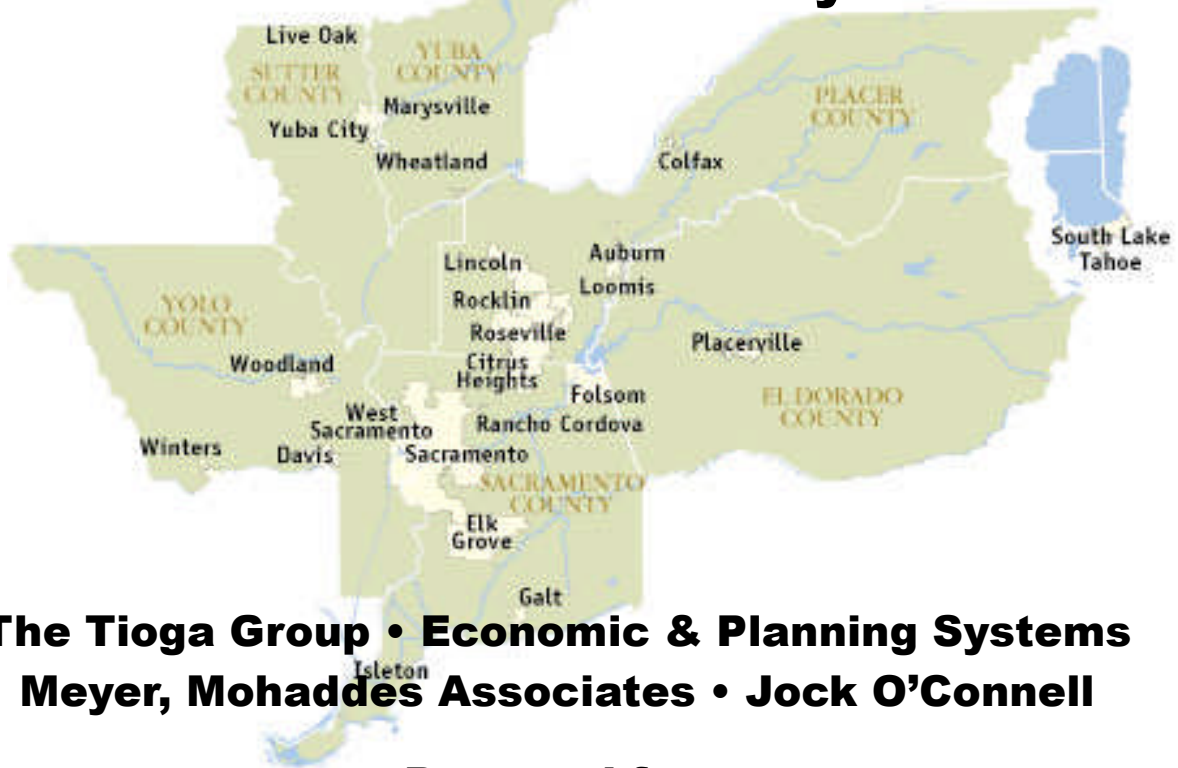




# **SACOG REGIONAL GOODS MOVEMENT STUDY**

## **Phase One Executive Summary**



**The Tioga Group • Economic & Planning Systems  
Meyer, Mohaddes Associates • Jock O'Connell**

**Prepared for:**



**Sacramento Area Council Of Governments**

**September 10, 2006**

*288 Rheem Blvd., Moraga, CA 94556  
(925) 631-0742 fax (925) 631-7936 [www.tiogagroup.com](http://www.tiogagroup.com)*

## Background

The Sacramento Area Council of Governments (SACOG) and other agencies are confronting serious long-term freight mobility issues in California. Straightforward capacity increases that worked in the past – more highways, larger airports – are not enough for the future. Moreover, capacity increases that compromise the environment, tax the budget, and impinge on sensitive communities may no longer be possible or desirable.

As both the regional Metropolitan Planning Organization and the Regional Transportation Planning Agency, SACOG has multiple freight transportation responsibilities. Regional policy makers need better information on goods movement:

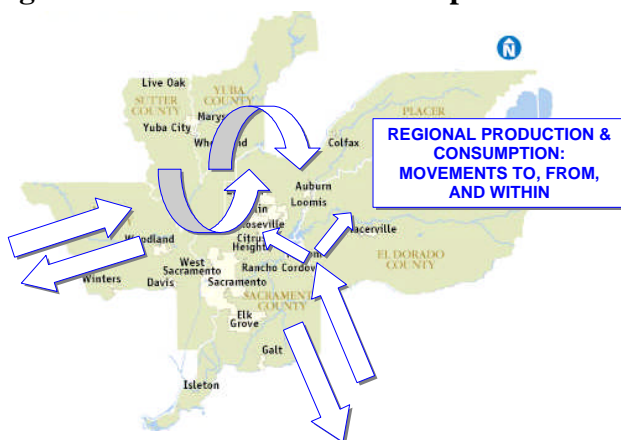
- to understand the role freight transportation and distribution plays in the broader economic development of the SACOG region and the surrounding portions of northern California;
- to recognize planning and policy decisions with implications for freight transportation, and recognize freight transportation trends with implications for public policy and planning; and
- to make the well-informed trade-offs needed to plan an urban environment.

SACOG intends to develop a three-phase regional freight action plan. Phase One of this effort, the subject of this report, begins this process by assessing current conditions in the SACOG region. The freight action plan is to be linked with the SACOG/Valley Vision Blueprint transportation and land use study, which will in turn serve as a key input to the 2030 Metropolitan Transportation Plan (MTP) and Metropolitan Transportation Improvement Plan (MTIP). This Phase One study will thus serve as a building block of SACOG's freight transportation policy and programming for years to come.

## Regional Freight Movements

There are three basic goods movement patterns affecting the SACOG Region.

**Regional Production and Consumption: Local Movements.** The region's population production and consumption result in goods movements to, from, and within the region (left).



These movements are predominantly truck trips but also include air cargo (with pickup and delivery by truck), waterborne shipments (with inland transport by truck or rail), and rail carload service (direct or trans-loaded).

- Freight movements use all the modes, but trucking overshadows the others. (Exhibit 1)
- Air cargo tends to be light weight, high value.
- “Other Intermodal” includes parcel, courier, and mail shipments.

**Exhibit 1: Sacramento Area Freight Modal Summary (2002)**

Mode	Tonnage (000)	Share
Air, air & truck*	140	0.1%
Other intermodal	2,227	1.6%
Pipeline & unknown	6,010	4.3%
Rail**	4,106	2.9%
<b>Truck</b>	<b>126,928</b>	<b>90.6%</b>
Truck and rail**	95	0.1%
Water***	619	0.4%
<b>Total</b>	<b>140,125</b>	<b>100%</b>

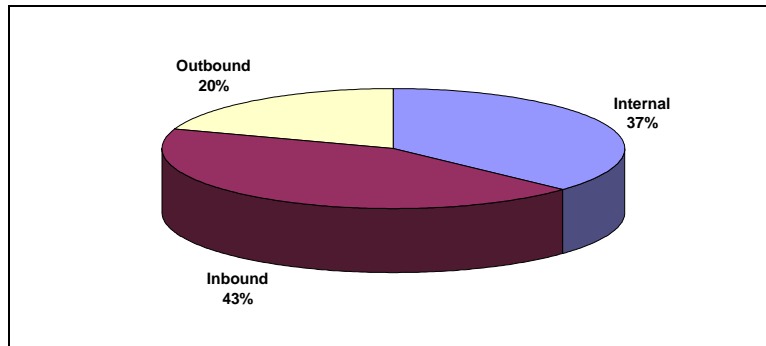
\* Source: Sacramento County Airport System

\*\* Source: 2003 Carload Waybill Sample

\*\*\* Source: US Army Corps of Engineers

Exhibit 2 shows, for example, that the SACOG region is on balance a net consumer, with in-bound flows exceeding outbound.

**Exhibit 2: Major Commodity Flow Shares**



As Exhibit 3 shows, over 60% of the reported commodity flows outbound from the Sacramento area are bound for the San Francisco Bay Area, arguably a regional rather than long-haul trip. The inbound flows are also mostly from the Bay Area.

**Exhibit 3: Origins and Destinations of SACOG Region Commodity Flows**

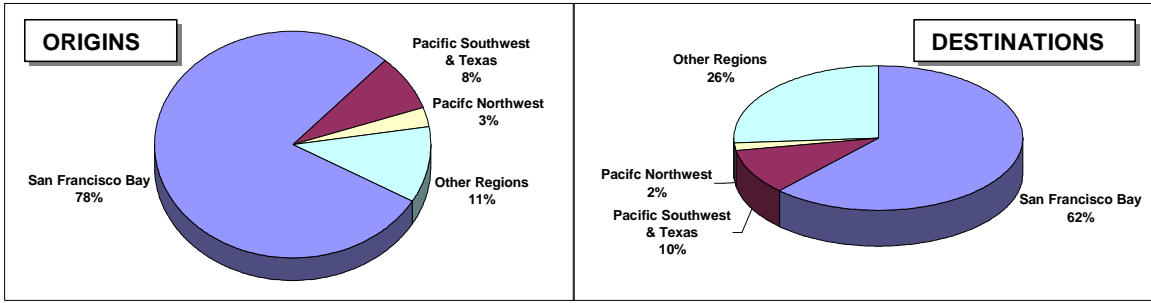
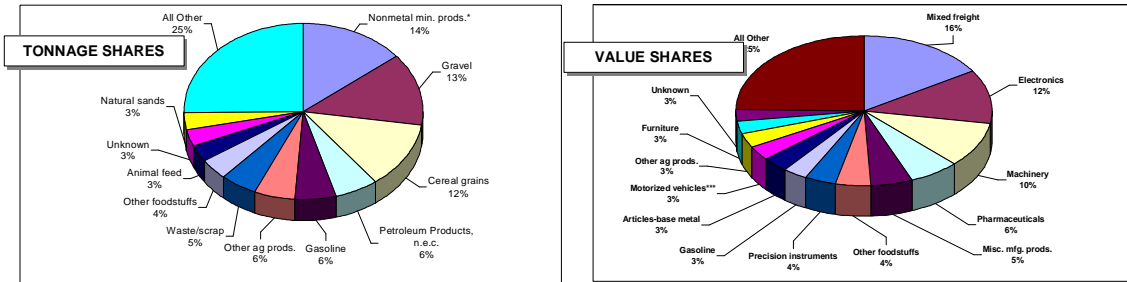


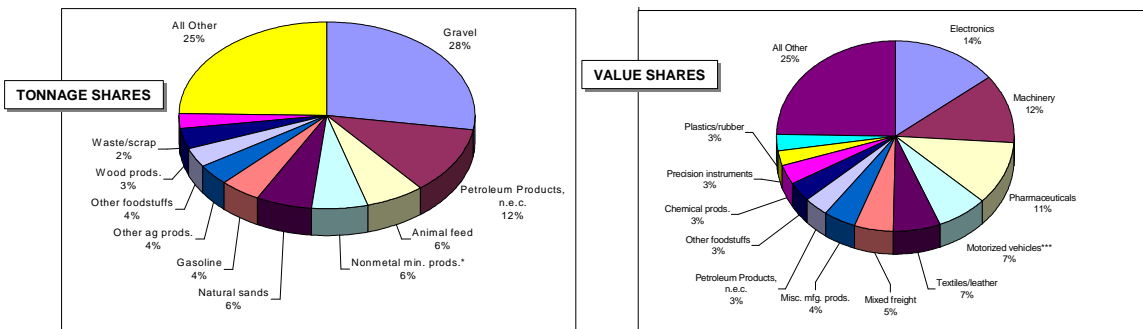
Exhibit 4 shows outbound commodity flows from the Sacramento area in terms of both tonnage and value. Outbound tonnage is dominated by heavy raw materials such as gravel and minerals; agricultural products including grains and animal feeds; and liquid bulks such as gasoline and petroleum products. Outbound value is dominated by consumer merchandise of several kinds.

**Exhibit 4: Outbound Commodity Shares - 2002**



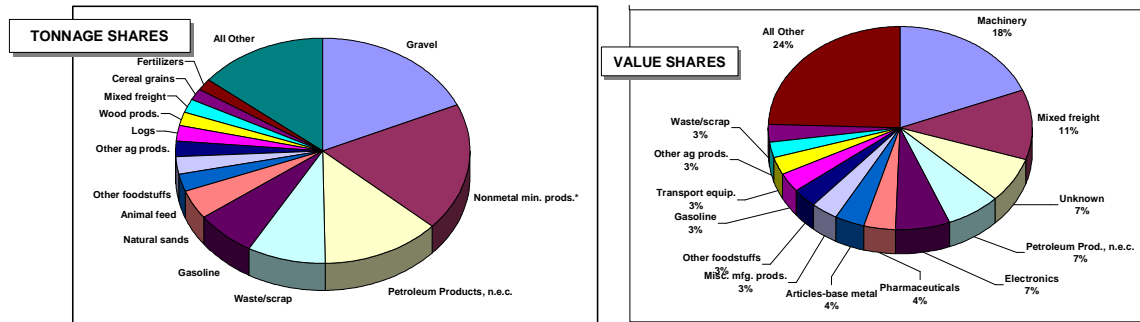
Inbound commodity shares (Exhibit 5) are very similar to the outbound mix. Inbound tonnage is dominated by bulk materials, agricultural products, and liquid bulks. Inbound value is dominated by consumer goods.

**Exhibit 5: Inbound Commodity Shares – 2002**



Local commodity movement tonnage (Exhibit 6) is dominated by minerals, fuels, and chemicals. Local value is, again, dominated by consumer goods.

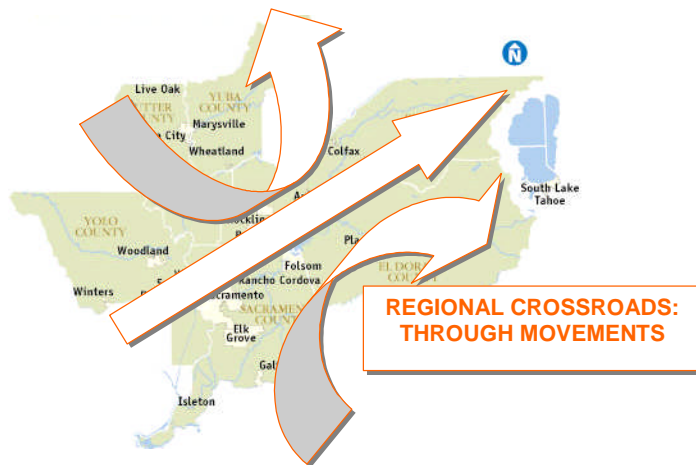
**Exhibit 6: Local Commodity Shares - 2002**



The obvious prominence of basic commodities such as sand, gravel, minerals, and petroleum products is due to both demand and supply factors. Demand for these basic commodities is driven by population (food, fuel), agriculture (agricultural products, chemicals), and construction (sand, gravel, steel, lumber, cement). Demand from these sources grows as the regional population expands and as per capita consumption grows. These commodities, especially sand and gravel, have a very low unit value that cannot support high transportation costs. Local sources of supply have decisive advantages. Where long-distance movement is necessary (e.g. gasoline, agricultural chemicals) low-cost modes are used to reach the region (pipeline for gasoline, ships for agricultural chemicals) and trucks are used for local delivery.

**Crossroads: Through Movements.**

The highways and rail lines converging and radiating in the SACOG region make it a crossroads for goods movements between other regions (Right).

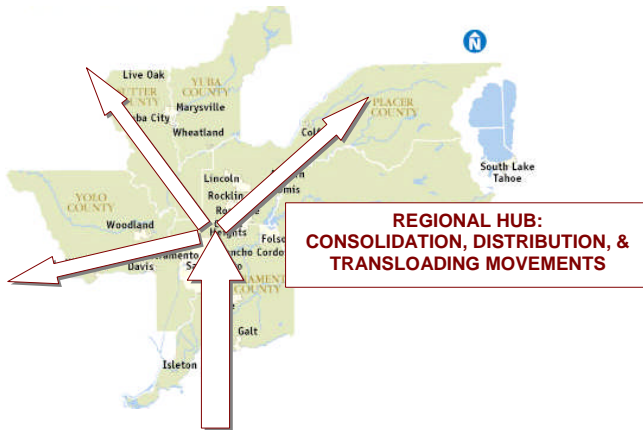


The through movements are again mostly truck trips but also include substantial volumes of carload and intermodal rail traffic. There is no through maritime traffic and “through” air traffic does not affect the region. Through freight has a higher average value per ton (Exhibit 7), and includes a greater proportion of rail.

**Exhibit 7: Estimated Through vs. Local Freight Flows -2002**

Through Freight					
Mode	Value (\$millions)	Share	Tonnage (000)	Share	\$/Ton
Truck	84,200	61%	26,797	70%	\$ 3,142
Rail	5,049	4%	9,324	24%	\$ 542
Unknown	3,582	3%	1,033	3%	\$ 3,468
Truck and rail	2,325	2%	729	2%	\$ 3,190
Other intermodal	42,190	31%	629	2%	\$ 67,052
<b>Total</b>	<b>137,346</b>	<b>100%</b>	<b>38,512</b>	<b>100%</b>	<b>\$ 3,566</b>

Inbound/Outbound/Local Freight					
Mode	Value (\$millions)	Share	Tonnage (000)	Share	\$/ton
Air, air & truck	2,421	2%	29	0%	\$ 82,166
Other intermodal	14,008	14%	2,227	2%	\$ 6,289
Pipeline & unknown	2,873	3%	6,010	4%	\$ 478
Rail	2,060	2%	3,769	3%	\$ 546
<b>Truck</b>	<b>75,020</b>	<b>77%</b>	<b>126,928</b>	<b>90%</b>	<b>\$ 591</b>
Truck and rail	493	1%	1,405	1%	\$ 351
Water	76	0%	78	0%	\$ 966
<b>Total</b>	<b>96,950</b>	<b>100%</b>	<b>140,447</b>	<b>100%</b>	<b>\$ 690</b>

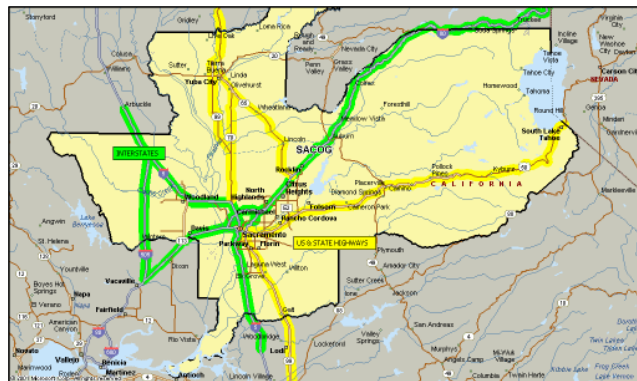


**Regional Hub.** The confluence of the rivers and valleys and its central location have made the Sacramento area a regional hub for more than a century, since the establishment of Sutter’s Fort. Its role as a hub results in consolidation, distribution, and transloading movements (Left). Consolidation, distribution, and transloading movements of this kind blend with the region’s own needs for inbound freight and cannot be easily distinguished in the available freight data.

**Highways**

The highway network in the SACOG region has multiple layers. The Interstate highway system is a federally-funded backbone for regional and interregional movement. As shown below, the SACOG region is served by Interstate 5 running north-south, Interstate 80 running east-west, Business 80 running through Sacramento, and Interstate 505 connecting them through Winters.

The California State highway system (US50 and US99) predate the Interstate system. Now, they provide access to portions of the region off the Interstates. US99, in particular, serves the population centers of the Sacramento and San Joaquin Valleys that Interstate 5 bypasses. Surface



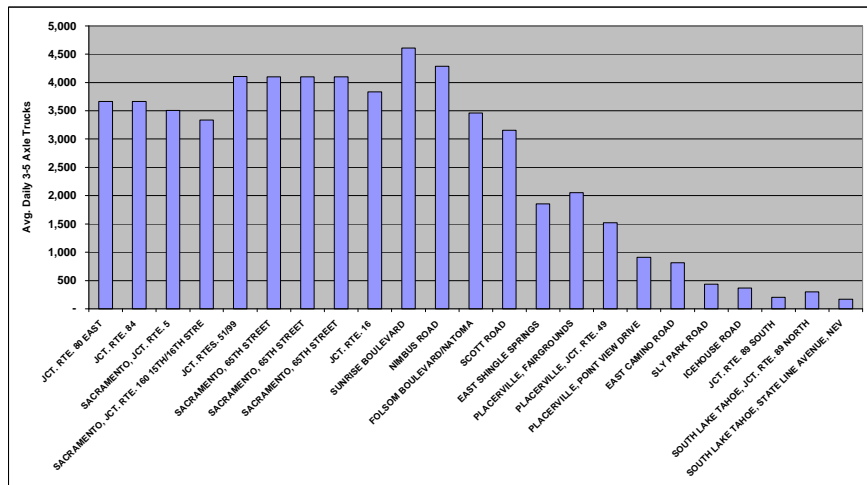
streets and roads are a mixed city and county system. For the purposes of goods movement, they provide access to most actual origins and destinations.

Truck counts are the best available measure of truck traffic volume and impact in the SACOG region. Exhibit 8 shows the average annual daily counts of 3-5 axle trucks on the major high-ways serving the SACOG region in 2004, drawn from Caltrans counts and estimates:

**Exhibit 8: Average Daily 3-5 Axle Trucks on Major SACOG Routes in 2004**

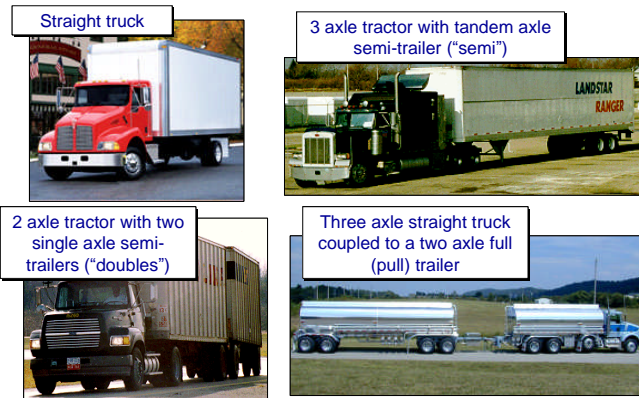


The concentration of trucking activity in the urbanized center is clear from the counts. As the truck count data imply, the volume of 3-5 axle trucks tends to decline in less populated areas. The chart at right shows this “taper” graphically for US Highway 50, going from the junction with Interstate 80 on the East to the Nevada state line at South Lake Tahoe.



In the context of freight movement, “trucking” is usually taken to include commercial, private, and owner-operators of trucks carrying goods. Commercial carriers are companies where trucking is the primary business. At private carriers, trucking is not the primary business, but is con-

ducted in support of the primary business (e.g., sale of goods). Owner-operators can be commercial carriers, but most often provide capacity to commercial or private carriers under contract.

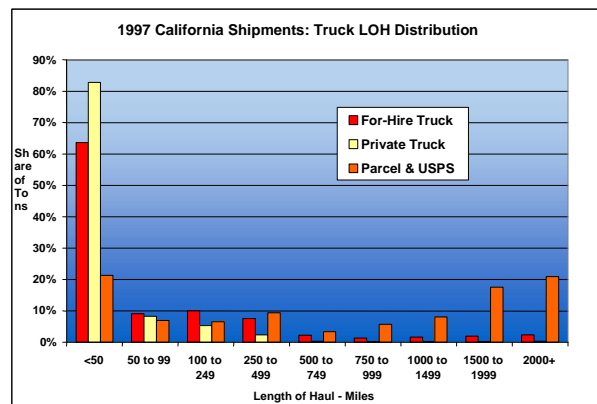


“Trucks” and combination vehicles vary in their configuration. Four types of commercial vehicles and combinations are common in California. (Left)

Only about a third of the heavy-duty trucks are used in for-hire trucking (e.g. hauling other people’s goods for pay). Two-thirds of

the heavy-duty trucks are used by private firms (hauling their own goods), service industries, or government

Private fleets are overwhelmingly used in local and regional business. (right) Over 80% of their trips are under 50 miles. A very large part of the total trucking activity is therefore carried out by local and regional carriers, contractors, and fleet operators whose names are not familiar to the general public. This perspective contrasts with a common association of “trucking” with large semi-trailers bearing prominent trucking company names moving over long distances.

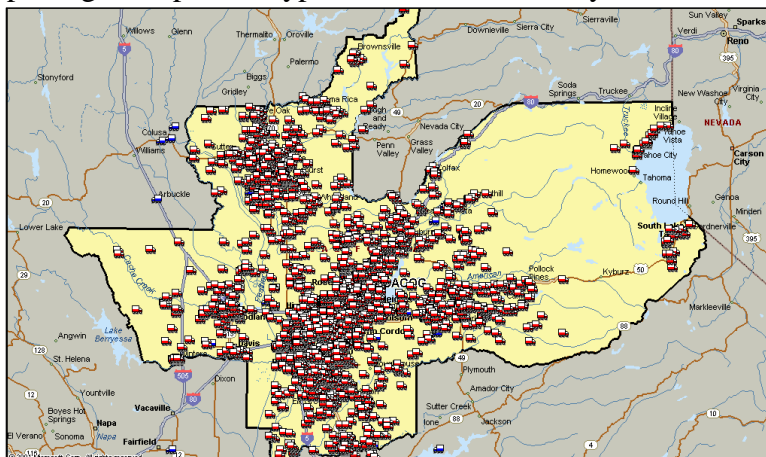


There are two basic shipment size distinctions.

- **Truckload (TL).** Commonly refers to a truck being used for a single shipment between shipper and consignee, whether or not the shipment actually fills the truck.
- **Less-than-Truckload (LTL).** As a generic term, LTL refers to any use of a truck for multiple shipments (including parcels, mail, multi-stop delivery, etc.).

The most trucking tonnage is carried over the highway in truckload lots. Virtually all long-haul private fleet movements are truckloads. True less-than-truckload movements account for much less total volume and many fewer highway vehicles than truckload carriage. Despite the ubiquity of Postal Service, FedEx, and UPS vehicles, their total tonnage is relatively small. Small packaged shipments typical of those hauled by UPS, US Postal Service, and other “parcel” truckers, which move in consolidated

loads between major terminals.



**Truck Fleet Locations.** Trucking fleets are based in many locations in the study area but they tend to cluster near heavy industrial areas, low rent commercial areas and

freeways. The map at left displays the enormous number of locations from which at least one commercial truck is operated. The listings include trucks used for goods movement as well as to provide services. The obvious observation is that the trucks follow the people and the highways. The “people” provide both the owner/driver and the customers, while the highways provide the access.

**Truck Terminals.** Freight handling within the trucking sector can include sorting, consolidation, deconsolidation, and transfer or transloading. Only a small percentage of “trucking facilities” actually handle the freight. The archetypical “trucking terminals” that split long-haul truckloads for local delivery or combine local pickups into long-haul truckloads are the limited province of LTL and parcel carriers. LTL sorting and consolidation operations resemble warehouse operations in their trip generation and distribution patterns. The primary function of an LTL terminal is to consolidate outbound loads from local pickups and deconsolidate inbound loads for local delivery. LTL terminals do not fulfill orders or reconfigure shipments; instead they consolidate, deconsolidate and sort existing shipments. As the map at right suggests, these terminals are centrally located within their market, but placed on the periphery of the Sacramento urban core.



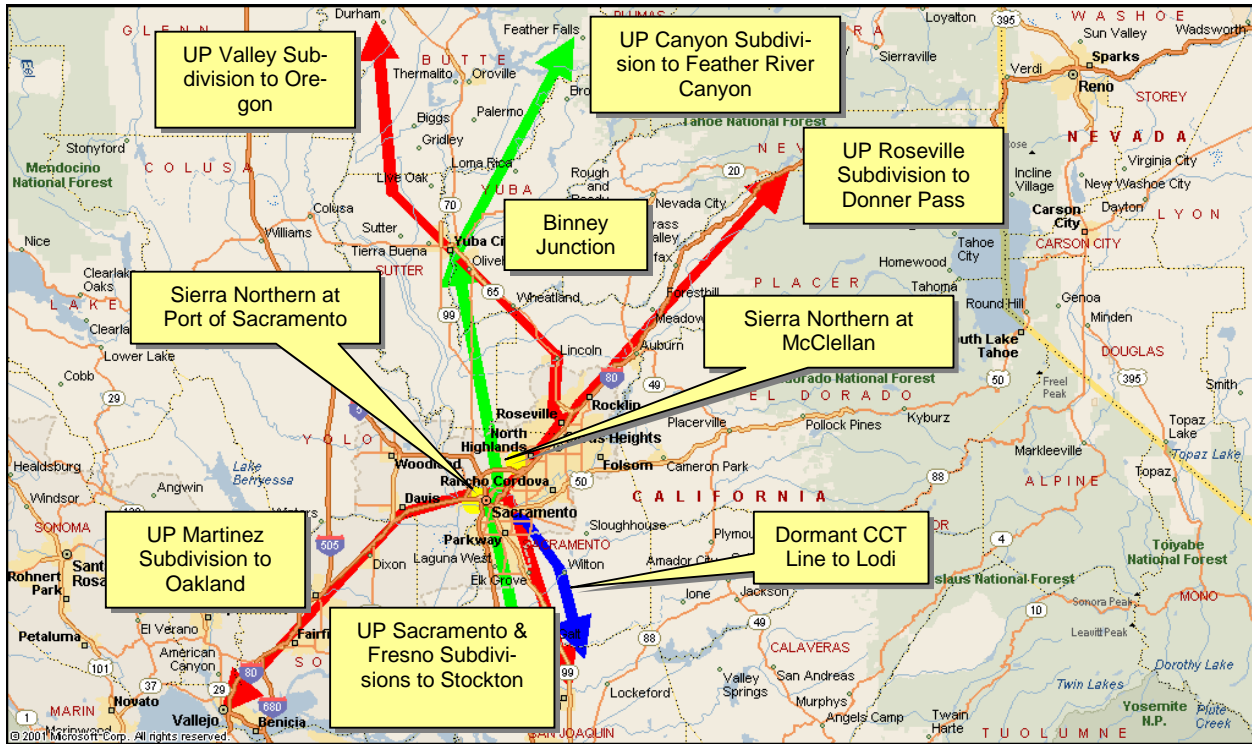
**Truck Stops.** Truck stops are a commercially provided part of the highway infrastructure and are necessary for efficient and safe long-haul trucking operations. A full-service truck stop usually offers parking for tractors and/or trailers; telephone/fax/computer communications; restaurant service; convenience store; fueling; truck and equipment servicing; overnight accommodations; and scales.

### ***Rail Network***

The rail system serving the SACOG region (Exhibit 9) is a legacy of multiple rail mergers. The lines were originally built by the Southern Pacific (SP), the Western Pacific (WP), and the Sacramento Northern (SN). The Union Pacific system is now organized as follows:

- The Martinez Subdivision is the former SP route between Sacramento and Oakland.
- The Roseville Subdivision is the former SP route over Donner Pass. Lacking double-stack train clearances, it is used for railroad freight trains and Amtrak Zephyrs.
- The Canyon Subdivision is the former WP route through the Feather River Canyon. With adequate clearances, this route carries UP’s intermodal business.
- The Valley Subdivision is a former SP route north of Roseville to Oregon.
- The Fresno Subdivision is the former SP route south of Sacramento and is UP’s primary route down the San Joaquin Valley.
- The Sacramento Subdivision is the former WP line from Sacramento to Stockton.

## Exhibit 9: Sacramento Area Rail Lines



**Rail Freight Yards.** The J. R. Davis Yard at Roseville (commonly referred to as Roseville Yard) served as SP's major classification and service facility in Northern California and fulfills that same role in the merged UP system. There are about 1,000 total employees. Davis Yard is over 6 miles long and covers 780 acres, bridging Sacramento and Placer counties. The yard was extensively rebuilt in 1997-1999 at a cost of \$142 million.

**BNSF Trackage Rights.** As a condition of the 1996 UP/SP merger, BNSF Railway (BNSF) obtained extensive trackage rights over UP's former SP and WP routes covering most of the SACOG area network. BNSF intermodal trains between the Port of Oakland and points east (e.g. Chicago) use UP trackage from Oakland to Sacramento and Sacramento to Bakersfield. This practice puts BNSF double-stack trains through urban Sacramento. BNSF trains of all kinds between Southern Oregon and California or the southwest, but chiefly manifest (carload) freights, use the Sacramento Subdivision to link BNSF lines south of Stockton to the BNSF line north of Keddie. Such a BNSF freight would thus pass through urban Sacramento as well. BNSF trains between Northern California (e.g. originating at Richmond or Stockton) and Denver (or points east) can use the Sacramento and Canyon Subdivisions through the Central Corridor.

**Sierra Northern.** Beginning in 2003, the Sierra Northern Railway combined the former operations of the Sierra Railroad Company (which formerly operated between Oakdale and Tuolumne) and the Yolo Short Line (which operated between Sacramento and Woodland, and south of Sacramento to Willow Point, both on former Sacramento Northern lines). Sierra Northern's operations in West Sacramento and the port area are currently handling roughly 2,200 cars annually. Commodities include lumber, dry and liquid agricultural chemicals, ammonia, rice, paper, and steel. Sierra Northern connects with both UP and with BNSF via trackage rights for this traffic.

Sierra Northern has also begun serving transloading operations at the former McClellan AFB. Last year Sierra Northern handled over 1,600 carloads of freight at McClellan, most of it lumber, minerals, and other industrial products. This business has grown steadily, and is taking long-haul truck traffic off the region's highways.

**Rail freight data.** Rail freight tonnage in the SACOG region is dominated by basic commodities. The tables below gives estimated carloads and tons for 2003 and forecast carloads and tons for 2020, along with trainload equivalents at 75 cars per train. Outbound (Exhibit 10), the railroads move the region's agricultural output and minerals from local sources. The region currently generates a little less than one full train of rail traffic each day (and note that those cars are not all going in the same direction). The average will rise to almost exactly one 75-car train daily by 2020.

**Exhibit 10: Outbound Rail Movements – 2003 to 2020**

Commodity	2003			2020		
	Carloads	Tons	Estimated Trains	Carloads	Tons	Estimated Trains
Field Crops	3,832	366,950	51	5,246	502,401	70
Fresh Fruits	2,160	191,760	29	2,957	262,544	39
Crushed Stone	3,520	191,240	47	4,819	261,832	64
Misc. Minerals	1,560	122,320	21	2,136	167,472	28
Dairy Products	2,000	121,960	27	2,738	166,979	37
Canned & Frozen Foods	1,480	88,160	20	2,026	120,702	27
Grain Products	1,000	86,680	13	1,369	118,676	18
Beverages	808	83,716	11	1,106	114,618	15
Misc. Foods	516	34,060	7	706	46,632	9
All Other	3,224	137,220	43	4,414	187,872	59
<b>Grand Total</b>	<b>20,100</b>	<b>1,424,066</b>	<b>268</b>	<b>27,519</b>	<b>1,949,727</b>	<b>367</b>

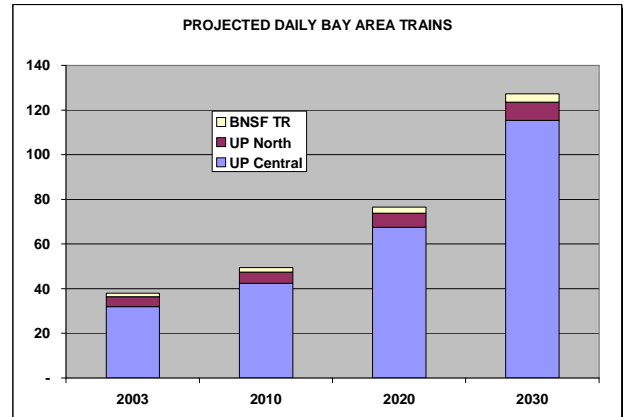
Inbound (Exhibit 11), the railroads move basic commodities such as cement, lumber, petroleum products, and chemicals that are demanded in large amounts but not produced in the SACOG region. The inbound numbers are nearly double the outbound, largely due to the inbound construction materials: cement, lumber, wood products, gypsum, etc.

**Exhibit 11: Inbound Rail Movements – 2003 to 2020**

Commodity	2003			2020		
	Carloads	Tons	Estimated Trains	Carloads	Tons	Estimated Trains
Cement	6,568	718,024	88	8,992	983,066	120
Lumber	5,840	396,800	78	7,996	543,270	107
Misc. Wood Products	3,720	317,240	50	5,093	434,342	68
Petroleum Products	2,096	178,856	28	2,870	244,877	38
Chemicals	1,505	146,676	20	2,061	200,818	27
Concrete, Gypsum, & Clay Prods.	1,548	123,232	21	2,119	168,720	28
Paper	1,480	99,360	20	2,026	136,036	27
Plastics	840	80,040	11	1,150	109,585	15
Misc. Mineral Products	600	55,920	8	821	76,562	11
Paperboard	760	51,400	10	1,041	70,373	14
Ashes	452	45,952	6	619	62,914	8
Misc. Mineral Products	600	45,160	8	821	61,830	11
Other	900	44,368	12	1,232	60,745	16
Forest Barks or Gums	480	41,400	6	657	56,682	9
Grain Products	400	32,400	5	548	44,360	7
Beverages	360	31,320	5	493	42,881	7
All Other	7,288	274,192	97	9,978	375,404	133
<b>Grand Total</b>	<b>35,437</b>	<b>2,682,340</b>	<b>472</b>	<b>48,518</b>	<b>3,672,464</b>	<b>647</b>

Purely local rail moves that both originated and terminated in the SACOG region are also almost all heavy bulk materials, accounting for an estimated 320 carloads in 2003 rising to 438 carloads in 2020.

The major source of rail traffic passing through the SACOG region is the Bay Area, for both eastbound and westbound trains. The graph at right shows the growth in Bay Area trains estimated for the MTC Regional Rail study. The great majority of the traffic is expected to pass through the Union Pacific Central Corridor, and therefore through Sacramento.



### Airports and Air Cargo

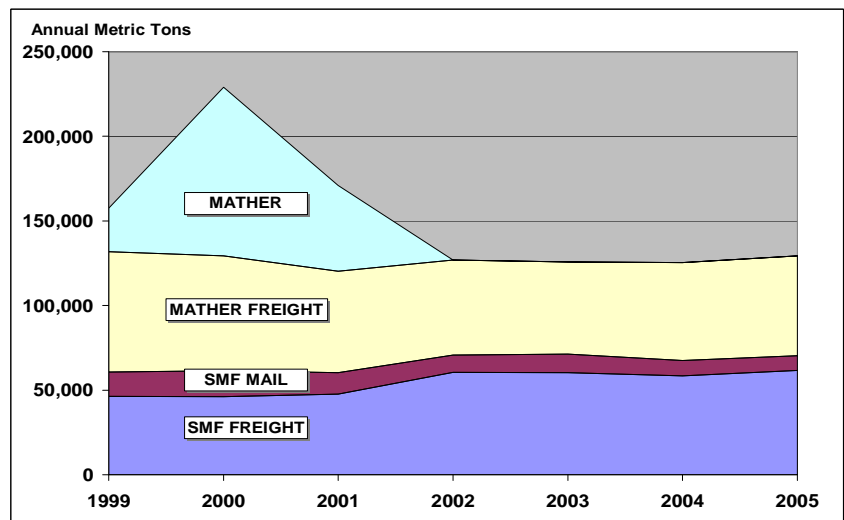
Air cargo can be divided into three conceptually distinct categories that overlap in practice.

- All-cargo operations use cargo-only planes (“freighters”) to carry freight shipments ranging from moderate-sized parcels to machinery and even livestock.
- Parcel or express carriers (e.g. FedEx Air, UPS, DHL, Airborne) handle shipments ranging from letters to moderate-sized parcels in all-cargo planes. These operations are commonly “overnight” services.
- “Belly cargo” is handled in the baggage compartment of passenger airliners, and can encompass both parcel and large air freight shipments.

Air cargo operations in Sacramento are dominated by the nation’s three leading “integrated carriers” – FedEx, UPS and DHL. In almost every case, pickup on one end of the trip and delivery on the other is done by truck.

After a decade of rapid growth in the 1990s, air cargo volumes at both SMF and MHR declined between 2000 and 2002 due to loss of mail business. (Right)

Air cargo operations at Mather Airport (MHR) currently generate approximately 965 weekly truck-trips. At Sacramento International Airport (SMF), the number of truck-trips associated with air cargo operations is estimated at 1,275 per week. These numbers are expected to decline over the next two to three years as one carrier (DHL) improves its cargo-handling capacity.



bilities at MHR, while another (UPS) constructs a new sorting facility in Rancho Cordova to supplement its existing facility in West Sacramento. In the longer run, the number of truck-trips at both SMF and MHR is expected to rise at a rate somewhat slower than air cargo volumes.

The air cargo forecasts contained in the Draft Master Plans for SMF and MHR are in need of significant revision. The Sacramento County Airport System recently engaged a consultant to update the Mather forecasts. Absent some development that would fundamentally alter air cargo operations at SMF and MHR, air cargo volumes will most likely grow at an average annual rate of 1.8 percent at both airports over the next decade. As rising jet fuel costs increasingly push all but the most time-sensitive shipments from air to surface modes of transportation, the air cargo growth rate is expected to slow to 1.2 percent between 2016 and 2032, and to 0.8 percent between 2032 and 2050.

Finding ways of facilitating the efficient movement of trucks associated with air cargo operations at Sacramento International Airport (SMF) and Mather Airport (MHR) ought to be of concern to regional transportation planning. That much of the truck movement on which the air cargo operations at the two airports depends occurs during peak early morning and late afternoon travel hours adds to the challenge. To meet their ground transport needs, each of the three integrated carriers serving SMF and MHR maintains a fleet of trucks and vans to transport incoming cargos either directly to customers or to sorting facilities where shipments are processed for later delivery. These vehicles are similarly responsible for picking up outbound shipments and conveying them back to the airports in time to be loaded onto departing flights.<sup>1</sup>

The number of truck-trips associated with the operations of FedEx at SMF would be expected to increase as air cargo volumes grow. Given the likelihood that higher cargo volumes would be accommodated by transporting more cargo to and from the airport in tractor-trailers, the actual rate of increase in the number of truck-trips will be far less than the growth rate for cargo. For reasons already alluded to, we expect the volume of truck traffic associated with air cargo operations at MHR and SMF to decline over the next two to three years. Thereafter, the study team expects that efficient integrated carriers like FedEx, UPS and DHL will contrive to maximum the use of their transportation assets. For that reason, the study team expects to see new truck-trips at MHR and SMF increase at no more than one percent per year through 2050.

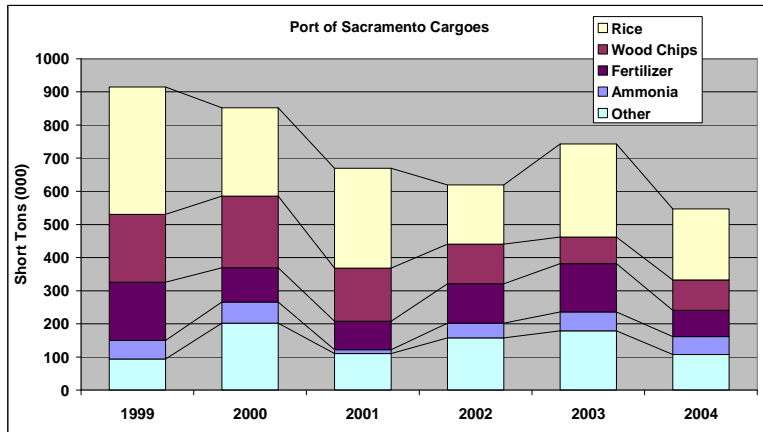
### **Port of Sacramento**

The Port of Sacramento offers bulk and break-bulk marine cargo services. The Port of Sacramento has recently undertaken a comprehensive restructuring of its governance and operations. In January 2006, the Port came under the direct management of the City of West Sacramento. Another result has been the establishment of a strategic alliance between the Port of Sacramento and the Port of Oakland. The purpose of the strategic alliance is to enhance the prospects for an economically successful Port of Sacramento.

---

<sup>1</sup> In addition to using trucks to convey inbound and outbound cargos, FedEx, UPS and DHL also rely upon small feeder aircraft to expedite express shipments to and from various Northern California communities such as Redding, Ukiah, Chico, Eureka and Fresno.

As shown below, Port of Sacramento tonnage was declining due to shrinkage in major commodity flows. A 2004 maritime demand analysis prepared for the Port Commission by Parsons Brinckerhoff concluded:



“The markets for the Port of Sacramento’s traditional base cargoes have undergone major structural changes in the past decade that are beyond the control of the Port. Moderate to severe declines have been seen in bulk rice exports, bulk grain, woodchips, logs and other commodities due to production issues in Northern California and market shifts overseas.”

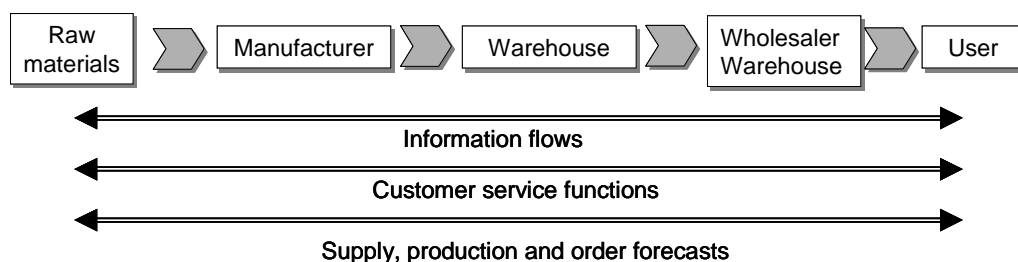
Two significant import cement project have recently been approved which promise to result in new import tonnage and revenue flows to the Port, as well as benefits to the region. In response to the region’s burgeoning construction needs, A&A and Cemex, two large cement companies, have both announced plans to build facilities at the Port.

The biggest political challenge involves the relatively shallow 30-foot depth of the Port’s shipping channel. The competing Ports of Stockton and Benicia both have channel depths of 35 feet. As part of its strategic alliance with the Port of Sacramento, the Port of Oakland has committed itself to bringing its considerable political influence to bear in lobbying federal and state government to finance the project to dredge the Sacramento ship channel to 35 feet. Over the next three years, Port of Sacramento officials plan to make several improvements to make the facilities more attractive to shippers.

### Distribution Facilities

Warehouses and distribution centers (DCs) hold inventory, re-configure shipments, and transfer freight between vehicles and modes. As intermediate handling facilities, warehouses, distribution centers, and other establishments occupy places in the supply chain between production and eventual consumption, as shown in Exhibit 12.

**Exhibit 12: Simple Supply Chain**



The term “warehouse” is the original generic term for a place where goods are held pending a future use. Distribution centers such as the one shown in Woodland (right) may perform the same functions as warehouses, but typically conduct more complex order fulfillment functions, creating mixed loads of products in response to customer orders rather than shipping in large, regular lots.



Inbound and outbound trucking at warehouses and DCs typically involve different participants with different operating patterns.

- **Inbound Trucks.** Loaded inbound trucks may belong to a supplier operating a private fleet or to a for-hire trucking company engaged by the supplier. Inbound trucks generally have delivery appointments, and may wait nearby to be certain of arriving on time to be unloaded.
- **Outbound Trucks.** Outbound shipments usually employ a different fleet of trucks and drivers to serve a different set of customers, locations, and requirements. Some DCs and warehouses have their own private fleets for outbound shipments based at or very near the DC.

### ***Rail-Truck Transloading Facilities***

Transloading facilities such as those provided by the Sierra Northern at McClellan (right) usually transfer freight between rail and truck, with storage or other handling a secondary concern. The truck trips that originate at transloading facilities are almost always full truckloads that return empty. Most transloading now occurs at private facilities with a rail spur serving the facility. Most of it is for distribution of commodities, not assembly into railcar loads.



### ***Goods Movement Decision Factors***

The demand for freight transportation is based on the need to move goods.

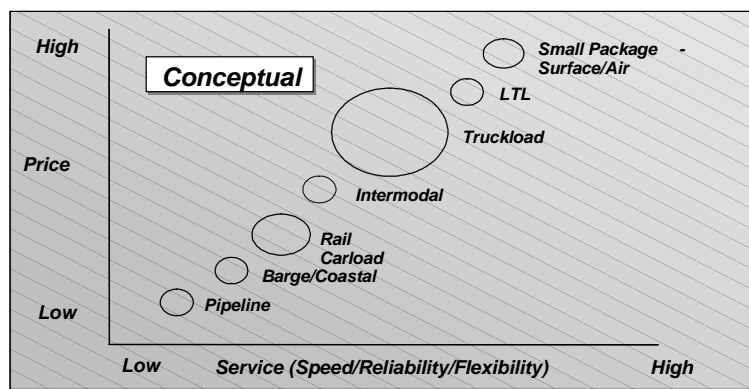
- **Population.** Basic human needs for food, shelter, clothing, fuel, and consumer goods are met through goods movement.
- **Economic Activity.** While population drives the ultimate consumption of goods and services, economic activity supplies them. The extent and the nature of economic activity affect the volume and nature of freight activity.
- **Resources.** Local resources dictate either the need to move local products to other regions, or the need to obtain products that cannot be produced locally.

- **Land use.** Industrial uses are expected to display heavy freight traffic, while residential areas would have little.
- **Modal options.** Truck is the default freight mode. Where realistic modal options exist, some shippers and consignees will find it convenient and economic to use them, decreasing the demand for trucking.
- **Shipment characteristics.** In addition to the fundamental relationship between shipment characteristics and transportation requirements, shipment characteristics change over time. Consumer goods have become smaller and lighter as technologies and materials have improved.

**Freight Customer Requirements.** Freight transportation and logistics requirements are ultimately driven by market conditions for the goods or service being delivered.

- In highly competitive markets with slim profit margins (e.g. retail supermarkets), participants are under intense pressure to minimize logistics costs while maintaining competitive service levels.
- Where profit margins are higher but competition is still stiff (e.g. retail computers), logistics performance is crucial but costs are of lesser concern.
- Where time-to-market is critical (e.g. high-fashion apparel), speed becomes foremost.
- Where product values are very low and predictable delivery is more important than speed (e.g. sand and gravel), logistics costs are driven down but reliability must be maintained.
- Where the implications for service failure are severe (e.g. “shut down” loads of parts for assembly lines), no logistics cost will be spared to deliver on time.

**Modal Choice.** Logistics professionals are concerned with obtaining the required services at the lowest possible cost and modal choice is a major tool. The chart at right illustrates the range of modal choices available and the conceptual trade-offs between cost and service.



Customers for logistics services have a very wide range of requirements and varying levels of sophistication. For years to come there will be a very large segment of the market that simply wants “better, faster, cheaper” from primary service operators/providers. In practical terms, “better, faster, cheaper” translates into a set of stringent customer demands for high-quality service:

- To provide “better” freight transportation, carriers and intermediaries alike must offer national or even global reach, e-commerce capabilities, high reliability, and strong customer service.

- To provide “faster” transportation, carriers must invest in new equipment, new terminals, and new operating systems.
- To provide “cheaper” transportation, carriers must continuously reduce costs and compete strenuously for new business.

**Potential Diversion of Highway Trips.** One issue where logistics choices and modal choices come together is the potential for diversion of over-the-road truck trips to other modes. The possibility of shifting truck moves to rail or barge has been raised with particular application to international container movements to and from the Port of Oakland. The concept of rail service has been embodied as the California Inter-Regional Intermodal System (CIRIS) and has been the subject of multiple studies. The key findings of these studies were:

- There exists a market for rail intermodal service to the Port of Oakland, primarily in the Stockton, Modesto, and Fresno areas, with volume for daily train service.
- A rail intermodal service cannot compete head-on with trucking, and would require a permanent operating subsidy.
- The critical issue facing regional rail service in California is rail line capacity. Railroads would not be willing to discuss regional shuttle services without an overall public-private program to increase rail capacity.

There has been interest in barge service between the Port of Oakland and Sacramento. Despite continued speculation and interest the barge option has not received any detailed analysis in recent years. The available studies conclude that a barge service would also require an operating subsidy. There are also issues of scale economies and port capability issues to be addressed.

**Rail-Truck Transloading Opportunities.** The most promising near-term opportunity to shift long-haul truck traffic to rail is rail-truck transloading. Rail cars carry 70 to 125 tons of freight, the equivalent of 3 to 5 truckloads. Using rail carload service for the long-haul trip into the SACOG region and distributing the goods locally by truck takes long-haul truck moves off the highway. Local delivery moves will still be made by truck, so there may be little difference in local street traffic. Rail-truck transloading is particularly effective for lumber, stone, structural steel, wallboard, and other building materials. Inbound agricultural chemicals, fertilizers, and minerals can also be successfully transloaded.

### ***Regional Goods Movement Issues & Needs***

**Survey of Jurisdictions.** An important part of the Sacramento regional goods movement study has been an outreach effort to affected jurisdictions through written surveys. Overall, the survey returns indicated that the trucking issue ranked as the worst problem by jurisdictions is street deterioration. (Exhibit 13)

### **Exhibit 13: Jurisdiction Survey Issue Ranking**

Issue	Average Ranking out of 5
Street Deterioration Due to Trucks	3.7
Construction Trucks	3.3
Truck Parking	3.3
Truck Noise	3.1
Truck Congestion	3.0
Long Haul Trucks	3.0
Truck Air Pollution	2.9
Neighborhood Intrusion by Trucks	2.8
Short Haul, Local Delivery Trucks	2.6
Truck Traffic Safety	2.5
Nighttime Truck Operations	2.3
Hazardous Materials Hauling	2.2

On average the cities ranked construction trucks, truck parking, and truck noise as their next biggest concern. This is likely a reflection of the region's considerable growth that has occurred with new construction all over the Sacramento Valley. Lincoln, Roseville and Elk Grove are three of the fastest growing cities in the nation with Lincoln being the fastest growing city in California for 2005.

Other issues raised by the jurisdictions in the surveys include problems with trucks using back roads to bypass I80, SR65, US50, and other major corridors. Other issues noted include congestion that occurs on at-grade crossings for railroad tracks when trucks cause additional traffic queues. Some jurisdictions had issues with the aggregate number of trucks and logging trucks.

**Truck Routes.** The current truck routes in the SACOG region are the result of state, county, and city actions that have not been coordinated or reconciled. Posted truck routes and streets restricted to trucks are two sides of the same coin: a system of permissible and non-permissible routings that truckers must know in order to obey. Truckers typically use and obey posted truck routes as much as possible, but they encounter three kinds of problems:

- Inadequate truck routes make it difficult for truckers to serve customers while obeying the restrictions.
- Inadequate signage makes it difficult for the trucker to stay on a truck route or avoid restricted streets.
- Lack of connectivity between truck routes in adjacent jurisdictions or between truck routes and freeway ramps, makes it impossible for the trucker to follow an approved route.

Well-chosen and well-marked truck routes are a critical tool in allowing efficient trucking to co-exist with sensitive communities. A regional perspective on truck routes would eliminate some of these problems, as would standard signage and periodic field surveys to ensure that signage is current and visible.

**Truck Parking.** Due to a shortage of legal parking for tractors and trailers in their cities and nearby, many communities are experiencing tractor and trailer parking in residential zones and

illegal parking of tractors and trailers in commercial and industrial zones. Exhibit 14 lays out the typical relationship between parking status, location, and significance to the community.

**Exhibit 14: Parking Location Issues - Conceptual**

	SIGNIFICANCE/PRIORITY		
PARKING STATUS	NO PROBLEM	MINOR NUISANCE	MAJOR NUISANCE
LEGAL	COMPANY LOT IN INDUSTRIAL AREA	DRIVER'S PROPERTY IN RESIDENTIAL AREA	PUBLIC STREET IN RESIDENTIAL AREA
QUESTIONABLE	VACANT LOT IN INDUSTRIAL AREA	RURAL ROADSIDES	PUBLIC SCHOOL PARKING LOT
ILLEGAL	?	URBAN DOUBLE PARKING	BLOCKING COMMERCIAL DRIVEWAYS

Potential approaches to the truck parking problem include:

- Municipal or county ordinances to control the worst offences.
- Stepped-up enforcement and compliant hotlines.
- Permit systems.
- Zoning changes.
- Development of truck parking lots

**Congestion.** Congestion reduces trucking productivity and reliability, and forces trucks into close contact with passenger vehicles. Commuters experience congestion primarily in the morning and evening hours; truck drivers may experience congestion all day long. Labor costs rise as working conditions deteriorate. Congestion also reduces the productivity of the truck itself, diminishing the earning power of a costly asset, and increases emissions. Congestion’s impact on reliability and predictability is less obvious but can be equally important. Freight movements of all kinds must be reliable and predictable. While much is made of “just in time” deliveries of critical assembly line parts, timely delivery of ready-mix concrete to a construction site is equally critical to the people involved.

**Circuitry.** Legacy highway and street systems are almost inevitably ill-suited for at least some emerging development and traffic patterns. The problems are magnified by geographic barriers. The most obvious problem with a geographic barrier in the SACOG region is the American River east of Sacramento. East of Interstate 80 (right), the American River is bridged at:

- Fair Oaks Blvd. (H St./J St.), a 4-lane surface street passing through commercial/residential areas.
- Howe Ave., a 4-lane arterial with a US50 interchange passing through commercial residential areas.



- Watt Ave., a major commercial/residential 4-lane arterial with US50 and I80 interchanges.
- Sunrise Blvd./Sunrise Ave., a 6-lane arterial through commercial/residential areas linking US50 and I80.
- Hazel Ave., a 4-lane arterial through residential areas.
- Folsom Blvd./Folsom Auburn Road, a 4-lane arterial through mixed urban and rural areas.

When most of the legacy highway system was put in place 30 – 40 years ago there was relatively little need for large trucks to link I80 and US50. With the expansion of urbanized development, business, and industry along both routes, however, the need for trucks to link them has increased enormously. These and other missing links in the highway network result in more trucks on surface arterials and more trucks through major interchanges such as I80/US50 in Sacramento.

**Truck Safety & Accidents.** Truck-involved collision data from 2002 through 2005 were obtained from the California Highway Patrol. A total of 3,084 truck-involved collisions located on the major freeways (I5, I80, US50 and US99) within the SACOG region were analyzed. The CHP data also gives the detailed locations of the collisions. Locations with a larger number of collisions are:

- I5 near US50
- US50 near I5
- US50 between 65th Street and State College
- I80 between SR244 and Madison Ave.
- I80 between Antelope Rd and Riverside Ave/Auburn Blvd.
- I80 between Douglas Blvd and Atlantic St.
- I80 between SR174 and Magra Rd.
- I80 between Drum Forebay Rd and Blue Canyon Rd.
- US99 between Mack Rd and Florin Rd
- US99 between Fruitridge Rd and 12th Ave (highest collision location)
- US99 between 12th Ave and I5/El Centro Rd.

**Rail Survey Issues.** The city of Lincoln and West Sacramento stated that they experience significant rail issues stating that there have been both congestion and noise issues associated with railroad operations. West Sacramento experiences significant issues with at-grade crossings at 15<sup>th</sup> Street & Jefferson and Stone Blvd. and Jefferson having significant problematic stoppages and train whistle noise complaints. The City is working with the Federal Railroad Administration to have those two sites designated as “Quiet Zones.” There is an unfortunate tradeoff between rail horn noise and safety. In some cases, efforts to keep trains from blowing horns at crossings has led to increased accidents and deaths.

**Rail Grade Crossings.** The places where rail freight movements and regional/community concerns are most likely to meet are at grade crossing between railroads and surface streets. Vehicular and pedestrian delays and safety concerns at rail grade crossings are a perennial problem and will be exacerbated as both rail freight movements and vehicular traffic continue to grow.

Separating rail grade crossing is inherently costly and often disruptive to the community nearby. Grade separations are typically multi-million dollar projects. Railroads prefer grade separations for safety, liability, and maintenance concerns. Since trains already have the unquestioned right-of-way and do not stop at grade crossings, separating the crossing has little benefit for rail operations. Railroads therefore have little incentive to pay for a grade crossing separation project, and the public sector usually funds it.

**Rail Capacity and Growth.** Over most of the last 50 years the railroads have had excess capacity due to over-building before WWII and steady productivity increases. Railroads responded by rationalizing their networks, shedding excess capacity, and concentrating traffic on fewer routes. In the last decade the situation has reversed. In the face of steady freight growth, particularly in international and domestic intermodal business, railroads are now increasing traffic and capacity on the remaining routes. For the SACOG region this new era of rail freight growth translates into more trains into, out of, and through the region on existing lines. Union Pacific is now more likely to upgrade its two north-south lines through Sacramento than to abandon one of them.

**Passenger Rail “Conflicts”.** In addition to the freight operations, a number of daily passenger trains are operated in the region by Amtrak and the Capital Corridor. This passenger traffic limits the ability of some rail routes to host increasing numbers of freight trains in the future.

### ***Lessons from Case Studies***

The study team conducted a number of case studies for this project, including:

- IKEA
- Los Rios Community College District
- Sacramento Bee
- Teichert Aggregates
- Whole Foods Market

The case study interviews yielded a wide range of insights into the concerns of regional businesses that rely on goods movement.

By far the most common complaint among the businesses and institutions interviewed for the SACOG Goods Movement Study involved the issue of transporting goods between the Interstate 80 and Highway 50 corridors. Likewise, for businesses in the Highway 50 corridor, improved access to southbound Highway 99 is frequently cited as a high priority. Truckers also complained about multiple jurisdictions imposing incompatible rules and regulations about the size and weight of vehicles that could legally travel on routes that pass through several jurisdictions.

Truckers display a remarkable talent for resourcefulness and adaptability in coping with the challenges they face while negotiating the region's streets and highways. When provided sufficient discretion, local delivery truck drivers will normally find the most convenient, quickest routes to their assigned destinations. Ironically, drivers whose routes are determined by computer programs sometimes find that strict adherence to these routes is not conducive to efficient, timely delivery. Construction crews laying light-rail tracks in downtown Sacramento or trains blocking grade crossings in midtown are sometimes not factored in to such programs.

A good deal of information related to traffic conditions is shared at the street level. For example, drivers of delivery trucks and vans calling on the Meridian Plaza building that houses the offices of SACOG seem to share advance knowledge of major trade shows at the Sacramento Convention Center which typically bring a large influx of tractor-trailer rigs. Delivery truck drivers – and even the valet parking attendants at Spataro's restaurant – have learned how best to cope under the circumstances. Drivers know when the ideal time is to make deliveries at certain locations, just as they know when to avoid certain intersections or streets during specific hours.

In some locations, deliveries generally occur late at night or in the very early morning in order to avoid congestion or to comply with local traffic laws. The stores in the Westfield Corporation's Downtown Plaza, for example, are primarily stocked with goods that mostly arrive between four and seven in the morning. This "solution" is necessary because of the heavy volume of traffic on adjacent street during the day and because of aggressive policing of parking regulations. Major deliveries at the two Macy's stores in the mall involve trailers hauled in tandem from a regional distribution center in Hayward. With Macy's loading docks located in a basement parking area, only one trailer at a time can be moved. The other must be left on the street. As the trailer would be ticketed during normal business hours, deliveries are restricted to the very early morning.

Several of the case studies revealed that deliveries originating from distribution centers outside of the SACOG region arrive during the night. IKEA, for example, turns around delivery trucks serving its new West Sacramento store within two to three hours in the early morning hours so that they never have to deal with rush-hour congestion on regional freeways. The goal of avoiding having to idle in rush hour traffic sometimes has ironic consequences. The Whole Foods Market in Sacramento is partially supplied by a truck arriving every morning by six from a distribution center in the Bay Area.

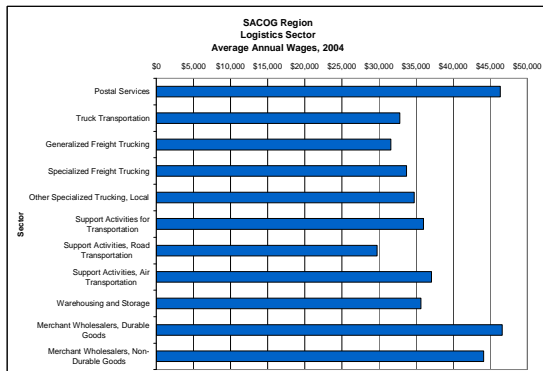
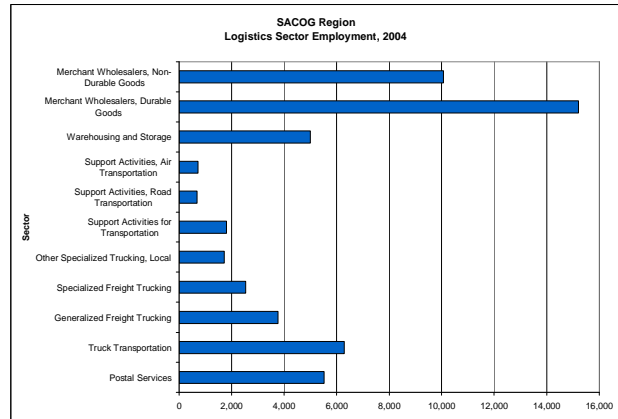
### ***Goods Movement Economic Impacts***

**Regional Population and Employment.** Projections of unprecedented population growth and the effect on transportation and air quality led SACOG, in partnership with Valley Vision, to initiate the Blueprint Transportation and Land Use Study. The three-year effort resulted in the adoption of the *Preferred Blueprint Scenario* in December 2004. This scenario supports smart growth principles, including more housing choices, infill, redevelopment, and a balance of jobs and housing in areas of the region.

**Logistics Sector.** The logistics sector is made up of a variety of industry groups that involve the shipping, receiving, processing, and storage of goods. These sectors combined accounted for 53,000 jobs in the region in 2004, or 5.8 percent of the region's total employment. Employment

in the wholesale sector accounts for 45 percent of the logistics sector total, with truck transportation the next largest group with more than 6,000 employees or approximately 11 percent. (Right)

Logistics employment in Sacramento County is a relatively low share of the total, due most likely to the higher share of government and “office” sector employment in Sacramento itself. Logistics employment in Yolo County is a much higher share, reflecting the concentration of logistics activity in West Sacramento and adjacent areas.



Logistics sector employment in the region yields annual payrolls of \$2.1 billion. Within the logistics sectors, the average annual wage and salary (left) was relatively strong, ranging from \$30,000 for support activities to \$47,000 for positions in wholesale.

A key question facing the SACOG region is whether and how to encourage the growth of the logistics industry. Growth in logistics businesses beyond

those required to support the region’s own production and consumption will add jobs. This may be an attractive strategy where the regional faces concerns about loss of jobs in agriculture and resources, which were traditional sources of entry-level employment. Growth in logistics business using the SACOG region as a hub, however, will also result in increased consolidation, distribution, and transloading movements.

In addition to the direct employment from the logistics group, many goods-producing industries rely on these sectors to transport finished goods and raw materials. These sectors include manufacturing, construction, and natural resources and mining. In the SACOG region, the goods-producing sectors represent 14 percent of the region’s total employment.

Although manufacturing does not represent an area of specialization, the region continues to serve as a lower cost alternative to the Bay Area. The trend in manufacturing to reduce inventory and rely on just-in-time delivery of goods and materials demands a transportation network that is fast and reliable. The importance of regional transportation facilities and service is critical to the success of these industries.

**Industrial Real Estate Trends.** Overall demand for warehouse/distribution in the region grew by an average of 20.6% between 2001 and 2005. It is interesting to note that employment growth for this sector during this period showed a 0.5-percent decline, indicating that the estimated space demand for this use may be understated at 10,000 square feet per employee. This result confirms industry experience that fewer employees are required for warehouse/distribution

activities as processes become more automated and mechanized handling equipment replaces manual handling.

EPS work in evaluating modern warehouse distribution facilities indicates that facilities are getting much larger (500,000 to 1,000,000 square feet) and more highly automated. Previous rules of thumb were 750 to 1,000 square feet per employee for "industrial" uses including manufacturing and assembly. Case study work in Stockton and Woodland in other projects points toward much lower employment densities than smaller, older, and less automated logistics facilities.

Space demand for warehouse/distribution in the market area through 2030 has been estimated using employment projections for the region. It is further assumed that this use requires 10,000 square feet per employee and generates a need for land with a floor area ratio (FAR) of 0.40, common for new warehouses and distribution centers.

Based on this calculation, the demand for additional warehouse/distribution through 2030 would total more than 29 million square feet, with land requirements of approximately 1,700 acres. (Exhibit 15)

**Exhibit 15: Estimated Space Demand 2004-2030: Warehouse/Distribution**

Industry	Estimated Total Employment Growth (2004-2030)	Percentage of Employees Using Warehouse/Distribution Space	Number of Employees Using Warehouse/Distribution Space	Estimated Gross Space Demand Sq. ft.	Acres [1]
<b>Assumptions</b>				<i>10,000 sq. ft. per employee</i>	<i>0.40 FAR</i>
<b>SACOG Region</b>					
Agriculture/Mining	-3,800	0.90%	-34	-342,000	-20
Construction	24,100	1.00%	241	2,410,000	138
Manufacturing	-1,900	4.80%	-91	-912,000	-52
TPU	15,400	4.80%	739	7,392,000	424
Wholesale Trade	9,200	5.00%	460	4,600,000	264
Retail Trade	50,700	0.80%	406	4,056,000	233
Services	189,300	0.50%	947	9,465,000	543
Government	93,100	0.30%	279	2,793,000	160
<b>Total Adjusted Market Area (Rounded) [2]</b>	<b>376,100</b>	<b>1.30%</b>	<b>2,946</b>	<b>29,462,000</b>	<b>1,691</b>

Sources: SACOG Projections of Employment, Population, Households, and Household Income in the SACOG Region for 2000-2050 and EPS.  
 [1] Reflects net developable acreage, with an FAR of 0.40.

**Preliminary Land Use Implications.** Industrial space for goods movement industries in the SACOG region is concentrated along the region’s major transportation corridors, including I-80, I-5, and Highways 50 and 99. As the cost and availability of land increases in the urbanized areas, industrial and warehouse activities are being located in outlying areas that offer lower cost land with potential for expansion.

Many jurisdictions in the region are engaged in the process of General Plan updates, including the City of Sacramento, Sacramento County, Rocklin, Rancho Cordova, Yolo County, and Lincoln. Transportation planning is a major component of the analysis being undertaken. Most jurisdictions in the region have adopted smart growth principles and are incorporating these concepts into their long range planning efforts and development processes. The City of Sacramento has a particular challenge in transportation planning because of limited options for truck access and parking when dealing with an existing and generally older infrastructure.

Although regional economic development leaders have shown interest in retaining industrial uses in the more urbanized areas of the region, the push for redevelopment of infill areas with higher value uses has fiscal implications. Compared to warehouse use, the property taxes generated and associated land values are substantially higher when the land is used for higher density office development, retail, or residential development. Although high density office development has been shown to generate the highest tax base among these uses, the sales tax revenue generation from retail uses is generally considered the most desirable to local government. Since Proposition 13 reduced local property tax revenues, sales tax revenues from retail activities are viewed even more favorably.

The estimated land demand for warehouse/distribution previously discussed could have major implications for land use decisions in the region. As jurisdictions in the region engage in General Plan updates and land use alternatives, care should be taken to ensure that such factors are considered and that adequate transportation planning is included in these processes.

**Policy Considerations.** Adoption of Smart Growth principles for the region will encourage the redevelopment of infill sites in the urban core and support less outward expansion of growth in the future. As the density of the urban core increases, however, the transportation infrastructure rarely keeps pace. Buildings get higher, but streets are no wider than before. The trend toward mixed-use and live/work developments can exacerbate the problem by putting land uses with differing freight transportation needs in the same development, if not the same building. Smart Growth concepts sometimes favor “livability” over functionality, and may not make explicit provision for efficient truck access.

Increasing distances between distribution centers and the market for goods in population and employment centers of the region may result in increased fuel costs, longer travel times, and increased emissions. Another important consideration is the potential effect on the local economy if transportation and goods movement industries decline in the region. The possible loss of jobs for unskilled or marginally educated workers in the region would result in a lower standard of living for many workers if comparable employment is not available.

In considering these implications and recent trends in land use and market-driven location decisions, SACOG and other stakeholders in the region may need to consider alternatives to support the retention of goods movement activities in the region. There are three fundamental approaches to promoting the coexistence of urban development and urban goods movement.

**Urban hubs with urban line-haul access.** Placing a truck service hub in the urban setting should, theoretically, minimize the total VMT required to meet urban goods movement needs. The hub would require efficient access for larger line-haul trucks (semis) and would perform local pickup and delivery with smaller trucks. There are two basic drawbacks to this approach.

- **Compatibility of trucking hubs with urban development.** In terms of land cost, environmental issues, esthetics, tax yield, and localized congestion, logistics hubs are unlikely to be acceptable in or near commercial and residential areas in an urban setting.
- **Ability to capture significant trucking activity.** Urban settings require service from many different kinds of trucks and trucking operations, some daily and some

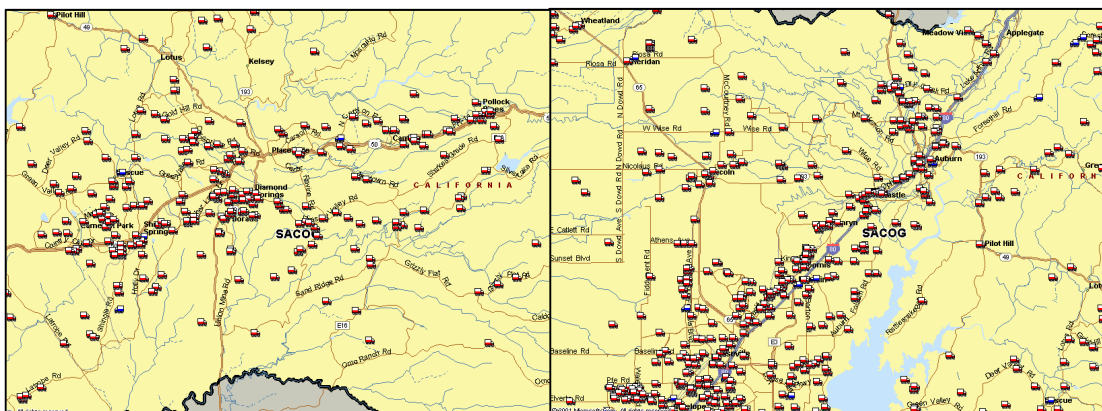
only annually. A large portion of the urban truck trips are made by private fleets that do not have trucking fleet locations separate from their production or distribution centers. Planners would likely find that urban trucking hubs would accommodate only a minority of the trucking operations.

It is perhaps instructive that over the previous decades the trend have moved away from this approach. Trucking operations that were located “downtown” have generally moved out to the periphery.

**Peripheral hubs with urban delivery access** The status quo is peripheral hubs, with pickups and deliveries made in smaller vehicles where possible. This approach allows for more compatible adjacent land uses and minimizes the intrusion of semis into the urban setting. The urban delivery access, however, is often inadequate. Goods movement into and out of the urban area is awkward at best, with a mix of unanticipated truck types attempting to negotiate legacy streets and loading areas. The status quo is not without its challenges. As noted above the tradeoff for locating logistics facilities in more compatible, lower cost areas may be more total VMT if one trip to the urban core is replaced by several trips in smaller trucks. The development of peripheral hubs is also consistent with the regional nature of commercial trucking. An LTL trucking facility in West Sacramento is serving much of the SACOG region, not just urban Sacramento. If the same hub were placed within the urban core, trips to Woodland or Rocklin would have to travel in and out. The same considerations apply to private distribution centers and their delivery fleets.

**Corridor Strategies.** A corridor strategy might be regarded as a compromise. The maps in Exhibit 16 clearly show the tendency of trucking firms to locate along major highway corridors. Land use policies that reserved space adjacent to freeways for logistics-related uses would effectively create corridors of “periphery” through the region. Recent confirmation of the health risks associated with diesel particulates and other vehicles emissions and longstanding concerns over noise provide two additional reasons to consider creation of industrial preserves or enclaves along freeways instead of allowing residential or commercial uses.

**Exhibit 16: Trucking Fleets Along Highways**



## **Next Steps**

Phase 2 of the Goods Movement Study is intended to be an analytic exploration of problems, options, and scenarios for the SACOG region. In Phase 2, the study will need to delve deeper into the major goods movement issues identified in Phase 1. Phase 3 will then lay out policies and action plans.

**Urban truck movements.** It is clear from the survey results and the study team's observations that the most troublesome aspect of goods movement is the difficulty of moving trucks into, out of, and through the urbanized part of the region. This problem is manifest as pavement deterioration, traffic tie-ups, noise, air quality, congestion, neighborhood incursion, and truck parking problems. The problem is most acute in the older, denser areas with legacy infrastructure. The challenge will be to understand the problem in detail, identify best mitigation practices, and custom tailor solutions for SACOG communities.

**Planning for goods movement.** Freight transportation is not ordinarily part of the urban planning curriculum and is an afterthought at best in most planning efforts. Whether the issue is truck routes, rail corridors, or flight paths, there is a pressing need to incorporate goods movement issues into future regional planning efforts.

**Land use tradeoffs.** As noted in the report the current pattern is for goods movement facilities – trucking fleets, DCs – to locate farther from the urban core in search of low-cost land and freedom from restrictions. While this tendency is thought to increase total truck VMT, there is a clear need for data collection and modeling to verify and inform the tradeoffs being made. If a land use plan opens up former industrial sites to residential and commercial development, what is the *net* impact on passenger and freight VMT and emissions? While the report offers some general suggestions regarding the circumstances under which peripheral locations would be preferable, more work is clearly needed to investigate local and regional circumstances.

**Coexistence with rail freight growth.** SACOG and its member jurisdictions have little influence over the location and use of rail lines. Union Pacific, BNSF, and Sierra Northern will continue to solicit desirable freight and move it as efficiently and expeditiously as possible within their own systems. Mitigating community impacts, particularly at grade crossings, will require cooperation between the railroads and the affected jurisdictions. There is an excellent model for a regional grade separation improvement plan in the Seattle area FAST corridor project.

**Development of logistics businesses.** Some logistics businesses are already located in the SACOG region and others will be attracted by local market growth, highway and rail access, and strategic location. The question facing the region is whether to seek and encourage logistics-based economic development. The rewards are good entry-level jobs with attractive compensation and opportunities for advancement. The costs are additional freight movements not required by local production or consumption.

**Port of Sacramento's future.** The Port of Sacramento is at a crossroads. Previous staple commodity movements have diminished and neighboring land uses are less and less compatible with marine cargo operations. At the same time, the Port has a new governing body and a new strategic alliance with the Port of Oakland intended to usher in an era of growth. At issue is the poten-

tial strategic and economic value of the Port to the region and the kind of cargo growth that might be expected under the new regime.

**Air cargo growth.** For a variety of reasons discussed in the report air cargo growth at SMF and MBR has been uneven, and slower than previously expected. At a minimum, it may be time for new detailed forecasts and revised strategic plans to match the region's aims with current and expected industry conditions.

**Data and information collection.** In dealing with all of these issues SACOG and other regional policy makes in transportation and land use would be well served by targeted efforts to fill data gaps and provide a stronger foundation for analysis. A data and information collection strategy could be linked to specific concerns of member jurisdictions and the requirements of modeling efforts in Phase 2.