the national recession. In addition:

- Total employment numbers increased by 5.7 percent from 2001 to 2008.
- However, 2009 total employment was nearly identical to 2001 employment.
- All five counties in the region lost jobs in 2009, including more than 12,000 positions in Santa Barbara County and nearly 10,000 jobs in Monterey County. Overall, the regional employment base contracted by 4.6 percent in 2009 (loss of 37,000 jobs).

Figure 2.2 Employment Trends by County
2001 to 2009



Source: Bureau of Economic Analysis.

Gross Regional Product Trends

Table 2.3 below highlights the gross regional product (GRP) by county. GRP is one way to measure the size of regional economic production, as it takes regional production, investment, and spending into account.[9] Santa Barbara and Monterey Counties are the largest economic engines in the Central Coast region at about $17.7 billion and $16.0 billion, respectively. Overall, the five-county Central Coast regional GRP was $53.8 billion in 2009.

[9] More specifically, GRP is defined as the market value of all final goods and services produced in a region in a given year, equal to total consumer, investment, and government spending, plus the value of exports minus the value of imports.

Table 2.3 Gross Regional Product by County
2009

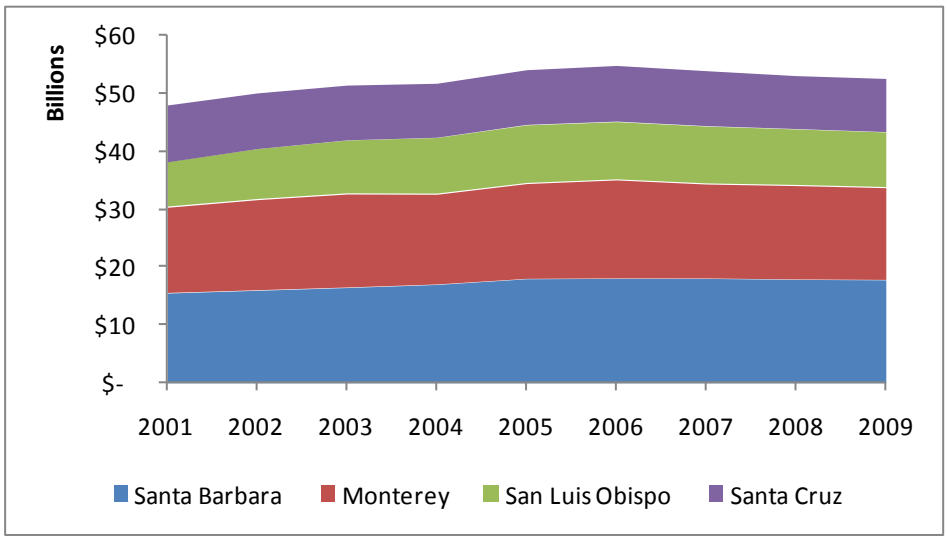
County	GRP
Santa Barbara	$17.7
Monterey	$16.0
San Luis Obispo	$9.6
Santa Cruz	$9.1
San Benito	$1.4
Total	$53.8

Sources: Bureau of Economic Analysis, IMPLAN (for San Benito County).

Figure 2.3 tracks historical GRP trends by county (time series data for San Benito County are not available). Overall, the region experienced a positive growth trajectory from 2001 to 2009, expanding from about $48 billion in 2001 to $52.4 billion in 2009. Other GRP trend highlights include the following:

- San Luis Obispo County and Santa Barbara County grew the fastest from 2001 to 2009 (by 23 percent and 15 percent, respectively).
- GRP for the four counties began to decline in 2007 and continued to drop through 2009 as the recession deepened. Of the counties for which data are available, only one – Santa Cruz – had positive GRP growth in 2009.
- Total regional GRP is higher than it was in 2001, and should continue to grow as the recovery gains momentum.

Figure 2.3 Historical Gross Regional Product by County
2001 to 2009 (in Chained 2005 Dollars)

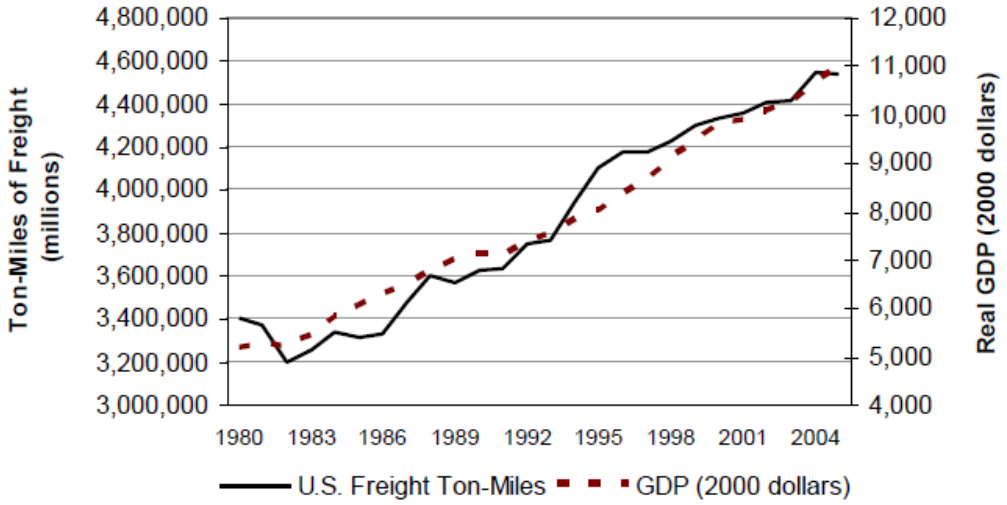


Source: Bureau of Economic Analysis. Historical data are not available for San Benito County.

2.3 IMPACT ON FREIGHT

The region's population and economic trends will impact freight demand in several ways. For example, there is a connection between GRP and freight volumes on regional roads. As depicted in Figure 2.4 below, freight volumes have followed GRP growth in the U.S., at least from 1980 through 2004. As a result of this expected increase in regional GRP, additional freight tonnage moving to, from, and within the Central Coast region is to be expected.

Figure 2.4 Relationship Between U.S. Freight Volumes and GDP
1980 to 2004



Source: Massachusetts Department of Transportation Freight Plan.

Assuming projected population growth materializes and assuming the economy recovers and continues moderate growth similar to the kind seen between 2001 and 2008, exports and imports to and from the region will continue to increase demand for freight movements. It is important for policy-makers and planners to be aware of such potential growth, and to address regional challenges that may be a result of growth. Chapter 3 highlights key regional industries that will be the primary drivers of freight, as they seek to meet local, domestic, and international demand of their goods.

3.0 Regional Industries and Freight Movement

A region's key industries – including its major businesses, their suppliers, the markets they serve, and their growth prospects – have a direct impact on the economic health of a region and on regional freight demand. An understanding of the key freight-dependent industries in the Central Coast region is critical to developing a system that meets industry and freight-system user needs. This chapter highlights key industries that contribute to the economic well-being of the Central Coast region, in terms of jobs created for residents by industry and GRP by industry. In addition, several freight-dependent industries are reviewed in more detail.

3.1 REGIONAL INDUSTRY OVERVIEW

Two key metrics commonly used to evaluate county and regional economic patterns are employment and GRP by industry. Employment levels often reflect the characteristics of an economy since the top industries tend to employ the most people. However, some industries that tend to employ fewer people are still key drivers of the regional economy, and may be especially relevant from a freight perspective.

Employment Levels by Industry

Table 3.1 presents the top 10 industries by employment in 2009 for each county in the Central Coast region. Industries highlighted in gray are those that could be considered "logistics dependent" (i.e., they rely heavily on the efficient movement of freight for their day-to-day operations). Each county has a mix of employment in both the goods-producing and service sector. The following are key takeaways from Table 3.1:

- **Government** is a key employer in the region – it is either the number one or number two employer in each county.
- **Retail trade** is also an important industry; it is one of the top four industries by employment for every county in the region.
- Other key goods-producing industries include forestry, fishing, and related activities (Monterey County); farming (Monterey, San Benito, and Santa Cruz Counties); manufacturing (San Benito and Santa Barbara Counties); and construction (all five counties).

Table 3.1 Top 10 Industries by Employment by County
2009

Monterey			San Benito[a]			San Luis Obispo			Santa Barbara			Santa Cruz[b]		
Industry	Employment	% of Total County Employment	Industry	Employment	% of Total County Employment	Industry	Employment	% of Total County Employment	Industry	Employment	% of Total County Employment	Industry	Employment	% of Total County Employment
Government and government enterprises	36,920	17%	Government and government enterprises	2,833	13%	Government and government enterprises	21,590	14%	Government and government enterprises	38,601	15%	Government and government enterprises	18,591	13%
Forestry, fishing, and related activities	27,471	13%	Manufacturing	2,763	13%	Retail trade	17,193	12%	Retail trade	23,720	9%	Retail trade	14,813	11%
Accommodation and food services	20,021	9%	Retail trade	2,237	11%	Accommodation and food services	15,014	10%	Health care and social assistance	22,701	9%	Health care and social assistance	14,622	10%
Retail trade	19,660	9%	Construction	1,567	7%	Health care and social assistance	13,791	9%	Professional, scientific, and technical services	21,257	8%	Professional, scientific, and technical services	11,557	8%
Health care and social assistance	15,548	7%	Other services, except public administration	1,276	6%	Professional, scientific, and technical services	11,073	7%	Accommodation and food services	21,157	8%	Accommodation and food services	10,360	7%
Farming	13,461	6%	Accommodation and food services	1,274	6%	Other services, except public administration	10,451	7%	Other services, except public administration	15,776	6%	Other services, except public administration	8,636	6%
Other services, except public administration	12,227	6%	Real estate and rental and leasing	1,215	6%	Construction	10,077	7%	Administrative and waste services	14,294	6%	Real estate and rental and leasing	7,550	5%
Professional, scientific, and technical services	11,593	5%	Farming	1,170	5%	Real estate and rental and leasing	8,626	6%	Manufacturing	13,320	5%	Farming	7,401	5%
Real estate and rental and leasing	8,843	4%	Health care and social assistance	1,107	5%	Administrative and waste services	7,031	5%	Construction	12,370	5%	Construction	7,121	5%
Construction	8,109	4%	Finance and insurance	943	4%	Finance and insurance	6,649	4%	Real estate and rental and leasing	12,130	5%	Administrative and waste services	6,773	5%
Other	45,511	21%	Other	4,902	23%	Other	27,935	19%	Other	57,477	23%	Other	31,855	23%
Total	219,364	100%	Total	21,287	100%	Total	149,430	100%	Total	252,803	100%	Total	139,279	100%

Source: Bureau of Economic Analysis.

Note: Fields in grey depict key logistics-/freight-dependent industries.

[a] Data are not available for forestry, fishing, and related; mining; utilities; transportation and warehousing; professional, scientific, and technical services; and management of companies and enterprises.

[b] Data are not available for forestry, fishing, and related; and mining.

- Most of the rest of the regional employment base is in the service sector, including accommodation and food services, health care, professional services, and real estate.

It is interesting to note that farming is not a top 10 industry by employment in any of the five counties, despite the fact that the region is a major agricultural center. This is likely due to the following several factors:

1. First, technological advances over the years have made farming less labor-intensive. As a result, producers can substitute capital for labor, thus producing more with fewer employees.
2. Second, many agriculture support jobs are classified under the "forestry, fishing, and related activities" category. Only those employees that are engaged in the direct production of agriculture commodities (regardless of whether the employee is a sole proprietor, partner, or hired labor) are included in the "farming" category.
3. Finally, economic data sources can only capture those employees that are on a traditional payroll, thereby missing any undocumented or casual employees.

Nonetheless, agriculture is critical to the region's economic health, and it drives other industries, such as transportation and warehousing (coolers).

GRP by Industry

Table 3.2 shows the top industries for each county by GRP.[10] Some of the key findings from this assessment include:

- **Manufacturing** and **Retail Trade** are important to all five counties. In Santa Barbara County, the manufacturing sector accounts for 10 percent of the economy, or $1.8 billion. Manufacturing also is a $1 billion industry in Monterey County, while it makes up 8 percent and 6 percent of total economic activity, respectively, in San Luis Obispo County and Santa Cruz County. **Retail Trade** generates 7 percent of Monterey County and Santa Barbara County economic output, and 9 percent each in San Luis Obispo and Santa Cruz Counties.
- **Agriculture** is a key industry in both Monterey and Santa Barbara Counties according to this metric. In Monterey County, agriculture is the second largest industry, totaling $2.7 billion in 2009 (17 percent of the total); in Santa Barbara County, it accounts for five percent of total GRP, or about $895 million.

[10]GRP data are not available for San Benito County.

Table 3.2 Top 10 Industries by GRP, by County
2009, in Millions of Chained 2005 Dollars

Monterey County			San Luis Obispo County			Santa Barbara County			Santa Cruz County[a]		
Industry	GRP	% of Total GRP	Industry	GRP	% of Total GRP	Industry	GRP	% of Total GRP	Industry	GRP	% of Total GRP
Government	$2,920	18%	Real Estate and Rental and Leasing	$1,537	16%	Real Estate and Rental and Leasing	$2,713	15%	Real Estate and Rental and Leasing	$1,498	16%
Agriculture, Forestry, Fishing, and Hunting	$2,659	17%	Government	$1,322	14%	Government	$2,564	14%	Government	$1,174	13%
Real Estate and Rental and Leasing	$1,671	10%	Utilities	$974	10%	Manufacturing	$1,808	10%	Retail Trade	$835	9%
Retail Trade	$1,158	7%	Retail Trade	$834	9%	Professional, Scientific, and Technical Services	$1,508	9%	Health Care and Social Assistance	$797	9%
Wholesale Trade	$1,147	7%	Manufacturing	$794	8%	Health Care and Social Assistance	$1,269	7%	Wholesale Trade	$656	7%
Manufacturing	$1,047	7%	Health Care and Social Assistance	$739	8%	Retail Trade	$1,252	7%	Professional, Scientific, and Technical Services	$580	6%
Health Care and Social Assistance	$922	6%	Professional, Scientific, and Technical Services	$577	6%	Agriculture, Forestry, Fishing, and Hunting	$895	5%	Manufacturing	$534	6%
Accommodation and Food Services	$750	5%	Construction	$529	6%	Finance and Insurance	$803	5%	Construction	$420	5%
Professional, Scientific, and Technical Services	$670	4%	Accommodation and Food Services	$410	4%	Accommodation and Food Services	$694	4%	Finance and Insurance	$340	4%
Finance and Insurance	$579	4%	Finance and Insurance	$328	3%	Information	$692	4%	Other Services	$306	3%
Other	$2,493	16%	Other	$1,533	16%	Other	$3,534	20%	Other	$1,982	22%
Total	$16,016	100%	Total	$9,577	100%	Total	$17,732	100%	Total	$9,122	100%

Source: Bureau of Economic Analysis.

Note: Data not available for San Benito County.

[a] Data are not available for Agriculture, forestry, fishing, and hunting; Mining; Utilities; and Transportation and warehousing.

- **Wholesale Trade** is important in Monterey County (where it comprises seven percent of the economy, or $1.1 billion) and Santa Cruz County (also seven percent of economic activity, or $656 million).
- **Construction** is the number eight industry in both San Luis Obispo and Santa Cruz Counties at $529 million and $420 million, respectively, in 2009.
- **Government** and **Real Estate** are the top service industries in all five counties. Real estate is the number one industry in San Luis Obispo, Santa Barbara, and Santa Cruz Counties, where it totaled $1.5 billion, $2.7 billion, and $1.5 billion, respectively, in 2009. In Monterey County, it was the third largest industry, accounting for 10 percent of the total economy or $1.6 billion.

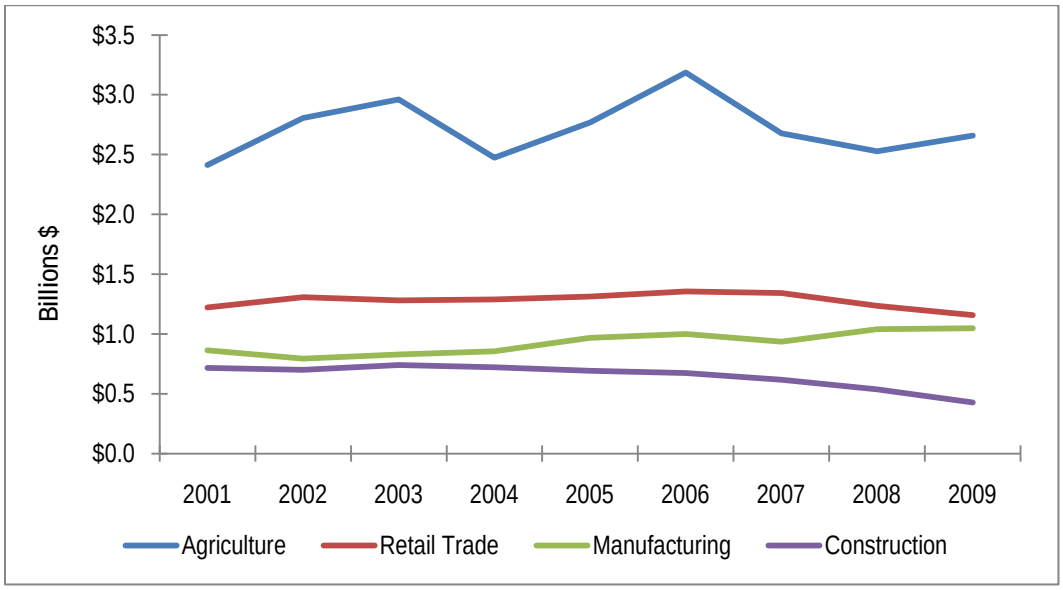
GRP Trends of Logistics-Dependent Industries

Figures 3.1 through 3.4 highlight historical changes in GRP for four key logistics-dependent industries in each of the counties: agriculture, retail trade, manufacturing, and construction. This data allows us to understand what the critical industries are by county in terms of size. Note that GRP data for San Benito County was not available at the time of publishing this report.

Monterey County

Figure 3.1 highlights GRP trends for key logistics-dependent industries in Monterey County between 2001 and 2009.

Figure 3.1 Monterey County Historical GRP by Industry
2001 to 2009, in Chained 2005 Dollars



Source: Bureau of Economic Analysis.

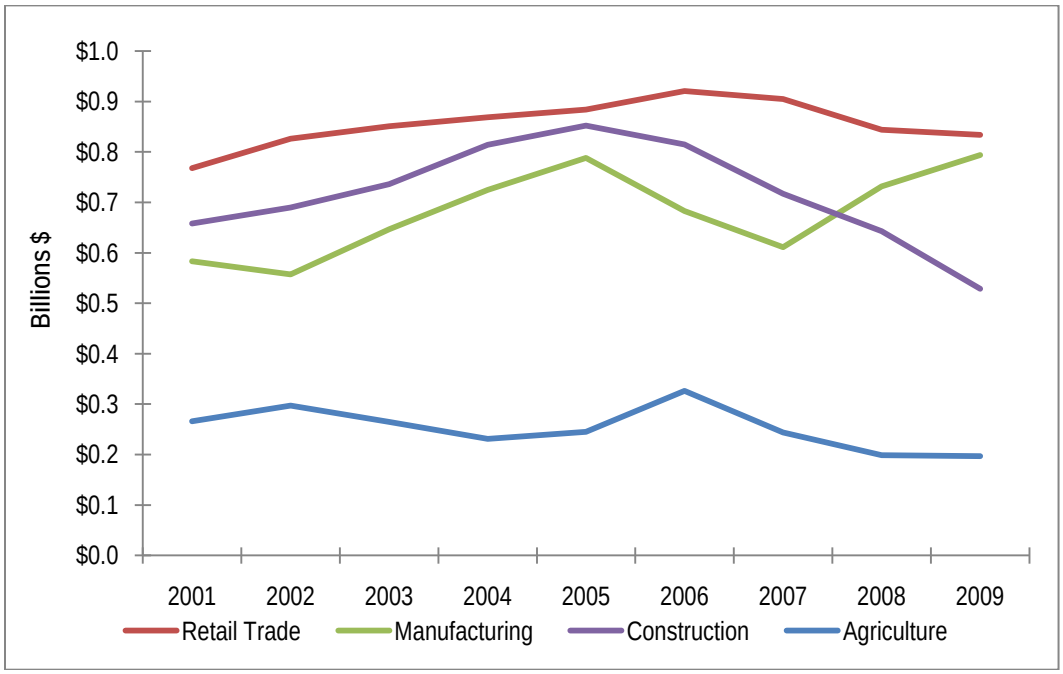
This data provides key insights:

- **Agriculture** is clearly the top logistics-dependent industry in Monterey County (Figure 3.1). It has been a volatile industry, showing spikes in 2003 and 2006, but tends to hover between about $2.4 billion and $3 billion most years.
- **Retail trade** is the second largest logistics-dependent industry; it showed modest growth until 2007, when it started to decline (most likely due to the ongoing global economic downturn).
- **Manufacturing** in Monterey County has shown relatively steady growth since 2002. It even continued to grow during the recessionary period from 2007 to 2009.
- **Construction** activity was slowly declining even before the recession, but the contraction accelerated; most likely due to the global economic downturn.

San Luis Obispo County

Figure 3.2 highlights GRP trends for key logistics-dependent industries in San Luis Obispo County between 2001 and 2009.

Figure 3.2 San Luis Obispo County Historical GRP by Industry
2001 to 2009, in Chained 2005 Dollars



Source: Bureau of Economic Analysis.

This data provides some key insights:

- **Retail trade** has been the top logistics-dependent industry in San Luis Obispo County over the last several years, peaking at $921 million in 2006. It has contracted somewhat since then, probably due to reduced consumer spending during the recession.
- Interestingly, **manufacturing** activity in the County declined from 2005 to 2007, but then rebounded sharply during the recession, reaching $794 billion in 2009. This was driven primarily by growth in a few industries, such as food product manufacturing, fabricated metals, and computer equipment manufacturing.
- **Construction** activity in San Luis Obispo County expanded rapidly between 2001 and 2005, but then dropped by 38 percent to $529 million in 2009 due to depressed conditions in the housing sector.
- **Agriculture** within San Luis Obispo County has generally been in a slight decline during this period, though it is rather cyclical, with spikes in 2002 ($297 million) and 2006 ($326 million).

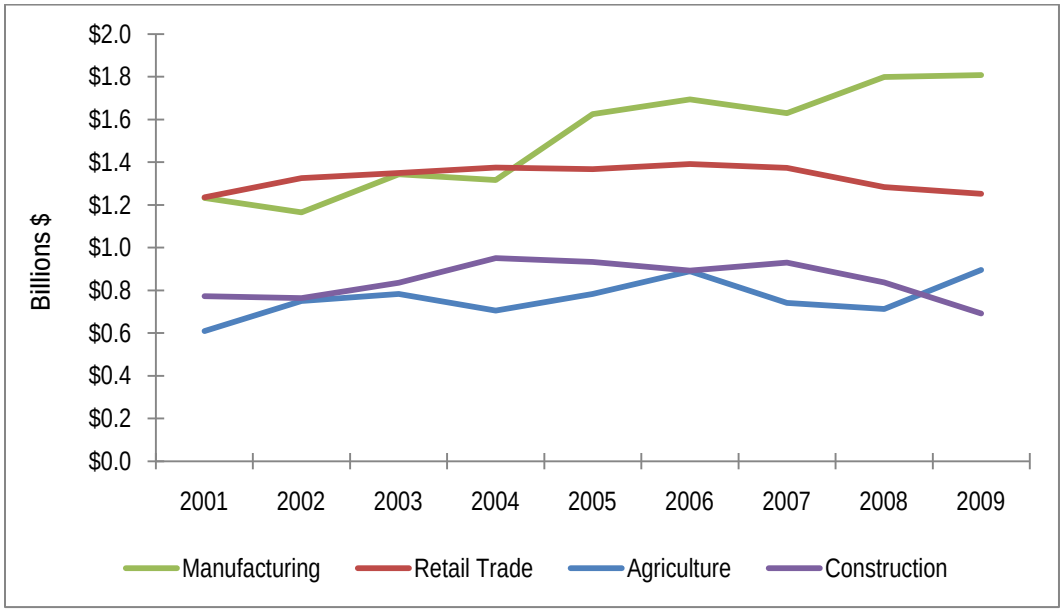
Santa Barbara County

Figure 3.3 highlights GRP trends for key logistics-dependent industries in Santa Barbara County between 2001 and 2009.

This data provides some key insights:

- **Manufacturing** in Santa Barbara County has been on an upward trajectory over the last decade. Total GRP for the sector grew by 47 percent from 2001 to 2009, reaching $1.8 billion in 2009 and surpassing retail trade as the largest logistics-dependent industry in the County. Like San Luis Obispo County, growth continued even during the recent 2008 recession. This was mainly driven by growth in the computer and electronic products manufacturing industry, which expanded by 322 percent during this period. Other manufacturing industries contributing to this growth include food products and chemicals.
- **Retail trade** has remained stable, growing by just 1.4 percent from 2001 to 2009.
- **Agriculture**, meanwhile, grew by nearly 47 percent during this period, reaching $895 million in 2009, and surpassing the previous high of $890 million reached in 2006.
- **Construction** generally grew until 2007, but then contracted by 26 percent, and stood at $691 million in 2009.

Figure 3.3 Santa Barbara County Historical GRP by Industry
2001 to 2009, in Chained 2005 Dollars



Source: Bureau of Economic Analysis.

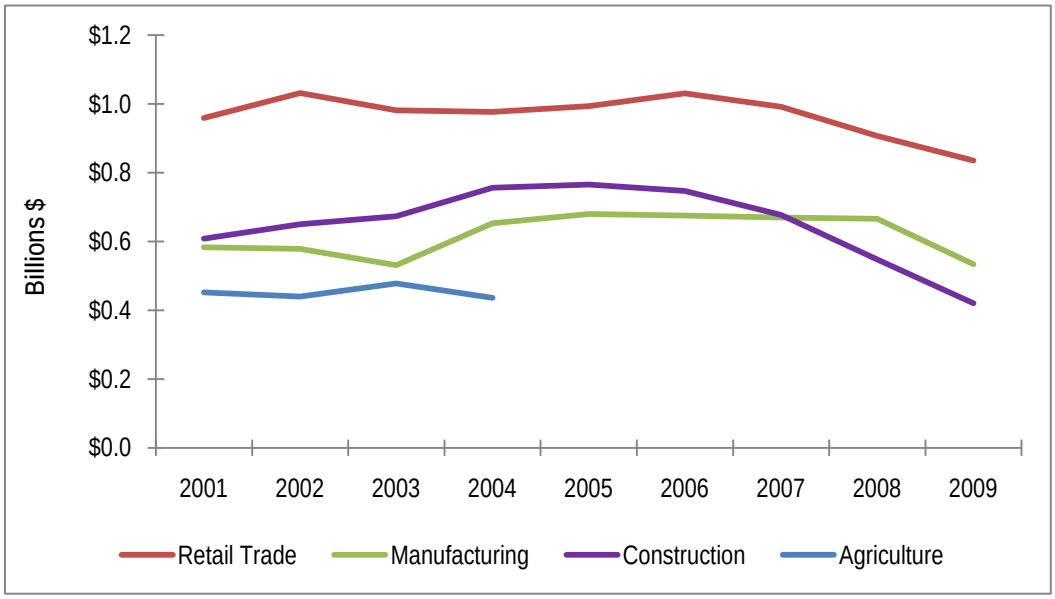
Santa Cruz County

Figure 3.4 highlights GRP trends for key logistics-dependent industries in Santa Barbara County between 2001 and 2009.

This data provides some key insights:

- **Retail trade** is the largest logistics-dependent industry sector in Santa Cruz County, accounting for nearly $1 billion of the County's GRP for much of the last decade. However, retail trade activity did begin to drop in 2007, and continued to decline to $835 million in 2009.
- Likewise, **construction** activity generally grew – or at least remained stable – until 2006, after which it contracted by 44 percent to about $420 billion.
- The severe correction in the construction industry made **manufacturing** the second largest industry in Santa Cruz County beginning in 2007. Overall, manufacturing has been relatively stable during this time, and grew substantially in 2004 and 2005, led partially by computer and electronic product manufacturing. However, in 2009, manufacturing GRP also fell, settling at $534 million.

Figure 3.4 Santa Cruz County Historical GRP by Industry[a]
2001 to 2009, in Chained 2005 Dollars



Source: Bureau of Economic Analysis.

Note: Agriculture data are not available for 2005 to 2009.

[a] Agriculture data is incomplete due to privacy restrictions, but it can be seen that this industry was stable in Santa Cruz County from 2001 to 2004.

Impact of the Recession on Trade-Dependent Industries

Trade-dependent industries, just like most other industries, were impacted by the recession that hit the world economy at the end of the last decade. As the time-series graphs in this section show, industries such as construction and retail trade were starting a downward trend in most counties in 2008 and 2009. Retail trade is impacted as a result of less buying power of the local population in the region, while export-dependent industries such as the region's agricultural products also are impacted by lower spending power in export markets. In turn, such decreases in national and international demand for regional products have hurt the local economy.

3.2 CHARACTERISTICS OF KEY FREIGHT DEPENDENT INDUSTRIES

Section 3.1 provided an overview of industries and industry growth in the Central Coast region. The purpose of this section is to highlight several of the key regional freight-dependent industries, including the following:

- Agriculture;
- Manufacturing; and
- Truck Transportation/Warehousing.

Agriculture

Agriculture is one of the most important industries in California, which is the leading state in the U.S. in terms of agriculture cash receipts. The State produces nearly one-half of U.S. grown fruits, nuts, and vegetables. California also is a major producer of livestock and livestock products: 6.5 percent of total U.S. revenue for livestock and livestock products were generated in California.[11]

Within California, Monterey County is ranked third for county agricultural cash receipts behind Fresno and Kern Counties.[12] Monterey, Santa Barbara, and San Luis Obispo Counties are all in the top 15 counties for California agricultural production (excluding timber) in 2009.[13] This reflects the importance of this industry to these three counties, and to the region as a whole.

Overview of Agricultural Products

Specifically, the Central Coast region is a major producer of broccoli, lettuce, and strawberries. The following are a few telling facts from 2009 data:

- Monterey County produced more than 63 percent of the State's lettuce;
- Monterey and Santa Barbara Counties combined produced more than 65 percent of the State's broccoli; and
- Monterey County and Ventura County (not in the study region) combined produced more than 65 percent of the State's total strawberries.

Table 3.3 below highlights the top three crops produced by each county in the study area. Strawberries and other berries are key crops throughout the region; and are the number one crops by value in Monterey, Santa Barbara, and Santa

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[11] http://www.cdfa.ca.gov/statistics/PDFs/ResourceDirectory_2010-2011.pdf.

[12] California Agricultural Resource Directory 2010-2011: http://www.cdfa.ca.gov/statistics/PDFs/ResourceDirectory_2010-2011.pdf.

[13] Ibid

Cruz Counties. Lettuce, wine grapes, broccoli, and nursery products also are important agricultural products for the Central Coast.

Table 3.3 Top Three Agricultural Products by County
2009, Gross Value of Agricultural Production by Crop

County	Top Crops (Millions $)
Monterey	Berries, Strawberries, Fresh Market ($746.1) Lettuce, Romaine ($483.3) Lettuce, Head ($436.0)
San Benito	Vegetables, Unspecified ($39.9) Lettuce, Bulk Salad Products ($21.1) Nursery Products, Misc ($20.4)
San Luis Obispo	Grapes, Wine ($166.4) Berries, Strawberries, Fresh Market ($63.6) Broccoli, Unspecified ($60.2)
Santa Barbara	Berries, Strawberries, Fresh Market ($299.4) Broccoli, Unspecified ($149.9) Grapes, Wine ($137.4)
Santa Cruz	Berries, Strawberries, Fresh Market ($172.6) Berries, Raspberries ($104.3) Flowers Cut, Unspecified ($60.0)

Source: California Agricultural Resource Directory, 2010 to 2011.

The Central Coast region also is a key producer of wine, as shown in Figure 3.5. Monterey County, for example, produced grapes for wine valued at $238 million in 2008.[14] Both Monterey and San Benito Counties are major producers of field crops, fruits and nuts, vegetable/row crops, and livestock, as are the other counties in the study area.

[14]Monterey County Agricultural Commissioner's Office, *Monterey County Crop Report 2008*.

Figure 3.5 Vineyard in San Luis Obispo County

Key Agriculture Production Locations

Figure 3.6 below depicts key crop production locations in the Central Coast region. The majority of major crop production locations are clustered near U.S. 101 – particularly in the Salinas Valley, south of Watsonville down to King City. Another major cluster is located around Santa Maria. In addition, some relatively major crop production locations are located east of Paso Robles near SR 46, and east of U.S. 101 near Hollister. The clustering of these major crop production areas does not occur by accident – they locate where the land is best for crop production, but also close to transportation facilities. Therefore, it is necessary that all the major arteries carrying goods to and from crop production locations (such as U.S. 101, SR 46, SR 129, SR 152, and SR 156) and the last-mile roads and railways are maintained to support efficient delivery and shipment of goods.

Figure 3.6 Crop Production Locations in the Central Coast Region

Source: ESRI Business Analyst Data, Mapped by Cambridge Systematics.

Crop Production and Transportation – Central Coast

The Central Coast is renowned for the sheer volume and the variety of agricultural products that are grown here. The Salinas Valley, for example, is known as "America's Salad Bowl" due to the amount of produce grown here and exported to other regions. A key component to the success of both small and large farmers in the region is the connectivity and condition of local roads that connect crop production locations with major state routes and U.S. 101. Interviewees in the study generally did not have major complaints about rural, local roads, and the connectivity they provide. Connectivity concerns were more related to congestion in urban areas, as well as several hot spots on major routes, such as U.S. 101, which impede timely delivery of goods.

Scenario: The Impact of a 50-Percent Increase in Output Dollar in the Vegetable Industry in the Five-County Region

For this project, a Freight Flows Tool was developed to help estimate increases in freight traffic as a result of growth in key regional industries. More information about this tool and its use for other purposes can be found in **Appendix B**. This tool allows planners to get an estimate of commodity movements by type and by number of additional trucks/trains as a result of a change in industry output.

This scenario takes a look at the impacts of increased output by the vegetable industry in the region. Assuming a 50-percent increase in the regional vegetable industry output, an additional 985 trucks would be on roads in the region daily. More than 700 of these would be trucks going in the "outbound" direction, given the export heavy nature of the industry in the region. Table 3.4 is a sample of the results that planners would see in the model.

Table 3.4 Sample Output from Freight Flows Tool

	Daily Units (Number of Trucks and Carloads)					
	Outbound		Inbound		Combined	
Commodity	Truck	Rail	Truck	Rail	Truck	Rail
Live animals/fish	–	–	1	–	1	–
Cereal grains	–	–	1	–	1	–
Other agricultural products	751	–	94	–	846	–
Total[a]	751	–	233	–	985	–

[a] Not all commodities shown above.

In addition to daily count information as a result of changes to industry-specific output, the model also provides data on annual tons of goods that would be a result of such additional output. While many tons are obviously going to be moving in the outbound direction, the model also shows that many commodities will be moved into the region to support the growth in the agriculture industry, such as fertilizer goods, gravel, and coal.

Manufacturing

Overview of Manufacturing Products

Manufacturing is a key and diverse industry in the region. In Monterey County, for instance, manufacturing activity is concentrated in nondurable goods, specifically food manufacturing and beverage and tobacco product manufacturing (a category that includes wine production). These two industries combined produced earnings of $209 million in Monterey County in 2009, or about one-half the total manufacturing industry earnings for the County. By contrast, in Santa Barbara and Santa Cruz Counties, manufacturing earnings are associated with the production of durable goods, especially computer and electronic products. This sector accounted for $415 million in earnings for Santa Barbara County (40 percent of total manufacturing earnings), and nearly $146 million for Santa Cruz County in 2009 (40 percent of the total).

Key Manufacturing Production Locations

Manufacturing facilities are located throughout the Central Coast region. Food manufacturing is a particularly important component of manufacturing in the region, given that it is a major region for crop production. Figure 3.8 below highlights key food manufacturing locations. The food manufacturing locations are generally in the same regions as the crop production locations: in the Salinas Valley, along the northern U.S. 101 corridor, near Santa Maria, and then in eastern Santa Barbara County (directly east of the City of Santa Barbara).

Food Manufacturing… What is it?

When most people hear the term manufacturing, images of cars, motors, and other industrial applications come to mind. Food manufacturing refers to an industry that links farmers with consumers by "manufacturing" raw foodstuffs and making them ready for purchase or sale at grocery stores, markets, restaurants, and other outlets. Food manufacturers process raw fruits vegetables, and grains into finished products ready for the grocer. Food manufacturers also process and dress meat or poultry; they process milk, cheese, and other dairy products; and they prepare and package items like frozen seafood and potato chips.

Since the region produces a large variety and quantity of raw fruit and vegetable products on its many acres of farmland, it is only natural that a large food manufacturing industry has sprung up to process many of these raw products. For example, Dole and Martinelli's both operate facilities in the region. Dole processes precut, prewashed vegetables and salads at its location in Monterey County. Martinelli's prepares apple juice in Watsonville. Large and small wineries alike process their grapes and prepare wines for grocery stores and restaurants around the world. In the end, food manufacturing is an important part of the process in getting Central Coast products to consumers around California and the world, while providing jobs for regional residents.

Figure 3.7 Truck Entrance to Dole Facility in Monterey County

Figure 3.8 Food Manufacturing Locations

Source: ESRI Business Analyst Data, Mapped by Cambridge Systematics.

Truck Transportation and Warehousing

'Transportation and Warehousing' is a key freight industry in the region, as it is responsible for moving goods for a variety of industries. This industry is responsible for the many steps of moving goods to and from retailers, and from farm to market. For example, some trucks are required to bring goods to coolers. Larger trucking firms pick up goods from coolers and ship them to a variety of destinations. For the retail industry, trucks bring goods to the region from major ports or from major urban centers where warehouses are located.

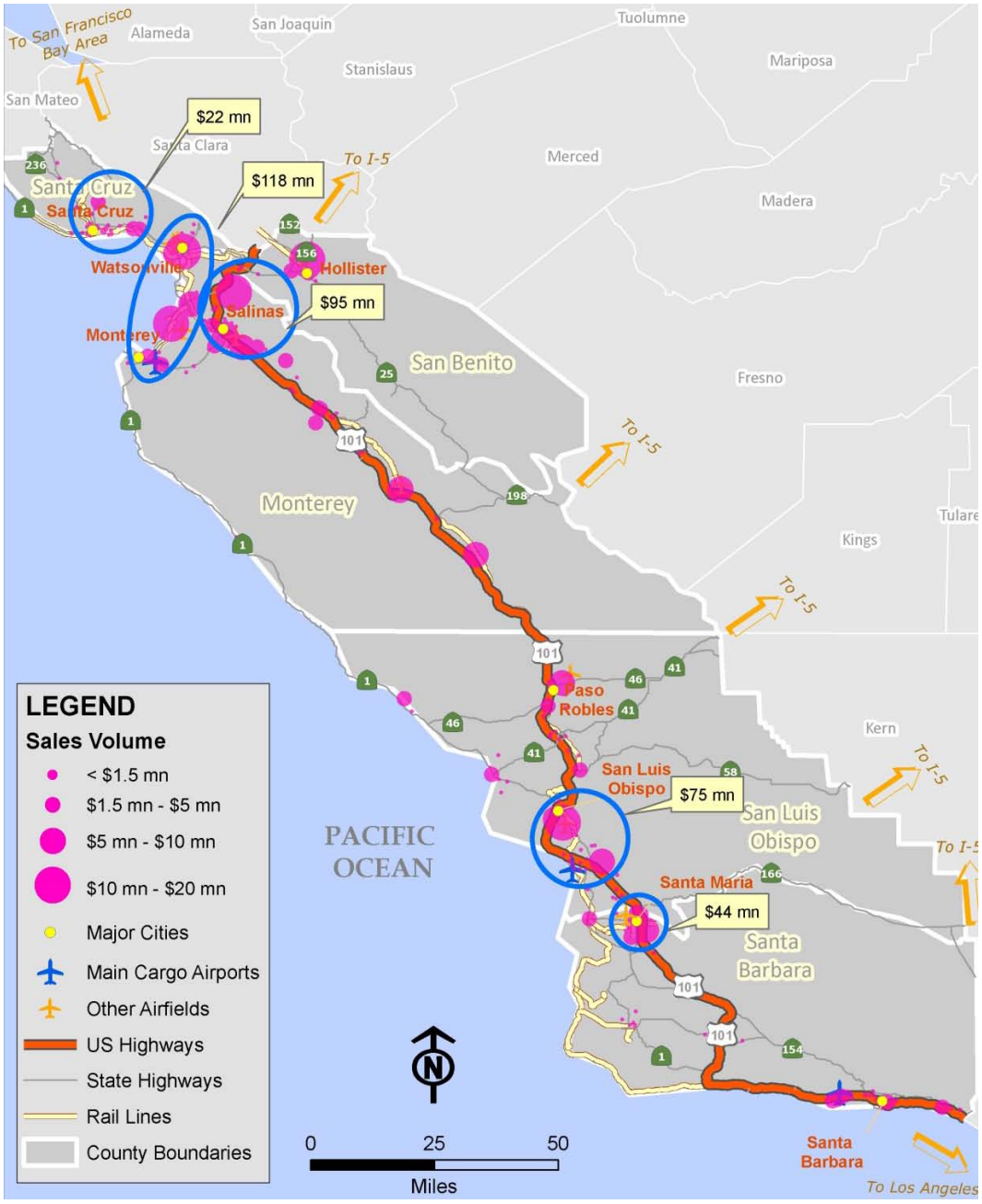
Figure 3.10 below highlights the location of truck transportation and warehousing industry locations in the Central Coast region. Not surprisingly, these businesses are concentrated near cities and near key crop production and food manufacturing locations. Key clusters are in the Salinas Valley, near Hollister, around Santa Cruz, along U.S. 101 in Monterey County, near Paso Robles, near San Luis Obispo, near Santa Maria, and near Santa Barbara.

Coolers – Another Critical Link Between the Farm and Grocery Store

A key component of the truck transportation and warehousing industry in this agricultural region are coolers located throughout the region. These coolers store farm-fresh produce until truck operators pick up the loads and deliver them to grocery stores and other outlets throughout the country and around the world. Coolers are located throughout the region, but are clustered in and around the Salinas Valley, San Luis Obispo region, and the Santa Maria region. A key concern raised in interviews for some coolers was the lack of adequate truck parking, especially during harvest season.

Figure 3.9 Food Manufacturing Facility

Figure 3.10 Transportation and Warehousing Industry Locations



Source: ESRI Business Analyst Data, mapped by Cambridge Systematics.

3.3 IMPACT ON FREIGHT

The region's key freight-dependent industries, including agriculture, transportation-related industries, and manufacturing, are critical to the region in terms of jobs and contribution to the regional economy. They also are critical to one another. Without a strong agricultural crop, it would be difficult for regional truckers and food processors to make a living. Without local carriers to move goods, it may become more expensive to ship goods from the region to outside producers, making the region's products less competitive. As a result, it is important that these industries are able to thrive in the region.

Local and regional governments can continue to help these industries thrive by supporting freight and transportation projects that improve the efficiency of goods movement to key clusters of industry, as highlighted in the maps above. This includes maintenance of key roadways, ensuring high levels of service on highways and arterials, improving the safety on key routes, and by providing adequate and efficient access to major destinations outside the region. Chapter 4 goes into more detail on where some of the key intermodal goods movement nodes are located; where the highest concentration of trucks are located; and what types and volumes of goods move into, out of, and within the region.

4.0 Regional Freight System and Commodity Flow Overview

More than 63 million tons of freight, worth approximately $50 billion, were transported into, out of, and within the Central Coast region in 2007. The majority of these goods, in terms of total tonnage, were moved by trucks (82 percent), followed by pipeline (14 percent), and rail (4 percent). Air and marine movements made up less than 1 percent each of total regional freight tonnage. As the regional, domestic, and national economies begin to recover, total tonnage of exports is expected to continue to grow, with moderate growth in the local population supplementing its effect on overall freight demand.

This chapter presents an overview of the region's freight infrastructure, as well as an overview of commodity flows into, out of, and within the region. Additional county-specific information on the freight system and commodity flows can be found in **Appendix A**. **Appendix C** provides further information on commodity flows, as well as an overview of the methodology used to create the commodity flow database for the Central Coast region.

4.1 THE CENTRAL COAST MULTIMODAL FREIGHT SYSTEM

Mobility for industries and citizens alike is provided by a multimodal transportation system that includes highways, roads, and railroad infrastructure. Port facilities and pipelines will not be included in this overview. Figure 4.1 below highlights the major freight infrastructure in the region.

Highways and Roads

There are several critical U.S. and state highways that provide connectivity from the study region to the rest of the State and nation. The primary artery running north-south through the region is U.S. 101, which provides direct connectivity to major markets and intermodal facilities in the Los Angeles and San Francisco Bay Area regions. In addition, a variety of critical east-west highways (such as SR 156/152, SR 41/46, SR 1, SR 129, SR 58, and SR 166) connects the region with Interstate 5 in California's Central Valley, which is a key highway in the national freight network. Currently, connections to the Central Valley mainly consist of two-lane highways, such as SR 41, SR 46 (currently under construction to convert from a two-lane to four-lane facility), SR 166, and others. SR 152 is a four-lane highway across Pacheco Pass. Considering the importance of the Central Valley as a trading partner for the region and the potential of increased freight traffic, east-west corridor capacity expansion is recommended.

Figure 4.1 Map of Key Regional Freight Infrastructure
U.S. and State Highways, Railroads, and Airports

Source: AMBAG data, prepared by Cambridge Systematics.

The highways shown in Figure 4.2 are critical to the regional economy, since trucking is the major mode for freight movement in the region. U.S. 101 carries the most truck freight in the region. In fact, when looking at truck count data from Caltrans, the top 10 locations in the region for daily five-axle truck trips are all on U.S. 101. Figure 4.4 below highlights these top truck count locations. All of the truck count locations in the figure have at least 5,500 total trucks per day,

of which an average of 8 to 15 percent are heavy-duty trucks (five-axles or more). The peak truck location is just north of Salinas on U.S. 101, which sees 11,020 trucks per day, of which 22 percent are heavy-duty trucks. **Appendix D** provides further county-by-county mapping of truck counts data.

Figure 4.2 Map of Key Regional Highway Infrastructure
U.S./State Highways

Source: AMBAG data, prepared by Cambridge Systematics.

Figure 4.3 U.S. 101 Interchange in the Central Coast

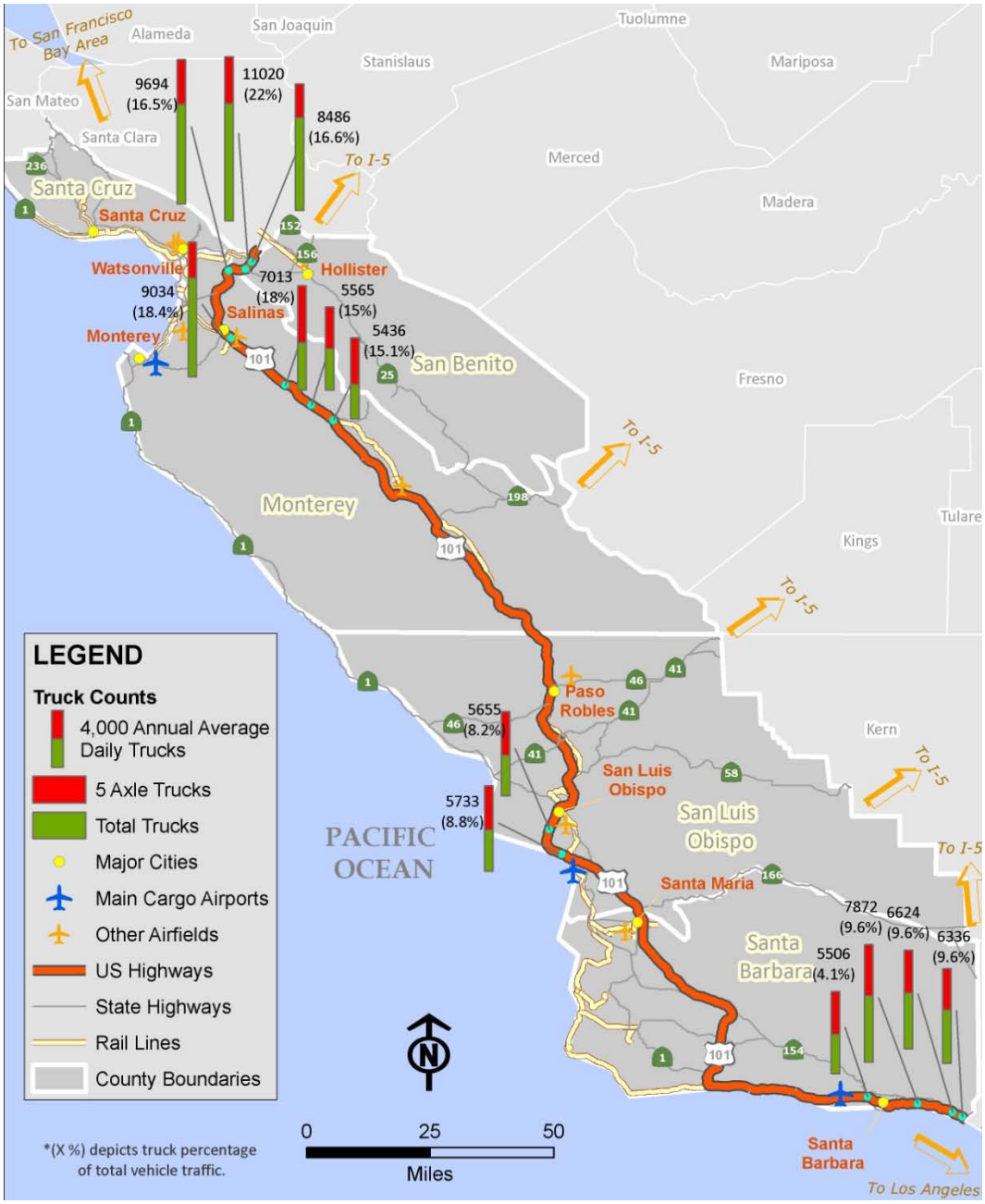
The Importance of U.S. 101 to the Region

When looking at a map of the Central Coast region, it is not difficult to discern that U.S. 101 is the major freight facility that connects all five counties with each other and with the rest of the nation. Most importantly, the highway connects the region with the major California markets, Los Angeles, and the San Francisco Bay region. The route also acts as a key alternative route to I-5, for example, during severe winter weather. Interviews with truck operators in the region revealed that congestion and other issues on U.S. 101, especially in the Santa Barbara, Atascadero, and Prunedale regions, are a primary concern in the region. When reviewing truck count information, it is easy to see why U.S. 101 is so important – it carries, by far, the most traffic of any freeway in the region.

While congestion on U.S. 101 does create concerns, interviews revealed that this congestion is seasonal in some locations (agriculture harvest season in Monterey County, for example), and generally only results in gridlock after a major accident. Other areas, such as U.S. 101 on the Santa Barbara County south coast, experience more chronic congestion. As a result, the key to keeping freight flows moving in an effective manner on this key highway is to mitigate congestion in urban and chronically congested areas, and to mitigate congestion during accidents and peak harvest season.

Regional leaders are aware of the importance of U.S. 101 to local businesses and residents. In 2010, the U.S. 101 Coalition was formed to help mitigate issues on this key artery.

Figure 4.4 Top Regional Truck Count Locations
2009; Five-Axle Trucks, All Truck Types



Source: Caltrans 2009 Truck Counts, Caltrans web site: http://traffic-counts.dot.ca.gov/index.htm, map prepared by Cambridge Systematics.

In addition to regional routes, local routes that provide "last-mile" connectivity to key industries and intermodal facilities also are critical components of the roadway system. Given the dispersed and decentralized nature of the agriculture industry, many of the last-mile roads in the region also are important for efficient and safe freight movement. Locations of key industry cluster locations were highlighted in Chapter 3. It is important that "last-mile" roads are operating at a high level of service (LOS), and are maintained to facilitate regional goods movement and reduce costs for region-critical industries.

Regional Rail Freight System

The Central Coast region is served by one Class I railroad, Union Pacific (UP), and by the Santa Maria Valley Railroad (SMVRR). Railroads in the region tend to move goods, such as lumber, coal, frozen foods, construction materials, fertilizer, and steel, as well as a variety of other goods. The UP Class I line also is used as a place for UP to store boxcars, as the primary north-south freight artery is in the Central Valley of the State. Amtrak shares the track with UP for its Coast Starlight service, which connects California with Washington State. Figure 4.5 below highlights key components of the freight rail network in the region.

Union Pacific (UP)

The UP line runs north-south throughout the entire region. In Watsonville, the UP's line splits: one section continues north-south, and the other continues northwest to Davenport. The north-south line moves parallel to the U.S. 101 Corridor, primarily moving lumber, fertilizer, and boxcars (which are then used on other routes in the region and country) to and from the region. Currently, no intermodal container shipments move through the region. In recent years, UP has made several improvements to the line, including improvements to track in Santa Barbara County. The LOSSAN Rail Corridor Agency seeks to increase ridership, revenue, capacity, reliability, and safety on the coastal rail corridor from San Diego to Los Angeles to San Luis Obispo. The LOSSAN Strategic Plan identifies several projects on the UP line in Santa Barbara County to improve rail.[15] These projects include:

1. Guadalupe Siding Extension;
2. Waldorf Siding Extension;
3. Narlon, Honda, and Conception Siding switch upgrades;
4. Capitan Siding Extension;
5. Goleta Service Track Extension;

[15]http://www.sandag.org/uploads/publicationid/publicationid_1314_7190.pdf.

Figure 4.5 Regional Class I and Shortline Railroads

Source: AMBAG data, prepared by Cambridge Systematics.

Note: UP has resumed service on the Class 2/3 line to the northwest of Watsonville as of 2011.

6. Ortega Siding;
7. Sandyland Siding;
8. Carpinteria Siding;
9. Tangair Siding Extension;
10. MP 276 Track Realignment and Highway 1 Overpass Replacement;
11. SB County Curve Realignment Projects (multiple); and
12. Devon to Tangair Curve Realignments.

UP also operates on tracks that run northwest from Watsonville to Davenport. UP has leased this line to shortline railroad firms, most recently Sierra Northern Railroad (SNRR). However, SNRR did not renew its lease, and service is being provided by UP. The primary commodities moved on this line include refrigerated cars with food products outbound to the junction with the north-south UP line. A key product moving westbound into the Santa Cruz region from the UP junction is lumber.

Santa Maria Valley Railroad (SMVRR)[16]

The SMVRR is a 14-mile long shortline railroad that moves goods in the Santa Maria Valley. The SMVRR intersects with the UP line in Guadalupe. The line has a number of sidings and spurs that SMVRR maintains. In addition, customers without direct rail access can utilize the transload facilities at the Betteravia Industrial Park. Primarily, goods are moved inbound by rail through the UP mainline, to the SMVRR, and then utilize the industrial park. Goods are moved to their final regional destinations using short-haul trucks.

The SMVRR moves goods, such as construction materials, lumber, steel, machinery, liquid fertilizer, and other items, from outside areas into the Santa Maria Valley. Goods that are shipped from the region on this railroad are primarily frozen vegetables and strawberries.

Salinas Valley Area Truck to Rail Intermodal Facility Study

AMBAG is currently studying the feasibility of constructing an intermodal facility in the Salinas region that would facilitate the movement of freight between Monterey County and the rest of the United States by rail.[17] Construction of such a facility could have significant impact on the use of rail to

[16] http://smvrr.com/.

[17] Information in this section provided by a draft version of the *Salinas Valley Truck to Rail Intermodal Facility Feasibility Study*, which was prepared by TranSystems for AMBAG on August 19th, 2011.

move agricultural (and other) products from the region to the U.S. East Coast by rail.

The *Draft Salinas Valley Truck to Rail Intermodal Facility Feasibility Study* indicates that intermodal service is the only feasible option at this point. This is in contrast to boxcar service, which would require that a refrigerated, multi-temperature facility be built at both the origin and destination sites.

The study suggests a facility on 150 to 200 acres, either in Chualar or in Gonzales. It also cites that primary regional benefits include a reduction in congestion (at least 10 percent fewer trucks on local roadways and potentially on U.S. 101) and a reduction in local emissions. For shippers, a rail line would provide an alternative to transcontinental trucking of regional products, which is becoming increasingly expensive as diesel costs continue to increase over time.

Aviation Network

Airfreight is a small component of regional freight movement, with less than one percent of total regional tonnage and approximately two percent of total regional value of freight moving by air. Freight moving by air tends to be focused on time-sensitive, high-value freight. In this region, this could involve the shipment of high-value, specialized fruits and vegetables, as well as machinery, to domestic or international locations. In the study area, the key cargo airports in order of 2009 tons of goods moved are the Santa Barbara Municipal Airport (SBA), San Luis Obispo County Regional Airport (SBP), and Monterey Peninsula Airport (MRY).[18] Other airports that were classified as "Commercial/Primary" or "Regional" airports by Caltrans include the airports in Santa Maria, Watsonville, Salinas, Hollister, and Paso Robles.[19]

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[18] *2008 2009 Air Passenger and Air Cargo Traffic Activity Report*, Caltrans, Division of Aeronautics, Office of Aviation Planning, web site: http://www.dot.ca.gov/hq/planning/aeronaut/documents/2009Comp2008062510.pdf.

[19] 2008 Map of CA Public Use Airports: Caltrans Division of Aeronautics, web site: http://www.dot.ca.gov/hq/planning/aeronaut/documents2/PublicUse2008.pdf.

4.2 CENTRAL COAST REGION COMMODITY FLOWS

The freight system highlighted above is responsible for serving the citizens and the industries of the region, as discussed in Chapters 2 and 3. This section provides information about the types of commodities that move through the region, the modes they utilize, and their primary origins and destinations. In addition to understanding what the drivers are behind freight demand (Chapters 2 and 3) and what constitutes the freight system (Section 4.1), it is important to understand how goods move to, from, and within the Central Coast region. This chapter presents an overview of commodity flows:

> One example of a small to medium-sized regional business that depends on an effective aviation system is C&D Aerospace Inc. The company is headquartered at Santa Maria Airport (SMX). The company retrofits passenger planes (which are flown to SMX) with interior parts such as overhead bins and other interior parts and auxiliary equipment.

- By direction (inbound, outbound, internal);
- By mode (truck, rail, air, pipeline, and other);
- By commodity type; and
- By key trading partners.

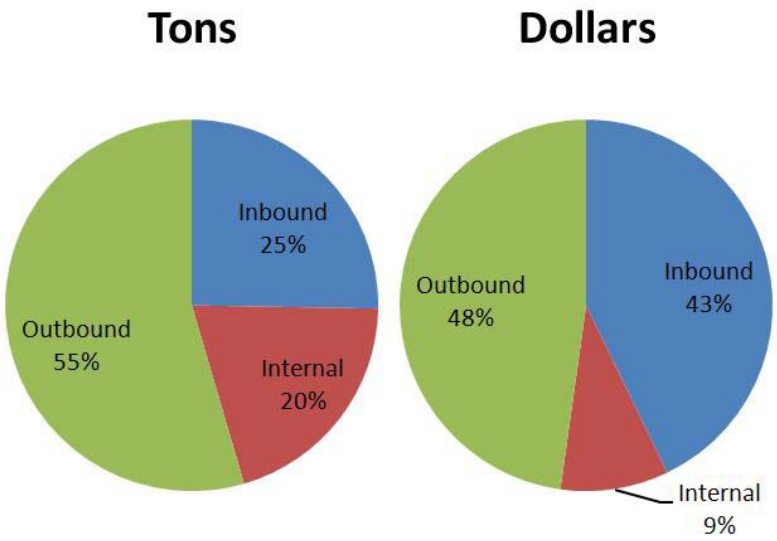
Further commodity flow information can be found in **Appendices A and B**.

Commodity Flows by Direction

Figure 4.6 shows the shares of regional freight by movement type: inbound, outbound, or internal. As the charts demonstrate, the Central Coast region is a net exporter of goods, particularly as measured by weight. Outbound shipments (i.e., the products of local industry) accounted for 55 percent of total freight volume (about 33 million tons) and 48 percent of total value ($21 billion) in 2007. Inbound shipments accounted for a quarter of total freight by weight (about 15 million tons), and 43 percent by value ($19 billion). The remaining freight was moving within the five-county area; these shipments totaled 12.1 million tons with a value of about $4.2 billion.

These freight flows are distributed amongst the five counties in the study area, as shown in Table 4.1. Monterey County has the highest total volume of freight at more than 22 million tons, followed by Santa Barbara County at 16 million tons. This reflects the freight demand generated by these counties' large populations, as well as their considerable production of agricultural commodities, food products, and other goods. San Luis Obispo and Santa Barbara Counties had the next highest volumes in 2007, followed by San Benito County, which has a smaller population base (and hence a smaller consuming market) than the other counties in the region. Overall, this reinforces the notion that the Central Coast exports more goods than it imports since outbound shipments are more than twice the level of inbound tonnage.

Figure 4.6 Total Freight Flows by Type of Movement
2007



Source: Cambridge Systematics analysis of FAF2 and IMPLAN data.

Table 4.1 Domestic Commodity Flows by County
2007, in Tons

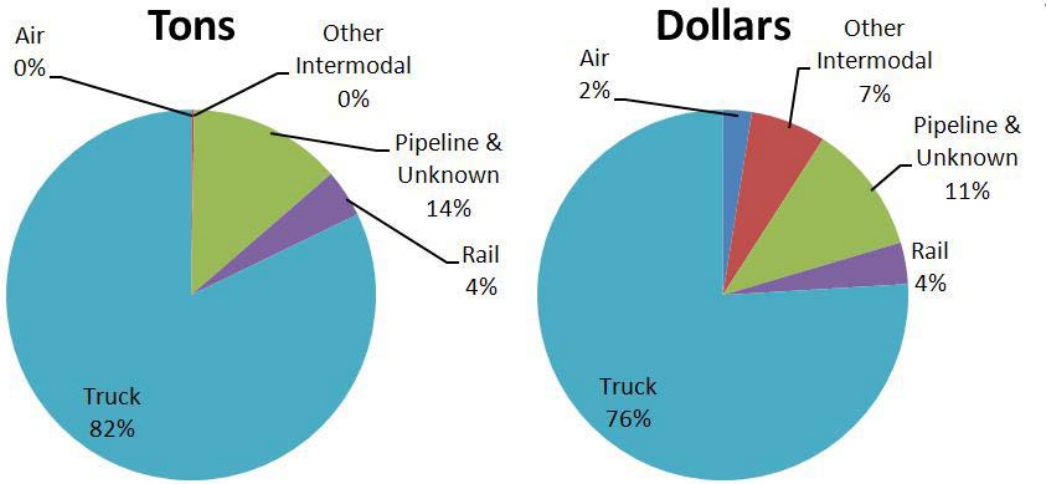
County	Inbound	Internal	Outbound	Total
Monterey	5,327,210	4,308,991	12,539,702	22,175,902
San Benito	717,150	285,628	1,677,834	2,680,612
San Luis Obispo	1,940,337	3,275,923	6,173,790	11,390,049
Santa Barbara	4,480,850	4,748,585	6,943,201	16,172,636
Santa Cruz	2,680,908	1,654,342	5,357,084	9,692,333
Total	15,146,455	14,273,468	32,691,611	62,111,534

Source: Cambridge Systematics analysis of FAF2 and IMPLAN data.

Commodity Flows by Mode

Like most regions, California's Central Coast is dependent on trucks for the transportation of most of its freight. Trucks generally provide the last link in the transportation chain, carrying all types of commodities from intermediate destinations, such as rail terminals and distribution facilities, to their final destinations. Trucks also are the preferred mode for time-sensitive agricultural products, including fresh produce and other agricultural commodities. As shown in Figure 4.7, trucks handled 82 percent of the region's freight by volume (49.5 million tons) and 76 percent by value ($33.9 billion) in 2007. Certain other key commodities also are highly dependent on trucks, including sand and gravel, nonmetallic minerals, and food products.

Figure 4.7 California Central Coast Mode Split by Weight and Value *2007*



Source: Cambridge Systematics analysis of FAF2 and IMPLAN data.

The region relies on a mix of other modes for the remainder of its freight. Rail handled 2.5 million tons of freight in 2007, valued at $1.6 billion. Rail is used to ship a wide variety of products, including high-weight/low-value commodities, such as fertilizers, minerals, and coal and petroleum products, as well as certain food/agricultural products and alcoholic beverages. Refined petroleum products (mainly gasoline and diesel), crude petroleum, and natural gas are shipped via pipeline, which accounted for 14 percent of all freight traffic by weight (8 million tons) and 11 percent by value ($5.1 billion).

The rest of the region's freight moves by air or "other intermodal" modes.[20] These tend to be very high-value, low-weight, time-sensitive commodities, which can absorb the extra costs associated with air transport or the use of multiple modes. Examples include electronic components, precision instruments, miscellaneous manufactured goods, and transportation equipment. Regional air freight shipments are a small portion of overall freight. However, it is likely that a portion of regional goods is transported into or out of the region by truck to major cargo airports in the Los Angeles and San Francisco Bay regions.

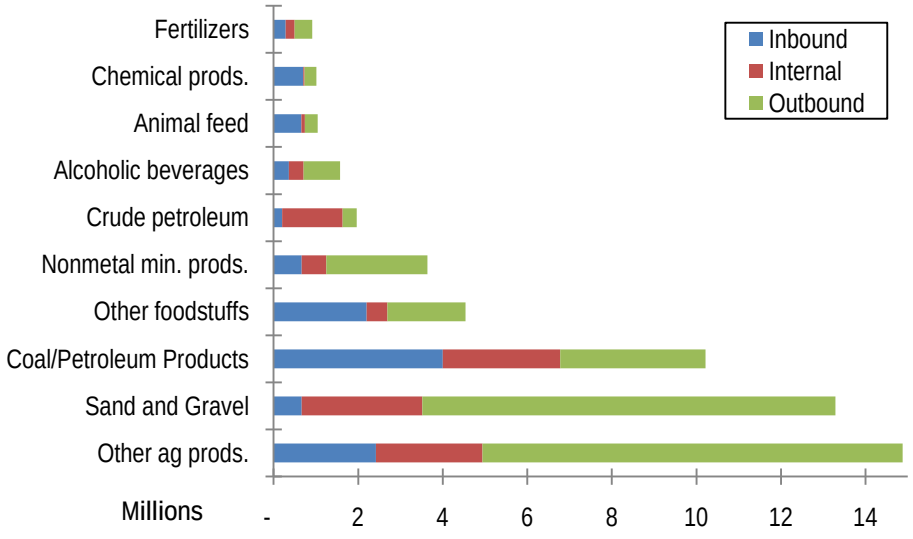
Flows by Commodity Type

The mix of commodities moving to, from, and within the Central Coast region is dominated by products that reflect the region's industry makeup. Figure 4.8 shows the top 10 commodities by weight and movement type for the five-county area. Other agricultural product (a category that includes all fruits, vegetables,

[20] "Other intermodal" includes parcel shipments and other shipments using multiple modes, which are not categorized as truck-rail or truck-air.

and field crops) is the largest commodity group by shipment weight, accounting for 14.9 million tons in 2007, or one-quarter of the total. It also is noteworthy that most of these shipments are outbound, which reflects the region's importance in terms of providing food for California and the nation as a whole. In fact, the products associated with the region's agricultural sector – including other agricultural products, foodstuffs, alcoholic beverages, and animal feed – account for 38 percent of total freight volume. Employment and earnings in farming, manufacturing, and wholesale trade are all driven to some extent by the Central Coast region's agriculture sector. For example, as shown in the economy discussion, farming employs more than 14,000 people and generates more than $900 million in industry earnings for Monterey County alone.

Figure 4.8 Top 10 Domestic Commodities by Movement Type
2007, in Millions of Tons



Source: Cambridge Systematics analysis of FAF2 and IMPLAN data.

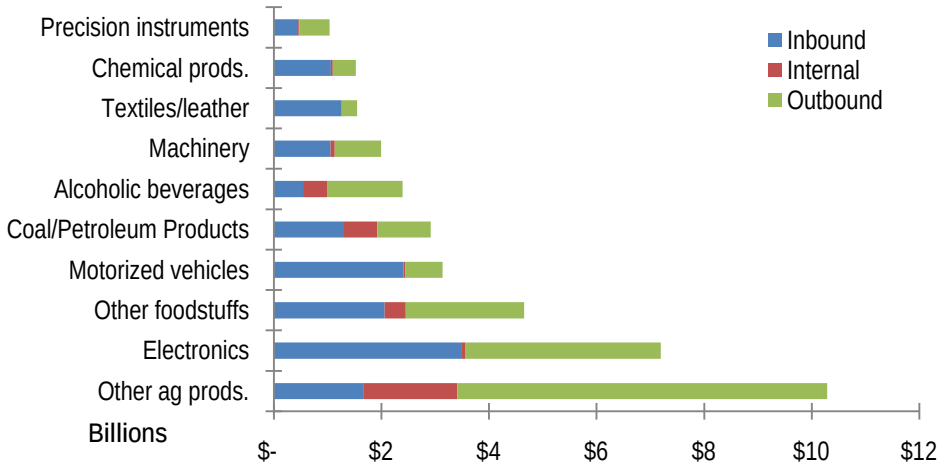
Other important commodities include construction-related materials, such as sand and gravel (13.3 million tons, or 22 percent of the total) and nonmetallic mineral products (3.6 million tons, or 6 percent of the total). Like agricultural products, these commodities tend to be exported from the region. This highlights the fact that although sand/gravel and mineral products do not account for a large share of the region's employment or earnings, they are a significant generator of freight on area roads and railways. Energy-related commodities like crude petroleum and coal and petroleum products (most of which move by pipeline or rail) make up much of the rest of the area's freight volume.

The commodity mix is more diverse when measured by value (Figure 4.9). Agricultural products are still the dominant commodity group by value – they totaled $10.3 billion in 2007, of which more than $6 billion were outbound from

the region. Other foodstuffs and alcoholic beverages – both of which are closely related to agriculture – totaled $4.7 billion and $2.4 billion, respectively. If all of the typical agriculture, farm, and food-related products in the region are combined (including products, such as livestock, cereal grains, and milled grain products that are not present in the top 10), they comprise 42 percent of total shipment value.

However, beyond the agricultural sector, other high-value commodities also are important. Electronics are the second largest commodity by value at $7.2 billion (16 percent of the total). These are fairly balanced between inbound and outbound shipments. Motorized vehicles ($3.1 billion), machinery ($2 billion), and precision instruments ($1 billion) also are examples of high-value commodities moving to, from, and within the Central Coast region. As shown in the discussion of the regional economy, the region does have some specialized production in computer and electronics, especially in Santa Barbara and Santa Cruz Counties. Nearly 5,000 people were employed in computer and electronics manufacturing in these two counties in 2009.[21] In 2008, this industry accounted for more than one-third of total manufacturing earnings for the two counties.

Figure 4.9 Top 10 Domestic Commodities by Movement Type
2007, in Billions of Dollars



Source: Cambridge Systematics analysis of FAF2 and IMPLAN data.

[21] U.S. Department of Labor, Bureau of Labor Statistics, Quarterly Census of Employment and Wages.

Commodity Flows by Trading Partners

The bulk of the Central Coast region's freight is either coming from or heading to other parts of California. In 2007, 78 percent (by weight) and 62 percent (by value) of shipments to and from the area originated or terminated in other California counties, as shown in Table 4.2. This amounted to more than 37 million tons valued at about $25 billion. The primary drivers of these shipments are agriculture/farm/food products; construction materials (sand/gravel and nonmetallic minerals); energy products (coal/petroleum products, crude petroleum, and natural gas); electronics; and motorized vehicles.

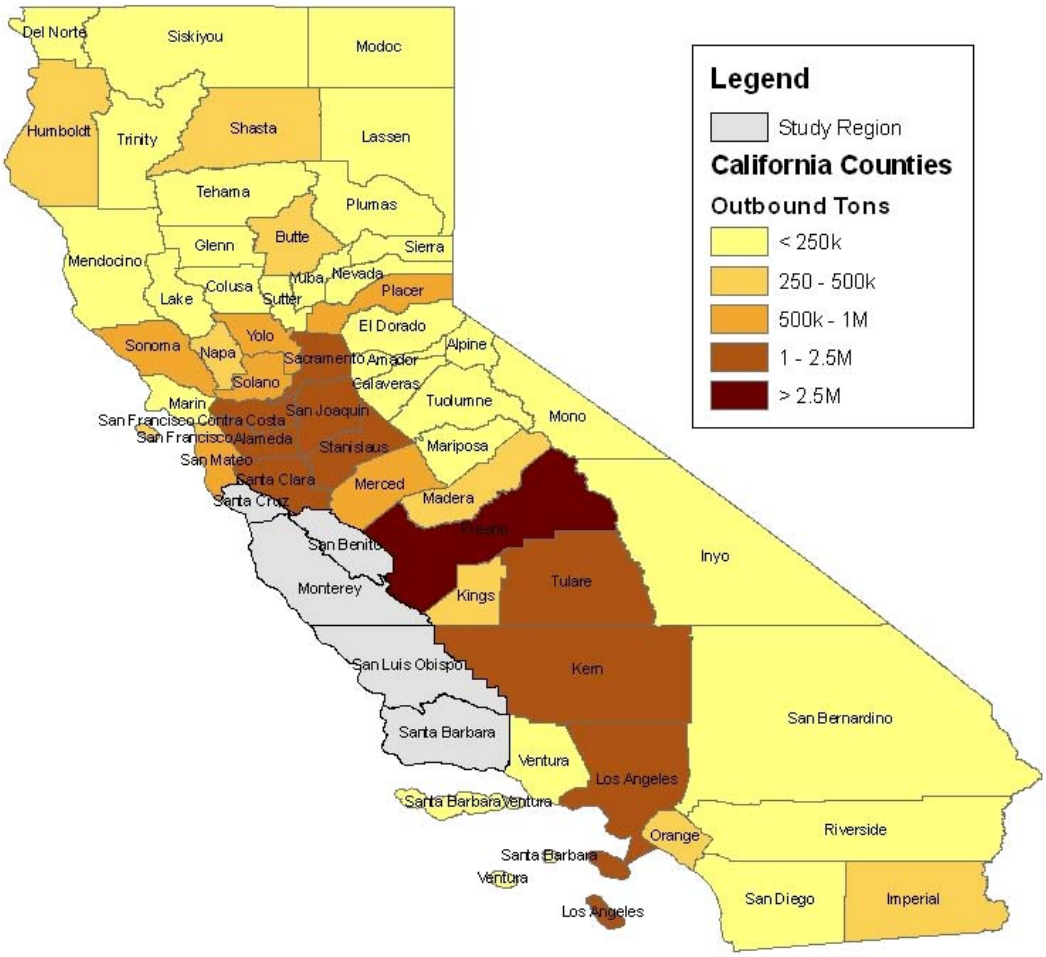
Table 4.2 Top Trading Partners
2007, Thousands of Tons

Trading Partner	Tons	Percentage of Share
California	37,196	77.8%
Asia	1,453	3.0%
Oregon	1,279	2.7%
Canada	522	1.1%
Arizona	501	1.0%
Texas	417	0.9%
Florida	414	0.9%
Mexico	412	0.9%
Nevada	411	0.9%
Americas	349	0.7%
All Others	4,884	10.2%
Total	47,838	100.0%

Source: Freight Analysis Framework 2, IMPLAN, Cambridge Systematics, 2007.

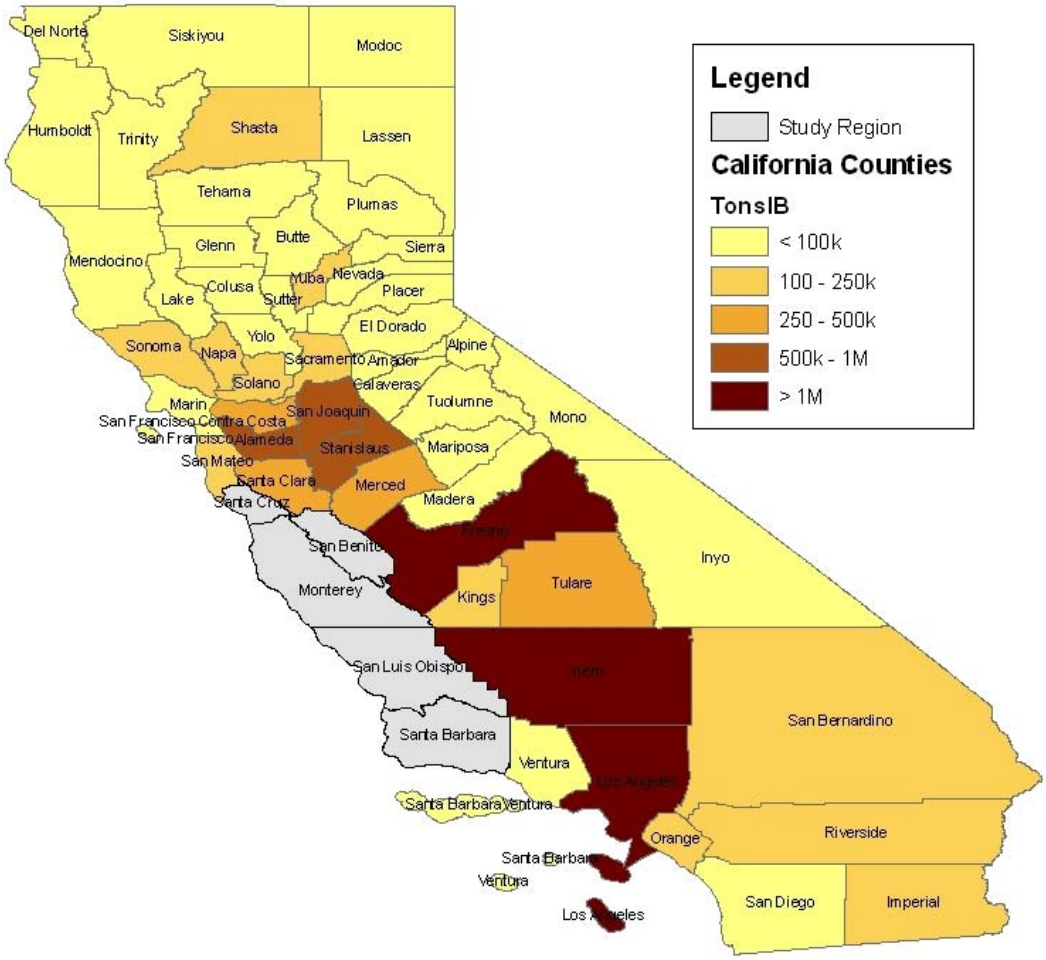
Figures 4.10 and 4.11 illustrate how these shipments are distributed amongst California's other counties. The maps reveal that the counties immediately surrounding the Central Coast send and receive much of this trade. These include Fresno, Kern, and Los Angeles Counties; each of which traded 3 million tons or more with the Central Coast in 2007. Other key trading partners include Sacramento County (2.5 million tons), Alameda County (2.4 million tons), San Joaquin County (2.5 million tons), and Stanislaus County (2.4 million tons). In general, Central Coast trade with the rest of California is centered around large urban areas (e.g., Los Angeles and the San Francisco Bay Area) and other important agriculture centers such as Fresno.

Figure 4.10 Outbound Shipments to the Rest of California
2007, in Tons



Source: Cambridge Systematics analysis of FAF2 and IMPLAN data.

Figure 4.11 Inbound Shipments from the Rest of California
2007, in Tons



Source: Cambridge Systematics analysis of FAF2 and IMPLAN data.

4.3 KEY CONCLUSIONS

Truck count data (how many trucks are traveling on several key regional roadways) and commodity flow data (who are major trading partners, what types of goods move where) make it possible to understand what components of infrastructure are critical to the Central Coast region. The following conclusions can be drawn:

- U.S. 101 is the region's primary truck artery, as shown by both the truck count data and the commodity flow data. Key markets (Los Angeles County, the San Francisco Bay Area, and the major ports and intermodal facilities located in these regions) are accessible through U.S. 101.

- When looking at inbound and outbound shipment destinations within California, it becomes evident that counties in the Central Valley are very significant trading partners. Fresno, Kern, Tulare, and Merced Counties are all major trading partners, both for imports and exports. This highlights the importance of the region's main east-west connectors, including SR 156, SR 46/41, and SR 58. In addition, since Oregon and Arizona are key trading partners, it is critical for the region to have access to major interstates such as I-5. The east-west connectors above, as well as U.S. 101, provide this access.
- From Figure 4.8, it is evident that the largest commodity type by weight is "other ag products", which includes all fruits, vegetables, and field crops. It should also be noted that a majority of these shipments are exports. As a result, many of the region's that produce "other ag products" see a sharp spike in truck traffic during peak harvest season. Interviews revealed that regions, such as the Salinas Valley, are full of trucks during peak seasons (especially mid-summer through fall), but relatively quiet during the remainder of the year. The large quantity of agricultural exports and the large quantity of exports outside of California (~22 percent) indicate that potentially a market exists to transport more goods by rail from the region.
- Chapter 3 highlighted some of the key regional industries, which includes manufacturing (primarily food manufacturing), shipping and warehousing, and agriculture. While the data above focus on the high-level goods movement picture and key trading partners, it is important to keep the location of these industries in mind when making improvements to the goods movement system. As shown in Chapter 3, most of the major industry clusters of these goods-movement dependent industries are located near the U.S. 101 corridor, as well as in the Salinas Valley.

5.0 Regional Issues/Concerns

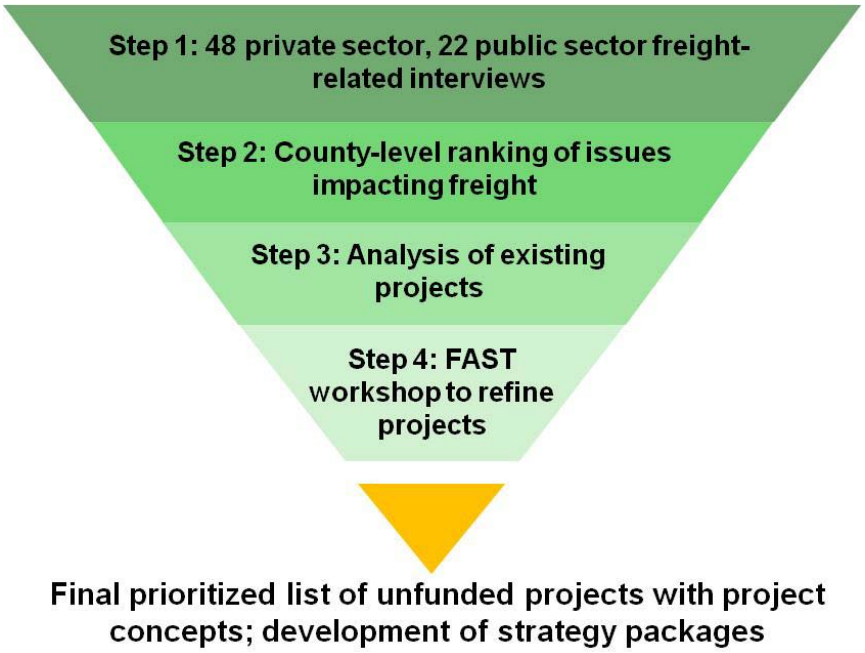
A key step to improving goods movement for the region is to better understand issues that negatively impact freight. Through interviews with 70 public and private sector stakeholders, major freight system issues, as well as organizational/data/policy issues, were identified. These issues are discussed here in more detail.

5.1 REGIONAL FREIGHT SYSTEM ISSUES

The Central Coast region's economy depends on efficient and safe movement of goods into, within, and outside of the region. System inefficiencies and unsafe freight transport hamper the region's economy. As a part of this study effort, freight stakeholders on the project team went through a process to prioritize key regional freight issues, based on the issues input from the interview process. Figure 5.1 below outlines the steps taken to get from interview responses down to a list of prioritized, unfunded freight projects. In this chapter, only the issues mentioned by stakeholders are discussed. Steps 3 and 4 are detailed further in Chapter 6.

Note that the freight system issues in this analysis are based on perceptions by public and private sector stakeholders, and not on quantifiable data.

Figure 5.1 Process to Develop List of Prioritized Unfunded Freight Projects



Step 1. Stakeholder Interviews to Understand Regional Freight Issues

In order to understand the key infrastructure and policy issues that negatively impact the effectiveness of freight movement in the Central Coast region, 70 stakeholder interviews were conducted to better understand the issues that regional freight stakeholders face. This process involved primarily private sector stakeholders in addition to public sector stakeholders at the regional, county, and city level. The study team received detailed input from various sources about key problem areas on the regional freight network, key policy issues at the state or regional level, and key improvements necessary, as well as other items of note. Table 5.1 below highlights issues defined by stakeholders in each county.

Some concerns were voiced more often than others. Table 5.2 highlights the comments, in no particular order, which were heard most frequently:

Table 5.1 Stakeholder Comments by County

Monterey County	San Benito County	San Luis Obispo County	Santa Barbara County	Santa Cruz County
• Gonzales: Experiences bottleneck on 5th St through town.	• SR 152 is reported to experience congestion with trucks and has steep grades. Truck traffic diverts onto county roads.	• On U.S. 101 through Atascadero, some on/off ramps experience congestion during peak AM/PM rush hours.	• U.S. 101 general traffic congestion from Carpinteria through Goleta during AM and PM peak hours.	• SR 1/SR 9 at-grade interchange experiences congestion.
• Greenfield: Ag-traffic comes from east and west through Greenfield; would like a loop.	• SR 156 from U.S. 101 to exit for Hollister experiences congestion. Freight carriers describe it as a bottleneck area.	• U.S. 101 Cuesta Grade experiences congestion and slow trucks.	• Main Street (SR 166) in Santa Maria experiences congestion. This is a regional truck route through urban neighborhoods and city center.	• SR 1/Bay St at-grade interchange experiences congestion.
• King City: Consider a truck loop to avoid Broadway.	• SR 156 sees heavy truck parking in summer months.	• U.S. 101 through San Luis Obispo experiences congestion.	• U.S. 101 northbound at the confluence of the Broadway interchange drops from 3 lanes to 2 lanes. Santa Maria River Bridge is a chokepoint. Note: The Santa Maria River Bridge widening project has begun construction and is scheduled for completion in 2014.	• SR 1/SR 17 interchange experiences congestion.
• Salinas: Heavy-truck traffic and congestion throughout Salinas.	• Section of SR 25 has been identified for a widening project. Safety and traffic congestion issues have been identified here.	• Lack of east-west capacity between U.S. 101 to I-5 contributes to congestion on SR 46.	• Santa Maria: Many stoplights on Betteravia Rd.	• SR 1/41st St interchange experiences congestion.
• SR 156 from Castroville to U.S. 101 experiences congestion.	• Truck routes within Hollister streets and San Benito County roads not well defined. County and city are working on an STAA truck route system.	• SR 1 through Oceano experiences congestion. SR 1 at Pismo Beach to the Santa Barbara county line is slow-moving.	• Truck navigation issues all along SR 166 in northern Santa Barbara County.	• SR 1/Harkins Slough Rd interchange experiences congestion.

Monterey County	San Benito County	San Luis Obispo County	Santa Barbara County	Santa Cruz County
• SR 1 through Carmel experiences congestion.	• Ag trucks turn up mud on streets and roads where agriculture is prevalent. This problem is a nuisance from a driver perspective because the road can be bumpy, can dirty cars, cost the vehicle wear and tear, and cost the public works department money to clean it up. Specific times of year, especially during the rainy season.	• SR 1 through the City of San Luis Obispo experiences congestion.	• SR 246 through Buellton shows infrastructure (pavement) distress.	• SR 152 through Watsonville experiences congestion.
• The SR 183/SR 1 at-grade intersection experiences poor flows and level of service.	• SR 25: Heavy commute pattern that shares the corridor with freight traffic.	• SR 46/U.S. 101 Interchange issues. Operational improvements anticipated to begin construction in fall 2011.	• Truck parking issues in Carpinteria, Santa Maria, and Buellton.	• SR 1 between Santa Cruz and Aptos experiences congestion.
• SR 68 between Salinas and Monterey is an often congested 2-lane road.		• SR 46 East/Airport Road intersection experiences congestion. A new Union Rd interchange with SR 46 could divert traffic away from this intersection.	• Rail infrastructure is antiquated and limits the expansion of freight traffic.	• SR 129 through Watsonville experiences congestion.
• U.S. 101 through Salinas: Abbott Rd, Airport Blvd, and Sanborn Rd experience congestion. The Airport Blvd interchange improvement project is underway. Operational improvements are being pursued at Abbott and Sanborn Rds.		• SR 46 East/Golden Hill Rd intersection experiences congestion. A new Union Rd interchange with SR 46 could divert traffic away from this intersection.		• SR 17 north of Santa Cruz traverses the coastal range and experiences congestion. SR 17 has been a designated safety corridor.

Monterey County	San Benito County	San Luis Obispo County	Santa Barbara County	Santa Cruz County
• Gonzales: Quarry traffic moving from the NE into town creates conflicts.		• SR 46 East through Paso Robles experiences congestion during AM/PM peak hours.		• SR 129 between U.S. 101 and SR 1 experiences congestion. Effort is currently underway to designate SR 129 as a safety corridor.
• Soledad: Metz Rd traffic in front of school can be an issue. Some U.S. 101 ramps are nonstandard.		• Atascadero: Truck turning issue at El Camino Real and Traffic Way. Truck turning radius may need to be improved.		• SR 152 to Gilroy from Watsonville has some tough turns for trucks. Trucks over 45 ft in length are prohibited on this route.
• SR 198: There are no passing lanes at the summit. Note: SR 198 is a CA Legal Advisory Route.		• SR 166 passing lanes. Provide more passing opportunities.		• Rising public safety concerns/ perceptions involving trucks (i.e., conflicts on Mission St (SR 1) through Santa Cruz).
• U.S. 101 between King City and Salinas: This was described as a highway that needs to be converted to a freeway. Comments addressed 1) at-grade intersections on U.S. 101, and 2) short acceleration lanes. Comments made about on/off ramps in King City, Greenfield, Gonzales, and Soledad.		• Some U.S. 101 interchanges can be difficult to navigate for trucks.		• RR infrastructure can be improved (Davenport to Watsonville): Modernize signal crossings, address several bridge concerns, increase weight capacity to 286k pounds per car.
• U.S. 101 in the Prunedale region north of Salinas consists of horizontal and vertical curves and at-grade intersections. The Prunedale Improvement Project is currently under construction.		• Paso Robles: Airport Rd is in poor condition – home to major industries in the area.		

Monterey County	San Benito County	San Luis Obispo County	Santa Barbara County	Santa Cruz County
• It was mentioned that some trucks go through the community off Spreckles Ave, which is a nuisance to residents.		• Paso Robles: West side of the city – windy roads, difficult to navigate for trucks.		
• Truckers get lost traveling on Old Stage Rd between Gonzales and Salinas because of confusing signage.		• U.S. 101 from Paso Robles to Santa Margarita and South Higuera St in SLO are in rough condition. U.S. 101 rehabilitation from the Cuesta Grade RR overhead.		
• Truck parking especially needed near U.S. 101 in the King City to Gilroy region. Comments made in Salinas, Greenfield, King City, and Gonzales.		• Oceano: SR 1/Railroad Ave intersection. Railroad Ave approach is a skewed angle for trucks turning left.		
• U.S. 101/San Juan Road I/C project: Will eliminate existing at-grade intersection and improve interregional travel.		• City of Arroyo Grande: Freight/residential conflicts.		
• U.S. 101/Soledad I/C: Improve local connections to freeway access to decrease congestion and delay on local roads.		• Truck parking: Issue in Paso Robles and Arroyo Grande.		
• U.S. 101/Walnut Ave I/C – Greenfield: Improve local connections to freeway access to decrease congestion and delay on local roads.		• New project needed: Rerouting of Willow Rd to create new interchange with U.S. 101 will route trucks away from the urban area of Nipomo.		

Monterey County	San Benito County	San Luis Obispo County	Santa Barbara County	Santa Cruz County
• U.S. 101/Gloria Road I/C – Gonzales: Improve local connections to freeway access to decrease congestion and delay on local roads. • South County Frontage Roads (Harris Road to Soledad) adjacent to U.S. 101: Provide frontage roads for local ag traffic that currently uses U.S. 101. • Westside Bypass – Salinas Corridor: Provide alternate access (bypass) around the west side of Salinas from Laurel to Blanco Rd. • Eastside Bypass – Salinas Corridor: Provide alternate access (bypass) around the east side of Salinas from Boronda Rd south to new U.S. 101/Harris Rd I/C.				

Table 5.2 Most Common Regional Freight Issues from Stakeholder Interviews

- Truck parking concerns (numerous counties).
- SR 166 – provide more passing opportunities.
- U.S. 101 general traffic congestion from Carpinteria through Goleta during AM and PM peak hours issues with Rail Infrastructure.
- Main Street (SR 166) in Santa Maria experiences congestion. This is a regional truck route through urban neighborhoods and city center.
- SR 156 from U.S. 101 to exit for Hollister is congested; freight carriers describe it as a bottleneck area.
- Salinas: Heavy truck traffic and congestion throughout Salinas.
- U.S. 101 in the Prunedale region north of Salinas consists of horizontal and vertical curves and at-grade intersections. The Prunedale Improvement Project is under construction.
- U.S. 101 between King City and Salinas – This was described as a highway that needs to be converted to a freeway. Comments addressed a) at-grade intersections on U.S. 101 and b) short acceleration lanes. Comments made about on/off ramps in King City, Greenfield, Gonzales, and Soledad.
- SR 156 from Castroville to U.S. 101 experiences congestion.
- SR 68 between Salinas and Monterey is an often congested 2-lane road.
- SR 1 between Santa Cruz and Aptos experiences congestion.
- Lack of east-west capacity between U.S. 101 and I-5 contributes to congestion on SR 46.

Step 2. County-Level Ranking of Regional Freight Issues

Next, regional stakeholders ranked the issues from highest priority to lowest priority, based on their knowledge of the region and the concerns that they have heard from the community. All the major highway-related issues were ranked, which gave the group an understanding of which issues require the most urgent attention. In the end, the group reviewed the rankings and provided additional input to come up with the final list of projects in Table 5.3 below that would address the most pressing concerns.

Table 5.3 Prioritized Issues/Projects without Funding Allocated (as of 6/1/2011)

County	Top Prioritized Freight Issues/Projects by County
Monterey	• San Juan Interchange Project on U.S. 101. • SR 156 West Widening Project to widen the road to 4 lanes and improve SR 156/U.S. 101 interchange.
San Benito	• SR 152 Corridor Improvements (pending study completion). • SR 25 Widening project. • SR 156 Improvement project.
San Luis Obispo	• SR 46 East – Airport Rd Intersection experiences congestion – interchange improvements required. • SR 1 through Oceano congestion; SR 1 from Pismo to SB County line congestion – road/operational improvements required.
Santa Barbara	• U.S. 101 peak-period traffic congestion from Carpinteria through Goleta. • Recommended LOSSAN rail improvement projects to UP line (see Chapter 4). • Main Street in Santa Maria experiences congestion – spot improvements to alleviate this congestion possible. • Overnight truck parking facility in SB County. • Betteravia Rd Circulation improvements between Hwy 101 and SR 135.
Santa Cruz	• SR 1 between Santa Cruz and Aptos experiences congestion. SR 1 HOV lanes project is proposed, but $500 million in construction costs not funded. • SR 17 north of Santa Cruz experiences congestion and has been designated a safety corridor. Truck climbing lane has been determined infeasible, but issues persist. • SR 129 between U.S. 101 and SR 1 experiences congestion; effort to designate this as a safety corridor.

In addition, regional stakeholders also identified two regional priority issues that the FAST will address in the future: east-west connectivity and truck parking.

East-West Highway Connectivity

The commodity flow assessment, coupled with interview results, confirmed that many of the goods produced in the Central Coast region are shipped to counties in California's Central Valley, especially Fresno, Tulare, and Kern Counties. In addition, other trading partners in northern and southeastern California also rely on the connection to I-5 from the Central Valley to receive their goods. Other major markets for goods from the Central Coast include the San Francisco Bay Area and Los Angeles County, but these are well-served by U.S. 101. The connections to the Central Valley are currently not as strong as those to the Los Angeles and San Francisco regions. SR 46, the main connector between San Luis

Obispo County and the Central Valley, is mostly a two-lane highway between U.S. 101 and I-5. For SR 152 and SR 156, there are currently several projects in the planning phases that seek support for improvement of this northern connector to I-5.

In addition, carriers did highlight issues with the roads connecting SR 1 with U.S. 101 in Monterey and Santa Cruz Counties. SR 129, SR 152, and SR 68 were highlighted as narrow, and in some cases windy roads that are not optimal for freight movements. These roads should continue to be improved, while keeping in mind community interests.

Truck Parking Concerns

Truck parking is a top issue for shippers and carriers, especially during peak season in major agricultural regions like Salinas. The following are several truck parking issues that were identified by stakeholders:

- There is a localized shortage of truck parking around large freight generating facilities, such as cooler facilities in Salinas. This can lead to trucks circling or parking illegally while waiting to gain access to the cooler.
- There is a lack of truck parking available for long-haul truckers that move goods along the U.S. 101 corridor.
- There is an issue with illegally parked trucks in some areas; in particular, in the Buellton and Solvang areas in the southern portion of the study area.

It was brought up at the May 18,2011 FAST meeting that a recent wave of complaints from truck operators provided an incentive to provide further truck parking in the Santa Barbara region. The following are key constraints that need to be taken into account when looking at the development of truck parking facilities in the region:

- Some areas are sensitive to truck-related development, such as the Gaviota Coast.
- Currently, legislation prevents vendors from operating at rest stops. Legalizing vendors at rest stops would help the chances for public-private cooperation in providing truck parking.
- Proposals for truck parking facilities are often met with opposition from local residents, given the potential for increased pollution and noise. However, some heavily populated areas, such as Salinas, are those that are most in need of rest stops. A balance needs to be struck so that locations chosen for truck rest areas are close enough to major freight demand drivers (i.e., coolers, manufacturing facilities), but at the same time are not decreasing the standard of living of existing residents. In addition, to the degree that plug-in auxiliary power units (APU) can be encouraged at these rest stops, the lower the emissions at rest stops.

Recommendations to address the issues above are described in Chapter 6.

5.2 ORGANIZATIONAL/DATA/POLICY ISSUES

Aside from the infrastructure issues that were defined above, discussions and interviews revealed that there is room for improvement in how regional freight planning is accomplished. The following issues, or areas to improve upon, were determined:

- The FAST is currently not tracking performance measures to better understand where key areas of concern exist in the region;
- Aside from Caltrans data in several locations on state highways, there is no regionwide truck count classification program in place to assist in analysis and prioritization of future projects;
- The FAST structure and mission statement should be updated to improve how the FAST makes decisions on improving the freight system;
- More coordination and cooperation with border counties should occur to improve the region's connection to key markets and other national infrastructure components, such as I-5; and
- Further identification of funding sources is required to help pay for priority freight projects.

Recommendations to address these issues are discussed in Chapter 6.

6.0 Recommendations to Address Regional Issues/Concerns

There are several strategies/actions that the study team recommends based on the feedback received through private and public sector interviews, through analysis of goods movement and the system in Chapters 1 to 4, and through discussions with the FAST group. These recommended actions are highlighted here and are discussed further in this chapter.

1. **Develop a Prioritized List of Freight Projects.** Develop a prioritized list of freight projects and initiatives that should be undertaken to improve goods movement in each of the counties.
2. **Develop and Implement a Framework to Evaluate Regional Freight Issues/ Projects Objectively.**
3. **Measurement of Key Freight Performance Metrics and Data Collection Effort.** Develop a set of key performance metrics that the FAST will use to monitor freight performance. This also will require data collection over time to ensure that enough data is available to measure performance.
4. **Implementation of a Regionwide Truck Count and Classification Program.** Include truck counts when the various jurisdictions in the region do their regular traffic counts. This will allow the region to support a heavy-truck model in the future, and get a better understanding of what key regional/ local truck and freight corridors are.
5. **Reformulate the Structure and Objectives of the Regional Freight Working Group.** Reformulate the FAST as a freight group that will meet consistently to discuss freight concerns, work to advance freight issues for funding, and measure performance of the freight system.
6. **Develop Strategic Partnerships with Regional Trading Partners.** It is recommended that the FAST seek strategic partnerships with government agencies in the Central Valley to promote projects of mutual interest.
7. **Further Investigate Financing Options for Key Freight Projects.** Consider a variety of financing options to support key regional freight projects.

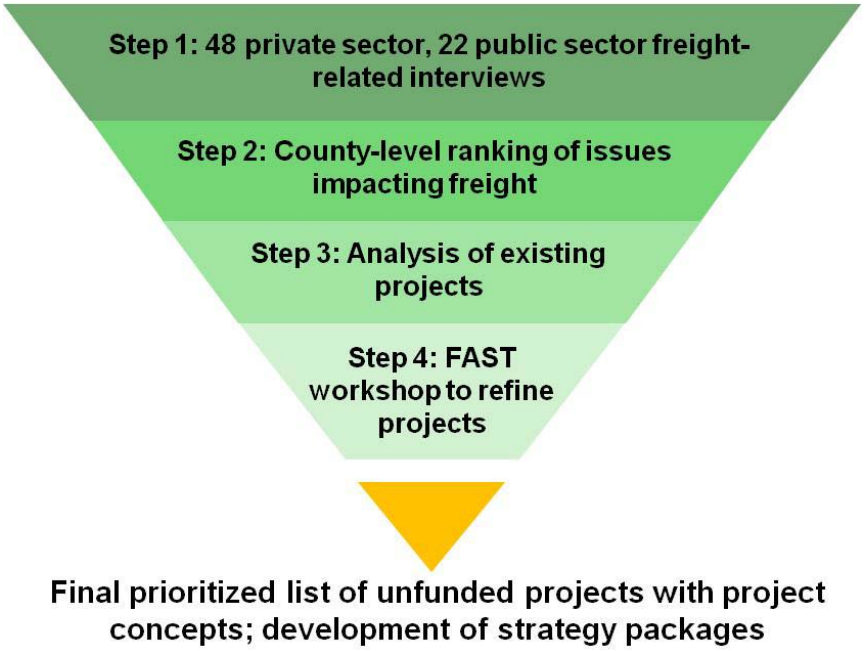
This chapter provides recommendations and guidance to help regional stakeholders push forward on these strategies.

6.1 DEVELOP A PRIORITIZED LIST OF FREIGHT PROJECTS

It is recommended that the FAST undergo a regular process to define "Priority Freight Projects" for the region. Taking proactive steps to define freight priorities and develop project concepts and cost estimates will provide the region with an advantage when going after funding when it becomes available. In addition, being able to highlight that a proactive, regionwide effort was taken to prioritize freight projects may also increase chances for funding when applying for Federal or state monies.

As a part of this study effort, freight stakeholders on the project team went through a process to prioritize key regional freight issues, based on the issues input from the interview process. Figure 6.1 below outlines the steps taken to get from interview responses down to a list of prioritized, unfunded freight projects. Steps 1 and 2 were covered in Chapter 5; the final steps are covered here in more detail.

Figure 6.1 Process to Develop List of Prioritized Unfunded Freight Projects



Step 3. Analysis of Existing Projects

In order to take action on the prioritized issues identified in Chapter 5, it is important to understand which issues are being addressed by existing projects. Many of the highest priority issues are being addressed either through planned projects, or, in some cases, funding has already been set aside. The study team worked with the FAST and key stakeholders to refine the list of unfunded

priority projects in Step 4. Generally, these projects fall on the major freight corridors highlighted in Figure 6.2 below.

Figure 6.2 Major Freight Routes in the Central Coast Region

Note: These highways are the most critical because of relatively high-truck volumes and connectivity benefits they offer for the region as a whole.

Below is an overview of major highway projects (both under construction and planned) that are important for freight movements in the region.[22] Note that this list is not comprehensive. Within each description, it is noted which key regional issue this project may address.

Monterey County Goods Movement Projects

U.S. 101 Airport/Boulevard Interchange Project. This project intends to improve safety, operations, and goods movement of the Airport Boulevard/ U.S. 101 interchange. The project will eliminate PM and some AM peak-hour operational deficiencies, and eliminate queues on the southbound off-ramp to Airport Boulevard. The project is under construction and should be finalized this year. This should address concerns voiced by carriers about congestion on U.S. 101 in Salinas, specifically near Airport Boulevard.

U.S. 101 San Juan Road Interchange Project. The San Juan Road area of U.S. 101 has been identified as a chokepoint in the region for many years. The project will remove three at-grade road intersections at U.S. 101, which will improve safety and reduce peak-hour congestion. Project construction could begin in late 2012. The project may address safety and congestion concerns raised by carriers in the U.S. 101 region north of Salinas.

U.S. 101 Prunedale Improvement Project. The Prunedale region of U.S. 101, just south of the San Juan Road project area above and stretching down to Salinas, also has some safety and operational concerns. This project intends to address those concerns through additional interchanges and other improvements. Another major project is planned on U.S. 101 in the Prunedale region that will address long-term congestion concerns, but safety concerns are the highest priority at this time. Long-term congestion concerns will be addressed as funding becomes available. The project is currently under construction. This project may address the safety concerns that carriers raised while traveling in the U.S. 101 region north of Salinas.

SR 1/Salinas Road Interchange Project. The purpose of this project is to improve the safety and function of the SR 1/Salinas Road intersection through reconfiguration of the intersection. Currently, this intersection experiences more collisions than any intersection in Monterey County.[23] The project is currently under construction. While this did not come up as a concern during interviews, freight carriers moving goods on SR 1 should benefit from this improvement.

Route 156 West Corridor Project. The purpose of this project is to improve safety, operations, and local road access to Route 156. It also is meant to reduce congestion and accommodate future increases in traffic. Improvements include

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[22] Caltrans District 5 web site: http://www.dot.ca.gov/dist05/projects/.

[23] http://www.dot.ca.gov/dist05/projects/salinas_rd/ccc080608.pdf.

reconstruction of the U.S. 101/156 interchange, as well as widening of SR 156 between U.S. 101 and Castroville Boulevard. The project is currently awaiting funding. This project would help improve east-west connectivity (a stated goal of the FAST), and may address carrier congestion concerns on SR 156.

San Benito County Goods Movement Projects

SR 25 Widening, Hollister to Gilroy. The purpose of this project is reduce congestion and improve safety on portions of SR 25 in Santa Clara and San Benito Counties. This project is currently funded to complete the preliminary design and environmental analysis phase. The project may address the safety and congestion concerns identified on this corridor by stakeholders. It also will help improve connectivity to U.S. 101.

SR 156 Improvement Project. The purpose of this project is to reduce delay and improve safety on SR 156 between San Juan Bautista and Hollister. The current two-lane highway will be converted to a four-lane highway. This project will address congestion concerns heard about this stretch of SR 156, and will improve east-west connectivity between U.S. 101 and I-5 in the Central Valley.

U.S. 101 Improvement Project.[24] This project, which stretches from southern Santa Clara County to northern San Benito County, intends to reduce current and future congestion on U.S. 101 from SR 129 north to Monterey Road. A key change would be that this stretch of the highway would be widened to a six-lane freeway. This project is deferred until funding is available. It would help address the congestion and safety concerns voiced by stakeholders on U.S. 101 north of Salinas, and help ease future congestion.

SR 152 Santa Clara/San Benito County Mobility Partnership.[25] The California Transportation Plan 2025 identified SR 152 as a "Major International Trade Highway Route", as it is critical to goods movement for counties in the Central Coast, the South Bay, and the Central Valley regions. Because of the importance of this corridor, this partnership has been formed between the two counties. At this point, various options are under review for significantly upgrading the SR 152 connection between U.S. 101 and the Central Valley. This is currently in the planning stages. However, it has major repercussions for the Central Coast region, as this is one of the only major arteries that connects the region directly with I-5 (SR 46 being the other route, which is 120 miles south).

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[24] http://www.vta.org/projects/101_monterey_sr_129/101_improv_monterey_sr_129.html.

[25] http://www.sanbenitocog.org/pdf/SR152_MobilityPartnership.pdf.

San Luis Obispo County Goods Movement Projects

SR 46 Corridor Improvement Project. This is an ongoing project that aims to improve safety and congestion on SR 46 east of U.S. 101. This will be done in several phases, and aims to create a four-lane highway, as necessary. Currently (February 2012), one of the segments east of Paso Robles (near Geneseo Road) is under construction and is being widened to four lanes. This is a key project that, in conjunction with all future efforts to expand this to a four-lane highway (see Route 46 East for the Future Plan), will help improve east-west connectivity between the Central Coast and the Central Valley, and improve operations for all vehicles.

U.S. 101/Willow Road Interchange Project. This project is intended to relieve congestion in the Nipomo Area, and relieve congestion at the Tefft Street interchange with U.S. 101. It also will provide a better connection to SR 1 from U.S. 101. The project is currently under construction. This will relieve congestion at current U.S. 101 interchanges, and improve traffic flow in the Nipomo/Oceano area, which is home to various cooler and agricultural facilities.

U.S. 101 Los Osos Valley Road Interchange Improvement Project. This project in the City of San Luis Obispo would improve safety and help reduce congestion through reconfiguration of the Los Osos Valley Road interchange with U.S. 101. There is a variety of options under consideration for improving the interchange. Such an improvement would help address concerns regarding congestion on U.S. 101 in the San Luis Obispo region.

U.S. 101/Santa Maria River Bridge Widening Project. This project will widen the Santa Maria River Bridge and increase the highway from a four-lane to six-lane highway. This has been a congestion point in the region, which this project will help alleviate. The project is currently under construction. When finalized, this will mitigate one of the most common bottlenecks mentioned by carriers in Santa Barbara and San Luis Obispo Counties.

Santa Barbara County Goods Movement Projects

U.S. 101/Santa Maria River Bridge Widening Project. This project will widen the Santa Maria River Bridge and increase the highway from a four-lane to six-lane highway. This has been a congestion point in the region, which this project will help alleviate. The project is currently under construction. When finalized, this will mitigate one of the most common bottlenecks mentioned by carriers in Santa Barbara and San Luis Obispo Counties.

U.S. 101 Milpas to Hot Springs Operational Improvements. Improvements to this stretch of U.S. 101 in Santa Barbara have been underway for some time. Operations improvements also will help reduce congestion on the roads. This helps address the primary freight issue in Santa Barbara of congestion on U.S. 101.

U.S. 101 Casitas Pass and Linden Avenue Interchange Project. This project in Carpinteria intends to improve access to and operations at the Linden Avenue and Casitas Pass Road interchanges with U.S. 101, as well as improve operations on U.S. 101 in Carpinteria. Construction is set to begin in 2015. This project will help address the need of improved operations and reduced congestion on U.S. 101.

U.S. 101 South Coast HOV Lanes Project. This project would add an HOV lane from Sycamore Creek in the City of Santa Barbara to Carpinteria Creek in the City of Carpinteria. The primary purpose, from a freight perspective, is reduced congestion for all vehicles on U.S. 101 on this stretch. This would also address the key issue reported by stakeholders of congestion on U.S. 101 near Santa Barbara.

Santa Cruz County Goods Movement Projects

SR 1 Soquel Avenue to Morrissey Auxiliary Lanes Project. The purpose of this project is to improve traffic conditions for lane changes and merges on SR 1 between Soquel Avenue and Morrissey Boulevard. This is generally the most heavily traveled section of SR 1 in Santa Cruz County, and the project would help improve traffic flow for all vehicles. This would help address the congestion issues on SR 1 in Santa Cruz County that were voiced by stakeholders.

SR 1 HOV Lanes from Aptos to City of Santa Cruz.[26] The purpose of this project is to reduce congestion on this heavily traveled section of SR 1. An additional lane would be added in each direction to carry vehicles with more than two people. Auxiliary lanes also would be constructed along the corridor, where possible. Funding for this project has not been secured beyond the environmental study. This project would help address peak-hour congestion on SR 1 in Santa Cruz County that was highlighted by several interviewees.

Step 4. FAST Workshop to Refine Projects and Issues

At the May 18, 2011 FAST meeting, the FAST members provided input to finalize a list of priority projects for which no funding is currently set aside. From the input received here and from the research performed by stakeholders, the issues in Table 6.1 below were ranked, but do not have funding set aside to address the issue. It is recommended that these issues/projects are prioritized as "key freight concerns and projects" that should be prioritized to be analyzed further and potentially funded.

[26] http://sccrtc.org/projects/streets-highways/1hov/.

Table 6.1 Prioritized Issues/Projects without Funding Allocated[a]

County	Top Prioritized Freight Issues/Projects by County
Monterey	• San Juan Interchange Project on U.S. 101. • SR 156 West Widening project to widen the road to 4 lanes and improve SR 156/U.S. 101 interchange.
San Benito	• SR 152 Corridor Improvements (pending study completion). • SR 25 Widening project. • SR 156 Improvement project.
San Luis Obispo	• SR 46 East – Airport Rd Intersection experiences congestion – interchange improvements required. • SR 1 through Oceano congestion; SR 1 from Pismo to SB County line congestion – road/operational improvements required.
Santa Barbara	• U.S. 101 peak-period traffic congestion from Carpinteria through Goleta. • Recommended LOSSAN rail improvement projects to UP line (see Chapter 4). • Main Street in Santa Maria experiences congestion – spot improvements to alleviate this congestion possible. • Overnight truck parking facility in SB County. • Betteravia Rd Circulation improvements between Hwy 101 and SR 135.
Santa Cruz	• SR 1 between Santa Cruz and Aptos experiences congestion. SR 1 HOV lanes project is proposed, but $500 million in construction costs not funded. • SR 17 north of Santa Cruz experiences congestion and has been designated a safety corridor. Truck climbing lane has been determined infeasible, but issues persist. • SR 129 between U.S. 101 and SR 1 experiences congestion; effort to designate this as a safety corridor.

[a] As of June 1, 2011.

In addition, the following four regional initiatives are recommended:

1. Improved east-west connectivity between U.S. 101 and Interstate 5;
2. Regional truck parking improvement;
3. Further exploring an intermodal truck to rail facility; and
4. Reiterate and focus on the importance of U.S. 101 and its continued maintenance/improvement for the region.

These are discussed here in more detail.

Improved East-West Connectivity between U.S. 101 and I-5

The FAST group highlighted the SR 156/152 and SR 46/41 corridors as key freight corridors that connect the Central Coast with I-5. The Santa Clara Valley Transportation Authority (VTA) and Caltrans are currently studying SR 152

between U.S. 101 and SR 99 in the SR 152 Trade Corridor Project.[27] One of the key objectives of this study is to improve the movement of goods, traffic operation, and travel time reliability between Santa Clara, San Benito, and Monterey Counties and the Central Valley. The intent also is to achieve full expressway standards throughout the corridor. Finally, the study intends to identify viable financing strategies for corridor improvement.

In addition to this effort, the SR 156 widening project in Monterey County west of U.S. 101, as well as the San Benito Route 156 Project, will continue to improve the flow of goods between U.S. 101 and I-5.[28,29]

It is recommended that the east-west connections between the Central Coast and Central Valley are improved to facilitate goods movement for Central Coast businesses. A four-lane interstate quality north connection (SR 152 and SR 156) and south connection (SR 46) are needed to facilitate trade between the two regions, and to improve access to Interstate 5 for regional businesses. Central Coast government agencies and the FAST are recommended to stand behind these planned improvements to continue pushing them forward.

Regional Truck Parking Improvements

To counteract truck-parking related issues described in Chapter 5, the following items are recommended for the Central Coast region:

1. Two truck parking facilities are recommended: one in western Santa Barbara County and one just south of Salinas. The truck parking facility in Santa Barbara County would alleviate some of the truck parking concerns heard from carriers in that region. The one near Salinas could be used by agriculture shippers waiting for their orders to be ready for pick-up at coolers.
2. It also is recommended that major freight locations, such as coolers, are equipped with appointment systems. From the interviews, several cooling facilities mentioned that they were able to mitigate the truck parking issue near their facilities by requiring carriers to schedule time in advance to pick up their goods. The FAST group could work with coolers to implement appointment scheduling systems to help mitigate emissions and queues around their facilities.
3. To mitigate emissions and noise pollution, it is suggested that truck operators acquire APUs to use while at truck parking facilities. This has both positive economic benefits for truck operators (reduced fuel consumption since no

[27] http://www.vta.org/projects/152_trade_corr_proj/index.html.

[28] http://www.tamcmonterey.org/programs/hwyproj/pdf/Roadway_04_SR_156_insert.pdf.

[29] http://www.dot.ca.gov/dist05/projects/sbt156/index.htm.

idling will be required) and for the surrounding environment (reduced emissions and noise). Several nonprofit organizations, such as Cascade Sierra Solutions, help truck operators finance clean, efficient equipment upgrades (including items such as APUs) through available grants, tax incentives, and low interest lending.[30] The FAST could seek to ensure that truck parking facilities are equipped with power outlets. In addition, it could educate carriers about the benefits of APUs and other truck enhancements that will save fuel and reduce emissions.

Figure 6.3 Trucks Parking on Side of Road Waiting to Pick up Products in Gonzales

Improved Intermodal Rail Opportunities

One of the major issues reported by stakeholders was heavy congestion in and around Salinas and on U.S. 101 through Salinas. Currently, there are several projects underway to address congestion in the region, which will help mitigate much of these congestion issues. This includes the Airport Boulevard project, which is slated for completion in 2012.[31]

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[30] http://www.cascadesierrasolutions.org/aboutus.aspx.

[31] http://www.tamcmonterey.org/programs/hwyproj/pdf/Roadway-01_Airport-Blvd-Interchange-East_Insert-2-11-11_sg.pdf.

The *Salinas Valley Truck to Rail Intermodal Facility Feasibility Study* recommends construction of a truck to rail intermodal facility in the Salinas Valley, either in Gonzales or Chualar. Such a facility would make it possible to ship agricultural products (and other products) from the Salinas Valley to destinations on the East Coast. Currently, most agricultural goods and manufactured food products leave the Salinas Valley by truck, creating high levels of congestion on local roads in and around Salinas and on U.S. 101. Moving some of these goods out of the region by train would reduce congestion on local roads by at least 10 percent. In turn, other goods that are imported by truck from the East Coast could be brought directly to the region by rail.

Maintain Focus on Improving/Maintaining U.S. 101 for Freight

Data and interviews presented in this document highlight the importance of U.S. 101 to regional businesses. Truck counts exceed all the other highways by far, and it connects the region to two major metropolitan markets (southern California and San Francisco Bay regions). In short, U.S. 101 is the region's single most valuable and important goods movement asset. Already, the region has prioritized U.S. 101 through the creation of the *U.S. 101 Central Coast Coalition*. It is important to continue to prioritize U.S. 101 as the key regional route, while also improving other connections (such as the east-west connections).

6.2 DEVELOP AND IMPLEMENT A FRAMEWORK TO EVALUATE REGIONAL FREIGHT ISSUES/PROJECTS OBJECTIVELY

One of the key tasks that the FAST can do to help secure funding for key freight projects is prioritization of regional issues and projects. In this study, each of the metropolitan planning organizations (MPO) was asked to prioritize issues and projects based on their knowledge of their respective counties. As a result, the list in Table 6.1 was developed, as well as the four initiatives described in Section 6.1. This is an important first step – if funding opportunities come around, the region has identified its most important concerns. Another good example of how to prioritize and market this prioritization can be observed at the Transportation Agency for Monterey County (TAMC). The highest priority projects have been identified and made available for the public to see at the top of their web site.[32]

It will be important to continue to prioritize regional (not just county by county) freight projects on an ongoing basis. In addition, it will be important to collect

[32]http://www.tamcmonterey.org/.

necessary data about these projects to help support regional prioritization in a more quantitative manner. Finally, it will be necessary to make sure that the development of key performance metrics (see Section 6.3) aligns with the needs for project prioritization.

Below follows a suggested framework for prioritizing projects in the Central Coast region. This is based on the general framework that Cambridge Systematics presented to CMAP in a PowerPoint titled *Regional Freight System Planning Recommendations*.

Step 1. Gather Data on Key Concerns/Issues

The first step that the FAST should take is to determine, on an ongoing basis, what the key freight issues are. This can change over time, especially as old concerns are addressed. A survey or interview process should be conducted every two to three years in the region.

- Conduct surveys/interviews to determine freight needs areas, by mode;
- Determine key negative freight impacts on communities; and
- Use available data (FAF3 or TRANSEARCH) to model future conditions and needs.

Step 2. Initial Filtering of Potential Projects

Once the issues are understood, all project concepts should be reviewed (TIP, stakeholder projects, others). This project review should occur regardless of the level of implementation – the key criterion here is whether the project is a freight project (Yes), and whether the project is unfunded or only partially funded (Yes). This also is the time to develop new project concepts to add to the list. Then, the following information should be calculated for each project (if data is available).

- Analyze key freight routes for the following:
  - High congestion (need to collect data to measure travel time index on truck routes);
  - High daily truck counts (need to collect more datapoints on key truck highways and arterials); and
  - High percentage of truck-related accidents.
- Communicate with railroads to determine potential public-private partnerships to address chokepoints and infrastructure deficiencies, and to work on potential improvements that may have a public benefit.
- Determine projects that are important to improving air/sea trade:
  - Highest volume airports; and
  - Any seaside needs for fishing industry.

Step 3. Evaluate Projects Using Performance Measures

Based on the results of Step 2, some projects could be thrown out at this stage. In this step, remaining projects are evaluated based on performance measures that address all areas of importance for stakeholders. This includes the following:

- Mobility.
- Connectivity/accessibility.
- Safety.
- Economic growth.
- System preservation.
- Environment/community.
- Readiness: If this project were to be funded today, how soon could construction begin?
- Multiple modes?

To finalize the list of prioritized projects, it will be important to compare projects based on this comprehensive review in addition to the following:

- It will be important to evaluate each project for each measure with available data. For example, statewide or local truck safety data should be used to determine how much of an impact a particular project could have on current safety issues. Also, if a capacity-enhancing project is to occur on a particular congested segment, it may have a high score under "Mobility".
- Each project will receive a relative score for each performance measure (no score when measure does not apply).
- The average score across these measures is responsible for determining project priority in relation to the others.
- Always do a reality check after finalizing the list.
- Use the freight flows tool or travel demand models to further understand impacts of specific projects.

The ability to effectively perform this analysis depends on the availability and reliability of key data, as discussed in the section on performance metrics in Section 6.3. It also will rely on the FAST group reviewing all potential projects objectively and coming to consensus on which projects will indeed be most important for the continued improvement of the freight system.

6.3 MEASUREMENT OF KEY FREIGHT PERFORMANCE METRICS AND DATA COLLECTION EFFORT

Along with understanding key issues in the region, it is important that the FAST and regional freight stakeholders are aware of ongoing performance of the regional freight system. Measurement of freight system performance over time will allow stakeholders to become aware of trends that may require action. Freight performance measurement will also help stakeholders understand where the greatest investment needs are.

The study team researched existing freight performance measures in use in other locations around the country. From this list, those that may apply to a rural region, such as the Central Coast region, were retained. Table 6.2 below provides a starter set of performance measures that could be tracked over time by the FAST.

The list below is only meant to serve as a starter list that can be used by the FAST to track performance measures. The FAST, along with stakeholders, should conduct further outreach with FAST members to review this list and add any additional ones that are of particular concern.

Table 6.2 Sample List of Potential Performance Measures

Performance Measure	Performance Metric	Description	Source of Metric	Data Needs	Potential Data Sources
System Demand	Truck Freight Demand	Heavy truck vehicle miles traveled (VMT)	Oregon Department of Transportation (DOT) Freight Performance Measures: Approach Analysis	Truck annual average daily traffic (AADT), roadway section lengths (centerline)	Caltrans web site: http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/index.htm Caltrans WIM Sensors: Request Process
	Rail Freight Demand	Rail freight tonnage	Oregon DOT Freight Performance Measures: Approach Analysis	Tons originating/terminating by rail in the region	Carload waybill sample
	Air Cargo Demand	Air freight tonnage	Oregon DOT Freight Performance Measures: Approach Analysis	Tons enplaned, deplaned, or both	Caltrans California Air Traffic Statistical Reports: http://www.dot.ca.gov/hq/planning/aeronaut/paxstats.html
Freight Delay	Truck Delay	Travel time above that needed to complete a trip at free-flow speeds for large trucks	Texas Transportation Institute	Average travel time, free-flow travel time	Requires travel time estimates for key corridors; not available currently
	Rural National Highway system (NHS) Travel Speed	Global positioning system (GPS) truck speed data for NHS segments in the Central Coast	National Cooperative Freight Research Program (NCFRP) 03	GPS positional records for trucks operating in the Central Coast region	Requires contracting with vendor with GPS truck data
	Rural Congestion	Percentage of rural miles congested	Oregon DOT Freight Performance Measures: Approach Analysis	Volume-to-Capacity (V/C) ratios for rural highways	Not readily available

Performance Measure	Performance Metric	Description	Source of Metric	Data Needs	Potential Data Sources
Freight Cost/ Value	Truck Congestion Cost	Annual cost of wasted time and fuel for large trucks due to congestion	Texas Transportation Institute	Daily vehicle hours of delay, percentage of commercial vehicles, value of commercial vehicle time (dollar per hour), annual conversion factor	Not readily available
	Truck Commodity Value	Value of commodities carried by truck in the region	Texas Transportation Institute	Commodity value for Central Coast truck movements	FAF database or TRANSEARCH data
System Condition	Pavement Condition	Percentage of pavement/lane miles in good or better condition	Texas DOT Tracker, Missouri DOT Tracker, Oregon DOT	International Roughness Index (for high-speed routes w/speed limits over 50 mph), conditional ratings (e.g., PASER or PSI) for lower-speed roads	Caltrans – Potentially Unavailable
	Bridge Condition	Percentage of bridges in good or better condition	Texas DOT Tracker, Missouri DOT Tracker	Number of bridges that are not structurally deficient, functionally obsolete, or substandard for load only, total number of bridges	Caltrans – Potentially Unavailable
	Deficient Bridges	Number of structurally deficient/ functionally obsolete bridges	Missouri DOT Tracker	Bridge condition ratings for deck, superstructures, substructures, culvert and retaining walls; appraisal ratings for structural condition, waterway adequacy, deck geometry, underclearances, approach roadway alignment	Caltrans – Potentially Unavailable
	Short Line 286K Railcar Capacity	Percentage of short line track miles capable of handling 286K cars	Oregon DOT Freight Performance Measures: Approach Analysis	Short line/regional track miles capable of handling 286K cars, total shortline/regional track miles	Caltrans working with the two regional shortlines

Performance Measure	Performance Metric	Description	Source of Metric	Data Needs	Potential Data Sources
Safety	Truck-Involved Crashes	Number of truck-involved injury/ fatality accidents	Oregon DOT Freight Performance Measures: Approach Analysis	Crash incident records including vehicle types involved; in spatial format if possible	Caltrans (formal request process)
	Grade Crossing Collisions	Number of highway-grade crossing collisions/fatalities	Oregon DOT Freight Performance Measures: Approach Analysis	Grade crossing accident reports/records; spatial format if possible	Caltrans (formal request process)
Services	Truck rest area/ parking utilization	Number of trucks that use rest areas/truck parking facilities	Missouri DOT Tracker	Time of day truck counts at truck parking facilities; capacity by facility	Not readily available

6.4 IMPLEMENTATION OF A REGIONWIDE TRUCK COUNT AND CLASSIFICATION PROGRAM

One of the key data deficiencies is a comprehensive, regionwide truck count program that makes it possible to determine key regional truck routes. Some physical truck count locations exist on key highways, such as U.S. 101 and SR 46, but it is important to get additional data about truck counts and classification on local and other less traveled roads. These are required in order to help the region prioritize freight investments. Further details about how to optimize a regional truck count and classification system can be found on the Federal Highway Administration (FHWA) web site: http://www.fhwa.dot.gov/ohim/tmguide/tmg4.htm#movements.

Why Does the Region Need More Truck Counts?

There is a significant number of factors that determine how these questions will be answered. The first step is for the FAST to determine how it would use truck counts. Some of the more common uses for truck counts include the following:

- Validate and calibrate the regional truck count model.
- Identify the key freight routes and track time-of-day and average daily truck traffic (ADTT) trends on these routes over time to help inform planning decisions.
- Analyze time-of-day and ADTT trends on freight access routes. These link to major freight generators and can be used in analyzing the truck trip generation characteristics of these facilities, as well as in analyzing chokepoints that might impede throughput at these facilities. The types of freight facilities include the region's ports, airports, warehouse districts, rail and intermodal terminals, truck terminals, and major industrial districts.
- Analyze how changes over time in time-of-day congestion characteristics of major commuter routes interact with freight usage of these same routes. This would focus counts on key interstate and state highway corridors.
- Analyze the different usage patterns, both by time of day and type of truck, associated with different roadway functional classes (requiring a reasonable distribution across these different functional classes).

What Types of Data Needs to be Collected?

The key data that needs to be collected are ongoing counts by various truck types. The FHWA lists the following truck classification types, which the technology should be able to distinguish between the following truck types, as laid out by the FHWA:

- **Two-Axle, Six-Tire, Single-Unit Trucks.** All vehicles on a single frame, including trucks, camping and recreational vehicles, motor homes, etc., with two axles and dual rear wheels.
- **Three-Axle Single-Unit Trucks.** All vehicles on a single frame, including trucks, camping and recreational vehicles, motor homes, etc., with three axles.
- **Four or More Axle Single-Unit Trucks.** All trucks on a single frame with four or more axles.
- **Four or Fewer Axle Single-Trailer Trucks.** All vehicles with four or fewer axles consisting of two units, one of which is a tractor or straight truck power unit.
- **Five-Axle Single-Trailer Trucks.** All five-axle vehicles consisting of two units, one of which is a tractor or straight truck power unit.
- **Six or More Axle Single-Trailer Trucks.** All vehicles with six or more axles consisting of two units, one of which is a tractor or straight truck power unit.
- **Five or fewer Axle Multi-Trailer Trucks.** All vehicles with five or fewer axles consisting of three or more units, one of which is a tractor or straight truck power unit.
- **Six-Axle Multi-Trailer Trucks.** All six-axle vehicles consisting of three or more units, one of which is a tractor or straight truck power unit.
- **Seven or More Axle Multi-Trailer Trucks.** All vehicles with seven or more axles consisting of three or more units, one of which is a tractor or straight truck power unit

Distinguishing trucks by these types of trucks will help planners understand goods movement patterns by industry, and where investment in the goods movement system should be focused. Truck counts and classification types should not be separated and should be measured together.

Recommendation

It is recommended that the FAST push for the inclusion of truck counts when the various jurisdictions in the region do their regular traffic counts. This will allow the region to support a heavy-truck model in the future and get a better understanding of what key regional/local truck and freight corridors are.

6.5 REFORMULATE THE STRUCTURE AND OBJECTIVES OF THE REGIONAL FREIGHT WORKING GROUP

A key ingredient to developing an improved freight system in the Central Coast region is an engaged and active freight group that addresses freight issues and promotes regional freight interests. Throughout the course of this study, the

FAST and its members have provided study input to the study team. The next step is to structure this group in an effective manner so that it can drive and advocate for regional freight system improvements.

Below, three case studies of other regional freight groups are presented to highlight the purpose, organizational structure, and key products/outputs of other freight stakeholder groups in the U.S. A brief overview of the existing U.S. 101 Coalition also is presented. This is followed by recommendations on how to structure and define the purpose and organizational structure of the FAST moving forward.

Case Study #1. International Mobility and Trade Corridor

Background and Purpose

The International Mobility and Trade Corridor Project (IMTC) is a binational coalition of government agencies and private businesses that promotes mobility and security improvements for the four international border crossings between Whatcom County in Washington State and the Lower Mainland of British Columbia. These crossings are collectively known as the Cascade Gateway and include the Peace Arch Bridge and Pacific Highway in Blaine, Washington/ Surrey, British Columbia; Sumas, Washington/Abbotsford, British Columbia; and Lynden, Washington/Aldergrove, British Columbia. The growth of North American Free Trade Agreement (NAFTA)-related truck and rail traffic, along with growth in passenger crossings, has led to increasing wait times and congestion for both truck and auto traffic at these gateways. The Blaine crossing, for instance, is now the third busiest passenger crossing and fourth busiest commercial crossing on the border.[33]

The IMTC acts as a mechanism through which cross-border regional mobility improvement projects are identified, prioritized, and then proposed for funding. The goals of the IMTC project are the following:

- Facilitate a forum for ongoing communication between agencies that affect regional, cross-border transportation, safety, and security;
- Coordinate planning of the Cascade Gateway as a transportation and inspection system, rather than as individual border crossings;
- Improve and distribute traffic data and information; and
- Identify and pursue improvements to infrastructure, operations, and information technology.[34]

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[33] Whatcom Council of Governments, *2010 IMTC Resource Manual*.

[34] http://www.wcog.org/Border.aspx.

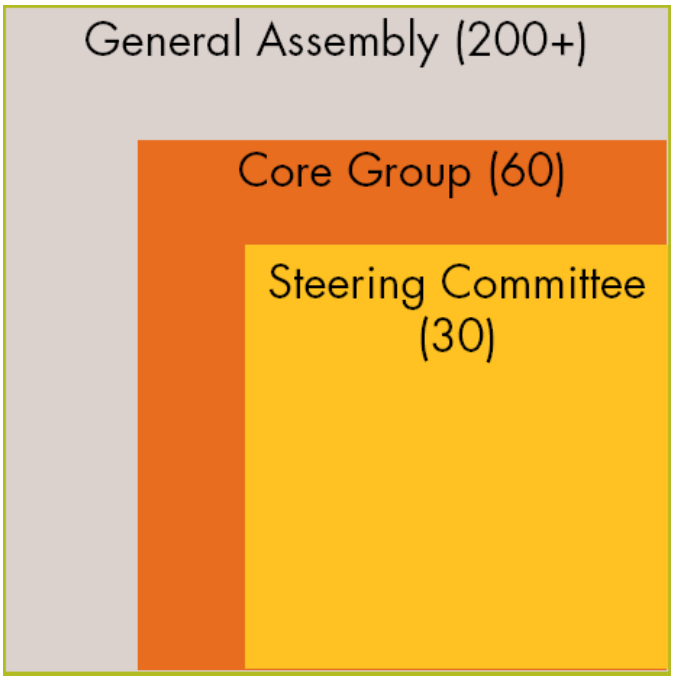
Since it was founded in 1997, the IMTC has helped secure more than $38 million to fund projects that pursue these goals. Funding has come from the FHWA, Transport Canada, Washington State, the Province of British Columbia, and various local entities.

Organizational Structure

The IMTC is composed of more than 60 public and private organizations that share concerns with business and traffic mobility issues surrounding the international border crossing between Washington State and British Columbia. The Whatcom Council of Governments (WCOG) is the lead agency. The IMTC is organized into three key levels, as shown in Figure 6.4:

1. The Steering Committee meets monthly and includes approximately 30 agencies, which collectively make suggestions to the Core Group.
2. The Core Group is the main decision-making body of IMTC, comprising about 60 agencies and organizations, including the Steering Committee, which meet on a quarterly basis and take decisions based on input from the Steering Committee.
3. The General Assembly is a broader constituency of stakeholders, including businesses, organizations, and agencies with an interest in cross-border operations. The General Assembly meets annually to stay informed of border policy and operational developments, and to provide general feedback to the Core Group/Steering Committee.

Figure 6.4 IMTC Organizational Structure



Source: Whatcom Council of Governments, *2010 IMTC Resource Manual*.

Participating entities come from many sectors, such as:

- **Transportation agencies**, including the FHWA, Federal Transit Administration (FTA), Transport Canada, WCOG, Vancouver International Airport, Washington State DOT, and the British Columbia Ministry of Transportation;
- **Customs and security agencies**, such as U.S. Customs and Border Protection and Canada Border Services Agency;
- **Cities and towns** along the border, including Abbotsford, Surrey, and White Rock (in British Columbia) and Bellingham, Everson, Blaine, Lynden, Sumas, Nooksack, and Ferndale (in Washington State);
- **Nongovernmental organizations**, such as the Cloverdale District Chamber of Commerce, Bellingham/Whatcom Chamber of Commerce, Better Borders Northwest, Cascadia Institute, and Pacific Corridor Enterprise Council; and
- **Private industry representatives**, including the British Columbia Trucking Association, Amtrak, Surrey Board of Trade, and U.S. and Canadian duty free stores.

Key Products and Outputs

The overarching function of the IMTC is as a clearinghouse for data and information. The object is to provide decision-makers and stakeholders with as much information as possible in order to make sound investment decisions, as well as to support applications for limited grant funding. All IMTC meeting materials are available on the Coalition's web site (www.wcog.org/imtc), as is a calendar of border-related events. There also is an ongoing inventory of projects, including planning studies and current construction. The IMTC has an ongoing border data collection program, which includes northbound and southbound truck, and automobile volumes, trade value data, origin-destination information for trucks and passengers, key truck commodities, and border processing times. A sample of recent IMTC work products is provided in Table 6.3.

Table 6.3 Recent IMTC Projects

2009 IMTC Commercial Vehicle Operations Evaluation Survey	WCOG partnered with the Border Policy Research Institute at Western Washington University (BPRI) and the University of Washington to evaluate commercial vehicle movement through the Cascade Gateway. Analysis included measurement of border arrival and processing rates at all three crossings, as well as the collection of origin-destination and commodity data.
Shortsea Shipping Study	IMTC participants completed a study to determine the potential of shortsea shipping to serve a meaningful share of the future West Coast cross-border freight traffic; and to describe the most feasible service types and supporting actions that governments could take.
Abbotsford-Sumas Border Improvement Project	This binationally funded project identified deficiencies and solutions to address the need for parking for southbound trucks, and to alleviate frequent blockage of streets in the City of Sumas. Based on this project, a new parking facility was developed in Huntingdon, and a subsequent Sumas Border Enhancements initiative was developed to improve truck signage and reroute vehicles during congestion to avoid city center blockages.
Aldergrove-Lynden Assessment	A subgroup of IMTC participants assessed data from existing sources and from two independent surveys of regional shippers and carriers to inform a collaborative assessment by inspection and transportation agencies about the future facility requirements of the crossing. The final report of the assessment was completed in the summer of 2010.

Source: Whatcom Council of Governments, *2010 IMTC Resource Manual*.

Case Study #2. Coast Rail Coordinating Council

Background and Purpose

The Coast Rail Coordinating Council (CRCC) is a coalition of coastal county transportation and planning agencies organized to improve passenger rail service along the coastal route between San Francisco and Los Angeles. The Council arose initially from the passage of California Assembly Resolution 39, in which the state legislature asked coastal planning agencies to prepare an upgrade study for the Pacific Coast Railroad Route. In response, transportation agencies from six coastal counties (Los Angeles, Ventura, Santa Barbara, San Luis Obispo, Monterey, and Santa Cruz) produced a series of studies, which established the feasibility of such a route, operational plans, and necessary capital improvements. The primary goal for the CRCC is to advance a new passenger train running from downtown San Francisco to downtown Los Angeles, known as the *Coast Daylight* train.

The CRCC promotes intergovernmental coordination by acting as a forum for the discussion of intercity rail issues, which impact all of the membership, including:

- Intercity rail planning efforts;
- Local and state rail plans;

- Freight railroad issues and concerns; and
- Rail capital improvement projects.

Topics of discussion typically include the status of *Coast Daylight* service planning, funding updates, legislative updates (including statements of support from key legislators and recommended legislative language), status of environmental clearances, and policy updates (for instance, the National Rail Plan).

Organizational Structure

The CRCC is made up of two key committees:

1. The Technical Committee is made up of staff members from various member agencies; and
2. The Policy Committee consists of elected officials from each of the agencies.

Each committee typically meets twice yearly, with meetings alternating between the Technical and Policy Committees.

CRCC member agencies include Los Angeles County Metropolitan Transportation Authority (LACMTA), Ventura County Transportation Commission, Santa Barbara County Association of Governments, San Luis Obispo Council of Governments, Transportation Agency for Monterey County, Santa Cruz County Regional Transportation Commission, Council of San Benito County Governments, San Mateo County Transit District, Association of Monterey Bay Area Governments, Metropolitan Transportation Commission, Santa Clara County Transportation Agency, Southern California Regional Rail Authority, and Caltrain. Ex-officio agencies include Amtrak, Caltrans Division of Rail, and Caltrans District 5.

Key Products and Outputs

As an interregional passenger rail discussion forum, the CRCC's key function is to keep member agencies informed of passenger rail developments in the Coastal Corridor, and to update them on progress towards initiating the *Coast Daylight* service. Consequently, a key work product is the coordination of Policy Committee and Technical Committee meetings, along with the staff support necessary to make them happen. The San Luis Obispo Council of Governments (SLOCOG) has taken responsibility for staffing the CRCC, including the creation and distribution of agendas and meeting materials. More broadly, the CRCC serves as an advocate for passenger rail development in this corridor at both the state and Federal levels.

CRCC or its various member agencies have conducted or assisted in the development of numerous plans and studies for the region:

- The CRCC acted as the Coastal Corridor Task Force to assist Amtrak in developing its 20-Year Rail Improvement Plan Summary Report for California;
- The *Southern Pacific Coast Route Infrastructure Report* was completed in 1996, concluding that a significant time savings could be achieved by upgrading corridor infrastructure and utilizing 'tilt-train' technology;
- The *Coast Daylight Implementation Plan* was published in 2000 and outlined a detailed operational plan for new passenger service along the Coastal Corridor;
- The *Coast Rail Capacity Analysis* identified the capital improvements that would be necessary to initiate passenger service;
- The *Coast Daylight Brochure* provided an updated service plan for the Los Angeles-San Francisco route; and
- The CRCC is presently coordinating with Caltrans and the Union Pacific Railroad to model rail capacity in order to further refine capital investment needs on the route.

Case Study #3. Delaware Valley Goods Movement Task Force

Background and Purpose

The Delaware Valley Goods Movement Task Force (DVGMTF) was established to maximize the Delaware Valley's goods movement capability by sharing information and technology between public and private freight interests, promoting the region's intermodal capabilities and capacity, and developing and implementing a regional goods movement strategy.[35] The DVGMTF, which is the Delaware Valley Regional Planning Commission's (DVRPC) freight advisory committee, is open to all trucking, railroad, port, airport, shipper, freight forwarder, economic development, and member government representatives.

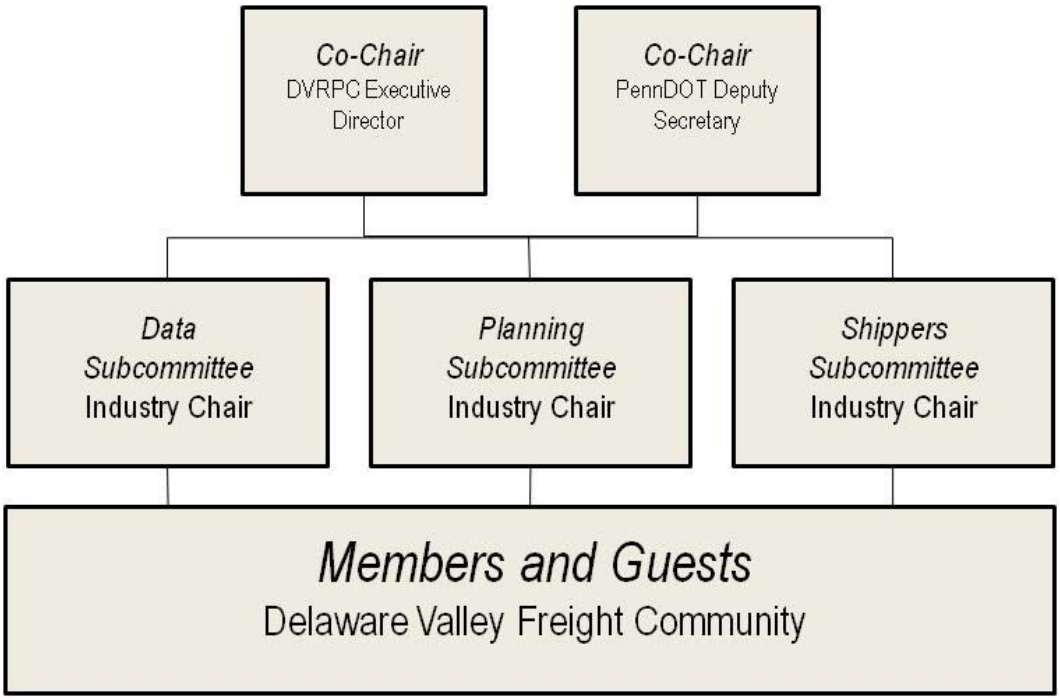
Organizational Structure

The DVGMTF is co-chaired by Pennsylvania DOT and DVRPC, meets quarterly, and includes three subcommittees (Data, Planning, and Shippers). The organizational structure is highlighted in Figure 6.5 below.

The co-chairs are there to provide leadership and overall direction, and are meant to highlight the importance assigned to freight in the region.

[35] http://www.dvrpc.org/asp/committee/committee.aspx?p=DVGMTF.

Figure 6.5 Delaware Valley Goods Movement Task Force Organizational Structure



Industry chairs head the three subcommittees of Data, Planning, and Shippers. Each subcommittee has a role in supporting the DVGMTF:

- **Data**
  - Transportation Management Systems;
  - Freight Page of the DVRPC web site; and
  - Bureau of Transportation Statistics (BTS) FAF.
- **Planning**
  - Transportation Improvement Program;
  - Long-Range Plan;
  - NHS Connectors; and
  - Delaware Valley Freight Corridors.
- **Shippers**
  - Freight Facility Tours;
  - Economic Development; and
  - Brownfields.

Each subcommittee has a chair who is an active Goods Movement Task Force member. The activities of these subcommittees reflect current issues and priorities of the larger task force.

"Members" include carriers, shippers, economic development agencies, member governments, adjacent regions, Federal agencies, and consultants. In addition, the region has a designated facilitator, who mobilizes MPO resources, provides a focal point for the freight community, and represents the agency at external functions and outside the region.

Freight Advisory Committee (FAC) meetings occur four times per year. The FAC has robust mailing and e-mail lists. The meeting agenda has a recurring format that includes coffee one-half hour, DVRPC business, state DOT business, guest presenters, two-minute reports, and lunch.

Key Products and Outputs

The Task Force ensures that the following objectives are met:

- Ensure the participation of the freight industry in the planning process;
- Identify improvements to facilitate the safe and efficient movement of freight;
- Implement regional congestion and intermodal management programs; and
- Improve communications and data and technology sharing.

The results of the effort are technical studies, capital improvements to transportation facilities, and greater considerations of freight movement in short- and long-range plans.

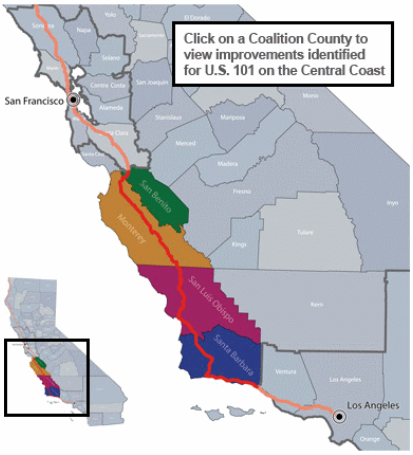
Existing Regional Freight Coalition: U.S. 101 Central Coast Coalition[36]

U.S. 101 is the most important freight artery in the region. It connects the region's economic and population centers, and it also connects regional industries with major population centers in the State and nation. As a result, maintaining and improving the U.S. 101 are high on the region's list of priorities.

The purpose of the U.S. 101 Central Coast Coalition is to address common transportation issues, and to raise the profile of the region with the goal of attracting more Federal and state investments to the U.S. 101 corridor. The coalition has been meeting periodically for about nine months; and has gathered common economic information, prepared an informational brochure, and set a plan of action for publicizing the Coalition at the state and Federal levels.

[36] http://centralcoastcoalition.com/Default.html.

About U.S. 101



U.S. 101 is the most direct route between two of the country's most populous metro areas:

- San Francisco Bay Area, population 7.5 million
- Greater Los Angeles Basin, population 15.5 million

U.S. 101 is the most direct north-south alternative to Interstate 5 and in need of investment to make it a safer and more reliable facility. When Interstate 5 is closed because of accidents, fire, snow, or other inclement weather, north-south traffic between Los Angeles and the Bay Area is diverted to the U.S. 101 freeway.

The facts about the Central Coast Coast U.S. 101 Corridor:

- 150,000 vehicles per day travel the corridor.
- $6.5 billion, and growing, worth of agricultural production per year - one of the largest values in California and the nation.
- 25,000 military personnel and employees at 6 military bases, deemed essential of the nation's defense.
- $5 billion tourism industry with some of the country's most premier tourist destinations.
- 100,000 students enrolled at 12 colleges and universities, including University of California Santa Barbara, Cal Poly San Luis Obispo, and California State University Monterey Bay Area.

Official U.S. 101 designations include:

- U.S. Department of Defense Strategic Highway Network Corridor
- State Focus Route and Highway Emphasis Route
- Principal arterial on the National Highway System
- State Highway Extra Legal Load Route as part of the National Truck Network

Future coalition goals include continuing joint state and Federal educational efforts; creating a strategic plan for delivery of top priority projects in the corridor; and working with Caltrans on key issues, such as traffic data collection and expedited project delivery.

Recommendation for the Central Coast's FAST

The Central Coast region has already taken steps to organize itself through development of the FAST group. This group brings together key private and public sector stakeholders in the region to address regional freight issues. Members include representatives from local and regional government agencies, carriers, shippers, and other interest groups in the freight community.

There are several opportunities to improve the FAST group. The following key recommendations are outlined here:

1. **Define purpose of the FAST and what it should achieve.** The first step that should be taken is to develop a clear purpose and definition of the FAST group. What are the goals of the FAST group, taking into account regional freight needs, deficiencies, and potential improvements? The DVGMTF purpose could be used as a framework for the FAST to create its own purpose statement:

   The Delaware Valley Goods Movement Task Force (DVGMTF) was established to maximize the Delaware Valley's goods movement capability by sharing information and technology between public and private freight interests, promoting the region's intermodal capabilities and capacity, and

developing and implementing a regional goods movement strategy.[37] *The DVGMTF, which is the Delaware Valley Regional Planning Commission's (DVRPC) freight advisory committee, is open to all trucking, railroad, port, airport, shipper, freight forwarder, economic development, and member government representatives.*

In addition, a freight program should be developed to guide the activities of the FAST group. Figure 6.6 below highlights a sample freight program that could be adapted to serve the needs of the FAST. It highlights actions in three different categories: regional "Freight Planning Process", "Education and Outreach", and "Quick Start Action Items".

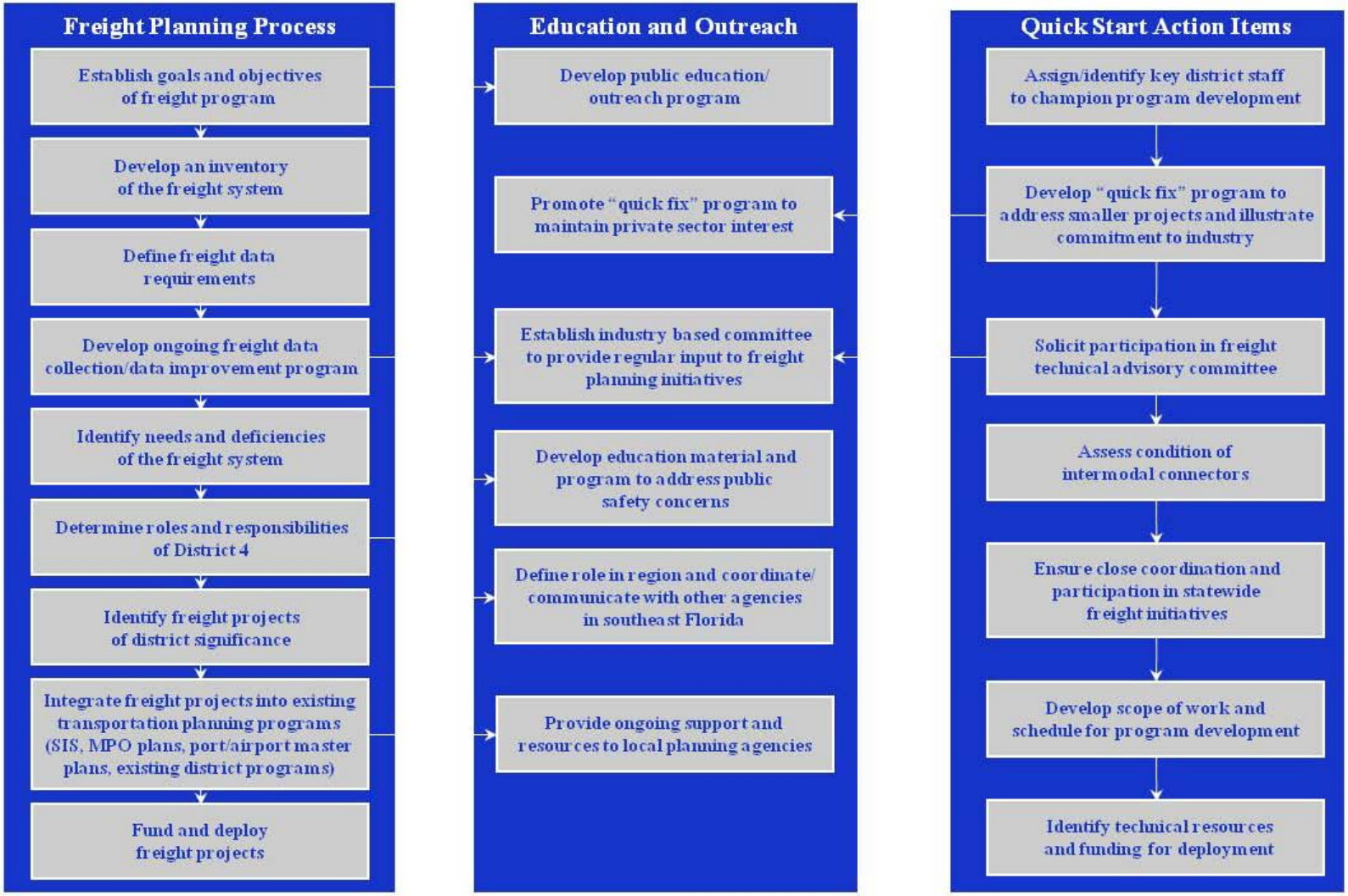
2. **Organization of the FAST.** It is recommended that the FAST group adapt an organizational structure similar to the one utilized by the DVGMTF, as discussed above. However, there should be one additional geographical division between the north (Monterey, San Benito, and Santa Cruz Counties) and the south (San Luis Obispo and Santa Barbara Counties). A suggested organizational structure is presented in Figure 6.7 below. Following this, a description of the roles of each group is discussed in more detail.

   a. **Co-Chairs (Numbers 1 to 4 in Figure 6.7).** The co-chairs should include higher-level officials in the Caltrans District 5 office: one industry executive from the agriculture industry, as well as one regional executive from the northern counties (high-level officials at AMBAG, SBCOG, or SCCRTC) and one from the southern counties (SBCAG, SLOCOG). Inclusion of top-ranking officials will highlight the importance of freight to the region. In addition, the co-chairs should provide leadership and overall direction for freight initiatives in the region. It is an important to include a high-level private sector-representative as a co-chair as it will foster additional communication and dialogue between the public and private sectors. It also will ensure that private sector stakeholders receive a "seat at the table" when making key freight decisions.

   b. **Data Leads (Number 5 in Figure 6.7).** Two data leads should be appointed: one from the northern counties and one from the southern counties. Data leads would be the "keepers" of regional freight data. They would be responsible for creating and tracking performance metrics and gathering data to support this. In addition, data leads would be the keepers of regional commodity flow data and regional industry-specific data. They would be responsible for providing data updates and input, as needed, for the regional and full FAST meetings. Finally, they would be responsible for maintaining the FAST web site, which is highlighted below.

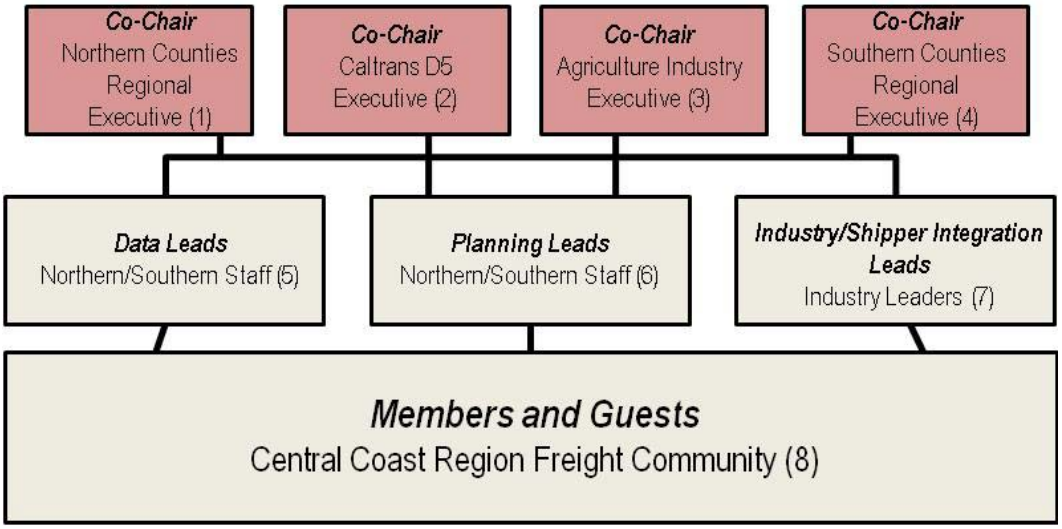
[37] http://www.dvrpc.org/asp/committee/committee.aspx?p=DVGMTF.

Figure 6.6 Example of Freight Program Development (District 4 in Florida)



Source: National Cooperative Highway Research Program (NCHRP) 8-47.

Figure 6.7 Suggested FAST Organizational Structure



c. **Planning Leads (Number 6 in Figure 6.7).** This role is suited for freight planning staff in the northern and southern counties. The staff would be responsible for integrating key freight needs into the planning process of MPOs, including long-range planning, transportation improvement programming, and the like. At a high level, they would work with key stakeholders to define freight projects of regional significance that are not funded or planned for, and work to incorporate these types of projects in MPO planning processes. They would also act as advocates, along with the co-chairs, for freight-related projects.

d. **Industry/Shipper Integration Leads (Number 7 in Figure 6.7).** This role is suited for industry representatives that would work to include and get input from regional private sector stakeholders throughout the region. This could involve dedicated private-sector stakeholders or representatives from the region's Grower-Shipper organizations. Their primary task would be to understand evolving concerns of shippers and carriers in the region (all industries), and bring them to the table for incorporation into the planning process. They would work closely with the Planning Leads and Data Leads to incorporate industry concerns.

e. **Members and Guests (Number 8 in Figure 6.7).** The FAST meetings should be open to the public in order to make it easy for any citizen, private or public sector stakeholder to voice concerns and to be heard. The web site should include a contact e-mail so that any concerns can be e-mailed directly to the group. It also is recommended to include district representatives from Sacramento and from the U.S. Congress for the region as members of this group. This would help make the Central Coast region a priority for legislators. Another important group to

include as a member would be regional agencies that have an impact on goods movement to and from the Central Coast, such as the Santa Clara VTA and Caltrans District 4. Finally, representatives from major regional cities, such as the City of Salinas, City of Santa Barbara, City of San Luis Obispo, and others, where residents benefit and are impacted by freight, should be encouraged to participate and voice their concerns, issues, and potential solutions.

3. **Meeting frequency and content.** Given the size of the region, it is suggested that the group is broken into two areas: north (Monterey, San Benito, and Santa Cruz) and south (San Luis Obispo and Santa Barbara). There should be a total of four meetings a year:

   a. One FAST meeting that include all representatives from both the north and the south, as well as the co-chairs and members/guests. The purpose of these meetings is to provide direction on future work and actions (as based on Figure 6.7 above), and to review current key initiatives. This would also be the time to involve guest speakers from within or outside the region to highlight new solutions, technologies, or other topics applicable to freight in the region. Meeting planning should be a collaborative effort between the co-chairs and the planning leads from the north and south region.

   b. Three region-specific FAST coordination meetings (three for the north, three for the south) that include the data, planning, and industry/shipper integration leads. These meetings should work on follow-up to directives from the full FAST meetings and outline next steps in the region. Key regional initiatives should also be discussed, as well as next steps to move forward on future key initiatives and data needs. This should include members and the public from the region, as well as the regional executives co-chair.

4. **Improved Visibility and Transparency through Freight Council Web Site.** A central web site is recommended to keep all regional members and the public informed on the region's freight activities. This will allow all stakeholders (and the general public) to access meeting documents, meeting agendas, key findings from studies, and other data related to freight. Links from each of the agency web sites and other government agencies should also be provided to integrate this new web site. The DVGMTF runs a simple yet informative web site that provides interested parties with pertinent information regarding freight in the region: http://www.dvrpc.org/Freight/DVGMTF.htm.

5. **Primary freight group in the region.** Currently, several other groups that impact freight are operating in the Central Coast region. This includes the *U.S. 101 Central Coast Coalition*, which was formed to raise awareness of the

U.S. 101 Corridor as a major economic asset to the State and nation, and to encourage investment in the U.S. 101 corridor in the five-county region.[38] In addition, the *Coast Rail Coordinating Council* mentioned in Case Study #2 above also is focused on improving rail operations along the main north-south line in the region, as well as restoring the *Coast Daylight* Amtrak line.

It is recommended that the FAST act as a regional freight advisory committee and not as a subgroup to any of these coalitions. The purpose of the FAST is to understand and advocate for freight at a regional, systemwide level. A single corridor or rail line should not be the focus of this group. If there are opportunities to merge the activities of the *U.S. 101 Central Coast Coalition* or the *Coast Rail Coordinating Council* into the FAST, action should be taken to do so to prevent two groups working on the same issue. If not, these groups could operate independently, with regular communication occurring between the existing groups and the FAST. However, there should be constant communication between the FAST and these other groups, and they should be working towards common goals. For example, the FAST could provide regional direction in terms of freight priorities to both groups. Reports or analyses could be shared between all three groups to help all participants better understand the regional freight picture. In terms of staff, there should be overlap between the groups to help facilitate information sharing.

6.6 DEVELOP STRATEGIC PARTNERSHIPS WITH REGIONAL TRADING PARTNERS

The commodity flow data revealed that major trading partners include counties in the Central Valley, Los Angeles County, and the San Francisco Bay Area. Working together with these regions through strategic partnerships on specific projects or initiatives could help the case for state or other funding of multiregion corridor project. For example, if both the Central Valley and the Central Coast stand to benefit from better east-west connections, working together to widen SR 46 could be beneficial for businesses in both regions.

Considering that the Central Valley and the Central Coast regions trade heavily with one another, the need for better infrastructure to connect the regions, and the Central Coast's need to get goods effectively to Interstate 5 for out-of-state trading, it is recommended that the FAST seeks strategic partnerships with government agencies in the Central Valley to promote projects of mutual interest. For example, a strategic partnership with Kern County could help prioritize widening of SR 46 between I-5 and U.S. 101. Figure 6.8 highlights some of the major counties and government agencies in the Central Valley.

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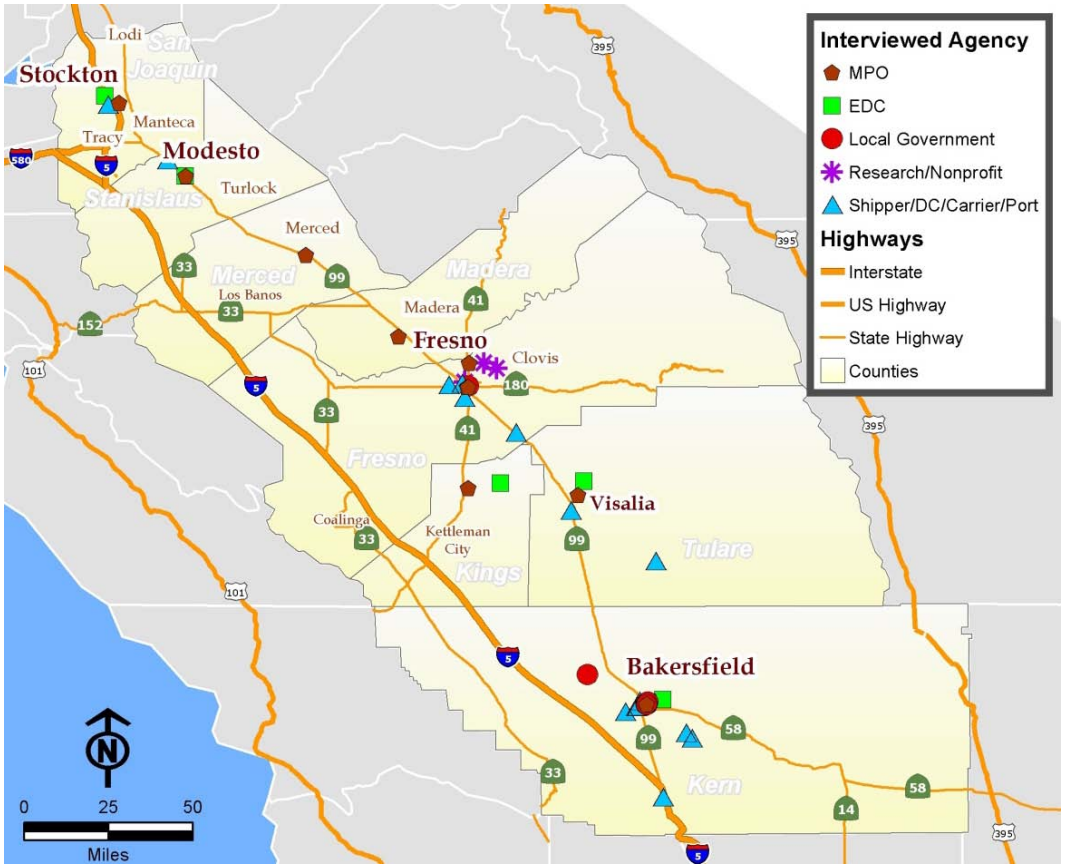
[38] http://centralcoastcoalition.com/Default.html.

Figure 6.8 San Joaquin Valley



Source: Cambridge Systematics.

6.7 FURTHER INVESTIGATE FINANCING OPTIONS FOR KEY FREIGHT PROJECTS

The public sector plays a significant role in funding critical freight improvements. While ports, railroads, and intermodal terminals are generally operated, maintained, and financed by the private sector, the public sector is responsible for financing the majority of roads and highways. In addition, there are increasing examples of places where the public and private sector have worked together on private-sector projects (such as those involving rail-grade crossings or new short line development). This type of Public Private Partnership (PPP) is generally only possible when a strong public benefit has been identified and quantified.

The goal of this section is to highlight some of the funding options that the region or individual jurisdictions could pursue to help fund freight improvements in the region. This includes Federal programs for which the counties could apply, grant programs, as well as specific ways to generate revenue within the region.

SAFETEA-LU Funding Grants and Programs

At time of writing (fall 2011), the Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users (SAFETEA-LU) is operating on a short-term extension. This was initially scheduled to operate between fiscal years 2005 to 2009, but has been operating on short-term extensions since 2009. As of November 2011, the Senate Environment and Public Works Committee released a 600-page bill for markup, entitle MAP-21, "Moving Ahead for the 21st Century", to start the process to put in place long-term surface transportation reauthorization.

The following grant programs and special programs are available for freight projects through SAFETEA-LU, which are applicable to the study region. There are additional programs that were authorized through SAFETEA-LU. For additional details on Federal funding opportunities from SAFETEA-LU, please review the 2007 U.S. DOT Report *Financing Freight Improvements*.[39]

National Highway System (NHS)

The NHS includes U.S. roadways that have been determined to be important to the nation's economy, defense, and mobility. The NHS program provides funding for roadways that are a part of the NHS, which includes U.S. 101, SR 41, SR 46, SR 156, and parts of SR 1 in the region.[40] Activities eligible for funding under this program include construction, reconstruction, resurfacing, and rehabilitation of eligible roadways.

Surface Transportation Program (STP)

Eligible freight projects under the STP include the following:

- Preservation of abandoned rail corridors;
- Capital costs of advanced truck stop electrification systems; and
- Freight transfer yards.

The Federal share of STP funding is generally 80 percent. Some safety improvements have a Federal share of 100 percent.

Rail Highway Crossings

This program provides funding for projects that improve safety at public highway-rail crossings through the elimination of hazards or through installation/upgrades of protective devices at crossings.

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[39] http://www.ops.fhwa.dot.gov/freight/publications/freightfinancing/freightfinancing.pdf.

[40] http://www.fhwa.dot.gov/planning/nhs/maps/ca_south/ca_californiasouth.pdf.

Highway Bridge Program

The Bridge Program provides funding for replacement, rehabilitation, and systematic preventative maintenance of bridges.

Congestion Mitigation and Air Quality Improvement Program (CMAQ)

The CMAQ program helps fund projects that reduce air pollution. One example is helping pay for construction of intermodal facilities that move freight movements from truck to rail, rail track rehabilitation, diesel engine retrofits, idle reduction projects, and new rail sidings. Truck stop electrification systems at truck parking facilities also qualify. The Federal share is generally 80 percent for CMAQ projects.

Local/Regional Funding Options

Aside from Federal and statewide sources, cities, counties, and regions can also generate their own funding streams for freight projects. The options shown here are only meant to provide a sample of potential funding sources. It is suggested that careful review and analysis of the benefits and costs of each potential revenue source are reviewed prior to moving forward.

Self-Help Counties (Sales Tax)

As of June 2011, 19 counties in California were "self-help" counties, including Santa Barbara County, through Measure A.[41] Self-help counties passed local transportation sales tax measures to help fund critical regional transportation projects. Passage of this measure requires two-thirds of voters in the County to approve. Monterey County and San Benito County have attempted to pass this sales tax, but have not been successful (San Benito County was a "self-help" county from 1989 through 1999.).[42] Such a tax would strongly help the counties in the region with local funding for freight projects vital to the regional economy.

Special Districts or Assessment Districts

Assessment districts can be formed in a county or city to help fund specific transportation projects. For example, the City of Salinas could be a part of an assessment district to help pay for intermodal access improvements in the City. Formulas will be used to calculate the benefit that each household will see from the improvement. The benefit cannot be tied directly to the value of property because of Proposition 13.[43]

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[41] http://selfhelpcounties.org/members.html.

[42] Correspondence with Mary Gilbert, SBCOG.

[43] http://www.californiataxdata.com/pdf/AssessmentDistrict.pdf.

Rental Car Fees or Tax Increase

Municipalities throughout the country have been turning to rental car fees or taxes to provide a dedicated revenue stream for transportation improvements. For example, Multnomah County in Oregon raised its rental car tax from 12.5 percent to 17 percent in 2009.[44] This fee would be added to the cars rented in the five-county region, with the proceeds of the tax moved to a dedicated freight fund.

Reallocation of Railroad Property Taxes to Rail-Specific Needs

One funding option that is being considered in both Oregon and Minnesota is the reallocation of property taxes paid by the railroads away from general funds and to a specific rail improvement fund. For example, one idea would be to estimate how much in property taxes all railroads pay in the five-county region, and to then allocate the proceeds from that funding specifically to improving or expanding railroad facilities in the region. Another idea would be to use the proceeds from this source to help fund the Salinas Valley truck to rail intermodal facility.

Cooling Facility Truck Trip Tax

Considering that agricultural truck movements make up a large proportion of the region's truck trips, which contribute significantly to local and regional road wear and tear, one option is to require trucks to pay a fee when delivering and/or picking up goods from cooling facilities. For example, the fee could be levied on the coolers, which could pass the tax on to shippers and carriers. While this would encounter opposition due to the size and importance of the agriculture industry in the region, there is a strong nexus between those that pay the fee and benefits reaped since the industry benefits significantly from well maintained and uncongested roads. Proceeds from the fee could be used for maintaining and upgrading highway and local roads that are critical to the agriculture industry.

Diesel/Fuel Tax Increase or Surcharge

Raising the diesel tax would focus the tax increase on those companies that rely on diesel, which is closely tied to freight usage. A general increase in the fuel tax for each county in the region would increase taxes for both truck operators and passenger vehicle operators to help fund freight improvements.

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[44] http://www.oregonlive.com/portland/index.ssf/2009/05/multonomah_county_car_rental_t.html.

Industry Harvest Tax

The industry harvest tax would levy a tax on the sales of harvested goods, such as agricultural crops in the region. It can be argued that these industries are heavy users of the road network, and additional maintenance or improvements to support freight would benefit the agriculture industry as a whole. However, such a tax may have an impact on the competitiveness of the industry being taxed. Another option is to levy taxes on other heavy freight users of the system, such as on mining or quarry operations.

Public-Private Partnerships

In a public-private partnership, the public and private sectors work cooperatively in the planning, financing, and construction of development projects adjacent to and integrated with transportation facilities. There are many types of public-private partnerships that could be pursued to provide benefits to both the public and private sector. Most of the successful attempts are focused on rail projects, considering that the railroads are private entities. Examples around the nation of successful public-private ventures include the Alameda Corridor, the Reno 'trench', the Kansas City Flyovers, and the Kyle Railroad Company/Kansas DOT partnership for infrastructure upgrade. In the AMBAG region, public-private partnerships could be developed to encourage intermodal facility development or tollways. In addition, they could be used to encourage adding capacity to truck parking facilities and to build new truck parking facilities. For example, truck parking facilities could be developed on public land. Another option is that the state or local/regional governments help finance the development of truck parking facilities on private land.

Next Steps

There is a variety of other options, such as local impact fees, that could be considered to help the FAST secure funding for freight-specific projects. It is recommended that the FAST put together a working group of local and regional public sector leaders, private sector representatives, and other parties to work through the process of finding additional funding sources for transportation and freight improvements. A collaborative effort involving finance experts, legislative leaders, and business leaders will help the region determine how best it can raise revenue to support additional freight and transportation funding needs.

A. County Profiles

The purpose of this section is to provide more detail on the economies and freight flows of the five specific counties involved in this study. This is meant to be used as supplemental information to provide further detail on freight in each specific county.

MONTEREY COUNTY

County Overview

Monterey County is the second largest county in the study region by population, with about 415,000 residents in 2010.[45] It also is the second fastest-growing county in the Central Coast region – its population is expected to grow by 41 percent by 2040, an average annual growth rate of 1.1 percent. Agriculture and tourism are the key industries for Monterey County. The County is known as "the salad bowl of the world" due to the volume of lettuce grown there, and it also is home to a thriving wine industry. In fact, much of the tourism in Monterey County is driven by agriculture as visitors come from all over to experience the wine country and coastal regions. In 2008, farming activities employed more than 14,000 people in the County, and generated nearly $1 billion in net earnings.[46] Cut flowers also are grown and exported from the County. Other key industries include retail and wholesale trade, food manufacturing, warehousing (including agricultural coolers), health care, and accommodation and food services. Table A.1 provides summary population and industry information for Monterey County.

[45] California State Data Center.

[46] U.S. Bureau of Economic Analysis.

Table A.1 Monterey County Population and Industry Data

Current and Projected Population			
2010	2040	Percent Change	Compound Annual Growth Rate
415,057	584,878	41%	1.1%

Key Freight-Dependent Industries		
	2008 Employment	2008 Earnings (in Thousands)
Forestry, fishing, and related	27,762	$1,138,648
Retail trade	21,939	$858,048
Farming	14,015	$911,560
Construction	10,004	$594,430
Manufacturing	7,010	$487,883
Wholesale trade	6,230	$666,022
Transportation and Warehousing	4,619	$281,779
Mining	531	$35,855
Utilities	527	$63,102

Sources: U.S. Bureau of Economic Analysis; 2010 population from the 2010 Census; 2040 population derived from the California Department of Finance data compiled in 2007.

Note: This forecast does not take into account 2010 actual Census figures, as it relies on the 2000 Census baseline for projections.

Freight Overview

Figure A.1 highlights the multimodal freight transportation system in Monterey County. The County's main artery for exports is U.S. 101, with SR 152/156 also playing a key role in connecting local producers with I-5 and other food processing centers in the Central Valley. The area is also served by two railroads (UP and Sierra Northern), as well as one cargo airport in Monterey.

Figure A.1 Monterey County Freight System

Source: AMBAG data, prepared by Cambridge Systematics, Inc.

Monterey County is highly dependent on trucks for the movement of most of its freight, as shown in Table A.2. In 2007, trucks handled 86 percent of the County's freight by weight (about 19 million tons), and 84 percent by value (nearly $11 billion). Most of the rest was transported via the pipeline/unknown mode, or by rail.

Table A.2 Monterey County Mode Splits by Weight and Value
2007

Mode	Weight	Value
Truck	19,094,072	$10,933,236,802
Pipeline & Unknown	2,197,856	$988,485,469
Rail	848,302	$602,183,977
Other Intermodal	30,449	$338,558,587
Air	5,223	$121,537,475
Total	22,175,902	$12,984,002,311

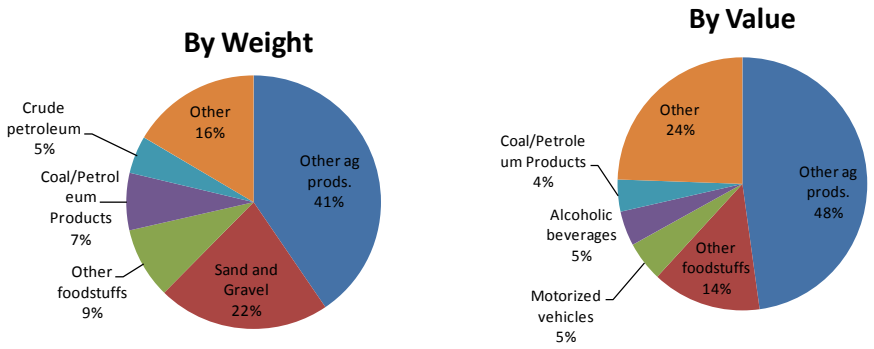
Source: Cambridge Systematics analysis of FAF2 and IMPLAN data.

The charts on the following page describe Monterey County commodity flows in more detail. Agricultural products are the top commodity in Monterey County by weight (9 million tons, or 41 percent of the total). This is not surprising given the importance of agriculture and related activities to the local economy. Sand and gravel products are the second largest commodity by weight at 22 percent of total tonnage, or 4.9 million tons. These commodities are an important input to the construction industry. Other key commodities include food products (2 million tons), coal and petroleum products (1.6 million tons), and crude petroleum (1.1 million tons).

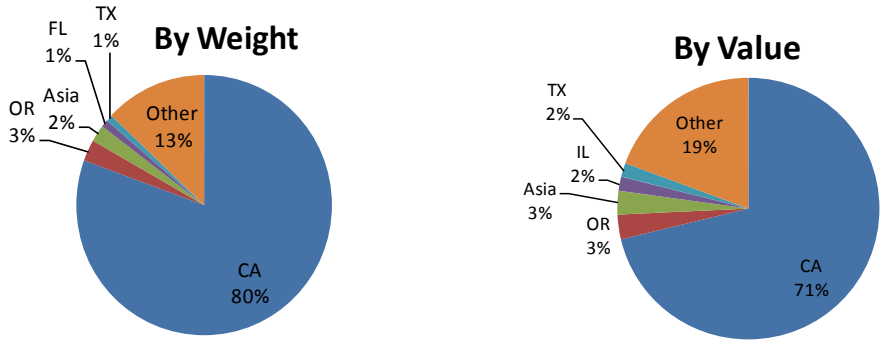
Agricultural products are also the number one commodity when measured by value at $6.2 billion (48 percent of the total). Foodstuffs are also important at $1.8 billion (14 percent of the total). Motorized vehicles ($664 million), alcoholic beverages ($581 million), and coal and petroleum products ($533 million) round out the top five commodities by value.

Most of Monterey County's freight stays in California, as the next two charts demonstrate. Nearly 18 million tons of goods, or 80 percent of Monterey County's total freight by weight, moved to or from other California counties or stayed within Monterey County in 2007. These shipments were worth about $8.8 billion, or 71 percent of the County's freight bill. Other important trading partners include nearby states (Oregon), larger states such as Texas and Florida, and Asia.

Top Commodities (2007)



Key Trading Partners (2007)



Source: Cambridge Systematics analysis of FAF2 and IMPLAN data.

SAN BENITO COUNTY

County Overview

San Benito County is the smallest County in the region by population, at about 55,000 residents in 2010.[47] However, it also is the fastest-growing. Demographers at the California State Data Center expect the county population to more than double by 2040. Located directly to the east of Monterey County, San Benito County is also highly dependent on agriculture and farming, which provided about 1,200 jobs and earned nearly $63 million for the County in 2008.[48] Even though about one-half of the San Benito County workforce commutes

[47] California State Data Center.

[48] U.S. Bureau of Economic Analysis.

elsewhere (mainly to the San Jose region), the County retains significant activity in retail trade, wholesale trade, manufacturing (especially food manufacturing), and construction. Manufacturing is the largest freight-dependent industry in the County by both employment (about 3,000 jobs in 2008) and earnings ($165 million). Most of this activity is concentrated in food manufacturing and various durable goods manufacturing activities. Table A.3 shows summary economic and population data for San Benito County.

Table A.3 San Benito County Population and Industry Data

Current and Projected Population			
2010	2040	Percent Change	Compound Annual Growth Rate
55,269	123,406	123%	2.7%
Key Freight-Dependent Industries			
		2008 Employment	2008 Earnings (in Thousands)
Manufacturing		3,002	$165,051
Retail trade		2,398	$95,966
Construction		2,022	$97,231
Farming		1,245	$62,723
Wholesale trade		545	$32,374
Forestry, fishing, and related		N/A	N/A
Mining		N/A	N/A
Utilities		N/A	N/A
Transportation and warehousing		N/A	N/A

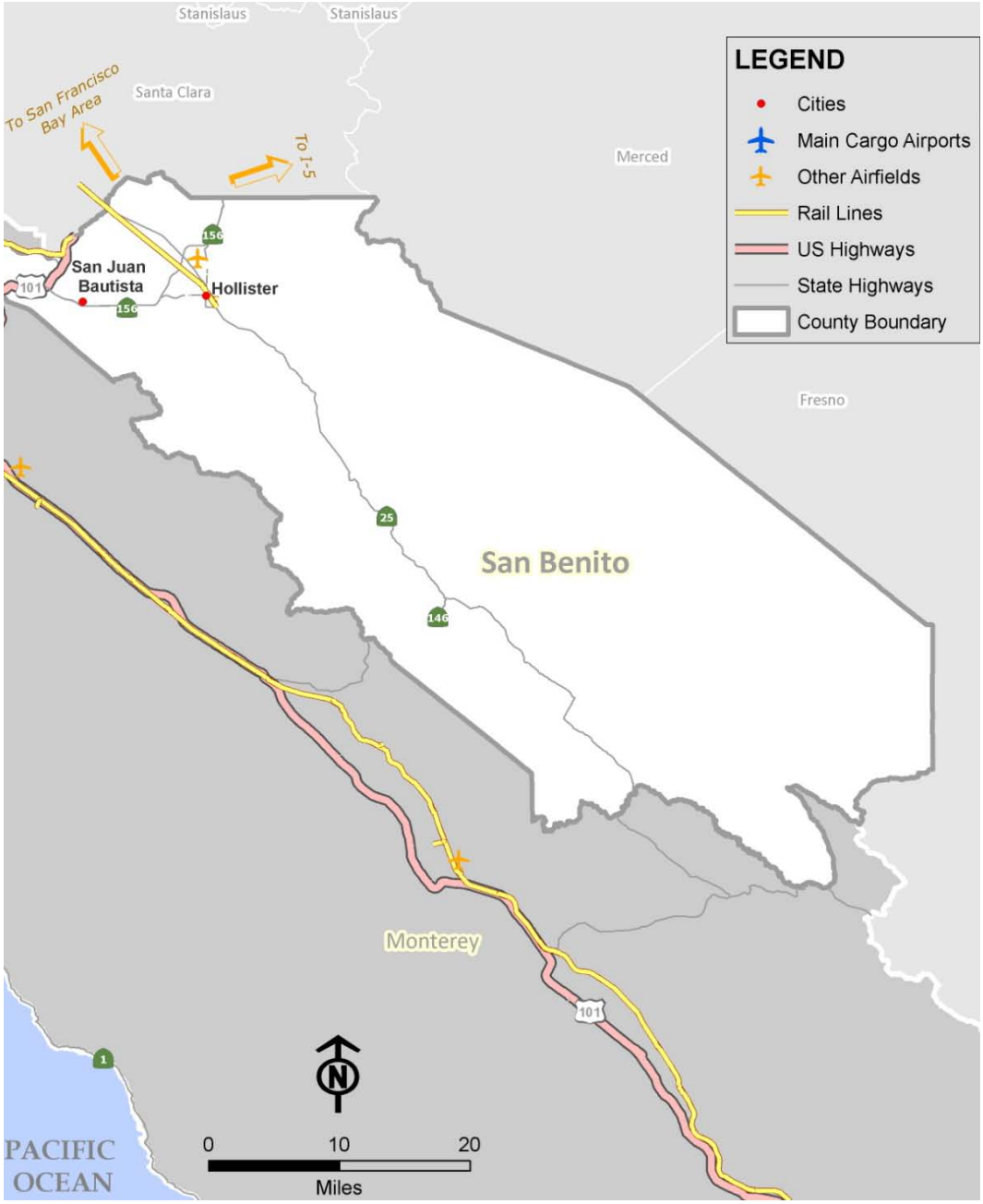
Sources: U.S. Bureau of Economic Analysis; 2010 population from the 2010 Census; 2040 population derived from the California Department of Finance data compiled in 2007.

Note: This forecast does not take into account 2010 actual Census figures, as it relies on the 2000 Census baseline for projections.

Freight Overview

Figure A.2 shows the key freight infrastructure in San Benito County. SR 156 is the key connector for this region, both to U.S. 101 and Salinas to the west and to I-5 in the east. SR 25 also is important in connecting more remote agricultural areas of southern San Benito County. Hollister is also served by a rail line. The closest major airport for shipment of cargo is in Monterey. In addition, the region is relatively close to San Jose and San Francisco International Airports.

Figure A.2 San Benito County Freight System



Source: AMBAG data, prepared by Cambridge Systematics, Inc.

Table A.4 shows freight mode usage for San Benito County in 2007 by weight and value. Trucks transport the vast majority of the County's freight by both weight and value. In 2007, trucks moved about 2.4 million tons of freight in San Benito County, amounting to 91 percent of total freight movements. These shipments constituted about $2.5 billion in value, or 82 percent of the County's freight value moved. Pipeline and unknown is the second largest freight mode

by weight and value; these shipments are mostly comprised of crude petroleum, as well as refined products like natural gas and gasoline.

Table A.4 San Benito County Mode Splits by Weight and Value *2007*

Mode	Tons	Dollars
Truck	2,436,901	$2,487,273,812
Pipeline & Unknown	163,574	$238,450,255
Rail	68,019	$97,259,028
Other Intermodal	8,253	$159,091,006
Air	3,865	$53,796,319
Total	2,680,612	$3,035,870,420

Source: Cambridge Systematics analysis of FAF2 and IMPLAN data.

Hollister Airport is currently undergoing an expansion, which will significantly increase the capacity for air freight moving into and out of the airport and the County. The airport master plan intends to double the number of planes based at the airport in the long term compared to 2002, and more than double yearly operations.[49] Note that the plan is demand based, thus "long term" is not defined in years.

The charts on the next page summarize key commodities and trading partners for San Benito County. Agricultural products make up one-quarter of San Benito freight flows by weight, or more than 675,000 tons. Nonmetallic mineral products (427,000 tons); foodstuffs (338,000 tons); sand and gravel (316,000 tons); and coal/petroleum products (164,000 tons) are also key commodities.

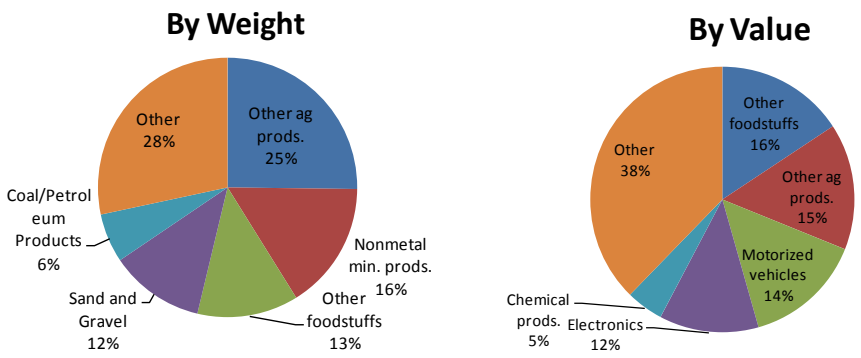
When measured by value, the commodity mix is more diverse. Food products are the number one commodity by this metric at about $477 million in 2007, followed by agricultural products ($467 million), motor vehicles ($440 million), electronics ($369 million), and chemicals ($138 million). All other commodities make up 38 percent of San Benito County's freight bill; these include plastics/ rubber, alcoholic beverages, base metal articles, and wood products, among many others.

Like the other counties in the Central Coast region, San Benito County trades the most within California. San Benito County freight that stayed in California in 2007 totaled 2.1 million tons (79 percent of the total) and was worth more than $2 billion (69 percent of the total). However, the County also has significant international trading ties, which include Asia (149,000 tons in 2007, valued at $107 million); Canada (60,000 tons, worth $101 million); and Mexico (49,000 tons,

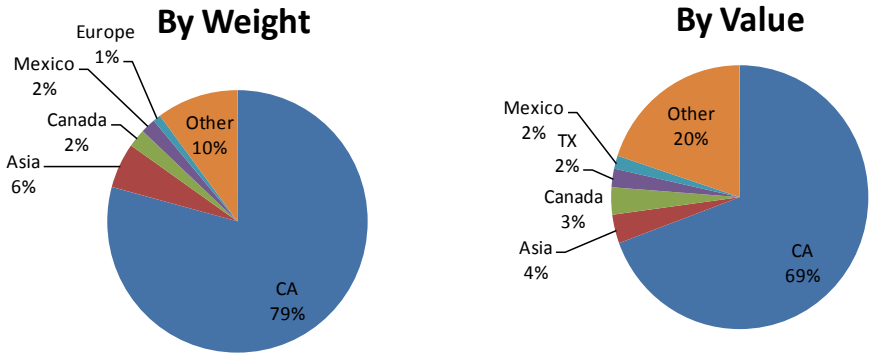
[49] Hollister Airport Master Plan.

worth $49 million). Other domestic trading partners (not shown on the charts) tend to be larger states, such as Texas or nearby ones, including Washington State and Oregon.

Top Commodities (2007)



Key Trading Partners (2007)



Source: Cambridge Systematics analysis of FAF2 and IMPLAN data.

SAN LUIS OBISPO COUNTY

County Overview

Table A.5 provides population and industry data for San Luis Obispo County. San Luis Obispo County is the third largest County by population in the study region at approximately 270,000 residents in 2010. State demographers expect the County's population to expand by a little less than one percent annually, reaching about 339,000 people by 2040.

Key freight-dependent industries in the County include retail trade, construction, manufacturing, farming and farm support activities, and utilities. Pacific Gas and Electric, which operates the Diablo Canyon Nuclear Powerplant in San Luis

Obispo County, is an important utility sector user of the freight system. Manufacturing activity is diverse in the County and includes machinery, metal products, beverage and tobacco products (mainly wine), and electrical equipment. The northern portion of the County benefits from the Napa Valley-San Luis Obispo County wine trade. Grapes produced in Paso Robles are frequently sold to Napa Valley winemakers, though there has been a push recently to get more wine production in San Luis Obispo County. Agricultural tourism – including wine tastings, special events, golf, resorts and spin-off activities – is a key growth industry for the region and is largely driven by the local and regional agriculture sector. Olive growing and olive oil production is another growth sector for the economy. The County also imports large quantities of sand and gravel for the local construction industry.

Table A.5 San Luis Obispo County Population and Industry Data

Current and Projected Population			
2010	2040	Percent Change	Compound Annual Growth Rate
269,637	338,760	26%	0.8%
Key Freight-Dependent Industries			
		2008 Employment	2008 Earnings (in Thousands)
Retail trade		18,726	$585,669
Construction		12,014	$713,678
Manufacturing		6,251	$356,492
Farming		3,919	$79,566
Wholesale trade		3,621	$202,535
Forestry, fishing, and related		3,025	$80,866
Transportation and warehousing		2,595	$128,322
Utilities		2,251	$366,165
Mining		365	$17,064

Sources: U.S. Bureau of Economic Analysis; 2010 population from the 2010 Census; 2040 population derived from the California Department of Finance data compiled in 2007.

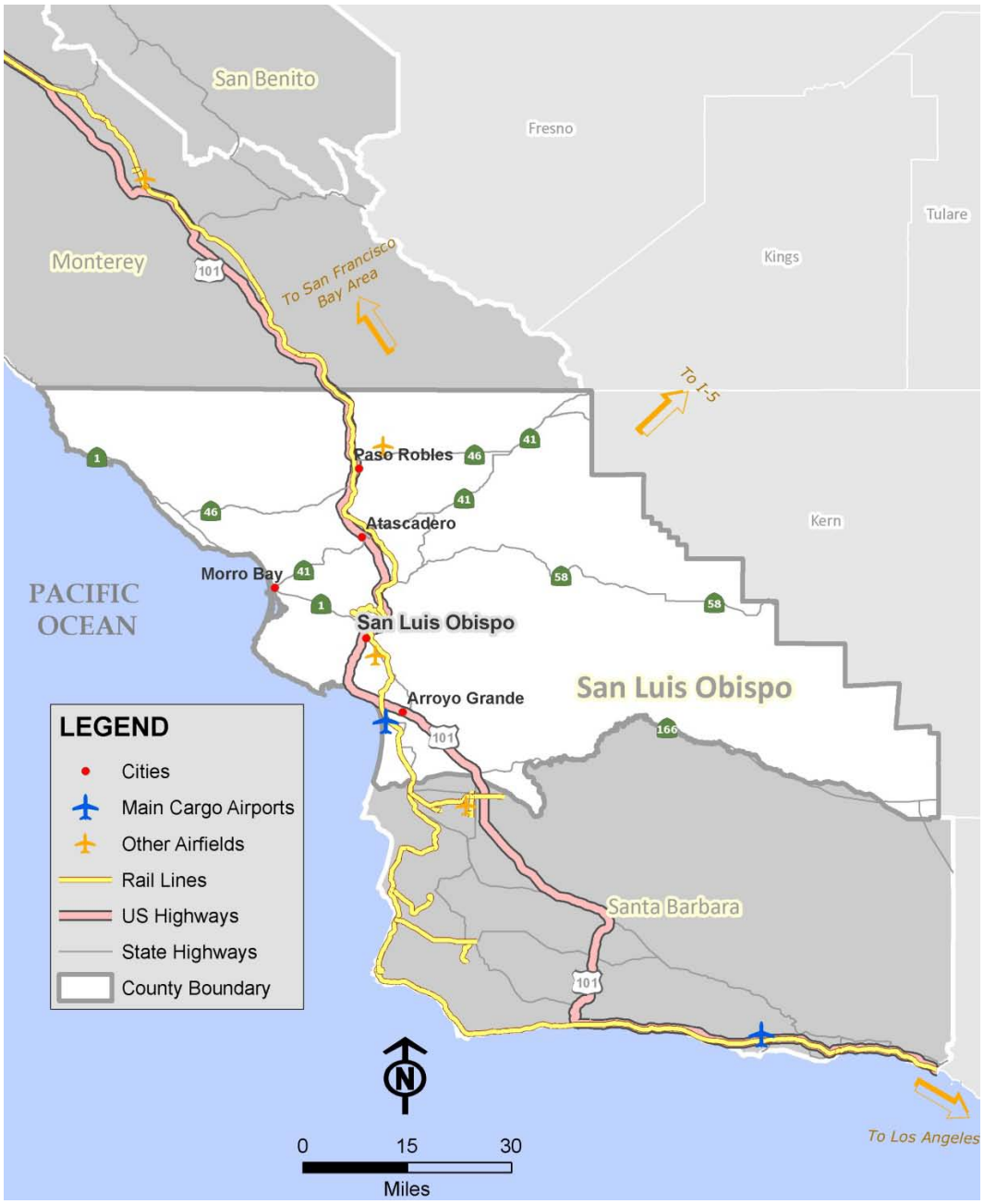
Note: This forecast does not take into account 2010 actual Census figures, as it relies on the 2000 Census baseline for projections.

Freight Overview

Figure A.3 shows the freight infrastructure in San Luis Obispo County. Again, U.S. 101 is the major artery connecting the region with Santa Barbara and Los Angeles to the south and the San Francisco Bay Area to the north. SR 41, SR 46, and SR 58 are key freight connectors from the region's main residential and commercial hubs (San Luis Obispo, Atascadero, Paso Robles, the Coast) out to I-5

and the Central Valley. The UP's route runs north-south through the region, connecting the region with Monterey to the north and Santa Barbara to the south. The major cargo aviation facility in the County is San Luis Obispo airport.

Figure A.3 San Luis Obispo County Freight System



Source: AMBAG data, prepared by Cambridge Systematics, Inc.

Table A.6 provides mode share information for San Luis Obispo County. Trucks transported 73 percent of the County's freight by both weight and value in 2007, amounting to 8.3 million tons valued at $4.4 billion. Most of the rest moved via

the pipeline or unknown mode. These shipments are comprised of refined petroleum and coal products, primarily natural gas. There is a natural gas pipeline in San Luis Obispo County that runs from the Central Valley to Morro Bay. There are also oil fields at San Ardo that use a pipeline to transfer crude oil to the Central Valley, from where the oil is trans-shipped by rail.

Rail movements comprised six percent of flows by weight in 2007 (644,000 tons), and four percent by value ($222 million).

Table A.6 San Luis Obispo County Mode Splits by Weight and Value *2007*

Mode	Tons	Dollars
Truck	8,323,849	$4,447,667,491
Pipeline & Unknown	2,402,058	$1,146,658,122
Rail	644,092	$221,765,772
Other Intermodal	17,907	$228,362,451
Air	2,143	$56,358,278
Total	11,390,049	$6,100,812,113

Source: Cambridge Systematics analysis of FAF2 and IMPLAN data.

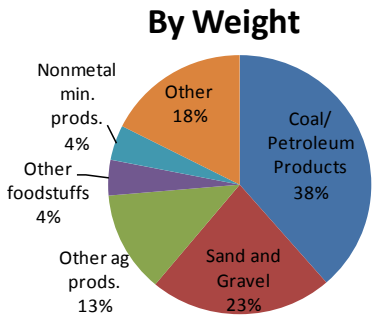
The charts on the following page summarize San Luis Obispo County's top commodities and trading partners. The number one commodity transported to, from, and within the County is coal and petroleum products, mostly natural gas, but also including refined products like gasoline and diesel fuel. This commodity group comprised 38 percent of the County's freight flows by weight in 2007 (4.4 million tons), and 19 percent of commodity value ($1.2 billion). When measured by weight, the remaining top commodities include sand and gravel (2.6 million tons), agricultural products (1.4 million tons), foodstuffs, and minerals (about one-half million tons each). All other commodities combined make up 18 percent of the County's tonnage and include goods, such as alcoholic beverages (mainly wine), animal feed, crude petroleum, and chemicals.

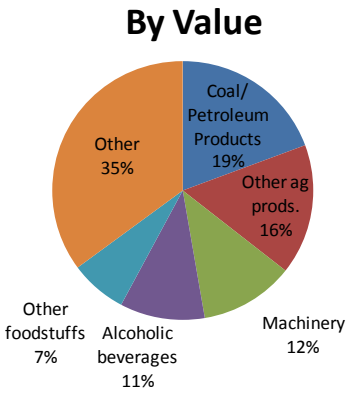
When considered by value, the commodity mix is more diverse and includes goods that are of higher value. Agricultural products are the number two commodity group, valued at slightly under $1 billion in 2007, or 19 percent of the total. Wine grapes are a key commodity moved in the northern part of the County, while vegetables are moved in the southern half. The remaining top commodities by value include machinery ($714 million), alcoholic beverages ($646 million), and food products ($431 million). Products in the 'other' category make up the remaining 35 percent of flows by value and include things like textiles, motor vehicles, electronics, and miscellaneous manufactured goods.

The vast majority of San Luis Obispo County's freight stays in California, especially when measured by weight. Nearly 10 million tons of goods (86 percent of total flows by weight) moved to or from other California counties

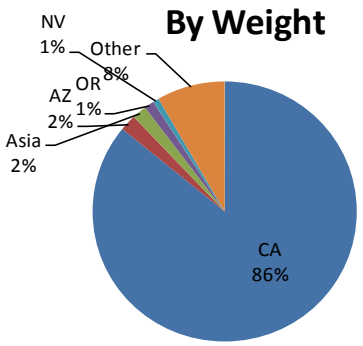
in 2007, or stayed within San Luis Obispo County. Other U.S. states the County trades with include Arizona (232,000 tons traded); Asian countries (201,000 tons); Oregon (138,000 tons); and Nevada (83,000 tons). Top trading partners by value are mostly the same, although intra-California flows are a smaller share of the total at 70 percent, or $4.2 billion. Asia is the County's second largest trading partner by value at just under $200 million in 2007, followed by Oregon ($134 million), Arizona ($115 million), and Canada ($105 million).

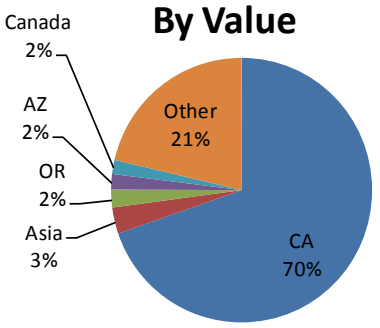
Top Commodities (2007)





Key Trading Partners (2007)





Source: Cambridge Systematics analysis of FAF2 and IMPLAN data.

SANTA BARBARA COUNTY

County Overview

Santa Barbara County has the largest population in the Central Coast region at nearly 424,000 people in 2010, as shown in Table A.7. The top goods movement-dependent industries by employment include retail trade (nearly 26,000 positions in 2008); manufacturing; and construction (nearly 15,000 jobs apiece). Agriculture is also an important activity, especially in the North County area from Buellton to Santa Maria. Overall, farms employed more than 9,000 people in the County in 2008 and generated nearly $329 million in earnings. Fruits and vegetables are produced in the Santa Maria Valley, wine in Santa Ynez and other locales, and flowers in Lompoc Valley. Although manufacturing employs far fewer people than retail trade, it earned $1.1 billion for Santa Barbara County in 2008, making it the largest freight-dependent industry by earnings in the County. Manufacturing in the County mostly revolves around computers and electronics ($412 million), miscellaneous manufacturing ($143 million), beverage and tobacco products ($106 million), and chemicals ($61 million). Vandenberg Air Force Base is a key driver of the local economy, supporting a thriving aerospace and high-technology cluster. Construction earnings and employment in Santa Barbara County have probably contracted since the bursting of the housing bubble, but more recent data are not yet available.

Table A.7 Santa Barbara County Population and Industry Data

Current and Projected Population			
2010	2040	Percent Change	Compound Annual Growth Rate
423,895	509,920	20%	0.6%

Key Freight-Dependent Industries		
	2008 Employment	2008 Earnings (in Thousands)
Retail trade	25,881	$890,902
Manufacturing	14,911	$1,100,299
Construction	14,851	$928,439
Farming	9,148	$328,566
Forestry, fishing, and related	7,355	$225,211
Wholesale trade	5,948	$401,764
Transportation and warehousing	3,914	$185,221
Mining	1,758	$160,129
Utilities	482	$45,464

Sources: U.S. Bureau of Economic Analysis; 2010 population from the 2010 Census; 2040 population derived from the California Department of Finance data compiled in 2007.

Note: This forecast does not take into account 2010 actual Census figures, as it relies on the 2000 Census baseline for projections.

Freight Overview

Figure A.4 highlights the multimodal freight network in Santa Barbara County. U.S. 101 is the main freight artery for this County as well, with a vital connection to Los Angeles to the south and the rest of the Central Coast and San Francisco to the north. This County is served by both the UP line that connects the region, as well as the SMVRR, which is a small line that connects Santa Maria with Guadalupe and the UP line. The Santa Barbara Municipal Airport is an air cargo facility for the region, while the major freight hub at the Los Angeles International Airport is only a few hours away by truck.

Figure A.4 Santa Barbara County Freight System

Source: AMBAG data, prepared by Cambridge Systematics, Inc.

Table A.8 lists estimated freight mode shares in Santa Barbara County for 2007, by weight and value. Nearly 13 million tons moved to, from, or within Santa Barbara County by truck in 2007, representing 79 percent of the total volume of freight. This cargo was valued at about $8.6 billion, or 73 percent of the total. The next largest mode by weight and value was pipeline and unknown, at 2.5 million tons (15 percent of the total) and $1.4 billion (12 percent of the total). As with the other counties in the study area, these shipments are dominated by

coal and petroleum products. The remainder of the County's freight is moved by a combination of rail (5 percent by weight, 4 percent by value); other intermodal (less than 1 percent by weight, 8 percent by value); and air cargo (less than 1 percent by weight, 3 percent by value). The air cargo and other intermodal categories account for significant freight value as compared to their tonnage, probably due to the fact that they include low-weight, but high-value air cargo and air parcel shipments.

Table A.8 Santa Barbara County Mode Splits by Weight and Value *2007*

Mode	Tons	Dollars
Truck	12,840,667	$8,594,312,396
Pipeline & Unknown	2,502,277	$1,407,989,087
Rail	786,691	$440,981,004
Other Intermodal	36,328	$958,588,598
Air	6,673	$380,402,523
Total	16,172,636	$11,782,273,608

Source: Cambridge Systematics analysis of FAF2 and IMPLAN data.

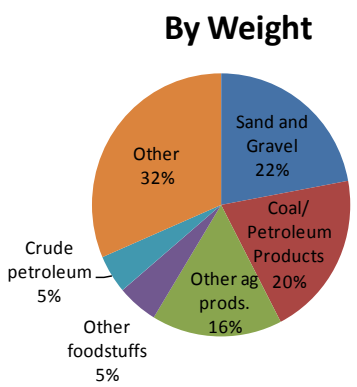
The charts on the following page highlight Santa Barbara County commodity flows in more detail. When measured by weight, the commodity mix in the County is dominated by sand and gravel (3.6 million tons), coal and petroleum products (3.3 million tons), and agricultural products (2.6 million tons). These three commodity groups combined make up 58 percent of the total tonnage in the County. Crude petroleum and food products round out the top five commodities by weight at approximately 821,000 and 765,000 tons, respectively, in 2007. The remaining 32 percent of Santa Barbara County flows are captured in the 'Other' category, which indicates that the overall commodity mix is quite diverse. Commodities in this group include minerals and mineral products, alcoholic beverages, animal feed, and chemicals.

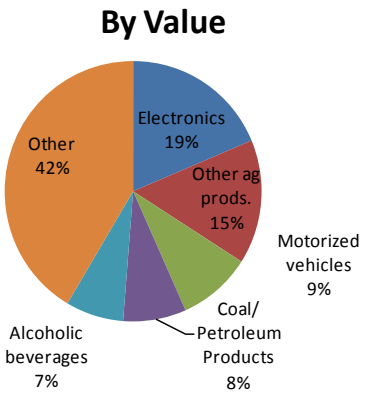
By value, the commodity mix is even more diverse, and more skewed towards higher value products. Electronics is the number one commodity moved in Santa Barbara County by value at about $2.2 billion in 2007. Agricultural goods are the next largest at $1.8 billion, followed by motorized vehicles ($1.1 billion), coal and petroleum products ($935 million), and alcoholic beverages ($857 million). All other commodities combined account for 42 percent of the County's freight value and include goods, such as food products, precision instruments, textiles and leather, and transportation equipment.

As with the region as a whole, most of Santa Barbara County's freight stays in California. When looking at volume, 82 percent of the County's freight remained in California in 2007, totaling more than 13 million tons. Other key trading partners include Oregon, Florida, Canada, and Asia. When measured by freight

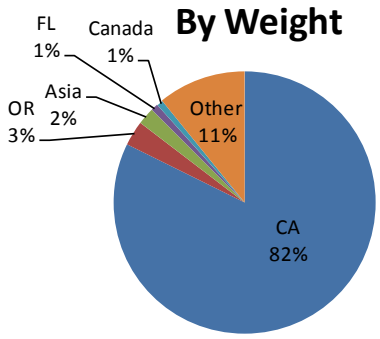
value, the County has a more diverse set of trading partners that is less dominated by California trade. Overall, 62 percent, or about $7.3 billion, of Santa Barbara County's freight value remained in California in 2007. Oregon, Canada, Texas, and Illinois round out the top five trading partners by value.

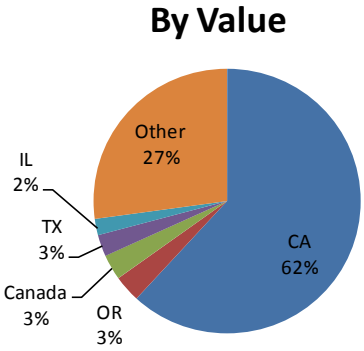
Top Commodities (2007)





Key Trading Partners (2007)





Source: Cambridge Systematics analysis of FAF2 and IMPLAN data.

SANTA CRUZ COUNTY

County Overview

Santa Cruz County had a population of 262,382 in 2010, making it the fourth largest County in the Central Coast region. It is a relatively slow-growing County, having gained only about 6,800 new residents over the last decade. However, demographers predict continued growth in the future, with the population expected to reach about 318,000 by 2040 (see Table A.9).

The top four freight-dependent industries (by employment) in Santa Cruz County are retail trade (approximately 16,000 positions); construction (9,130 jobs); manufacturing (7,418 jobs); and farming (about 6,800 employees). Key shippers in the area include Martinelli's, Threshold, Santa Cruz Nutritionals, Good Earth Teas, Safeway, and Dallas Electronics. There are a lot of coolers and packing facilities for agricultural products in and around Watsonville, which has substantial freight traffic in farm products. Granite Rock operates a quarry in Santa Cruz and ships large quantities of sand by truck. There is also some logging in the County, but this has declined in recent years.

Table A.9 Santa Cruz County Population and Industry Data

Current and Projected Population			
2010	2040	Percent Change	Compound Annual Growth Rate
262,382	318,413	21%	0.6%
Key Freight-Dependent Industries			
	2008 Employment		2008 Earnings (in Thousands)
Retail trade	16,155		$629,606
Construction	9,130		$608,228
Manufacturing	7,418		$449,359
Farming	6,793		$247,845
Wholesale trade	5,013		$353,341
Transportation and warehousing	2,061		$107,737
Utilities	174		$22,304
Forestry, fishing, and related	N/A		N/A
Mining	N/A		N/A

Sources: U.S. Bureau of Economic Analysis; 2010 population from the 2010 Census; 2040 population derived from the California Department of Finance data compiled in 2007.

Note: This forecast does not take into account 2010 actual Census figures, as it relies on the 2000 Census baseline for projections.

Freight Overview

Figure A.5 shows key Santa Cruz County freight infrastructure. The key routes that connect this County with the rest of the region's freight network are SR 17, SR 129, and SR 1. In addition, the Sierra Northern Railroad connects various shippers in the County with the Class I UP mainline in Watsonville. For aviation, the primary cargo airports include those in San Jose and San Francisco, as well as the Monterey airport to the south, which can be reached via SR 1.

Figure A.5 Santa Cruz County Freight System

Source: AMBAG data, prepared by Cambridge Systematics, Inc.

Table A.10 shows Santa Cruz County modal usage by weight and value for 2007. Like the rest of the region, Santa Cruz County relies on trucks for the movement of most of its freight. In 2007, trucks carried about 8.2 million tons of goods valued at almost $8 billion to, from, and within Santa Cruz County. This represented 85 percent of the County's total freight volume and 70 percent of its freight bill. Much of the rest (13 percent by volume, and 12 percent by value) moved via the pipeline and unknown mode. Rail handled 2 percent of the County's freight by both weight and value in 2007. Most rail activity in the area is centered on Watsonville. The other intermodal and air categories account for negligible tonnage, but substantial freight value in Santa Cruz County, since these modes tend to reflect the higher value, but lower weight shipments made by air.

Table A.10 Santa Cruz County Mode Splits by Weight and Value
2007

Mode	Tons	Dollars
Truck	8,217,789	$7,988,797,574
Pipeline & Unknown	1,241,183	$1,408,119,012
Rail	189,003	$255,698,672
Other Intermodal	28,759	$1,273,244,735
Air	15,600	$512,730,610
Total	**9,692,333**	**$11,438,590,604**

Source: Cambridge Systematics analysis of FAF2 and IMPLAN data.

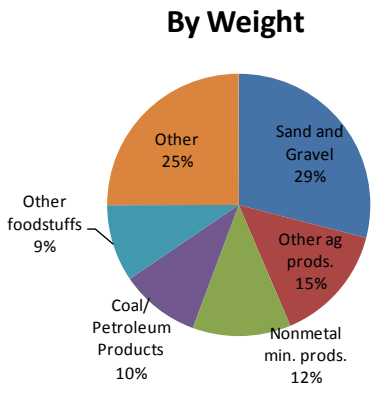
The pie charts on the next page detail the Santa Cruz County commodity mix and key trading partners. When looking at freight volume, sand and gravel products are the largest commodity group in the County at 29 percent of the total, or 2.8 million tons. As noted above, Granite Rock operates a quarry in the area and is a key producer of this commodity. Agricultural goods are the second largest commodity by volume, estimated at 1.4 million tons in 2007. Nonmetallic minerals, coal and petroleum products, and foodstuffs round out the top five commodities by weight.

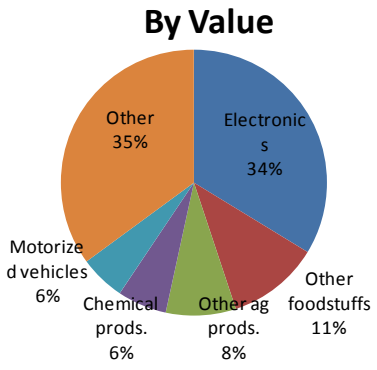
A key change that impacts the above data is that a major plant in Davenport owned by CEMEX has closed down. This has had impacts on jobs in the region and reduced the volume of heavy goods shipments (primarily cement product) down the rail line from Davenport to Watsonville. In addition, coal shipments that used to power the plant are no longer being made. As a result, cement and coal shipments might be overstated in the 2007 data for Santa Cruz County.

Electronics are the dominant commodity when considering freight value. These products comprised 34 percent of total shipments by value in 2007, or about $3.9 billion. Food products ($1.3 billion) are the next most important commodity by this measure, followed by agricultural products ($973 million), chemical products ($685 million), and motor vehicles ($631 million). All other commodity groups make up the remaining 35 percent of freight value, and include items, such as machinery, base metals, and precision instruments, among others.

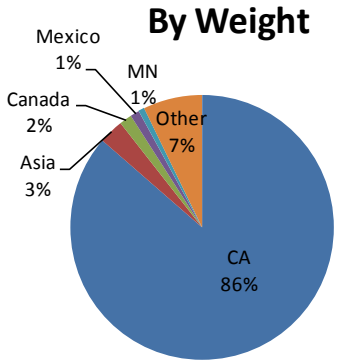
Like the other counties in the study area, Santa Cruz County trades the most with other counties in California. Nearly 8.4 million tons of its freight (86 percent of the total) stayed in California in 2007; this trade was valued at about $7.4 billion, or 64 percent of the total. Internationally, Santa Cruz County trades significantly with Asia (292,000 tons in 2007, valued at $301 million) and Canada (148,000 tons worth about $400 billion). Other key domestic trading partners include Illinois, Texas, and Minnesota.

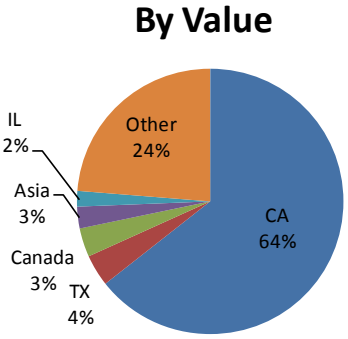
Top Commodities (2007)





Key Trading Partners (2007)





Source: Cambridge Systematics analysis of FAF2 and IMPLAN data.

B. The Central Coast Freight Flows Planning Tool Overview

The key objective of the Central Coast Freight Flows Planning Tool is to allow planners to test and understand the impact of specific economic scenarios on the volume of regional freight flows. The tool, at a high level, requires planners to enter industry impact and mode split information, which then provides the user with the transportation impact in terms of additional/fewer truck and/or rail movements. The concept behind the tool is that changes in industry output will drive changes in tons exported/imported in the region. This type of information can help planners understand impacts on traffic moving on the region's freight system based on economic forecasts for an industry or as a result of an arrival or departure of a freight-dependent business.

This overview document is intended to provide critical information on 1) how the tool is used by the planner, and 2) how the tool works behind the scenes to provide the impact on additional rail/truck traffic.

Using the Tool

The Central Coast Freight Flows Planning Tool will be easy to operate for planners. MS Excel is required to operate the tool. In order to better explain how a planner would use the tool, we will use the following example:

> *A planner is interested in determining the impact that additional vineyards would have on freight traffic and commodity movements in the County. For the example discussed throughout this document, the planner assumes that new vineyards in the County will produce an additional $10 million in output, which indicates that the value of the goods that leave the new vineyards will be around $10 million.*

Using this example, the planner would open the tool in MS Excel, and would encounter several empty data fields, which require the user to enter data manually to calculate the impact on freight flows of this project. Below follow the **inputs** into the system:[50]

[50] These are preliminary ideas on how the tool would be operated by a planner. This is just to give the reader an idea of how the tool may look and feel. Changes are possible.

- **Change (increase/decrease) in output by individual IMPLAN industries.** In this example, the user would enter +10 million for the winery industry. This is the critical input component that will be used to calculate much of the output data below.
- **Mode split for resulting traffic.** For the AMBAG region, traffic would be assigned to either truck or rail. In this example, it is assumed that 70 percent of the resulting traffic from the new vineyard will be truck movements, while the remaining 30 percent of movements will be by rail.
- **Adjustments to value and payload by commodity.** A separate tab with default parameters by commodity and industry will be available in the tool containing information, such as value/ton by each of the 43 commodity classifications, payload factors by commodity and mode, and industry production/attraction for different commodities. The planner will be able to alter these parameters, which would alter the results accordingly.

Once this information has been entered by the planner, he/she would click an action button and the tool would calculate the impact information that the user is trying to get, also known as the **outputs**. These include the following:

- **Breakdown of exports and imports by industry ($).** This result shows the value of goods and services produced and purchased as a result of the scenario being analyzed. In the case of the scenario mentioned above, $10 million in output would be produced by the winery industry, while nearly $800,000 worth of goods and services will be purchased from a variety of industries (This is covered in detail in the next section.).
- **Imports and exports by commodity (tons and dollars).** The tool will use a series of conversion tables to estimate the actual commodities being produced and consumed in the region due to the new activity. For example, as a result of the above scenario, an additional 6,600 annual tons of alcoholic products would be exported and 537 annual tons of 'other foodstuffs' would be imported.
- **Imports and exports by mode (daily and annual units).** The final result from the tool is actual truck and rail units being imported/exported to/from the region by commodity. The calculations for this step are based on historical transportation datasets showing typical payload factors (i.e., tons per truck or rail unit) by commodity. The tool will produce annual and daily truck and rail units. As a result of the above example, the user would see that an additional 145 truck units and 13 rail units would move to and from the region per day.

Now that the basic user's view of the tool has been explained, we will dig into the details of what is happening behind the scenes in the tool after the user hits the action button.

How the Tool Works

In this section, we discuss, in more detail, how the tool uses the inputs given by the user to get commodity flow and truck/rail count information. There are a number of steps to get to the end result, which is discussed below. In order to illustrate further, the same workflow used in the section above will be used throughout this section.

The tool relies on regional economic data from IMPLAN. This software contains relationships between industry output and the mix of commodities that this industry imports and exports. For example, Table B.1 below presents the "Make" and "Use" tables from IMPLAN for the winery industry for a group of Mid-Atlantic States. The Make column represents the value of each commodity or service produced by the winery industry with the sum of all commodities produced adding up to this industry's total output, in this case $1.34 billion. The Use column details the dollar value of goods and services purchased by each industry to use in their production process. As Table B.1 illustrates, Mid-Atlantic States import over $105 million worth of goods from a wide array of industries to produce $1.34 billion worth of wine.

Table B.1 Make and Use Table for the Winery Industry
In Millions

IMPLAN Commodity Code	IMPLAN Commodity	Make Value	Use Value
81	Flavoring syrup and concentrate manufacturing	$21.60	
86	Breweries		$ 2.54
87	Wineries	$1,320.13	$30.11
391	Air transportation		$3.69
393	Water transportation		$0.04
397	Scenic and sightseeing transportation and support		$0.01
462	Colleges- universities- and junior colleges		$0.16
467	Hospitals		$0.01
471	Performing arts companies		$0.33
472	Spectator sports		$0.19
475	Museums- historical sites- zoos- and parks		$0.08
476	Fitness and recreational sports centers		$0.01
478	Other amusement-gambling-and recreation industries		$1.08
479	Hotels and motels- including casino hotels		$0.03
480	Other accommodations		$0.01
481	Food services and drinking places		$65.94
491	Religious organizations		$1.09
493	Civic- social- professional and similar organization		$0.58
Total		$1,341.72	$105.88

Step 1. Calculating Additional Output by Industry

The idea behind the tool is to allow the user to enter sample scenarios that will have an impact on a specific industry's total output. Using the winery example ($10 million in output) and then using the table above, the software tool would calculate the percentage of the industry's current output that this represents (in the example case 7.45 percent). The tool would then scale the table accordingly to figure out how much more/less product will be imported and exported from the region in terms of dollars. The result of this step in the tool is displayed in Table B.2 below.

Table B.2 Annual Impact of $10 Million in Additional Output for the Winery Industry
In Millions

IMPLAN Commodity Code	IMPLAN Commodity	Make Value	Use Value
81	Flavoring syrup and concentrate manufacturing	$0.16	
86	Breweries		$0.02
87	Wineries	$9.84	$0.22
391	Air transportation		$0.03
393	Water transportation		$0.00
397	Scenic and sightseeing transportation and support		$0.00
462	Colleges- universities- and junior colleges		$0.00
467	Hospitals		$0.00
471	Performing arts companies		$0.00
472	Spectator sports		$0.00
475	Museums- historical sites- zoos- and parks		$0.00
476	Fitness and recreational sports centers		$0.00
478	Other amusement-gambling-and recreation industries		$0.01
479	Hotels and motels- including casino hotels		$0.00
480	Other accommodations		$0.00
481	Food services and drinking places		$0.49
491	Religious organizations		$0.01
493	Civic- social- professional and similar organization		$0.00
Total		$10.00	$0.79

Step 2. Calculating Additional Output by Commodity

IMPLAN to SCTG2: The next step is to convert the results shown in Table B.2 to freight traffic, for which the tool relies on data from the FHWA's FAF2 dataset. The IMPLAN commodities in Tables B.1 and B.2 are classified in terms of industries that produce/attract goods instead of a commodity classifications system, such as the Standard Classification for Transported Goods (SCTG) used in FAF2 or the Standard Transportation Commodity Classification (STCC) used in other datasets, such as TRANSEARCH. To address this issue, the tool

translates from IMPLAN industries to the standard NAICS industries with a crosswalk table provided by IMPLAN, and from there they are converted to two digit SCTG commodities (SCTG 2) using the same crosswalk table that the FHWA uses to produce the FAF2.

SCTG2 Tonnage to Value: After obtaining the imported and exported commodities dollars in the SCTG 2 classification, the next step is to convert this information to actual tonnage that will move on the region's transportation infrastructure. To do this, a crosswalk was developed for all 43 SCTG 2 commodities in the study area that lists the total amount of tonnage and dollars traded. Based on this, a dollars to tons conversion is estimated for each commodity, which is applied to the make and use value columns. The result is illustrated in Table B.3. The scenario with the new winery producing $10 million in output will result in 6,900 tons of goods exported from the region and 721 tons imported. The exports consist mainly of alcoholic beverages, while the imports are made up of foodstuffs and some alcoholic beverages.

Table B.3 Annual Impact of $10 Million in Additional Output for the Winery Industry by Commodity
In Millions of Dollars and Actual Tons

SCTG2	Commodity	Make Value	Use Value	Make Tons	Use Tons
3	Other agricultural products	$0.16	$ –	217	–
7	Other foodstuffs	$–	$0.51	–	537
8	Alcoholic beverages	$ 9.84	$0.22	6,672	152
21	Pharmaceuticals	$ –	$0.00	–	0
43	Mixed freight	$ –	$0.03	–	9
99	Unknown	$ –	$0.03	–	23
Total		$10.00	$0.79	6,888	721

This scenario can be applied to any of the 500 individual industries available in IMPLAN to determine the transportation impact of new activity. Another approach is to use forecast economic data from sources, such as Woods & Poole or Global Insight, and apply the industry projection to the IMPLAN industries in the tool in order to obtain the equivalent of that forecast in terms of transportation.

Step 3. Calculating Actual Truck/Rail Units – Annual

Total Tons to Annual Truck/Rail Tons. The next step is to convert the additional traffic to actual annual truck and rail units on the transportation network. To do this, the system will use the projected mode split for new traffic entered by the user, and the tool will use a crosswalk table to go from tons to trucks and/or rail units. For the case above, the user entered that 70 percent of

trips would be truck trips, while the rest would be rail trips. The resulting traffic in terms of annual tonnage is summarized in Table B.4.

Table B.4 Scenario Impact in Terms of Tons by Commodity and Mode
Annual Tons

		Outbound		Inbound		Combined	
SCTG2	Commodity	Truck	Rail	Truck	Rail	Truck	Rail
3	Other agricultural products	20,503	8,787	–	–	20,503	8,787
7	Other foodstuffs	–	–	50,851	21,793	50,851	21,793
8	Alcoholic beverages	631,285	270,551	14,398	6,171	645,683	276,721
21	Pharmaceuticals	–	–	–	–	–	–
43	Mixed freight	–	–	851	365	851	365
99	Unknown	–	–	2,134	915	2,134	915
Total		651,787	279,337	68,235	29,243	720,022	308,581

Annual Truck/Rail Tons to Truck/Rail Units. Using the crosswalk to convert from tonnage to truck and rail units, the data from Table B.4 is adjusted to produce actual network traffic in terms of units as shown in Table B.5.

Table B.5 Scenario Impact in Terms of Truck and Rail Units
Annual Units

		Outbound		Inbound		Combined	
SCTG2	Commodity	Truck	Rail	Truck	Rail	Truck	Rail
3	Other agricultural products	1,344	111	–	–	1,344	111
7	Other foodstuffs	–	–	2,832	304	2,832	304
8	Alcoholic beverages	30,923	3,528	911	80	40,834	3,608
21	Pharmaceuticals	–	–	–	–	–	–
43	Mixed freight	–	–	50	4	50	4
99	Unknown	–	–	126	11	126	11
Total		41,267	3,639	3,919	400	45,186	4,038

Step 4. Calculating Actual Truck/Rail Units – Daily

The final step is to produce daily numbers from the estimates in Table B.6. For freight traffic, typically six-day weeks are used to go from annual to daily, which would result in a factor of 312 days per year. Based on all the aforementioned factors, a $10 million increase in output from the winery industry in the region would result in approximately 145 trucks and 13 rail units per day.

Table B.6 Scenario Impact in Terms of Truck and Rail Units
Daily Units

		Outbound		Inbound		Combined	
SCTG2	Commodity	Truck	Rail	Truck	Rail	Truck	Rail
3	Other agricultural products	4	–	–	–	4	–
7	Other foodstuffs	–	–	9	1	9	1
8	Alcoholic beverages	128	11	3	0	131	12
21	Pharmaceuticals	–	–	–	–	–	–
43	Mixed freight	–	–	–	–	–	–
99	Unknown	–	–	–	–	–	–
Total		132	12	13	1	145	13

Summary of Tool Benefits

The output from the tool has informed the planner of 1) the additional types and volumes of goods that will be imported/exported into the County as a result of the $10 million increase in winery output, and 2) the additional number of truck and rail units that can be expected daily/annually as a result of this change. From the vineyard example, the tool shows that:

- An additional 145 daily trucks will be entering and leaving the County as a result of the assumed $10 million increase in vineyard output. Most of these trucks will be taking the finished product from the vineyards out of the County. This has implications on traffic, air quality, and other important factors.
- Thirteen additional rail units will be used to move goods into and out of the County as a result of the $10 million increase in vineyard output. This increase has implications for rail – can the current rail system support this many additional rail units?
- The types of commodities that will be exported as a result of the increase in winery output include exports of 'alcoholic beverages' and other agricultural products. The following commodities will be imported as a result of the additional winery output: other foodstuffs, alcoholic beverages, mixed freight, and unknown freight will be imported into the County. The exports far outweigh the imports, both in terms of tonnage and value of freight.

As a result of using the tool, the planner now has a picture of how freight movements in the County will change if businesses, such as additional vineyards, were opened in the region. This can help inform planning decisions at the County and at the local level. For example, it can help county or regional planners understand changes in freight traffic based on various long-term economic scenarios. In addition, it could help local planners understand the traffic and commodity flow impact of a specific business entering or leaving a city.

C. Central Coast of California Freight Flows Summary

This Technical Memo characterizes current freight flows in the five-county region encompassing the Central Coast of California: Santa Cruz, San Benito, Monterey, San Luis Obispo, and Santa Barbara Counties. Usage is presented by means of a range of measures including mode, commodity, tonnage and value. These data provide an indication of facility use and linkages between trading partners and the region's transportation network. Data for the year 2007 have been used throughout, as it is the most recent year for which complete data on goods movement were available. It thus provides an indication of the level of freight activity during the beginning of the economic recession; it should be noted that subsequent to 2007, traffic volumes declined in the range of 15 to 50 percent, depending on location and mode, reaching a trough during the first one-half of 2009.

DATA BACKGROUND AND METHODOLOGY

Data on the Central Coast of California's freight traffic were assembled from the Minnesota IMPLAN Group's 2007 economic model for the region, the FHWA's Freight Analysis Framework 2 (FAF2) dataset, and several local sources for commodity generation, such as the California Department of Conservation, and each county's Agriculture Commissioner's office. This section describes how these sources were used in order to produce an origin-destination dataset for the five-county region. The information is presented in three subsections covering traffic generation and attraction, distribution and mode split, and adjustments made to the dataset based on local sources.

Commodity Production and Attraction

The initial approach for this project called for the use of county-level disaggregated FAF2 data for traffic generation, attraction, distribution, and mode split. However, the results produced with this approach were not satisfactory, mainly because they were inconsistent with general observations about the structure of the regional economy. To address this, the study team used the economic model from the Minnesota IMPLAN Group to get a better estimate of commodity generation and attraction for each of the five counties.

The IMPLAN database and model use input-output analysis in combination with region-specific social accounting matrices and multiplier models, to provide an accurate and adaptable economic model for the region. The model provides information on commodity production by industry as well as consumption by

industries (to use in their production process) and by institutions, such as households and government (for final consumption).

Production and attraction data from the model are classified using an industry classification system rather than a commodity classification system; that is, a commodity in IMPLAN is classified based on the industry that generally produces the commodity. An example is the commodity "crude oil" which is classified as Oil and Gas Extraction (the industry that produces crude oil for sale). This can be somewhat confusing and makes comparison with standard commodity databases, which use commodity classifications (such as the Standard Classification of Transported Goods, SCTG), difficult. To bridge this gap, the study team developed a crosswalk table that identified the SCTG commodities associated with each of the 440 IMPLAN industries. Table C.1, below, presents a sample of this conversion table.

As illustrated, commodities classified by the industries that produce goods (such as farming and mining) have been assigned a corresponding commodity classification (agricultural products, cereal grains, coal, etc.). On the other hand, industries that do not produce freight goods, such as wholesale and retail trade, transportation, construction, finance, insurance, real estate, and others, have not been assigned a commodity. As a result, production (reported as industry output in IMPLAN) from these industries is not included in the traffic generation analysis; however, the demand for commodities (commodity consumption) generated by all industries is accounted for in the traffic attraction analysis.

Table C.1 IMPLAN Industry to SCTG2 Commodity Crosswalk

IMPLAN Industry	Commodity
Oilseed farming	Other agricultural prods
Grain farming	Cereal grains
Cattle ranching and farming	Live animals/fish
Commercial logging	Logs
Support activities for agriculture and forestry	Service/Other
Extraction of oil and natural gas	Crude petroleum
Mining coal	Coal
Mining iron ore	Metallic ores
Mining/quarrying sand, gravel	Sand and Gravel
Mining and quarrying other nonmetallic minerals	Nonmetallic minerals
Construction – new nonresidential	Service/Other
Construction – new residential	Service/Other
Flour milling and malt manufacturing	Milled grain prods
Wet corn milling	Milled grain prods
Sugar cane mills and refining	Other foodstuffs

IMPLAN Industry	Commodity
Beet sugar manufacturing	Other foodstuffs
Wholesale trade businesses	Service/Other
Retail Stores – Motor vehicle and parts	Service/Other
Transport by truck	Service/Other

Source: IMPLAN, Cambridge Systematics, Inc.

The commodity production and attraction estimated from the IMPLAN data was available in terms of dollars. It was converted to tons using the average commodity value per ton for corresponding 2-digit SCTG (or SCTG2) commodities from FAF2. The result was a table for each of the five counties showing total commodity production and attraction in terms of tons and dollars for all 43 SCTG2 commodities.

The final adjustment to IMPLAN data was to estimate the internal flows (i.e., from each county in the region to every other county in the region) by commodity. IMPLAN estimates this, and presents it as the Regional Purchase Coefficient (RPC), which is the proportion of goods and services that are purchased regionally under normal circumstances, based on the area's economic characteristics described in terms of actual trade flows within the area. The RPC is available for each of the IMPLAN commodities, and were translated to SCTG2 commodities using the same crosswalk table described above.

The resulting local demand was subtracted from the total production and total attraction and labeled as internal flows. The final table provides, for each county, the volume of outbound, inbound, and internal flows in terms of commodity tons and dollars.

Commodity Distribution and Mode Split

Once production and attraction volumes had been established, the next step was to distribute the flows to their corresponding origin/destination pairs and assign mode. IMPLAN does not provide information about the origin/destination patterns of flows and provides no information about modal usage. Modeling of the flow distribution and mode split with economic gravity models and mode choice models was beyond the resources of this study. As an alternative approach, the study team opted to use the same flow distribution and mode split patterns reported in the FAF2 database. Using this approach would only require that the shipments in the FAF2 dataset be scaled up or down to match the IMPLAN production and attraction data.

The FAF2 data are published at a very aggregate level of detail for California that needs to be further adjusted and disaggregated in order to be useful in analyzing Central Coast freight flows. In this case, as illustrated in Figure C.1, this study's five-county region is split amongst two FAF2 regions (San Francisco and the

Remainder of California), and even within each of these regions makes up a small portion of total economic/freight activity.

Figure C.1 FAF2 Regions in California

Source: Freight Analysis Framework 2, Cambridge Systematics, Inc., 2008.

To address this, the study team is using a disaggregated version of the dataset produced for Caltrans in 2009. To produce this disaggregated dataset, the data were allocated by county using regression equations that link commodity production and attraction to employment by industry, population, energy production, and agriculture/farm data (by county). The resulting county-level dataset was adjusted based on the IMPLAN production and attraction data, while maintaining mode split within each commodity/origin-destination combination.

Adjustments and Validation Based on Local Data

The last step in the process was to adjust and/or validate the resulting dataset using local information about commodity production and attraction. Four data sources were used as described below.

- **Employment Data from Economic Development Districts (EDD)**. The first step in the validation process was to compare employment data from IMPLAN to those from the EDDs operating in the region. The California Economic Development Department produces a monthly and annual dataset of all employment by industry and county, which is collected with cooperation from the EDDs. On initial inspection, the jobs data from the EDD was found to be consistently lower than that in IMPLAN for all counties and industries (by approximately 25 percent). The reason for this is that IMPLAN counts a wider range of jobs than most other datasets, including primarily self-employed, in addition to military, railroad workers (who have their own retirement systems), religious organizations and some private elementary school jobs, which are typically missing from BLS employment counts. These are very important in terms of commodity generation and attraction, thus, should be included in the analysis.

  The jobs included in the EDD and IMPLAN dataset had the same distribution amongst counties, and were also validated over several key industry sectors, such as manufacturing, construction, retail, wholesale trade, and services. This means that the allocation of jobs between industries for each county was very similar in both datasets.

- **County Agriculture Commissioners' Offices Data**. One of the primary issues with the original approach (using disaggregated FAF2 data), was that agricultural production was significantly under-represented. This was a significant issue for this region since this industry is a primary driver of the economy. The agricultural production and consumption data from IMPLAN were more in line with the information gathered from each county's agricultural department (which detail production of vegetables, fruits/nuts, field crops, and nursery/seed crops); IMPLAN agricultural data were generally within 10 percent of County Agriculture Commissioner data in terms of total dollar output (depending on the county).

- **Gravel and Natural Sands**. The initial FAF2 disaggregation of gravel and sand shipments, which was done at the national level, did not produce reasonable results for the study region. It resulted in several instances of gravel and sand being shipped back and forth between two counties, and these goods being exported from places where they are not produced. To address this, data from the U.S. Census' County Business Patterns was used in order to redistribute these shipments to the corresponding counties. Employment in the Construction sector (NAICS 23) was used as the sole attraction indicator, while employment in the Construction Sand and Gravel Mining (NAICS 212321) and Industrial Sand Mining (NAICS 212322) were

used as production indicators for both commodities. Using these factors, flows for Gravel and Sand were disaggregated to the corresponding county from its original FAF2 region.

- **Petroleum and Natural Gas Production**. Crude petroleum and natural gas production shipments were over-represented in IMPLAN. To address this, data from the California Department of Conservation were used, which shows total production in terms of barrels of oil and thousands of cubic feet of natural gas. These were converted to tons and dollars, and were subsequently used to scale down the outbound flows for these commodities (SCTG 16).
- **Road Intercept Survey from Air Resources Board**. The California ARB recently produced a report discussing proposed amendments to the truck and bus regulation, the drayage truck regulation, and the tractor-trailer greenhouse gas regulation. As part of the study, the team collected truck traffic data at 15 weight stations and 15 roadside locations throughout the State. This data would have served to validate the truck production and attraction produced from IMPLAN for the five-county Central Coast of California region; however, there were no survey locations inside the five-county region.

  Only two locations collected data relevant to this study, U.S. 101 at Casa Conejo (just south of the study region), and U.S. 101 at Gilroy (just North of the study region). The first one only collected northbound traffic (going into the region from the South) and the second one only collected southbound traffic (going into the region from the North). As a result, the only type of traffic that could be estimated is inbound, which was not enough to provide any useful comparison to the data generated with IMPLAN. As a result, the roadside data was not used to validate the finalized OD dataset.

OVERALL COMMODITY MOVEMENTS

Over 63 million tons of freight, worth approximately $50 billion, was transported into, out of, and within the Central Coast region via highway, railroad, and air in 2007. A brief description of freight flows by direction is provided below.

- **Inbound** movements accounted for 15.1 million tons with a value of $19.14 billion.
- **Outbound** movements accounted for 32.7 million tons with a value of $21.4 billion.
- **Internal** movements (entirely within the five-county region) accounted for 12.1 million tons with a value of $4.2 billion.
- **Through** truck movements were either nonexistent, or too small to be captured by the data and model used for this project. This is primarily a result of the geographic location of the region, as well as the available

alternate roads to bypass the region, namely I-5. There are some through rail moves in the region, which were not counted due to limitations in the data available.

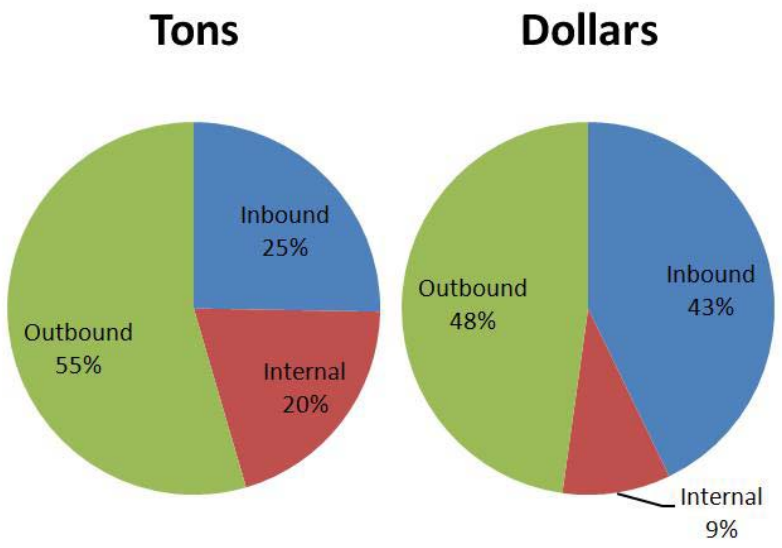
Table C.2 Freight Flows by Direction of Travel
2007

Direction	Tons (Millions)	Dollars (Billions)
Inbound	15.1	$19.14
Internal	12.1	$4.20
Outbound	32.7	$21.35
Total	59.9	$44.68

Source: FREIGHT ANALYSIS FRAMEWORK 2, IMPLAN, Cambridge Systematics, Inc., 2007.

Figure C.2 shows the percentage of trade comprised by these movements by weight and value. Outbound shipments make up the largest portions of the overall freight moves in the region with 55 percent of the tons and 48 percent of the dollars traded. These flows (in terms of value) consist primarily of agricultural goods, electronics, food, and alcoholic beverage. Other key products include coal and petroleum products (such as gasoline, asphalt, and lubricating oil), and several high weight/low value goods, such as sand and gravel and nonmetallic minerals.

Figure C.2 Total Freight Flows by Type of Movement
By Weight and Value



Source: Freight Analysis Framework 2, IMPLAN, Cambridge Systematics, INC., 2007.

Inbound shipments account for 25 percent of total flows by weight and 43 percent by value. The primary imports by value are electronics, motorized vehicles, food, and agricultural products. These products combined for nearly 5.2 million tons worth approximately $9.6 billion. In terms of weight, the largest import is coal and petroleum products, which account for 4 million tons of freight and $1.3 billion.

Internal shipments meet the demand for goods that are produced within the five-county region. In terms of weight, these are comprised in large part by agricultural products, sand and gravel, and energy products, such as coal/ petroleum products, petroleum, and natural gas. Sand/gravel and to a large degree petroleum shipments are used for construction (petroleum is used in the production of asphalt), while coal/petroleum products and natural gas are used as energy sources.

As Table C.3 illustrates, Monterey County is the largest and primary source of outbound flows by weight for the region (12.5 million tons annually), accounting for nearly 40 percent of the region's total exports by weight, and roughly 31 percent by value. These shipments are composed primarily of agricultural products (6.1 million tons), sand and gravel (3.5), and foodstuffs (931k). When analyzed by value, the top commodity produced, is also agricultural products, which account for $4.2 billion, followed by foodstuffs ($1.0b), and alcoholic beverages ($327 million). Santa Barbara is the second largest producer of goods in the region with 6.9 million tons of outbound products, San Luis Obispo (6.2 million), Santa Cruz (5.4 million), and San Benito County (1.7 million).

Monterey and Santa Barbara are also the largest recipients of inbound flows (5.3 and 4.5 million tons/year, respectively), reflecting the demand generated by their large population bases (these are the two largest counties in the region in terms of population with more than 400,000 people residing in each county), as well as the local economy. These shipments are made up primarily of coal/petroleum products, agricultural products, food, electronics and motorized vehicles. Santa Cruz is the third largest importer of goods in the region with 2.7 million tons, followed by San Luis Obispo (1.9 million) and San Benito County (717,000).

Table C.3 Domestic Commodity Flows by County
Thousands of Tons

County	Inbound	Internal	Outbound	Total
Monterey	5,327,210	4,308,991	12,539,702	22,175,902
San Benito	717,150	285,628	1,677,834	2,680,612
San Luis Obispo	1,940,337	3,275,923	6,173,790	11,390,049
Santa Barbara	4,480,850	4,748,585	6,943,201	16,172,636
Santa Cruz	2,680,908	1,654,342	5,357,084	9,692,333
Total	15,146,455	14,273,468	32,691,611	62,111,534

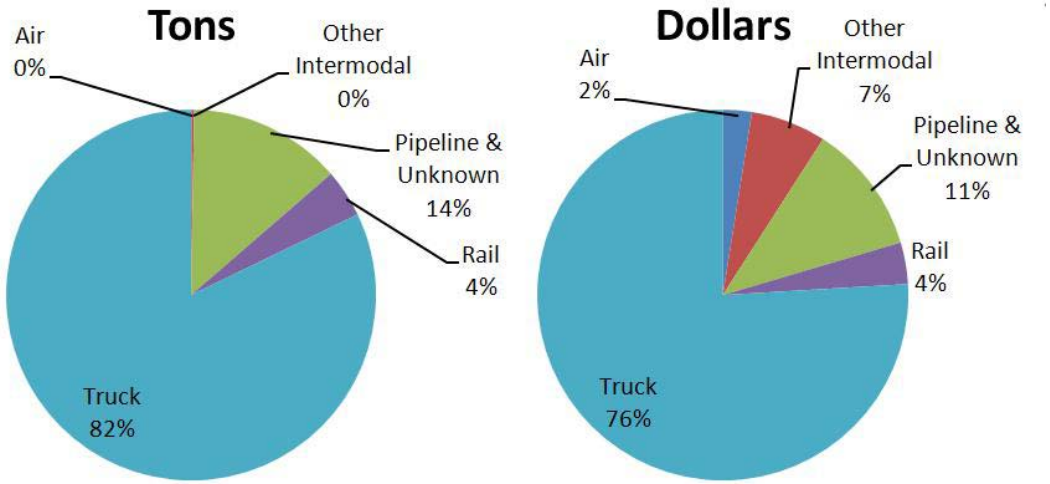
Source: Freight Analysis Framework 2, IMPLAN, Cambridge Systematics, Inc., 2007.

Note: The traffic between counties within the region are double counted as outbound for the originating county and inbound for the terminating county. Internal traffic is entirely within one county.

VOLUMES BY MODE

Like most regions, California's Central Coast is dependent on motor carriage for the transportation of the vast majority of its freight. Trucks generally provide the last link in the transportation chain, carrying all types of commodities from intermediate destinations, such as seaports, rail terminals and distribution facilities to their final destinations. As shown in Figure C.3, trucks moved 82 percent of the tonnage and 76 percent of the value of freight going into, out of, and within the region. This amounted to 49.5 million tons and $33.9 billion in 2007. Modal share for truck is higher than that of the U.S. as a whole (67 percent by weight and 75 percent by value), but more in line with that of California (80 percent/70 percent). Given the smaller presence of rail and marine-oriented industry and infrastructure in the region (for example compared to the LA region), this difference is not surprising.

Figure C.3 Mode Split by Weight and Value
2007



Source: Freight Analysis Framework 2, IMPLAN, Cambridge Systematics, Inc., 2007.

Rail movements accounted for 2.5 million tons of freight valued at $1.6 billion, representing approximately 4 percent of all the freight moving into, out of, within, and through the region. Coal/petroleum products, food, agricultural products, alcoholic beverages, fertilizers, and nonmetallic minerals are the top commodities transported by rail. One-half of all rail shipments by weight is headed out of the region.

The "other intermodal" mode accounts for shipments using parcel and any multiple mode combination (excluding truck-rail and truck-air) which have been categorized as air and rail, respectively. These flows are typically made up of low-weight/high-value goods that can absorb the additional cost of transportation through different modes. The primary goods categorized under this mode are electronics, precision instruments, miscellaneous manufactured goods, and textile/leather products.

Pipeline/unknown traffic accounts for 8.0 million tons of traffic valued at $5.1 billion, which represents roughly 14 percent of all traffic in terms of weight and 11 percent value. This category covers primarily energy products, specifically coal/petroleum products (primarily gasoline and diesel), crude petroleum, and natural gas these goods make up over 90 percent of all tonnage transported through this mode.

Air shipments play a minor role in freight moves in the region, accounting for 33,000 tons worth $1.1 billion. This disparity between shipment weight and shipment value highlights the high-value, low-weight nature of air freight shipments, which consist primarily of electronics, precision instruments, transportation equipment, and other manufactured goods. While the Region's airports may handle very modest freight volumes, a considerably larger volume of the Central Coast's commerce is likely to move by air through some of the

major nearby gateway airports, such as San Francisco, Oakland, and to a lesser degree Los Angeles.

TOP COMMODITIES

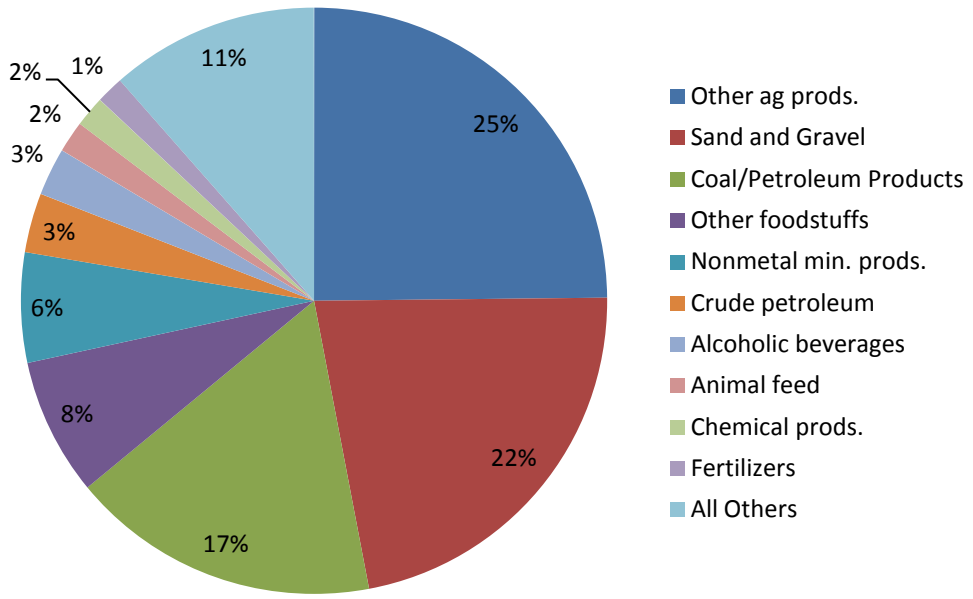
Figures C.4 and C.5 illustrate the top 10 commodities moving into, out of, and within the Central Coast of California Region in 2007 by both weight and value. The top five commodity groups in 2007 accounted for 78 percent of the total flows by weight, representing 46.5 million tons.

These commodity groups consisted of:

- SCTG 3 – Other agricultural products, 14.9 million tons (25 percent);
- SCTG 12 – Gravel, 13.3 million tons (22 percent);
- SCTG 19 – Coal/petroleum products, 10.2 million tons (17 percent);
- SCTG 7 – Other foodstuffs, 4.5 million tons (8 percent); and
- SCTG 13 – Nonmetallic mineral products, 3.6 million tons (6 percent).

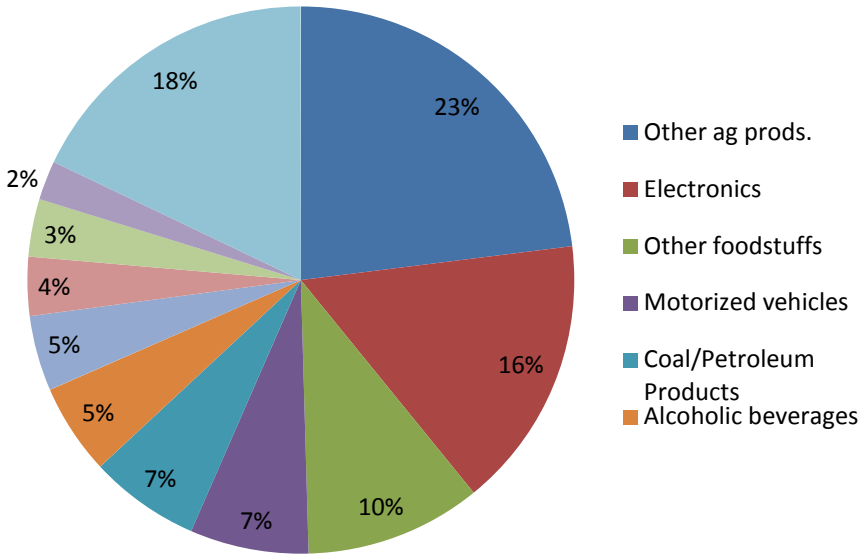
Each of these commodities accounted for at least 3.5 million tons. It should be noted that if all of the typical agriculture, farm, and food products are combined (SCTG Codes 1 to 9) this category would make up nearly 40 percent of all commodities transported into, out of, and within the region, representing 23 million tons.

Figure C.4 Top Commodities
By Weight



Source: Freight Analysis Framework 2, IMPLAN, Cambridge Systematics, Inc., 2007.

Figure C.5 Top Commodities (Inbound Plus Outbound Plus Internal) *By Value*



Source: Freight Analysis Framework 2, IMPLAN, Cambridge Systematics, Inc., 2007.

When shipment value is considered, there is a lower concentration amongst the top commodities, with the top 5 accounting for 63 percent of all shipments, which represents $28.2 billion. The top commodities by value consisted of:

- SCTG 3 – Other agricultural products, $10.3 billion (23 percent);
- SCTG 35 – Electronics, $7.2 (16 percent);
- SCTG 7 – Other foodstuffs, $4.7 billion (10 percent);
- SCTG 36 – Motorized vehicles, $3.1 billion (7 percent); and
- SCTG 19 – Coal/petroleum products, $2.9 billion (7 percent).

Each of top 6 commodities exceeded $2.9 billion in value. Again, as is the case in the analysis by weight, if all of the typical agriculture, farm, and food products are combined (SCTG Codes 1 to 9) this category would make up 42 percent of all shipments by value into, out of, and within the region, representing $18.6 billion.

The top commodity analysis highlights several key points for the Central Coast region. First, although the top five commodities make up the majority of the freight transported (by weight), the region's transportation network handles a wide array of goods. In fact, each of the top nine commodities (by weight) accounted for over 1 million tons, and each of the top 17 commodities (by value) accounted for over $500 million. That said, particular attention must be paid to agricultural and farm products, which are the primary drivers of the region's economy, and make up roughly 40 percent of all goods transported into, out of,

and within the region. Special attention should be paid to these commodities to ensure that its transportation needs are met and it can continue providing economic wealth for California's Central Coast.

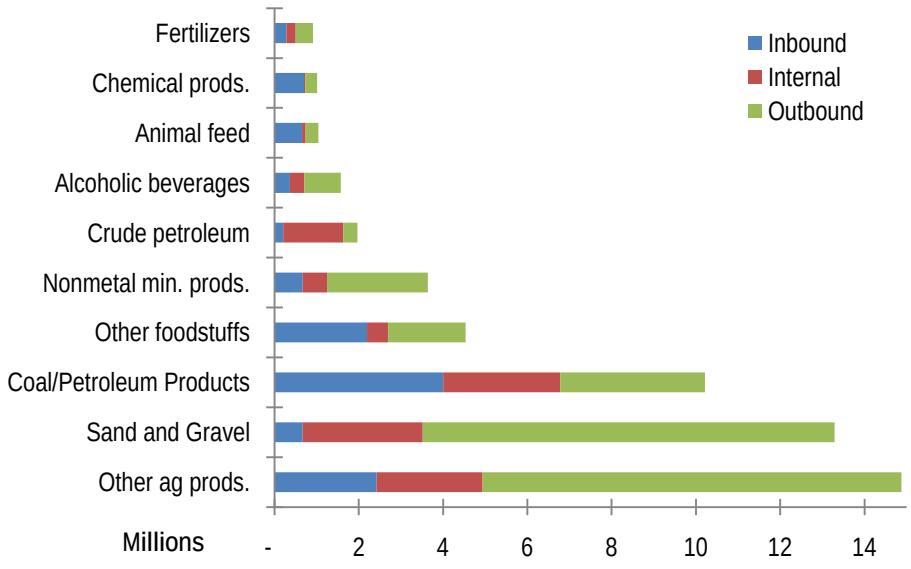
Energy-related products also play a key role in the region's economy and freight flows. These goods, made up of coal, petroleum, and (more importantly) their derived products, make up 12 million tons valued at approximately $3.2 billion. These are key products for the region's economy and population.

Finally, other key goods that should be followed closely are high-weight/low-value goods, such as sand/gravel and nonmetallic minerals and products. These make up a combined 18 million tons of freight or roughly 30 of all tons transported, and as a result put a significant amount of stress on the region's roadways.

Commodity Shipments by Direction

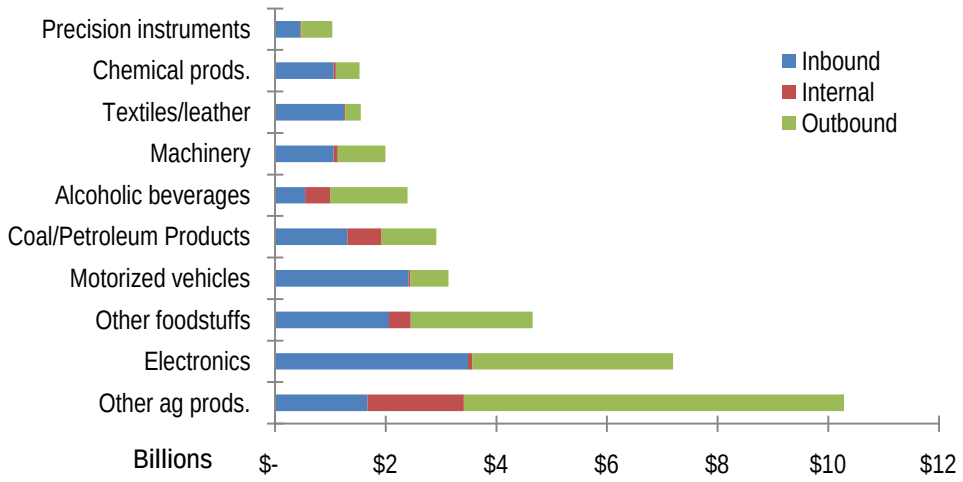
Figures C.6 and C.7 present the breakdown of the top 10 domestic commodities by direction of flow that moved throughout the Central Coast region in 2007, first by weight (Figure C.6) and then by value (Figure C.7). As illustrated, with the exception of oil and natural gas, inbound and outbound traffic dominate freight flows in the region, but it varies between commodities. The products that are predominantly exported from the region include sand and gravel, agricultural products, nonmetallic mineral products, and alcoholic beverages; these constitute 70 percent of the region's exports by weight.

Figure C.6 Top 10 Domestic Commodities by Direction of Flow
2007, By Tons (in Millions)



Source: Freight Analysis Framework 2, IMPLAN, Cambridge Systematics, Inc., 2007.

Figure C.7 Top 10 Domestic Commodities by Direction of Flow
2007, By Value



Source: Freight Analysis Framework 2, IMPLAN, Cambridge Systematics, Inc. (2007).

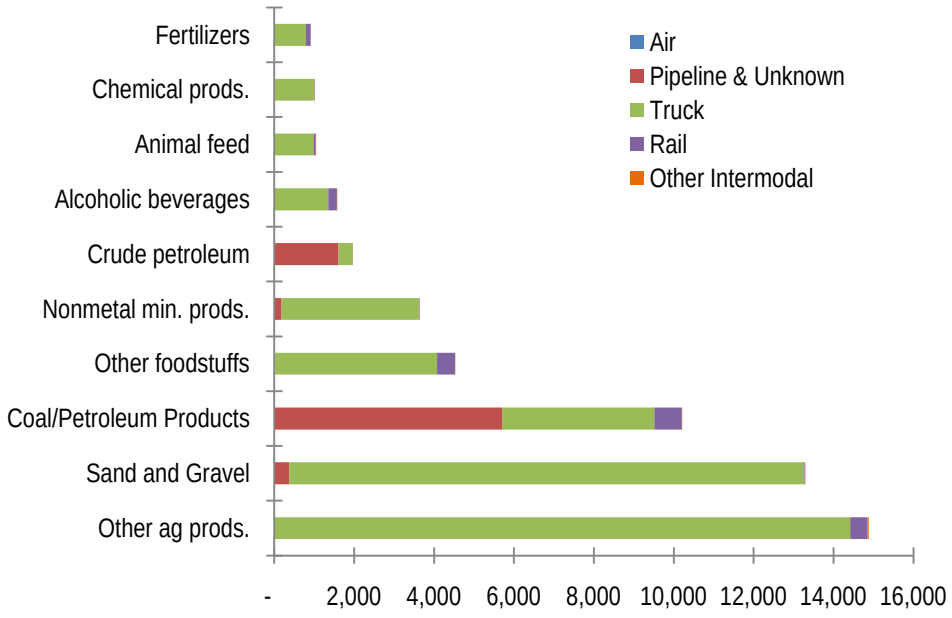
Chemical products (mainly soap, toiletries and other cleaning products), animal feed, and other foodstuffs constitute a large portion of imports; roughly 54 percent of these shipments are transported into the region. Overall, in terms of weight the region has a significant trade surplus, with outbound shipments outpacing inbound flows by more than 2 to 1. However, in terms of value, the distribution of inbound and outbound shipments is more balanced, with these accounting for 48 and 43 percent of the dollars shipped, respectively.

Commodity Shipments by Mode

Figures C.8 and C.9 provide a view of the region's modal usage for the top 10 commodity groups, first by tons, and then by value. As illustrated, trucks handle the largest share of the tonnage for 8 of the top 10 commodities, with the two exception being crude petroleum/natural gas and coal/petroleum products (mainly gasoline and diesel) which are transported primarily by pipeline.

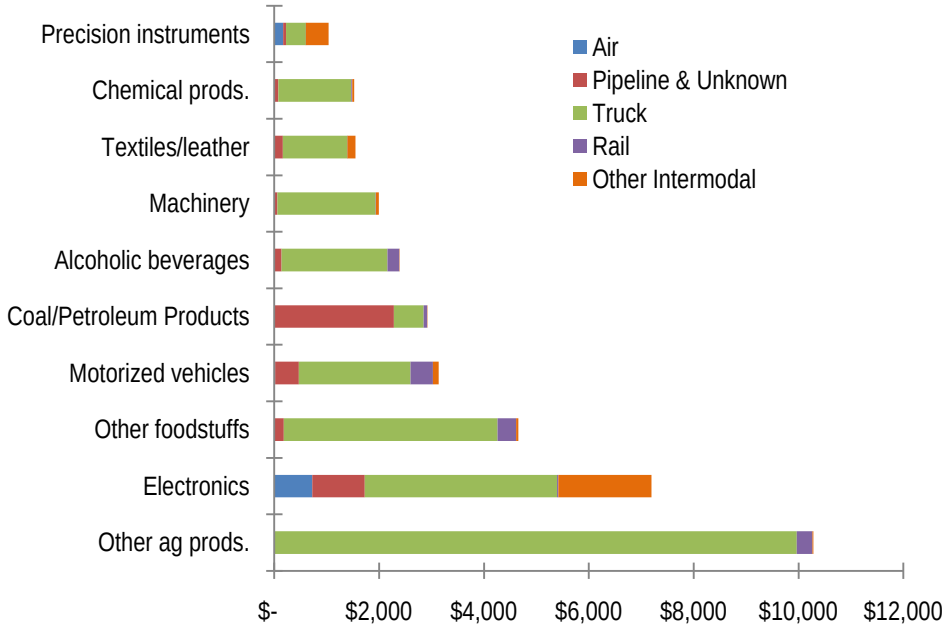
When analyzed by value, trucks are still the prevalent mode for nine out of the top commodities, with the exception being coal/petroleum products. However, other modes play a more important role under this metric, with air and "other intermodal" handling a significant portion of electronics and precision instruments shipments, in addition to rail being a key player in the trade of motorized vehicles, foodstuffs, and alcoholic beverages.

Figure C.8 Modal Usage of Top 10 Commodities by Weight
2007, Thousands of Tons



Source: Freight Analysis Framework 2, IMPLAN, Cambridge Systematics, Inc, 2007.

Figure C.9 Modal Usage of Top 10 Commodities by Value
2007, Millions of Dollars



Source: Freight Analysis Framework 2, IMPLAN, Cambridge Systematics, Inc., 2007.

Top Trading Partners

In addition to the commodity flows reported above, it also is important to identify the Central Coast's key trading partners (i.e., where the region's freight traffic is originating and terminating beyond the its borders). This provides essential insights into the characteristics of the freight being handled, such as length of haul, market penetration, route selection, and modal preference and suitability.

In 2007, the Central Coast of California traded over 59 million tons of freight valued at $45 billion. As Tables C.4 and C.5 illustrate, the bulk of these shipments (78 percent by weight and 62 percent by value) are headed to or from the remaining counties in California. The primary drivers of these shipments are the same covered earlier: agriculture/farm/food products, construction materials (sand/gravel and nonmetallic minerals), energy products (coal/petroleum products, crude petroleum, and natural gas), electronics, and motorized vehicles.

It should be noted however, that the dataset only accounts for initial distribution of shipments. As a result, for example, if agricultural shipments are being sent to a redistribution facility in Los Angeles, from where the goods will be sent out to many cities throughout the country, the dataset will only show goods traveling from the Central Coast region to Los Angeles. The second portion will not show up. As a result, trade with the rest of California may be overstated in this dataset, but it would be very difficult to quantify the extent of this issue.

Table C.4 Top Trading Partners
2007, Thousands of Tons

Trading Partner	Tons	Percent Share
California	37,196	77.8%
Asia	1,453	3.0%
Oregon	1,279	2.7%
Canada	522	1.1%
Arizona	501	1.0%
Texas	417	0.9%
Florida	414	0.9%
Mexico	412	0.9%
Nevada	411	0.9%
Americas	349	0.7%
All Others	4,884	10.2%
Total	47,838	100.0%

Source: Freight Analysis Framework 2, IMPLAN, Cambridge Systematics, Inc., 2007.

Table C.5 Top Trading Partners
2007, Value (Millions)

Trading Partner	Dollars	Percent Share
California	$24,934	61.6%
Canada	$1,171	2.9%
Asia	$1,147	2.8%
Texas	$1,127	2.8%
Oregon	$1,065	2.6%
Illinois	$793	2.0%
Florida	$584	1.4%
Arizona	$547	1.4%
Colorado	$517	1.3%
Nevada	$503	1.2%
All Others	$8,099	20.0%
Total	$40,487	100.0%

Source: Freight Analysis Framework 2, IMPLAN, Cambridge Systematics, Inc., 2007.

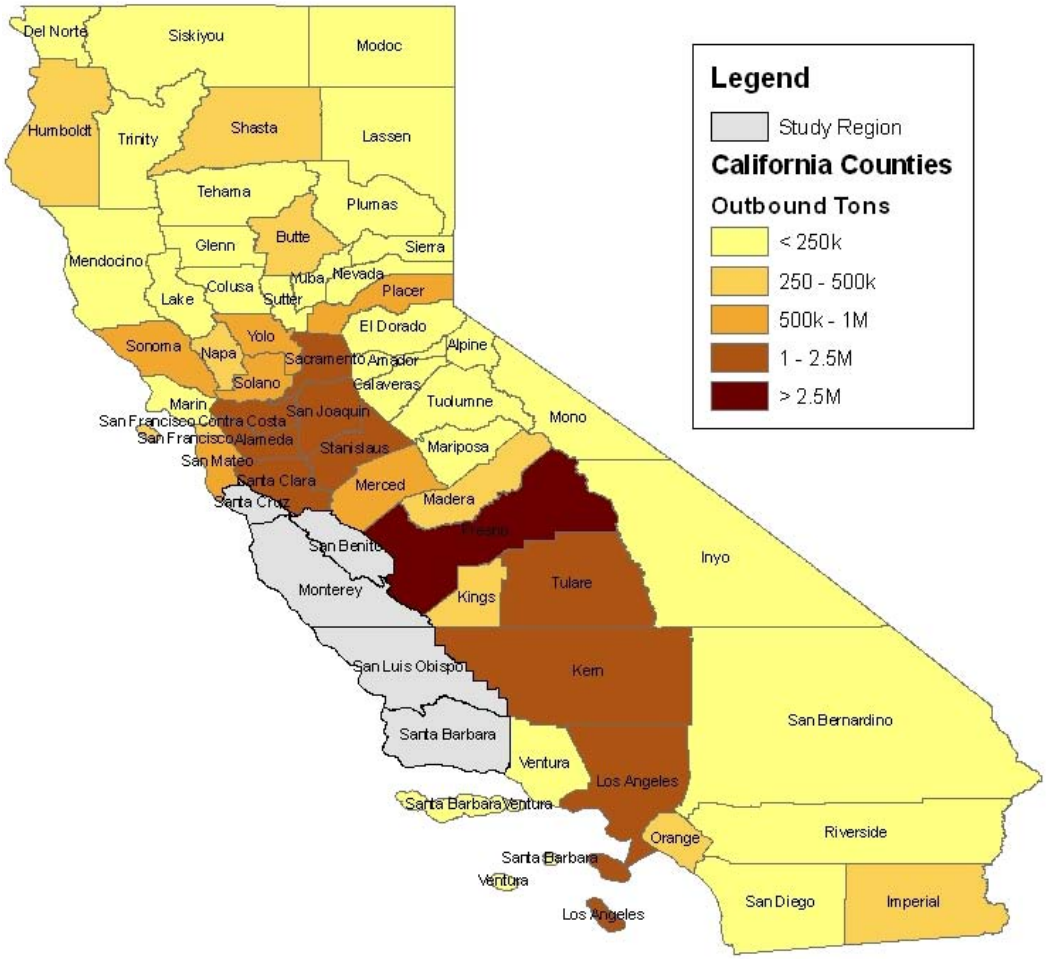
Given the region's strong connection to the rest of California, it is important to analyze which counties within the State are driving this trade. Table C.6 and Figures C.10 to C.11 reveal the Region's ties to its immediately surrounding counties, primarily Fresno, Kern, and Los Angeles, as well as Alameda, San Joaquin, Stanislaus, and Sacramento Counties. Fresno County is the primary trade partner by weight, with 3.9 million tons shipped to/from the region valued at $1.9 billion. These shipments consist mainly of agricultural products (1.1 million tons), sand and gravel (1.1 million), coal/petroleum products (560,000), and foodstuffs (303,000). Shipments to/from Kern County are also similar, but with a heavier concentration on coal/petroleum products (1.1 million tons).

Table C.6 Top Trading Partners within California – Inbound and Outbound

California County	Tons (Millions)	Dollars (Billions)
Fresno	3.85	$1.90
Kern	3.63	$1.27
Los Angeles	3.00	$2.78
Sacramento	2.45	$1.21
San Joaquin	2.46	$1.24
Stanislaus	2.35	$1.56
Alameda	2.40	$2.53
Tulare	1.42	$0.82
Santa Clara	1.52	$2.64
Contra Costa	1.50	$0.65

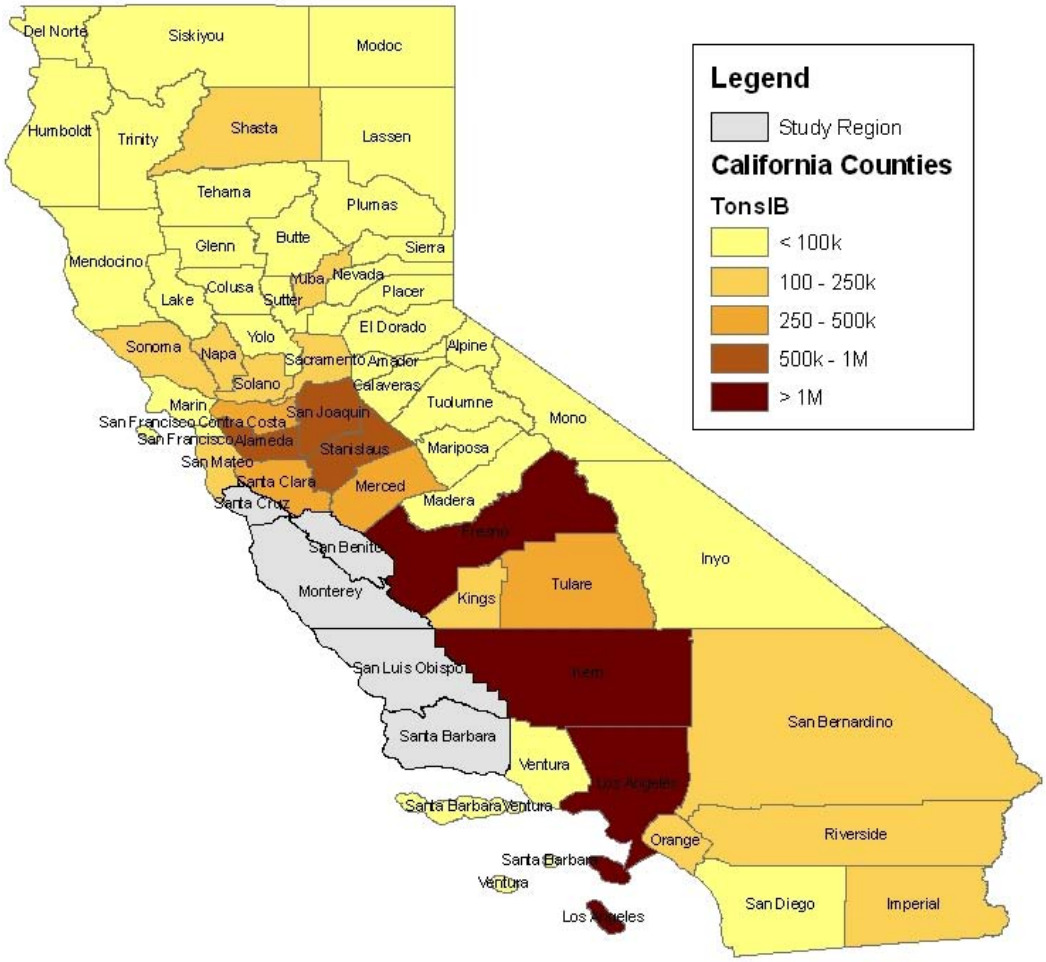
Source: Freight Analysis Framework 2, IMPLAN, Cambridge Systematics, Inc., 2007.

Figure C.10 Outbound Shipments to the rest of California
2007, Tons



Source: Freight Analysis Framework 2, IMPLAN, Cambridge Systematics, Inc., 2007.

Figure C.11 Inbound Shipments from the Rest of California
2007, in Tons



Source: Freight Analysis Framework 2, IMPLAN, Cambridge Systematics, Inc., 2007.

D. Further Truck Count Information

This appendix supplements the truck counts discussion started in Chapter 4. Table D.1 below provides information in table format on top five-axle truck locations, top share of five-axle trucks compared to other vehicles and top total truck locations. In addition, Figures D.1 to D.5 provide maps of truck counts in locations in the region based on Caltrans 2009 truck count data.

Table D.1 Top 10 Count Locations in the Central Coast Region, 2009

Top 10 Locations: 5-Axle Trucks				Top 10 Locations: 5-Axle Truck Share				Top 10 Locations: All Truck Types			
Route	Location	County	Daily Percent of 5-Axle Trucks	Route	Location	County	Daily Percent of vehicles That are 5-Axle Trucks	Route	Location	County	Daily Percent of All Trucks
101	North Gonzales	MON	3,829	166	Maricopa, Jct. Rte. 33	SLO	74.1	101	Jct. Rte. 156 East	SBT	11,020
101	Montecito, Sheffield Drive	SB	3,432	101	Paso Robles, Jct. Rte. 46 East	SLO	65.5	101	Jct. Rte. 156 East	SBT	10,186
101	Montecito, Sheffield Drive	SB	3,307	101	Jolon Road, North Jct.	MON	64.5	101	Monterey/San Benito County Line	MON	9,694
101	Jct. Rte. 156 East	SBT	3,162	101	Jolon Road	MON	64.3	101	Salinas, Airport Boulevard	MON	9,034
101	Jct. Rte. 156 East	SBT	3,160	101	San Lucas, Jct. Rte. 198	MON	63.7	101	Jct. Rte. 129 West	SBT	8,486
101	Jct. Rte. 156 East	MON	3,126	101	Jolon Road	MON	63.5	101	Montecito, Sheffield Drive	SB	7,872
101	Monterey/San Benito County Line	MON	3,007	46	Jct. Rte. 41 Northeast	SLO	63.3	101	Montecito, Sheffield Drive	SB	7,584
101	Pismo Beach, Jct. Rte. 1 South	SLO	2,975	101	Jct. Rte. 146 East	MON	61.5	101	North Gonzales	MON	7,013
101	Santa Fe	SLO	2,929	101	San Lucas, Jct. Rte. 198	MON	61.2	101	Carpinteria, Casitas Pass Road	SB	6,624
101	Carpinteria, Casitas Pass Road	SB	2,888	101	Paso Robles, Jct. Rte. 46 East	SLO	61.0	101	Carpinteria, Casitas Pass Road	SB	6,624

Source: California Department of Transportation Truck Counts: 2009.

Figure D.1 Monterey County Truck Counts
2009

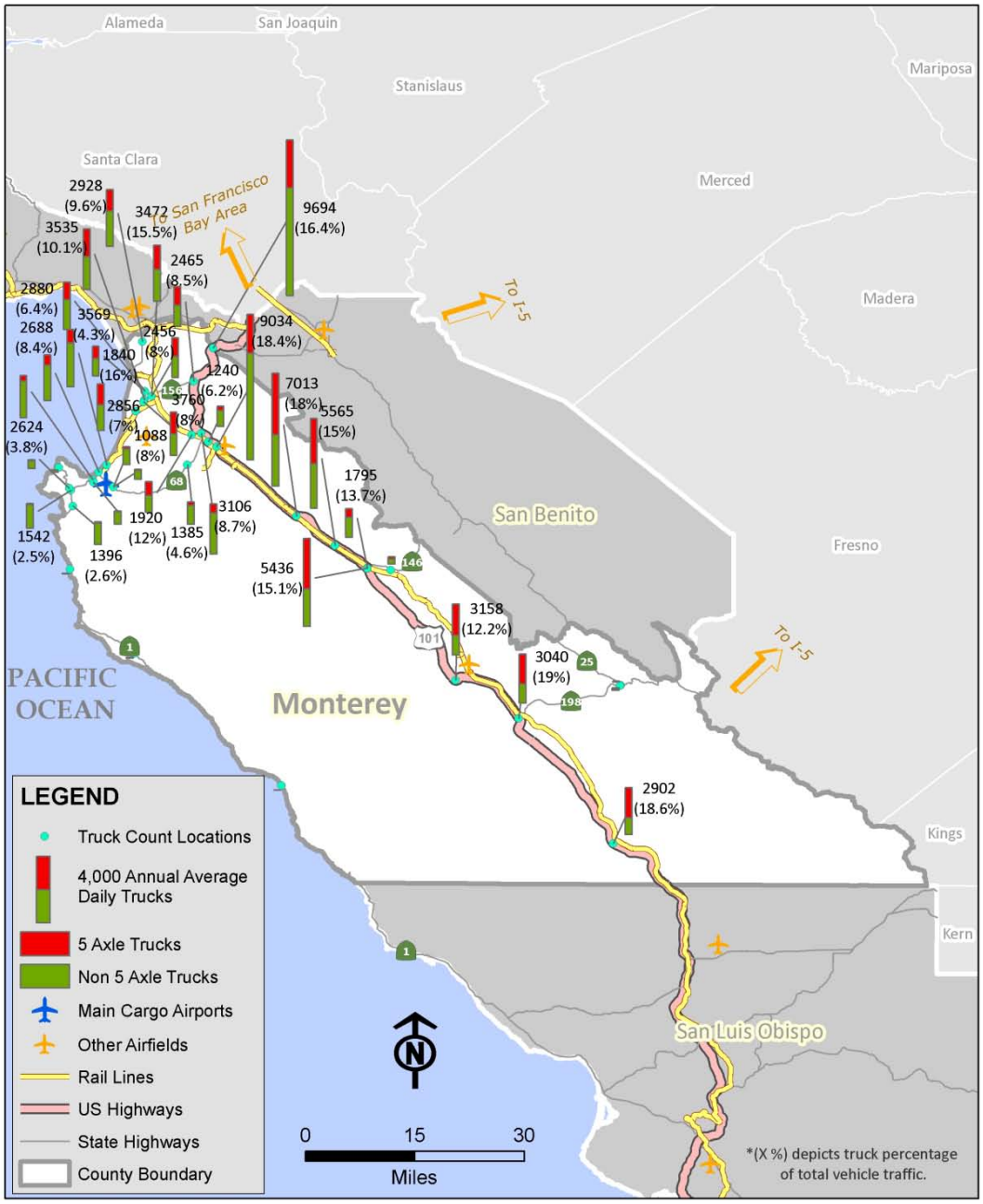


Figure D.2 San Benito County Truck Counts *2009*

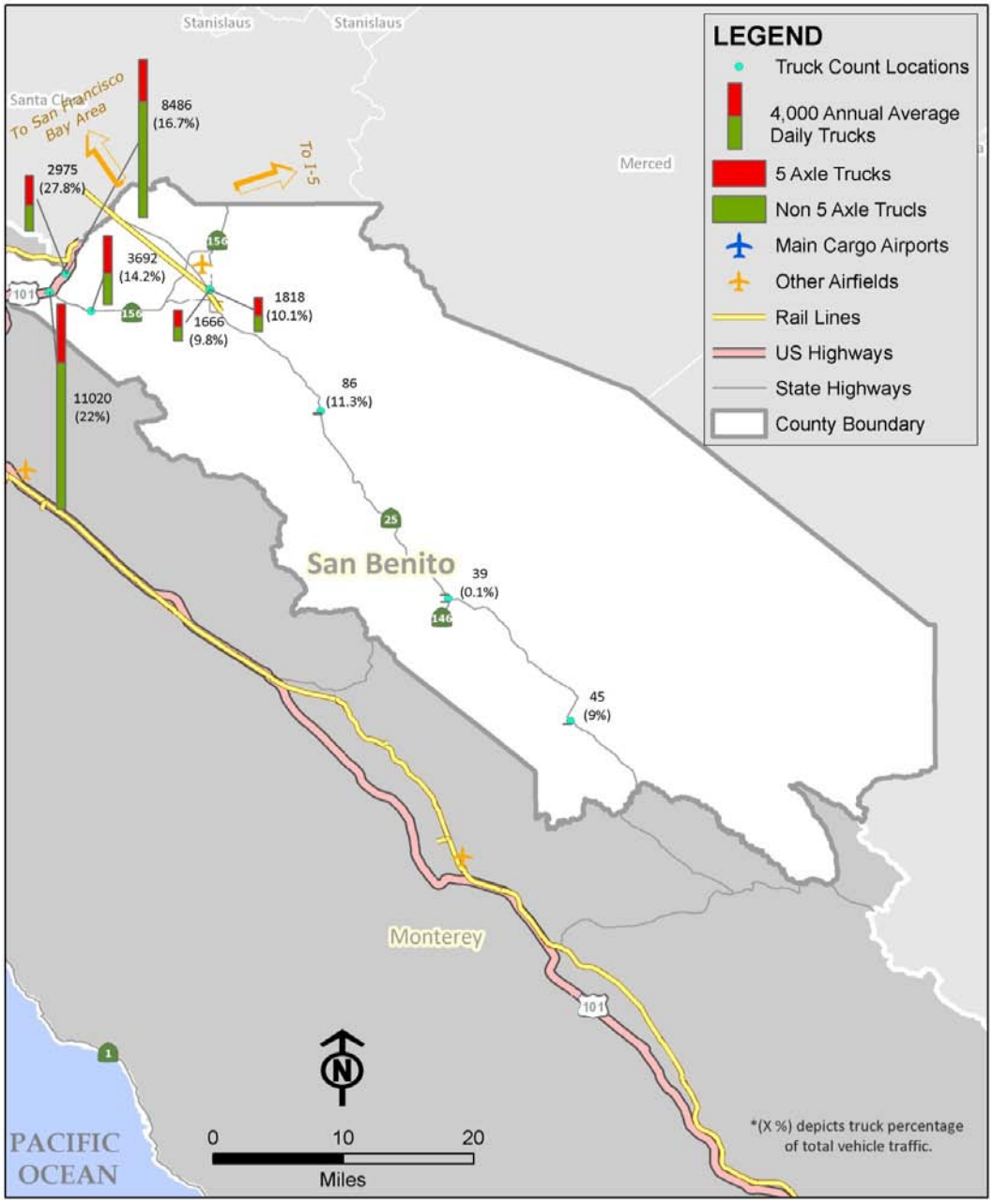


Figure D.3 San Luis Obispo County Truck Counts *2009*

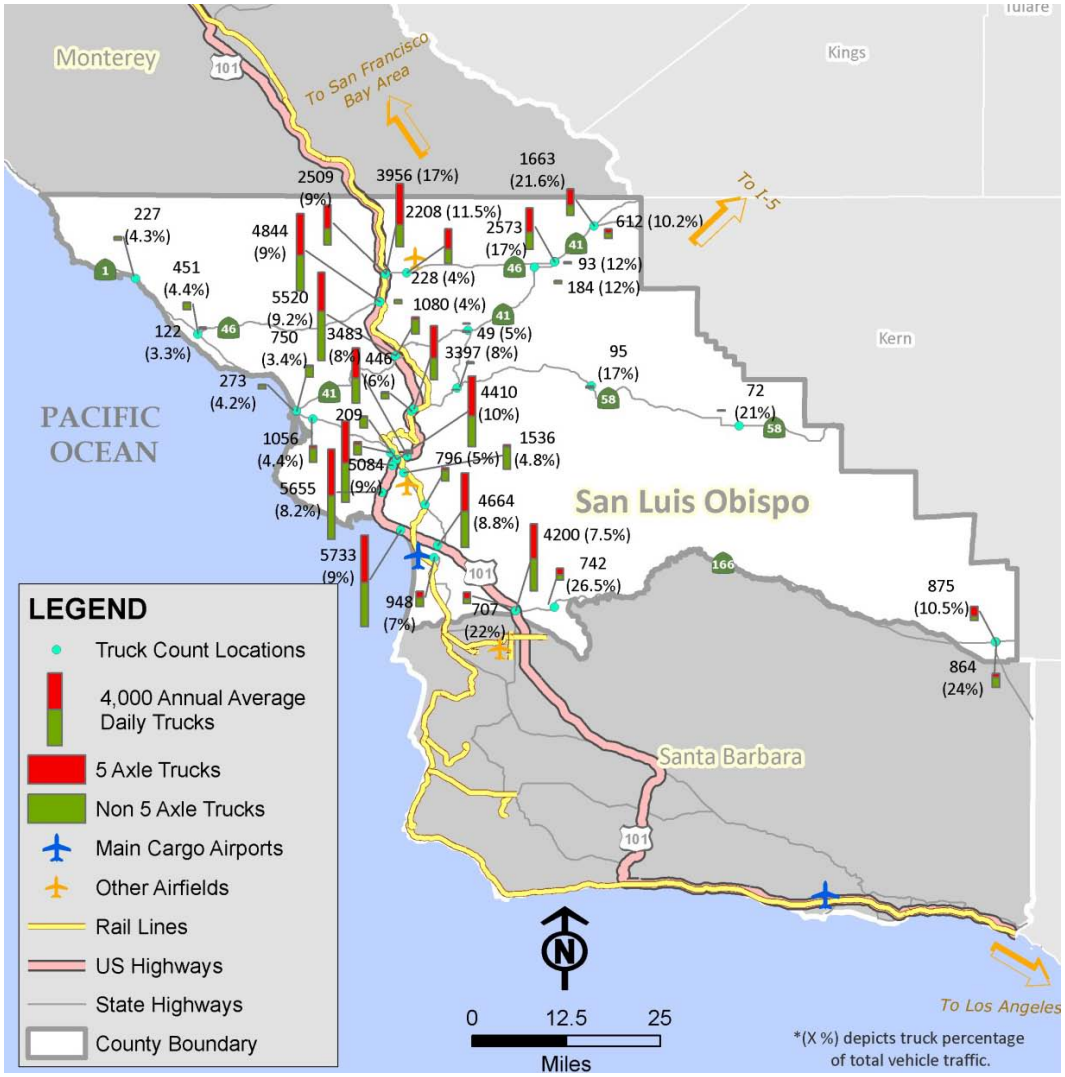


Figure D.4 Santa Barbara County Truck Counts *2009*

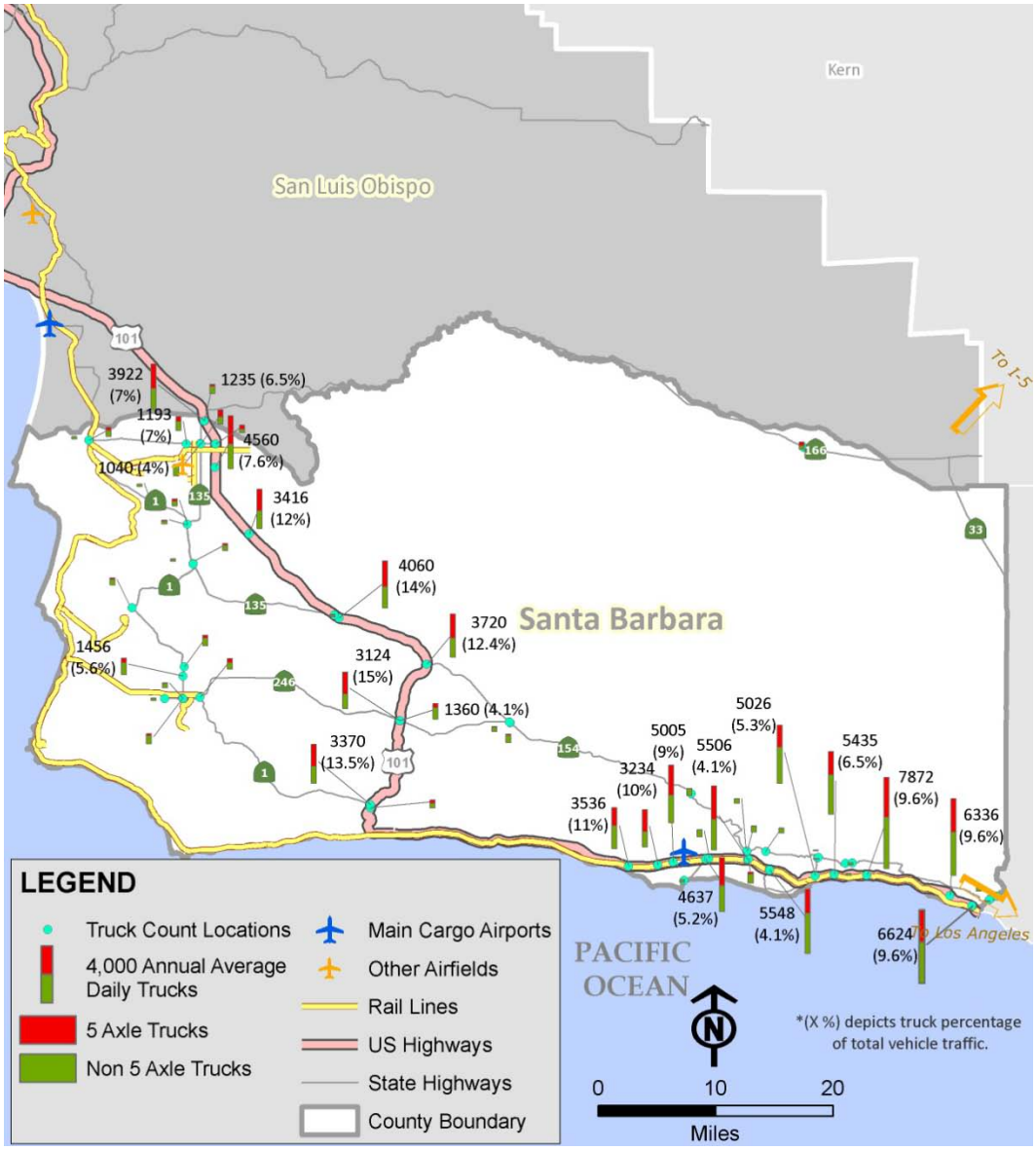
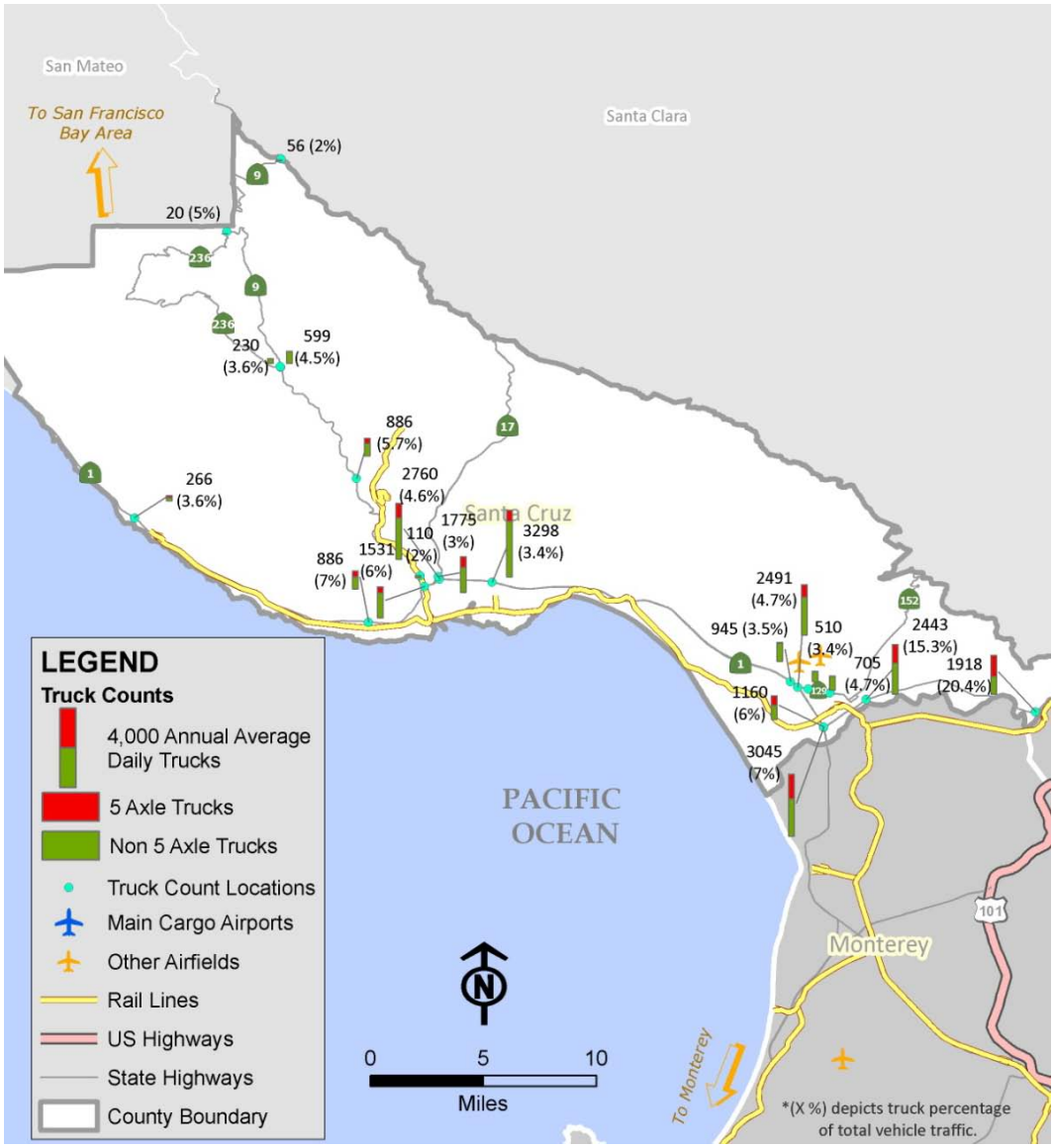


Figure D.5 Santa Cruz County Truck Counts
2009



E. December 2010 Issues List with Maps

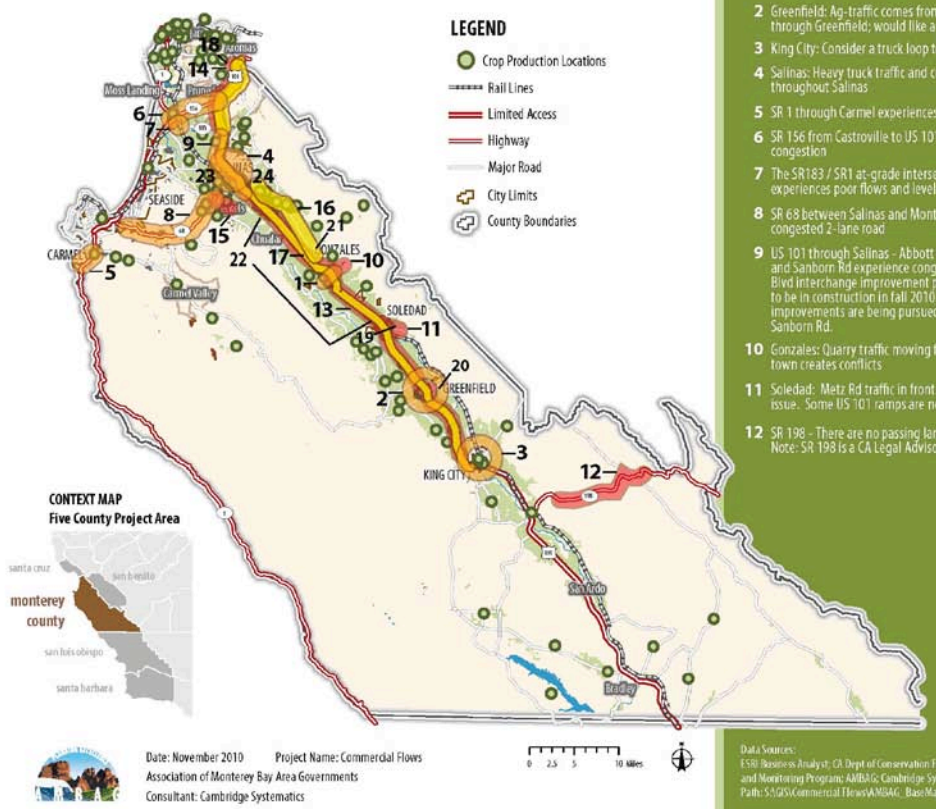
Chapter 5 highlights key issues based on updated inputs in February 2012. Below is the original list of issues that were recorded by the project team in December 2010. Minor edits were made since then, and those edits are incorporated in Chapter 5.

Figure E.1 Key Issues for Truck Freight Movements – Monterey County

Transportation Issues Reported by Freight Stakeholders + Crop Production Locations

Monterey County

The issues presented in this map were issues reported by various freight stakeholders in the AMBAG region. This does not mean that this list is comprehensive or that the problems reported are indeed actual issues. This map is intended to highlight some of the key issues that freight stakeholders encountered and mentioned during interviews.



FREIGHT TRANSPORTATION ISSUES

Transportation issues numbered in the order they were reported by stakeholders

1. Gonzales: experiences bottleneck on 5th street through town
2. Greenfield: Ag-traffic comes from east and west through Greenfield; would like a loop
3. King City: Consider a truck loop to avoid Broadway
4. Salinas: Heavy truck traffic and congestion throughout Salinas
5. SR 1 through Carmel experiences congestion
6. SR 156 from Castroville to US 101 experiences congestion
7. The SR183 / SR1 at-grade intersection experiences poor flows and level of service
8. SR 68 between Salinas and Monterey is an often congested 2-lane road
9. US 101 through Salinas - Abbott Rd, Airport Blvd, and Sanborn Rd experience congestion. The Airport Blvd interchange improvement project is anticipated to be in construction in fall 2010. Operational improvements are being pursued at Abbott Rd and Sanborn Rd.
10. Gonzales: Quarry traffic moving from the NE into town creates conflicts
11. Soledad: Metz Rd traffic in front of school can be an issue. Some US 101 ramps are non-standard
12. SR 198 - There are no passing lanes at the summit. Note: SR 198 is a CA Legal Advisory Route
13. US 101 between King City and Salinas - this was described as a highway that needs to be converted to a freeway. Comments addressed a) at-grade intersections on US 101 and b) short acceleration lanes. Comments made about on/off ramps in King City, Greenfield, Gonzales, and Soledad
14. US 101 in the Prunedale Region north of Salinas consists of horizontal and vertical curves and at-grade intersections. The Prunedale Improvement Project is anticipated to go into construction in Spring 2011
15. It was mentioned that some trucks go through the community off Spreckels Ave, which is a nuisance to them.
16. Truckers get lost traveling on Old Stage Rd between Gonzales and Salinas because of confusing signage
17. Truck parking especially needed near US 101 in the King City to Gilroy region. Comments made in Salinas, Greenfield, King City, Gonzales.
18. US 101/San Juan Road I/C project: will eliminate existing at-grade intersection and improve interregional travel.
19. US 101/Soledad I/C. Improve local connections to freeway access to decrease congestion and delay on local roads.
20. US 101/Walnut Ave I/C - Greenfield. Improve local connections to freeway access to decrease congestion and delay on local roads.
21. US 101/Gloria Road I/C - Gonzalez. Improve local connections to freeway access to decrease congestion and delay on local roads.
22. South County Frontage Roads (Harris Road to Soledad) adjacent to US 101. Provide frontage roads for local ag traffic that currently uses US 101.
23. Westside Bypass -Salinas Corridor. Provide alternate access (bypass) around the west side of Salinas from Laurel to Blanco Rd.
24. Eastside Bypass - Salinas Corridor. Provide alternate access (bypass) around the east side of Salinas from Boronda Rd south to new US 101/Harris Rd I/C.

Data Sources:
ESRI Business Analyst; CA Dept of Conservation Farmland Mapping and Monitoring Program; AMBAG; Cambridge Systematics
Path: S:\GIS\Commercial Flows\AMBAG_BaseMap_MontereyCounty.ai

Figure E.2 Key Issues for Truck Freight Movements – San Benito County

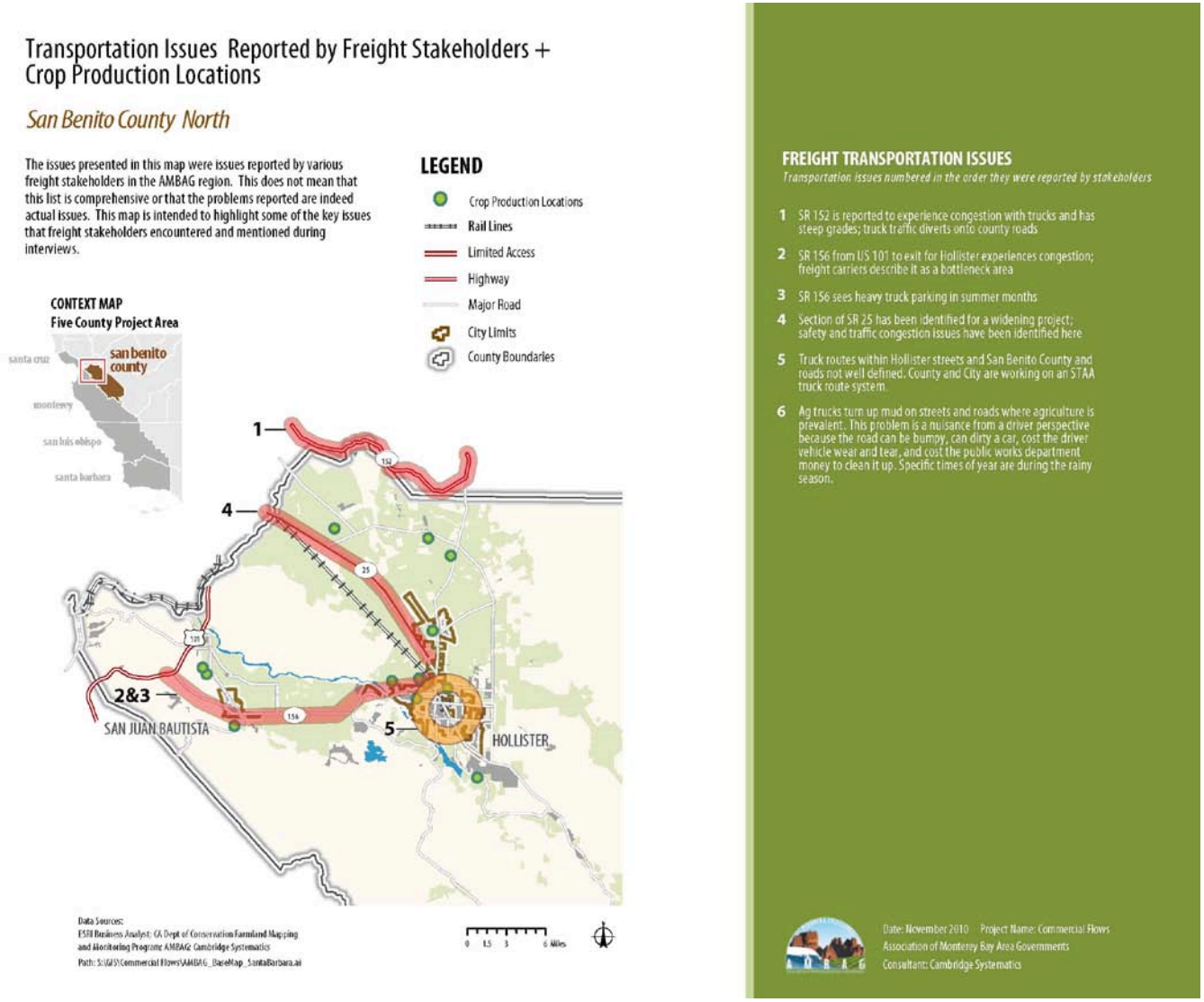


Figure E.3 Key Issues for Truck Freight Movements – San Luis Obispo County

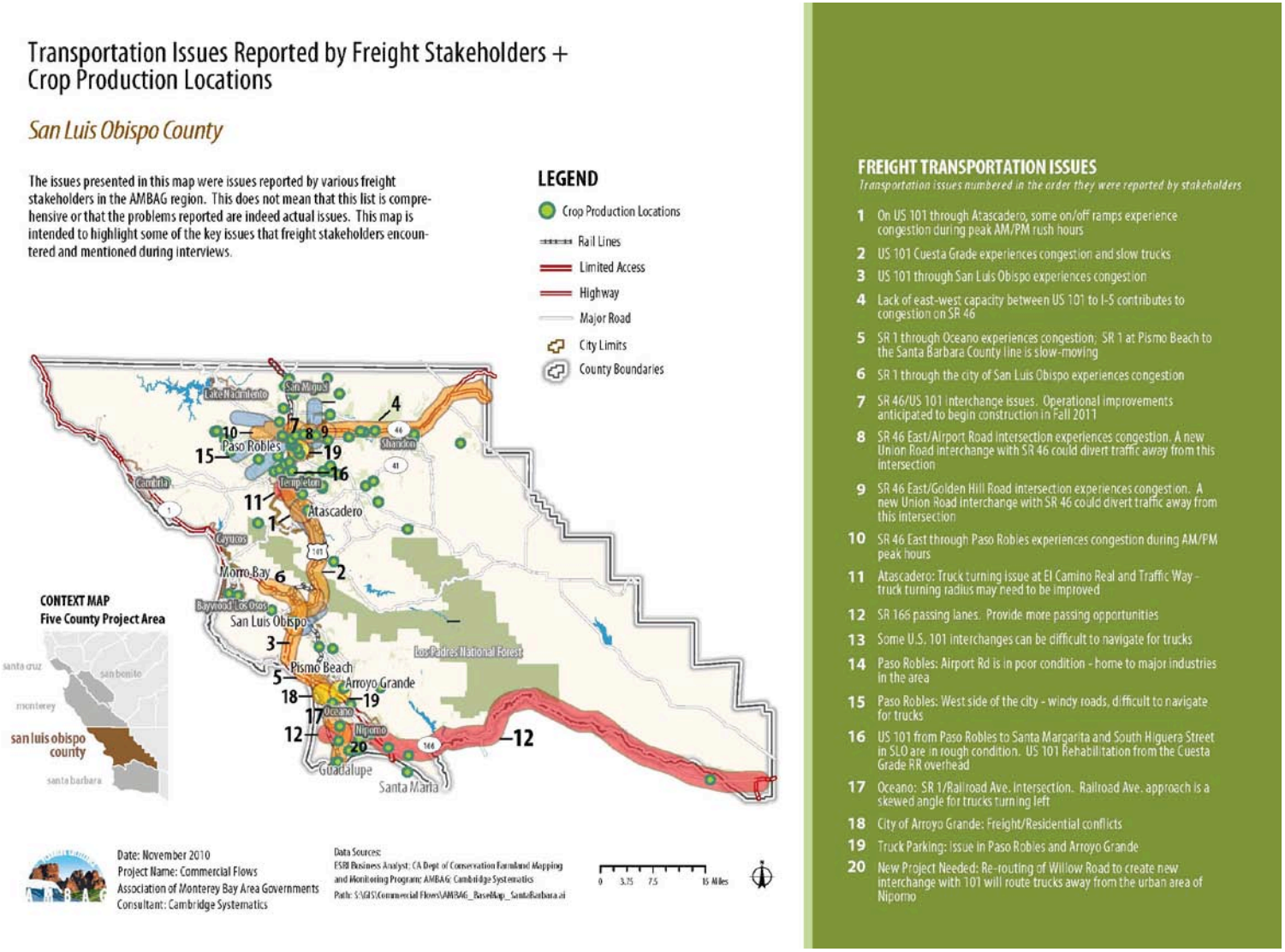


Figure E.4 Key Issues for Truck Freight Movements – Santa Barbara County

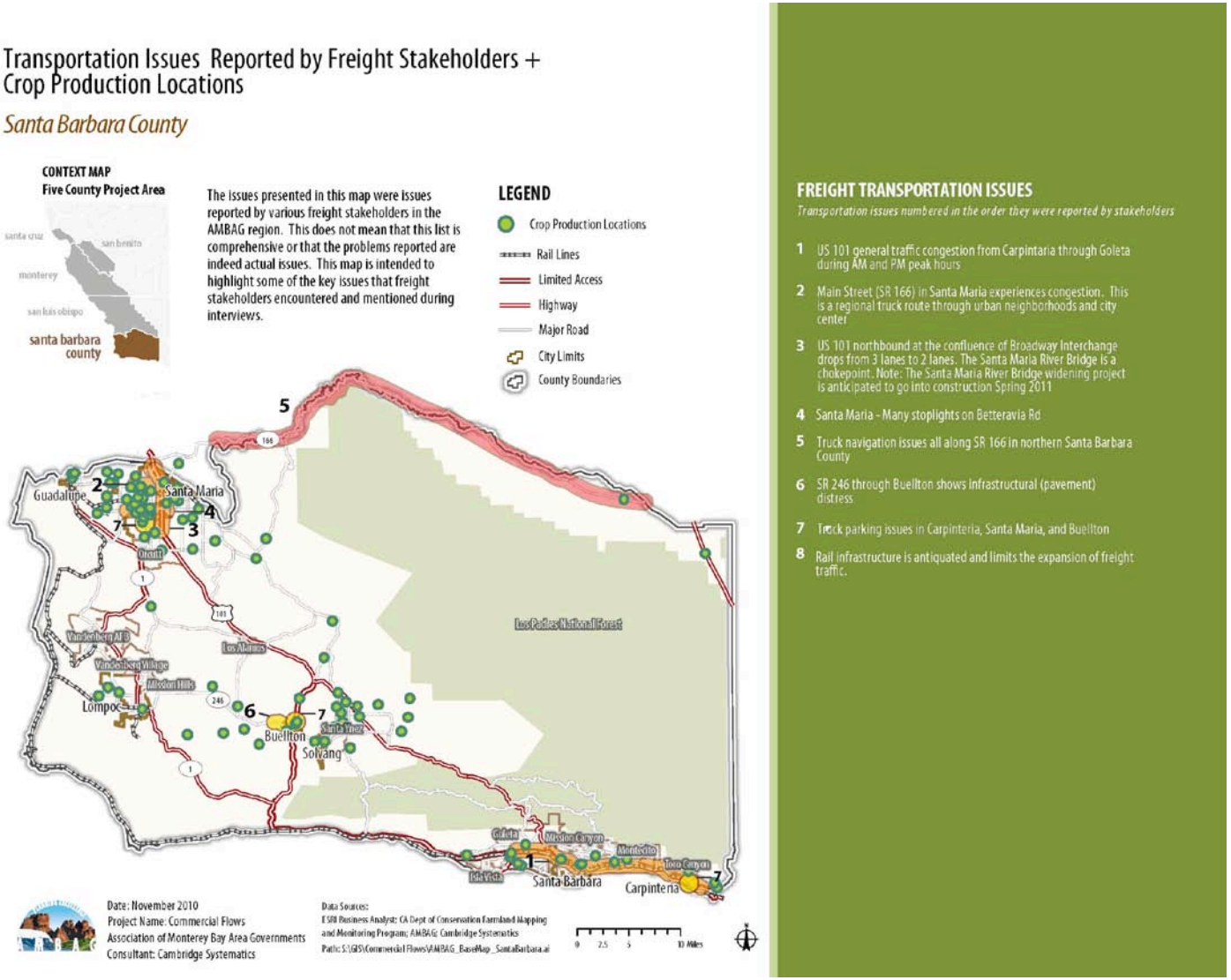
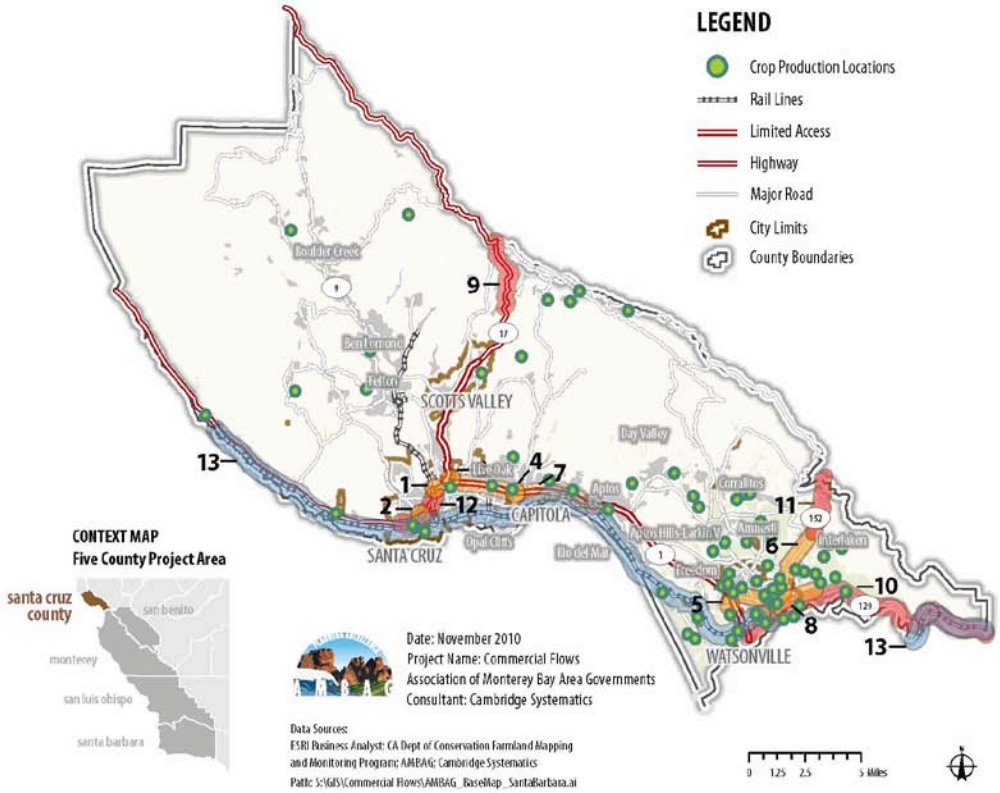


Figure E.5 Key Issues for Truck Freight Movements – Santa Cruz County

Transportation Issues Reported by Freight Stakeholders + Crop Production Locations

Santa Cruz County

The issues presented in this map were issues reported by various freight stakeholders in the AMBAG region. This does not mean that this list is comprehensive or that the problems reported are indeed actual issues. This map is intended to highlight some of the key issues that freight stakeholders encountered and mentioned during interviews.



FREIGHT TRANSPORTATION ISSUES

Transportation issues numbered in the order they were reported by stakeholders

1. SR 1/SR 9 at-grade interchange experiences congestion
2. SR 1/Bay St at-grade interchange experiences congestion
3. SR 1/SR 17 interchange experiencies congestion
4. SR 1/41st Street interchange experiences congestion
5. Harkins Slough Rd/SR 1 Interchange experiences congestion
6. SR 152 through Watsonville experiences congestion
7. SR 1 between Santa Cruz and Aptos experiences congestion
8. SR 129 through Watsonville experiences congestion
9. SR 17 north of Santa Cruz traverses the coastal range and experiences congestion. SR 17 has been a designated safety corridor.
10. SR 129 between US 101 and SR 1 experiences congestion. Effort is currently underway to officially designate SR 129 as a safety corridor
11. SR 152 to Gilroy from Watsonville includes Hecker Pass has some tough turns for trucks. Trucks over 45' in length are prohibited on this route.
12. Rising public safety concerns/perceptions involving trucks (ie, conflicts on Mission St (SR1) through Santa Cruz)
13. Shortline RR infrastructure can be improved (Davenport to Watsonville): Modernize signal crossings, address several bridge concerns, increase weight capacity to 286k pounds.