3. Goods Movement Issues and Impacts

As part of this study, the team reviewed relevant goods movement documents and studies pertaining to the South Bay. The largest ongoing effort is the *Multi County Goods Movement Action Plan* (MCGMAP) led by Metro. The MCGMAP identifies goods movement issues and constraints facing Southern California:

- Community concerns about environmental impacts
- Port and airport facility efficiency, capacity, and throughput
- Highway congestion, delay, and maintenance
- Truck access and turnaround times at goods movement facilities
- Mainline rail capacity
- Rail intermodal capacity constraints
- Grade crossings
- Truck safety
- Changes in regional shipping and transloading
- Shifting of land uses and development patterns
- System-wide goods movement data and information
- Security
- Availability of funding
- A disparate goods movement system and community[7]

As a smaller geographic unit of Southern California, the South Bay faces the same issues. This section discusses this issues in the context of the growth of goods movement, local goods movement issues, safety, facility obsolescence and deterioration, and environmental issues.

3.1 Local Goods Movement Issues of the South Bay

3.1.1 Goods Movement Survey of the South Bay Cities

In 1999, a goods-movement survey of the South Bay Cities was conducted. The surveys asked Cities to identify major truck generators; rank truck-related impacts; and identify problems on arterial streets, intersections, and at-grade freight rail crossings.

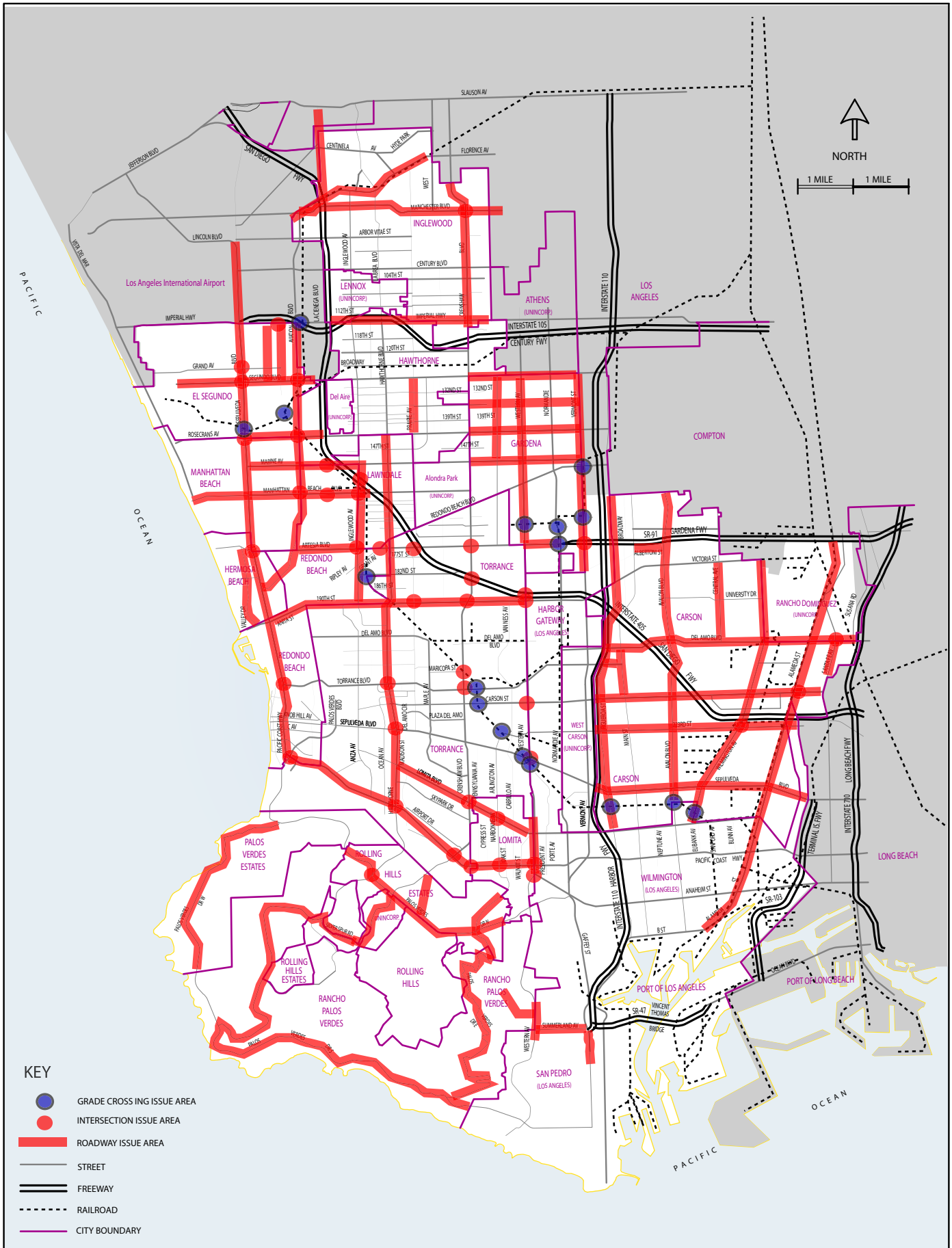
For the 2007 South Bay Goods Movement Study, a similar survey was distributed to city staff, officials, and councilpersons. The survey was emailed in December 2006. The intent was to update the 1999 information, and determine if changes have occurred with respect to goods movement in the South Bay. City officials of 13 of the 16 jurisdictions responded. The results of this survey are provided in Table 15. Specific roadways, intersections, and highway-rail grade crossings identified as having goods movement issues, are shown in Figure 27.

[7] *Multi County Goods Movement Action Plan* "Final Technical Memorandum 3: Existing Conditions and Constraints"

Table 16
South Bay City Goods Movement Survey Results

Jurisdiction	Most Severe Truck Impacts	Highest Reported Level of Impact	Truck Impacted Arterial Streets Goods Movement	Truck Impacted Intersection Issues	Other Trucking/Goods Movement Related Issues
Carson	Congestion	5	Trucks use up much of the capacity at intersections and create conflicts at mid-block driveways along arterials. Wilmington Av between 223rd St and Carson St, Avalon St, Del Amo, Sepulveda, and Wilmington are problematic.	Trucks turning at intersections use up several lanes while swinging wide to make the turns. Trucks periodically block intersections while stopped in congested traffic. Trucks use up a disproportionate share of intersection capacity. Intersections are: Wilmington/23rd, Del Amo/Santa Fe, Carson/Alameda.	Trucks routinely use residential streets as access routes. Trucks routinely use the public streets as a stacking area. Parked trucks create visibility restrictions at driveways and intersections.
	Neighborhood Intrusion	5			
	Parking	5			
	Safety	5			
	Street Deterioration	5			
	Hazardous Material	5			
El Segundo	Street Deterioration	4	Truck traffic is concentrated into the El Segundo Blvd corridor due to construction on Rosecrans Ave. Construction and regular truck traffic are congesting this route.	Northwest corner of Sepulveda Bl/ Grand Av. Trucks have hit the signal post and encroach into eastbound Grand Av traffic lanes when turning right from Sepulveda Bl due to inadequate curb return radius. Trucks making westbound right turns at the intersection of El Segundo Boulevard at Aviation Boulevard damage signal equipment on the Northeast corner. Trucks making an eastbound right turn at the intersection of Nash Street and Imperial Hwy mount the curb and damage the storm drain structure. Trucks entering Imperial Highway from cargo centers north of the intersection of Imperial Highway at Hughes Way conflict with commuter traffic leaving the Boeing Facility. An exclusive signal phase for the cargo trucks is needed.	There is a general on-street loading problem on the streets and alleys in the Smoky Hollow Specific Plan area of the city.
Gardena	Street Deterioration	5	Artesia from the terminus of the 91; Redondo Beach, length of city; Rosecrans length of city	Artesia during the pm peak hours	Cut-thru truck traffic on signalized residential streets, results in excessive speeding, noises and accidents. On street loading creates congestion and public safety hazards and is a blighting influence and affects the efficiency of other businesses.
	Pollution	4			
Hawthorne			Some of the trucking facilities are located within close vicinity of arterial streets. Truck traffic generated by these facilities frequently diminish lane and turn lane capacity. Slower movement and larger turning radius of truck traffic also decrease the	Same as street problems.	Some truck facilities are located within close proximity to major intersections in the city. Truck traffic often times add to congestion and minimize storage capacity especially at turn lanes. Some of the facilities are located at the NW, NE, and SW corners of El Segundo and Crenshaw Blvd.
Hermosa Beach			Some problems if occurs during peak periods. Narrow streets in beach community; turning radii difficult; off-street loading non-existent; double loading rampant		Residential cut-thru truck traffic from PCH to residential areas and commercial loading in lower pier/downtown.
Inglewood	Parking	3	Vicinity of I-405 Fwy. and Manchester Blvd. and Florence Blvd.	Truck traffic is not usually excessive, but substandard streets/street intersections and badly located freeway ramps (Manchester and Florence Blvd.) make normal truck traffic difficult to accommodate.	Some cut-through traffic on non-truck route streets to avoid problem area in vicinity of I-405 Fwy.
	Street Deterioration	3			
	Noise	3			
Lomita	Congestion	4	Trucks add significantly to traffic on PCH, Western Avenue, and Lomita Blvd.	Truck attempting to back into a small driveway - blocks traffic. PCH/Western, PCH/Narbonne, Western/Palos Verdes Drive North, Western/Lomita, Lomita/Narbonne.	PCH onto Pennsylvania southbound, difficult to access creates bottleneck of traffic and often results in trucks using residential streets to maneuver. On-Street loading is a problem for several businesses.
	Street Deterioration	4			
	Noise	4			
	Pollution	4			
Palos Verdes Estates	Street Deterioration	3			NO.
Rancho Palos Verdes	Safety	3	Trucks related to construction activity are sometimes a problem.		
	Street Deterioration	3			
Redondo Beach	Street Deterioration	5	PCH/Torrance Bl - truck turning radius is larger than intersection. Drivers must illegally use opposing lanes to complete turns. Inglewood and Manhattan Beach Ave; Manhattan Beach Blvd. and Redondo Beach Ave.; Redondo Beach Ave. and Marine Ave.	Inglewood/Manhattan Beach Bl & Inglewood/I-405 on-ramps. Excessive traffic , vehicle and trucks, results in major congestion in this area.	Cut-thru traffic in residential areas; on-street loading (trucks park in two-way left turn lanes to unload); off truck route - ignore signs restricting routes and don't map out routes. Trucks not using or going to/from closest truck routes.
	Noise	4			
	Pollution	4			
Rolling Hills			No public streets		
Rolling Hills Estates					"Run-Away" turn-out lane. NB, SE leg of intersection of Palos Verdes Dr. N and Hawthorne Blvd. Prior instances of facilities to capture run-away vehicles.
Torrance	Street Deterioration	4	Crenshaw @ PCH, Lomita Blvd., Maricopa, 190th, 182nd , and I-405 ramps (north- & southbound),	Trucks tend to slow the progression of traffic through an intersection and cause undue delay.	Cut-thru traffic, street/roadway deterioration, noise/air pollution.
	Noise	4			
	Pollution	4			

Notes: (1) Ranked on a scale of 0 - 5, 0 representing no impact, 3 moderate impact, 5 severe impact.



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Issue Areas Identified in Surveys and General Plans

Figure 24

Rankings of Truck-Related Impacts
Cities were asked to rank truck-related impacts on a scale from one to five in both 1999 and 2007.

Table 17
South Bay Goods Movement Survey
Issue Severity Comparison, 1999 and 2007

Truck -Related Issue	1999 Severity Rank	2007 Severity Rank
Street Deterioration	3.2	3.8
Neighborhood Intrusion	3.0	2.7
Truck Parking	3.0	2.4
Noise	2.9	2.8
Pollution	2.6	2.8
Safety	2.4	2.5
Congestion	2.2	2.8
Hazardous Materials	1.9	2.2

(5 = Severe, 1=No Problem)

In 2007, street deterioration continued to be the number one truck-related impact ranked by South Bay Cities. However, severity of nearly all of the issues has risen in the past eight years. From 1999 to 2007, the perceived impact of goods movement related street deterioration, congestion, pollution, safety, and hazardous materials increased, while those of noise, neighborhood intrusion, and truck parking decreased. This would seem to indicate some success in dealing with local goods movement issues (neighborhoods and parking), while regional issues and impacts have worsened.

3.1.2 Focus Groups

A focus group of representatives from trucking organizations, logistics companies, and developers was conducted for this study on April 17, 2007. The purpose of the focus group was to obtain information, data, opinions, and anecdotal information from goods movement stakeholders in the South Bay. The issues discussed at the meeting were:

- Concern about the general condition and maintenance of streets that serve goods movement
- Concerns about traffic operations including left-turn lane timings and the configuration of road sensors for large vehicles
- The trend towards large-scale, mega -industrial warehouse development going on in Ontario/Chino. Both construction and land are cheaper, but employee access and distance from ports is a major issue. While being close to POLA and POLB continues to be very desirable for warehousing and distribution, however there are land constraints.
- On-site LAX warehousing is built-out, many are moving south of the airport, off-site to Inglewood, Hawthorne, Torrance, and Carson
- Rail spurs to industrial areas are not used for many South Bay goods movements, only bulk users.
- The major freight trends favor movement to intermodal
- Areas of congestion: Interstate 405 between Avalon Boulevard and Del Amo Boulevard and the northbound off-ramps at Wilmington Boulevard

- Truck parking is a big issue in South Bay, no public truck parking facility to turn engine off
- Coordination with Gateway Cities ITS efforts for goods movement.
- Some truckers are in favor of fees for truck exclusive facilities if they are part of an interconnected system: not just moving the bottleneck to another location.
- Better signage and lighting is needed, especially around ports. Many truckers complain about finding addresses.

The issues discussed at the focus group reinforced other sources of information collected for this study, as well as provided valuable insight into additional issues. A major issue discussed at the focus group is the development of distribution centers and warehousing outside of the South Bay (predominately in the Inland Empire). Even though Los Angeles County had more than three time the net rentable square footage of warehouse and industrial space when compared to the Inland Empire in 2005, scarcity of large parcels of available land in the South Bay as well as the rest of Los Angeles County, is forcing virtually all new distribution center and warehouse development to the Inland Empire.

Even though the South Bay is home to the most desirable goods-movement related industrial space, these trends will produce new challenges to the South Bay. It will affect the patterns of goods movement, by shifting many activities outside of the subregion, especially those that need larger facilities. In addition, skilled laborers living in the South Bay, because of its proximity to their current employer, may change employer or location of employment and will have to commute to the Inland Empire.

3.2 Growth of Goods Movement

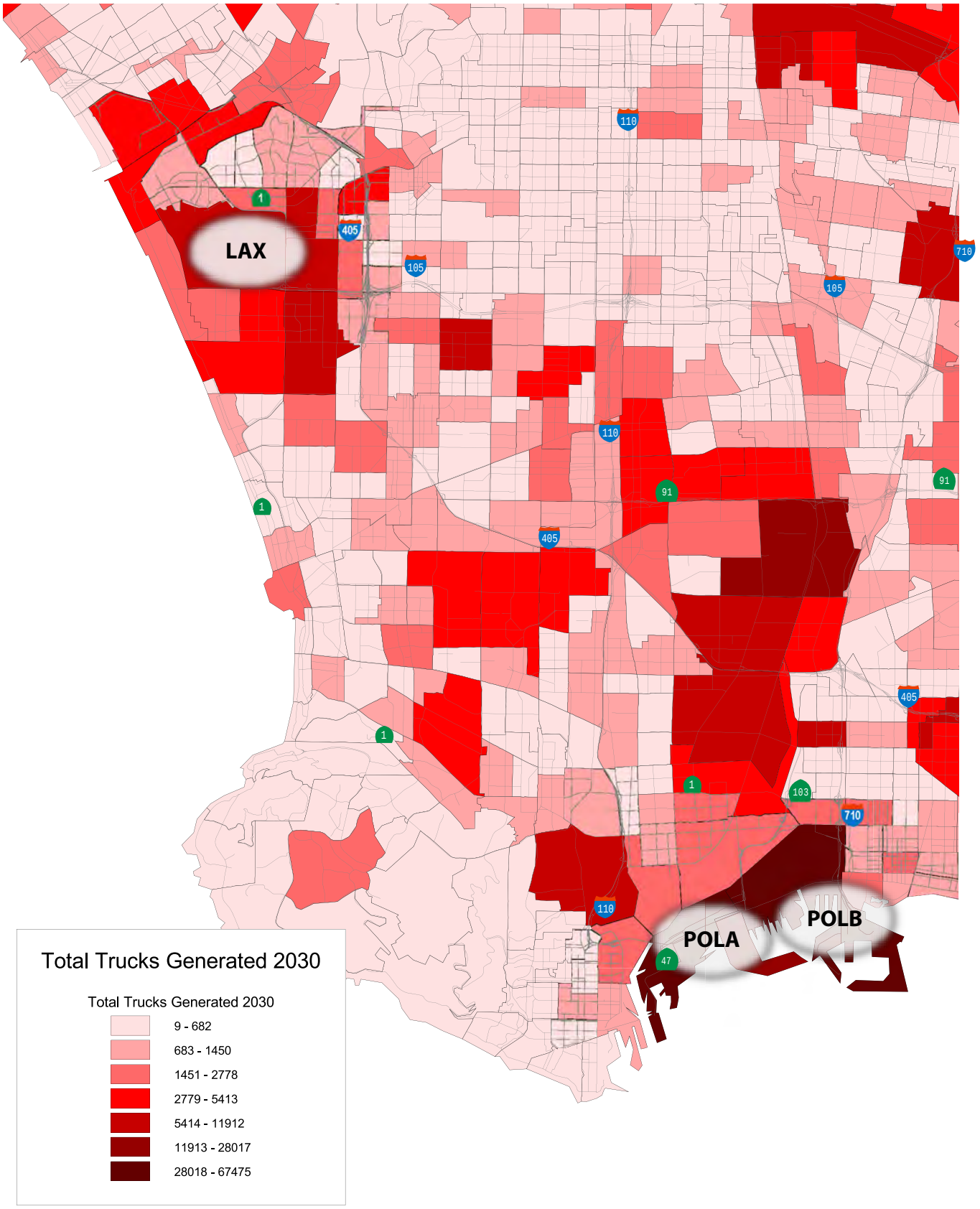
3.2.1 Impact of Projected Economic Growth on the South Bay Goods Movement System

The large investment in goods movement infrastructure in the South Bay, including railroads, roadways, port facilities, and warehouses and distribution centers, has been successful in attracting trade and its associated benefits to Southern California. However, these facilities require expensive maintenance, and the projections of economic growth in the South Bay mean that the current goods movement infrastructure will have more demand placed on it.

The growth in demand will be both in terms of volume of trucks and rail and the distribution of these trips. Trips will become more distributed as land is developed for purposes serving the increase in freight volume, and as alternate routes are taken to avoid more preferred, but congested, routes. Examination of current and projected usage of the goods movement system will help guide decision makers as they allocate limited transportation infrastructure resources to meet the needs of the transportation system.

Figure 22 shows the projected 2030 truck trip generation illustrated by traffic analysis zones (TAZ), in and adjacent to the South Bay. This data is from the regional heavy duty truck model of the Southern California Association of Governments. As shown, the heaviest truck volumes are projected to be generated at the seaports, in the Carson area, in the LAX area, and in portions of Torrance and El Segundo.

The growth in goods movement will be positive for the economy of the South Bay in terms of job growth, revenues, and tax base. However, overall success of the South Bay's transportation system will be measured by the efficiency of goods movement and the level of impact it has on communities and passenger users.



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2030 Total Truck Average Daily Truck Trip Generation

Figure 25

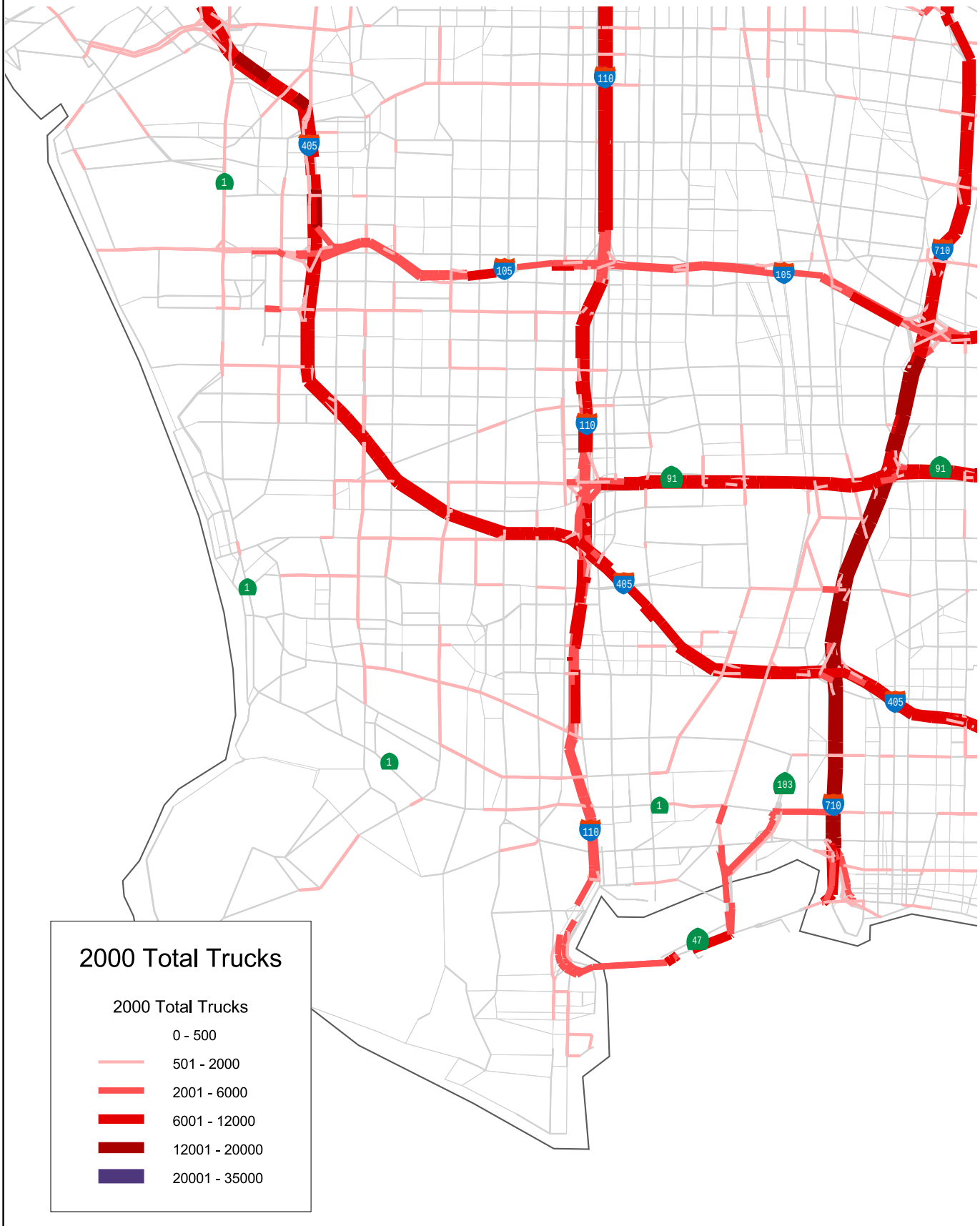
3.2.2 Regional Heavy Duty Truck Model Volume Projections

In order to get a comprehensive view of how the growth in goods movement will affect the freeways and major arterials of the South Bay, the regional Heavy Duty Truck Model was used to project future conditions in 2030. For more information about the travel demand model used for this study, see the Appendix.

The model was used to estimate future truck volumes on South Bay freeways and arterial roadways. These are vehicles which have a gross weight of 8,500 pounds or more, per the California Air Resources Board definition. Thus they do not include small trucks, pick-up trucks or sport-utility vehicles.

Figures 23 through 25 illustrate existing (2000) and future (2030) South Bay freeway and arterial truck volumes and the difference between the two model years. As shown in the figures, the freeways carry the majority of heavy duty trucks. The total truck difference between 2000 and 2030 illustrates that most growth in truck flow in the South Bay will occur on Interstate 110 and State Route 91, followed by Interstate 405.

Figures 26 and 27 illustrate the portion of volume that is trucks for 2000 and 2030 by using "passenger car equivalents," or PCE values. Trucks take up more roadway capacity than autos due to their size and different acceleration characteristics. The PCE factor used for this analysis was two, which means each truck is considered to be the equivalent of two autos. As seen in Figure 27, the most heavily traveled arterials by truck will be predominately in Carson and Wilmington, with some also in the area south of Interstate 105, between Interstate 405 and Interstate 110.



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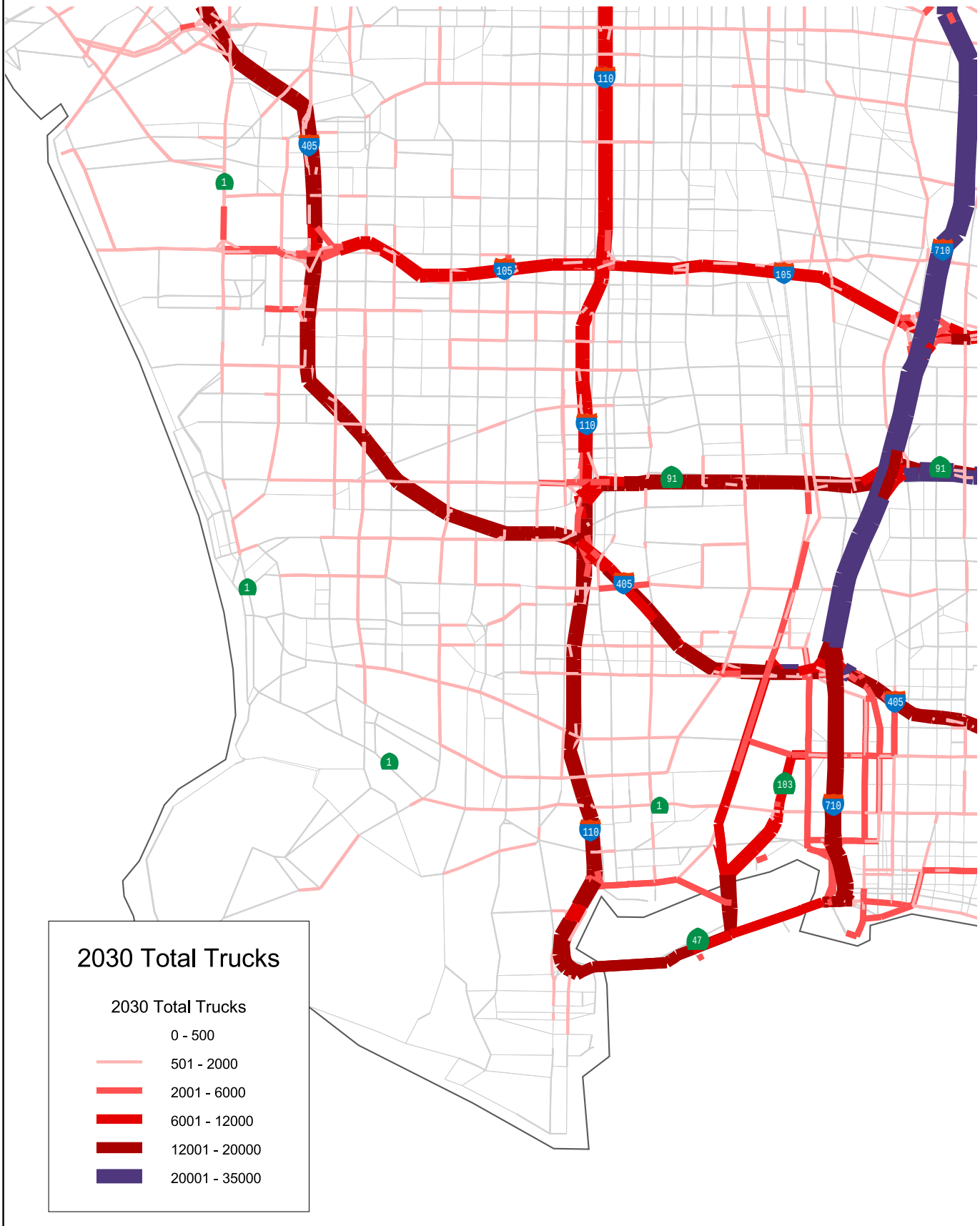
Average Daily Truck Traffic (2000)

Figure 26



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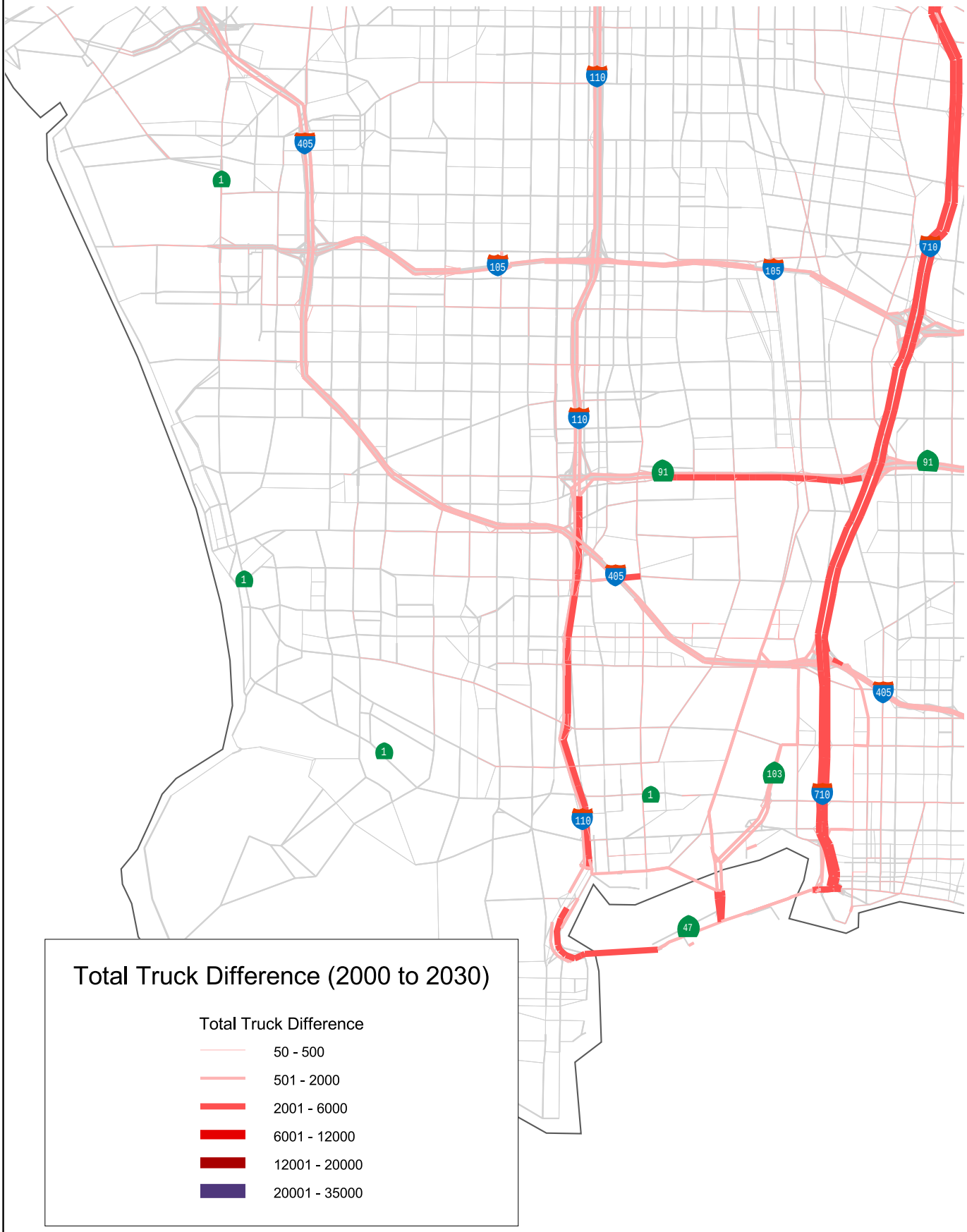
Average Daily Truck Traffic (2030)

Figure 27



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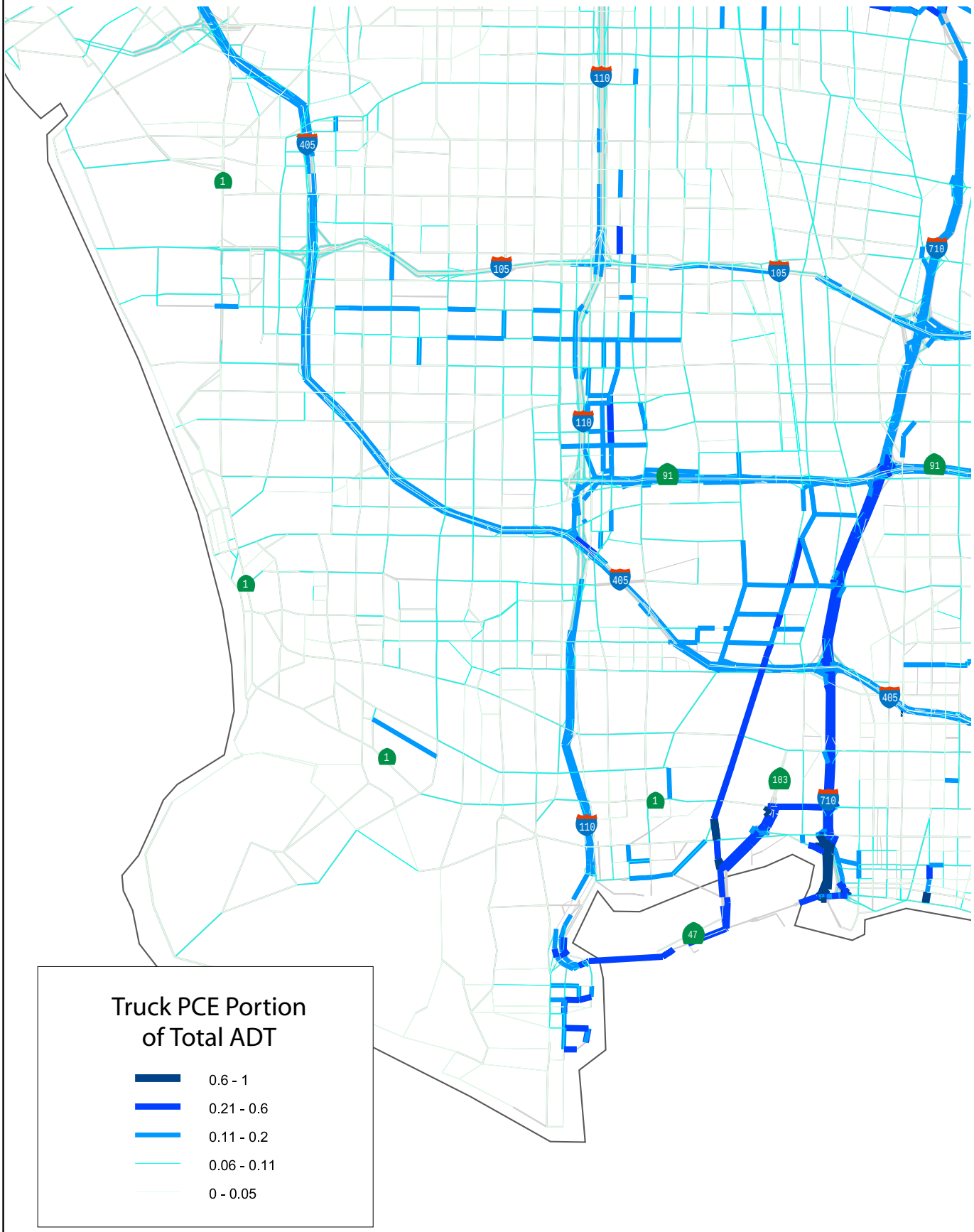
Difference in Average Daily Truck Traffic (2000 to 2030)

Figure 28



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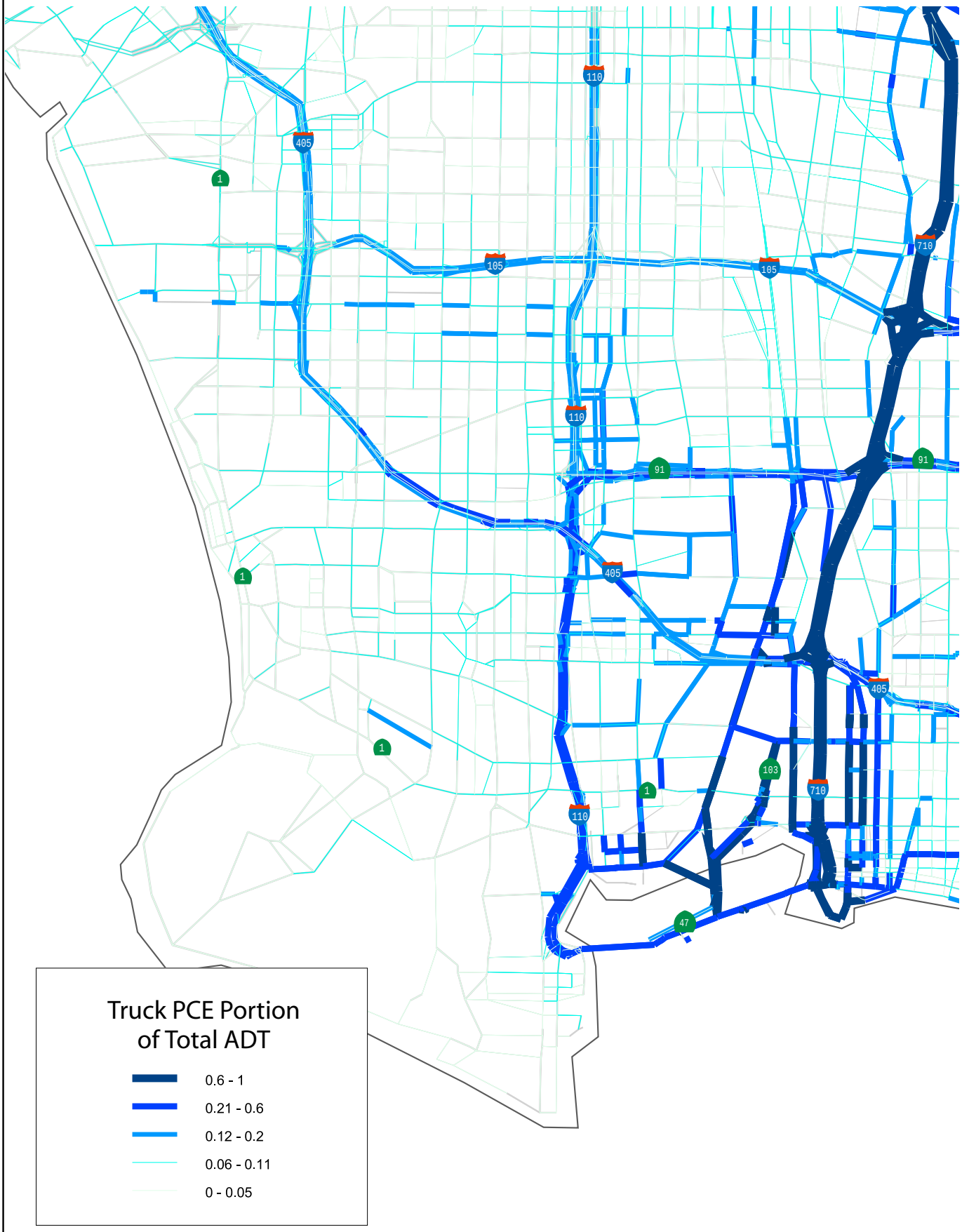
Truck Passenger Car Equivalents as a Percent of Total Average Daily Traffic (2000)

Figure 29



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Truck Passenger Car Equivalents as a Percent of Total Average Daily Traffic (2030)

Figure 30

Freeway Truck Volumes

Currently, Interstate 710 carries the largest amount of trucks of any freeway in the South Bay. It carries more than double the amount of trucks on Interstate 405, and triple the amount of trucks on Interstate 110 or State Route 91. In terms of percent of total traffic, about 35 percent of the passenger car equivalent volume on Interstate 710 is trucks.

Projections for 2030 show significant changes to truck volumes of South Bay freeways, driven by the projected growth of port activity and other economic forces. Truck volume is projected to increase 30 percent on Interstate 405 and Interstate 105 while growing over 100 percent on Interstate 710, Interstate 110 and State Route 91. The share of volume used by trucks is projected to grow on all freeway segments, with significant growth along Interstate 110, Interstate 710, and State Route 91. Table 17 below shows existing (2000) and projected 2030 truck volumes on South Bay Freeways.

Table 18
2000 and 2030 Truck Average Daily Traffic on Selected Mainline Freeway Segments

Segment		2000		2030		Change 2000 - 2030	
		Total ADT	Truck Percent	Total ADT	Truck Percent	Percent Total Δ	Percent Truck Δ
I-110	North Of Pacific Coast Highway	183,957	11.5%	235,164	27.3%	27.8%	203.8%
I-110	North Of I-405	290,689	10.3%	314,790	20.2%	8.3%	111.1%
SR-91	East of Avalon	230,091	11.5%	252,409	21.5%	9.7%	104.9%
SR-91	East of I-110	230,182	11.5%	252,488	21.5%	9.7%	104.9%
SR-91	East of Alameda	259,702	12.5%	290,676	21.9%	11.9%	97.0%
I-405	South of I-710	309,371	15.4%	338,301	20.7%	9.4%	46.8%
I-105	East of I-110	240,940	9.2%	264,293	12.3%	9.7%	46.5%
I-105	East of Crenshaw	231,554	9.0%	244,146	12.4%	5.4%	44.3%
I-105	East of Sepulveda	149,318	5.1%	144,541	7.4%	-3.2%	39.8%
I-110	North Of SR-91	265,243	9.9%	272,903	13.2%	2.9%	37.2%
SR-91	East of Normandie	97,506	7.6%	110,771	9.0%	13.6%	33.1%
I-405	At La Cienega	326,350	13.7%	327,800	18.0%	0.4%	31.5%
I-405	At Redondo Beach Blvd	235,816	17.3%	261,008	20.1%	10.7%	29.0%
I-405	South of I-105	324,159	13.4%	354,996	15.8%	9.5%	28.7%
I-110	North Of I-105	296,055	10.1%	301,827	11.9%	1.9%	20.7%
I-405	South of Wilmington Blvd	244,191	16.8%	261,323	18.1%	7.0%	14.8%
I-405	South of I-110	247,745	17.1%	260,317	18.4%	5.1%	12.7%

Notes: Values represent mainline freeway volumes only, no HOV volume is included; truck percent of total based on passenger car equivalents.

Arterial Truck Volumes

Projections for 2030 show moderate truck growth on many South Bay roadways, but high growth at selected locations. For example, truck traffic on Alameda Street is projected to increase 300 percent to 400 percent. This is most likely due to the diversion of local truck trips from congested freeways to Alameda Street. Other arterials with high truck volume growth are:

- Del Amo Boulevard
- Santa Fe Avenue
- Wilmington Avenue
- Sepulveda Boulevard
- Del Amo Boulevard
- Central Avenue
- Artesia Boulevard
- Carson Street
- 223rd Street
- Western Avenue
- Crenshaw Boulevard
- Imperial Highway
- Artesia Boulevard
- Rosecrans Avenue
- El Segundo Boulevard
- Avalon Boulevard

Table 19
2000 and 2030 Average Daily Truck Traffic on Selected East/West Arterial Segments

Segment			2000		2030		Change 2000 - 2030	
			Total ADT	Truck Percent	Total ADT	Truck Percent	Percent Total ADT Δ	Percent Truck PCE ADT Δ
182nd St	e/o	Hawthorne Blvd	15,164	5.0%	18,117	6.3%	19.5%	49.1%
190th St	w/o	Crenshaw Blvd	49,934	7.1%	48,887	8.6%	-2.1%	17.6%
190th St	w/o	Western Av	33,922	6.8%	35,931	7.8%	5.9%	21.5%
190th St	e/o	Prairie Av	53,187	7.1%	53,015	8.4%	-0.3%	17.1%
223rd St	e/o	Avalon Blvd	23,255	6.0%	26,462	10.0%	13.8%	90.0%
223rd St	w/o	Figueroa St	31,244	5.8%	35,878	8.5%	14.8%	68.1%
9th St	w/o	Gaffey St	8,622	4.9%	9,579	5.2%	11.1%	18.0%
Anaheim St	w/o	Gaffey St	13,401	4.6%	16,426	5.1%	22.6%	35.9%
Anita St	e/o	Pacific Coast Hwy	25,707	6.7%	29,639	6.8%	15.3%	17.5%
Artesia Blvd	e/o	Pacific Coast Hwy	22,894	5.2%	23,009	5.4%	0.5%	4.0%
Artesia Blvd	e/o	Hawthorne Blvd	28,360	6.7%	35,864	7.3%	26.5%	38.3%
Artesia Blvd	e/o	Prarie Av	47,184	5.8%	57,983	6.7%	22.9%	41.5%
Artesia Blvd	e/o	Western Av	37,850	6.5%	55,045	8.2%	45.4%	81.8%
Carson St	w/o	Hawthorne Blvd	8,858	3.9%	9,720	5.2%	9.7%	47.4%
Carson St	e/o	Crenshaw Blvd	31,000	6.1%	35,545	7.1%	14.7%	32.6%
Carson St	e/o	Avalon Blvd	30,051	7.4%	33,945	10.8%	13.0%	64.4%
Carson St	e/o	Wilmington Blvd	6,256	14.2%	9,090	30.5%	45.3%	211.7%
Carson St	e/o	Figueroa St	18,577	7.1%	22,135	11.8%	19.2%	99.2%
Centinela Av	e/o	La Brea Av	22,746	4.8%	26,302	5.1%	15.6%	22.7%
Century Blvd	e/o	Aviation Blvd	42,260	4.0%	49,531	5.3%	17.2%	55.1%
Century Blvd	e/o	Hawthorne Blvd	41,784	4.8%	46,357	4.9%	10.9%	11.9%
Century Blvd	e/o	Crenshaw Blvd	40,701	4.8%	45,511	5.0%	11.8%	17.0%
Del Amo Blvd	w/o	Central Av	7,993	6.2%	25,644	13.3%	220.8%	587.1%
Del Amo Blvd	e/o	Alameda St	28,523	15.6%	37,298	26.7%	30.8%	123.5%
Del Amo Blvd	e/o	Avalon Blvd	7,993	6.2%	25,644	13.3%	220.8%	587.1%
El Segundo Blvd	e/o	Sepulveda Blvd	33,700	11.6%	34,175	14.6%	1.4%	28.2%
El Segundo Blvd	e/o	Crenshaw Blvd	25,534	11.0%	26,517	11.3%	3.8%	6.2%
El Segundo Blvd	w/o	Western Av	30,697	9.4%	34,167	9.5%	11.3%	13.1%
El Segundo Blvd	w/o	Aviation Blvd	89,049	10.1%	98,634	11.8%	10.8%	30.1%
Figueroa St	w/o	Sepulveda Blvd	34,589	5.6%	41,038	8.0%	18.6%	70.7%
Florence Av	w/o	La Brea Blvd	22,309	7.3%	25,080	7.1%	12.4%	9.9%
Gould Ave	e/o	Ardmore Ave./ Valley Dr.	22,894	5.2%	23,009	5.4%	0.5%	4.0%
Grand Av	e/o	Vista Del Mar	3,948	7.8%	6,717	9.3%	70.1%	102.6%
Grand Av	w/o	Sepulveda Blvd	8,693	8.3%	11,879	10.4%	36.7%	71.5%
Imperial Hwy	w/o	Nash St	12,919	5.2%	10,160	5.8%	-21.4%	-13.0%
Imperial Hwy	e/o	Douglas St	17,446	6.2%	19,102	7.1%	9.5%	25.2%
Imperial Hwy	w/o	Aviation Blvd	38,312	8.2%	39,520	10.9%	3.2%	37.6%
Lomita Blvd	w/o	Hawthorne Blvd	21,249	5.3%	25,088	5.4%	18.1%	19.4%
Lomita Blvd	e/o	Vermont St	40,003	7.8%	42,258	9.3%	5.6%	26.5%
Lomita Blvd	w/o	Western Av	44,537	6.6%	49,337	7.6%	10.8%	27.4%
Lomita Blvd	w/o	Narbonne Blvd	35,355	6.3%	41,058	6.7%	16.1%	24.0%
Manchester Blvd	e/o	La Brea Blvd	26,519	5.3%	30,386	5.4%	14.6%	17.3%
Manchester Blvd	w/o	Inglewood Ave	30,973	6.5%	34,285	6.3%	10.7%	7.8%
Manhattan Beach Blvd	e/o	Sepulveda Blvd	11,933	5.2%	12,263	5.4%	2.8%	7.1%
Manhattan Beach Blvd	e/o	Inglewood Ave	24,723	6.0%	26,883	6.4%	8.7%	16.6%
Marine Av	e/o	Inglewood Ave	24,260	5.5%	25,171	5.7%	3.8%	7.5%
Marine Av	e/o	Redondo Beach Av	22,771	4.5%	23,576	4.7%	3.5%	7.9%
Normandie Av	e/o	Redondo Beach Blvd	36,346	5.4%	40,068	6.5%	10.2%	33.0%
Normandie Av	w/o	228th St	24,811	7.1%	25,875	8.5%	4.3%	24.9%
Pacific Coast Hwy	e/o	Hawthorne Blvd	10,500	3.0%	14,129	3.0%	34.6%	37.4%
Pacific Coast Hwy	e/o	Narbonne Blvd	29,797	6.0%	31,360	6.8%	5.2%	17.8%
Pacific Coast Hwy	w/o	Alameda St	28,514	8.9%	33,971	9.6%	19.1%	29.2%
Pacific Coast Hwy	w/o	Western Av	37,301	6.3%	39,930	6.9%	7.0%	16.2%
Pacific Coast Hwy	w/o	Hawthorne Blvd	19,159	3.4%	22,700	3.1%	18.5%	9.0%
Palos Verdes Dr N.	w/o	Western Av	34,485	4.9%	37,986	5.1%	10.2%	14.0%
Rosecrans Av	e/o	Sepulveda Blvd	27,239	8.0%	33,223	8.4%	22.0%	28.6%
Rosecrans Av	e/o	Crenshaw Blvd	29,865	6.2%	33,531	6.5%	12.3%	19.5%
Rosecrans Av	w/o	Western Av	28,687	6.6%	33,436	8.9%	16.6%	58.9%
Sepulveda Blvd	w/o	Hawthorne Blvd	31,671	5.1%	36,763	5.7%	16.1%	30.7%
Sepulveda Blvd	e/o	Western Av	37,759	5.8%	40,683	6.5%	7.7%	20.0%
Sepulveda Blvd	e/o	Alameda St	20,200	7.5%	27,615	23.0%	36.7%	320.0%
Sepulveda Blvd	w/o	Vermont Av	42,444	5.8%	46,130	6.4%	8.7%	19.9%
Skypark Dr	e/o	Hawthorne Blvd	16,634	5.4%	19,577	5.2%	17.7%	14.0%
Torrance Blvd	e/o	Pacific Coast Hwy	42,311	5.2%	46,888	6.0%	10.8%	26.7%
Torrance Blvd	w/o	Figueroa St	27,537	6.8%	35,960	7.8%	30.6%	50.3%
Torrance Blvd	e/o	Crenshaw Blvd	24,956	5.4%	29,988	6.6%	20.2%	47.5%
Victoria St	w/o	Wilmington Av	5,623	5.9%	6,135	6.2%	9.1%	14.4%

Notes: Values represent mainline freeway volumes only, no HOV volume is included. Truck percent of total is based on passenger car equivalents.

Table 20
2000 and 2030 Average Daily Truck Traffic on Selected North/South Arterial Segments

Segment			2000		2030		Change 2000 - 2030	
			Total ADT	Truck Percent	Total ADT	Truck Percent	Percent Total ADT Δ	Percent Truck PCE ADT Δ
Alameda St	n/o	Del Amo Blvd	11,512	22.8%	20,815	63.9%	80.8%	407.3%
Alameda St	n/o	Carson St	16,500	19.3%	25,408	49.8%	54.0%	296.6%
Alameda St	n/o	Sepulveda Blvd	29,926	18.4%	44,047	61.3%	47.2%	389.9%
Alameda St	n/o	Pacific Coast Hwy	22,464	25.9%	37,599	66.3%	67.4%	328.7%
Alameda St	n/o	Anaheim St	10,159	9.4%	11,529	32.3%	13.5%	290.1%
Ardmore Ave./ Valley Dr.	n/o	Gould Ave	14,005	4.6%	16,236	4.3%	15.9%	8.7%
Avalon Blvd	n/o	Carson St	21,778	3.7%	28,254	6.4%	29.7%	122.4%
Avalon Blvd	n/o	Sepulveda Blvd	11,848	4.3%	17,180	9.4%	45.0%	215.3%
Avalon Blvd	n/o	Del Amo Blvd	20,077	4.8%	31,619	6.1%	57.5%	98.6%
Aviation Blvd	s/o	Century Blvd	33,893	6.2%	39,127	7.4%	15.4%	38.3%
Aviation Blvd	n/o	El Segundo Blvd	26,540	7.8%	37,551	8.7%	41.5%	57.7%
Central Ave	n/o	Victoria St	32,839	4.2%	37,464	4.6%	14.1%	25.1%
Central Ave	n/o	Del Amo Blvd	8,102	5.8%	15,493	14.8%	91.2%	386.0%
Crenshaw Blvd	s/o	Century Blvd	25,177	4.5%	26,254	5.0%	4.3%	16.8%
Crenshaw Blvd	n/o	190th St	71,762	8.4%	77,403	9.6%	7.9%	24.0%
Crenshaw Blvd	s/o	Rosecrans Blvd	22,396	6.2%	25,498	6.3%	13.9%	15.8%
Crenshaw Blvd	n/o	Lomita Blvd	43,478	7.3%	49,516	7.6%	13.9%	18.4%
Crenshaw Blvd	n/o	El Segundo Blvd	46,776	9.4%	47,658	9.4%	1.9%	1.5%
Douglas St	s/o	Imperial Hwy	8,111	6.7%	11,453	8.6%	41.2%	81.3%
Figueroa St	n/o	Torrance Blvd	19,993	6.8%	24,235	8.8%	21.2%	56.1%
Figueroa St	n/o	223rd St	10,980	5.9%	12,492	7.3%	13.8%	40.7%
Gaffey St	n/o	Anaheim St	28,524	4.7%	30,337	5.9%	6.4%	31.9%
Gaffey St	s/o	9th St	26,405	6.1%	27,120	5.1%	2.7%	-13.1%
Hawthorne Blvd	s/o	Artesia Blvd	69,004	4.5%	76,159	5.0%	10.4%	23.2%
Hawthorne Blvd	s/o	Century Blvd	33,170	5.0%	33,446	5.4%	0.8%	8.1%
Hawthorne Blvd	n/o	El Segundo Blvd	31,028	4.7%	34,070	5.2%	9.8%	20.8%
Hawthorne Blvd	n/o	Pacific Coast Hwy	42,842	3.4%	46,790	3.6%	9.2%	16.1%
Hawthorne Blvd	n/o	Lomita Blvd	50,742	4.5%	57,014	4.9%	12.4%	22.3%
Hawthorne Blvd	n/o	Pacific Coast Hwy	42,842	3.4%	46,790	3.6%	9.2%	16.1%
Inglewood Ave	s/o	Manchester Blvd	5,435	7.0%	7,053	7.2%	29.8%	33.0%
Inglewood Ave	s/o	Marine Av	34,418	5.3%	35,786	6.1%	4.0%	18.8%
Inglewood Ave	s/o	Manhattan Beach Blvd	32,082	5.2%	35,626	5.7%	11.0%	22.4%
La Brea Av	s/o	Centinela Av	28,029	5.5%	29,260	6.0%	4.4%	14.4%
La Brea Av	s/o	Florence Av	27,196	5.7%	28,412	6.0%	4.5%	11.4%
La Brea Av	s/o	Manchester Blvd	22,307	4.8%	24,006	5.2%	7.6%	16.8%
Narbonne Blvd	s/o	Pacific Coast Hwy	4,127	1.5%	6,940	1.8%	68.2%	100.0%
Narbonne Blvd	n/o	Lomita Blvd	5,352	4.7%	6,417	5.1%	19.9%	30.4%
Nash St	s/o	Imperial Hwy	8,580	4.4%	10,274	6.6%	19.7%	79.3%
Normandie Av	n/o	Redondo Beach Blvd	11,721	5.1%	14,502	5.2%	23.7%	25.9%
Normandie Av	n/o	228th St	8,673	4.8%	10,888	4.8%	25.5%	26.4%
Pacific Coast Hwy	n/o	Crenshaw Blvd	26,164	3.8%	31,307	3.9%	19.7%	25.5%
Pacific Coast Hwy	n/o	Anita St	57,647	4.8%	62,674	4.8%	8.7%	9.6%
Pacific Coast Hwy	n/o	Torrance Blvd	56,629	4.5%	63,781	5.0%	12.6%	26.6%
Prairie Av	n/o	190th St	24,835	4.8%	31,233	5.4%	25.8%	43.0%
Prairie Av	n/o	Artesia Blvd	21,562	4.5%	25,850	4.7%	19.9%	23.3%
Redondo Beach Av	s/o	Marine Av	3,615	5.8%	6,000	5.1%	66.0%	46.7%
Santa Fe Av	n/o	Carson St	28,286	6.5%	35,260	22.1%	24.7%	327.5%
Sepulveda Blvd	s/o	Lincoln Blvd.	48,347	4.7%	54,726	6.6%	13.2%	58.7%
Sepulveda Blvd	n/o	Grand Av	59,128	6.6%	59,957	7.8%	1.4%	19.1%
Sepulveda Blvd	n/o	El Segundo Blvd	65,770	6.8%	69,975	8.3%	6.4%	29.2%
Sepulveda Blvd	n/o	Rosecrans Blvd	70,960	5.3%	78,355	5.8%	10.4%	20.0%
Sepulveda Blvd	n/o	Manhattan Beach Blvd	44,564	3.6%	48,464	3.8%	8.8%	16.8%
Van Ness Av	s/o	190th St	26,369	7.8%	29,459	9.4%	11.7%	34.5%
Vermont Av	s/o	Sepulveda Blvd	19,822	7.7%	21,652	8.8%	9.2%	25.4%
Vista Del Mar	n/o	Grand Av	19,757	4.5%	24,812	4.4%	25.6%	25.5%
Western Av	n/o	El Segundo Blvd	10,766	6.3%	23,016	10.3%	113.8%	250.0%
Western Av	n/o	Sepulveda Blvd	25,430	4.2%	29,868	5.3%	17.5%	47.0%
Western Av	n/o	Pacific Coast Hwy	19,896	3.6%	23,001	4.2%	15.6%	32.7%
Western Av	n/o	Palos Verdes Dr North	12,344	3.0%	13,768	2.9%	11.5%	8.7%
Western Av	n/o	237th St	23,607	3.8%	27,821	4.8%	17.9%	46.9%
Western Av	s/o	190th St	17,267	4.0%	21,361	4.9%	23.7%	50.9%
Wilmington Av	n/o	223rd St	54,732	11.9%	64,401	16.3%	17.7%	61.3%
Wilmington Av	s/o	Victoria St	6,777	7.4%	9,879	16.9%	45.8%	234.4%
Wilmington Av	n/o	Carson St	28,274	14.9%	31,635	24.5%	11.9%	84.0%
Wilmington Av	n/o	Sepulveda Blvd	27,764	7.8%	30,555	12.7%	10.1%	78.4%

Notes: Values represent mainline freeway volumes only, no HOV volume is included. Truck percent of is total based on passenger car equivalents.

3.3 Truck and Rail-Related Collisions and Incidents

Truck collision data for the South Bay Cities was obtained and analyzed. Truck and rail-related collision statistics were used to identify locations with a large number of vehicle conflicts due to high volumes. While many collisions can be attributed to operator error, locations with reoccurring incidents can indicate geometric or operational conditions that contribute to these incidents. This section first describes the analysis of truck-involved collisions on roadways, and then highway-rail incidents at rail crossings in the South Bay Cities area.

3.3.1 Truck-Involved Collision Data

Collision data was obtained from the Statewide Integrated Traffic Records System (SWITRS) which is maintained by the California Highway Patrol (CHP). Collision data was obtained for all 16 cities and the unincorporated areas of the South Bay. The data includes all collisions involving trucks (excluding pick-up trucks) from January 2003 to June 2006. It is very important to note that collision analysis involves the use of reported collision data. Many minor incidents are often unreported by motorists. Therefore, the database reflects only those collisions with property damage or injury severe enough to warrant reporting by the affected parties.

The truck-involved collision data was organized into a database. The database includes collision-related information such as collision location, type, factors, time of day, weather conditions, number of parties involved, number of injuries, and number of fatalities. The total number of collisions in each city was calculated and used to determine the number of collisions per mile of city roadway. The truck-involved collision database was also analyzed to identify arterials and intersections in the South Bay Cities with a relatively high number of collisions and to determine significant collision-related factors.

The total number of reported truck-involved collisions in the South Bay Cities from 2003-2005 was 1,438. The following aggregate collision characteristics and collision factors relating to truck collisions in the South Bay Cities have been identified (note: all categories do not total 100 percent):

Collision Severity

- 70 percent of the reported collisions were property damage only.
- 29 percent of the reported collisions involved non-fatal injuries.
- One percent of the reported collisions involved fatalities.

Collision Type

- 40 percent of the reported collisions were sideswipe type collisions.
- 21 percent of the reported collisions were rear-end type collisions.
- 17 percent of the reported collisions were broadside type collisions.
- 11 percent of the reported collisions involved striking an object other than a moving vehicle.
- Four percent of the reported collisions were head-on type collisions
- Two percent of the reported collisions were overturned type collisions
- The remainder involved pedestrians or the type of collision was not stated on the collision report.

Location

- 76 percent of the reported collisions occurred on City or County roads, 24 percent occurred on a state highway.

- 22 percent of the reported collisions occurred in intersections, 28 percent occurred within 10 feet of an intersection, and 87 percent occurred within 500 feet of an intersection.

Fault

- 48 percent of collisions were recorded as the fault of a truck.

Sobriety of Driver

- 5.2 percent of collisions involve alcohol

At-Fault Traffic Movements

- 35 percent involved vehicles proceeding straight in a lane.
- 17 percent involved vehicles making right turns.
- 13 percent involved vehicles changing lanes
- 11 percent involved vehicles making left turns
- Six percent involved vehicles backing
- The other at-fault movements included entering traffic, unsafe turning, making a u-turn, passing another vehicle, merging, and slowing or stopping.

Primary Factor

- Virtually all—93 percent—of reported collisions had the primary factor listed as vehicle code violation.
- The other primary factors were improper driving, other than driver, not stated and unknown.

Violation Category

- 27 percent of the reported collisions included a citation for improper turning.
- 17 percent of the reported collisions included a citation for unsafe speed.
- 13 percent of the reported collisions included a citation for unsafe lane change.
- Nine percent of the reported collisions included a citation for automobile right of way.
- Seven percent of the reported collisions included a citation for unsafe starting or backing.
- Six percent of the reported collisions included a citation for improper passing.
- Other violations such as following too closely, traffic signals and signs, driving under the influence of alcohol or a drug, wrong side of the road and other improper driving.

Collisions during this time period, January 2003 to June 2006, were compared to the miles of roadway maintained by each City in the South Bay. This produced a collision rate for each municipality, as seen in Table 14. Carson has the highest collision rate at 0.65, followed by Lomita, El Segundo, and Lawndale who range between 0.37 and 0.34, and Hawthorne, Inglewood, and Manhattan Beach who range between 0.17 and 0.12. It is important to note that although Carson has the highest collision ratio, it also has the highest overall truck volume.

Table 21
Truck-Involved Collisions per Maintained Mile of Roadway in South Bay Cities

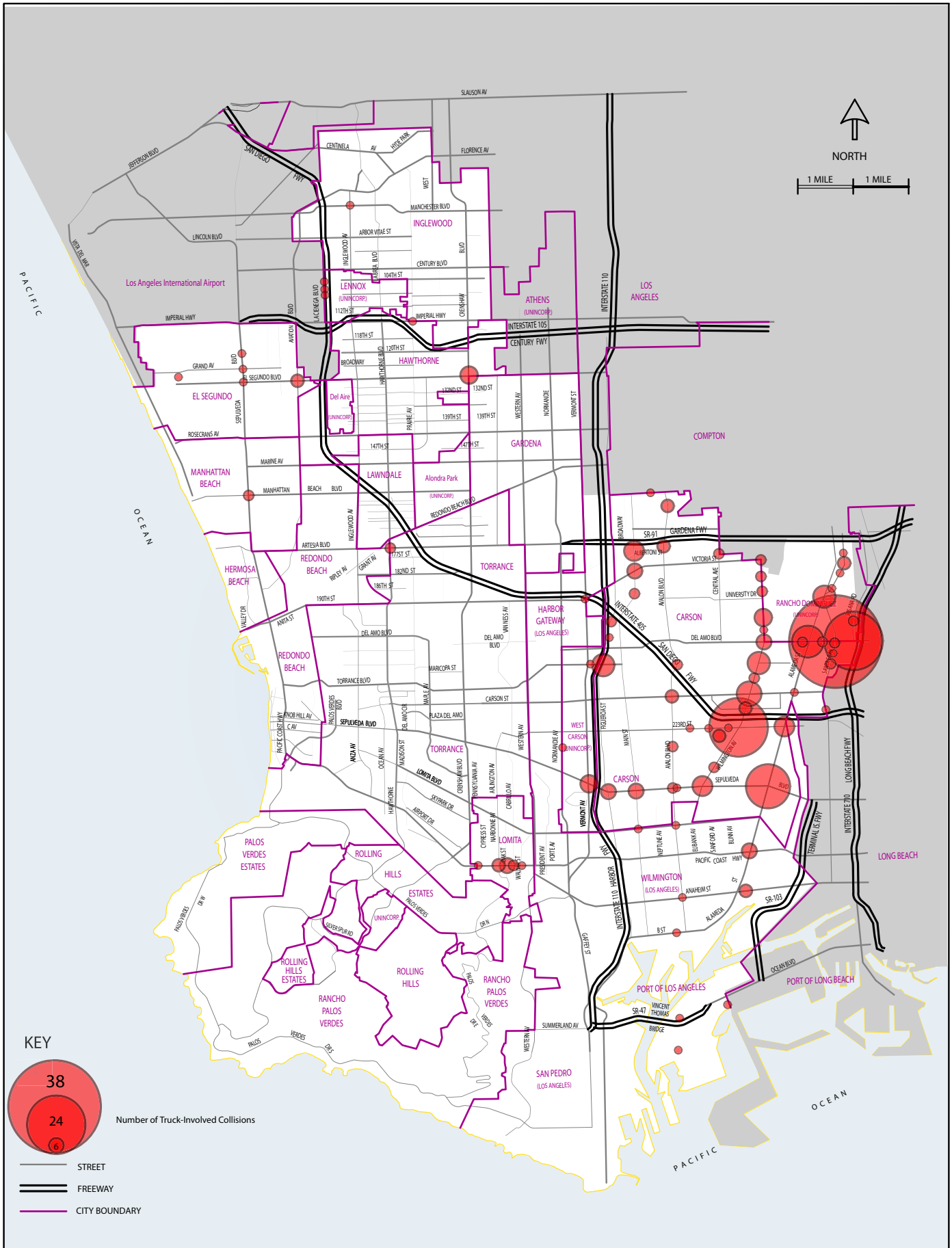
City	Maintained Miles	Truck-Involved Collisions January 2003-June 2006	Truck-Involved Collisions/ Maintained Mile
Carson	208.67	406	0.65
Lomita	31.3	35	0.37
El Segundo	52.17	55	0.35
Lawndale	42.3	43	0.34
Hawthorne	90.91	47	0.17
Inglewood	191.16	85	0.15
Manhattan Beach	89.1	32	0.12
Gardena	110.12	26	0.08
Hermosa Beach	47.3	9	0.06
Torrance	317.16	53	0.06
Rolling Hills Estates	26.78	4	0.05
Redondo Beach	128.8	18	0.05
Rancho Palos Verdes	119.78	10	0.03
Palos Verdes Estates	143.44	3	0.01

Note: The cities of Los Angeles and Rolling Hills are not included

Given the amount of industrial land uses in its city limits, Torrance has a very low collision rate, nearly one-tenth the rate of Carson. One factor in this disparity is Torrance's large geographic area. Another factor is that, since its incorporation in 1921, Torrance was planned as an industrial city with limited driveway access and wide industrial collector streets. The City of Carson was not incorporated until 1968. Before its incorporation, many large industrial facilities and streets were not necessarily planned and constructed specifically to serve the large volumes of truck travel that now occurs in the city.

Arterial Truck Collision Locations

Arterial intersections were sorted from the SWITRS database to determine those locations with the highest number of collisions. Figure 28 and Table 21 display intersections with a total of five or more reported collisions. As shown by the data in the table, some cities have several intersections on the list, while other cities have none. Virtually all of the locations with significant truck-related collisions are in the industrial areas of Carson and the unincorporated area of Rancho Dominguez (northeast of Carson). Another 53 additional locations in the South Bay had three or four truck-involved collisions in the three-year period—those locations are shown in Figure 28.



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South Bay Arterial Locations With Three or More Truck-Involved Collisions (January 2003-June 2006)

Figure 31

Table 22
South Bay Arterial Locations with Five or More Truck-Related Collisions
(January 2003-June 2006

City	Primary Road	Secondary Road	Total
Unincorporated (Rancho Dominguez)	Del Amo Blvd	Santa Fe Avenue	38
Carson	223rd Street	Wilmington Avenue	24
Unincorporated (Rancho Dominguez)	Del Amo Blvd	Susana Road	24
Carson	Alameda Street	Sepulveda Blvd	18
Carson/Unincorporated (Rancho Dominguez)	Alameda Street	Del Amo Blvd	13
Carson	Carson Street	Wilmington Avenue	10
Unincorporated (Rancho Dominguez)	Alameda Street	Santa Fe Avenue	9
Carson	Dominguez Street	Wilmington Avenue	9
Carson	Torrance Blvd	Figueroa Street	9
Carson	220th Street	Wilmington Avenue	8
Carson	Alameda Street	223rd Street	8
Carson	Albertoni Street	Main Street	8
Carson	Wilmington Avenue	Sepulveda Blvd	8
Hawthorne	Crenshaw Blvd	El Segundo Blvd	7
Unincorporated (Harbor City)	Vermont Avenue	Sepulveda Blvd	7
Unincorporated (Rancho Dominguez)	Wilmington Avenue	Gladwick Street	7
Los Angeles (Wilmington)	Alameda Street	Pacific Coast Highway	6
Carson/Unincorporated (Rancho Dominguez)	Del Amo Blvd	Wilmington Avenue	6
Lomita	Pacific Coast Highway	Oak Street	6
Carson	Sepulveda Blvd	Main Street	6
Carson	Sepulveda Blvd	Figueroa Street	6
Carson	Victoria Street	Main Street	6
Los Angeles (Wilmington)	Anaheim Street	Henry Ford Avenue	5
Carson	Avalon Blvd	Gardena Blvd	5
Carson	Avalon Blvd	Albertoni Street	5
Carson	Avalon Blvd	Carson Street	5
El Segundo	Aviation Blvd	El Segundo Blvd	5
Carson	Broadway	Victoria Street	5
Lomita	Pacific Coast Highway	Narbonne Avenue	5
Unincorporated (Rancho Dominguez)	Santa Fe Avenue	Harcourt Street	5
Carson	Watson Center Road	Lucerne Street	5

Table 22 shows the top collision locations regardless of truck involvement. This demonstrates the number of truck-related collisions at a location is not proportional to the number of total collisions, but it is likely more a function of truck percentage on the roadway and local land uses.

Table 23
South Bay Locations with 40 or More Collisions
(January 2003 – June 2006)

City	Primary Road	Secondary Road	Total	Truck	Percent Truck
Lomita	Pacific Coast Highway	Oak Street	97	6	6%
Lomita	Pacific Coast Highway	Narbonne Avenue	76	5	7%
Carson	Avalon Blvd.	Carson Street	75	5	7%
Lomita	Pacific Coast Highway	Eshelman Avenue	70	2	3%
Carson	Wilmington Avenue	223rd Street	64	17	27%
Inglewood	Century Blvd.	Crenshaw Blvd.	63	1	2%
Lomita	Pacific Coast Highway	Walnut Street	62	3	5%
Carson	Sepulveda Blvd.	Main Street	59	6	10%
Redondo Beach/Lawndale	Inglewood Avenue	Manhattan Beach Blvd.	57	2	4%
Unincorporated (Rancho Dominguez)	Santa Fe Avenue	Del Amo Blvd.	55	38	69%
El Segundo	Sepulveda Blvd.	El Segundo Blvd.	55	4	7%
Hawthorne	El Segundo Blvd.	Crenshaw Blvd.	54	7	13%
Hawthorne/Lawndale	Rosecrans Avenue	Prairie Avenue	54	1	2%
Carson	Carson Street	Main Street	51	2	4%
Carson	Avalon Blvd.	Victoria Street	50	2	4%
Inglewood	Manchester Blvd.	Crenshaw Blvd.	50	1	2%
Rolling Hills Estates	Palos Verdes Drive N	Rolling Hills Road	49	0	0%
Lawndale	Hawthorne Blvd.	Marine Avenue	48	2	4%
Carson	Carson Street	Wilmington Avenue	47	10	21%
Carson	Avalon Blvd.	Sepulveda Blvd.	45	4	9%
Lawndale	Hawthorne Blvd.	162nd Street	45	1	2%
Carson	Wilmington Avenue	Interstate 405	45	19	42%
Carson	Figueroa Street	Sepulveda Blvd.	44	7	16%
Redondo Beach/Lawndale	Inglewood Avenue	Marine Avenue	44	2	5%
Lomita	Lomita Blvd.	Pennsylvania Avenue	44	1	2%
Carson	Sepulveda Blvd.	Figueroa Street	44	6	14%
Hawthorne	Imperial Highway	Hawthorne Blvd.	43	0	0%
Lomita	Pacific Coast Highway	Pennsylvania Avenue	43	3	7%
Carson	Sepulveda Blvd.	Alameda Street	43	18	42%
El Segundo/Manhattan Beach	Sepulveda Blvd.	Rosecrans Avenue	43	1	2%
Hawthorne	Hawthorne Blvd.	Rosecrans Avenue	42	1	2%
Hawthorne	Rosecrans Avenue	Inglewood Avenue	42	2	5%
Carson/Unincorporated (Harbor City)	Sepulveda Blvd.	Interstate 110	42	21	50%
Carson	Albertoni Street	Avalon Blvd.	41	5	12%
Gardena	Artesia Blvd.	Normandie Avenue	41	1	2%
El Segundo	Sepulveda Blvd.	Mariposa Avenue	41	4	10%
Rancho Palos Verdes/Rolling Hills	Hawthorne Blvd.	Silver Spur Road	40	0	0%
Rolling Hills Estates	Palos Verdes Drive N	Crenshaw Blvd.	40	2	5%
Gardena	Rosecrans Avenue	Van Ness Avenue	40	1	3%

The following areas show a pattern of truck-related collisions and are analyzed in more detail.

Del Amo Boulevard in Rancho Dominguez
The two intersections with the highest number of reported truck-involved collisions in the South Bay Cities subregion are in close proximity to each other: Del Amo Boulevard at Santa Fe Avenue and Del Amo Boulevard and Susana Road in the unincorporated area of Rancho Dominguez.

Source: Google Earth
Del Amo Boulevard and Santa Fe Avenue

Source: Google Earth
Del Amo Boulevard and Susana Rd.

The intersection of Del Amo Boulevard and Santa Fe Avenue is located in an industrial area, adjacent to the Del Amo Metro Blue Line Station. The primary factor in 23 of the 38 identified collisions was directly related to turning movements (automobile right-of-way or improper turning). This resulted in 22 sideswipe collisions at this location.

The data indicates most of the collisions are due to movements from the Interstate 710 freeway ramps (North) and the industrial areas of Rancho Dominguez (West). There is less conflict among the other movements because the southern portion of Susana Road is a short access roadway, and trucks are prohibited from Del Amo Boulevard, east of the Interstate 710 northbound on-ramps, to the east of the Del Amo Boulevard/Susana Road intersection.

Pacific Coast Highway in Lomita
Four locations along Pacific Coast Highway in Lomita have more than three truck-involved crashes in the observed time period: Oak Street, Walnut Street, Pennsylvania Street, and Narbonne Boulevard These locations are located along a commercial strip development, with many driveway curb cuts, short turn-pockets, unprotected turns, and narrow roadways. Major truck generators in the area are the land uses adjacent

Source: Google Earth
Pacific Coast Highway in Lomita

to Torrance Airport and Chandler Quarry.

Alameda Street in Carson
Alameda Street has some of the highest non-freeway truck volumes in the South Bay region. Alameda Street extends from the port area to downtown Los Angeles.

Before the opening of the Alameda Corridor, Alameda Street and the at-grade rail line facilitated an agglomeration of freight-related activities around Alameda Street in Wilmington and Carson. Those facilities continue to be served by Alameda Street and Wilmington Avenue. Truck traffic along Alameda Street is likely to rise as cargo volume at the POLA and POLB increases (especially at the West Basin Terminals) and, as area freeways become more congested, Alameda Street is the first option for northbound and southbound non-freeway goods movement travel through the South Bay.

Source: Google Earth
Alameda Street and Wilmington Avenue in Carson

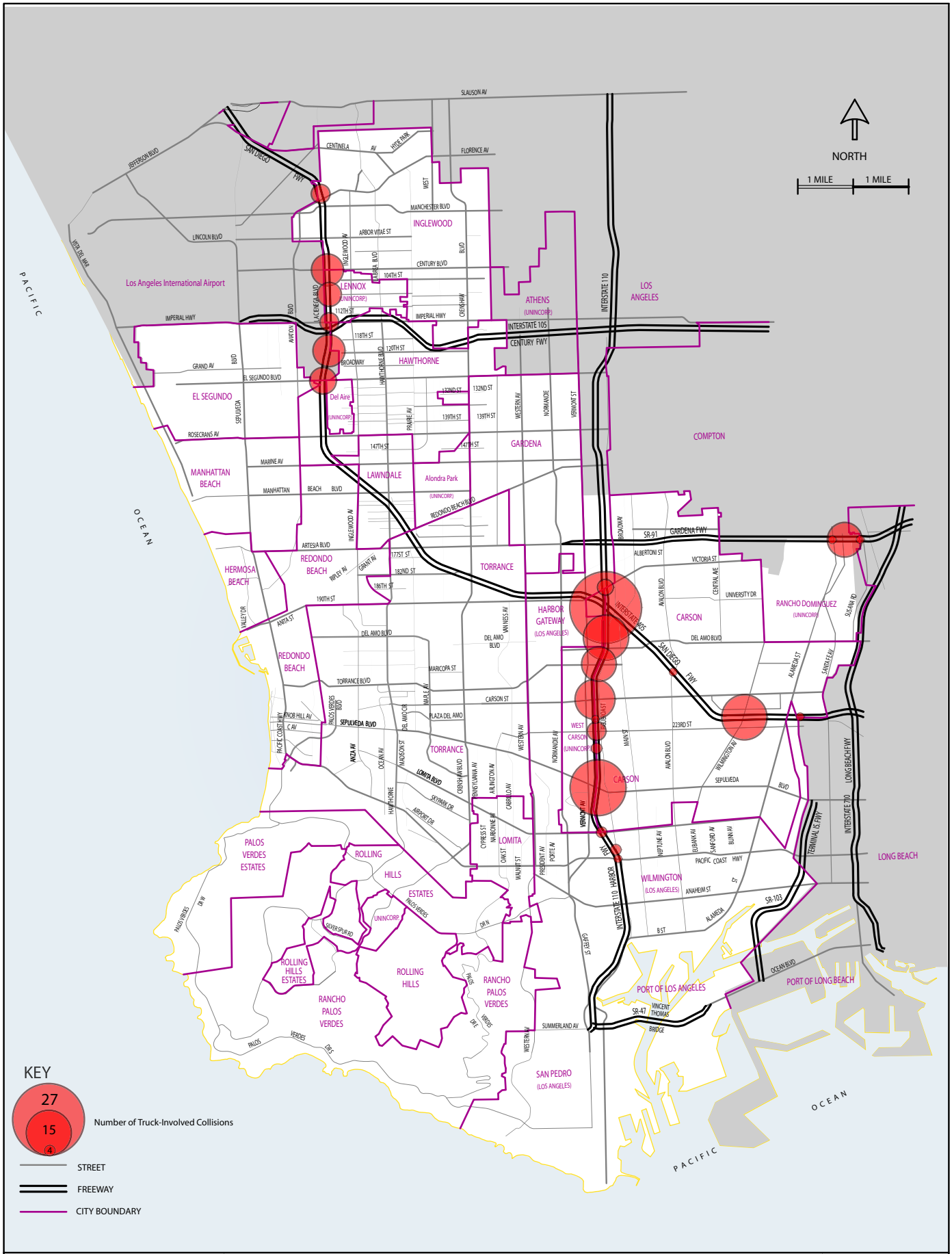
Wilmington Avenue in Carson
Unlike Alameda Street, Wilmington Avenue does not directly serve the port area, it terminates at Sepulveda Boulevard. However, it serves the large industrial land uses in central Carson, which include a large amount of businesses working with the ports.

Sepulveda Boulevard in Carson
This East-West truck route serves the Intermodal Container Freight Facility, and provides access to and from the Interstate 110 and Interstate 710 freeways.

Source: Google Earth
Sepulveda Boulevard in Carson

El Segundo Boulevard and Crenshaw Boulevard in Hawthorne/Gardena
El Segundo Boulevard is an alternative route to Interstate 105 serving industrial areas in Hawthorne and Gardena, adjacent to Hawthorne Airport.

Freeway Truck Collisions
Figure 29 and Table 23 display locations of truck-related collisions on freeways in the South Bay subregion. The two major areas of concentration of truck-involved freeway collisions is along Interstate 110, between Sepulveda Boulevard and Interstate 405, and along Interstate 405 near LAX. These patterns indicate truck collisions are most likely in places where significant lane weaving for entering and exiting vehicles occur. Improvements extending acceleration and deceleration distances, such as auxiliary lanes can help alleviate these weaving conflicts.



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South Bay Freeway Locations With Three or More Truck-Involved Collisions (January 2003-June 2006)

Figure 32

Table 24
South Bay Freeway Locations with Three or More Truck-Related Collisions
(January 2003 – June 2006)

City	Primary Road	Secondary Road	Total
Carson/Los Angeles/Unincorporated(Harbor City)	Interstate 405	Interstate 110	27
Carson/Unincorporated (Harbor City)	Interstate 110	Sepulveda Blvd.	21
Carson	Interstate 405	Wilmington Avenue	17
Carson/Unincorporated (Harbor City)	Interstate 110	Del Amo Blvd.	17
Carson/Unincorporated (Harbor City)	Interstate 110	Carson Street	15
Carson/Unincorporated (Harbor City)	Interstate 110	Torrance Blvd.	13
Unincorporated (Rancho Dominguez)	State Route 91	Santa Fe Avenue	13
Inglewood	Interstate 405	Century Blvd.	12
Hawthorne/Unincorporated (Del Aire)	Interstate 405	120th Street	12
Hawthorne/Unincorporated (Del Aire)	Interstate 405	El Segundo Blvd.	10
Unincorporated (Lennox)	Interstate 405	Lennox Blvd.	9
Inglewood	Interstate 405	La Cienega Blvd.	7
Unincorporated (Harbor City)	Interstate 110	223rd Street	7
Los Angeles/Hawthorne/Unincorporated (Lennox)	Interstate 405	Imperial Highway	7
Carson/Los Angeles (Harbor City)	Interstate 110	190th Street	6
Carson/Unincorporated (Harbor City)	Interstate 110	228th Street	4
Los Angeles (Wilmington)/Carson/Unincorporated (Harbor City)	Interstate 110	Lomita Blvd.	4
Los Angeles (Wilmington)	Interstate 110	Figueroa Street	4
Unincorporated (Rancho Dominguez)	State Route 91	Susana Road	3
Unincorporated (Rancho Dominguez)	State Route 91	Alameda Street	3
Unincorporated	Interstate 110	Pacific Coast Highway	3
Los Angeles	Interstate 405	223rd Street	3
Carson	Interstate 405	Avalon Blvd.	3
Carson	Interstate 110	220th Street	3

The following areas on the local freeway system show a pattern of truck-related collisions and are analyzed in more detail.

Interstate 110 North of Sepulveda, South of Interstate 405
Torrance, Harbor Gateway, and West Carson have many industrial land uses that are served by Interstate 110. Northbound Interstate 110 narrows to three mainline lanes, north of Torrance Boulevard. This is intended to accommodate additional lane capacity for the on-ramp to Interstate 405; however, it causes a bottleneck along Interstate 110 when the capacity of the three remaining mainline lanes is reached during peak periods. Truck-involved collisions often occur when trucks decelerate to exit or accelerate slowly when entering a freeway.

Interstate 405 adjacent to LAX
This section of Interstate 405 serves the Los Angeles International Airport cargo facilities and other industrial land uses in El Segundo and Inglewood.

Wilmington Avenue/Interstate 405 Interchange
13 collisions were specifically indicated as occurring on the Wilmington Avenue/ Interstate 405 on- and off-ramps. This is a large amount of truck-related collisions, considering the next highest level of collisions in the South Bay is at La Cienega/Interstate 405 with five. The City of Carson has identified the ramps at the interchange as in need of improvement, and the northbound on-ramps and off-ramps are currently under construction.

3.3.2 Highway-Rail Crossings

The South Bay has 384 highway-rail grade crossings. Some of these are located in the port area and support port activities. While most of the highway-rail grade crossings are located on small streets that serve industrial land uses, the rail system must also cross major arterials that

support large volumes of both auto and truck volumes. The following locations were indicated by Cities in the trucking/goods movement survey as causing significant motorist delay:

Carson
- BNSF at Figueroa Street
- BNSF at Avalon Blvd
- BNSF at Wilmington Blvd

El Segundo
- Imperial Highway at Aviation Blvd
- Sepulveda Boulevard at Hughes Way
- Douglas Street at Utah Street

Gardena
- Redondo Beach Blvd at Vermont Avenue
- Western Avenue at 166th Street
- Gardena Blvd at Vermont Avenue
- Normandie Avenue South of 168th Street
- Artesia Boulevard at Normandie Ave

Redondo Beach
- Inglewood Avenue North of Manhattan Beach Blvd

Torrance
- Arlington Avenue South of Plaza Del Amo
- Carson Street East of Crenshaw Blvd
- Torrance Boulevard East of Crenshaw Blvd
- Sepulveda Boulevard West of Western Avenue
- Torrance Boulevard East of Van Ness Avenue
- Western Avenue South of Sepulveda Blvd
- 182nd Street West of Kingsdale

Table 25
Highway-Rail Crossings
Total and Type by South Bay City

City	Total	Public	Private	Pedestrian
Los Angeles	180	136	43	1
Carson	50	38	9	3
Hawthorne	30	21	6	3
Torrance	53	36	15	2
Redondo Beach	6	4	2	0
Gardena	22	20	2	0
Inglewood	23	13	8	2
El Segundo	20	10	8	2
Total	384	278	93	13

Table 26
Crossing Type

Grade	Number
At Grade (cars must cross tracks)	382
Railroad Under	40
Railroad Over	21
Total	443

Note: There are 220 at-grade public crossings in the South Bay, 59 are closed or abandoned crossings.

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Table 27
Type of Crossing

Type	Number
Public Vehicle	319
Private Vehicle	105
Pedestrian Only	19
Total	443

Table 28
Warning Systems for Public At-Grade Crossings

Warning System	Number
Gates	86
Flashing Lights	71
Crossbucks	36
Highway Traffic Signal	12
Stop Signs	8
No signs or signals	2
No information	5
Total	220

Highway-Rail Collisions

Between 2002 and 2006, there were 15 collisions at highway-rail crossings. Almost all of the incidents involved vehicles ignoring warnings and entering the crossing. Two locations had more than one incident:

- The Union Pacific tracks at Inglewood Avenue, between Broadway and El Segundo Boulevard, in the City of Hawthorne had three incidents. This site is adjacent to Hawthorne High School.
- The Union Pacific tracks at Sartori Avenue in downtown Torrance had two incidents.

Table 29
Rail-Highway Crossing Incidents (2002-2006)

City	Highway	Railroad	Grade Crossing Number	Year	Type of Vehicle	Position of Highway User	Circumstances of Accident	Type of Track	Action of Motorist	Killed	Injured	Crossing	Narrative
Carson	Wilmington Avenue	UP	747912B	2006	Truck-Trailer	Moving over crossing	Rail equipment struck highway user	Industry	Did not stop	0	0	standard fls, audible, cross bucks,	
Dominguez	2417 E Carson Street	UP	411914J	2002	Truck-Trailer	Moving over crossing	Rail equipment struck highway user	Industry	Stopped then proceeded	0	0	stop signs, cross bucks, flagged by crew,	
Hawthorne	Inglewood & Broadway	UP	760602M	2004	Motorcycle	Moving over crossing	Rail equipment struck by highway user	Main	Did not stop	0	1	standard fls,	
Hawthorne	Inglewood Avenue	UP	760602M	2003	Auto	Moving over crossing	Rail equipment struck by highway user	Industry	Did not stop	0	0	standard fls, audible,	
Hawthorne	Inglewood Avenue	UP	760602M	2004	Pick-up Truck	Moving over crossing	Rail equipment struck by highway user	Industry	Did not stop	0	0	standard fls, audible, cross bucks,	
Los Angeles	Alameda & Henry Ford	UP	761525T	2002	Truck-Trailer	Moving over crossing	Rail equipment struck highway user	Main	Stopped then proceeded	0	0	standard fls, stop signs, cross bucks,	
Los Angeles	Avalon Blvd.	BNSF	027963Y	2002	Pedestrian	Moving over crossing	Rail equipment struck highway user	Main		0	1	Gates, cantilever fls,	
Los Angeles	Avalon Boulevard	UP	760561K	2004	Auto	Moving over crossing	Rail equipment struck by highway user	Industry	Drove around or through gate	0	0	Gates, cantilever fls, standard fls, audible, stop signs, cross bucks,	
Los Angeles	Das Private Crossing	PHL	747752P	2002	Auto	Stopped on crossing	Rail equipment struck highway user	Industry	Stopped on crossing	0	0	stop signs,	traincrew while shoving into an industry struck a pov that ingnored railroad crossing indications and was stopped on the crossing.
Los Angeles	Fries Ave	PHL	747735Y	2004	Truck-Trailer	Moving over crossing	Rail equipment struck highway user	Yard	Did not stop	0	1	cross bucks,	light engine was going through a crossing, bells and whistles blowing, approaching the yard when a truck tried to go through the crossing ahead of the engine. the engine did not have enough time to stop and hit the truck in the crossing.
Los Angeles	Oxford St /Menlo Ave	UP	760571R	2003	Other Motor Vehicle	Stopped on crossing	Rail equipment struck highway user	Main	Stopped on crossing	0	0	stop signs, cross bucks,	Fire truck
Los Angeles	S. Fries Ave.	PHL	747750B	2002	Auto	Moving over crossing	Rail equipment struck highway user	Industry	Did not stop	0	0	stop signs, other	while shoving into an industry a civilian pov ignored rail crossing notices and proceeded across a private crossing and was struck on the passenger side of vehicle. (item 32 code 11: there were street obscures view to right side of vehicle.
Los Angeles	Victoria Street	UP	747701E	2003	Auto	Moving over crossing	Rail equipment struck by highway user	Industry	Did not stop	0	0	standard fls, audible, cross bucks	
Torrance	Sartori Avenue	UP	760544U	2004	Other Motor Vehicle	Moving over crossing	Rail equipment struck highway user	Industry	Did not stop	0	0	highway traffic signals, cross bucks,	
Torrance	Sartori Avenue	UP	760544U	2005	Auto	Moving over crossing	Rail equipment struck highway user	Industry	Stopped then proceeded	0	0	stop signs, cross bucks,	

3.4 South Bay Goods Movement Generated by LAX

The effect of trucks generated by the Port of Los Angeles and the Port of Long Beach are well documented. However, trucks generated by LAX are not well quantified or documented. As shown in Figure 28 trucks entering and leaving the South Cargo Complex – West, South Cargo Complex – East, and the Imperial Cargo Complex have access to Interstate 105 and its connection to Interstate 405. The Century Cargo Complex has access to Interstate 405 via Century Boulevard. These facilities are shown in Figure 30.

LAX conducts annual counts of the driveways serving its cargo facilities each August. These counts show that truck volumes are highest in the PM peak period, as shown in Table 29. Total truck traffic to/from LAX cargo facilities is 663 trucks during the midday peak hour (airport peak). In contrast, the Ports of Los Angeles and Long Beach generated 4,889 trucks from 11 AM to noon.

Table 30
Cargo-Related LAX Trip Generation - August 2006

Cargo Facility	Driveway Inbound and Outbound Volume								
	AM			AP			PM		
	Truck	Total	Percent	Truck	Total	Percent	Truck	Total	Percent
Century Cargo Complex	209	703	25%	272	861	32%	227	899	27%
Imperial Cargo Complex	191	637	26%	247	620	44%	274	764	39%
South Cargo Complex - East	86	383	22%	100	327	30%	103	500	19%
South Cargo Complex - West	21	118	15%	44	135	27%	30	146	31%
Total	507	1841	28%	663	1943	34%	634	2309	27%

AM: AM peak hour (8AM to 9AM)
AP: Airport peak hour (11AM to noon)
PM: PM peak hour (5PM to 6PM)

As shown in Table 29, truck volumes peak in the midday period. In addition, truck volumes are more consistent throughout the day when compared to passenger volumes, as seen in Figure 18 in section 2.1.4.

In order to illustrate where trips go once they are outside the immediate LAX vicinity, the trips generated from the SCAG model traffic analysis zone (TAZ) containing the LAX cargo terminals were segregated out of the total heavy duty truck trips in the 2030 model scenario. The results of this analysis are shown in Figure 31 and Table 30 for freeway segments, and Tables 31 and 32 for arterial segments. Truck passenger car equivalents (PCEs) are displayed instead of truck volumes in order to adequately demonstrate the percent share of truck traffic on the roadway segments.

LAX Cargo Facilities and Regional Highway Access

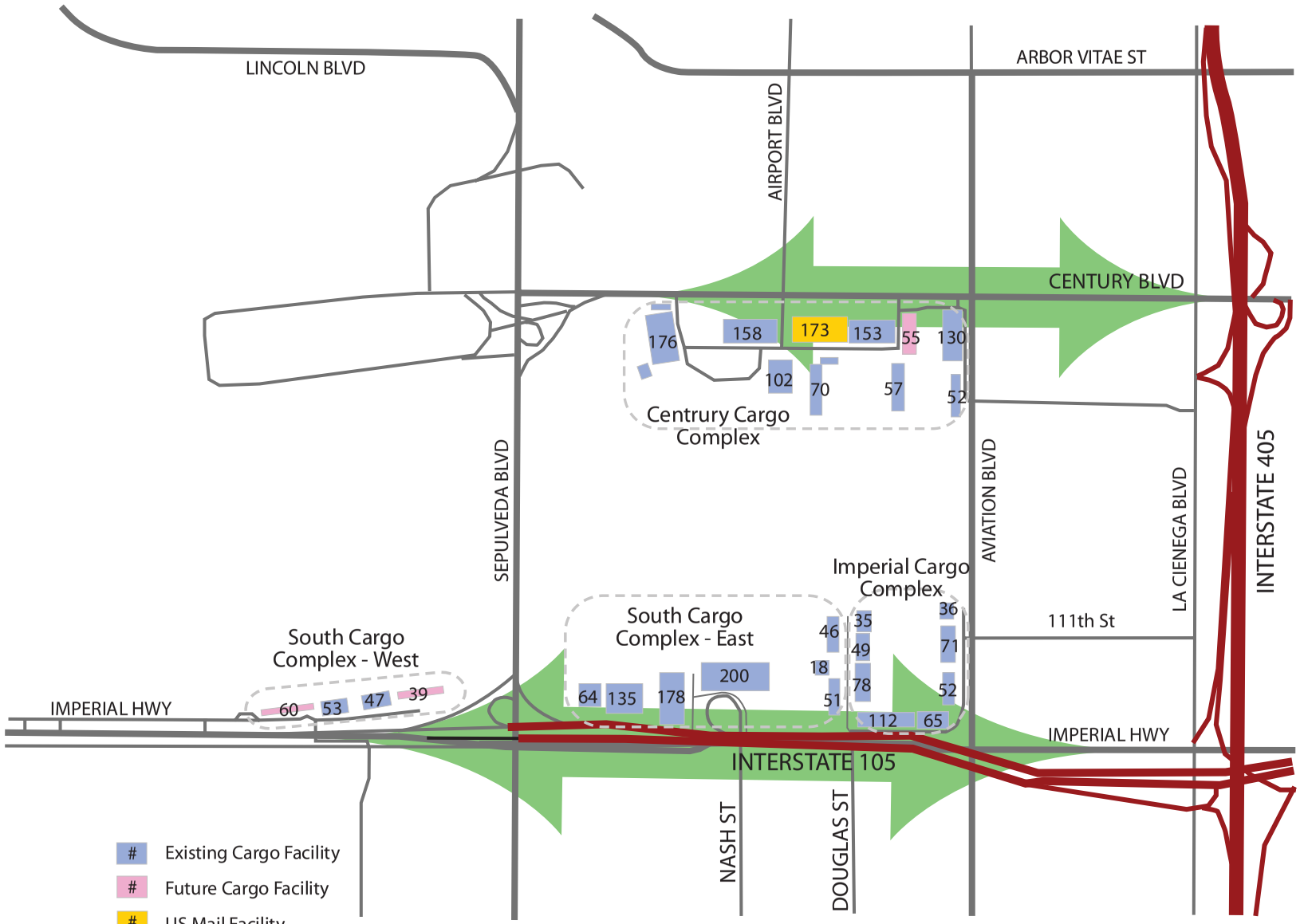


Figure 33

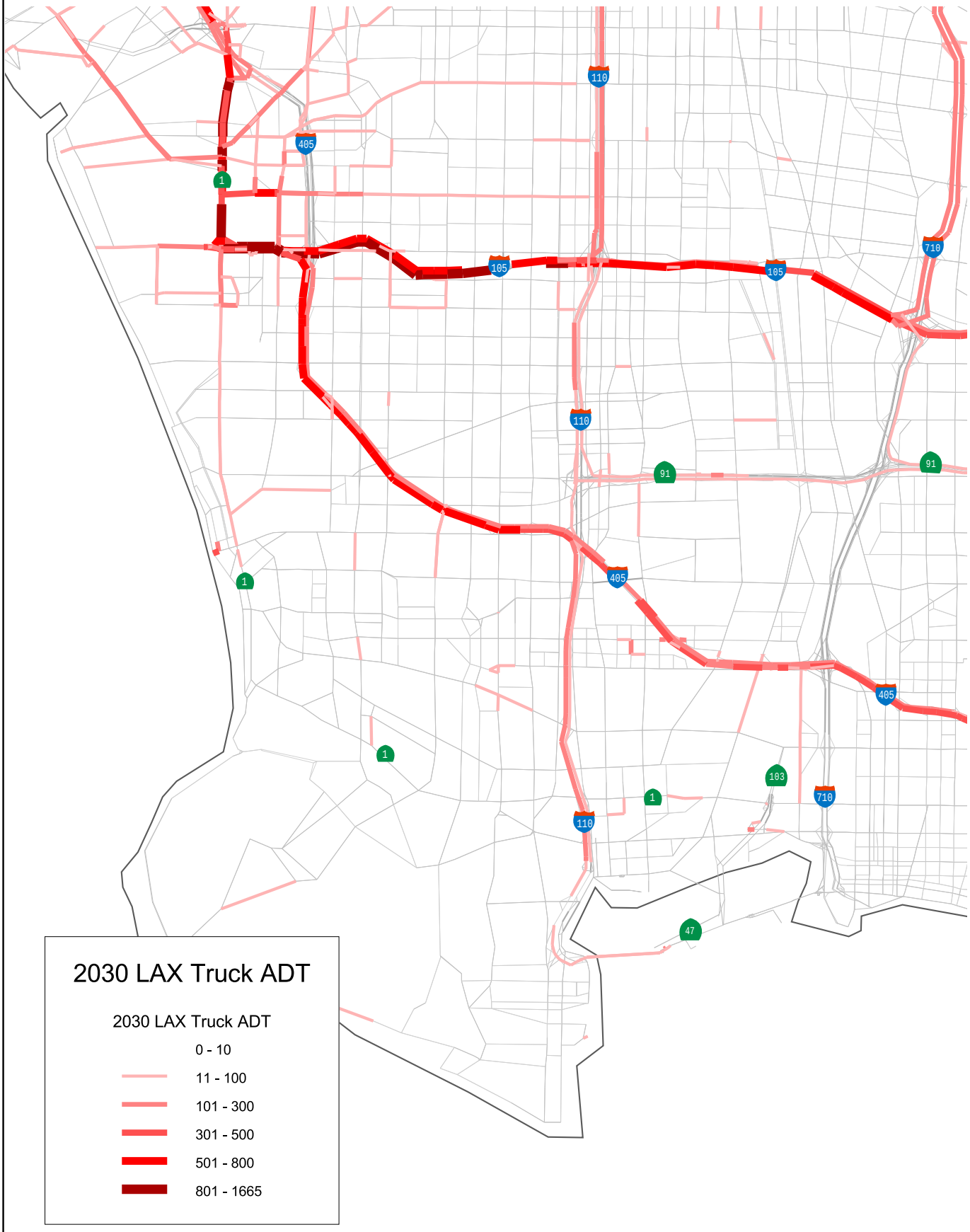
Table 31
2030 LAX-Generated Average Daily Truck Traffic
on Selected Freeway Segments

Segment		LAX Truck PCE ADT	LAX Total ADT	LAX Truck Percent of Total	Truck PCE ADT	Total ADT	Total Truck Percent of Total	LAX Percent of Total Truck PCE ADT	LAX Percent of Total
I-405	La Cienega	-	265	0.0%	58,924	327,800	18.0%	0.0%	0.1%
I-405	South of I-105	1,734	28,421	6.1%	56,050	354,996	15.8%	3.1%	8.0%
I-405	Redondo Beach Blvd	1,542	16,374	9.4%	52,546	261,008	20.1%	2.9%	6.3%
I-405	South of I-110	1,116	9,544	11.7%	47,842	260,317	18.4%	2.3%	3.7%
I-405	South of Wilmington Blvd	814	6,570	12.4%	47,182	261,323	18.1%	1.7%	2.5%
I-405	South of I-710	960	7,938	12.1%	70,082	338,301	20.7%	1.4%	2.3%
I-105	East of Sepulveda	3,930	59,238	6.6%	10,680	144,541	7.4%	36.8%	41.0%
I-105	East of Crenshaw	3,328	26,130	12.7%	30,168	244,146	12.4%	11.0%	10.7%
I-105	East of I-110	1,616	8,939	18.1%	32,612	264,293	12.3%	5.0%	3.4%
I-110	North Of I-105	740	7,824	9.5%	35,950	301,827	11.9%	2.1%	2.6%
I-110	North Of SR-91	232	1,825	12.7%	36,018	272,903	13.2%	0.6%	0.7%
I-110	North Of I-405	24	297	8.1%	63,500	314,790	20.2%	0.0%	0.1%
I-110	North Of Pacific Coast Highway	258	2,631	9.8%	64,252	235,164	27.3%	0.4%	1.1%
SR-91	East of Normandie	-	100	0.0%	9,922	110,771	9.0%	0.0%	0.1%
SR-91	East of I-110	82	815	10.1%	54,222	252,488	21.5%	0.2%	0.3%
SR-91	East of Avalon	82	790	10.4%	54,212	252,409	21.5%	0.2%	0.3%
SR-91	East of Alameda	136	951	14.3%	63,718	290,676	21.9%	0.2%	0.3%

Note: Volumes represent mainline freeway volumes only, no HOV volume is included.

The two freeways adjacent to LAX, Interstate 105 and Interstate 405, handle the most trucks generated by the LAX TAZ. Interstate 105 carries about 40 percent of LAX cargo truck traffic east of Sepulveda Boulevard; Interstate 105 is easily accessed from the cargo facilities to the south of the airport, along Imperial Highway. Interstate 405 carries nearly 10 percent of LAX truck traffic, and is easily accessed from the cargo facilities along Century Boulevard by either Century Boulevard or La Cienega Boulevard. Interstate 110 and State Route 91 carry nominal LAX cargo volume.

Arterial streets are generally not used by LAX-bound cargo trucks unless they are serving a local South Bay land use, or are using South Bay streets to avoid a freeway incident that is causing congestion.



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2030 LAX-Generated Average Daily Truck Traffic

Figure 34

Table 32
2030 LAX-Generated Average Daily Truck Traffic on Selected East/West Arterial Segments

Segment			LAX Truck PCE ADT	LAX Total ADT	LAX Truck Percent	Truck PCE ADT	Total ADT	Total Truck Percent	LAX Percent of Total Trucks	LAX Percent of Total
190th St	w/o	Crenshaw Blvd	-	-	-	4,180	48,887	8.6%	-	-
223rd St	e/o	Avalon Blvd	-	10	0.0%	2,634	26,462	10.0%	-	0.0%
9th St	w/o	Gaffey St	-	49	0.0%	498	9,579	5.2%	-	0.5%
Anaheim St	w/o	Gaffey St	-	-	-	840	16,426	5.1%	-	-
Artesia Blvd	e/o	Sepulveda Blvd	12	454	2.6%	1,242	23,009	5.4%	1.0%	2.0%
Artesia Blvd	e/o	Aviation Blvd	2	176	1.1%	1,512	25,446	5.9%	0.1%	0.7%
Artesia Blvd	e/o	Hawthone Blvd	-	5	0.0%	2,634	35,864	7.3%	-	0.0%
Artesia Blvd	e/o	Prarie Av	14	784	1.8%	3,902	57,983	6.7%	0.4%	1.4%
Artesia Blvd	e/o	Western Av	-	76	0.0%	4,490	55,045	8.2%	-	0.1%
Carson St	w/o	Hawthorne Blvd	-	56	0.0%	504	9,720	5.2%	-	0.6%
Carson St	e/o	Crenshaw Blvd	8	139	5.8%	2,516	35,545	7.1%	0.3%	0.4%
Carson St	e/o	Avalon Blvd	-	59	0.0%	3,676	33,945	10.8%	-	0.2%
Carson St	e/o	Wimington Av	-	17	0.0%	2,768	9,090	30.5%	-	0.2%
Carson St	e/o	Alameda St	-	20	0.0%	790	4,620	17.1%	-	0.4%
Carson St	w/o	Santa Fe Av	-	36	0.0%	4,468	37,967	11.8%	-	0.1%
Century Blvd	e/o	Aviation Blvd	1,284	25,637	5.0%	2,602	49,531	5.3%	49.3%	51.8%
Century Blvd	e/o	Hawthorne Blvd	234	5,212	4.5%	2,262	46,357	4.9%	10.3%	11.2%
Century Blvd	e/o	Crenshaw Blvd	104	2,944	3.5%	2,288	45,511	5.0%	4.5%	6.5%
Del Amo Blvd	w/o	Central Av	2	159	1.3%	3,422	25,644	13.3%	0.1%	0.6%
Del Amo Blvd	e/o	Wimington Av	-	57	0.0%	1,936	27,749	7.0%	-	0.2%
Del Amo Blvd	e/o	Alameda St	10	279	3.6%	9,968	37,298	26.7%	0.1%	0.7%
Del Amo Blvd	w/o	Santa Fe Av	-	-	-	1,124	27,446	4.1%	-	-
El Segundo Blvd	e/o	Sepulveda Blvd	406	2,524	16.1%	4,994	34,175	14.6%	8.1%	7.4%
El Segundo Blvd	w/o	Hawthorne Blvd	14	278	5.0%	2,386	20,969	11.4%	0.6%	1.3%
El Segundo Blvd	w/o	Western Av	-	36	0.0%	3,256	34,167	9.5%	-	0.1%
Florence Av	w/o	La Brea Blvd	96	2,168	4.4%	1,778	25,080	7.1%	5.4%	8.6%
Grand Av	e/o	Vista Del Mar	14	1,017	1.4%	624	6,717	9.3%	2.2%	15.1%
Grand Av	w/o	Sepulveda Blvd	46	1,077	4.3%	1,238	11,879	10.4%	3.7%	9.1%
Imperial Hwy	w/o	Aviation Blvd	88	1,456	6.0%	4,306	39,520	10.9%	2.0%	3.7%
Lomita Blvd	w/o	Hawthorne Blvd	2	90	2.2%	1,344	25,088	5.4%	0.1%	0.4%
Lomita Blvd	e/o	Crenshaw Blvd	2	58	3.4%	2,750	41,058	6.7%	0.1%	0.1%
Lomita Blvd	e/o	Vermont St	-	65	0.0%	3,938	42,258	9.3%	-	0.2%
Manchester Blvd	e/o	La Brea Blvd	42	315	13.3%	1,652	30,386	5.4%	2.5%	1.0%
Manhattan Beach Blvd	e/o	Sepulveda Blvd	-	16	0.0%	666	12,263	5.4%	0.0%	0.1%
Manhattan Beach Blvd	e/o	Inglewood Ave	-	5	0.0%	1,730	26,883	6.4%	0.0%	0.0%
Marine Av	e/o	Inglewood Ave	18	455	4.0%	1,438	25,171	5.7%	1.3%	1.8%
Normandie Av	e/o	Redondo Beach Blvd	-	-	-	2,606	40,068	6.5%	-	-
Pacific Coast Highway	e/o	Hawthorne Blvd	-	48	0.0%	426	14,129	3.0%	-	0.3%
Pacific Coast Highway	e/o	Narbonne Ave	-	1	0.0%	2,118	31,360	6.8%	-	0.0%
Pacific Coast Highway	w/o	Alameda St	-	-	-	3,266	33,971	9.6%	-	-
Rosecrans Av	e/o	Sepulveda Blvd	-	5	0.0%	2,794	33,223	8.4%	-	0.0%
Rosecrans Av	w/o	Hawthorne Blvd	2	127	1.6%	844	17,564	4.8%	0.2%	0.7%
Rosecrans Av	e/o	Crenshaw Blvd	4	138	2.9%	2,196	33,531	6.5%	0.2%	0.4%
Rosecrans Av	w/o	Western Av	4	109	3.7%	2,990	33,436	8.9%	0.1%	0.3%
Sepulveda Blvd	w/o	Hawthorne Blvd	-	84	0.0%	2,110	36,763	5.7%	-	0.2%
Sepulveda Blvd	e/o	Western Av	58	1,339	4.3%	2,642	40,683	6.5%	2.2%	3.3%
Sepulveda Blvd	e/o	Avalon Blvd	-	132	0.0%	3,692	35,787	10.3%	-	0.4%
Sepulveda Blvd	w/o	Wimington Av	4	26	15.4%	1,858	19,773	9.4%	0.2%	0.1%
Sepulveda Blvd	e/o	Alameda St	-	32	0.0%	6,350	27,615	23.0%	-	0.1%
Torrance Blvd	e/o	Pacific Coast Highway	2	153	1.3%	2,806	46,888	6.0%	0.1%	0.3%
Torrance Blvd	w/o	Hawthorne Blvd	-	11	0.0%	986	24,472	4.0%	-	0.0%
Torrance Blvd	e/o	Crenshaw Blvd	-	16	0.0%	1,974	29,988	6.6%	-	0.1%

Table 33
2030 LAX-Generated Average Daily Truck Traffic
on Selected North/South Arterial Segments

Segment			LAX Truck PCE ADT	LAX Total ADT	LAX Truck Percent	Truck PCE ADT	Total ADT	Total Truck Percent	LAX Percent of Total Trucks	LAX Percent of Total
Alameda St	n/o	Del Amo Blvd	10	181	5.5%	13,292	20,815	63.9%	0.1%	0.9%
Alameda St	n/o	Carson St	-	58	0.0%	12,660	25,408	49.8%	-	0.2%
Alameda St	n/o	Sepulveda Blvd	48	370	13.0%	27,012	44,047	61.3%	0.2%	0.8%
Alameda St	n/o	Pacific Coast Highway	-	10	0.0%	24,910	37,599	66.3%	-	0.0%
Alameda St	n/o	Anaheim St	-	43	0.0%	3,722	11,529	32.3%	-	0.4%
Avalon Blvd	n/o	Carson St	10	293	3.4%	1,810	28,254	6.4%	0.6%	1.0%
Avalon Blvd	n/o	223rd St	6	265	2.3%	1,746	23,199	7.5%	0.3%	1.1%
Avalon Blvd	n/o	Sepulveda Blvd	10	112	8.9%	1,608	17,180	9.4%	0.6%	0.7%
Aviation Blvd	s/o	Century Blvd	188	3,808	4.9%	2,888	39,127	7.4%	6.5%	9.7%
Aviation Blvd	s/o	Imperial Hwy	32	878	3.6%	3,012	32,191	9.4%	1.1%	2.7%
Aviation Blvd	s/o	Artesia Blvd	-	10	0.0%	1,866	26,612	7.0%	-	0.0%
Central Ave	n/o	Victoria St	-	47	0.0%	1,724	37,464	4.6%	-	0.1%
Central Ave	n/o	Del Amo Blvd	6	278	2.2%	2,294	15,493	14.8%	0.3%	1.8%
Crenshaw Blvd	s/o	Century Blvd	10	117	8.5%	1,320	26,254	5.0%	0.8%	0.4%
Crenshaw Blvd	n/o	190th St	76	2,290	3.3%	7,450	77,403	9.6%	1.0%	3.0%
Crenshaw Blvd	s/o	Rosecrans Blvd	2	89	2.2%	1,598	25,498	6.3%	0.1%	0.3%
Crenshaw Blvd	n/o	Carson St	30	1,166	2.6%	3,260	46,862	7.0%	0.9%	2.5%
Crenshaw Blvd	n/o	Torrance Blvd	28	1,150	2.4%	1,630	22,578	7.2%	1.7%	5.1%
Crenshaw Blvd	n/o	Lomita Blvd	22	1,109	2.0%	3,772	49,516	7.6%	0.6%	2.2%
Gaffey St	n/o	Anaheim St	-	6	0.0%	1,786	30,337	5.9%	-	0.0%
Gaffey St	s/o	9th St	8	158	5.1%	1,390	27,120	5.1%	0.6%	0.6%
Hawthone Blvd	s/o	Artesia Blvd	24	2,812	0.9%	3,798	76,159	5.0%	0.6%	3.7%
Hawthorne Blvd	s/o	Century Blvd	18	328	5.5%	1,796	33,446	5.4%	1.0%	1.0%
Hawthorne Blvd	n/o	El Segundo Blvd	6	195	3.1%	1,774	34,070	5.2%	0.3%	0.6%
Hawthorne Blvd	n/o	Rosecrans Blvd	-	55	0.0%	2,304	44,968	5.1%	-	0.1%
Hawthorne Blvd	n/o	Carson St	14	2,100	0.7%	2,424	50,018	4.8%	0.6%	4.2%
Hawthorne Blvd	s/o	Torrance Blvd	2	19	10.5%	1,408	21,637	6.5%	0.1%	0.1%
Hawthorne Blvd	n/o	Lomita Blvd	12	1,729	0.7%	2,820	57,014	4.9%	0.4%	3.0%
Hawthorne Blvd	n/o	Pacific Coast Highway	-	1,451	0.0%	1,672	46,790	3.6%	-	3.1%
Inglewood Ave	s/o	Marine Av	18	514	3.5%	2,174	35,786	6.1%	0.8%	1.4%
Inglewood Ave	s/o	Manhattan Beach Blvd	24	1,066	2.3%	2,040	35,626	5.7%	1.2%	3.0%
La Brea Blvd	s/o	Florence Av	-	4	0.0%	1,716	28,412	6.0%	-	0.0%
La Brea Blvd	s/o	Manchester Blvd	-	5	0.0%	1,252	24,006	5.2%	-	0.0%
Narbonne Ave	s/o	Pacific Coast Highway	-	34	0.0%	124	6,940	1.8%	-	0.5%
Normandie Av	n/o	Redondo Beach Blvd	-	42	0.0%	758	14,502	5.2%	-	0.3%
Prarie Av	n/o	Artesia	20	740	2.7%	1,208	25,850	4.7%	1.7%	2.9%
Santa Fe Av	n/o	Carson St	4	111	3.6%	7,806	35,260	22.1%	0.1%	0.3%
Santa Fe Av	s/o	Del Amo Blvd	-	-	-	1,410	17,470	8.1%	-	-
Sepulveda Blvd	s/o	Lincoln Blvd.	1,390	18,666	7.4%	3,606	54,726	6.6%	38.5%	34.1%
Sepulveda Blvd	n/o	Grand Av	572	9,267	6.2%	4,660	59,957	7.8%	12.3%	15.5%
Sepulveda Blvd	n/o	El Segundo Blvd	618	10,344	6.0%	5,792	69,975	8.3%	10.7%	14.8%
Sepulveda Blvd	n/o	Rosecrans Blvd	120	6,861	1.7%	4,554	78,355	5.8%	2.6%	8.8%
Sepulveda Blvd	n/o	Manhattan Beach Blvd	74	4,667	1.6%	1,864	48,464	3.8%	4.0%	9.6%
Sepulveda Blvd	s/o	Artesia Blvd	60	4,321	1.4%	2,016	50,740	4.0%	3.0%	8.5%
Pacific Coast Highway	n/o	Torrance Blvd	18	2,042	0.9%	3,218	63,781	5.0%	0.6%	3.2%
Vermont St	n/o	Lomita Blvd	-	75	0.0%	1,908	21,652	8.8%	-	0.3%
Vista Del Mar	n/o	Grand Av	12	757	1.6%	1,104	24,812	4.4%	1.1%	3.1%
Western Av	n/o	El Segundo Blvd	34	567	6.0%	2,380	23,016	10.3%	1.4%	2.5%
Western Av	s/o	Rosecrans Blvd	2	108	1.9%	2,242	29,229	7.7%	0.1%	0.4%
Western Av	s/o	Artesia Blvd	-	19	0.0%	986	14,841	6.6%	-	0.1%
Western Av	n/o	Sepulveda Blvd	10	509	2.0%	1,588	29,868	5.3%	0.6%	1.7%
Wimington Av	s/o	Victoria St	10	79	12.7%	1,672	9,879	16.9%	0.6%	0.8%
Wimington Av	n/o	Del Amo Blvd	-	-	-	2,828	14,058	20.1%	-	-
Wimington Av	n/o	Carson St	6	133	4.5%	7,754	31,635	24.5%	0.1%	0.4%
Wimington Av	n/o	Sepulveda Blvd	-	92	0.0%	3,872	30,555	12.7%	-	0.3%

The roadway segments serving the LAX cargo facilities that are projected to have the highest LAX-generated truck volumes include: Century Boulevard (1,284 daily PCE truck trips) and Sepulveda Boulevard (1,390 daily PCE truck trips). Other roadways with some LAX-generated truck traffic are segments of El Segundo Boulevard, Aviation Boulevard, Florence Avenue, Imperial Highway, Manchester Boulevard, Alameda Street, Crenshaw Boulevard, Hawthorne Boulevard, Inglewood Avenue, and Western Avenue.

3.5 Facility Obsolescence and Deterioration

Arterial Roadway Geometrics

In 1927, the median weight of combination trucks was less than 40,000 pounds. By 1948, it had risen to 48,000 pounds. It increased again to 72,000 pounds by 1964, and by 1975, the maximum allowed weight on the Interstate system was 80,000 pounds (as it is today). Widths has varied less, from a limit of 96 inches through 1982 to 102 inches since 1982.[8] These changes are very significant considering that many of the roadways in the South Bay Cities were designed and built decades before modern truck weights and sizes were standardized. As vehicles become larger, they have slower acceleration, longer stopping distances, and larger turning radii.

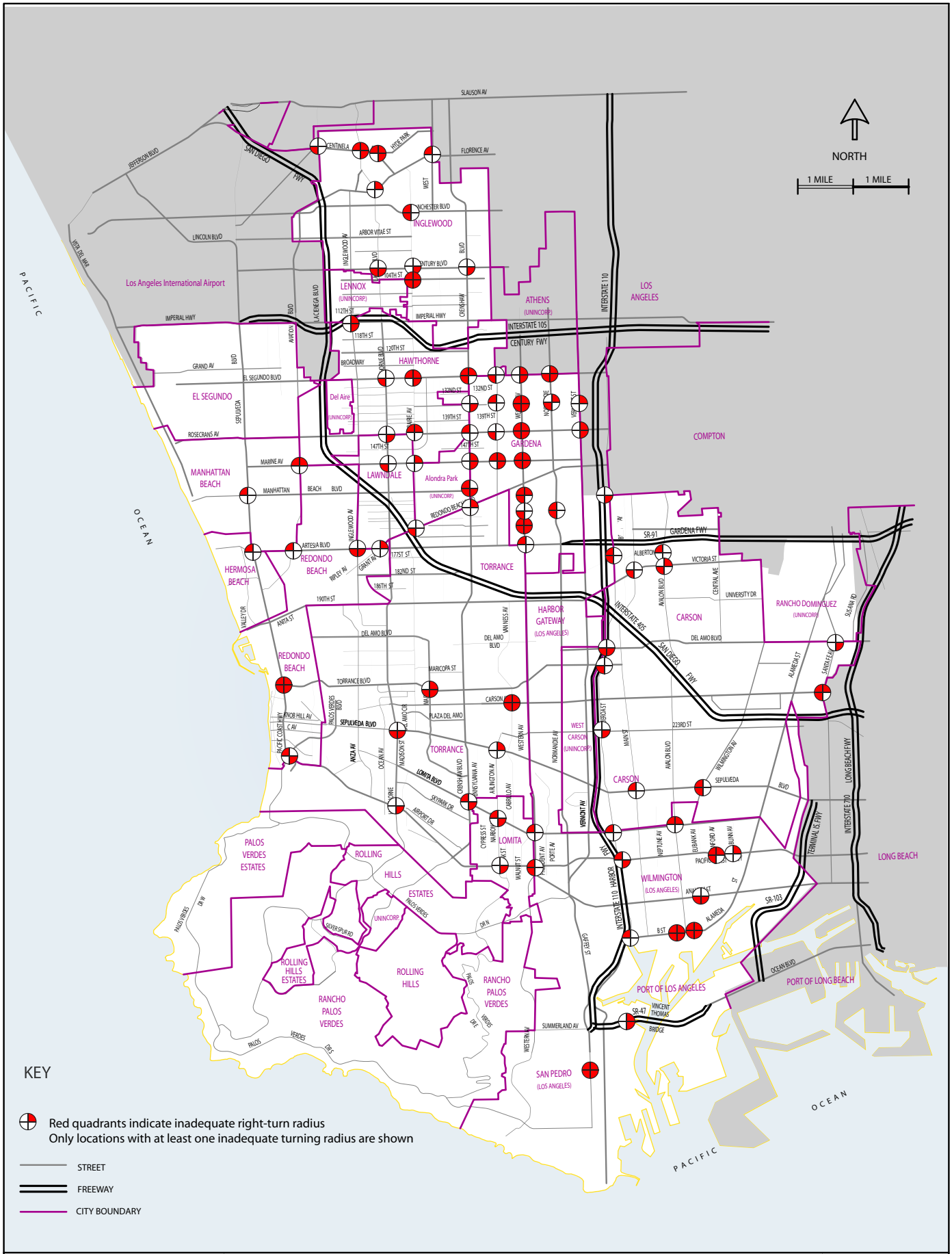
Each intersection and roadway has specific characteristics that contribute to appropriate design considerations. A trained transportation engineer must make a determination regarding appropriate design guidelines based on special conditions of each site. It is possible, however, to generally list those conditions that contribute to difficult truck operations, or result in slower truck movements such as inadequate sight distance, channelization requirements, lack of advanced warning sign placement, stopping distances that do not consider large vehicle deceleration rates, and smaller curb radii. With respect to curb radius design, the ITE Geometric Design and Operational Considerations for Trucks states the following:

> "Two factors that influence the maneuverability of large vehicles, including trucks, are turning radii and off-tracking. Off-tracking is the phenomena by which the rear wheels of a vehicle do not follow the same path as the front wheels (i.e., the rear of a truck turns less sharply than the front). Both factors are significant in the design of intersections, the differences in off-tracking between a passenger vehicle and large vehicles are significant in the design of virtually every intersection."

Turning radii are one of the most important design elements of intersections. The operations, safety, and efficiency of an intersection are controlled by the turning movements. If the turning vehicles are geometrically limited from completing the maneuver properly, the intersection will break down, capacity is limited, and collision potential will increase. Smaller curb radii cause trucks to swing far out into adjacent lanes to make turns, disrupting traffic on two or more lanes, slowing the truck down through the turn, and creating potential vehicle conflicts and the possibility of collisions.

Ideal curb radii for intersections with a significant number of large vehicles is 35 feet or greater. Even larger curb radii may be appropriate in heavily industrialized areas with high truck percentages, such as parts of Carson. An analysis of all of the right-turn radii at the intersections of the truck routes in the South Bay shows that 20 percent of these turning radii are inadequate (less than 35 feet). Figure 32 shows intersections with inadequate right-turn radii in the South Bay. Table 33 lists these locations.

[8] Geometric Design and Operational Considerations for Trucks, ITE Technical Council Committee 5B-28, February, 1992.



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Inadequate Right-Turning Radii Locations

Figure 35

Table 34
Inadequate Turning Radii at the Intersection of Truck Routes

Intersection		Corner of Intersection			
		Northwest	Northeast	Southeast	Southwest
CARSON					
223rd Street	Figueroa Street			Inadequate	
Avalon Boulevard	Albertoni Street	Inadequate			
Carson Street	Santa Fe Avenue	Inadequate	inadequate		Inadequate
Figueroa Street	Albertoni Street	Inadequate			Inadequate
Figueroa Street	Del Amo Boulevard			Inadequate	Inadequate
Figueroa Street	Torrance Boulevard				Inadequate
Main Street	223rd Street	Inadequate			
Main Street	Sepulveda Boulevard.	Inadequate			
Santa Fe Avenue	Del Amo Boulevard			Inadequate	
Sepulveda Boulevard	Figueroa Street	Inadequate			
Sepulveda Boulevard	Main Street	Inadequate	Inadequate		
Sepulveda Boulevard	Wilmington Avenue	Inadequate			inadequate
Victoria Street	Avalon Street		Inadequate		Inadequate
Victoria Street	Main Street				Inadequate
GARDENA					
135th Street	Crenshaw Boulevard			Inadequate	
135th Street	Normandie Avenue		Inadequate		Inadequate
135th Street	Van Ness Avenue	Inadequate			
135th Street	Vermont Street		Inadequate		
135th Street	Western Avenue	Inadequate	Inadequate	Inadequate	Inadequate
Artesia Boulevard	Western Avenue	Inadequate			
Crenshaw Boulevard	El Segundo Boulevard	Inadequate	Inadequate		Inadequate
Crenshaw Boulevard	Manhattan Beach Boulevard	Inadequate		Inadequate	Inadequate
Crenshaw Boulevard	Marine Avenue		Inadequate	Inadequate	
Crenshaw Boulevard	Redondo Beach Boulevard		Inadequate		
Crenshaw Boulevard	Rosecrans Avenue	Inadequate			
El Segundo Boulevard	Normandie Avenue		Inadequate	Inadequate	Inadequate
El Segundo Boulevard	Van Ness Avenue				Inadequate
El Segundo Boulevard	Western Avenue		Inadequate	Inadequate	
Marine Avenue	Normandie Avenue	Inadequate	Inadequate	Inadequate	Inadequate
Marine Avenue	Van Ness Avenue	Inadequate	Inadequate	Inadequate	Inadequate
Marine Avenue	Vermont Street	Inadequate			Inadequate
Marine Avenue	Western Avenue	Inadequate	Inadequate	Inadequate	Inadequate
Normandie Avenue	Gardena Boulevard	Inadequate			Inadequate
Rosecrans Avenue	Vermont Street			Inadequate	Inadequate
Rosecrans Avenue	Western Avenue	Inadequate	Inadequate	Inadequate	Inadequate
Rosecrans Avenue	Van Ness Avenue				Inadequate
Western Avenue	162nd Street	Inadequate	Inadequate		Inadequate
Western Avenue	166th Street	Inadequate	Inadequate	Inadequate	Inadequate
Western Avenue	Gardena Boulevard				Inadequate
HAWTHORNE					
El Segundo Boulevard	Prairie Avenue	Inadequate	Inadequate	Inadequate	
Hawthorne Boulevard	Rosecrans Avenue			Inadequate	
Imperial Hwy	Inglewood Avenue		Inadequate	Inadequate	
Prairie Avenue	Marine Avenue		Inadequate		
Prairie Avenue	Rosecrans Avenue	Inadequate	Inadequate		
INGLEWOOD					
Centinela Avenue	Hyde Park Boulevard	Inadequate	Inadequate	Inadequate	
Centinela Avenue	La Brea Avenue	Inadequate	Inadequate	Inadequate	
Centinela Avenue	La Cienega Boulevard				Inadequate
Century Boulevard	Crenshaw Boulevard			Inadequate	
Century Boulevard	La Brea Avenue			Inadequate	Inadequate
Century Boulevard	Prairie Avenue			Inadequate	
Florence Avenue	La Brea Avenue		Inadequate		
Florence Avenue	West Boulevard	Inadequate			

Table 34 (continued)
Inadequate Turning Radii at the Intersection of Truck Routes

Intersection		Corner of Intersection			
		Northwest	Northeast	Southeast	Southwest
INGLEWOOD (continued)					
Manchester Boulevard	Prairie Avenue	Inadequate			Inadequate
Prairie Avenue	104th Street	Inadequate	Inadequate	Inadequate	Inadequate
Prairie Avenue	Century Boulevard			Inadequate	
Prairie Avenue	Florence Avenue				
LAWNDALE					
Artesia Boulevard	Inglewood Avenue			Inadequate	Inadequate
Hawthorne Boulevard	Manhattan Beach Boulevard	Inadequate			
Hawthorne Boulevard	Marine Avenue				Inadequate
Hawthorne Boulevard	Rosecrans Avenue			Inadequate	
Marine Avenue	Prairie Avenue		Inadequate		
Prairie Avenue	Redondo Beach Boulevard				Inadequate
Prairie Avenue	Rosecrans Avenue	Inadequate	Inadequate		
LOMITA					
Lomita Boulevard	Crenshaw Boulevard	Inadequate		Inadequate	
Lomita Boulevard	Narbonne Avenue	Inadequate		Inadequate	
Pacific Coast Highway	Narbonne Avenue	Inadequate	Inadequate		Inadequate
MANHATTAN BEACH					
Artesia Boulevard	Aviation Boulevard	Inadequate			
Artesia Boulevard	Sepulveda Boulevard	Inadequate			
Aviation Boulevard	Marine Avenue	Inadequate	Inadequate		
Manhattan Beach Boulevard	Sepulveda Boulevard	Inadequate			
Sepulveda Boulevard	Artesia Boulevard	Inadequate			
REDONDO BEACH					
Artesia Boulevard	Aviation Boulevard	Inadequate			
Artesia Boulevard	Inglewood Avenue			Inadequate	Inadequate
Artesia Boulevard	Redondo Beach Boulevard		Inadequate		
Aviation Boulevard	Artesia Boulevard	Inadequate			
Aviation Boulevard	Marine Avenue	Inadequate			
Pacific Coast Highway	Palos Verdes Boulevard	Inadequate		Inadequate	
Pacific Coast Highway	Torrance Boulevard	Inadequate	Inadequate	Inadequate	Inadequate
Prospect Avenue	Anita Street/190th Street	Inadequate	Inadequate		
Prospect Avenue	Artesia Boulevard	Inadequate			
Prospect Avenue	Aviation Boulevard	Inadequate			
Prospect Avenue	Del Amo Boulevard	Inadequate			
Prospect Avenue	Pacific Coast Highway			Inadequate	
TORRANCE					
Anza Avenue	Pacific Coast Highway			Inadequate	Inadequate
Anza Avenue	Sepulveda Boulevard			Inadequate	Inadequate
Arlington Avenue	Lomita Boulevard		Inadequate		Inadequate
Arlington Avenue	Pacific Coast Highway		Inadequate		
Arlington Avenue	Sepulveda Boulevard		Inadequate		
Artesia Boulevard	Aviation Boulevard	Inadequate			
Artesia Boulevard	Inglewood Avenue			Inadequate	Inadequate
Carson Street	Maple Avenue				Inadequate
Carson Street	Van Ness Ave./Cabrillo Ave.	Inadequate	Inadequate	Inadequate	Inadequate
Crenshaw Boulevard	Lomita Boulevard			Inadequate	
Del Amo Boulevard	Western Avenue		Inadequate	Inadequate	
Hawthorne Boulevard	190th Street				Inadequate
Hawthorne Boulevard	Pacific Coast Highway			Inadequate	
Hawthorne Boulevard	Sepulveda Boulevard			Inadequate	Inadequate
Maple Avenue	Torrance Boulevard		Inadequate	Inadequate	Inadequate
Redondo Beach Boulevard	Crenshaw Boulevard			Inadequate	
Redondo Beach Boulevard	Hawthorne Boulevard		Inadequate		
Redondo Beach Boulevard	Prairie Avenue	Inadequate	Inadequate	Inadequate	Inadequate
Van Ness Ave./Cabrillo Ave.	223rd Street	Inadequate			

Freeway Geometrics

The South Bay Cities Council of Government's "I-405 Arterial Improvement Planning Studies" report (July 2003) evaluated Interstate 405 interchanges from the La Cienega Boulevard Interchange in the north to Western Avenue Interchange to the south. This study identifies corridor-wide concerns at interchanges and intersections adjacent to interchanges. The highest priorities identified are listed below; the responsible agency is listed in parentheses:

- I-405 southbound off-ramp/Rosecrans Avenue (Caltrans, City of Hawthorne)
  - Install signal
- Southbound I-405 off-ramp to Hindry Avenue (Caltrans, City of Hawthorne)
  - Install freeway sign directing traffic to second exit
- Northbound I-405/Manchester Boulevard (Caltrans, City of Inglewood)
  - Modify ramp to add right turn lane and close Ash
- La Cienega Boulevard/Manchester Boulevard (Caltrans, City of Inglewood)
  - Widen to add westbound right-turn curb radii for truck turns
- La Cienega Boulevard/Florence Avenue (Caltrans, City of Inglewood)
  - Widen southeast curb radii fro truck turns
  - Restripe southbound right-turn only lane to through-right lane
- La Cienega Boulevard to southbound I-405 on-ramp (Caltrans)
  - Remove ramp metering
- Inglewood Avenue/Marine Avenue (City of Lawndale, County of Los Angeles
  - Add southbound through lane by widening
- Hawthorne Boulevard/northbound I-405 ramps (Caltrans, City of Lawndale)
  - Modify Hawthorne Boulevard median to allow southbound left turns
- Crenshaw Boulevard/182nd Street (City of Torrance)
  - Add westbound through lane (to allow double lefts) by widening
  - Modify signal to allow double left and protected phasing
- Crenshaw Boulevard/Southbound I-405 Ramps (Caltrans, City of Torrance)
  - Construct new NB Crenshaw to SB-405 on-ramp
  - Add northbound right-turn pocket to new southbound on-ramp
  - Remove northbound left-turn pocket/access
- 190th Street/southbound I-405 ramps (City of Torrance)
  - Restripe to add third westbound through lane

Individual South Bay cities should refer to the report for potential improvements that are under their jurisdiction, while working with Caltrans to design and fund improvements under Caltrans jurisdiction.

3.5.1 Role of Trucks in Roadway Facility Deterioration

As demonstrated in survey responses (Table 12), pavement deterioration is considered the most significant trucking-related impact by many South Bay Cities. The combined effects of vehicle loading and environment conditions cause pavement to deteriorate over time. The rate of deterioration for a roadway is due to many different variables, including thickness of the pavement, quality of construction materials and practices, maintenance, underlying soil conditions, weather (primarily rainfall and temperature), and the number of axles and the weights of axle loads on the pavement.

The concept of equivalent single axle loads (ESALs)[9] is used by engineers to evaluate the effects of heavy vehicles on pavement. The key consideration is the load on each axle as opposed to the overall weight of the vehicle.

Pavement damage caused by a particular load is roughly related to the load (via axle weight/load) by about a power of four; therefore pavement deterioration increases rapidly as axle loads increase. In general, a vehicle weighing twice as much as another (and having the same axle/tire arrangement) will cause 16 times as much damage to the pavement. The relative pavement deterioration rapidly increases for axle loads over about 15,000 pounds per axle. In some cases, larger and heavier vehicles may have less impact if they have more axles and lower axle loads. Therefore, it is not possible to directly equate heavy vehicle volume to pavement deterioration. Factors such as axle load and the number of vehicles in the traffic stream must be assessed.

Roadways that serve goods movement can be expected to deteriorate at a higher rate when compared to other roadways. The pavement of these routes will have a shorter life-cycle, unless the roadway is specifically constructed to account for heavy vehicle traffic.

Although the exact number of miles of roadway in poor condition in the South Bay Cities is not known, the problem has been acknowledged as very significant by many cities. The 2007 Highway Performance Monitoring System, administered by Caltrans, collects pavement roughness and pavement serviceability data from cities. In the South Bay, 31.1 percent of roadways are considered poor in terms of roughness—the same percentage as the entirety of Los Angeles County. However, 9.8 percent of the South Bay's roadways are considered deteriorated in terms of serviceability, as compared to 6.7 percent of Los Angeles's roadways.

The state of pavement serviceability in the South Bay is poorer than other parts of the region due to the large industrial concentrations, high truck volumes, lack of funding for maintenance, and the relatively old infrastructure in the subregion.

For existing roadways in the South Bay Cities, increases in truck traffic and increases in heavy vehicle axle loadings will affect pavement rehabilitation costs in two ways. First, increases in trucks shorten the time interval to the next required resurfacing. Second, when resurfacing is required, the overlay thickness may need to be greater. The costs of pavement wear extend beyond roadway maintenance to vehicle operating cost as well. This is true because pavements in worse condition create higher vehicle operating costs due to higher repair incidence, speed reduction and lower fuel economy. It has been estimated that the operating cost of a typical passenger car increases by more than 1 cent per mile for roadways in poor condition.[10]

Bridges

Heavy vehicles contribute to overstress and fatigue effects on bridges through the course of normal operation. Overstress is caused by a single extreme loading. as in the case of supporting multiple trucks simultaneously. Fatigue is due to the cumulative damage caused by repeated heavy vehicle loadings.

[9] The definition of ESAL is equal to an 18,000 pound single axle.

[10] "Truck Weight Limits: Issues and Options," Transportation Research Board, National Research Council, Special Report 225, Washington, D.C., 1990

Bridges in the South Bay are routinely inspected. Those bridges that are determined to be structurally deficient, functionally obsolete, or have an overall sufficiency rating of below 80 are considered deficient by the Federal Highway Administration and are compiled into an "Eligible Bridge List" by Caltrans. This list is used to calculate the California's annual federal apportionment of bridge program funds and for determining eligibility for traditional replacement and rehabilitation projects. Eight South Bay bridges are included in this list; and one, Wilmington Avenue over Dominguez Channel, has fund programmed in the region's Transportation Improvement Program.

Table 35
South Bay Bridges on the Caltrans Eligible Bridge List

Agency	Bridge No	Facility	Feature Intersected	Location	Sufficiency Rating	Deficiency
Carson	53C0459	Wilmington Av	Dominguez Channel	0.8 mile S/0 Carson St	55.7	Structurally Deficient
Carson	53C0652	Sepulveda Blvd	Dominguez Channel	1/2 mile E/O Alameda St	70.9	Structurally Deficient
Carson	53C0845	223rd Street	SPRR & Alameda Street	0.1 mile S/O San Diego Fwy	58.8	Structurally Deficient
Carson	53C2005	Carson Street	Alameda Street & Sprr	0.5 mile N/O 405 Freeway	77.7	Functionally Obsolete
El Segundo	53C0881	Vista Del Mar Bl	Std Oil Pipe Line	3/4 mile N/O Rosecrans Ave	58.3	Functionally Obsolete
Torrance	53C0852	Prairie Ave	BNSFRR	0.5 mile S/O 190Th St	64	Functionally Obsolete
Torrance	53C1655	Prairie Ave	Mobil Oil Co Pipelines	1/4 mile S/O 190Th St	66.4	Functionally Obsolete
Torrance	53C1656	Prairie Ave	Mobil Oil Co Access Rd	0.2 mile S/O 190Th St	62	Functionally Obsolete

Intersections

Many arterial intersection radii are substandard when considering the most common trailer wheelbase; the critical maneuver is often right turns. At these intersections, truck operators and automobile drivers often take compensatory measures to negotiate restricted radii such as encroachment into adjacent lanes and sometimes crossing over curbs. These actions create conflicts with on-coming vehicles.

A study of geometrically or operationally deficient intersections on high truck-volume roads or truck routes should be conducted to identify locations where actions can be taken to address the problem, such as removing parking, adjusting signal timing, offsetting the centerline location, prohibiting rush hour parking, restricting turns, providing additional turn pocket storage, and widening the roadway.

3.5.2 State of California Monitoring and Maintenance Programs

The State of California's Draft 2007 State Highway Operation and Protection Program (SHOPP) includes two elements that deal with roadways with a large amount of heavy truck traffic. While Caltrans programs tend to deal only with state highways, similar programs could be adopted for the South Bay for uses in monitoring and maintaining its designated truck routes.

Long-Life Pavement Rehabilitation

The primary purpose of this element is to implement Long-Life Pavement Rehabilitation corridors on roadways where the average daily traffic is greater than 150,000 vehicles and 50,000 trucks.

Long-Life Pavement Rehabilitation has its provision of extending the service life of the pavement to at least twice the normal rehabilitation project, and will upgrade the existing corridor to current federal standards. Other roadway improvements, such as signing and lighting upgrades, traffic safety and operational improvements may be added to this work if justified by accident statistics or are required by federal standards to qualify the project for federal funding. The expected life of a long-life pavement project is 20 to 40 years.

Weigh Stations & Weigh-in-Motion Facilities
The primary purpose of this element is to provide for Commercial Vehicle Enforcement Facilities (commonly called weigh stations) and Weigh-in-Motion (WIM) systems.

Commercial Vehicle Enforcement Facilities
The only commercial vehicle enforcement facility located in the South Bay are closed: the Carson scales along Interstate 405. However, there are eight privately owned public scales located in the South Bay.

Table 36
Privately-Owned Public Scales in the South Bay

City	Name	Address
Carson	Alameda Scale	22500 So. Alameda St.
Gardena	Ambit Pacific Recycling, Inc.	16228 S. Figueroa St.
Gardena	Wyckoff, Inc.	19204 S. Figueroa St.
Los Angeles	South City Scale	13210 South Figueroa St.
Los Angeles	South Coast Recycling, Inc.	4560 Doran St.
Rolling Hills Estates	Chandler's Palos Verdes Sand And Gravel Corporation	26311 Palos Verdes Drive East
Wilmington	Action Sales & Metal Co. Inc.	1625 E. Pacific Coast Hw.
Wilmington	Sunshine Truck Stop, Inc.	1800 E. Pacific Coast Hwy.

Weight-In Motion (WIM) Systems
In the late 1980s, Caltrans began to install data WIM systems on its highways to record truck traffic information. Currently, over 100 data WIM stations are installed on the California highway system. These data WIM stations are producing massive amounts of traffic data every day. WIM systems can continuously measure and store loads and axle spacing data for each lane of travel. With the information provided by WIM systems, it is possible to get detailed truck traffic data, such as axle load spectra, required in modern pavement design methods.

Currently, there are no WIM facilities in the South Bay. There are three WIM facilities near the South Bay region: Interstate 710 near Long Beach Boulevard, State Route 91 near Avalon Boulevard, and State Route 47 near the Heim Bridge.

3.6 Environmental Issues

The increasing growth in trade has been good for the regional economy, but it also made the San Pedro seaports the region's largest single source of air pollution. Both workers and residents are increasingly concerned—about air pollution, health, traffic, economic impacts, the

potential for hazardous materials incidents, port security, and their overall quality of life. As the volume of containers continues to increase, the Cities of the South Bay should be active in mitigation efforts.

Given the dangerous effects of pollution, noise, and other problems, reducing these unintended consequences, is as important for the future success of the freight transportation system as building new infrastructure and implementing new operational strategies.

3.6.1 Air Quality

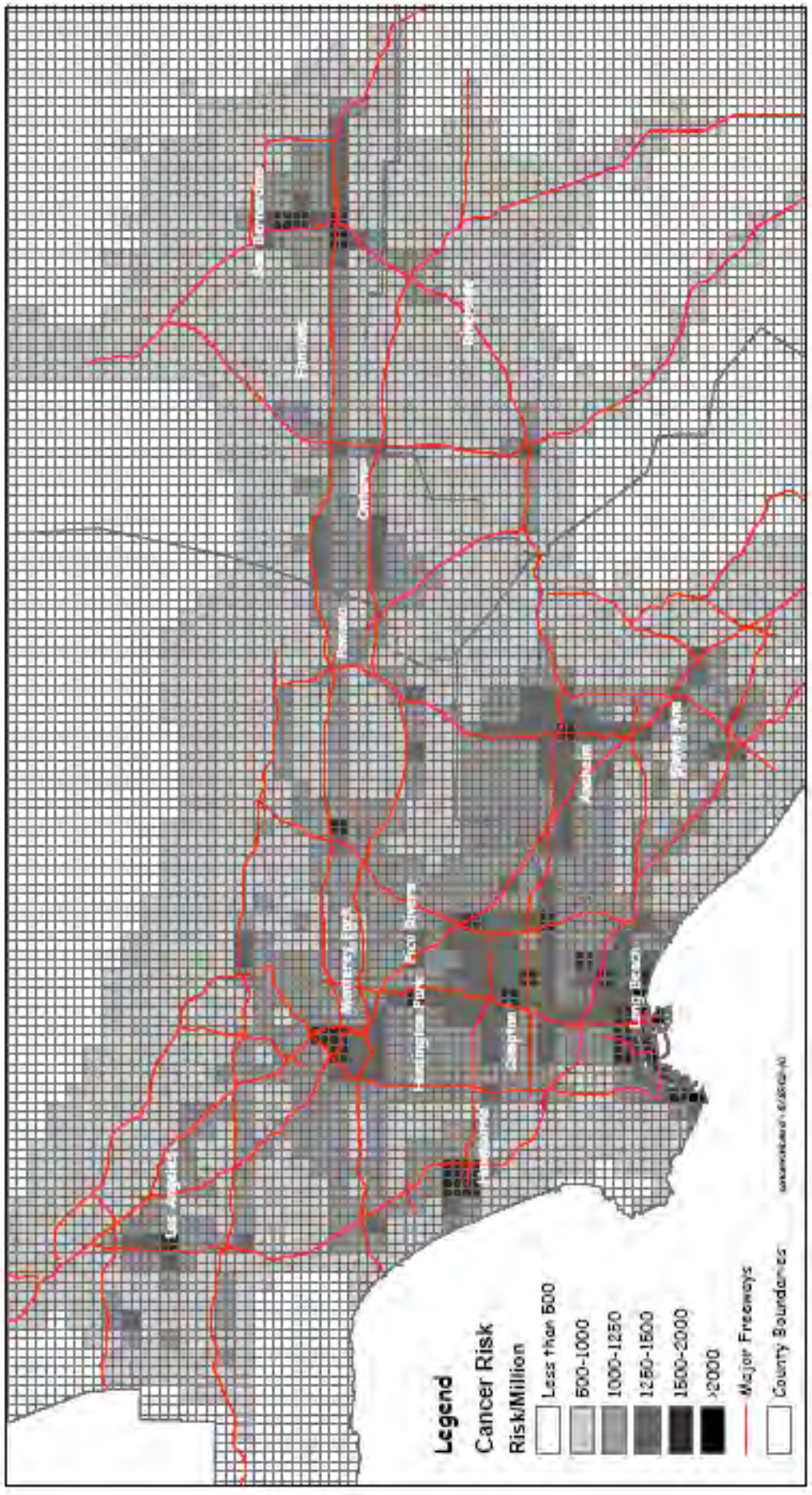
The South Coast Air Basin's severe air pollution problem is a consequence of the combination of emissions from the nation's second largest urban area, and meteorological conditions which are adverse to the dispersion of those emissions. The average wind speed for Los Angeles is the lowest of the nation's ten largest urban areas. In addition, the summertime maximum mixing height (an index of how well pollutants can be dispersed vertically in the atmosphere) in Southern California averages the lowest in the U.S. The Southern California area is also an area with abundant sunshine, which drives the photochemical reactions which form pollutants such as ozone.

Air pollution causes adverse health effects, particularly for children, the elderly, and those with compromised health. The communities closest to the ports, adjacent to heavily traveled freeways, and near rail facilities are subjected to even greater impacts and have a greater localized risk due to exposures to unacceptably high levels of diesel particulate matter. Diesel particulate matter poses a lung cancer hazard and causes respiratory and cardiovascular health effects that increase the risk of premature death.

Diesel engines in heavy-duty trucks, locomotives, and commercial vessels continue to be major producers of air pollution. These vehicles, as well as equipment at the ports, emit diesel particulate matter and other pollutants that increase health risks to nearby residents. Port operations are also a significant source of oxides of nitrogen (NOx), which contribute to the formation of regional smog, or ozone, and fine particulate matter. In 2005, the estimated truck emissions for trucks related to the seaports were: 491 tons of PM per year, and 6,048 tons of NOx per year.[11]

Figure 33 shows the overall cancer risk from all stationary and mobile sources of air pollution in the South Coast Air Basin.

[11] Evaluation of Port Trucks and Possible Mitigation Strategies, California Environmental Protection Agency, Air Resources Board, Stationary Source Division Project Assessment Branch, preliminary draft, April, 2006.



Source: South Coast Air Quality Management District

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Range of Cancer Risk From All Mobile and Stationary Sources in the South Coast Air Basin

Figure 36

Overall goods movement-related emission projections in the South Coast Air Basin, which contains the South Bay, are displayed in Table 35. These projections are based on the emission reduction measures adopted in the South Coast Air Basin, as of October 2005. As shown in the table, trucks dominate the emissions in the air basin; however, current programs that target trucks will greatly reduce their contribution to air emissions. Ships, which are largely unregulated emission sources, will see their share of contribution greatly increase without further action.

Table 37
South Coast Air Basin Emissions from Ports and Goods Movements with Benefits of All Emission Measures Adopted as of October 2005
(tons per day)

Sector	Year				
	2001	2005	2010	2015	2020
Diesel Particulate Matter					
Ships	2.4	4	5.2	6.3	7.8
Harbor Craft	1	1	0.8	0.5	0.5
Cargo Handling Equipment	0.6	0.5	0.4	0.3	0.1
Trucks	9.1	7.6	5.2	3	1.5
Locomotives	1	1	0.9	0.9	1
Total	14.1	14.1	12.5	11	10.9
Oxides of Nitrogen					
Ships	30	46.6	59	71.2	85.4
Harbor Craft	21.3	19.2	15.1	11.4	9.9
Cargo Handling Equipment	15	13.5	11.6	8.2	4.5
Trucks	147	154.7	131	96	69.9
Locomotives	42.7	34.2	21	24.7	27.4
Total	256	268.2	237.7	211.5	197.1
Reactive Organic Gases					
Ships	0.6	1.1	1.4	1.7	2
Harbor Craft	2.1	1.9	1.6	1.2	1
Cargo Handling Equipment	1.8	1.4	0.8	0.6	0.5
Trucks	15.7	15.1	12.1	8.5	6.6
Locomotives	2.7	2.6	2.5	2.6	2.7
Total	22.9	22.1	18.4	14.6	12.8
Oxides of Sulfur					
Ships	20	31.9	41.7	51.5	64.4
Harbor Craft	0.1	0.1	0	0	0
Cargo Handling Equipment	0	0	0	0	0
Trucks	1	1.1	0.2	0.2	0.2
Locomotives	1.3	1.4	0.2	0	0
Total	22.4	34.5	42.1	51.7	64.6

Source: Air Resources Board, Emission Reduction Plan for Ports and Goods Movement in California, Appendix B, March 21, 2006.

While air emission data is usually collected at the air basin level (because localized air pollutants are quickly absorbed and spread through the regional air basin), specific localized air pollution occurs.

The California Air Resources Board (ARB) is sponsoring the Harbor Communities Monitoring Project to monitor the air quality in the communities of Wilmington, parts of Carson, West Long Beach, and San Pedro. These communities were chosen because of the various emission

sources in the area and the close proximity of residents to these emission sources. The goals of the project are to:

- Find pollution "hot spots"
- Test low-cost, easy-to-use monitors
- Determine impacts of local versus regional sources of air pollution
- Establish baseline for control program effectiveness

The study will measure the levels of many pollutants (not just PM, NOx, ROG, and SOx). These include black carbon, carbon monoxide, ultrafine particles, and hydrogen sulfide. The study will also measure noise impacts at various locations.

The project will establish a current baseline pollution level in these communities which can be used to measure the effectiveness of the ARB Goods Movement Emission Reduction Plan (discussed in Section 4).

The project will use three types of air pollution sampling: a network of passive samplers, a mobile platform, and a network of particle counters. Sampling will take place over the course of one year: from the fall of 2006 to the fall of 2007. The results of this project will be available in 2008.

Goods-Movement Related Stationary Sources of Emissions

Petroleum refining is a major economic component of the South Bay. The products are consumed throughout Southern California, as well as Nevada and Arizona. However, the air pollution from these activities is borne by the South Bay and the rest of the South Coast Air Basin.

According to South Coast Air Quality Management District data from 2002, six of the top ten, and 35 of the top 300 stationary source emission producers of VOC in the South Coast Air Basin are located in the South Bay. These top emitters are the oil refineries such as Chevron in El Segundo; Exxon-Mobil in Torrance; Equilon, British Petroleum in Carson; and Enterprises (Shell Oil), Conoco-Phillips, and Ultramar (now Valero) in Wilmington. The South Bay is also home to seven of the top ten and 30 of the top 300 emission producers of NOx in the South Coast Air Basin.

These refineries were originally located in the South Bay due to its proximity to local oil fields. Despite the decline in output from oil fields in Southern California, the refineries have stayed in the South Bay because of its proximity to sea terminals and the sea ports where crude oil is imported.

Alameda Corridor Air Quality Benefits

From 2002 to 2004, the Alameda Corridor has eliminated 3,863 total tons of pollutants from the study area. Because trains generate significantly less pollution than the 250 to 280 trucks they replace, the growth in use of the Alameda Corridor will continue to have positive impacts on air quality.

In 2005, ACTA conducted an analysis which projected the Alameda Corridor's air quality benefits through 2012, considering such factors as growth of port-related cargo volume and the capacity of the Alameda Corridor.

Projected 2012 benefits from the Corridor take into account the imposition of control measures for both locomotives and trucks, as well as the implementation of several infrastructure projects

within the seaports that will increase their ability to transfer cargo to trains. The overall emission reductions for 2012 are projected as follows: 101 tons of reactive organic gases (ROG); 304 tons of carbon monoxide (CO); 2082 tons of oxides of nitrogen (NOx); 19 tons of particulate matter (PM); and 4 tons of oxides of sulfur (SOx). Projected benefits for 2012 would be even greater if short-haul shuttle trains from the seaports to the Inland Empire, and grade separations along Alameda Corridor East Program areas were implemented.[12]

In addition to the air quality and associated health benefits of the Alameda Corridor emissions reductions, there are also safety and travel time benefits to other vehicles and pedestrians identified in the analysis.

3.6.2 Noise

With projected growth in freight volumes and increases in usage of the highway and air modes, noise reduction will continue to be a major challenge for the transportation community. Millions of people who live or work near highways, airports, and rail yards are exposed to elevated levels of noise. Although this rarely leads to hearing impairment, transportation-related noise can result in loss of sleep and other health-related problems. Efforts to reduce noise include the use of quieter aircraft, the installation of noise barriers along roadways, and improved mufflers in motor vehicles.

[12] Alameda Corridor Air Quality Benefits Final Report, June 10, 2005, Weston Solutions, Inc.