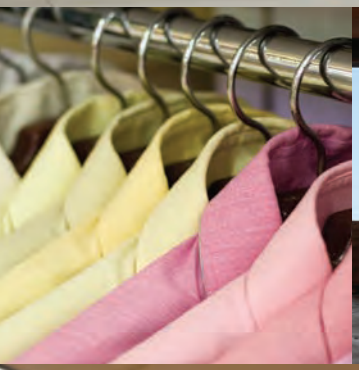


ON THE MOVE

SOUTHERN CALIFORNIA DELIVERS THE GOODS

SOUTHERN CALIFORNIA ASSOCIATION of GOVERNMENTS

FREIGHTWORKS
SOUTHERN CALIFORNIA DELIVERS THE GOODS

Comprehensive Regional Goods Movement Plan and Implementation Strategy

ON THE MOVE

SOUTHERN CALIFORNIA DELIVERS THE GOODS

Comprehensive Regional Goods Movement Plan
and Implementation Strategy

final
report

prepared for

The Southern California Association of Governments

prepared by

Cambridge Systematics, Inc.

with

Arellano Associates

Diverse Strategies for Organizing, Inc.

Economics and Politics, Inc.

ICF International

Leachman and Associates

**METRANS Transportation Center –
University of Southern California and
California State University at Long Beach**

Public Financial Management, Inc.

URS Corporation

Wiltec, Inc.

February 2013

The preparation of this report was financed in part through grants from the United States Department of Transportation (U.S. DOT).

3 The Goods Movement System

The goods movement system in the SCAG region is a complex series of interconnected infrastructure components designed to serve the goods movement functions and markets described in the previous section. While the system is often described in terms of its modal components, it must function as an integrated whole with efficient intermodal connections. Shippers and receivers of goods look at the end-to-end performance of the regional goods movement system to determine how well it meets their needs. This includes consideration of costs to use the system, the throughput and velocity of goods moving through the system, and the reliability of the system. What makes the SCAG region attractive as a center for goods movement activity is the variety of modal alternatives; access to key goods movement centers within the region; connections to local, national, and international customers and suppliers; and high-quality intermodal connections.

The goods movement system in the SCAG region is owned and operated by a mix of public and private sector organizations. In addition, many elements of the system share capacity with passenger traffic. Understanding how the mix of owners, operators, and users interact is an important aspect of understanding how the goods movement system functions. This is described in more detail in Section 4.

The remainder of this section describes the key elements of the existing regional goods movement system. Figure 3.1 is a map showing the major components of this system.

3.1 The Existing Regional Highway System

3.1.1 Defining the SCAG Truck Highway System

The SCAG region has about 53,400 total road miles, which includes local roads, arterials, and connector facilities, as well as 1,630 miles of highways and Interstates.[1] This roadway system provides mobility for truck trips of all types – whether they are trips to deliver raw materials to local businesses and industry; trips to bring goods to the region's large consumer base; or trips associated with the movement of international goods through the Ports of Los Angeles, Long Beach, and Hueneme, Los Angeles and Ontario International Airports, and land border crossings with Mexico.

[1] http://www.dot.ca.gov/hq/tsip/hpms/hpmslibrary/hpmspdf/2009PRD.pdf (last accessed on December 10, 2010).

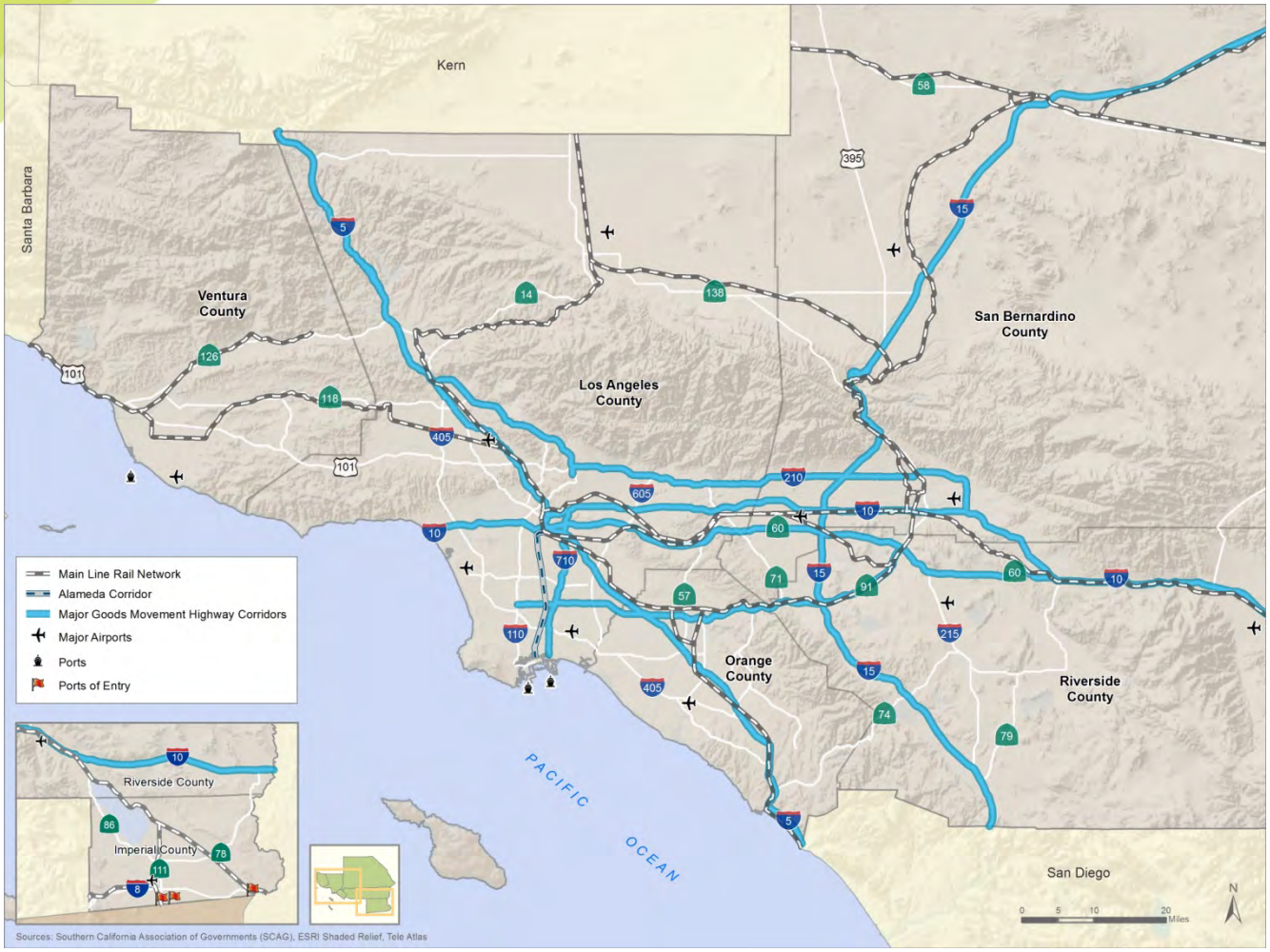
Figure 3.1 The SCAG Regional Goods Movement System

Although currently there is no dedicated truck highway system, it is possible to identify those highways that carry the highest average truck volumes using the Caltrans Average Annual Daily Truck Traffic (AADTT) data.[2] Figure 3.2 shows the highways that have segments with five-axle daily truck counts that exceed 5,000 trucks per day. Sections of I-710, I-605, SR 60, and SR 91 carry the highest volumes of truck traffic in the region (over 25,000 trucks per day in 2008). Other major components of the regional highway network also serve significant numbers of trucks, including I-5, I-10, I-15, and I-210 (sections of each carry over 20,000 trucks per day). More detail about current and projected truck volumes on these major highways is presented in Chapter 4.

While most of the discussion of the goods movement highway system in this section focuses on the roadway infrastructure, other important elements of the highway modal system include the trucks that carry the goods as well as the fleets and businesses that provide the trucking services. The two insert boxes on pages 3-5 and 3-6 ("What is a Truck" and "Trucking Fleets") describe each of these elements of the highway modal system. The discussion of the types of trucks that operate on the system depicts the different types of equipment; types of goods movement functions each performs; and how the different classifications of trucks are related to air quality regulation and the analysis of congestion on the regional road system. The second insert box describes different types of trucking fleets and the types of commercial roles of these fleets.

[2] http://traffic-counts.dot.ca.gov/.

Figure 3.2 Top Regional Truck Highways



3.1.2 Goods Movement Functions Served by the Region's Highway System

The manner in which the region's highway system serves each of the previously introduced goods movement functions is described below. It is important to keep in mind that most of the key roadways in the region serve multiple functions and this is taken into account in the following discussion.

The regional roadway system also can be thought of as providing the "connecting tissue" that ties together the multimodal freight transportation system in Southern California, providing critical last mile connections to intermodal terminals, marine terminals, airports, border crossings, warehouses, and distribution centers, as well as manufacturing facilities. Critical routes connecting this intermodal system are described later in this section.

What is a Truck?

Trucks involved in goods movement are often referred to in this report as "heavy-duty" vehicles (HDV) which fall under three categories: "light-heavy," "medium-heavy," and "heavy-heavy." These three categories, used by the U.S. Environmental Protection Agency and the California Air Resources Board for emission standards, are classified based on the gross vehicle weight rating of the truck. The Federal Highway Administration classifies trucks in a slightly different way, based on the number of axles that the truck has and the configuration of the truck. The diagram below shows how these different truck classifications relate to each other and also depicts typical examples of the different types of trucks that fall in each category.

From an air quality and traffic perspective, emissions and congestion impacts are contributed by all of the heavy duty vehicle types. Class 8, the heaviest truck category, is what many people think of when they think about trucks. Tractor-trailers are primarily engaged in long-haul freight transportation and intermodal freight connections. However, HDVs also include vehicles that are strictly speaking, not engaged in the movement of goods, such as utility trucks, large tow trucks, and large SUVs.

ARB Weight Class	Examples			
Light-Heavy Duty	Class 2b 8,501-10,000 lbs 2 Axles Passenger Vans and SUVs		Class 3 10,001-14,000 lbs 2 Axles Pickups, Panels, Vans	
Medium-Heavy Duty	Class 4 14,001-16,000 lbs 2 or 3 Axles Parcel Delivery Trucks, All Buses		Class 5 16,001-19,500 lbs 2 Axles, 6 tires (dual rear tires) Single Unit Trucks	
	Class 6 19,501-26,000 lbs 3 Axles Single Unit Trucks		Class 7 26,001-33,000 lbs 4 or more Axles Single Unit Trucks	
Heavy-Heavy Duty	Class 8a 33,001-60,000 lbs 3 or 4 Axles Single Trailer Trucks, "Tractor-Trailers"		Class 8b > 60,000 lbs 5 or more Axles Single or Multiple Trailers, "Tractor-Trailers"	

Trucking Fleets

An important component of the highway goods movement system is the fleets and trucks that provide the transportation services. Trucking fleets generally fall into two broad categories: for-hire fleets (often referred to as motor carriers) and private fleets. For-hire fleets, as their name suggests, are carriers that haul freight for other businesses. For-hire motor carriers also are further categorized into Truckload (TL) and Less-Than-Truckload (LTL) carriers, where the former engage in shipping only a single customer's goods in a single truck, and the latter engage in shipping multiple customers' goods in a single truck.

For-Hire Trucking (TL/LTL)

For the SCAG region, tonnage from TL companies is estimated at about 393 million tons, or 48 percent of total freight tonnage for inbound, outbound, and intra-SCAG region traffic. Within the U.S., TL revenue is about $310 billion per year, which translates to roughly 40 percent of total transportation revenue and close to 50 percent of truck revenue. As a result, TL trucking is a dominant trucking transportation choice. The LTL component of the industry is much smaller. LTL tonnage is just over 11 million tons for the SCAG region (inbound, outbound, intrastate), or about 1 percent of total freight tonnage. In the United States, the higher value of most LTL shipments generates revenues of about $50 billion annually to account for approximately 6 percent of total revenue and 7 percent of truck revenue.

Because of the nature of the trucking business, the trucking industry is dominated by a few large trucking companies that perform mainly TL service. Specifically, there are about 360,000 companies with truck fleets in the U.S., but 96 percent of these companies operate fewer than 28 trucks. The remaining few companies operate the vast majority of trucks on the road today. Some of the key players include J.B. Hunt, Swift Transportation, Schneider International, YRC Worldwide Inc., and Werner Enterprises. Each of these companies operate upwards or close to 10,000 trucks, and many more trailers.

Private Trucking

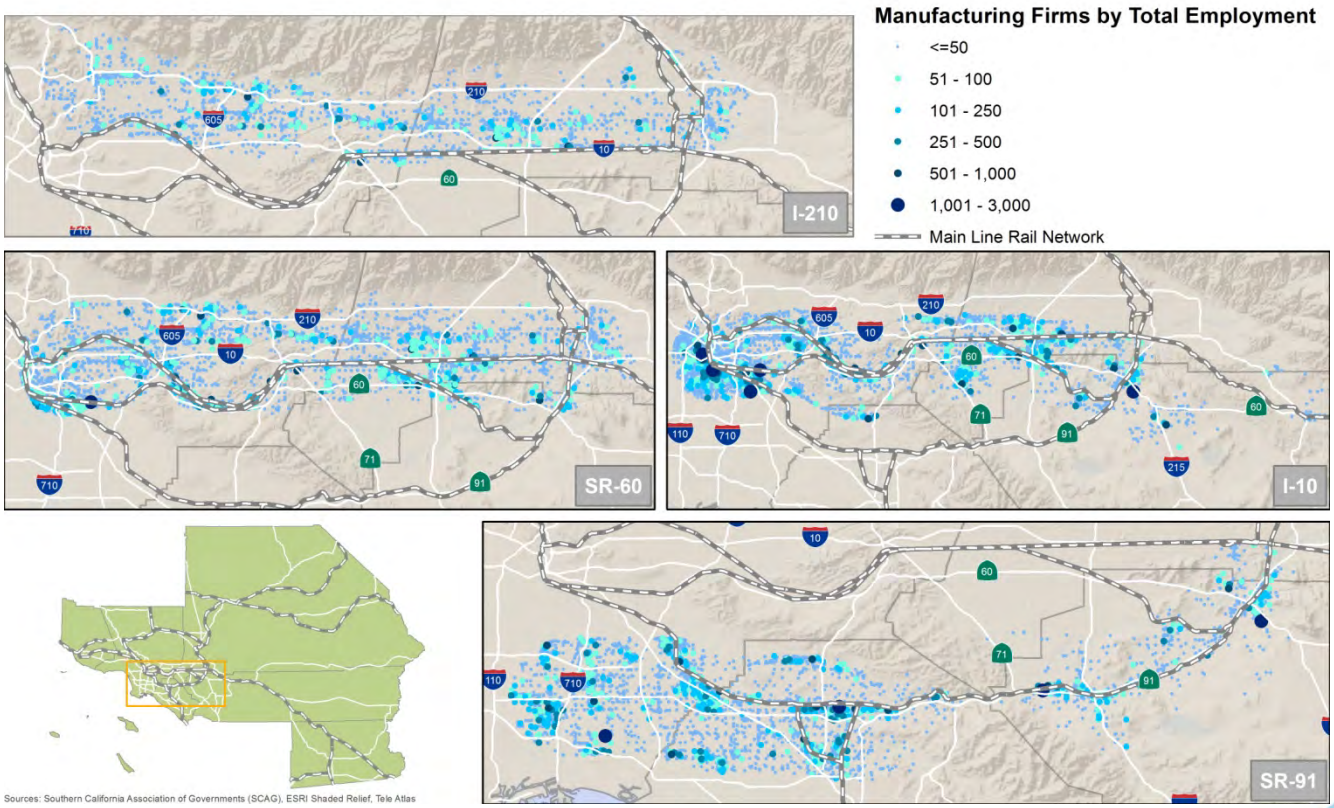
Private trucking firms, which are manufacturers, retailers and other businesses, handle more than 407 million tons of cargo each year, representing more than 50 percent of total freight tonnage in the SCAG region, thus making it the most dominant transportation mode. On average, in the U.S., more than 37 percent of total transportation revenue and nearly 45 percent of truck revenue come from private trucking firms. Examples of private trucking firms include large food/beverage retailers and many other grocery store chains.

Sources: All U.S. statistics are from the American Trucking Association Report on "Trucking and the Economy, 2007-2008."
All SCAG-specific statistics are analyzed using 2007 TRANSEARCH data.

Trucking Support for Regional Manufacturing. As described in Section 2, Southern California remains the leading manufacturing center in the U.S. While the region provides many non-transportation advantages to manufacturers (such as access to a large consumer market), access to efficient and reliable transportation contributes to the attractiveness of the region for certain types of manufacturing. Trucking connections to suppliers and markets are an important element in many manufacturing supply chains. These involve both intraregional connections to clusters of related businesses (often referred to as "supply chain ecosystems") and long-haul corridors. It is not at all surprising to see that regional manufacturing is largely located along key freight corridors in order to make connections to the Interstate system, intermodal rail facilities, and air cargo facilities. Figure 3.3, illustrates the locations of major manufacturing facilities along selected key goods movement highway corridors. While Section 4 provides additional discussion of how manufacturers use key highway corridors in the region, it is useful to note that:

- Approximately 15 percent of the truck traffic on the key east-west corridors (SR 91, SR 60, I-10, and I-210) originates or is destined for manufacturing facilities; and
- Approximately 13 percent of the truck traffic on I-5, the most critical north-south goods movement corridor in the region, originates or is destined for manufacturing facilities.

Figure 3.3 Manufacturing Concentrations along Key Goods Movement Highway Corridors



Another critical roadway function that supports regional manufacturing is the ability to make interregional connections. The Interstate highway system serves as the primary connection between Southern California and national markets and suppliers although several state routes also are important. The corridors which carry the highest volume of truck traffic at the regional boundaries include:

- I-5 at both the northern and southern boundaries of the region;
- I-15 in San Bernardino County;
- I-40;
- I-10; and
- SR 111 at the international border.

These interregional corridors are also important to regional and national distribution centers that are components of growing logistics activities in Southern California.

Support for Local Businesses and the Consumer Economy. It is difficult to identify a specific set of roads that tie together the vast network of goods movement dependent businesses in the retail, wholesale trade, construction, and service industries throughout Southern California. In fact, it is precisely because of trucking's flexibility to travel anywhere it is needed that helps drive the high percentage of the region's goods movement activity that occurs using trucks. Arterial highways throughout the region provide direct connections into commercial centers and residential areas that allow for deliveries to stores, homes, construction sites, and service businesses. Nevertheless, for this system to function effectively, it must rely on a core set of highways that facilitate east-west and north-south connections. These are similar to the routes that support regional manufacturing but also include roads serving population clusters, such as I-405 on the west side of the region.

Access to International Gateways. Major international gateways in Southern California include the three seaports (Ports of Los Angeles, Long Beach, and Hueneme), Los Angeles International Airport (LAX), and the commercial border crossing of Calexico East-Mexicali II in Calexico. Each of these relies on roadway connections. The I-710 freeway offers direct access to the San Pedro Bay Ports complex, as well as points north and almost every major east-west highway corridor. The I-710 also provides a primary access corridor to the intermodal rail terminals that handle the majority of international intermodal cargo (ICTF, Hobart Yard, and East Los Angeles Yard); marine terminals at the Port of Long Beach; and major concentrations of warehouses, transloading facilities, and logistics service providers in the Gateway Cities subregion. Similarly, the I-110 provides access to certain marine terminals at the Port of Los Angeles. In addition, the local arterial roadway system plays a critical role providing "last mile" connections to the San Pedro Bay Ports and intermodal terminals. State Route 47 (SR 47)/SR 103 near the San Pedro Bay Ports is an example of this type of facility. There are three bridges connecting the freeway system to Terminal Island: Vincent Thomas Bridge on the west, Commodore Schuyler F. Heim Bridge on the north, and Gerald Desmond Bridge on the east.

The results of a port truck origin-destination survey conducted in 2010 for the Comprehensive Regional Goods Movement Plan and Implementation Strategy revealed the following concerning major access routes to the San Pedro Bay Ports:

- Over 50 percent of the port truck trips use I-710;
- 10 percent to 15 percent of the port truck trips use I-110;
- Approximately 10 percent of the port truck trips use Alameda Street and port-area roads;
- Approximately 10 percent of the port truck trips use SR 47 (Terminal Island Freeway) and port-area roads; and
- 15 percent to 20 percent use other combinations of roads or did not respond.

The primary access route to the Port of Hueneme (the third international seaport in the SCAG region) is U.S. 101, along with the secondary routes of SR 126 and SR 1. As specified in the City of Oxnard's General Plan, the preferred arterial access route for trucks is Hueneme Road and Rice Avenue.

Air cargo facilities at LAX also provide a major international gateway in the SCAG region. Two of the largest air cargo complexes at LAX are the Imperial Cargo Complex and the Century Cargo Complex. These facilities are located along West Century Boulevard and SR 90 (Imperial Highway), which, along with La Cienega Boulevard (connecting Century Boulevard and Imperial Highway), were identified by Los Angeles Department of Transportation as the major arterial truck routes serving air cargo at LAX. Major freeway connections are provided by I-405 and I-105.[3]

Highway connections to the international border crossing in Calexico are described later in the section on border crossing infrastructure.

Support to the Logistics Industry. Logistics-related infrastructure in the SCAG region consists primarily of trucking terminals, transload and cross-dock warehouses, import warehouses, and regional/national distribution centers. Trucking terminals are locations where large, primarily for-hire trucking fleets park and service their trucks. They also may perform sort and consolidation/deconsolidation operations. Transload and cross-dock warehouses are particular types of facilities operated by logistics service providers where consolidation/deconsolidation of import cargoes takes place. Import warehouses are generally larger warehouses where imported goods may be stored until the owner of the goods determines what market area is in need of these products. Regional distribution centers (RDC) are large warehouses from which products are distributed to retail outlets throughout a greater region of the U.S. (e.g., many RDCs in Southern California serve southwestern U.S. markets in California, Arizona, Nevada, and Utah). While this classification of different types of warehouses and logistics facilities is a convenient way of describing logistics operations, individual warehouses may perform multiple operations. Owners of transload and cross-dock facilities generally prefer locations near the seaports and airports (subregions such as the South Bay Cities and the Gateway Cities in Southern California) whereas large modern import warehouses and RDCs are frequently found in the San Gabriel Valley and Inland Empire with access to long-haul Interstate corridors.

As shown in Figure 3.4, many of the region's warehouse and distribution facilities are clustered along key goods movement highway corridors. The map illustrates the importance of several major highway facilities in the region as access routes supporting logistics activities:

- I-405 provides access to clusters of air cargo facilities where sorting and consolidation/de-consolidation activities occur near LAX.

- I-710 provides access to logistics service providers, truck terminals, and transload facilities serving the San Pedro Bay Ports, as well as providing connections to the warehouse concentrations in Downtown Los Angeles and East Los Angeles. Approximately 15 percent of the region's warehousing space is located within a five-mile corridor along I-710.

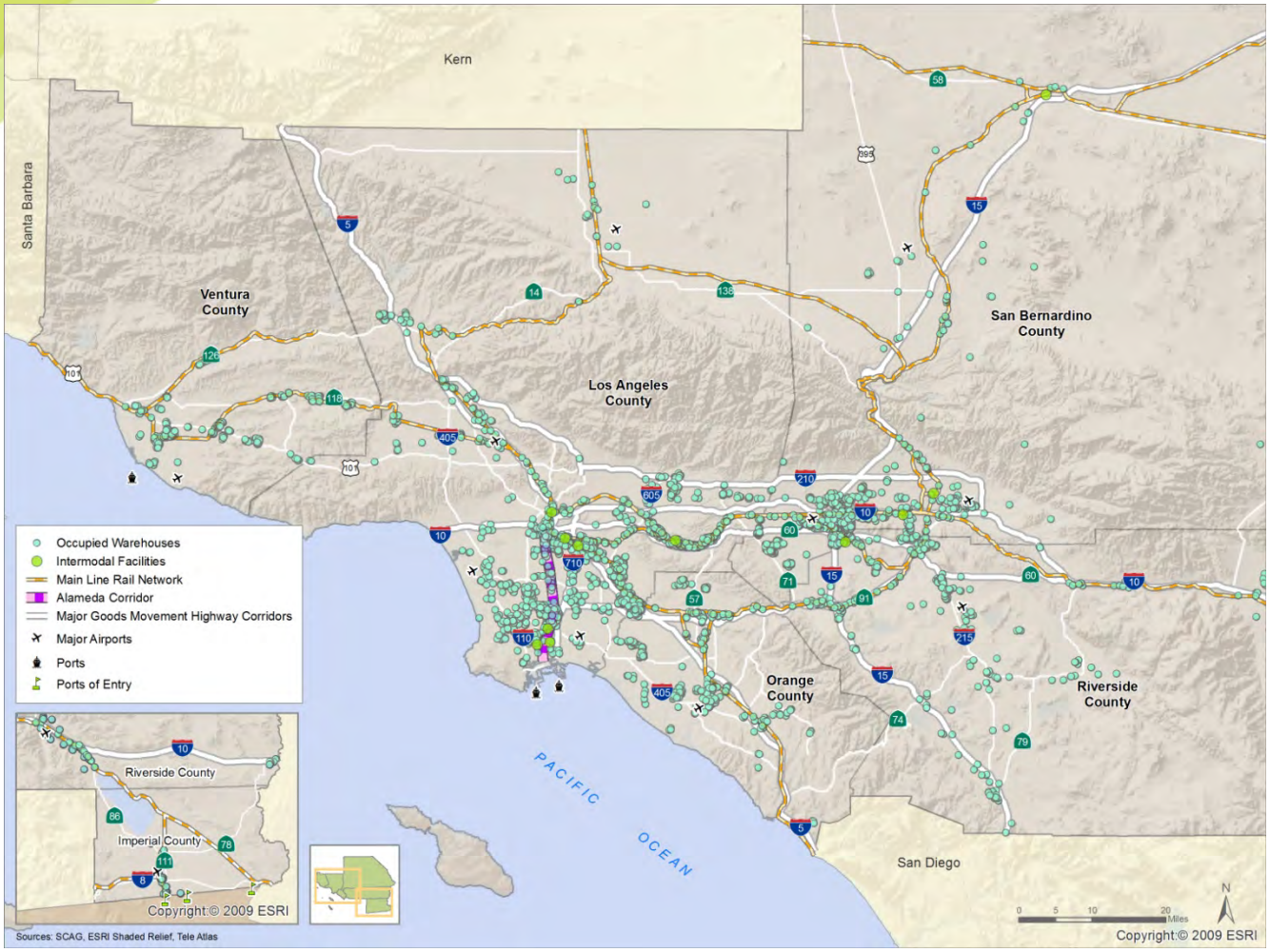
- I-5 provides access to warehouse clusters in the Gateway Cities subregion and in areas in northern Orange County (such as warehousing clusters in Anaheim). These warehouses serve a mix of uses.

- East-west corridors, including SR 60 and I-10, provide access to major warehouse clusters in the San Gabriel Valley (especially in the City of Industry) and the Inland Empire (including major concentrations in Ontario, Fontana, and Mira Loma). These tend to be larger modern warehouses that include many large trucking terminals, air cargo facilities near Ontario Airport, import warehouses, and RDCs. SR 60 is a primary access route to many of these locations with over 50 percent of the region's warehouse space located in a corridor within five miles of the highway.

---

[3] *The City of Los Angeles Transportation Profile*, Los Angeles Department of Transportation, 2009.

Figure 3.4 Warehouse Clusters and the Regional Highway System



3.2 The Existing Regional Rail System

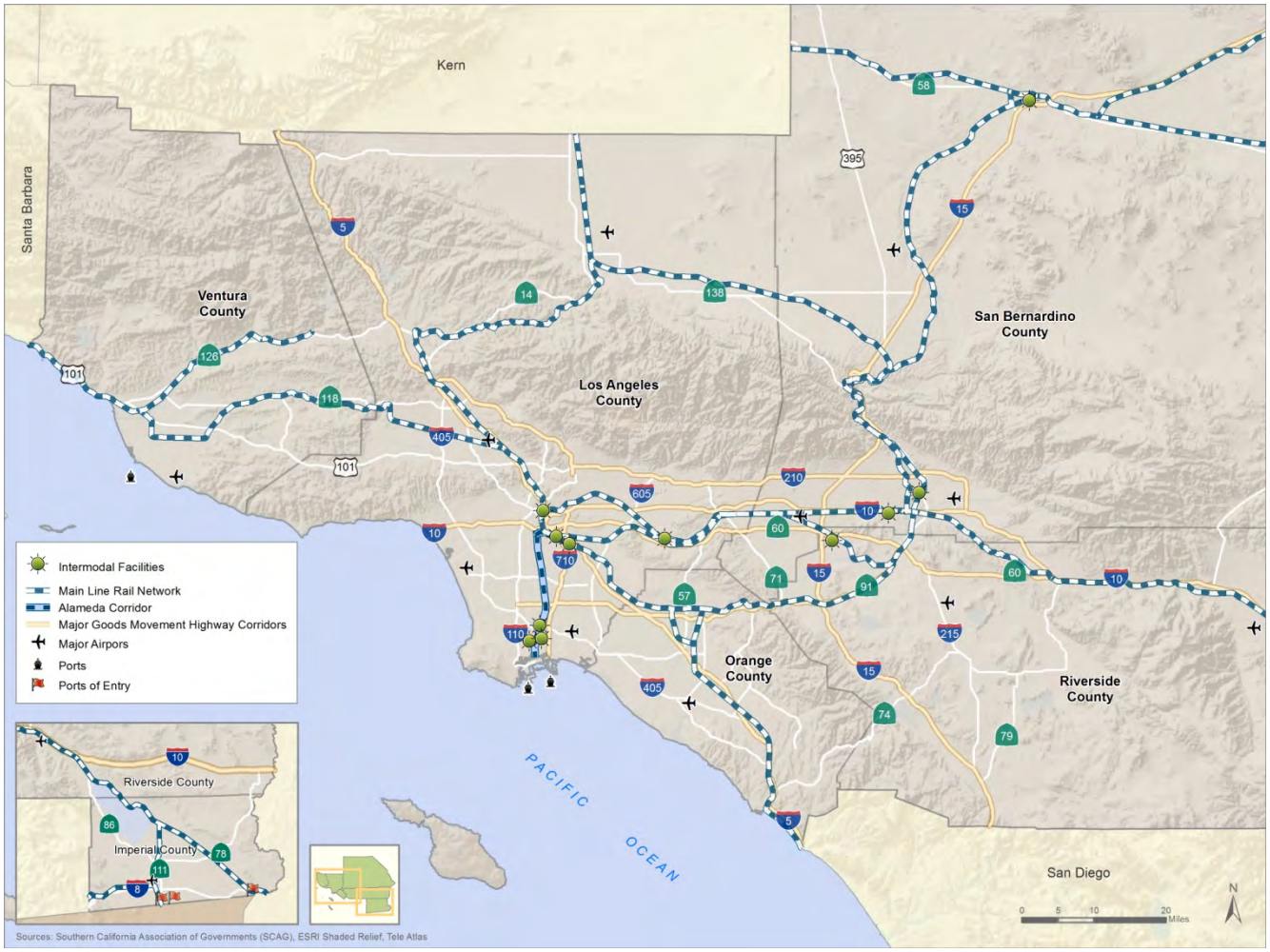
3.2.1 Description of the Regional Rail System

The SCAG region is served by two Class I railroads: Union Pacific Railroad (UP) and Burlington Northern Santa Fe Railway (BNSF). In addition, there are three Class III railroads: Pacific Harbor Line (PHL), Los Angeles Junction Railway (LAJ), and the Ventura County Railroad (VCRR). PHL provides rail transportation, maintenance, and dispatching services within the San Pedro Bay Ports area. The VCRR connects the Port of Hueneme to the UP Coast main line in Oxnard. VCRR is a subsidiary short-line railroad that is part of RailAmerica's Sunset Division. RailAmerica began operating on the Ventura County Railway in 1998. The VCRR currently extends for just over 12 miles on four branches serving the industrial areas of south Oxnard, the Port of Hueneme, and Naval Base Ventura County Port Hueneme Division. It connects with the Union Pacific Railroad (UPRR) Coast Main Line in downtown Oxnard.[4] The LAJ provides industrial switching services in the Cities of Vernon, Maywood, Bell, and Commerce. The LAJ provides connections to both UP and BNSF.

[4] http://www.portofhueneme.org/the_port_at_work/ventura_county_railway.php.

Figure 3.5 provides a map illustrating the railroad mainlines and rail yards that comprise the existing regional freight railroad system in the SCAG region and the accompanying inserts provide definitions of some key rail terms that are used throughout this section.

Figure 3.5 Railroad Main Lines and Yards in SCAG Region



What is the difference between an Intermodal Train and a Carload Train?

Trains may haul bulk material, intermodal containers, general freight, or specialized freight in purpose-designed cars. Intermodal trains carry cargo in containers (often referred to as "containers-on-flat-car" or COFC) or in trailers (often referred to as "trailers-on-flat-car" or TOFC). Containers are standardized reusable steel boxes used for the efficient, safe storage and movement of miscellaneous consumer products and they can be double-stacked to increase carrying capacity. These trains are called "intermodal" because the cargo is delivered to the railroad by another mode (usually truck or ship) and the trailers or containers are loaded onto the trains.

"Carload trains" are railroad freight shipments that are neither intermodal nor handled in unit train service. Bulk products and automobiles are typically shipped via unit trains (trains that carry one type of product) and are thus not considered "carload" trains. Traditionally, manufactured goods in North America are carried in boxcars, essentially a versatile railroad box that has side doors that are used to carry general freight. In addition to general freight and consumer products, railroads also are a primary means of carrying bulk cargo, which includes dry bulk (coal, grain) and liquid bulk (petroleum, milk, gaseous commodities). Dry bulks are usually carried in hopper cars which are open-top and liquid bulk are carried in tank cars. In addition, there are also several type of cargo not suited for containerization or bulk, and therefore they are carried in specialized cars. These include automobiles (stacked in auto-racks), steel plates (coil cars), and temperature-sensitive materials (refrigerator cars/reefers).

The San Pedro Bay Ports are served by the Alameda Corridor, which was completed in 2002. The Alameda Corridor has three main tracks, 10 miles of which are lowered in a trench between SR 91 and approximately 25th Street near downtown Los Angeles (see Figure 3.6). All harbor-related trains (i.e., trains that originate or are destined for the on-dock and near-dock terminals) of the UP and the BNSF use the Alameda Corridor to access regional rail mainlines that begin near downtown Los Angeles. These trains do not pick up or drop off rail cars at the downtown intermodal terminals but continue on to locations in the interior U.S. The Alameda Corridor was developed in order to consolidate rail traffic from four previously separate rail lines into a single corridor and to eliminate at-grade crossings that divided communities along those rail lines. This improved train speeds, increased capacity, and mitigated impacts on communities. The Alameda Corridor eliminated all of the at-grade crossings between the Ports and the intermodal railyards located on Washington Boulevard (BNSF's Hobart Yard and UP's East Los Angeles Yard).

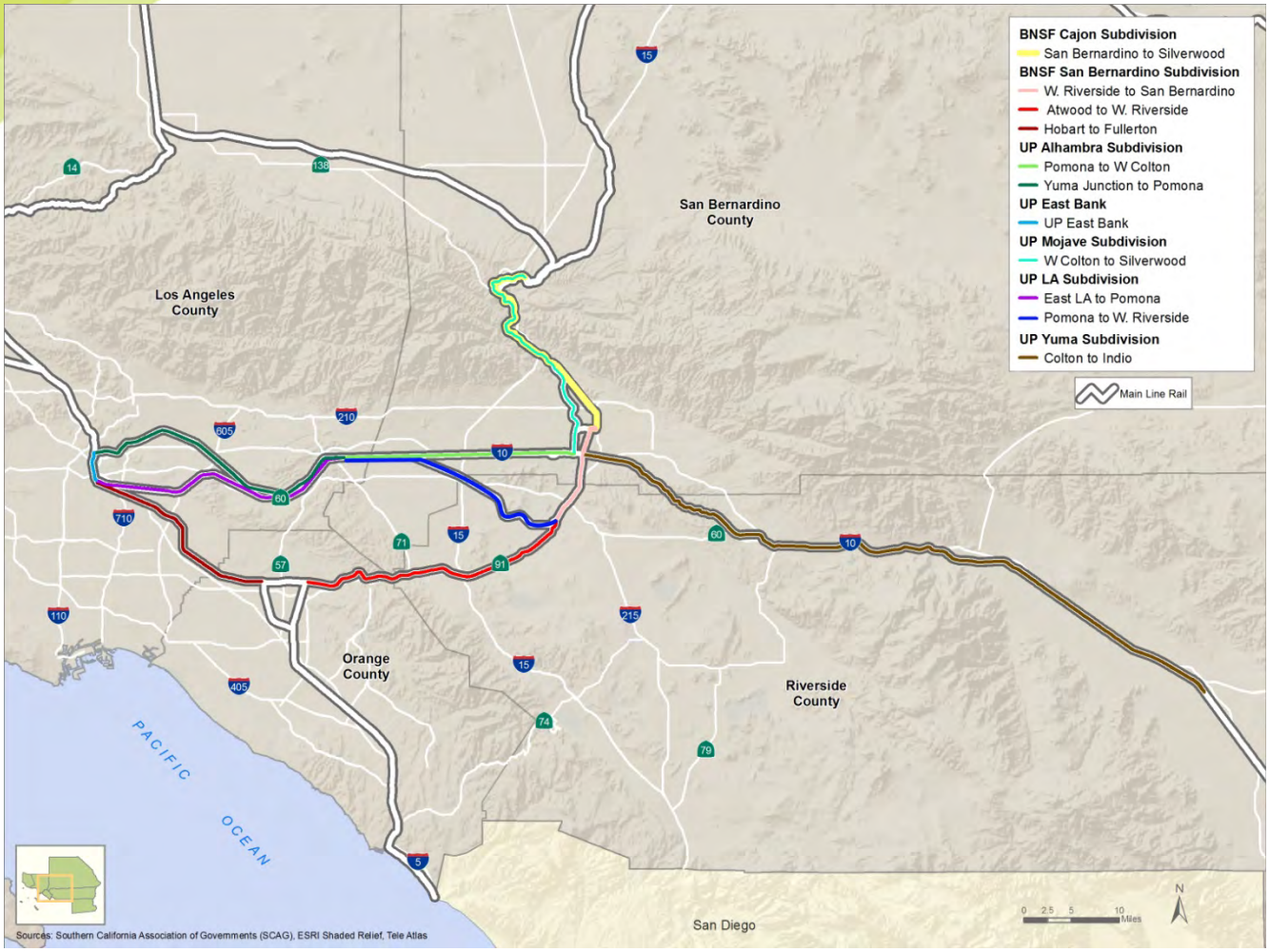
Figure 3.6 The Alameda Corridor

Source: Alameda Corridor Transportation Authority.

To transition from the Alameda Corridor to the Alhambra Subdivision, the UP utilizes trackage rights over Metrolink's East Bank Line, which runs parallel to the Los Angeles River on the east side of downtown Los Angeles. There are no grade crossings on the East Bank line. The UP Los Angeles Subdivision terminates at West Riverside Junction where it joins the BNSF San Bernardino Subdivision. The BNSF San Bernardino Subdivision continues north of Colton Crossing and transitions to the BNSF Cajon Subdivision. The Cajon line continues north to Barstow and Daggett, and then east toward Needles, California and beyond. UP trains exercise trackage rights over the BNSF Subdivision from West Riverside Junction to San Bernardino and over the Cajon Subdivision from San Bernardino to Daggett, which is a short distance east of Barstow. The UP Alhambra Subdivision and the BNSF San Bernardino Subdivision cross at Colton Crossing in San Bernardino County. East of Colton Crossing, the UP Yuma Subdivision passes through the Palm Springs area, Indio, and to Arizona and beyond (see Figure 3.7).

Within the SCAG region, the UP also operates on the Coast Mainline, which serves as a connection between the City of Oxnard and all major west coast destinations. As the only intercity freight rail provider in the city, this line provides an important link for the delivery of goods out of Oxnard (see Figure 3.7).

Figure 3.7 Major Rail Subdivisions by Segment in the SCAG Region



There are six intermodal terminals operated by the Class I railroads in the SCAG region:

1. Hobart Yard in Commerce (operated by BNSF);
2. San Bernardino Yard (operated by BNSF);
3. East Los Angeles Yard (ELA) at the west end of the UP Los Angeles Subdivision (operated by UP);
4. Los Angeles Transportation Center (LATC) at the west end of the UP Alhambra Subdivision (operated by UP);
5. City of Industry (COI) on the UP Alhambra Subdivision (operated by UP); and
6. Intermodal Container Transfer Facility (ICTF) near the south end of the Alameda Corridor (operated by UP).

In addition, both UP and BNSF operate trains hauling marine containers that originate or terminate at on-dock terminals within the Ports of Los Angeles and Long Beach.

In addition to these intermodal terminals, there are railyards that serve carload traffic of various types in the SCAG region. UP also has a large carload freight classification yard at West Colton (at the east end of the Alhambra Subdivision). A large auto unloading terminal is located at Mira Loma (midway between Pomona and West Riverside on the Los Angeles Subdivision).

Rail System Capacity

As will be discussed in Section 4, there is expected to be significant growth in rail traffic in the SCAG region over the next 25 years. Clearly, rail plays an important role in providing efficient long-haul movements (both in terms of energy efficiency and emissions) for a number of key markets at lower costs than would be possible by truck. The goods movement system in the SCAG region demonstrates how the different modes complement each other and work together to provide a system that uses each mode to its greatest advantage. In order for rail to continue to play its role in this system, it will be critical to ensure there is sufficient capacity in terminals and on mainline tracks. The capacity constraints that the region may face in the future are discussed in the next section but to set the stage for this discussion it is useful to provide a picture of the capacity of the current system.

Mainline capacity. In general, a mainline track has capacity for approximately 50 trains per day. For example, the Alameda Corridor with three tracks has an estimated capacity of about 150 trains per day. Intermodal trains (containers and trailers on flatcars) typically vary in length from between 6,000 feet and 10,000 feet; however, the trend in the future is toward longer trains up to about 12,000 feet. Unit bulk, unit auto, and carload trains are typically 5,000, 6,500, and 6,000 feet in length, respectively.

The BNSF San Bernardino Subdivision has at least two main tracks. There are segments of triple track between Hobart and Fullerton. The BNSF recently completed a third main track from San Bernardino to the summit of the Cajon Pass.

The UP Alhambra Subdivision is mostly single-track, while the UP Los Angeles Subdivision has two main tracks west of Pomona and a mixture of one and two tracks east of Pomona.

North from West Colton, UP operates the single-track Mojave Subdivision to Northern California and Pacific Northwest points. This line closely parallels the BNSF Cajon Subdivision as the two lines climb the south slope of the Cajon Pass. Connections are afforded at Keenbrook and Silverwood to enable UP trains to enter/exit the main tracks of the BNSF Cajon Subdivision. Beyond Silverwood to Palmdale, the UP Mojave Subdivision has very little train traffic.

East from Colton Crossing, UP operates its transcontinental Sunset Route main line, also known as the UP Yuma Subdivision. The line now has two main tracks the entire distance to Indio. East of Indio, the Sunset Route still has stretches of single track, but construction of a second main track is underway.

North of downtown Los Angeles, the UP operates the Coast Line through the San Fernando Valley and north through Ventura County.

The capacity of an intermodal yard is typically measured in "lifts per year," the number of containers or trailers that can lifted onto or off of rail cars over the course of year.

Terminal Capacity. The existing estimated capacities of the railroad intermodal yards in the SCAG region are listed in Table 3.2.

Table 3.1 Estimated Capacity of Intermodal Rail Yards
2010

Name	Facility Type	Railroad	Data Year	Yard Capacity (Lifts)
Southern California				
City of Industry	Off-Dock	UPRR	2010	232,000
East Los Angeles	Off-Dock	UPRR	2010	650,000
Hobart	Off-Dock	BNSF	2010	1,700,000
Intermodal Container Transfer Facility (ICTF)	Near-Dock	UPRR	2010	822,000
Los Angeles Transportation Center (LATC)	Off-Dock	UPRR	2010	340,000
Port of Los Angeles (POLA)/Port of Long Beach (POLB) On-Dock Intermodal Facilities	On-Dock	BNSF/UPRR	N/A	N/A
San Bernardino	Off-Dock	BNSF	2010	660,000

Source: Ports of Los Angeles/Long Beach, Multicounty Goods Movement Action Plan, 2008; I-710 Railroads Goods Movement Study, 2009; San Joaquin Valley Goods Movement Study and Consultant Analysis.

3.2.2 Markets Served by the Regional Rail System

The freight rail system in the SCAG region provides critical services to shippers and receivers of particular types of commodities that travel long distances (typically over 500 miles for intermodal markets). As such, the regional rail system serves all four of the major goods movement markets and functions discussed throughout this report:

- Regional Manufacturing. Regional manufacturers use the rail system to obtain supplies and to ship particular commodities. Top manufacturing industries that are particularly dependent on rail for shipping products from the region include apparel, transportation equipment, chemical and allied products, plastics and rubber products, and furniture and fixtures manufacturing.[5] All of these industries are among the top 10 manufacturing industries in terms of contribution to regional GDP, and the commodities they produce are among the top 10 commodities shipped by rail. There is a network of industrial rail spurs that connect manufacturing facilities with the railroad mainlines throughout the region. These commodities are often shipped as loose carload traffic though manufacturers are increasingly using intermodal service, particularly for shipping finished consumer products.

- Local Businesses and Consumer Economy. Because the SCAG region hosts the two largest container ports in the U.S., many imported consumer products used in the area come directly to regional markets by truck from the seaports and do not utilize the rail system for local distribution. However, a variety of consumer and business products are shipped by intermodal rail from manufacturers in other parts of the U.S. for retail distribution in the SCAG region. For example, a major consumer of rail intermodal service in the SCAG region is United Parcel Service, which receives intermodal service from BNSF (Hobart Yard). The region also receives shipments of automobiles from the Midwest by rail at auto ramps in San Bernardino and Mira Loma. Construction supplies are another product category that is heavily dependent on rail and serves the local business and consumer economy.

- International Gateways. Rail access has been a major factor in the attractiveness of the San Pedro Bay Ports for importers. Most rail traffic generated by the San Pedro Bay Ports is intermodal container traffic that falls into the two

[5] Cambridge Systematics, Inc. analysis based on IHS Global Insight TRANSEARCH Commodity Flow database for Southern California and REMI PI+ version 1.3.13 model data for Southern California.

market categories described in Section 2 – IPI and transload. Rail (IPI plus transload) carries approximately 65 percent of the containerized cargo imported through the San Pedro Bay Ports. IPI currently represents about 38 percent of the ports' containerized imports and is handled at on-dock, near-dock, and off-dock rail terminals. Transload cargo carried by rail to inland destinations is estimated to comprise roughly 27 percent of San Pedro Bay Ports' containerized imports and is loaded at intermodal rail yards throughout the region. Rail connections to the Port of Hueneme are also important to accommodate the significant number of automobiles passing over its docks. More detailed descriptions of rail infrastructure serving the seaports is presented later in this section while additional descriptions of the cargo characteristics and volumes of rail traffic generated at the ports is provided in Section 4. Rail does not provide any significant level of service to other types of international gateways in the SCAG region. Cargo moving to and from LAX moves relatively short distances and in small shipments that are not economical for rail service and there is limited rail access at the international land border crossing at Calexico.

- Logistics Industry. Access to rail connections is an important aspect of the logistics services provided in the SCAG region. Logistics service providers (LSPs) handle substantial amounts of international cargo in transload operations that deliver domestic containers and trailers to intermodal rail yards throughout the region. A number of major retail chains and consumer products manufacturers operate large import warehouses and distribution centers in the Inland Empire and often must connect with the inland intermodal terminals in the SCAG region.

3.3 Seaports

The SCAG region is home to three deepwater ports: the San Pedro Bay Ports of Los Angeles and Long Beach, and the Port of Hueneme in Ventura County. The Ports of Los Angeles and Long Beach are the two largest container ports (by volume) in the United States. Combined, the San Pedro Bay Ports in 2010 were the world's eighth busiest container port complex by container volume, after Shanghai (China), Singapore, Hong Kong, Shenzhen (China), Busan (South Korea), Ningbo (China), and Guangzhou (China).[6] The Port of Hueneme specializes in automobiles, fresh fruit and produce, and other break bulk and project cargo.

3.3.1 Port of Los Angeles

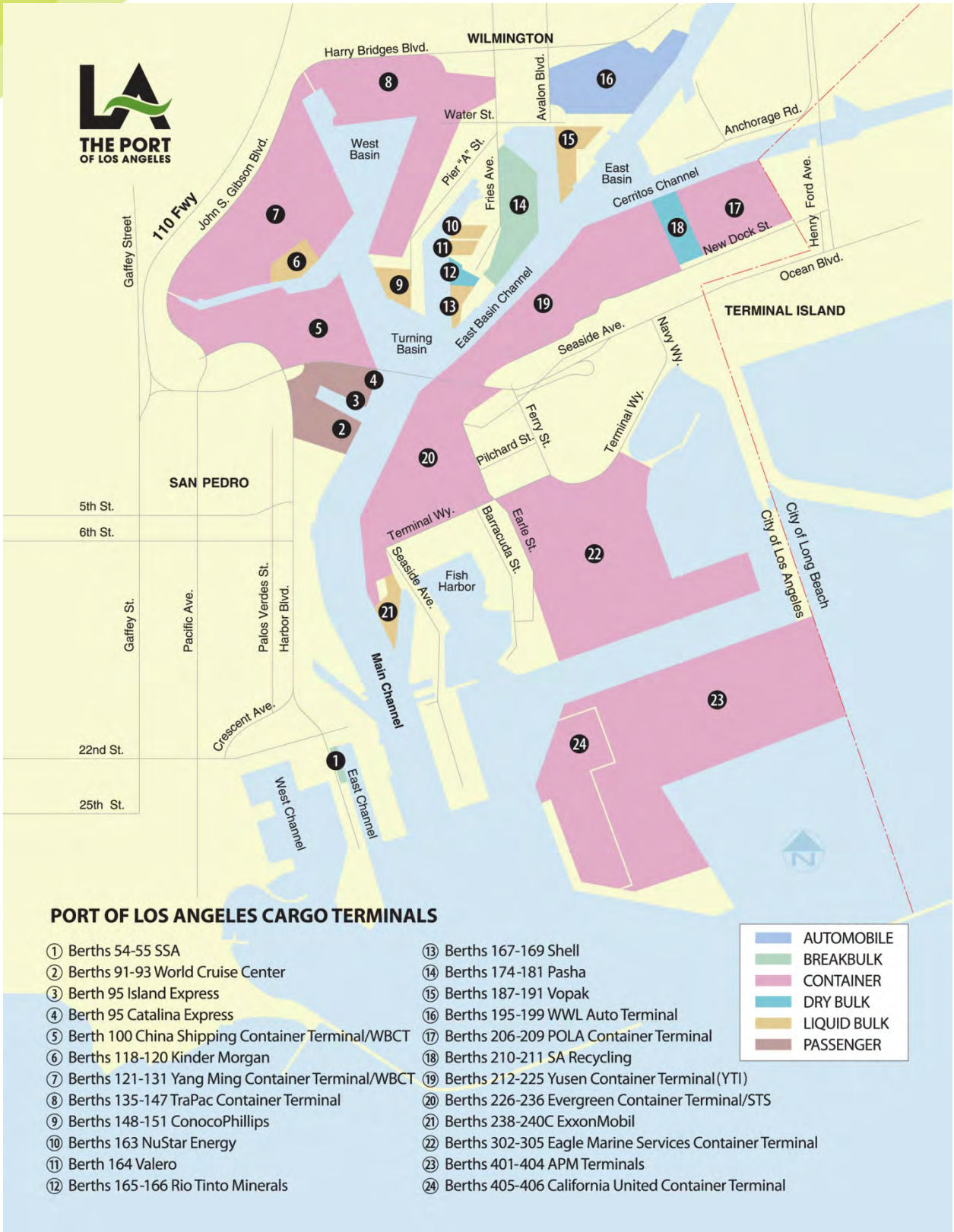
The Port of Los Angeles has nine container terminals with four on-dock rail yards (see Figure 3.8).[7] One of the terminals (Berths 206-209) is currently not leased. The Port also has eight liquid bulk terminals, one automobile terminal, three break bulk terminals, three dry bulk terminals, and a cruise terminal with three berths. The Port comprises 4,200 acres of land, with 1,634 acres of container terminals. Current entitlements (i.e., development with existing approvals) would allow container terminal acreage to increase to 1,737 acres. According to the Port's master plans with full build-out, acreage will expand to 2,165 acres.

---

[6] American Association of Port Authorities: http://www.aapa-ports.org.

[7] http://www.portofla.org/facilities/container.asp.
Berth 100 (WEST BASIN CONTAINER TERMINAL).
Berths 121-131 (WEST BASIN CONTAINER TERMINAL).
Berths 135-139 (TRANS PACIFIC CONTAINER SERVICE CORP). (TraPac).
Berths 206-209 (PORT OF LOS ANGELES CONTAINER TERMINAL).
Berths 212-225 (YUSEN CONTAINER TERMINAL).
Berths 226-236 (EVERGREEN CONTAINER TERMINAL).
Berths 302-305 (APL TERMINAL/GLOBAL GATEWAY SOUTH).
Berths 401-404 (APM TERMINALS/PIER 400).
Berths 405-406 (CALIFORNIA UNITED TERMINALS).

Figure 3.8 Map of Port of Los Angles Terminals



Source: Port of Los Angles (http://www.portofla.org/pdf/POLA_Facilities_Map_2011.pdf).

Plans for expansion at the Port of Los Angeles include:

- A deep-water petroleum bulk liquid marine offloading and storage facility with related storage facilities at Berth 408 on Terminal Island;
- Expansion of the TraPac container terminal at Berths 136-147 in the West Basin of Los Angeles Harbor (improvements include a new on-dock rail yard);
- Expansion of the APL terminal at Pier 300;
- Expansion of the TI West/Evergreen Terminal at Berths 226-236;
- Creation of a new container terminal called Pier 500 adjacent to Pier 400; and
- Leasing of the terminal at Berths 206-209.

3.3.2 Port of Long Beach

The Port of Long Beach has six container terminals, five of which have on-dock rail yards (see Figure 3.9).[8] A seventh container terminal on Pier S is under construction. The Port also has seven liquid bulk terminals, eight break bulk and roll-on and roll-off terminals, seven dry bulk terminals, and one cruise terminal. The POLB comprises 3,200 acres of land[9] (1,371 acres of which is container terminals). Current entitlements (i.e., development with existing approvals) would allow container terminal acreage to increase to 1,523 acres. According to the Port's master plans, with full build-out, container terminal acreage will expand to 1,703 acres.

Plans for expansion at the Port of Long Beach include:

- New 160-acre container terminal at Pier S (under construction);
- Middle Harbor redevelopment, which will combine two existing terminals and construct a new on-dock rail yard;
- Gerald Desmond Bridge replacement project, which will raise the vertical clearance of the bridge from 150 feet to 200 feet and provide a total of six lanes of traffic;
- Pier G modernization, which includes construction of a new terminal administration and operations complex, new maintenance and repair facility, and a new on-dock rail yard;
- Long Beach Harbor dredging to aid navigation and to safely contain contaminated sediments; and
- On-dock Rail Support Facility to facilitate on-dock rail use and to eliminate rail bottlenecks.

---

[8] http://www.polb.com/economics/cargotenant/containerized/default.asp.
Pier T Berths T130-T140 (TOTAL TERMINALS, INC.).
Pier G Berths G226-G236 (INTERNATIONAL TRANSPORTATION SERVICE).
Pier F Berths F6-F10 (LONG BEACH CONTAINER TERMINAL).
Pier J Berths J243-J247, J266-J270 (PACIFIC CONTAINER TERMINAL).
Pier A Berths A88-A96 (SSA TERMINALS).
Pier C Berths C60-C62 (SSA TERMINALS).

[9] http://www.polb.com/about/facts.asp.

Figure 3.9 Map of Port of Long Beach Terminals

Source: Port of Long Beach (http://www.polb.com/facilities/maps/default.asp).

3.3.3 Port of Hueneme

The Port of Hueneme consists of the following facilities (see Figure 3.10):

- South Terminal – One continuous 1,800-linear-foot, deep-draft, concrete piling wharf which provides three 600-foot berths, Berth Numbers 1, 2, and 3.
- One 379-linear-foot concrete piling, shallow-draft, wharf (18' MLLW) is at the west end of this terminal adjacent to the entrance channel.
- North Terminal – One continuous 1,450-linear-foot concrete piling wharf which provides two 700-foot deep-draft berths, Berth Numbers 4 and 5, designed to accommodate Roll-on Roll-off operations. These berths support the auto terminal operations. Berth 5 is also a heavy-lift berth.
- Reefer Shed 1A – 70,735 square feet, 10 truck docks.

- Reefer Shed 1B – 63,196 square feet, 14 truck docks (Reefer sheds operated by NYKCool USA, Inc.).
- Reefer Shed 3 – 83,000 square feet of refrigerated space, 552,960 of refrigerated space, 18 truck docks (Reefer shed operated by Del Monte Fresh Produce NA, Inc.).

Figure 3.10 Port of Hueneme Terminals

The Port has dedicated approximately 34-acres of terminal land for the use by its automobile customers. The Port has contracts with three vehicle distribution companies for the handling of vehicles at the Port: BMW of North America, Wallenius-Wilhelmsen Logistics (WWL), and Global Automobile Processing, Services, Inc. (GAPS). These companies process the vehicles prior to delivery to dealers and coordinate their inland transportation.

The Port of Hueneme has 223,000 square feet of refrigerated terminal space available for fresh fruit importers and exporters. Bananas and fresh fruit comprise the single largest commodity type handled at the Port of Hueneme. In 1998, the District entered into a lease for the distribution of liquid fertilizer. Today, Yara North America, one of the world's largest fertilizer suppliers, operates a state-of-the-art automated terminal at the Port of Hueneme for distribution of fertilizer to the agriculture industry in the area surrounding the Port.[10]

3.4 Regional Air Cargo

3.4.1 Markets Served by the Regional Air Cargo System

While the Southern California air cargo system serves all of the major market segments in the region to some degree, it provides this service to a fairly narrow range of products. However, these products are very high-value, time-sensitive products that represent the output and supplies for critical industries in the region (such as electronics and computer components, high-value agriculture, and scientific and medical instrumentation). The express package and parcel services provided to the service business and consumer economy and consumer products such as high-value food stuffs, electronics, and apparel also are often moved by air cargo. Los Angeles International Airport (LAX) is the principal international air freight gateway for the region and in 2008 was the 11th largest international gateway in the U.S. (by value) of any mode and the third leading air cargo gateway (by value) behind New York's JFK International Airport and the combined Chicago Gateway of O'Hare International and Midway Airports.[11] The leading export commodity group through LAX is vegetables, fruit, and nuts. Base metals; computer equipment; photo, science, and medical instruments; paper and pulp products; plastics; prepared foodstuffs; and aircraft products are other leading export commodities – many of which, as noted in Section 2, are the output of leading manufacturing industries in the region. The leading import commodities are apparel, computer equipment, audio and video media, fish, office machinery, textiles, footwear, vehicles, instrumentation, and electronic components.

3.4.2 General Description of the Regional Air Cargo System

There are six commercial airports that handle air cargo in the SCAG region. Together, these airports handled over 2.1 million tons of air cargo in 2010. Los Angeles International (LAX) and Ontario International (ONT) handle the vast majority of this cargo – almost 96 percent. The majority of the remaining air cargo moves through Bob Hope (BUR), Long Beach (LGB), John Wayne (SNA), and Palm Spring International Airport (PSP). The share handled by the remaining airports combined was significantly less than 0.1 percent in 2010.

Air cargo handled at the region's airports is served by a mix of commercial passenger carriers (often, referred to as "belly cargo"), integrated carriers (such as Federal Express and United Parcel Service (UPS)) who provide integrated air and truck service, and air cargo carriers. Both LAX and Ontario International Airport provide all three of these types of air cargo carriage. As described previously in the section about highway access, LAX has a large cargo operation that includes the 98-acre Century Cargo complex, the 57.4-acre Imperial Cargo complex, the Imperial Cargo Center, and a number of terminals on the south side of the airport. Ontario International Airport has almost three acres of cargo building and office

[10] http://www.portofhueneme.org/about_us/general_overview.php.

[11] *America's Freight Transportation Gateways: Connecting Our Nation to Places and Markets Abroad*, Bureau of Transportation, U.S. Department of Transportation.

space to support all-cargo, airline belly cargo, and air mail. UPS has a 156-acre West Coast Distribution Center adjacent to the airport. There also is a 94-acre site in the northwest corner of the airport proposed for a new air cargo development.

In addition to these existing operations, there are three airports in the regions that have plans for significant expansion of air cargo operations. The March Air Force Base/March Inland Port (MIP) has capability to handle significant air cargo operations. Forecasts in the 2012 SCAG RTP project that MIP could be the third largest air cargo airport in the region by 2035. The San Bernardino International Airport (SBD) is aggressively marketing itself as a cargo facility. It can provide expedited Customs clearance, significant space for new development, excellent freeway access, and a Foreign Trade Zone. The Southern California Logistics Airport (SCL) in the northwest corner of the City of Victorville is envisioned to be a domestic and international air cargo facility, with a 4,740-acre business complex, including manufacturing, industrial multimodal, and office facilities.

3.5 Border Crossings

The SCAG region hosts international truck and rail border crossings with Mexico in Imperial County. There are currently three land ports-of-entry (POE) in the county that process commercial truck traffic – Calexico West-Mexicali I, Calexico East-Mexicali II, and Adrade-Los Algodones. However, the vast majority of trucks (approximately 99 percent), which handle most of the trade flow between the U.S. and Mexico, cross the border at Calexico East-Mexicali II.[12] This POE is located approximately 130 miles east of San Diego and 60 miles west of Yuma, Arizona. The port includes nine passenger lanes, four pedestrian lanes, and three commercial lanes (including one FAST lane). As shown in Figure 3.11, the Calexico-East Mexicali II POE is connected to the regional freight truck network via State Route 7 (SR 7), which directly serves the POE and connects to Interstate 8 (I-8). State Route 86 (SR 86) is the major truck corridor connecting Calexico the rest of the SCAG region. The POE is open from 3 a.m. to midnight Monday through Friday and 6 a.m. to midnight on Saturdays and Sundays.

[12] U.S. Department of Transportation, Bureau of Transportation Statistics, Transborder Surface Freight Data.

Figure 3.11 Major Truck Routes in Imperial County

Source: Caltrans, 2010a.

The vast majority of goods crossing the border in Imperial County (by value) are moved by truck (see Table 3.3).

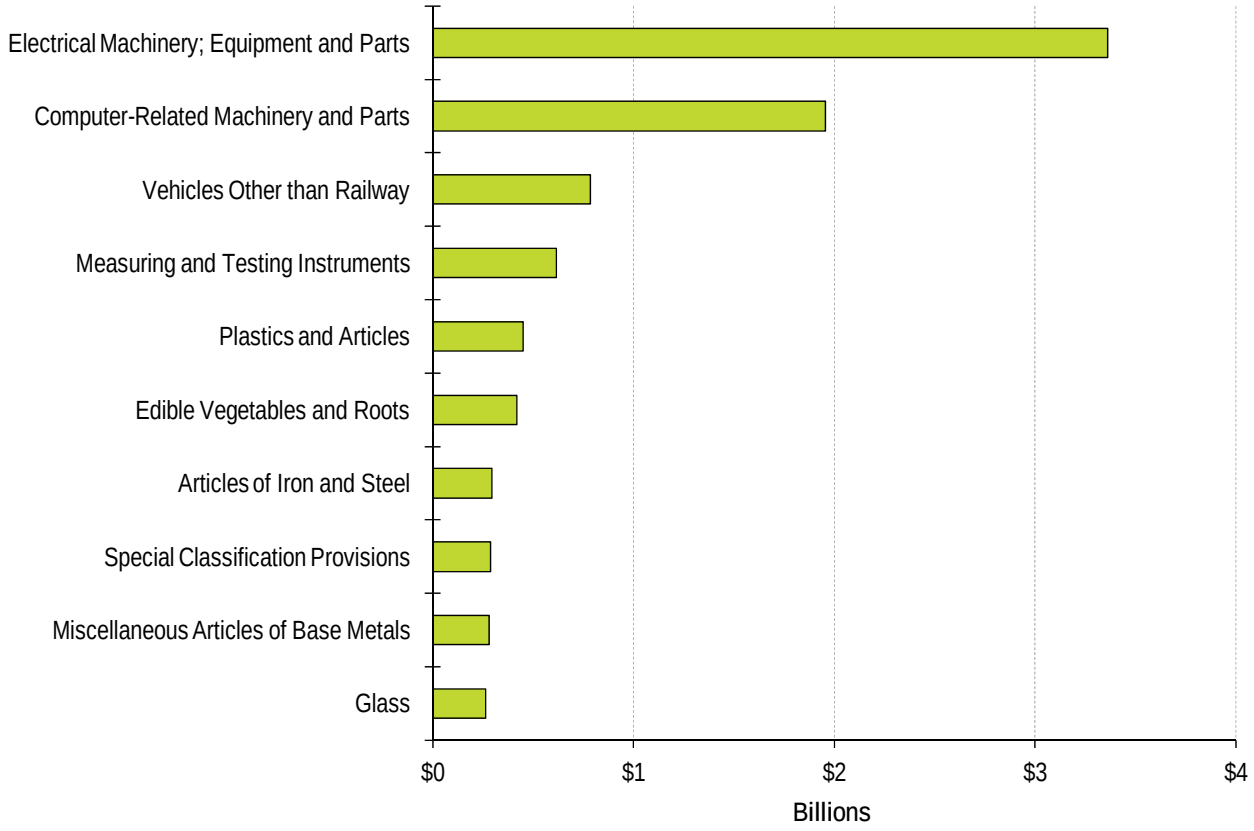
Table 3.2 Total Value Transported by Truck
January-November 2010

Value ($ million)	Andrade	Calexico West	Calexico East	POE Total
Mexico to the U.S.	$0.0	$0.0	$6,007.2	$6,007.2
U.S. to Mexico	$0.3	$134.2	$5,394.7	$5,529.2
Total	$0.3	$134.2	$11,401.9	$11,536.4

Source: U.S. Department of Transportation, Bureau of Transportation Statistics, Transborder Surface Freight Data.

Figure 3.12 shows the top commodities traded by truck through the Imperial County POEs.

Figure 3.12 Top 10 Commodities Traded through Imperial County POEs by Trucks
2010

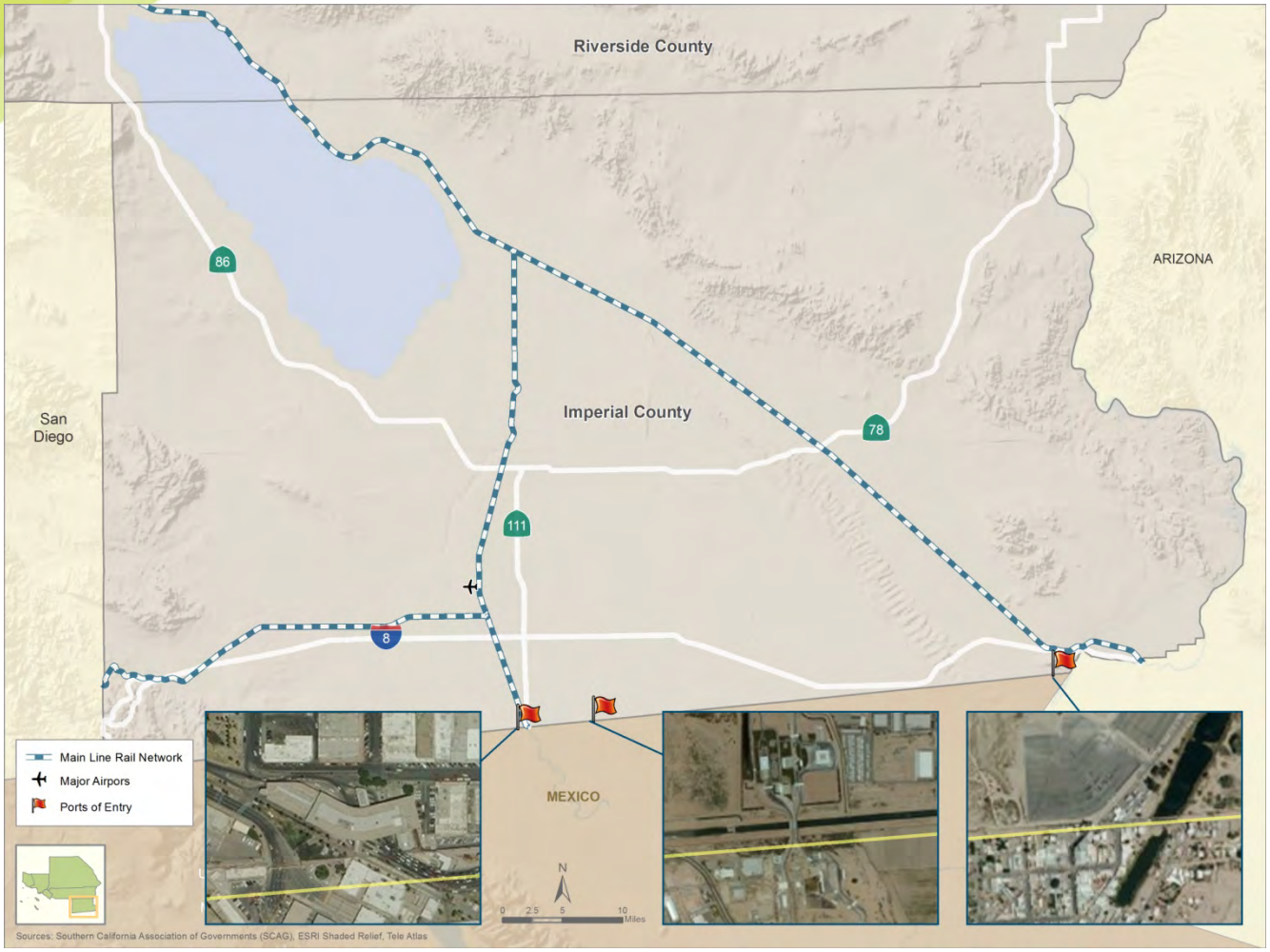


Source: U.S. Department of Transportation, Bureau of Transportation Statistics, Transborder Surface Freight Data.

As compared to trucking, a relatively small amount of goods move by rail across the international borders in the SCAG region. As shown in Figure 3.13, the UPRR has a branch line that connects to the border at Calexico and moves north to the El Centro Branch line and ultimately connects to the Sunset mainline in Niland. The Carrizo Gorge Railway (CSRY) owns rights on a small section between the San Diego County line and Plaster City but this line is not currently operational. Table 3.4 shows the value of rail traffic crossing the border at Calexico (which is almost all export traffic from the U.S. to Mexico) and Figure 3.14 shows the top 10 commodities traded by rail.

There has been an increase in integration of the U.S.-Mexico border in the Imperial County-Mexicali region since the implementation of the North American Free Trade Agreement (NAFTA). This has changed logistics practices at the border and fostered growth in maquiladora activity. As already noted, most of the merchandise flows in the region are made by truck and most move to and from export-oriented manufacturing and maquiladora industries.

Figure 3.13 Imperial County Rail Lines



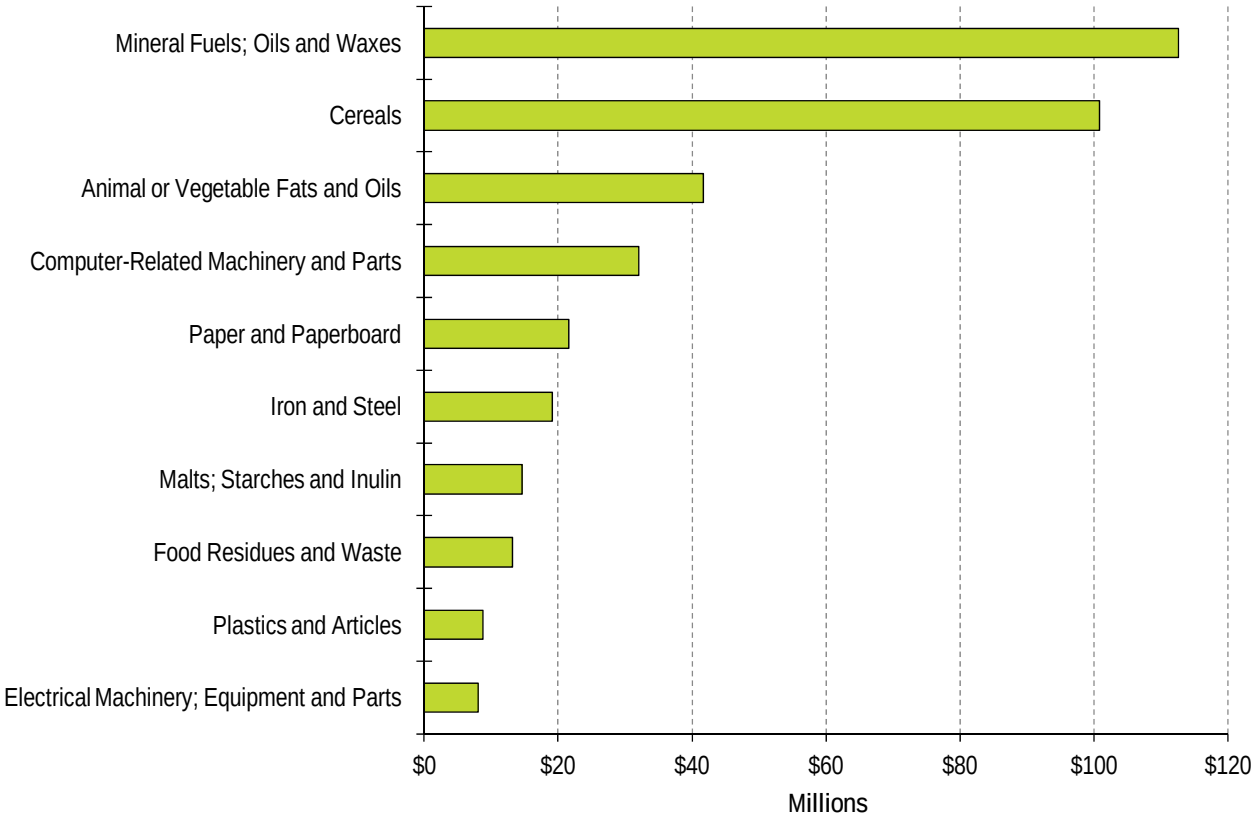
Source: SD Freight Rail Consulting.

Table 3.3 Total Value Transported by Freight Trains at Calexico
January-November 2010

Value ($ millions)	Andrade	Calexico	Calexico East	POE Total
Mexico to the U.S.	$0.0	$0.0	$36.3	$36.3
U.S. to Mexico	$0.0	$103.1	$260.7	$363.8
Total	$0.0	$103.1	$297.0	$400.1

Source: U.S. Department of Transportation, Bureau of Transportation Statistics, Transborder Surface Freight Data.

Figure 3.14 Top 10 Commodities Traded through Imperial County POEs by Rail
2010



Source: U.S. Department of Transportation, Bureau of Transportation Statistics, Transborder Surface Freight Data.

3.6 Regional Warehouse and Distribution Space

As has already been discussed, warehousing and distribution facilities have become an increasing important component of the global supply chain infrastructure and the integration of these facilities with the rest of the goods movement infrastructure is critical to supply chain performance. An example of this type of integration is the location of transloading and cross-docking facilities near the San Pedro Bay ports and intermodal rail facilities to allow for rapid processing of imports before they are moved to inland locations via intermodal rail. As supply chains become more and more sophisticated and warehousing space becomes more specialized, movements of products among warehouses within the SCAG region.

An example is useful to help visualize why this integration between different types of warehouses and the other modal systems is so important. Take the case of a large big box retail chain with distribution facilities in the SCAG region. This company may be purchasing products directly from suppliers in Asia and bringing these products into the Ports of Los Angeles and Long Beach. Some of the products may be shipped directly by IPI to distribution facilities in other parts of the country. Others may be drayed to transload or cross-dock facilities near the port and then drayed to near-by intermodal facilities for shipment to distribution facilities throughout the U.S. In some cases, this transloading activity is handled by a logistics services provider. Some of the product may be drayed to regional distribution centers in the SCAG region for distribution in the greater region. These larger regional distribution centers tend to be located in the Inland Empire and need to be accessible from major highway corridors linking the ports and the Inland Empire as well as being accessible to the interstate system for delivery to other Southwestern states. The regional distribution center may also be receiving products from ports in other parts of the U.S. or from U.S. manufacturers in other parts of the country. Some of these domestic products may be shipped by rail to domestic intermodal yards in the Inland Empire or the San Gabriel Valley and will need to be delivered to the regional distribution center by truck. This big box retail chain may also be purchasing supplies from an

original equipment manufacturer (OEM) who has its own similar network of warehouses and distribution facilities. This example illustrates the need for a diverse stock of warehousing with different physical configurations and technology applications and the need for access to different modal connections based on the particular functions that individual warehouses perform. It also illustrates the amount of movement that occurs among warehouses in the SCAG region. Operators of the most modern, technologically sophisticated warehouses in the region report that product move through these warehouses at a very rapid paces, in some cases moving through the facilities in a matter of hours where product might sit for weeks 20 years ago. This high velocity logistics system requires highly reliable modal connections and efficient modal connections.

The SCAG region has an extensive network of warehouse and distribution facilities. These facilities provide a variety of functions, including cargo storage, cross-docking, and value added services (such as sorting, labeling, tagging, etc.). The different types of warehouses and their locations around the region (relative to the highway system) was discussed earlier in this section in the context of roadway access. The major warehouse and distribution functions described earlier were transloading, cross-docking, import warehousing, and regional distribution centers. It also was noted that these warehouse and distribution facilities support a wide range of logistics services and value added operations. These include:

- Stacking products on pallets for shipping to final destinations;
- Shrink-wrapping;
- Sorting for final destination shipping;
- Quality inspection;
- Pick and pack for shipments to customers;
- Processing returns for customers;
- Product repairs;
- Verification of shipping manifests; and
- Light finishing operations for manufactured products.

In addition, some regional manufacturers maintain warehouse and product storage/distribution operations that are integrated with their manufacturing facilities.

The type and physical configuration of modern warehousing in the SCAG region, as is true elsewhere in the world, is undergoing a transformation.[13] Modern warehouses will have fewer loading doors, higher clear height, and more employee parking (expanding the overall footprint) and will be highly automated with GPS, RFID, high speed sorting equipment, sensors, and robotics. This has been accompanied by workforce evolution such as:

- Transformation of the retail workforce into a logistics workforce (especially as more retail activity is conducted online);
- Highly skilled “supply chain technicians” are in demand;
- Workers need technology skills; and
- Increasing demand for clerical skills (PC/communications skills).

[13] Information in this paragraph is drawn from a presentation by B. J. Patterson, President/CEO of Pacific Mountain Logistics, presented to the SCAG Goods Movement Subcommittee, October 29, 2012.

As described in Chapter 2, the combination of a plentiful and diverse warehouse supply and a logistics workforce is already producing economic benefits for the region that are expected to continue if the performance demands of the logistics sector continue to be met. The remainder of this section describes the existing warehouse supply. Chapter 4 presents an analysis of current and future demand for warehouse space in the region. The degree to which warehouse supply can meet demand is, to some degree, a function of a number of variables that are related to how that space is used and includes factors such as:

- The amount of floor area space within the structure that is used to store product as compared to the amount that is used for aisles, storage of technological components, and office space;
- Stacking height;
- Turnover rate and inventory practices; and
- The degree to which product needs to be moved multiple times to different warehouses in the region.

These factors and their interaction with demand forecasts for future warehousing space are discussed in Chapter 4.

3.6.1 Summary of Existing Space

In 2008, there were a total of 4,695 warehousing facilities[14] in the SCAG region (Table 3.5 and Figure 3.15). Of these, 84.8 percent (3,983) were occupied and 15.2 percent (712) were "available" (vacant or occupied but becoming vacant). The 4,695 facilities represent 837,689,768 square feet of warehouse space. They cover 1,463,925,978 square feet of land representing an average 57.1 percent floor area ratio (FAR). A total of 693,842,860 square feet, or 82.8 percent, were occupied and 143,846,908 square feet, or 17.1 percent, were available.

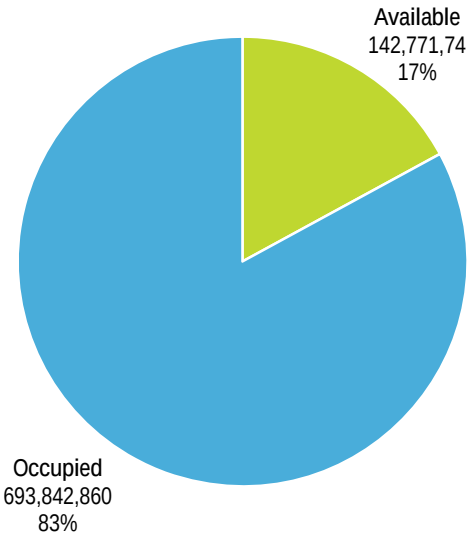
Table 3.4 Profile of Warehousing Facilities in the SCAG Region (2009)

Status	Facilities (Number)	Percentage Share	Facilities (Square Feet)	Percentage Share	Land (Square Feet)	Percentage Share
Occupied	3,983	84.8%	693,842,860	82.9%	1,164,574,572	79.6%
Available	712	15.2%	142,771,748	17.1%	299,351,406	20.4%
Total Existing	4,695	100.0%	836,614,608	100.0%	1,463,925,978	100.0%

Source: SCAG Regional Goods Movement Plan and Implementation Study. Existing Supply of Warehouse Facilities (Task 5, Deliverable #1, Part 1). September 22, 2009.

[14] Data on warehousing facilities were developed as part of the Comprehensive Regional Goods Movement Plan and Implementation Strategy using a combination of county assessor records and commercial real estate data from Lee & Associates. The assessors used various parcel classifications that included warehouses but may also have included light industry. A line-by-line review of the data were conducted to eliminate self-storage facilities, named manufacturing facilities under a certain size, named agricultural facilities in outlying areas, and buildings determined to be too small to conduct goods movement operations. See Cambridge Systematics/Economics & Politics Technical Memorandum, "Existing Supply of Warehouse Facilities" (Task 5, Deliverable #1, Part 1), September 22, 2009.

Figure 3.15 Occupancy of Warehousing Facilities in the SCAG Region (2009)
Square Feet



3.6.2 Occupied Space

Of the 3,983 occupied warehouse facilities, the largest shares are in Los Angeles (51.8 percent) and San Bernardino (16.5 percent) counties, followed by Riverside (12.8 percent) and Orange counties (9.3 percent) (Table 3.6 and Figure 3.16). As a share of the regional total of warehousing square footage, San Bernardino County and Riverside County represent 23.7 percent and 19.7 percent, respectively, while Los Angeles County accounts for 44.8 percent (Table 3.6 and Figure 3.17). The facilities in San Bernardino and Riverside counties tend to be larger, newer and built with more recent technology.

Table 3.5 Occupied Warehousing Facilities (2009)
By County

County	Number of Facilities		Facilities (by square feet)		Land Area (by square feet)	
Imperial	47	1.2%	7,273,270	1.0%	11,364,491	1.0%
Los Angeles	2,063	51.8%	310,696,717	44.8%	471,368,956	40.5%
Orange	369	9.3%	34,488,034	5.0%	77,493,686	6.7%
Riverside	508	12.8%	136,421,050	19.7%	213,157,898	18.3%
San Bernardino	657	16.5%	164,716,871	23.7%	328,323,740	28.2%
Ventura	339	8.5%	40,246,918	5.8%	62,885,801	5.4%
Total	3,983	100.0%	693,842,860	100.0%	1,164,574,572	100.0%

Source: SCAG Regional Goods Movement Plan and Implementation Study. Existing Supply of Warehouse Facilities (Task 5, Deliverable #1, Part 1). September 22, 2009.

Figure 3.16 Number of Occupied Warehousing Facilities (2009)
By County

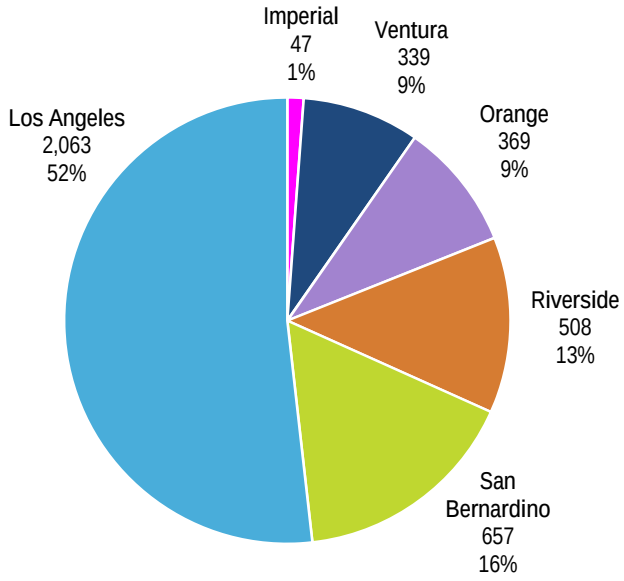
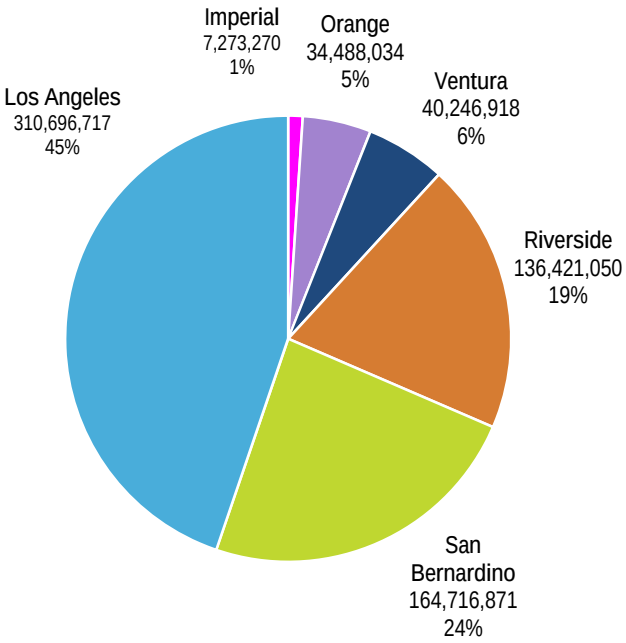


Figure 3.17 Square Footage of Occupied Warehousing Facilities (2009)
By County



3.6.2 Available Space

Of the 712 available warehouse facilities (defined as either vacant or occupied but on the market), the largest shares were in Los Angeles (40.3 percent) and San Bernardino (29.2 percent) counties, followed by Riverside (14.7 percent) and Orange (12.6 percent) (Table 3.7 and Figure 3.18). In terms of square footage the inland counties again had higher shares with San Bernardino at 37.3 percent and Riverside at 23.1 percent, while Los Angeles had 28.2 percent and Orange had 9.2 percent (Table 3.7 and Figure 3.19).

Table 3.6 Available Space for Warehousing (2009)
By County

County	Number of Facilities		Facilities (by square feet)		Land Area (by square feet)	
Imperial	N/A	0.0%	1,075,160	0.0%	N/A	0.0%
Los Angeles	287	40.3%	40,289,109	28.2%	75,446,297	25.2%
Orange	90	12.6%	13,116,570	9.2%	25,718,467	8.6%
Riverside	105	14.7%	32,958,011	23.1%	63,032,998	21.1%
San Bernardino	208	29.2%	53,316,426	37.3%	126,910,023	42.4%
Ventura	22	3.1%	3,091,632	2.2%	8,243,620	2.8%
Total	712	100.0%	143,846,908	100.0%	299,351,406	100.0%

Source: SCAG Regional Goods Movement Plan and Implementation Study. Existing Supply of Warehouse Facilities (Task 5, Deliverable #1, Part 1). September 22, 2009.

Note: Assessor data from Imperial County did not include "vacant" parcels.

Figure 3.18 Number of Available Warehousing Facilities (2009)
By County

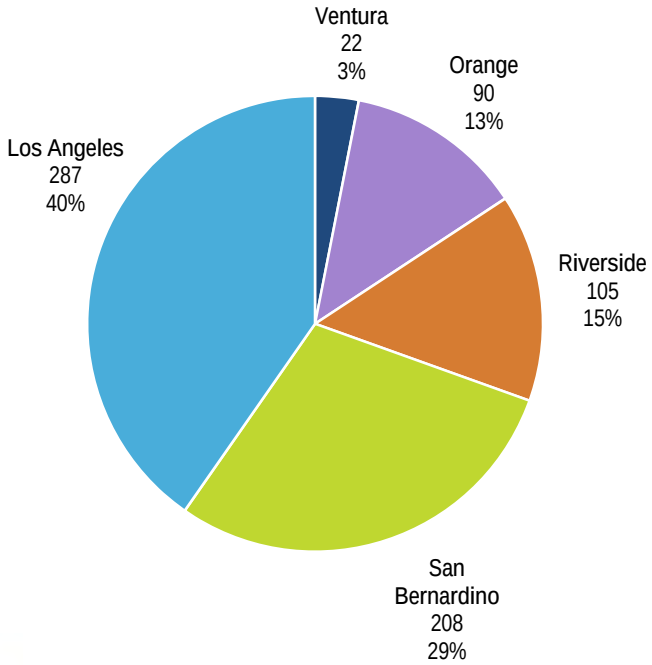


Figure 3.19 Square Footage of Available Warehousing Facilities (2009)
By County

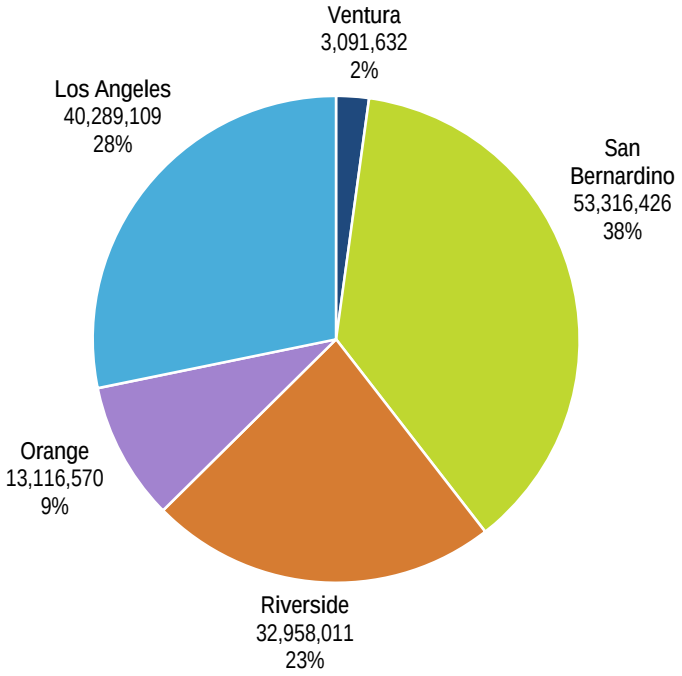


Table 3.8 summarizes, for each county, the occupied and available (vacant or occupied but becoming vacant) facilities as determined in this study.[15]

Table 3.7 Summary of Occupied, Available, and Total Warehousing Space
By County, 2009 (includes facilities of 50,000 square feet and larger)

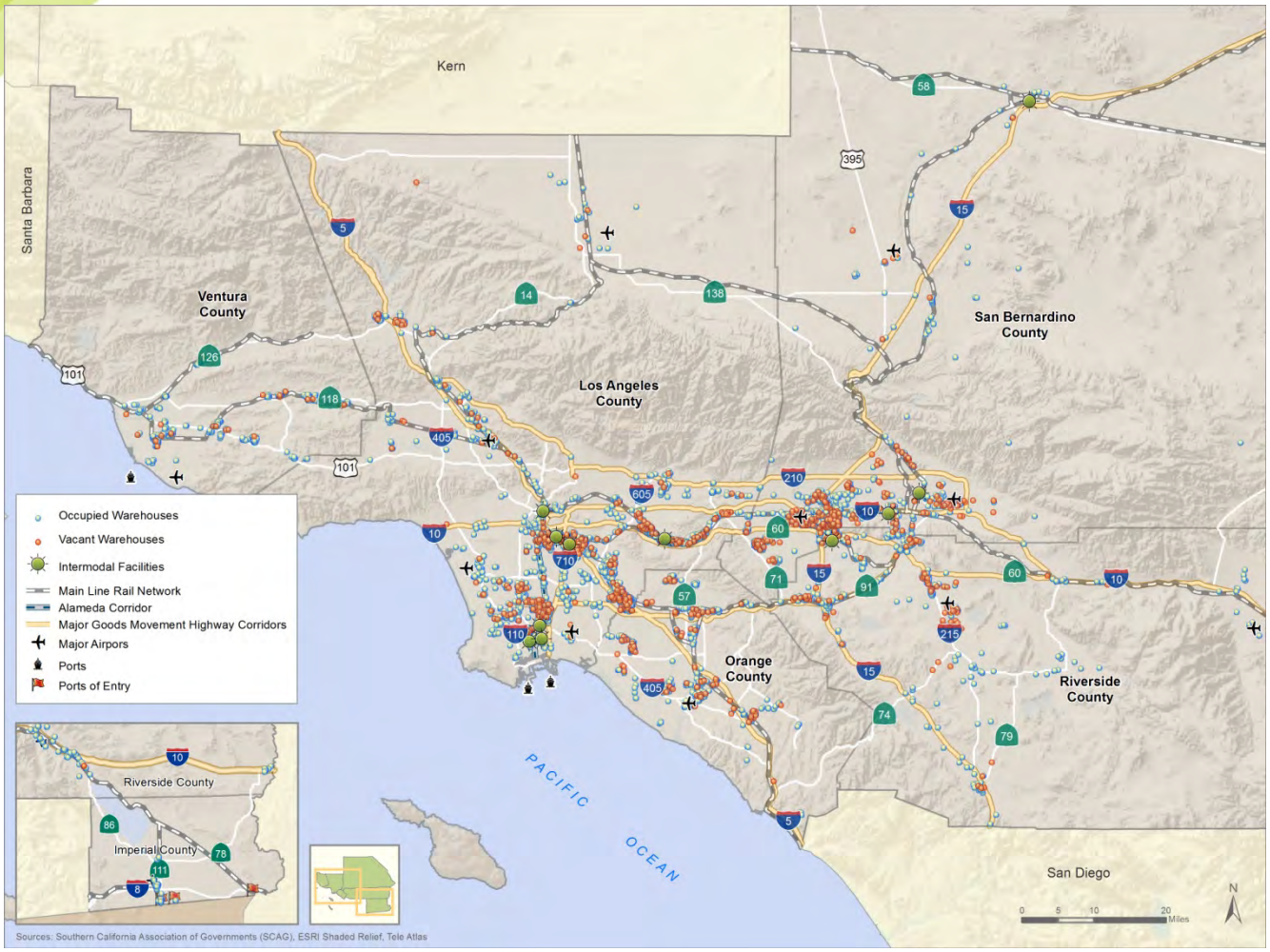
County	Occupied Space (square feet)		Available Space (square feet)		Total (square feet)	
Imperial	7,273,270	1.0%	N/A		7,273,270	
Los Angeles	310,696,717	44.8%	40,289,109	28.2%	350,985,826	11.5%
Orange	34,488,034	5.0%	13,116,570	9.2%	47,604,604	27.6%
Riverside	136,421,050	19.7%	32,958,011	23.1%	169,379,061	19.5%
San Bernardino	164,716,871	23.7%	53,316,426	37.3%	218,033,297	24.5%
Ventura	40,246,918	5.8%	3,091,632	2.2%	43,338,550	17.1%
Total	693,842,860	100.0%	142,771,748	100.0%	836,614,608	100.0%

Source: SCAG Regional Goods Movement Plan and Implementation Study. Existing Supply of Warehouse Facilities (Task 5, Deliverable #1, Part 1). September 22, 2009.

[15] Note that these data only include facilities of 50,000 square feet and above.

Figure 3.20 is a map of the SCAG region showing the location of occupied and available warehouses in Southern California.

Figure 3.20 Occupied and Available Warehouses in the SCAG Region



3.6.3 Developable Land

Based on a review of available land that is zoned industrial, the analysis indicated that the SCAG region (Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties) could hold another 186.2 million square feet of warehousing and distribution buildings (Table 3.9 and Figure 3.21).

This assumes no other land, such as agricultural sites, is converted to industrial. The largest share of these potential facilities would be in Riverside County (60.0 million square feet, 32.2 percent) and San Bernardino County (57.5 million square feet, 30.9 percent). Next would be Los Angeles County (50.8 million square feet, 27.3 percent). Imperial County ranked fourth (10.9 million square feet, 5.8 percent), followed by Ventura County (4.0 million square feet, 2.1 percent) and Orange County (3.1 million square feet, 1.7 percent). Importantly, within each county, the vast majority of the potential space is in outlying desert areas: San Bernardino (74.9 percent), Los Angeles (71.5 percent), Riverside (67.5 percent), and Imperial (100.0 percent).

Table 3.8 **Summary of Undeveloped and Total Warehousing Space by County**
2009 (includes facilities of 50,000 square feet and larger)

County	Undeveloped Suitable Space (square feet)		Total Existing Space (square feet)	
Imperial	10,855,366	5.8%	8,348,430	12.9%
Los Angeles	50,769,558	27.3%	350,985,826	11.5%
Orange	3,105,882	1.7%	47,604,604	27.6%
Riverside	60,066,788	32.2%	169,379,061	19.5%
San Bernardino	57,514,418	30.9%	218,033,297	24.5%
Ventura	3,962,787	2.1%	43,338,550	17.1%
Total	186,274,798	100%	837,689,768	17.2%

Figure 3.21 **Warehouse Development Potential (Square Feet) on Vacant But Suitable Industrial Land in SCAG Region (186.2 Million)**