

4. Evaluation of Goods Movement Projects

4.1 Key issues for Different Types of Goods Movement Purposes

There are several planned improvements to goods movement infrastructure and systems that will affect the South Bay. While many of these improvements are located in the South Bay Cities, several large projects located outside the subregion will have a major role in determining the volume, mode, and pattern of goods movement within the South Bay.

Part of the work scope for the South Bay Goods Movement Study includes review of “early action projects” already in the project development timeline, other improvements that affect South Bay goods movement, both inside and outside of the South Bay, and areas of need without identified projects to fulfill current and future goods movement needs. These include infrastructure and policy actions that either improve the movement of goods, or mitigate the impacts of goods movement, or both. Early action projects are those that can be completed in a near-term timeframe, which includes both large and medium sized projects currently in the project development pipeline, as well as smaller-scale improvements that can be designed, funded, and constructed in the near-term.

Infrastructure improvements that improve the movement of goods do so by increasing velocity, throughput, reliability and connectivity of the transportation system. This can be achieved by eliminating lane-drops, increasing mainline roadway capacity, and improving interchanges, intersections and highway-rail grade crossings. Projects that reduce the impacts of goods movement on communities, such as public health and environmental impact actions, do so by addressing threats to public health, reducing emissions, reducing discharges/runoff, and mitigating noise and light impacts, while accommodating community preferences.

All of the goods-movement related projects listed in this section are important to the South Bay as its member cities plan for the growth in goods movement. The evaluation of these projects is used to demonstrate the magnitude of benefits each project brings to the South Bay in terms of goods movement.

The sources of these improvement projects include the 2007 South Bay call-for-projects list submitted to Metro, the Southern California Association of Governments’ 2004 Regional Transportation Plan, the draft 2007 Regional Transportation Plan project list, Air Resource Board and South Coast Air Quality Management District plans, plans for the Ports of Los Angeles and Long Beach, the LAX Master Plan, and other plans and studies related to the region’s goods movement system. In addition, goods movement issues identified in Section Three, that did not have a related improvement, are indicated and evaluated.

In order to evaluate improvements to the transportation system in the South Bay, improvements that relate to goods movement are separated into four types (based on purpose rather than mode): inter-subregional freight, intra-subregional freight, port-related, and mitigation measures.

Inter-Subregional Freight Improvements

This category includes improvements to freight that originates in the South Bay and is destined for outside of the subregion, or originates outside of the South Bay and is destined for the South Bay. This also includes improvements to facilities that carry goods through the South Bay without stopping, such as Interstate 405. The majority of these improvements are related to moving goods to/from the seaports. These types of improvements should focus on facilitating

goods movement with as little impact on the surrounding communities as possible. Key issues include:

- The full utilization of the Alameda Corridor to minimize freeway trips replicating trips to/from the transcontinental rail network, including improvements to facilities outside of the South Bay that improve downstream rail capacity.
- Construction of truck lanes along Interstate 710 that will accommodate growth that would otherwise be shifted to Interstate 110.
- Removing mainline bottlenecks on freeways and the construction of freeway auxiliary lanes to ease mainline congestion due to weaving.

Intra-Subregional Freight Improvements

Modern society necessitates service and delivery trips by heavy vehicles. In this sense, the South Bay has similar issues to other subregions in accommodating local goods movement trips. However, the South Bay is home to international trade gateways, and is therefore an attractive location for port-related warehousing and distribution. Because of this, the South Bay has intense heavy vehicle usage on some of its local roadways. Economic growth will further intensify usage of local transportation facilities, and exacerbate any existing issues in communities and conflicts with passenger vehicles. Key issues include:

- The improvement of truck routes and other streets serving commercial or industrial zoned areas, including the elimination of lane drops and intersection improvements.
- The improvement of South Bay freeway interchanges that are not designed to handle large vehicles.
- Pavement rehabilitation and reconstruction of truck routes.

Port-Related Improvements

Improvements that are directly related to airport or seaport operations are the final types of improvements delineated in this study. These are improvements that are directly related to port operations, whose proponents are most likely the ports themselves. These projects include:

- Improvements to roadways directly serving the ports
- Improvements to intermodal transfer facilities
- Programs to improve efficiency and throughput at port facilities
- Mitigation to negative environmental externalities of the ports

Mitigation Measures

Mitigation measures include improvements that mitigate the negative effects of goods movement on communities such as noise barriers and air quality improvement programs.

4.2 Project Evaluation Methodology

The criteria developed for the California Goods Movement Action Plan (GMAP) is used as a framework for evaluating these projects in the context of the South Bay. The GMAP outlines a strategy to address the economic and environmental issues associated with moving goods via the state's highways, railways and ports.

The GMAP will guide allocation of funds for goods-movement related projects, including \$3.1 billion of the \$19.9 billion approved by voters in the Highway Safety, Traffic Reduction, Air Quality and Port Security Bond Act of 2006 (Proposition 1B). The GMAP identifies projects for consideration in the CTC's allocation of the \$2 billion for infrastructure investment. The Air Resources Board will allocate the remaining \$1 billion for emission reduction projects related to goods movement.

The GMAP criteria to be used to select goods-movement-related projects for funding are:

Infrastructure Projects and Operational Improvements

- Improves velocity
- Increases throughput
- Improves reliability
- Reduces congestion
- Reduces the impact on communities
- Increases connectivity
- Considers innovative technology
- Improves energy efficiency
- Leverages federal, local or private funding

Public Health and Environmental Impact Mitigation Actions

- Provides long-term reductions
- Demonstrates technology feasibility
- Takes advantage of technological developments
- Promotes alternate fuel use that achieves emission reductions and promotes fuel diversity
- Delivers cost-effective results relative to alternate action
- Demonstrates enforceability

Community Impact Mitigation

- Accommodates community preferences
- Secures community buy-in
- Achieves "like for like" mitigation for impacts related to public health
- Optimizes number of residents served and/or benefiting from mitigation action
- Demonstrates feasibility
- Fits with available funding
- Carries potential for multiple benefits
- Achieves partial or full mitigation
- Delivers accountability for follow-through
- Considers noise and light impacts and implements noise and/or light mitigation where needed
- Considers environmental justice

Workforce Development Actions (not used to evaluate in this study)

- Educates/trains the workforce
- Creates jobs in the local community
- Develops partnerships with secondary and higher education
- Leverages existing resources
- Incorporates aggressive outreach to industry and community

Public Safety and Security Actions

- Reinforces or compliments federal, state and local safety efforts
- Does not deteriorate goods movement system performance
- Increases likelihood of intercepting suspicious or problem containers
- Enhances landside domain awareness and control

- Enhances seaside domain awareness and control
- Extends virtual security perimeter

In addition, the GMAP segregates projects into timeframes that can be used in this evaluation of projects for the South Bay:

Goods Movement Action Plan Timeframes

- Immediate (immediate implementation, generally operational improvements)
- Short-term (0-3 years)
- Intermediate-term (4-10 years)
- Long-term (10+ years)

Both the immediate and short-term timeframe projects are considered “early action” projects.

In addition to using GMAP criteria, potential South Bay related improvements were also evaluated using the following:

Degree of Importance for South Bay Goods Movement

- High – Alters travel patterns or mitigates specific existing or future identified issue
- Medium – Directly improves operation of goods movement in the South Bay
- Low – Improves conditions for goods movement in South Bay, including downstream capacity constraints.

Truck Usage in the South Bay

- High – Over 20,000 truck PCE ADT on freeways and over 2,000 truck PCE ADT on arterials
- Medium – Between 20,000 and 5,000 truck PCE ADT on freeways and between 2,000 and 500 truck PCE ADT on arterials.
- Low – Less than 5,000 truck PCE ADT on freeways and less than 500 truck PCE ADT on arterials

Truck Growth in the South Bay

- High – Greater than 20 percent growth of truck PCE ADT
- Medium – Between 20 percent and five percent truck PCE ADT growth
- Low – Less than five percent truck PCE ADT

Truck-Related Collision Locations in the South Bay

- High – Three or more truck-related collisions in three years
- Low – Less than three truck-related collisions in three years

For projects with little data available, evaluations were determined by the intent or nature of the project.

4.3 Evaluation of Goods Movement Improvements

This section includes descriptions of projects related to goods movement in the South Bay, both inside and outside of the subregion. The relative importance of each project to the South Bay is indicated by “(high, medium, or low)”, following each project description. A summary of the evaluations are included in Table 38 at the end of Section 4.

4.3.1 Early Action Projects

Because the South Bay is largely built out, incremental investment in minor improvements in the South Bay transportation system will be more feasible than investment in large projects in the future. Correcting inadequate turning radii, expanding left-turn storage, signalization improvements (including synchronization), and pavement rehabilitation and reconstruction have a large cumulative effect on goods movement, and will help maintain the economic competitiveness of the South Bay, while preserving the quality of life in communities. While these projects improve safety and alleviate congestion for all roadway users, they are especially important for commercial users of the roadways who place more importance on system reliability and efficiency. Furthermore, strategic investment in minor improvements can alleviate bottlenecks in the transportation system without major construction impacts.

Early action projects are those projects which are able to be implemented within the short-term time period (0-3 Years). These projects can be implemented in this timeframe either because they are already in a project development process or they are smaller in scope than major projects such as the I-710. These projects include arterial lane drop elimination, intersection improvements, pavement rehabilitation and reconstruction, bridges, and grade separations. Early action projects are, in general, those under the purview of the South Bay Cities as opposed to the major projects under the jurisdiction of Caltrans or Metro. Proposed early action projects are listed below. These projects will generally improve both truck and auto flow, but are specifically chosen because of their strategic benefit to goods movement due to location, function, level of truck activity, and amount of truck-related collisions.

Lane Drop Elimination

Bottlenecks occur at lane drops, where a roadway narrows from three to two lanes or two lanes to one lane, reducing throughput and creating traffic queues. These can be especially disruptive to goods movement.

- Carson – Widen Sepulveda Boulevard from Alameda Street to the City limit (serves ICTF and other potential near-dock intermodal site) (*Highest Importance*)
- Carson – Widen Broadway from two lanes to four lanes from Main Street to Griffith Street (*High Importance*)
- El Segundo – Widen Aviation Boulevard from four lanes to six lanes from Imperial Highway to Hawaii Street. (*High Importance*)
- Harbor Gateway - Complete missing Del Amo segment between Denker Avenue and Normandie Avenue. Project one of three Del Amo gap closure projects. (*High Importance*)
- Lawndale – Inglewood Avenue corridor widening project (*High Importance*)
- Los Angeles County – Widen Aviation Boulevard from Manhattan Beach Boulevard to Arbor Vitae (*High Importance*)

- Los Angeles County – Reconstruct and widen Del Amo Boulevard from Normandie Avenue to Vermont Avenue. Project two of three Del Amo gap closure projects. (*High Importance*)
- Manhattan Beach – Add one northbound lane to Sepulveda Boulevard (State Route 1) between 33rd Street and Rosecrans Avenue (*High Importance*)
- Torrance – Construct missing piece of Del Amo Boulevard from Madrona Avenue to Crenshaw Boulevard. Project three of three Del Amo gap closure projects. (*High Importance*)
- Wilmington – Widen Anaheim Street from Farragut Avenue to Dominguez Channel (*High Importance*)

Intersection Improvements (from the South Bay Call for Projects list)

- Hawthorne – Intersection improvements at Rosecrans Avenue and Aviation Boulevard including railroad bridge widening. (*Important*)
- Hawthorne – Improve intersections on Hawthorne Boulevard from Imperial Highway to Rosecrans Avenue (*High Importance*)
- Inglewood – Inglewood ITS deployment and integration project (*High Importance*)
- Lawndale – Intersection improvements at Inglewood Avenue and Marine Avenue (*Important*)
- Los Angeles – ATSAC/ATCS intersection improvements in Harbor Gateway, San Pedro, Westchester, and Wilmington (*High Importance*)
- Los Angeles County – South Bay Forum Traffic Signal Corridors Project (*High Importance*)
- Los Angeles County – South Bay Traffic Signal Synchronization (*High Importance*)
- Manhattan Beach – Intersection improvements at Nash Street/Douglas Street at Rosecrans Avenue (*Important*)
- Torrance – Intersection improvements at Torrance Boulevard and Maple Avenue (*Important*)
- Torrance – Intersection improvements at Hawthorne Boulevard and Sepulveda Boulevard (*Important*)
- Torrance – Intersection improvements at 190th Street at Anza Avenue and Inglewood Avenue (*Important*)
- Various – Improvement of inadequate right-turn radii at South Bay locations. A map and listing of the 180 individual inadequate turning radii for heavy vehicles were identified at 102 intersections of South Bay truck routes is in Section 3.5.

Intersection Improvements at Locations with Truck-Related Collisions

Collision data in section 3.3.1 identified South Bay locations a high number of truck-related collisions. While these collisions can generally be attributed to disproportionately high volumes of truck traffic at these locations, intersection conditions such as turning radii geometrics, sign and signal placement, and signal timing can be altered to improve the operating conditions for large vehicles. The specific improvements for each location need to be identified through further study. Each location is of *Highest Importance* to the South Bay.

- Carson – Wilmington Avenue at Sepulveda Boulevard
- Hawthorne – Crenshaw Boulevard and El Segundo Boulevard
- Lomita –Pacific Coast Highway with Pennsylvania Avenue, Narbonne Avenue, and Oak Street
- Rancho Dominguez – Del Amo Boulevard and Santa Fe Avenue
- Rancho Dominguez –Del Amo Boulevard and Susana Road

- Torrance – Figueroa Street and Torrance Boulevard

Pavement Rehabilitation and Reconstruction

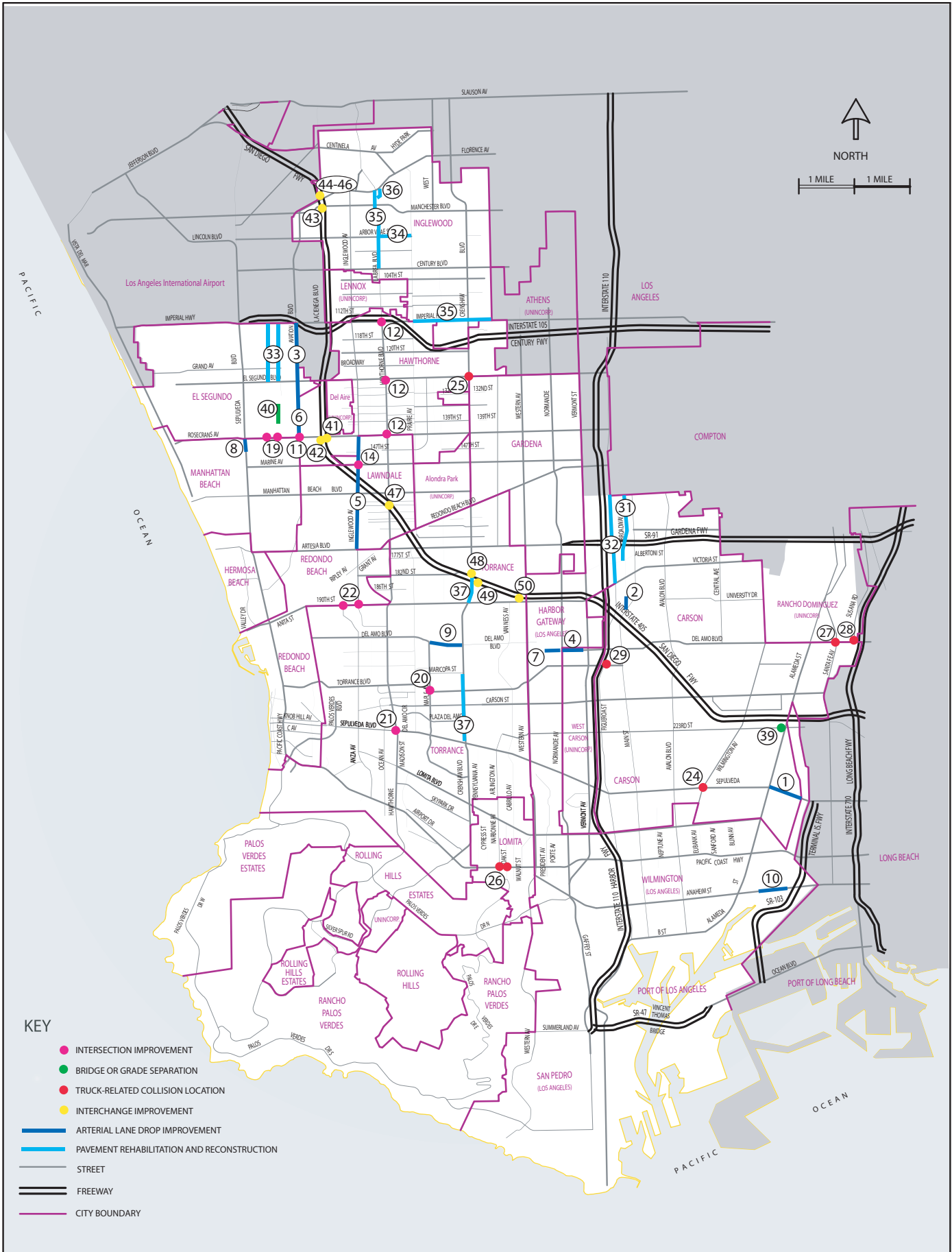
- Carson – Pavement reconstruction and other improvements on Broadway (*Important*)
- El Segundo – Nash/Douglas conversion to two-way streets (*Important*)
- Inglewood – Reconstruction of Arbor Vitae from La Brea Avenue to Prairie Avenue (*Important*)
- Inglewood – Reconstruction of La Brea Avenue from Florence Avenue to Century Boulevard (*Important*)
- Inglewood – Reconstruction of Imperial Highway from Prairie Avenue to Van Ness Avenue (*Important*)
- Inglewood – Realignment of La Brea Avenue with Hillcrest Boulevard (*Important*)
- Torrance – Rehabilitation of Crenshaw Boulevard between 182nd Street and 190th Street and between Maricopa Street and Sepulveda Boulevard. (*Important*)

Bridges and Grade Separations

- Carson – Wilmington Avenue Bridge over Dominguez Channel (*Highest Importance*)
- El Segundo – Douglas Street gap closure/railroad grade separation (*Highest Importance*)

Interchange Improvements from “I-405 Arterial Improvement Planning Studies” Report

- 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 for 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



KEY

- INTERSECTION IMPROVEMENT
- BRIDGE OR GRADE SEPARATION
- TRUCK-RELATED COLLISION LOCATION
- INTERCHANGE IMPROVEMENT
- ARTERIAL LANE DROP IMPROVEMENT
- PAVEMENT REHABILITATION AND RECONSTRUCTION
- STREET
- FREEWAY
- CITY BOUNDARY



Early Action Projects

Figure 37

**Table 38
Early Action Project Key**

Arterial Lane Drop Improvements

1	Carson	Widen Sepulveda Blvd. from Alameda Street to the City limit
2	Carson	Widen Broadway from two lanes to four lanes from Main St. to Griffith St.
3	El Segundo	Widen Aviation Blvd from Imperial Highway to Hawaii.
4	Harbor Gateway	Complete Del Amo segment between Denker Ave. and Normandie Avenue.
5	Lawndale	Inglewood Avenue Corridor Widening Project
6	Los Angeles County	Widen Aviation Blvd. from Manhattan Beach Blvd. to Arbor Vitae
7	Los Angeles County	Reconstruct and widen Del Amo Blvd. from Normandie Ave. to Vermont Ave.
8	Manhattan Beach	Add one NB lane to Sepulveda Blvd. (SR-1) from 33rd St. to Rosecrans Ave.
9	Torrance	Construct missing piece of Del Amo Blvd. from Madrona Ave. to Crenshaw Blvd.
10	Wilmington	Widen Anaheim St. from Farragut Ave. to Dominguez Channel

Intersection Improvements

11	Hawthorne	Improvements at Rosecrans and Aviation including railroad bridge widening.
12	Hawthorne	Improve intersections on Hawthorne Blvd. from Imperial Hwy to Rosecrans
13	Inglewood	Inglewood ITS deployment and integration project
14	Lawndale	Intersection improvements at Inglewood Ave. and Marine Ave.
15	Los Angeles	ATSAC/ATCS in Harbor Gateway, San Pedro, Westchester, and Wilmington
16	Los Angeles	ITS and intersection improvements at LAX
17	Los Angeles County	South Bay Forum Traffic Signal Corridors Project
18	Los Angeles County	South Bay Traffic Signal Synchronization
19	Manhattan Beach	Intersection improvements at Nash St./Douglas St. at Rosecrans Ave.
20	Torrance	Intersection improvements at Torrance Blvd. and Maple Ave.
21	Torrance	Intersection improvements at Hawthorne Blvd. and Sepulveda Blvd.
22	Torrance	Intersection improvements at 190th St. at Anza Ave. and Inglewood Ave.
23	Various	Right-turn turning radius improvements at various locations

Truck-Related Collision Locations

24	Carson	Improvements to the intersection of Wilmington Ave. and Sepulveda Blvd.
25	Hawthorne	Improvements to the intersection of Crenshaw Blvd. and El Segundo Blvd.
26	Lomita	Improvements at PCH with Pennsylvania Ave., Narbonne Ave., and Oak St.
27	Rancho Dominguez	Del Amo Blvd. at Santa Fe Avenue
28	Rancho Dominguez	Del Amo Blvd. at Susana Road
29	Torrance	Figueroa St. at Torrance Blvd.
30	Los Angeles County	Lump Sum Collision Reduction Projects

Pavement Rehabilitation and Reconstruction

31	Carson	Reconstruction on Broadway from Albertoni to North City Limit
32	Carson	Figueroa St. reconstruction from Victoria St. to Alondra Blvd.
33	El Segundo	Nash/Douglas conversion to two-way streets
34	Inglewood	Reconstruction of Arbor Vitae from La Brea Ave. to Prairie Ave.
35	Inglewood	Reconstruction of La Brea from Florence Ave. to Century Blvd, and reconstruction of Imperial Highway from Prairie Ave. to Van Ness Ave.
36	Inglewood	Realignment of La Brea Ave. with Hillcrest Blvd.
37	Torrance	Rehabilitation of Crenshaw Blvd. between 182nd St. and 190th St. and between Maricopa St. and Sepulveda Blvd.
38	Los Angeles County	Lump Sum Roadway Preservation Projects

Bridges and Grade Separations

39	Carson	Wilmington Avenue Bridge over Dominguez Channel
40	El Segundo	Douglas Street gap closure/railroad grade separation

Interchange Improvements from "I-405 Arterial Improvement Planning Studies" Report

41	Hawthorne	I-405 southbound off-ramp/Rosecrans Avenue signal
42	Hawthorne	Southbound I-405 off-ramp to Hindry Avenue signage
43	Inglewood	Northbound I-405/Manchester Boulevard add right lane
44	Inglewood	La Cienega Boulevard/Manchester Boulevard improve turn radii
45	Inglewood	La Cienega Boulevard/Florence Avenue turn radii, and through-right lane
46	Inglewood	La Cienega Boulevard to southbound I-405 on-ramp metering
47	Lawndale	Hawthorne Boulevard/northbound I-405 ramps southbound left turns
48	Torrance	Crenshaw Boulevard/182nd Street westbound through lane, modify signal
49	Torrance	Crenshaw Boulevard/Southbound I-405 new southbound ramp
50	Torrance	190th Street/southbound I-405 ramps add westbound through lane

4.3.2 Intra-Subregional Freight

Schuyler Heim Bridge Replacement/State Route 47 Project and Alameda Street

The largest goods movement-related project under development in the South Bay is the extension of State Route 47 to Alameda Street, as part of the Schuyler Heim Bridge Replacement/State Route 47 Project under development by the Alameda Corridor Transportation Authority (ACTA). The four-lane elevated highway would connect Terminal Island to the industrial areas of Wilmington, Carson, and Rancho Dominguez via Alameda Street, which is currently underutilized as a regional truck route. It is also an important alternate route to Interstate 710 and Interstate 110 in cases of congestion, incidents, or construction activities. Alameda Street was reconstructed as part of the Alameda Corridor project and grade-separated from major cross streets: Pacific Coast Highway, Sepulveda Boulevard, 223rd Street, Carson Street, and Del Amo Boulevard. Each of these grade separations connects Alameda Street to the cross street via a connector road with three-way signals at each end. The geometrics of these access roads, and the collision histories at these locations, indicates that these interchanges will not be adequate to support the future projected truck traffic. We recommend that improvement to these interchanges be studied.

In response to these plans, the City of Carson is studying the feasibility of a sound wall to mitigate noise and other impacts along the Alameda Corridor. In addition, the City is evaluating a strategy that would involve partial acquisition of properties, possible closure of residential streets and economic development incentives to revitalize the adjacent area. The Schuyler Heim Bridge Replacement/State Route 47 Project is of *Highest Importance* to goods movement in the South Bay.

Interchange Improvements in the South Bay

Many of the freeway interchanges in the South Bay are outdated for use by heavy-duty trucks. The improvement of these interchanges is vital to connecting trucks from the local street system to the regional freeway system. Caltrans has identified 22 freeway interchanges for improvement in the South Bay. The following five are currently programmed:

Interstate 105

- Widen northbound off-ramp at Sepulveda Boulevard from westbound Interstate 105 from one lane to two (*High Importance*)
- Study report for a new Interstate 105 interchange at LAX (*High Importance*)

Interstate 110

- 'C' Street interchange improvements (*High Importance*)

Interstate 405

- Construct south half of interchange with Arbor Vitae (*High Importance*)
- Wilmington Avenue northbound interchange improvements, including the widening of Wilmington Avenue to 223rd Street (*High Importance*)
- La Tijera bridge widening over Interstate 405 freeway, including dual left turn lanes to freeway ramps (*High Importance*)
- Avalon Boulevard interchange improvements, including new southbound on-ramp, and widening northbound on- and off-ramps. (*High Importance*)

Unprogrammed freeway interchanges that should be funded if additional funding becomes available are (all are *High Importance*):

Interstate 110

- Capitol Drive
- Gaffey Street/Pacific Avenue
- Pacific Coast Highway

Interstate 405

- Alameda Street
- Rosecrans Boulevard/Hindry
- Manchester Avenue
- Hawthorne Boulevard
- Del Amo Boulevard
- Prairie Avenue
- Inglewood Avenue
- 190th/Western Avenue
- Crenshaw Boulevard/182nd Street
- Artesia Boulevard

State Route 47/103

- Navy Way
- Pier B Street
- Anaheim Street

State Route 91

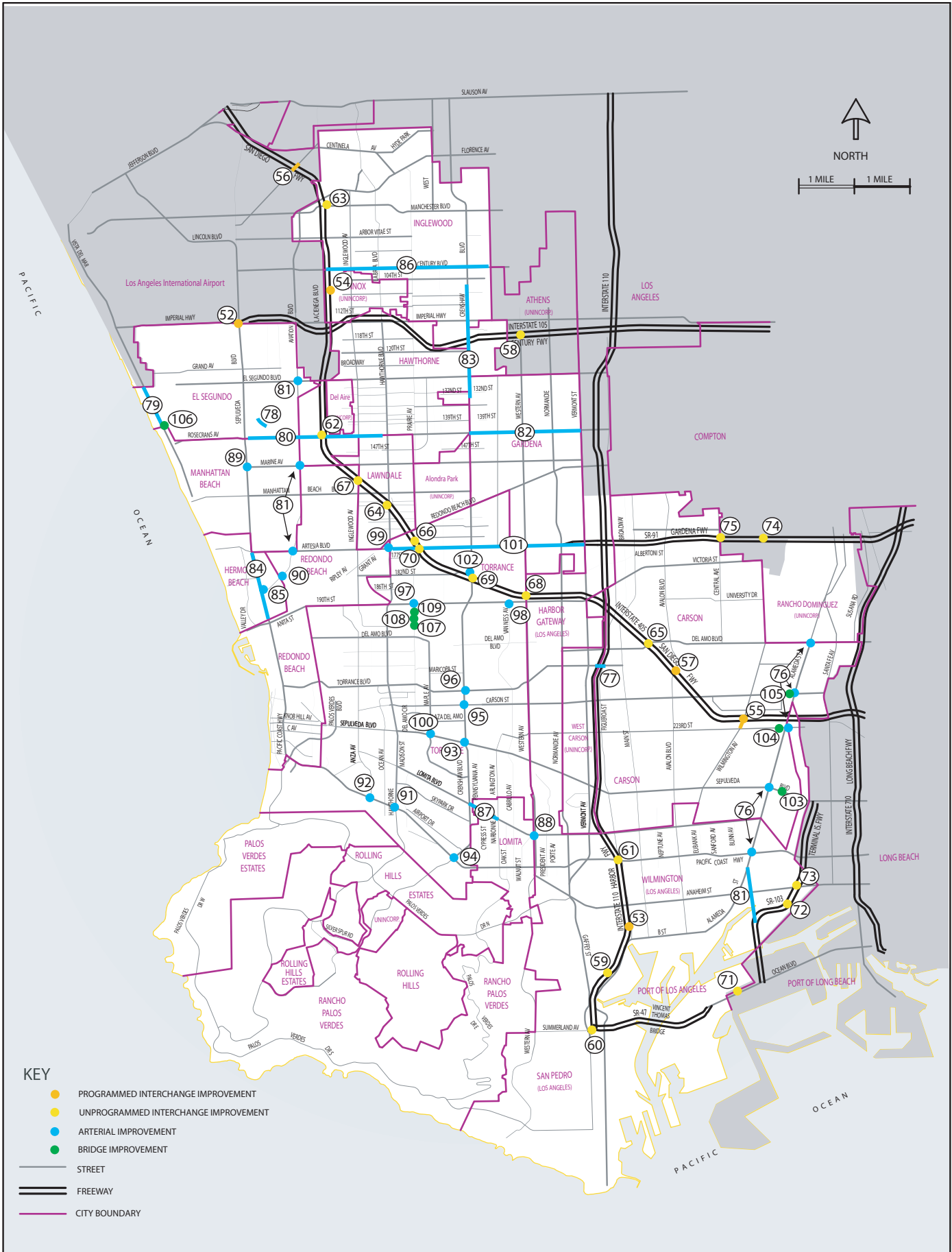
- Alameda Street
- Wilmington Avenue
- Central Avenue

Other Arterial Improvements in the South Bay

The following goods movement-related arterial projects are at various stages of development, however they are unprogrammed and there is no current funding identified for the projects.

- Carson – Improvements to the interchanges of Alameda Street and Pacific Coast Highway, Sepulveda Boulevard, 223rd Street, Carson Street, and Del Amo Boulevard (*Highest Importance*)
- Carson – Widen the Torrance Boulevard/Interstate 110 undercrossing (*High Importance*)
- El Segundo – Construct Park Place highway-rail grade separation from Allied Way to Nash Street (*Highest Importance*)
- El Segundo – Vista Del Mar safety improvements (*Important*)
- El Segundo/Hawthorne/Lawndale/Manhattan Beach – Improve Rosecrans Avenue from Sepulveda Boulevard to Hawthorne Boulevard (*Important*)
- El Segundo/Hawthorne/Manhattan Beach/Redondo Beach – Improve Aviation Boulevard at El Segundo Boulevard, Marine Avenue, and Artesia Boulevard (*Important*)
- Gardena – Install media with left-turn pockets along Rosecrans Boulevard from Vermont Avenue to Crenshaw Boulevard (*Important*)
- Hawthorne – Improve Crenshaw Boulevard from 105th Street to 135th Street (*Important*)
- Hermosa Beach – Improve Pacific Coast Highway from Artesia Boulevard to Herondo Street (*Important*)
- Hermosa Beach – Intersection improvements at Pacific Coast Highway and Aviation Boulevard (*Important*)
- Inglewood – Century Boulevard phased improvements (*Important*)

- Lomita – Improve Lomita Boulevard from Narbonne Avenue to Crenshaw Boulevard (*Important*)
- Lomita – Intersection improvements at Lomita Boulevard and Western Avenue (*Important*)
- Manhattan Beach – Add dual left turn lanes eastbound and westbound at Sepulveda Boulevard and Marine Avenue (*Important*)
- Redondo Beach – Signal synchronization at Aviation Boulevard and Prospect Avenue (*Important*)
- Torrance – Signal upgrades and add eastbound, westbound, and northbound right-turn lanes at the intersection of Hawthorne Boulevard and Pacific Coast Highway (*Important*)
- Torrance – Intersection improvements at Anza Avenue and Pacific Coast Highway (*Important*)
- Torrance – Intersection improvements at Crenshaw Boulevard and Sepulveda Boulevard (*Important*)
- Torrance – Intersection improvements at Crenshaw Boulevard and Pacific Coast Highway (*Important*)
- Torrance – Intersection improvements at Crenshaw Boulevard and Carson Street (*Important*)
- Torrance – Intersection improvements at Crenshaw Boulevard and Torrance Boulevard (*Important*)
- Torrance – Intersection improvements at Prairie Avenue and 190th Street (*Important*)
- Torrance – Intersection improvements at Van Ness Boulevard and 190th Street (*Important*)
- Torrance – Intersection improvements at Hawthorne Boulevard and Artesia Boulevard (*Important*)
- Torrance – Add southbound right-turn pocket at Maple Avenue and Sepulveda Boulevard (*Important*)
- Torrance/Gardena – Improve Artesia Boulevard from Hawthorne Boulevard to Vermont Avenue (*Important*)
- Torrance – Intersection improvements at Crenshaw Boulevard and 182nd Street (*Important*)



NORTH
1 MILE 1 MILE

- KEY**
- PROGRAMMED INTERCHANGE IMPROVEMENT
 - UNPROGRAMMED INTERCHANGE IMPROVEMENT
 - ARTERIAL IMPROVEMENT
 - BRIDGE IMPROVEMENT
 - STREET
 - == FREEWAY
 - CITY BOUNDARY



Intra-Subregional Projects

Figure 38

**Table 39
Intra-Subregional Freight Improvements Key**

51	Schuyler Heim Bridge Replacement/State Route 47 Project and Alameda Street	
Interchange Improvements		
52	Interstate 105	Widen northbound off-ramp at Sepulveda Blvd. from westbound I-105 from one lane to two
53	Interstate 110	'C' St. interchange improvements
54	Interstate 405	Construct south half of interchange at Arbor Vitae
55	Interstate 405	Wilmington Ave. northbound interchange improvements
56	Interstate 405	La Tijera bridge widening over I-405 freeway, dual left turn lanes to ramps
57	Interstate 405	Avalon Blvd. interchange improvements
58	Interstate 105	Western Avenue Interchange Improvements
59	Interstate 110	Capitol Drive Interchange Improvements
60	Interstate 110	Gaffey St./Pacific Ave. Interchange Improvements
61	Interstate 110	Pacific Coast Highway Interchange Improvements
62	Interstate 405	Rosecrans Blvd./Hindry Interchange Improvements
63	Interstate 405	Manchester Ave. Interchange Improvements
64	Interstate 405	Hawthorne Blvd. Interchange Improvements
65	Interstate 405	Del Amo Blvd. Interchange Improvements
66	Interstate 405	Prairie Ave. Interchange Improvements
67	Interstate 405	Inglewood Ave. Interchange Improvements
68	Interstate 405	190th/Western Ave. Interchange Improvements
69	Interstate 405	Crenshaw Blvd./182nd St. Interchange Improvements
70	Interstate 405	Artesia Blvd. Interchange Improvements
71	State Route 47	Navy Way Interchange Improvements
72	State Route 47	Pier B St. Interchange Improvements
73	State Route 47	Anaheim St. Interchange Improvements
74	State Route 91	Wilmington Ave. Interchange Improvements
75	State Route 91	Central Ave. Interchange Improvements
Arterial Improvements		
76	Carson	Improvements to the interchanges of Alameda St. and Pacific Coast Highway, Sepulveda Blvd., 223rd St., Carson St., and Del Amo Blvd.
77	Carson	Widen the Torrance Blvd. I-110 undercrossing
78	El Segundo	Construct Park Place grade separation from Allied Way to Nash Street
79	El Segundo	Vista Del Mar safety improvements
80	El Segundo to Hawthorne	Improve Rosecrans Avenue from Sepulveda Blvd. to Hawthorne Blvd.
81	El Segundo to Hawthorne	Improve Aviation Blvd at El Segundo Blvd., Marine Ave., and Artesia Blvd.
82	Gardena	Left-turn pockets along Rosecrans Blvd. from Vermont Ave. to Crenshaw Blvd.
83	Hawthorne	Improve Crenshaw Blvd. from 105th St. to 135th St.
84	Hermosa Beach	Improve Pacific Coast Highway from Artesia Blvd. to Herondo
85	Hermosa Beach	Intersection improvements at Pacific Coast Highway and Aviation Blvd.
86	Inglewood	Century Blvd. phased improvements
87	Lomita	Improve Lomita Blvd. from Narbonne Ave. to Crenshaw Blvd.
88	Lomita	Intersection improvements at Lomita Blvd. and Western Ave.
89	Manhattan Beach	Add dual left turn lanes EB and WB at Sepulveda Blvd. and Marine Ave.
90	Redondo Beach	Signal synchronization at Aviation Blvd. and Prospect
91	Torrance	Signal upgrades at Hawthorne Blvd. and Pacific Coast Highway
92	Torrance	Intersection improvements at Anza Ave. and Pacific Coast Highway
93	Torrance	Intersection improvements at Crenshaw Blvd. and Sepulveda Blvd.
94	Torrance	Intersection improvements at Crenshaw Blvd. and Pacific Coast Highway
95	Torrance	Intersection improvements at Crenshaw Blvd. and Carson St.
96	Torrance	Intersection improvements at Crenshaw Blvd. and Torrance Blvd.
97	Torrance	Intersection improvements at Prairie and 190th Street
98	Torrance	Intersection improvements at Van Ness and 190th Street
99	Torrance	Intersection improvements at Hawthorne Blvd. and Artesia Blvd.
100	Torrance	Add southbound right-turn pocket at Maple Avenue and Sepulveda Blvd.
101	Torrance/Gardena	Improve Artesia Blvd. from Hawthorne Blvd. to Vermont Ave.
102	Torrance	Intersection improvements at Crenshaw Blvd. and 182nd St.
Bridges		
103	Carson	Sepulveda Blvd. over Dominguez Channel
104	Carson	223rd Street over Alameda Corridor and Alameda St.
105	Carson	Carson Street over Alameda Corridor and Alameda Street
106	El Segundo	Vista Del Mar Blvd. over Standard Oil Pipeline
107	Torrance	Prairie Avenue over BNSF railroad track
108	Torrance	Prairie Avenue over Mobile Oil pipeline
109	Torrance	Prairie Avenue over Mobile Oil Access Road

4.3.3 Inter-Subregional Freight

Interstate 710 Major Corridor Study

The Interstate 710 Corridor is the principal transportation connection between East Los Angeles and the Ports of Long Beach and Los Angeles. It plays an important role in the regional, statewide, and national transportation system, serving both person trips and goods movement needs. The Interstate 710 Corridor is already experiencing serious performance problems due to a number of interrelated reasons. A complicating factor is the large numbers of trucks that use Interstate 710 to travel between the Ports and rail freight yards located near Interstate 5, and to warehousing and distribution points scattered throughout the Southern California urban area. Near Long Beach, trucks make up nearly twenty percent of the traffic stream during the day, compared with an average daily truck percentage of six to 13 percent on similar freeways in Los Angeles County.

To remain economically competitive in the global marketplace, the Southern California region must support and manage increasing demand for goods movement in the Interstate 710 Corridor. With the recent completion of the Alameda Corridor and its corresponding expansion in freight rail capacity, the regional focus has turned to trucks because of the essential role that this travel mode plays in the logistics chain for goods movement. By 2025, the number of heavy duty trucks on Interstate 710 is expected to more than double.

The Interstate 710 Major Corridor Study Program (*Highest Importance to South Bay*) consists of possible mainline improvements to the freeway. The locally preferred strategy would make a total of four truck lanes, 10 mixed flow lanes, and specified interchange improvements. Other alternatives will be accessed in the Major Corridor Study. While these improvements are not located in the South Bay, they are important for the South Bay subregion for a number of reasons: the improvements will 1) continue the economic competitiveness of the Southern California's goods movement system by maintaining good access to the seaports and providing a backbone for a Southern California truck lane system, 2) upgrade a freeway that serves South Bay industrial areas in Carson and Rancho Dominguez, 3) alleviate projected diversion of trips from Interstate 710 to Interstate 110 and Alameda Street to avoid congestion, and 4) bring associated mitigations that will alleviate environmental impacts of goods movement in the corridor.

Because many of the truck trips using Interstate 710 connect to east/west freeways, the long-term success of the Interstate 710 improvement project in accommodating goods movement will be contingent on the ability of the east/west freeways (State Route 91, Interstate 105, State Route 60, Interstate 10 and Interstate 210) freeways to also handle increased truck traffic. The Interstate 710 project is of *High* importance to goods movement in the South Bay.

Other Freeway Mainline Improvements Relevant to the South Bay

While no freeway mainline projects in the South Bay are programmed, there are many important needs to be addressed in order to accommodate projected growth in goods movement. The interchange of Interstate 110 and Interstate 405 has lane drops on the mainline of both freeways as they move through the interchange. The lane drop

compounds issues created by traffic weaving and merging movements, and high volumes of traffic, which reduce throughput and create traffic queues on the ramps and mainline. Currently, the widening of Interstate 405 through the Interstate 110/Interstate 405 is being studied; however the widening of Interstate 110 through the interchange is not. As freight volumes from the port increase, this section of Interstate 110 will become a major bottleneck for trucks from the West Basin or trucks avoiding Interstate 710 to connect to State Route 91, Interstate 105 and Interstate 10/State Route 60. These projects are primarily intended to serve auto travel demand, however they will also facilitate truck movements. Goods-movement related freeway mainline improvements located in the South Bay are:

Interstate 105

- Add auxiliary lanes (*High Importance*):
 - Eastbound from Yukon to Crenshaw
 - Westbound from Crenshaw Boulevard on-ramp to Crenshaw Boulevard off-ramp

Interstate 110

- Add through lane through Interstate 405 interchange (*Highest Importance*)

Interstate 405

- Add a northbound lane from Hawthorne Boulevard and Interstate 105 (*Highest Importance*)
- Add auxiliary lanes (*High Importance*):
 - Southbound from Manchester Boulevard to Century Boulevard
 - Southbound from Florence Avenue to Howard Hughes Parkway
 - Northbound from Hawthorne Boulevard to Inglewood Avenue
 - Northbound from Inglewood Avenue to Rosecrans Boulevard
 - Northbound from Redondo Beach Boulevard to Hawthorne Boulevard
- Realign from south of State Route 90 at bend north of Manchester Boulevard (*Highest Importance*)
- Add connector metering between Interstate 105 and State Route 90 interchanges (*High Importance*)

Other goods-movement related freeway improvements located outside of the South Bay (all are rated *Important* to the South Bay) are:

- State Route 91 Chokepoint Project – Add auxiliary lane in each direction from State Route 241 to State Route 71 to alleviate congestion.
- State Route 91 Truck Storage Lane – The construction of a storage lane to be added at the existing Commercial Vehicle Enforcement Facility to prevent the back-up of trucks into mainline lanes.
- East-West Corridor (Interstate 210, Interstate 10, State Route 60, State Route 91) – Capacity improvements.
- Interstate 15 Truck Lanes – Two new lanes for trucks only would be added in each direction from State Route 60 to the Mojave River.
- Interstate 15 Reversible Lanes – Reversible lanes from State Route 210 to U.S. 395 with HOV lanes north and south of the reversible lanes.
- State Route 78/Brawley Bypass – This is the last project to complete an expressway from the Mexican border to Interstate 10 in Riverside County to handle increasing levels of international truck traffic following adoption of NAFTA.

This project would predominately serve trucks destined for Arizona and other eastern destinations.

- Interstate 5 Truck Lanes, State Route 14 to Calgrove Boulevard – Add truck climbing lanes.

Intermodal Improvements in the South Bay

Containerized freight originating and destined for outside of the South Bay will continue to be concentrated along the Alameda Corridor, and on the Interstate 710 and Interstate 110 freeways in the future. Focusing on the improvement and mitigation of these facilities is a strategy that will help facilitate trade without widespread impacts on the South Bay. Part of this strategy is to fully utilize of the Alameda Corridor. Approximately 21 percent of containers moving through the Ports of Los Angeles and Long Beach were transferred to and from trains at on-dock rail yards in 2005.

The Alameda Corridor was successful in significantly increasing the mainline rail capacity from the port area to distribution centers and transfer facilities near downtown Los Angeles. However, while mainline capacity was increased, dockside access to the corridor and bottlenecks downstream of the Alameda Corridor limit its use. Improvements such as additional on-dock, and near dock intermodal facilities are under development to facilitate access to the Alameda Corridor. In addition, projects that alleviate downstream bottlenecks such as the Alameda East grade separations, Colton Crossing improvements and Burlington Northern Santa Fe/Union Pacific rail capacity improvements are under development. Even though these major projects are located outside of the South Bay subregion, they have a significant role in reducing truck traffic in the South Bay, along with its associated congestion, noise, and air quality impacts.

Intermodal improvements inside the South Bay Cities include on-dock and near-dock intermodal facilities (*Highest Importance*). Downstream improvements to intermodal freight that affect goods movement in the South Bay Cities are:

- Alameda East grade separations (*Important*)
- Colton Crossing improvements (*Important*)
- Burlington Northern Santa Fe/Union Pacific rail capacity improvements (*Important*)
- Shuttle Train/Inland Container Yard Demonstration Project (*Important*)

4.3.4 Port-Related Improvements in The South Bay

Improvements to the transportation operations and infrastructure directly serving the POLA and POLB are important components of the goods movement infrastructure in the South Bay. These types of improvements include improvements to roadways and rail lines:

- West Basin interchange improvements (John S. Gibson Street, Figueroa/C Street, and 47/Harbor Boulevard) (*High Importance*)
- Harry Bridges Boulevard Improvement (*High Importance*)
- Rail grade separations (Neptune Avenue, Fries Avenue, and Avalon Boulevard) (*High Importance*)
- Harbor Boulevard signalized intersection improvements from Swinford to 6th: upgrade traffic signal equipment to operate in 'limited service' mode when trains are present (*High Importance*)

- Navy Way Connectors to westbound Seaside Avenue (State Route 47) (*High Importance*)

Operational Efficiencies

Other important improvements to port facilities include operational improvements. Improving the efficiency of the systems and equipment designed to move cargo can reduce the need for infrastructure improvements.

Empty Container Logistics for Trucks

Only an estimated two percent of the empty import containers handled by local short haul truckers are reloaded with outbound cargo. For a variety of reasons, only a small portion of the empty containers can ever be reused for export loads. The potential for expanded reuse may be roughly five to ten percent. While an increase from two percent to five percent or ten percent does not appear dramatic, the large number of containers at stake can create a substantial impact.

Container logistics are complex, and successful implementation requires considerable coordination and agreement among multiple parties, such as motor carriers, ocean carriers, leasing companies, and chassis pool operators.

Chassis logistics are a major limiting factor in empty container logistics. Even when an ocean carrier operator has no immediate need for a specific empty container to be returned to the port, it may have a pressing need to use the attached chassis for another shipment.

Two options to reduce truck trips involving empty containers are:

- Increasing the current two percent reuse (i.e., using emptied import containers to transport export-bound goods back to the port).
- Implementation of depot-direct off-hiring, where all local trucks would be directed to an off-port container depot rather than directly to the port. The container depot would match incoming and outgoing containers to reduce the number of empty container trips into the port. A Southern California Association of Governments study found that such a truck depot would reduce truck trips, overall. However, the benefits of reduced “empty container” trips may be somewhat offset by the shift of truck traffic from the port to the off-port depot.

Use of the Internet is essential to provide more information and help match containers and increase efficiency. A virtual container yard could eliminate many empty container movements on roadways. (*High Importance*)

Automated Cargo Handling

Yard trucks are used to move containers from one location to another in the port. Containers are moved multiple times while they are on terminal property. The fewer times a container is moved, the lower the emissions associated with its transit through the port. Container moves can be reduced through:

- Technology-dependent options, such as installing automated and electrified container-moving equipment on a rail system within the container storage areas.

- Computerized tracking and management practices that allow containers to move from the ship directly onto the trains or trucks that move them from the port. (*High Importance*)

Speed Loading and Unloading of Vessels

Terminal delays can be reduced through the use of advanced information technologies, expanded operating hours, and “destination loading” on ships from the far east to reduce unloading and hotelling times at the POLA and POLB. (*High Importance*)

Transport Mode Shifts

Shifting the mode of transport of containers from trucks to trains can realize emission reductions. In the long run this can be done with major infrastructure improvements, such as construction of on-dock and near-dock intermodal facilities, and the removal of downstream railroad bottlenecks. In the mean time, short-term actions to accommodate increases in on-dock transfers to trains include:

- Working with railroads to assure timely availability of loading equipment and crews.
- Working to improve the productivity of loading and unloading of rail cars.
- Maximizing the number of rail cars loaded on dock.
- Preventing storage of containers on rail lines at on-dock terminals.¹³ (*High Importance*)

4.4 Environmental Impact Mitigation

Efforts to offset the negative externalities of current and future goods movement infrastructure in the South Bay are as important as efforts to improve the infrastructure itself. Efforts to buffer communities from major transportation facilities include land use decisions, noise barriers, and targeted air quality improvement programs.

4.4.1 Land Use Decision-Making

While the cities of the South Bay have little statutory or practical means of regulating noise or emissions from transportation facilities, land use decisions are a local government responsibility that have a role in preventing or lessening exposure to avoidable noise and air pollution exposures that pose a health risk.

People who live close to major sources of pollution are exposed to greater concentrations of harmful emissions, and therefore are at greater health risk. Recent studies have shown that public exposure to air pollution can be substantially elevated near some sources of pollution, but health risks are greatly reduced with distance.

Goods movement-related facilities like ports, rail yards, and freeways are major sources of air pollution, and land use decision makers should use caution when considering siting sensitive land uses such as new residences, schools, day care centers, playgrounds and medical facilities near these types of sources. Community members who live close to goods movement facilities have emphasized that it is important not only to have cleaner ships, trains, and trucks, but also to apply other exposure-reducing

¹³ Southern California Association of Governments, *Southern California Regional Goods Movement Policy Paper*, pp. 17-18.

safeguards, such as buffer zones, that keep people away from the greatest concentrations of pollutants.

Even though much of the South Bay is built out, important decisions about redevelopment and reuse can have a major effect on the exposure of future development to noise and air pollution. General plans and zoning ordinances ensure that nearby land uses are compatible. By emphasizing the separation of goods movement facilities from non-compatible uses, cities can help to avoid future conflicts between communities and goods movement facilities.

4.4.2 Noise Barriers

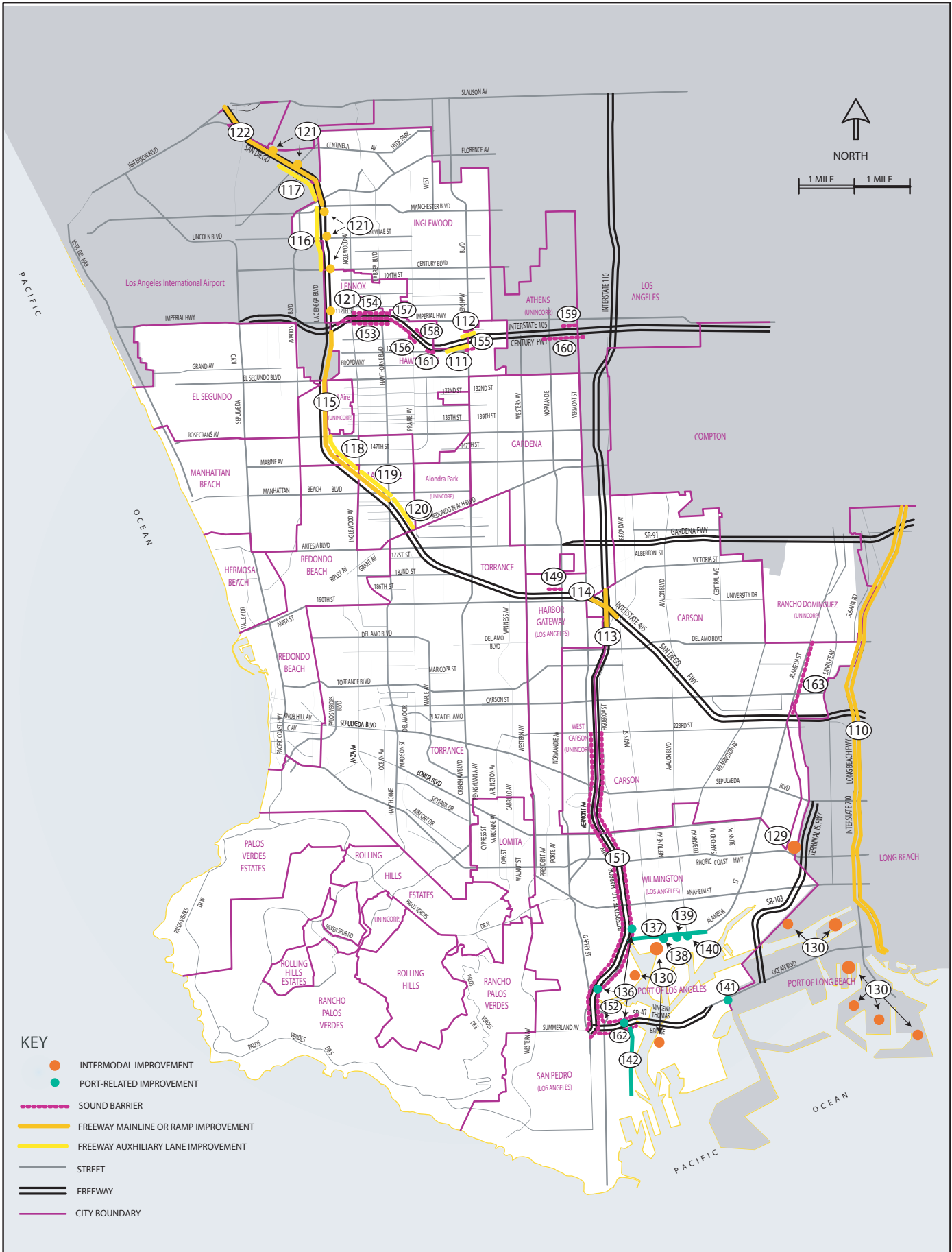
Noise is one of the most significant goods movement-related issue indicated in the South Bay goods movement survey. The construction of noise barriers adjacent to high volume transportation facilities is an effective strategy to mitigate noise impacts. In addition, barriers provide some limited protection from particulate matter as evidenced by concentrations often found at the base of the highway side of a noise barrier.

The South Bay Cities have several noise barrier projects on the post-1989 sound wall retrofit program list:

- Interstate 405 northbound from Normandie Avenue to Denker Avenue, adjacent to a school (0.4 miles)
- Interstate 405 northbound from Redondo Beach Boulevard to 166th Street.
- Interstate 110 northbound and southbound from Oliver Street to north of 223rd Street (11.8 miles)
- Interstate 110 northbound from El Beron Avenue to MacArthur Avenue (0.3 miles)
- Interstate 105 eastbound from east of Prairie Avenue to west of Prairie Avenue (0.3 miles)
- Interstate 105 eastbound from west of Normandie Avenue to west of Hoover Street (0.9 miles)
- Interstate 105 eastbound from east to west of Dominguez Creek. (0.2 miles)
- Interstate 105 westbound from east of Interstate 405 to west of Prairie Avenue (1.0 miles)
- Interstate 105 eastbound from east of Inglewood Avenue to west of Hawthorne Boulevard.
- Interstate 105 westbound from east of Prairie Avenue to west of Doty Avenue (0.2 miles)
- Interstate 105 westbound from west of Inglewood Avenue to west of Hawthorne Boulevard (0.9 miles)
- Interstate 105 westbound from west of Budlong Avenue to west of Vermont Avenue (0.3 miles)
- Interstate 105 westbound from east of Crenshaw Boulevard to west of Crenshaw Boulevard (0.4 miles)
- State Route 47 eastbound and northbound from east of Gaffey Street to west of Harbor Boulevard.

In addition, the City of Carson is studying the feasibility of sound walls to mitigate noise and other impacts along the Alameda Corridor, in response to the proposed Schuyler Heim Bridge/State Route 47 improvements.

Noise barrier construction along major goods-movement corridors is an important mitigation for impacts caused by goods movement. The completion of the post-1989 sound wall retrofit barriers, as well as the concurrent construction of noise barriers with major improvements, are important components in mitigating current and future goods movement impacts in South Bay communities.



Inter-Subregional, Port-Related, and Sound Barrier Improvements

Figure 39

Table 40
Inter-Subregional, Port-Related, and Sound Barrier Improvements Key

Mainline Freeway Improvements		
110		I-710 Improvement Project
111	Interstate 105	Add auxiliary lanes: Eastbound from Yukon to Crenshaw
112	Interstate 105	Add auxiliary lanes: WB from Crenshaw Blvd. on-ramp to Crenshaw Blvd. off-ramp
113	Interstate 110	Add through lane through I-405 interchange
114	Interstate 405	Add through lane through I-110 interchange
115	Interstate 405	Add a northbound lane from Hawthorne Blvd. and I-105
116	Interstate 405	Add auxiliary lanes: Southbound from Manchester Blvd. to Century Blvd.
117	Interstate 405	Add auxiliary lanes: Southbound from Florence Ave. to Howard Hughes Parkway
118	Interstate 405	Add auxiliary lanes: Northbound from Hawthorne Blvd. to Inglewood Ave.
119	Interstate 405	Add auxiliary lanes: Northbound from Inglewood Ave. to Rosecrans Blvd.
120	Interstate 405	Add auxiliary lanes: Northbound from Redondo Beach Blvd. to Hawthorne Blvd.
121	Interstate 405	Realign from south of SR-90 at bend north of Manchester Blvd.
122	Interstate 405	Add connector metering between I-105 and SR-90 interchanges
123	SR-91 Chokepoint	add auxiliary lane in each direction from SR-241 to SR-71.
124	SR-91 Truck Storage	Not shown on graphic -outside study area
125	I-210, I-10, SR-60, SR-91	Not shown on graphic -outside study area
126	I-15 Truck Lanes	Not shown on graphic -outside study area
127	I-15 Reversible Lanes	Not shown on graphic -outside study area
128	SR-78/Brawley bypass	Not shown on graphic -outside study area
129	Interstate 5 Truck Lanes	Not shown on graphic -outside study area
Intermodal Improvements		
130	Port Area	On-Dock intermodal facilities
131	South Bay	Near-Dock intermodal facilities
132	Outside South Bay	Alameda East grade separations
133	Outside South Bay	Colton Crossing improvements
134	Outside South Bay	Burlington Northern Santa Fe/Union Pacific rail capacity improvements
135	Outside South Bay	Shuttle Train/Inland Container Yard Demonstration Project
Port-Related Improvements		
136	Port Area	West Basin. interchange improvements
137	Port Area	Harry Bridges Boulevard Improvement
138	Port Area	Fries Ave. grade separation
139	Port Area	Avalon Blvd. grade separation
140	Port Area	Neptune Ave. grade separation
141	Port Area	Navy Way Connectors to westbound Seaside Avenue
142	Port Area	Harbor Blvd. signalized intersection improvements
143	Port Area	Empty Container Logistics for Trucks - not shown
144	Port Area	Automated Cargo Handling - not shown
145	Port Area	Speed Loading and Unloading of Vessels - not shown
146	Port Area	Transportation Mode Shifts - not shown
147	Port Area	PierPass Extended Gate Hours Program - not shown
148	Port Area	PierPass Emission Reduction Program - not shown
Noise Barriers		
149	I-405	Northbound from Normandie Ave. to Denker Ave., adjacent to a school (0.4 miles)
150	I-405	Northbound from Redondo Beach Blvd. to 166th St.
151	I-110	Northbound and southbound from Oliver Street to north of 223rd St. (11.8 miles)
152	I-110	Northbound from El Beron Ave. to MacArthur Ave. (0.3 miles)
153	I-105	Eastbound from Inglewood Ave to Hawthorne Blvd. (0.9 miles)
154	I-105	Westbound from Inglewood Ave to Hawthorne Blvd. (0.9 miles)
155	I-105	Westbound from Crenshaw Blvd. to Crenshaw Blvd. (0.4 miles)
156	I-105	Eastbound from east of Prairie Ave. to west of Prairie Ave. (0.3 miles)
157	I-105	Westbound from east Rte 405 to west of Prairie Ave. (1.0 miles)
158	I-105	Westbound from east of Prairie Ave. to west of Doty Ave. (0.3 miles)
159	I-105	Westbound from Budlong Ave. to Vermont Ave. (0.3 miles)
160	I-105	Eastbound from Normandie Ave. to Hoover St. (0.9 miles)
161	I-105	Eastbound from east to west of Dominguez Creek. (0.2 miles)
162	SR-47	Eastbound and Northbound from East of Gaffey St. to West of Harbor Blvd.
163	Alameda Street	Alameda Street Noise Barriers adjacent to residential areas

4.4.3 Air Resources Board Programs

The California Air Resources Board's draft Emission Reduction Plan for Ports and International Goods Movement lists strategies to reduce emissions from goods movement sources and projects emissions reductions to the year 2020. This plan includes strategies designed to reduce the highest priority pollutants – diesel particulate matter (diesel PM) and nitrogen oxides (NOx)—that are responsible for most of the quantified mortality and health risk associated with goods movement. The plan also seeks to reduce two additional pollutants where possible, reactive organic gases (ROG) and sulfur oxides (SOx). Emissions of SOx are an important contributor to particulate pollution. ROG is a key ingredient of ozone, and also contributes to the formation of particulate pollution.

These strategies are focused on goods movement-related emissions from ships, commercial harbor craft, cargo handling equipment, trucks, locomotives, operational efficiencies, and land use decision-making. The implementation mechanisms for these strategies include:

- *State of California Rules and Regulations:* ARB and local agencies throughout the State can adopt regulations that compel the use of clean technologies by setting new emission standards or by requiring the use of cleaner technologies.
- *National and International Actions:* National regulations, funding programs, and advocacy for emission standards through the International Maritime Organization can fulfill the federal government's responsibility to clean up air pollution sources under its jurisdiction.
- *Incentives:* Incentive programs encourage owners and operators of port equipment to voluntarily reduce their emissions and to accelerate the reduction of port-related emissions. There are two types of incentive programs – those that provide funding to purchase cleaner equipment and those that use incentives, such as reduced port fees, to reward lower-emitting or more efficient operations.
- *Market Participation Concepts:* Market forces can also influence the actions that private companies take to reduce emissions. These concepts could include the lease agreements mentioned above and/or mitigation fees to achieve comparable reductions from other sources affecting the nearby community.
- *Enforceable Agreements:* Properly executed enforceable agreements can be effective in reducing emissions, without the potential lag time associated with litigation, in situations where regulatory authority is lacking or not unclear.
- *Environmental Review and Mitigation.* The California Environmental Quality Act (CEQA) includes a comprehensive check list for evaluating environmental impacts and determining the need for mitigation. Applying greater rigor to the CEQA review could prevent excess emissions from occurring during construction and operation of the project.
- *Lease Agreements:* Port authorities may stipulate environmental conditions as part of their negotiations for new and expanding leases. The Port of Los Angeles

used this approach when it adopted a comprehensive policy requiring new and renewing leases to contain emission reduction provisions.

Ships

Ocean-going vessels, or “ships,” bring the vast majority of international imported goods into the South Bay. Ships include vessels such as container ships, bulk carriers, general cargo ships, tankers, and the “roll-on, roll-off” ships used to transport automobiles.

Most ships are propelled by large diesel piston engines, although some are powered by steam turbines or diesel-fueled turbines. In addition to the propulsion engines, ocean-going ships generally run auxiliary diesel generators and boilers. Diesel generators provide electrical power for lights and equipment, and boilers provide steam for hot water and fuel heating. Most vessels turn off their propulsion engines while at dockside (“hotelling”) and only operate their auxiliary engines and boilers, which are significant emission sources at ports.

Most ocean-going ships run their main propulsion engines and auxiliary engines on heavy fuel oil (or “bunker fuel”), which typically costs between 30 to 50 percent less than distillate marine fuels. Distillate marine fuels have lower levels of sulfur and other contaminants compared to bunker fuel, but higher sulfur levels than land-based diesel fuels. Bunker fuel is very viscous and requires heating to allow it to be pumped and injected into an engine. Bunker fuel typically contains much higher levels of sulfur, nitrogen-containing compounds, ash, and other compounds that increase exhaust emissions. For example, typical bunker fuel used by ships visiting the seaports averages about 25,000 parts per million (ppm) sulfur, compared to 15 ppm sulfur for most California landside diesel.

The factors that determine the level of emissions from ships are ship engine standards, age, the type of fuel used, and operational practices such as vessel speed, how auxiliary engines are used while in port, and the amount of time spent in and near ports.

The Port of Los Angeles runs a voluntary Alternative Maritime Power program to provide shore power to container and passenger ships. POLA retrofitted the China Shipping Terminal to include a shore-power infrastructure. Two ships began connecting to shore power in June 2004. According to the POLA, there are now currently 15 ships that are equipped to plug into shore power while at the terminal. POLA recently built shore-side infrastructure to provide power to a container ship (NYK Atlas) when in port. The NYK Atlas was equipped with shore power capabilities when built in 2004. The Port also has shore-side infrastructure at Pier 400, although no ships calling at this terminal are currently equipped to connect to shore power.

Shore-side infrastructure will also be built at berths 206-209. The lease for the container terminal's new tenant, P&O Nedlloyd, will require that 70 percent of ships calling there be connected to shore power within three years. Additionally, the Port has indicated that they will begin designing a shore-power infrastructure at their passenger ship terminal (berths 91-93) once they receive a firm commitment from a tenant to utilize shore power when in port.

The Port of Long Beach has committed to providing shore-side power to all new and reconstructed container terminal berths, and other berths as appropriate. Through lease

language, POLB will require selected vessels to use shore power, and all other vessels to use low-sulfur diesel in their auxiliary generators. Cold-ironing projects are being developed at three berths at the POLB—one of them a voluntary project with the tenant. British Petroleum (BP) equipped two of its new Alaskan-class tankers that dock in Long Beach with shore-power capabilities in 2006.

Immediate Actions

- Vessel Speed Reduction Agreement
- U.S. EPA Main Engine Emission Standards
- U.S. EPA Non-road Diesel Fuel Requirements

Short-Term and Intermediate Actions

- ARB Rule for Ship Auxiliary Engine Fuel
- Cleaner Marine Fuels for Main Engines
- Emulsified Fuels
- Expanded Vessel Speed Reduction Programs
- Install Engines that Exceed International Maritime Organization Standards in New Vessels
- Dedicate the Cleanest Vessels to California Service
- Shore Based Electrical Power

Long-Term Actions

- Extensive Retrofit of Existing Engines
- Highly Effective Emission Controls on Main Engines and Auxiliary Engines
- Sulfur Emission Control Area or Alternative
- Build New Ships that Far Exceed International Maritime Organization Standards or Expand the Use of Cleanest Vessels in California Service
- Expanded Shore Power and Alternative Controls
- Full Use of the Cleanest Vessels in California Service
- Maximum Use of Shore Power or Alternative Controls

Commercial Harbor Craft

Harbor craft operate primarily along California's coastline and inland waterways. These vessels generally stay within California coastal waters, and usually leave and return to the same port. The commercial vessels related to goods movement include tug/tow boats, pilot boats, workboats, crew/supply boats, and others. These vessels, as well as other harbor craft such as ferries and fishing vessels, operate in and around ports and their emissions contribute to community health risk. We have included all types of harbor craft, not just those used in goods movement, in our analyses in this plan.

Most harbor craft use diesel-powered propulsion and auxiliary engines. In 2002, there were approximately 4,100 commercial harbor craft, with 7,400 engines, operating in California's waters. Of that number, approximately 250 were tugboats, towboats and workboats—boats that serve import goods movement—with 700 engines.

Immediate Actions

- Incentives for Cleaner Engines
- Low Sulfur Diesel Fuel Rule

Short-Term and Intermediate Actions

- ARB Rule to Clean Up Existing Engines
- Cleaner Engines
- Cleaner Fuels
- Add-On Emission Control Devices
- Shore Based Electrical Power

Long-Term Actions

- U.S. EPA or ARB New Engine Emission Standards

Cargo Handling Equipment

Cargo handling equipment is used at ports and intermodal rail yards to transfer container and bulk goods between ships, trains, trucks, or storage areas within the facility. The equipment may be owned by the facility operator or private companies operating as tenants.

The most common type of cargo handling equipment at ports are yard trucks (also referred to as yard tractors, yard goats, hustlers, utility tractor rigs, or yard hostlers) – approximately 60 percent of the equipment by number. Yard trucks move trailers carrying containers within ports, rail yards, and distribution centers. Many are operated exclusively within the facility and can be equipped with either on-road or off-road engines. The majority of the emissions in this sector are from off-road mobile equipment running on diesel fuel, with small contributions from the other types.

Immediate Actions

- Low Sulfur Diesel Fuel Rule
- Stationary Diesel Engine Rule
- Portable Equipment Rule
- Incentives for Cleaner Fuels

Short-Term and Intermediate Actions

- ARB Cargo Handling Equipment Rule (Adopted December 2005)
- ARB Rule for Gas Industrial Equipment
- Upgrade To 85 Percent Diesel PM Control or Better

Long-Term Actions

- Zero or Near-Zero Emission Equipment

Trucks

Most heavy-duty trucks are powered by diesel fuel, and emit about 30 percent of diesel PM emissions and 20 percent of NOx emissions statewide. Concentrated truck activity near distribution centers and along highway corridors can result in negative impacts in adjacent neighborhoods. Reducing the negative impacts to communities can be accomplished by actions such as reducing the number of truck trips required to move goods, movement of truck trips to alternate modes, and by stricter enforcement of idling limits, speed limits and parking regulations.

Despite the growth expected in goods movement activity due to increases in population and trade, ARB expects emissions of all pollutants from heavy trucks to decline by about one-half or more by 2020, as the existing truck fleet slowly turns over to the cleaner engines required by ARB and U.S. EPA regulations.

Typically the truck fleet used for long-distance hauling is newer and cleaner than the trucks used for shorter or regional trips. Thus, there is a trickle down effect – new trucks are purchased for long-haul trips, the trucks they replace are sold for progressively shorter trips, and the oldest trucks are eventually retired. The trucks that would be addressed by ARB's proposed statewide fleet rule and the port truck modernization strategy tend to older and dirtier. Although these trucks would eventually be replaced in the normal course of business, the impacts of these vehicles need to be mitigated more quickly to address community health issues and to meet air quality standards.

Reductions in idling can help reduce unnecessary emissions. The lack of truck parking in the South Bay (there is only one public facility with room for 100 trucks) also causes air quality impacts due to truck idling and the extra miles driven to park the trucks. While it is unlikely a new truck parking facility in the South Bay would be publicly operated, public entities can have a role by providing incentives such as possible redevelopment sites for truck parking.

In addition to ARB efforts, Metro programmed funds for a regional diesel emissions reduction program for engine retrofit that provides incentive grants to owner operator of old diesel trucks to upgrade their equipment. Funding for these programs targeting goods-movement related activities must be increased in order to maintain current air quality in the face of rapid goods-movement growth.

South Bay Cities should review their truck parking and truck idling regulations if these issues are deemed significant by the city. Local law enforcement is already empowered to enforce California Air Resources Board diesel truck idling regulations.

Immediate Actions

- Review Truck Idling Regulations
- 2007 New Truck Emission Standards
- Vehicle Replacement Incentives
- Low Sulfur Diesel Fuel
- Smoke Inspections for Trucks in Communities
- Truck Idling Limits
- Community Reporting of Violators
- Clean Transport Refrigeration Units
- Low NOx Software Upgrade

Short-Term and Intermediate Term

- ARB Private Truck Fleets Rule
- Port Truck Modernization
- Enhanced Enforcement of Truck Idling Limits
- ARB Rule for International Trucks (Adopted January 2006)

Long-Term Actions

- Implementation of the ARB private truck fleets rule and port truck program completed

Locomotives

Trains have long been considered an efficient way to move goods for long distances—each container train can replace up to an estimated 250 truck trips. The locomotives that pull trains have powerful, long-lasting engines that typically run on diesel fuel.

At this time, moving goods with locomotives generates less pollution than with trucks, but this will not be true in the future unless locomotive engines become significantly cleaner to keep pace with the improvements to truck engines. The average locomotive in 2000 generated less than half of the NO_x and PM emissions that the average truck would have generated to move the same ton of cargo the same distance. However, emissions from trucks are being reduced at a faster rate than emissions from locomotives as a result of more stringent truck regulations. ARB estimates that diesel PM emissions per ton-mile of goods moved by rail will equal or exceed comparable truck emissions by 2015, as new trucks meeting 2007 emission standards start to reduce truck fleet emissions.

Federal law limits the abilities of states and local jurisdictions to control locomotive emissions, or to enforce rules that affect national railroad transportation. Rules have to be narrowly and carefully crafted to survive federal preemption, limiting the emission reductions that can be obtained. In light of this, ARB focuses on voluntary agreements with the railroads (such as BNSF and UP) as part of the State's strategy.

Immediate Actions

- Low Sulfur Diesel Fuel Rule
- Idle Reduction Training
- Statewide Railroad Agreement with the UP and BNSF railroads to reduce emissions. To accomplish this, UP and BNSF have agreed to:
 - Phase out non-essential idling
 - Install idling reduction devices
 - Identify and expeditiously repair locomotives with excessive smoke
 - Ensure that at least 99 percent of the locomotives operating in California pass smoke inspections
 - Maximize the use of low sulfur fuel (15 ppm)
 - Prepare health risk assessments for 17 major rail yards
 - Work with the local air districts and neighboring communities to identify risk reduction measures
 - Annually report their plans to implement feasible measures beginning January 2006

Short-Term and Intermediate Term Actions

- Upgrade Engines in Switcher Locomotives
- Retrofit Diesel PM Control Devices on Existing Engines
- Use of Alternative Fuels
 - Alternative Diesel
 - Natural Gas
 - Fisher-Tropsch Diesel

Long-Term Actions

- More Stringent National Requirements

- EPA Tier 3 Emission Standards
- On-Board Diagnostics
- Idle Limiting Devices on New and Rebuilt Engines
- Concentrate Tier 3 Locomotives in California

4.4.4 POLA and POLB Emission Reduction Efforts

POLA and POLB are undertaking initiatives to help reduce emissions in and around the ports. ARB staff has not calculated emission benefits for each port program, nor are these programs specifically credited in the plan's assumptions. However, such programs are important contributors to achieving the emission reductions identified for each sector in this plan.

Port of Los Angeles

Recent emission reduction efforts at the Port of Los Angeles include:

- In October 2001, the POLA's Board of Harbor Commissioners created a Port Community Advisory Committee and announced a new environmental policy "that there will be no net increase in air emissions or traffic impact from future port operations."
- In 2004, the Natural Resources Defense Council negotiated a settlement with China Shipping to use low-emission technologies in the company's new terminal at the Port of Los Angeles, as well as other community mitigation actions. These technologies include use of shore-based electrical power for 70 percent of ships at the terminal and use of alternative fuel yard tractors at the terminal.
- In February 2006, the Board of Harbor Commissioners announced a new, comprehensive leasing policy that includes clean air requirements in all new and revised port leases. Lease provisions will include shore-side power requirements, the use of low-sulfur fuel in main and auxiliary ship engines, the use of alternative fuels in all new yard tractors, and the use of low-emission truck and locomotives used within terminal facilities.

Port of Long Beach

Recent emission reduction efforts at the Port of Long Beach include:

- In August 2005, the Port of Long Beach launched its Green Port Policy that aims to reduce air emissions per ton of cargo handled. Programs outlined in this policy include: a voluntary vessel speed reduction program, a goal to provide shore power at all container terminals, various clean fuel and clean engine efforts, and clean switcher locomotive programs. The Port has added catalysts to over 600 pieces of cargo handling equipment, 300 of those pieces using emulsified fuel, and another 100 pieces using ethanol blended diesel fuel.
- In January 2006, the POLB began a program to provide financial incentives to ship and harbor craft owners by reducing dock fees when the ships comply with the vessel speed reduction program. The goal is to have 100 percent compliance with the program.

- The Long Beach Harbor Patrol staff is trained to report ships and harbor craft that emit black smoke from their smoke stacks.

Joint Port of Los Angeles and Port of Long Beach Programs

Recent joint emission reduction efforts at the POLA and POLB include

- In May 2001, the Ports of Los Angeles and Long Beach began implementing a voluntary speed reduction program for ocean-going vessels entering or leaving the ports.
- The Gateway Cities Clean Air Program provides financial incentives to replace, re-power or retrofit existing diesel-powered on-road trucks. reduce diesel emissions in Southern California. It includes funding from ARB, U.S. EPA, the South Coast Air District’s Mobile Source Review Committee, and the Ports of Los Angeles and Long Beach. This program is part of \$50 million earmarked by the seaports to address significant impacts of port-related activities. Other programs include community aesthetic mitigation projects.
- The POLA and POLB formed a not-for-profit organization and launched the PierPass program for trucks serving these ports in July 2005. Expanding port hours helps to reduce truck congestion on nearby freeways and at the terminal.
- The Switcher Locomotive Program will upgrade 18 harbor locomotive engines with various emission reduction techniques. These techniques include: replacing the engines with cleaner Tier 2 models, using liquefied natural gas engines, using emulsified diesel fuel, and installing diesel oxidation catalysts. All of the engines will include a device that limits idling to 15 minutes.

The projected South Coast Air Basin emissions from ports and goods movement and health benefits to 2030 with full implementation of the aforementioned emission reduction strategies are in Tables 36 and 37.

Table 41
South Coast Emissions from Ports and Goods Movement
with Full Implementation of Plan Strategies
(tons per day)

Pollutant	Year					Percent Reduction 2001-2020
	2001	2005	2010	2015	2020	
Diesel PM	14.1	14.0	8.3	4.3	3.1	78%
NOx	256.1	268.2	207.2	144.6	99.1	61%
ROG	22.9	22.1	17.7	12.9	10.0	56%
SOx	22.5	34.6	12.3	4.5	4.5	80%

Table 42
South Coast Air Basin
Health Benefits and Economic Value of Plan Strategies in Year 2020

Health Outcome	Cases Avoided in 2020	Uncertainty Range ² (cases per year)	Value in 2020 (in millions)	Uncertainty Range ³ (in millions)
Premature Death	400	120 to 690	1,800	420 to 4,300
Hospital Admissions (respiratory causes)	210	120 to 290	4.4	1.9 to 7.7
Hospital Admissions (cardiovascular causes)	150	100 to 230	3.9	1.8 to 7.6
Asthma and Other Lower Respiratory Symptoms	12,000	4,500 to 18,000	0.12	0.03 to 0.24
Acute Bronchitis	950	-230 to 2,000	0.22	-0.04 to 0.61
Work Loss Days	68,000	58,000 to 79,000	8.1	5.1 to 12
Minor Restricted Activity Days	530,000	350,000 to 720,000	18	8.7 to 30
School Absence Days	94,000	38,000 to 150,000	5.5	1.6 to 11

¹ Does not include the reduction in contributions from particle sulfate formed from SO_x emissions, which is being addressed with several ongoing emissions, measurement, and modeling studies.

² Range reflects uncertainty in health concentration-response functions, but not in emissions or exposure estimates. A negative value as a lower bound of the uncertainty range is not meant to imply that exposure to pollutants is beneficial; rather, it is a reflection of the adequacy of the data used to develop these uncertainty range estimates.

³ Range reflects statistically combined uncertainty in concentration-response functions and economic values, but not in emissions or exposure estimates.

Summary

The South Bay is home to some of the most significant goods movement infrastructure in the region, including railroads, roadways, port facilities, and warehouses and distribution centers. This infrastructure, both exclusive and multiuse, has supported trade and its associated benefits to Southern California. However, these facilities require continued investment in maintenance and mitigation of the negative impacts of their use. Given the projections of economic growth, and the resulting growth in goods movement, improvements to regional facilities need to be prioritized in a goods movement context.

			Cost Estimate (in millions of dollars)	S. Bay Related					Status	Infrastructure and Operations								Health and Environmental								Community Impact Mitigation								Public Safety												
				Importance to South Bay	Goods Movement Usage	Goods Movement Growth	Truck-Related Collisions	Funding Programmed		Time Frame	Velocity	Throughput	Reliability	Congestion	Reduces Impact	Connectivity	Innovative Tech.	Energy Efficiency	Leverage Funding	Add. Public Health	Emissions or runoff	Immediate reduce.	Long-term redact.	Technological fees.	Technological dev.	Alternative Fuel	Cost-effective	Enforceability	Community pref.	Community buy-in	Like mitigation	Optimizes ben.	Feasibility	Available funding	Multiple benefits	Partial mitigation	Accountability	Noise/light mitig.	Env. justice	Safety efforts	Dn't deteriorate GM	Problem containers	Landside aware	Seaside domain	Extends security	
16	Los Angeles	ITS and intersection improvements at LAX	\$1.3	●	●	●	○	X	Short	X	X	X				X	X							X						X	X	X														
17	Los Angeles County	South Bay Forum Traffic Signal Corridors Project	\$9.0	●	●	●	○	X	Short	X		X	X			X	X						X						X	X	X															
18	Los Angeles County	South Bay Traffic Signal Synchronization	\$29.0	●	●	●	○	X	Short	X		X	X			X	X						X						X	X	X															
19	Manhattan Beach	Intersection improvements at Nash St./Douglas St. at Rosecrans Ave.	\$5.4	○	●	●	○	X	Short	X		X					X	X					X						X	X									X							
20	Torrance	Intersection improvements at Torrance Blvd. and Maple Ave.	\$0.7	○	●	●	○	X	Short	X		X					X	X					X						X	X										X						
21	Torrance	Intersection improvements at Hawthorne Blvd. and Sepulveda Blvd.	\$0.5	○	●	●	○	X	Short	X		X					X	X					X						X	X											X					
22	Torrance	Intersection improvements at 190th St. at Anza Ave. and Inglewood Ave.	\$0.4	○	●	●	○	X	Short	X		X					X	X					X						X	X											X					
23	Various	Right-turn turning radius improvements at various locations		○	●	●	●	X	Short	X		X	X										X						X													X				
Truck-Related Collision Locations																																														
24	Carson	Improvements to the intersection of Wilmington Ave. and Sepulveda Blvd.		●	●	●	●		Short			X																X	X												X	X				
25	Hawthorne	Improvements to the intersection of Crenshaw Blvd. and El Segundo Blvd.		●	●	○	●		Short			X					X											X	X												X	X				
26	Lomita	Improvements at the intersection of Pacific Coast Highway with Pennsylvania Ave., Narbonne Ave., and Oak St.		●	●	●	●		Short			X					X											X	X													X	X			
27	Rancho Dominguez	Del Amo Blvd. at Santa Fe Avenue		●	●	●	●		Short			X					X											X	X													X	X			
28	Rancho Dominguez	Del Amo Blvd. at Susana Road		●	●	●	●		Short			X					X											X	X													X	X			
29	Torrance	Figuerola St. at Torrance Blvd.		●	●	●	●		Short			X					X											X	X													X	X			
30	Los Angeles County	Lump Sum Collision Reduction Projects	\$1,478.9	●	●	●	●	X	Short			X					X											X	X	X												X	X			
Pavement Rehabilitation and Reconstruction																																														
31	Carson	Pavement reconstruction and other improvements on Broadway from Albertoni to North City Limit	\$7.0	○	●	●	○	X	Short	X		X	X				X	X					X					X	X													X				

			Cost Estimate (in millions of dollars)	S. Bay Related					Status	Infrastructure and Operations							Health and Environmental							Community Impact Mitigation							Public Safety													
				Importance to South Bay	Goods Movement Usage	Goods Movement Growth	Truck-Related Collisions	Funding Programmed		Time Frame	Velocity	Throughput	Reliability	Congestion	Reduces Impact	Connectivity	Innovative Tech.	Energy Efficiency	Leverage Funding	Add. Public Health	Emissions or runoff	Immediate reduce.	Long-term redact.	Technological fees.	Technological dev.	Alternative Fuel	Cost-effective	Enforceability	Community pref.	Community buy-in	Like mitigation	Optimizes ben.	Feasibility	Available funding	Multiple benefits	Partial mitigation	Accountability	Noise/light mitig.	Env. justice	Safety efforts	Dn't deteriorate GM	Problem containers	Landside aware	Seaside domain
				Highest Importance = <input checked="" type="checkbox"/> High Importance = <input checked="" type="radio"/> Important = <input type="radio"/>																																								
32	Carson	Figuroa St. reconstruction from Victoria St. to Alondra Blvd.	\$3.5	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	Short	X	X	X			X	X							X							X	X							X						
33	El Segundo	Nash/Douglas conversion to two-way streets	\$1.9	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	Short	X	X		X		X	X							X						X	X								X						
34	Inglewood	Reconstruction of Arbor Vitae from La Brea Ave. to Prairie Ave.	\$3.5	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	Short	X	X	X			X	X							X	X					X	X								X						
35	Inglewood	Reconstruction of La Brea from Florence Ave. to Century Blvd, and reconstruction of Imperial Highway from Prairie Ave. to Van Ness Ave.	\$6.0	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	Short	X	X	X			X	X							X	X					X	X								X						
36	Inglewood	Realignment of La Brea Ave. with Hillcrest Blvd.	\$10.0	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	Short	X	X	X			X	X							X	X	X			X	X									X						
37	Torrance	Rehabilitation of Crenshaw Blvd. between 182nd St. and 190th St. and between Maricopa St. and Sepulveda Blvd.	\$2.0	<input type="radio"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	Short	X	X	X			X	X							X						X	X								X						
38	Los Angeles County	Lump Sum Roadway Preservation Projects	\$0.3	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	Short						X	X							X					X	X								X							
<i>Bridges and Grade Separations</i>																																												
39	Carson	Wilmington Avenue Bridge over Dominguez Channel		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	Short			X				X																												
40	El Segundo	Douglas Street gap closure/railroad grade separation	\$32.5	<input checked="" type="checkbox"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	Short	X	X	X	X	X	X	X							X						X	X														
<i>Interchange Improvements from "I-405 Arterial Improvement Planning Studies" Report</i>																																												
41	Hawthorne	I-405 southbound off-ramp/Rosecrans Avenue signal		<input checked="" type="radio"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>		Short	X	X	X	X									X	X						X										X					
42	Hawthorne	Southbound I-405 off-ramp to Hindry Avenue signage		<input checked="" type="radio"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>		Short	X	X	X	X									X	X						X											X				
43	Inglewood	Northbound I-405/Manchester Boulevard add right lane		<input checked="" type="radio"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>		Short	X	X	X	X									X	X						X										X					
44	Inglewood	La Cienega Boulevard/Manchester Boulevard improve turn radii		<input checked="" type="radio"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		Short	X	X	X	X									X	X						X										X					
45	Inglewood	La Cienega Boulevard/Florence Avenue turn radii, and through-right lane		<input checked="" type="radio"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		Short	X	X	X	X									X	X						X										X					
46	Inglewood	La Cienega Boulevard to southbound I-405 on-ramp metering		<input checked="" type="radio"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		Short	X	X	X	X									X	X						X										X					

			Cost Estimate (in millions of dollars)	S. Bay Related				Status	Infrastructure and Operations										Health and Environmental						Community Impact Mitigation						Public Safety											
				Importance to South Bay	Goods Movement Usage	Goods Movement Growth	Truck-Related Collisions		Funding Programmed	Time Frame	Velocity	Throughput	Reliability	Congestion	Reduces Impact	Connectivity	Innovative Tech.	Energy Efficiency	Leverage Funding	Add. Public Health	Emissions or runoff	Immediate reduce.	Long-term redact.	Technological fees.	Technological dev.	Alternative Fuel	Cost-effective	Enforceability	Community pref.	Community buy-in	Like mitigation	Optimizes ben.	Feasibility	Available funding	Multiple benefits	Partial mitigation	Accountability	Noise/light mitig.	Env. justice	Safety efforts	Dn't deteriorate GM	Problem containers
			Highest Importance = <input checked="" type="checkbox"/>			High Importance = <input checked="" type="checkbox"/>			Important = <input type="checkbox"/>																																	
47	Lawndale	Hawthorne Boulevard/northbound I-405 ramps southbound left turns		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Short	X	X	X	X					X	X					X															X				
48	Torrance	Crenshaw Boulevard/182nd Street westbound through lane, modify signal		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Short	X	X	X	X					X	X					X															X				
49	Torrance	Crenshaw Boulevard/Southbound I-405 new southbound ramp		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Short	X	X	X	X					X	X					X					X										X				
50	Torrance	190th Street/southbound I-405 ramps add westbound through lane		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Short	X	X	X	X					X	X					X					X										X				
Intra-Subregional Freight																																										
51	Schuyler Heim Bridge Replacement/State Route 47 Project and Alameda Street		\$515.7	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Intern.	X	X	X	X	X	X		X	X						X	X	X			X	X				X	X		X						
Interchange Improvements																																										
52	Interstate 105	Widen northbound off-ramp at Sepulveda Blvd. from westbound I-105 from one lane to two	\$19.3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Intern.	X					X		X							X					X										X				
53	Interstate 110	'C' St. interchange improvements	\$30.0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Intern.	X				X		X								X					X	X									X				
54	Interstate 405	Construct south half of interchange at Arbor Vitae	\$279.5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Intern.	X	X	X	X	X		X							X						X										X				
55	Interstate 405	Wilmington Ave. northbound interchange improvements, including the widening of Wilmington Ave. to 223 rd St.	\$31.7	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Intern.	X	X	X	X	X		X							X						X	X							X	X					
56	Interstate 405	La Tijera bridge widening over I-405 freeway, including dual left turn lanes to freeway ramps	\$8.5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Intern.	X					X														X	X													
57	Interstate 405	Avalon Blvd. interchange improvements, including new southbound on-ramp, and widening northbound on- and off-ramps.	\$21.2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Intern.	X				X		X							X						X	X								X					
58	Interstate 105	Western Avenue Interchange Improvements		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Long	X					X														X														
59	Interstate 110	Capitol Drive Interchange Improvements		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Long	X					X														X									X					
60	Interstate 110	Gaffey St./Pacific Ave. Interchange Improvements		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Long	X					X														X									X					

			Cost Estimate (in millions of dollars)	S. Bay Related				Status	Infrastructure and Operations									Health and Environmental							Community Impact Mitigation							Public Safety																		
				Importance to South Bay	Goods Movement Usage	Goods Movement Growth	Truck-Related Collisions		Funding Programmed	Time Frame	Velocity	Throughput	Reliability	Congestion	Reduces Impact	Connectivity	Innovative Tech.	Energy Efficiency	Leverage Funding	Add. Public Health	Emissions or runoff	Immediate reduce.	Long-term redact.	Technological fees.	Technological dev.	Alternative Fuel	Cost-effective	Enforceability	Community pref.	Community buy-in	Like mitigation	Optimizes ben.	Feasibility	Available funding	Multiple benefits	Partial mitigation	Accountability	Noise/light mitig.	Env. justice	Safety efforts	Dn't deteriorate GM	Problem containers	Landside aware	Seaside domain	Extends security					
																																														Importance to South Bay	Goods Movement Usage	Goods Movement Growth	Truck-Related Collisions	Funding Programmed
95	Torrance	Intersection improvements at Crenshaw Blvd. and Carson St.		<input type="radio"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	Interm.	X																					X								X												
96	Torrance	Intersection improvements at Crenshaw Blvd. and Torrance Blvd.		<input type="radio"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	Interm.	X																					X								X												
97	Torrance	Intersection improvements at Prairie and 190th Street		<input type="radio"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	Interm.	X																					X								X												
98	Torrance	Intersection improvements at Van Ness and 190th Street		<input type="radio"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	Interm.	X																					X								X												
99	Torrance	Intersection improvements at Hawthorne Blvd. and Artesia Blvd.		<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	Interm.	X																					X								X												
100	Torrance	Add southbound right-turn pocket at Maple Avenue and Sepulveda Blvd.		<input type="radio"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	Interm.	X																					X								X												
101	Torrance/Gardena	Improve Artesia Blvd. from Hawthorne Blvd. to Vermont Ave.		<input type="radio"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	Interm.	X																					X								X												
102	Torrance	Intersection improvements at Crenshaw Blvd. and 182nd St.		<input type="radio"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	Interm.	X																					X								X												
Bridges																																																		
103	Carson	Sepulveda Blvd. over Dominguez Channel		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	Interm.		X						X																																		
104	Carson	223rd Street over Alameda Corridor and Alameda St.		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	Interm.		X						X																																		
105	Carson	Carson Street over Alameda Corridor and Alameda Street		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	Interm.		X						X																																		
106	El Segundo	Vista Del Mar Blvd. over Standard Oil Pipeline		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	Interm.		X						X																																		
107	Torrance	Prairie Avenue over BNSF railroad track		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	Interm.		X						X																																		
108	Torrance	Prairie Avenue over Mobile Oil pipeline		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	Interm.		X						X																																		
109	Torrance	Prairie Avenue over Mobile Oil Access Road		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	Interm.		X						X																																		
Inter-Subregional Freight Mainline Freeway Improvements																																																		
110		I-710 Improvement Project	\$5,500.0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	Long	X	X	X	X	X	X	X	X	X	X										X	X											X	X	X	X						
111	Interstate 105	Add auxiliary lanes: Eastbound from Yukon to Crenshaw		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	Long			X	X				X		X												X													X							

