4.0 ALTERNATIVES CONSIDERED

Section 4.0 identifies and describes the alternatives considered in the I-710 Major Corridor Study. The development and screening of transportation alternatives was a two step process. In the first step, a broad range of twelve alternatives was defined to meet the purpose and need for improvements in the I-710 Corridor. In the second step, a preliminary evaluation was performed to screen the alternatives. This screening process resulted in narrowing down the potential alternatives from a long list of twelve conceptual alternatives to a final set of five alternatives. The final set of five alternatives was then carried forward for detailed technical analysis and evaluation in subsequent phases of the I-710 Study.

4.1 Alternatives Development

Between December 2001 and February 2002, an initial set of twelve transportation alternatives was developed to respond to the need for transportation improvements in the I-710 Corridor. These alternatives are described in the following pages. The development of a broad range of transportation improvements was an important step in the I-710 Major Corridor Study.

4.1.1 Sources for Potential Transportation Improvements

In developing these transportation alternatives for the I-710 Study Area, input from several sources was considered. Technical information on travel patterns, accident statistics, future growth, and transportation system performance was analyzed. Previous studies and current planning efforts relating to both land use development and transportation were also examined. Substantial emphasis was given to discussions with residents, business interests, community leaders, local officials, city representatives, and with agencies such as the California Highway Patrol, about the most critical problems in the I-710 Corridor and what should be done about them.

Comments collected from members of general public and stakeholders through community roundtables, questionnaires, interviews with city staff/officials, and public open houses elicited a number of ideas for transportation improvements in the I-710 Study Area. These public comments are summarized and documented in the *August 2001 Issues Analyses Report*, which is provided in Appendix F of this report. Table 4.1-1 highlights the most commonly heard observations and suggestions from these groups.

Table 4.1-1
Stakeholder Suggestions for Transportation Improvements

Suggestions	Public Comment Summary
Added travel lanes for I-710, preferably to handle trucks	One area of consensus among all stakeholders was to separate trucks from general passenger vehicles, in whatever form it may take. Many were in favor of exploring ways to separate truck traffic from general passenger vehicles to improve the flow of traffic and safety. A Truck Only lane was the most favored alternative, but added general purpose and carpool lanes were also suggested. Widening of the freeway or double decking was suggested as well. If widening does occur, most would like the Southern California Edison right-of-way to be used and the Los Angeles river corridor preserved.

Table 4.1-1 Continued
Stakeholder Suggestions for Transportation Improvements

Suggestions	Public Comment Summary
24-Hour Port Operation	Extending port hours or making deliveries at night to alleviate congestion during rush hour was a commonly heard suggestion, particularly in the Long Beach or southern corridor area. Other suggestions regarding the ports included operating on 3 shifts, running 24 hours. The empty container issue should also be addressed. Suggestions included: attaching gate fees to peak hour deliveries, providing economic incentives for after hour deliveries and/or constructing an Inland port.
Truck Travel Restrictions	A "7-7" plan was suggested to move commercial vehicles to a 7 p.m. to 7 a.m. time period and reserve the 7 a.m. to 7 p.m. hours for non-commercial vehicles only. A similar plan restricting truck traffic to certain hours of the day was implemented during the 1984 Olympics and many felt that this system was successful because it alleviated congestion significantly.
Truck Weigh Station	A major goal of the California Highway Patrol (CHP) is to have a weigh station/truck scale located on the I-710. The only other weigh station in the area is the Carson scale on the I-405. Most of the trucks coming out of the ports do not necessarily pass through the Carson scale and this results in inefficient enforcement by the CHP.
I-5/I-710 Interchange	Adding the missing freeway-to-freeway connectors to the I-5/I-710 interchange, and the provision of right-hand-side connectors in general, were viewed as necessary improvements for this corridor. It is widely believed that the construction of these interchange ramps would increase the safety of this corridor as well as decrease the congestion on both the freeway and connecting arterials such as Atlantic Boulevard and Washington Boulevard.
Slauson On/Off-Ramp	Nearly every city, particularly in the northern section of the corridor, expressed a need for construction of an on and off ramp at Slauson Avenue on the I-710. Slauson Avenue is heavily industrial and is the major destination for port deliveries. Currently Washington Boulevard and Atlantic Avenue are the arterials of choice for many trucks to gain access to Slauson Avenue. An off-ramp at Slauson Avenue is believed by respondents to solve most of the traffic issues on Washington Boulevard, Atlantic Avenue and other nearby arterials.
Reconfiguration of Ramps	The radii of the I-710 on/off ramps need to be reconfigured to accommodate the size of the large trucks and to reduce the possibility of trucks overturning. The ramps on the I-710 from the I-405 are particularly tight and the "hair-pin" turns are perceived to lead to many collisions. Reconfiguration of the short ramps is also necessary to reduce the back-up of trucks on the freeway.
Direct Off-Ramp for Trucks into Rail Yards	A direct off-ramp for trucks to the rail yards on Washington Boulevard was suggested by cities in the northern section of the Corridor. It was felt that an off-ramp leading directly into the rail yards would alleviate congestion on arterial streets.

Table 4.1-1 Continued
Stakeholder Suggestions for Transportation Improvements

Suggestions	Public Comment Summary
Upgrades to Street Arterials	As a result of the congestion on the I-710, motorists are using arterial streets as an alternative to the freeway. This is particularly evident when an accident occurs on the I-710. The truck traffic on heavy shipping days can also affect the local bus transit system by making it difficult for buses to pass through, resulting in long delays of service. Any construction to the I-710 Freeway must be preceded by improvements to parallel arterials.
Improved Landscaping	Besides the issues of high truck volumes and congestion on the I-710 Freeway, the poor aesthetic condition of this freeway has been mentioned during numerous meetings. Improving the look and landscape of this corridor should be included in all plans for improvement.
Improved Signage	Some of the signs are difficult to read. In other cases, they cannot be seen because of all of the trucks in the way. The signage near Long Beach is confusing and in need of improvement. For example, lanes to the Queen Mary should not be confused with lanes to the port, which is currently the case.
Improved Incident Management	On a freeway with a perceived high volume of accidents and spills, a better incident management system needs to be implemented. Use of all intelligent transportation system (ITS) tools for incident management is important for clearing the roadway and for motorist information. The synchronization of traffic signals on arterials during particularly heavy congestion could improve the flow of traffic. Increasing the width of shoulders was also suggested as a way to move accidents and break downs off the freeway, when possible. Shoulders also allow for proper enforcement of the freeway.

Source: *Issues Analyses Report*, Consensus Planning Group, August 2001.

4.1.2 Approach to Alternatives Development

The purpose of developing various alternatives is to identify a fairly large list of possible transportation options so that these different alternatives can be studied and compared to each other to come up with the best solution for the I-710 Corridor. The twelve alternatives developed for the I-710 Study include operational improvements to existing transportation programs and services as well as major construction projects involving a substantial financial investment in the transportation system, particularly I-710. A building block approach was used to develop the alternatives, generally from the simplest to the more complex, starting with Alternative 1, the “no action” alternative. Considerable attention was then devoted to developing Alternative 2, the Transportation Systems Management/Transportation Demand Management Alternative, which has more of an operational and policy focus as opposed to transportation improvements that would involve major construction to the transportation system. Those alternatives that would require a major capital investment, and thus construction, are called “build” alternatives. For the I-710 Major Corridor Study, the build alternatives were further classified into three categories: low build, medium build, and high build.

During alternative development, preliminary concepts of alternatives were discussed with representatives from local jurisdictions, community leaders, and members of the public over a period of several weeks in workshops, open houses, and briefings. During this phase of the I-710 Study process, the planning effort was geared toward adding new solutions and on broadening the range of alternatives. Study participants were asked to consider the purpose and need for transportation improvements within the I-710 Study Area and suggest either new alternatives or changes to the preliminary alternatives. Through this process, Alternative 11 was added by the I-710 Technical Advisory Committee in January 2002 and Alternative 12 was added by the I-710 Oversight Policy Committee in February 2002.

Even though some of the twelve alternatives contain similar transportation features, each alternative is structured to be fundamentally different from the others. This is done so that the different benefits, costs, and impacts of these alternatives can be examined and understood. The alternatives also emphasize different modes of travel or answer specific transportation needs that have been identified in the I-710 Study Area. These different travel modes include: general purpose traffic (all types of vehicles); high occupancy vehicles (HOV or carpools); trucks; goods movement (both trucks and freight rail); and passenger rail.

In summary, the twelve initial alternatives are:

Alternative 1 – No Build Alternative
Alternative 2 – Transportation Systems Management/Transportation Demand Management (TSM/TDM) Alternative
Alternative 3 – Low General Purpose Alternative
Alternative 4 – Low Truck Alternative
Alternative 5 – Medium HOV Alternative
Alternative 6 – Medium General Purpose Alternative
Alternative 7 – Medium Truck Alternative
Alternative 8 – High General Purpose Alternative
Alternative 9 – High Truck Alternative
Alternative 10 – High Goods Movement Alternative
Alternative 11 – High HOV Alternative
Alternative 12 – High Rail Alternative

The build alternatives may be classified based on their respective levels of capital investment as shown on the chart below. For example, Alternative 3 represents a low-range investment with an emphasis on serving general purpose trips, whereas Alternative 9 represents a high-range investment designed to handle growing truck demand.

Table 4.1-2
Build Alternatives Grouped by Levels of Investment

Mode	Low-Range	Mid-Range	High-Range
General Purpose (GP)	Alternative 3	Alternative 6	Alternative 8
Truck	Alternative 4	Alternative 7	Alternative 9
Goods Movement			Alternative 10
High Occupant Vehicle (HOV)		Alternative 5	Alternative 11
Rail			Alternative 12

Source: Initial Set of Alternatives, Parsons Brickerhoff, February 2002.

The Initial Set of Alternatives, described in Section 4.2 of this report, includes both capital improvements and operational strategies, emphasizing different transportation modes and potential alignments.

4.2 Initial Set of Alternatives

Section 4.2 describes each of the twelve alternatives that comprise the Initial Set of Alternatives. As explained in Section 4.1, a building block approach was used to develop the Initial Set of Alternatives, beginning with Alternatives 1 and 2. The text descriptions point out key similarities and differences among the alternatives. All of the No Build (Alternative 1) improvements are included in all the other alternatives. Also, the TSM/TDM improvements (Alternative 2) are carried forward into all of the remaining build alternatives (Alternatives 3 – Alternatives 12) since these operational improvements increase the effectiveness of these build alternatives. Maps are provided for all of the build alternatives, here, in Section 4.2. For a more detailed portrayal of the Initial Set of Alternatives, look to Appendix G of this report.

Alternative 1 - No Build Alternative

Also called the "No Project" Alternative, the No Build Alternative examines what travel conditions will be like by 2025, the future planning horizon year for the I-710 Study. The No Build Alternative is the starting point for the development of the other eleven transportation alternatives and is the future baseline scenario against which these alternatives are compared.

The No Build Alternative encompasses future improvements to the existing transportation system that are expected to be in place by 2025. Major transportation projects that are already under construction or that are already planned to occur are folded into the No Build. Examples of these projects include the construction of the Alameda Corridor, replacement of all of the pavement on I-710 by Caltrans, added bus service throughout the I-710 Study Area, and improvements to truck-impacted intersections, among other future transportation projects.

Alternative 2 – TSM/TDM Alternative

The TSM/TDM Alternative is made up of a list of operational improvements that provide the greatest benefit to the transportation system in the I-710 Study Area and that stops just short of a major financial investment in new transportation facilities. The TSM/TDM Alternative includes several transportation strategies to better manage how the existing freeways, roadways, and the transit systems operate in the I-710 Study Area.

Alternative 2 includes transportation improvements such as added bus service for local communities, the completion of the ramp metering system on I-710, and the use of advanced technologies to manage traffic and to inform motorists about alternate routes to avoid traffic congestion. Other proposed TSM/TDM improvements include the consolidation of truck trips or a shift of truck traffic into the late evening or early morning hours.

As opposed to some of the more capital-intensive alternatives, the TSM/TDM Alternative can potentially be implemented within a short time frame.

Alternative 3 - Low General Purpose Alternative

As one of the low build alternatives, Alternative 3 calls for a capital investment to the highway and roadway system in the I-710 Study Area on top of the improvements that are already occurring in the No Build Alternative and the operational improvements that are proposed in Alternative 2, the TSM/TDM Alternative. See Figure 4.2-1 for a map of Alternative 3.

The purpose of Alternative 3 is to improve traffic flow and safety for all types of vehicles, focusing on a network of the most congested arterial streets that either lead to I-710 or that run parallel to I-710. Alternative 3 responds to projected traffic increases on these arterials as a result of the population and employment growth taking place within the I-710 Study Area. In addition, by improving certain interchanges on I-710 this alternative addresses some the worst safety concerns on I-710.

Alternative 3 accomplishes this by:

- adding a lane for general purpose traffic in each direction to a network of ten arterials within the I-710 Study Area
- replacing the existing left-side connector ramps at the I-5/I-710 interchange with right-side connector ramps to allow for safer weave movements at this high accident location
- reconfiguring the design of the I-710 interchanges at Florence Avenue and Imperial Avenue.

Alternative 4 - Low Truck Alternative

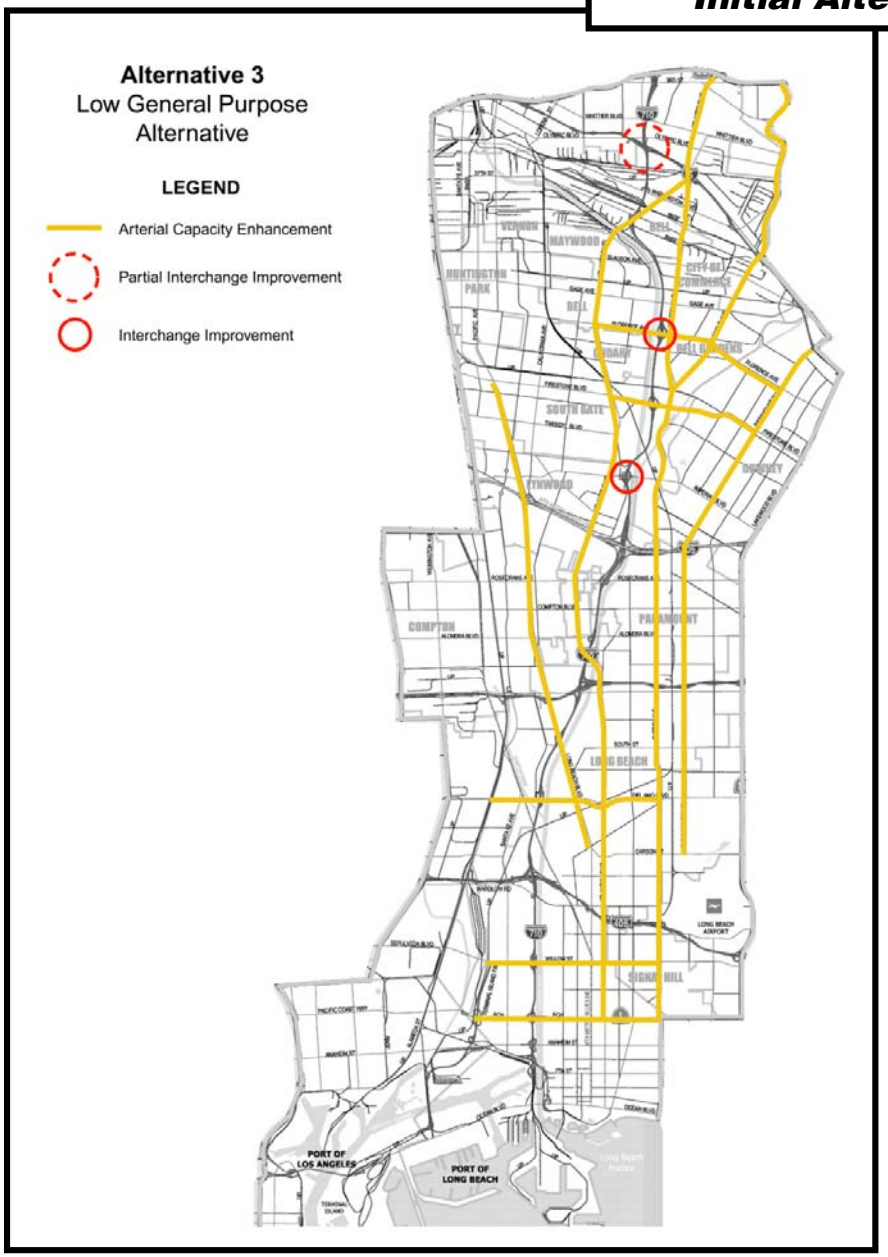
Alternative 4 is a low build alternative and is illustrated in Figure 4.2-1. Alternative 4 includes the improvements described in the No Build and TSM/TDM Alternatives. In addition, Alternative 4 focuses on safety and mobility problems associated with heavy-duty trucks.

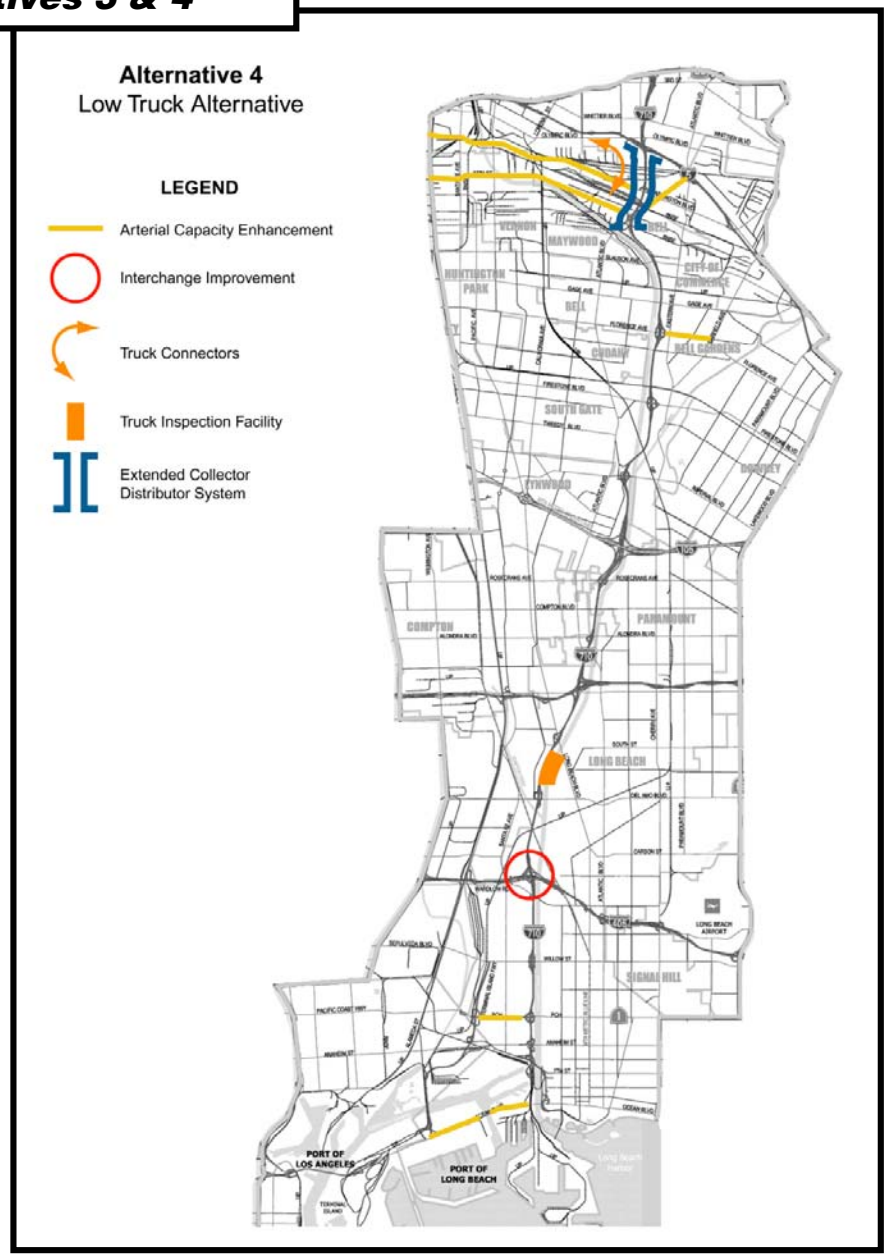
In the northern part of the I-710 Study Area, Alternative 4 includes special roadway facilities called collector-distributor roads that would allow for vehicles to merge safely onto the main travel lanes of I-710 as well as connector ramps, only for trucks, to separate the existing truck and auto movements at the I-5/I-710 interchange.

Alternative 4 also proposes the following improvements:

- Redesigning and rebuilding the I-710/I-405 interchange to improve safety and to better handle high levels of traffic.
- Constructing a California Highway Patrol truck inspection facility adjacent to northbound I-710 between Del Amo Boulevard and Long Beach Boulevard in Long Beach.
- Expanding the use of advanced technology to manage the flow of truck traffic, including improved incident management to help route truck traffic away from traffic trouble spots.
- Adding a general purpose lane in each direction to selected arterials that connect to I-710 and that are projected to carry very high volumes of truck traffic.

Figure 4.2-1
Initial Alternatives 3 & 4





Source: Initial Set of Alternatives, Parsons Brinckerhoff, February 2002.

Alternative 5 - Medium High Occupancy Vehicle (HOV) Alternative

Alternative 5 is a medium build alternative in that it proposes an additional level of transportation improvements compared to Alternatives 3 and 4. See Figure 4.2-2 for a map of Alternative 5. Alternative 5 calls for the addition of a carpool lane in each direction for the full length of I-710 from 9th Street (City of Long Beach) to the SR-60 Freeway. The new carpool lanes on I-710 would look and operate very much like the HOV lanes that presently exist on the I-105 Freeway. Alternative 5 would also add express bus service on I-710 that would use the new HOV lanes. The main purpose of the HOV lanes is to increase the person-carrying capacity of I-710, by encouraging carpooling and transit use.

Also, under Alternative 5, the entire I-5/I-710 interchange would be completely rebuilt by:

- replacing the existing left-side connector ramps at the I-5/I-710 interchange with right-side connector ramps for general purpose traffic to allow for safer weave movements.
- adding two new connector ramps for general purpose traffic to enable northbound I-710 vehicles to transition directly to I-5 in the southbound direction, as well as the reverse movement (northbound I-5 to southbound I-710); two movements that are currently missing from this freeway to freeway interchange.
- adding two new connector ramps only for carpools and buses, so that they do not need to leave the HOV lanes on I-710 to transition to northbound I-5 as well as the reverse movement (southbound I-5 to southbound I-710).

Alternative 6 - Medium General Purpose Alternative

Alternative 6 is another medium build alternative in that it would involve transportation improvements along the full length of I-710. Alternative 6 is geared toward safety and design improvements, improving access to and from I-710, and adding travel lanes where they are most needed on I-710. Alternative 6 is shown in Figure 4.2-2.

The main features of Alternative 6 are:

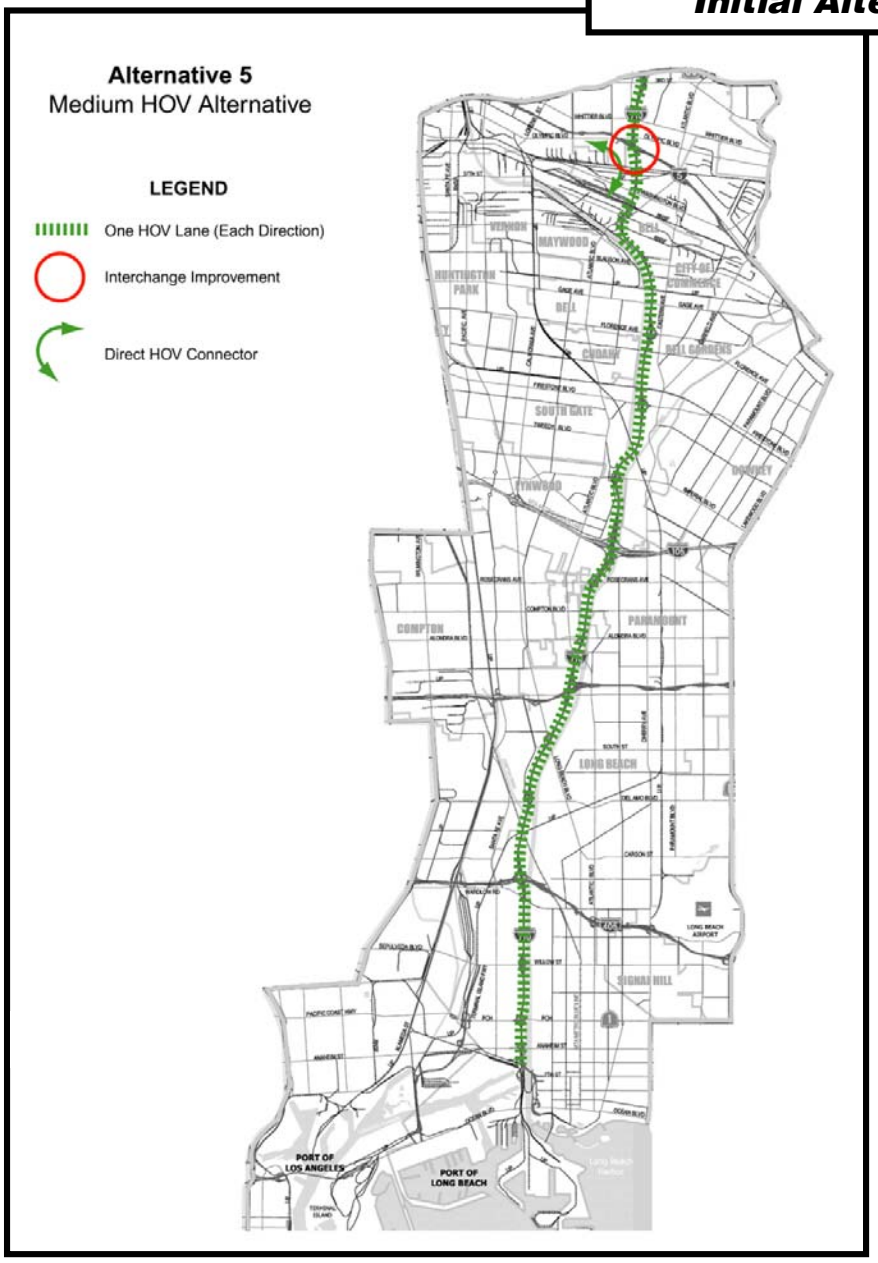
- improvements to several of the interchanges along I-710
- a new interchange on I-710 at Slauson Avenue
- the addition of a mixed flow lane in each direction on I-710 from 9th Street in Long Beach to I-405 and from Imperial Boulevard to Atlantic Boulevard.

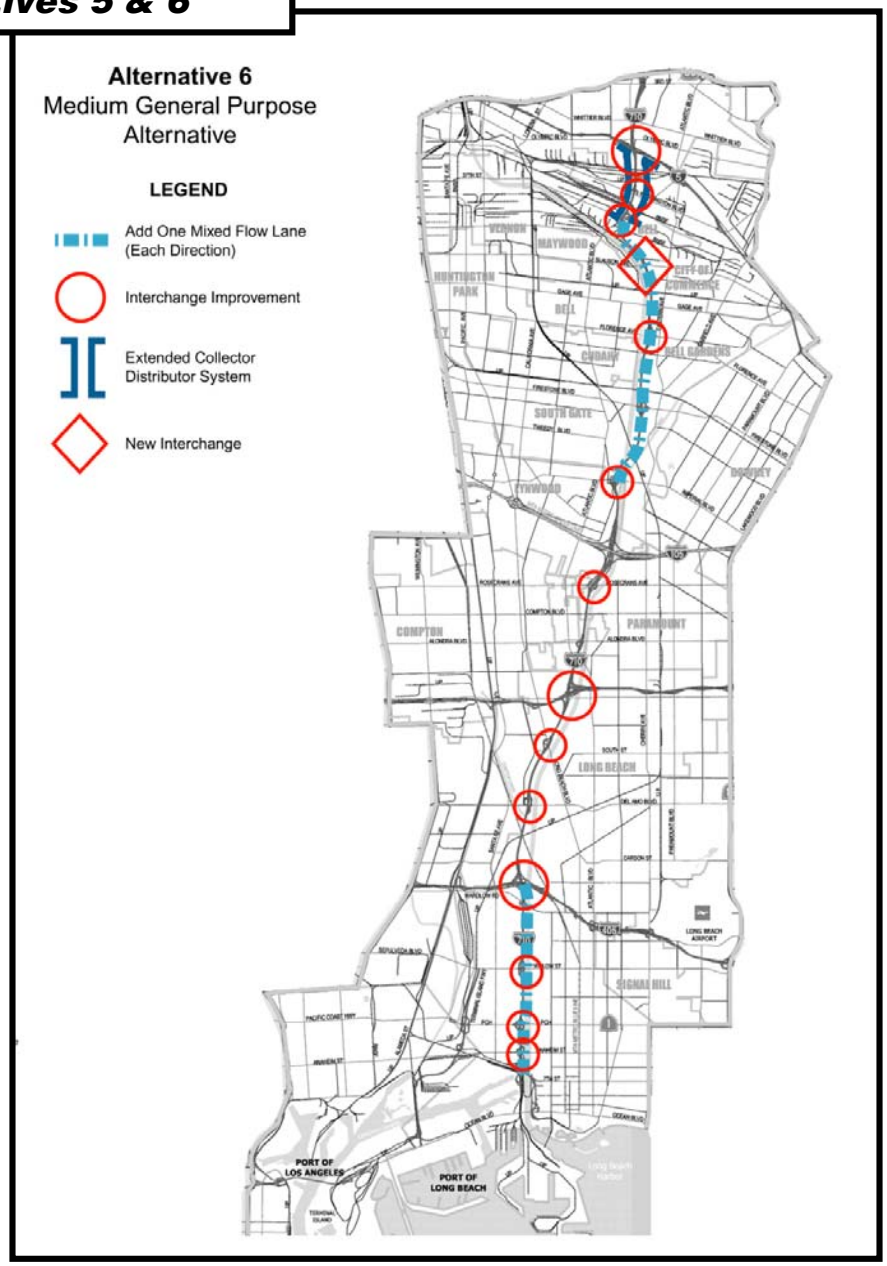
Alternative 6 also includes collector-distributor roads that would allow for vehicles to merge safely onto the main travel lanes of I-710 between Atlantic Boulevard and the I-5/I-710 interchange.

The interchange improvements involve redesigning and rebuilding each interchange to operate more safely and to accommodate higher volumes of traffic. In addition, the I-5/I-710 interchange would be rebuilt by:

- replacing the existing left-side connector ramps at the I-5/I-710 interchange with right-side connector ramps to allow for safer weave movements.
- adding two new connector ramps to enable northbound I-710 vehicles to transition directly to I-5 in the southbound direction, as well as the reverse movement (northbound I-5 to southbound I-710); two movements that are currently missing from this freeway to freeway interchange.

Figure 4.2-2
Initial Alternatives 5 & 6





Source: Initial Set of Alternatives, Parsons Brinckerhoff, February 2002.

Alternative 7 - Medium Truck Alternative

Alternative 7 is also categorized as a medium build alternative, however, Alternative 7 is designed to respond to the high level of truck trips that are projected to occur within the I-710 Study Area. See Figure 4.2-3 for a map of Alternative 7. Alternative 7 focuses on improving safety, reliability of travel, and access to I-710, with an emphasis on heavy-duty trucks. Consequently, Alternative 7 contains several design features such as direct truck ramps and truck bypass lanes to separate truck traffic from other vehicles at those locations in the I-710 Study Area that experience heavy truck movements or where points of conflict are most likely to occur between heavy duty trucks and auto traffic on I-710.

A key difference between Alternative 7 and the other two medium build alternatives (Alternatives 5 and 6) is that Alternative 7 does not propose any additional "through" lanes for I-710. However, Alternative 7 would add lanes to the mainlines of I-710, called auxiliary lanes, at several locations between local interchanges to improve the flow of traffic as vehicles enter and exit I-710. Alternative 7 would also increase the width of the two right-hand lanes on I-710 in each direction to accommodate larger vehicles such as trucks and to provide some additional space between different-sized vehicles that are frequently required to travel next to each other on I-710.

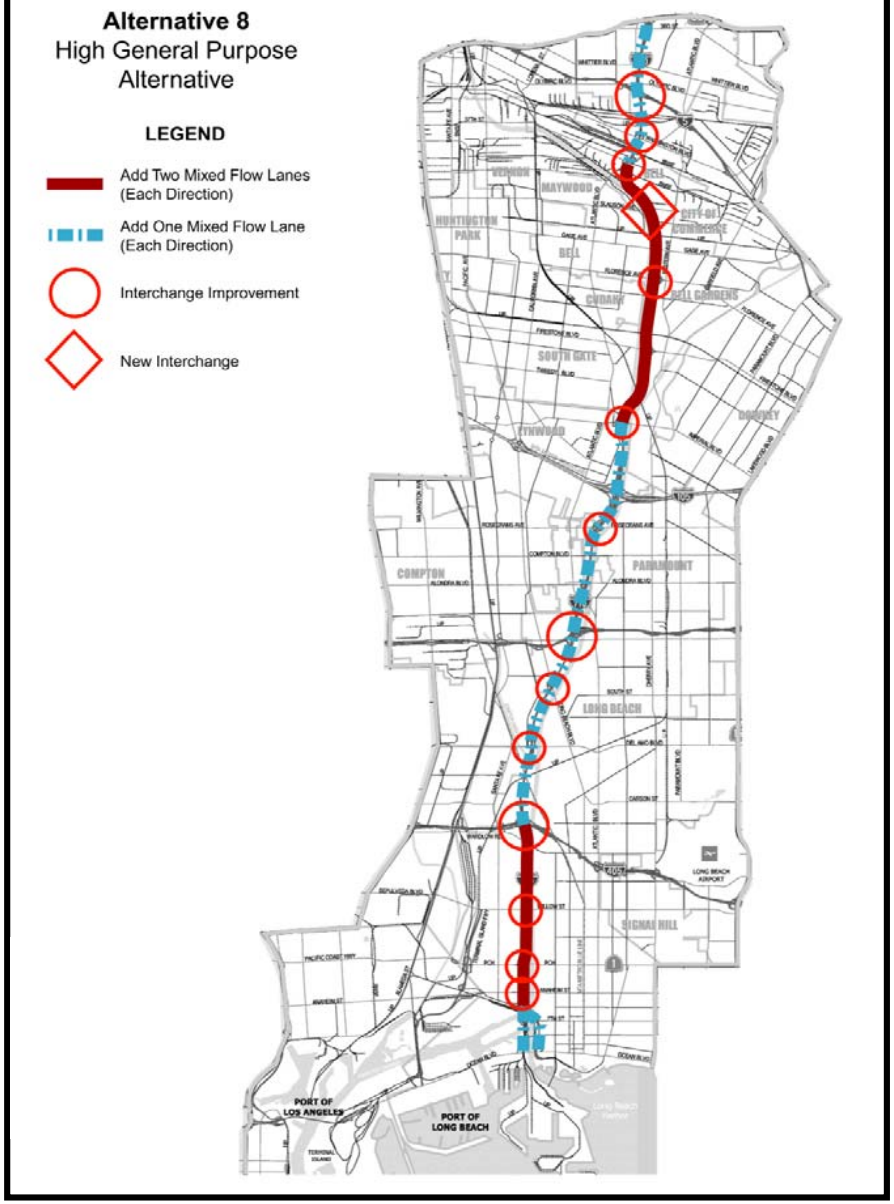
Specific design features of Alternative 7 include:

- Truck bypass lanes that would divert "through" truck traffic out of the mixed flow traffic stream and carry these trucks to the right and around major freeway-to-freeway interchanges, thereby minimizing conflicts between trucks and autos at these major meeting points on I-710.
- Direct truck ramps that would be built only for trucks to use at those local interchanges on I-710 that experience very high volumes of heavy duty trucks. In these cases, autos would use the existing on- and off-ramps at the interchanges and heavy duty trucks would use the new truck-only ramps.
- Added lanes for selected arterial roadways that connect I-710 with freight facilities and with land uses that attract high numbers of trucks in order to improve traffic flow and reliability of travel.
- Redesign and reconstruction of three freeway-to-freeway interchanges on I-710 for safety purposes and to handle the high traffic flows: I-405/I-710, SR-91/I-710, and I-5/I-710. Under Alternative 7, the design improvements proposed for the I-5/I-710 interchange would be essentially the same as those described for this interchange in Alternative 6.

Alternative 8 - High General Purpose Alternative

Alternative 8 is geared toward improving mobility for general purpose traffic as well safety and design improvements in addition to improving access to and from I-710. Alternative 8 is categorized as a high build alternative in that it represents another level of financial investment above the medium build alternatives (Alternatives 5, 6, and 7). Alternative 8 is shown on Figure 4.2-3.

Figure 4.2-3
Initial Alternatives 7 & 8



Source: Initial Set of Alternatives, Parsons Brinckerhoff, February 2002.

Alternative 8 proposes two additional travel lanes in each direction for some sections of I-710 and one additional travel lane in each direction for the remaining sections. Alternative 8 would involve a significant increase in freeway capacity for general purpose traffic, between Ocean Boulevard and SR-60, compared to existing conditions. Essentially, Alternative 8 seeks to provide sufficient freeway capacity to reduce the congestion problems that motorists currently experience on I-710 and that are expected to worsen in future years.

As part of Alternative 8, approximately ten local interchanges and three freeway-to-freeway interchanges would be redesigned and rebuilt, including the I-5/I-710 interchange. Alternative 8 also proposes a new interchange on I-710 at Slauson Avenue. Plus, Alternative 8 would involve the construction of auxiliary lanes between local interchanges to improve traffic operations on the main travel lanes of I-710 as vehicles enter and exit the freeway.

Alternative 9 - High Truck Alternative

Alternative 9 is another high build alternative. See Figure 4.2-4. Alternative 9 focuses on truck movement within the I-710 Study Area. Alternative 9 is unique in that it would involve the construction of additional travel lanes to be used only by trucks along the same general alignment as the existing I-710 freeway. In concept, Alternative 9 seeks to remove as many trucks as possible from the present mix of traffic on I-710, thereby reducing points of conflict between autos and trucks. In this manner, trucks would realize the benefit of new travel lanes. At the same time, the vehicles remaining on I-710 would benefit from the additional capacity freed up by those trucks no longer using I-710.

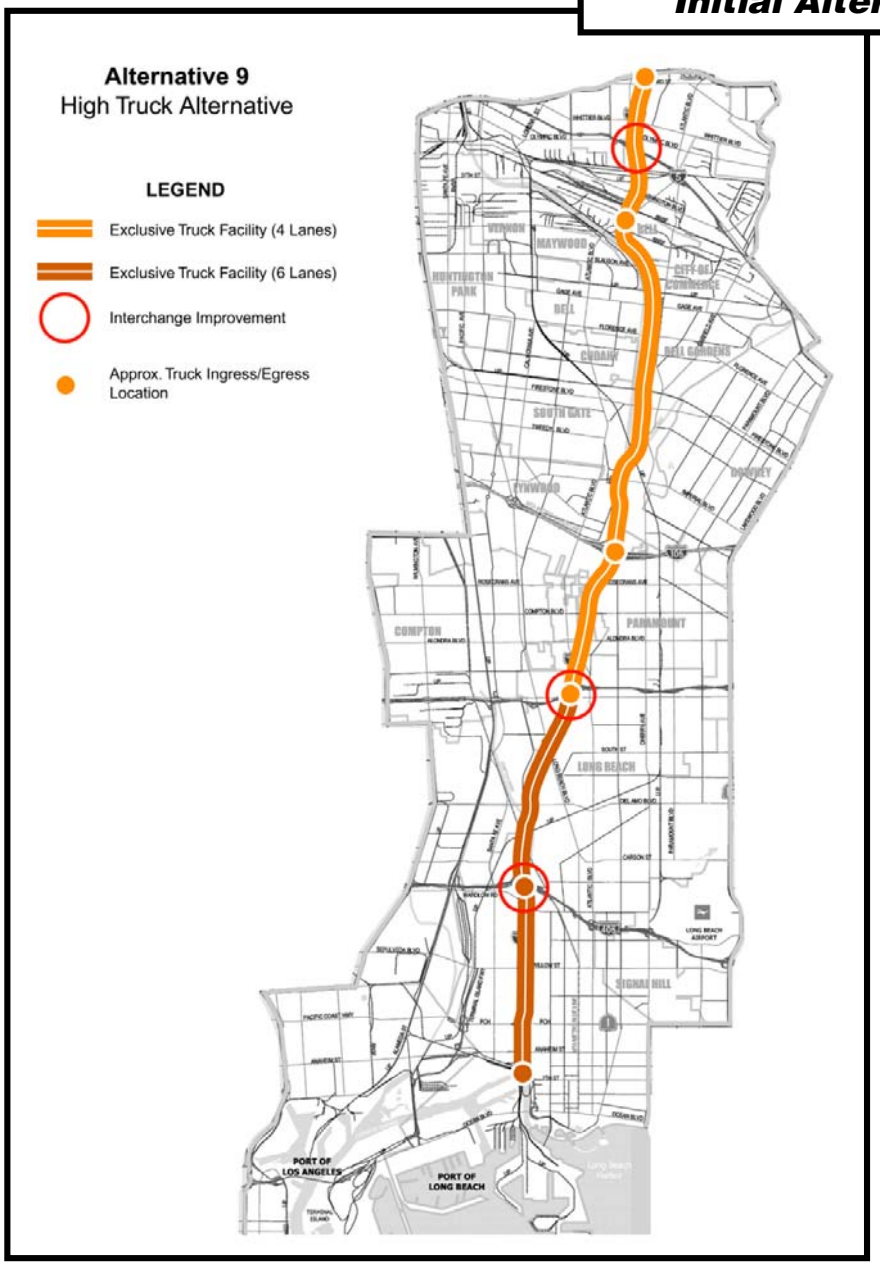
Several sections of the truck lanes, if not all, would need to be elevated on a separate roadway structure so as to avoid the need to widen I-710 as much as possible. The exclusive truck facility would either be located in the median or adjacent to I-710 depending upon the location and best fit given the various physical constraints along the I-710 Corridor such as the Los Angeles River. Access and exit ramps for the truck-only lanes would be built approximately every three or four miles. This means that not all trucks would elect to use the new truck-only lanes, particularly for short trips on I-710. Also, a toll may be required for the use of the truck-only lanes, depending upon future traffic conditions in the I-710 Corridor.

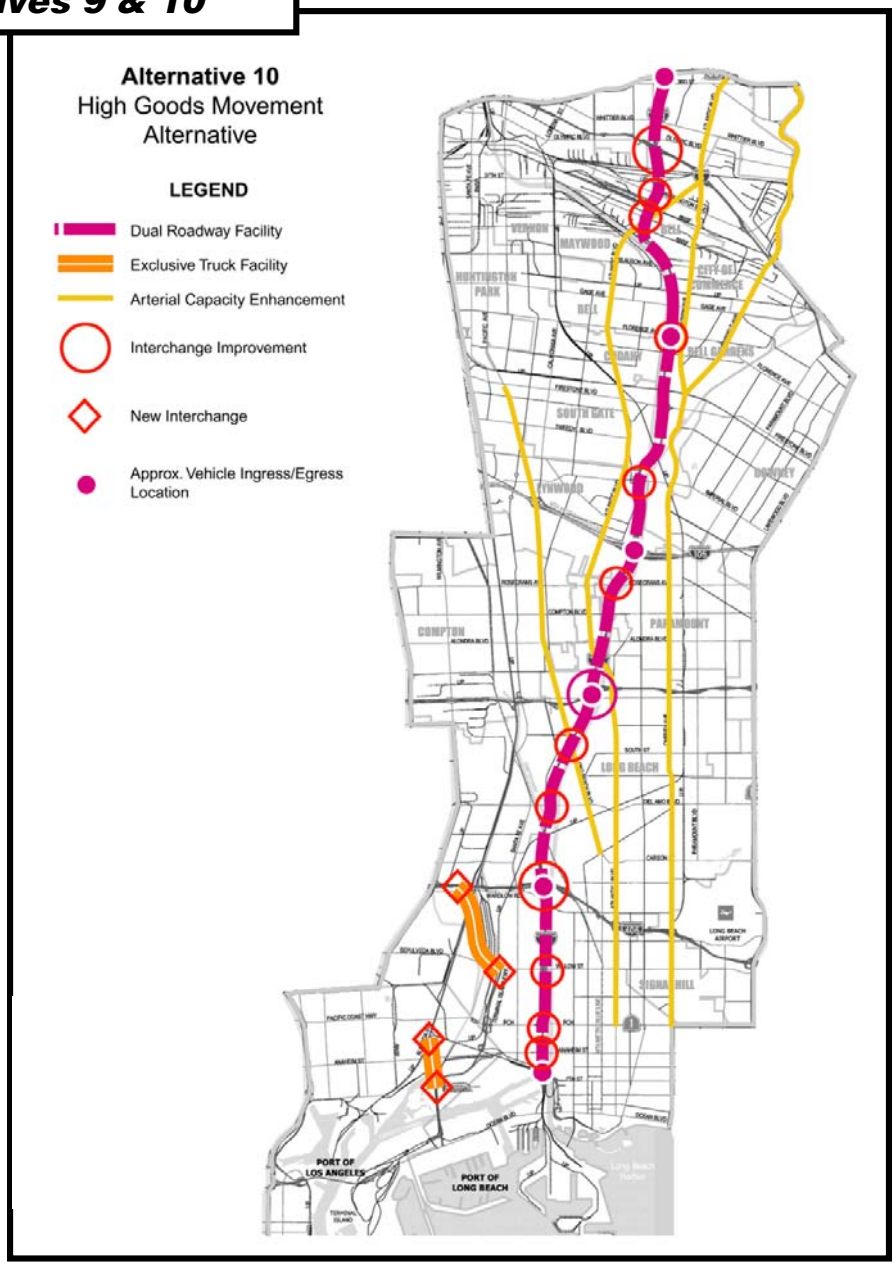
In addition to the truck facility, Alternative 9 proposes the redesign and reconstruction of three freeway-to-freeway interchanges on I-710 for safety purposes and to handle the high level of traffic volumes at these locations. The three interchanges are: I-405/I-710, SR-91/I-710, and I-5/I-710.

Alternative 10 - High Goods Movement Alternative

Alternative 10 is a high build alternative that seeks a comprehensive solution for all types of trips associated with goods movement in the I-710 Study Area, including trucks. A map of Alternative 10 is provided in Figure 4.2-4. Alternative 10 proposes the construction of four additional travel lanes at surface level in the median of I-710 that would be separated from mixed flow traffic by concrete barriers. To accomplish this, I-710 would need to be reconstructed along the full length of the Corridor, from 9th Street in Long Beach to the SR-60 Freeway. These new travel lanes, called special purpose lanes, would primarily be used by automobiles since medium- and heavy-duty trucks would be prohibited from entering the new lanes.

Figure 4.2-4
Initial Alternatives 9 & 10





Source: Initial Set of Alternatives, Parsons Brinckerhoff, February 2002.

With the new lanes autos would tend to use the inner travel lanes for their trips and trucks would be directed to the outside lanes. Use of the faster, less-congested special purpose lanes could require a toll, depending upon future traffic conditions on I-710. Access points that would allow vehicles to enter and exit the inner lanes would be provided about every three or four miles.

This means that autos that are making relatively short trips would likely opt for the outside lanes or would elect to remain on the arterial roadway system. For this reason, Alternative 10 also proposes that an additional travel lane be added in each direction to four key arterial streets that run parallel to I-710.

In addition to improvements on the I-710, Alternative 10 proposes that special roadway facilities be built, to be used primarily by trucks, to connect the Terminal Island Freeway with Alameda Street and to extend the Terminal Island Freeway up to the I-405 Freeway. The purpose of these new roadway connectors would be to encourage more trucks entering and leaving the Long Beach / Los Angeles Port complex to use the Terminal Island Freeway.

Alternative 10 also includes transportation improvements and operational strategies to better manage truck trips occurring within the I-710 Study Area. Examples of these goods movement strategies include:

- Building a new near-dock rail facility where cargo containers would be transferred from trucks to railcars, reducing the future number of trucks on I-710 that would need to travel to the rail yards along Washington Boulevard in the cities of Commerce and Vernon.
- Building new staging areas for trucks where chassis and containers could be conveniently transferred and stored, while reducing the number of truck trips needed to perform these functions.

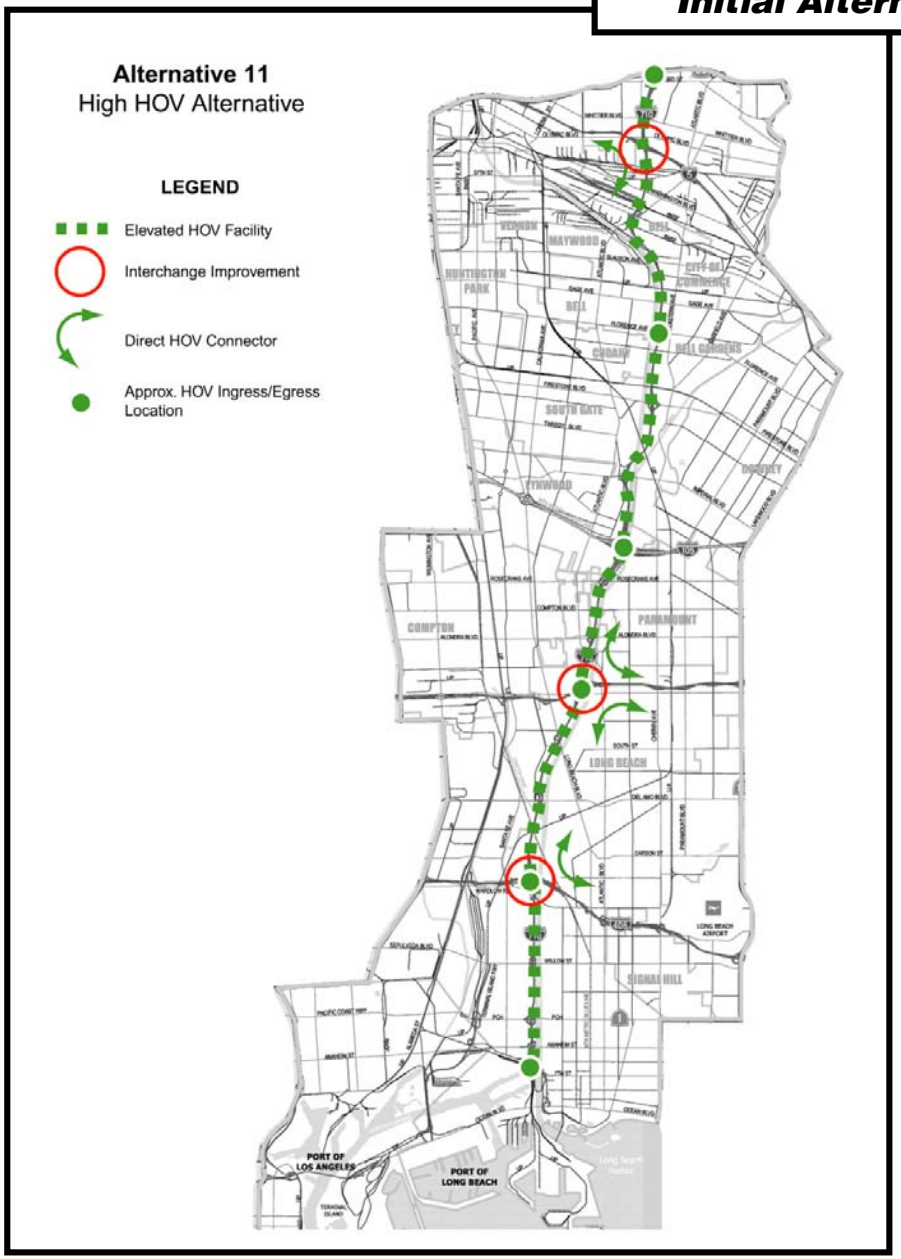
In order to respond to the safety and traffic operational problems on I-710, Alternative 10 provides for the redesign and reconstruction of three freeway-to-freeway interchanges and approximately ten local interchanges along the full length of I-710. These interchange modifications would be similar to those described in Alternatives 6 and 8.

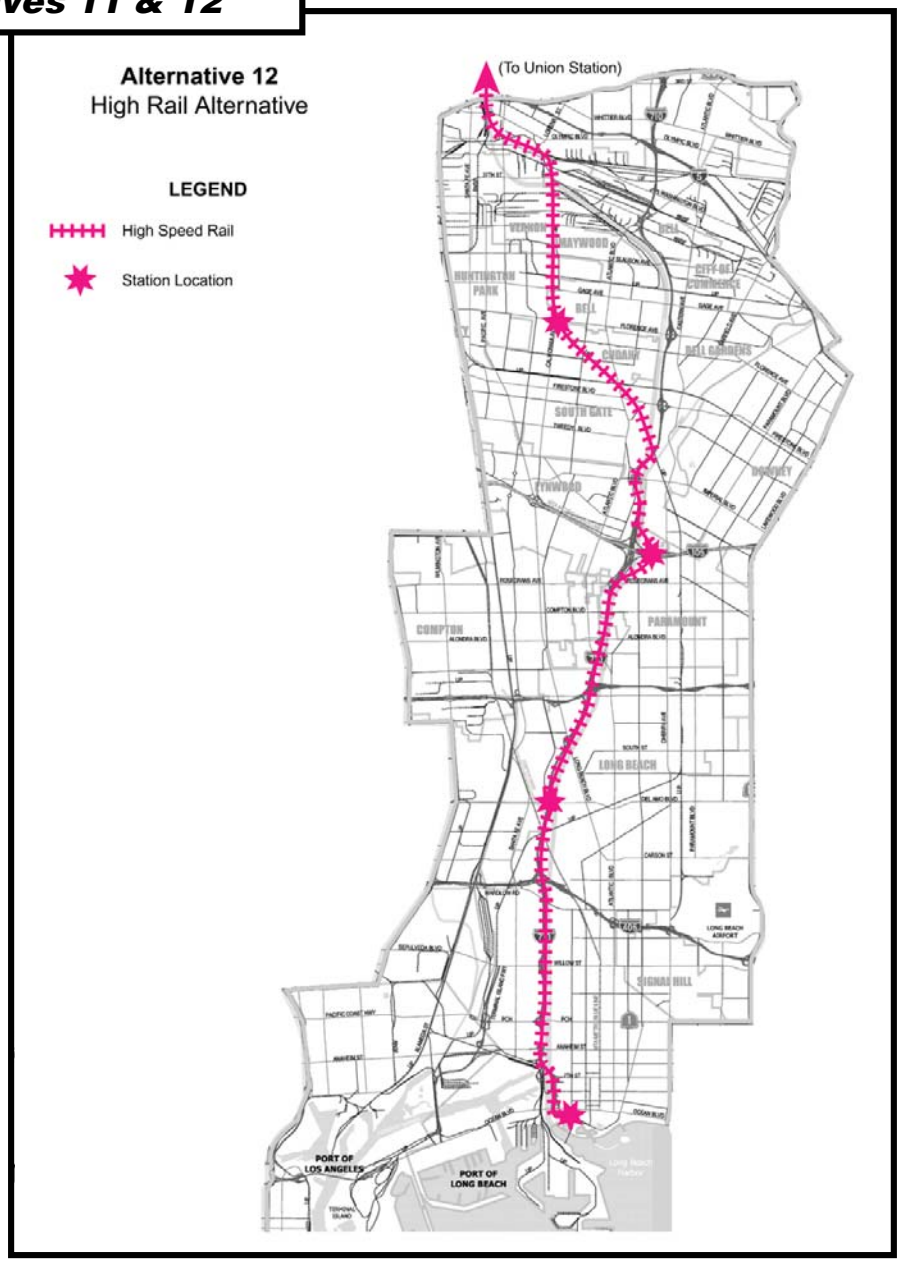
Alternative 11 - High HOV Alternative

Alternative 11 is a high build alternative that involves the construction of new carpool lanes, two in each direction, for the full length of I-710. See Figure 4.2-5. The new carpool lanes would be built on elevated roadway structure, most likely in the median of I-710. The elevated roadway structure would reduce the number of places where I-710 would need to be widened to fit in the new HOV lanes. In this case, the proposed HOV lanes would look and operate very much like the elevated carpool lanes that presently exist on the I-110 Harbor Freeway.

Only vehicles with two or more occupants would be allowed to use the new carpool lanes. Alternative 11 would also add express bus service in the I-710 Corridor to take advantage of the travel time savings provided by the new HOV lanes as compared to the more heavily congested mixed flow lanes. Carpools and buses would enter and exit the elevated HOV lanes via special ramps at selected locations along I-710, approximately every three or four miles.

Figure 4.2-5
Initial Alternatives 11 & 12





Source: Initial Set of Alternatives, Parsons Brinckerhoff, February 2002.

At some of the freeway-to-freeway interchanges, new freeway connector ramps would be built only for use by HOV traffic, so that carpools do not need to leave the HOV lanes on I-710 to transition to other freeways such as I-405, SR-91 or I-5. In addition, these three freeway-to-freeway interchanges (I-405/I-710, SR-91/I-710, I-5/I-710) would be redesigned and rebuilt to operate more safety for all types of vehicles at these problem locations.

Alternative 12 - High Rail Alternative

Alternative 12 is a high build alternative intended to increase the use of transit in the I-710 Study Area by building a double-track, high-speed passenger rail system between the Queensway Bay area in the City of Long Beach and Union Station in downtown Los Angeles. Alternative 12 is illustrated on Figure 4.2-5.

Depending upon best fit, the new rail line would be located either in the median or alongside I-710, and would transition into a Union Pacific Railroad right-of-way just north of where Imperial Highway crosses I-710. To save on cost, the new rail system would be placed at surface level and separated from the adjacent travel lanes on I-710. However, it is likely that some sections of the new rail alignment would need to be elevated to cross over existing structures or existing transportation facilities.

Trains would travel at an average speed of 50 miles per hour, including stops at rail stations, completing the end-to-end trip in less than thirty minutes. This represents a significant improvement over the 55-minute travel time currently experienced by transit riders, end to end, on the Long Beach to Los Angeles Blue Line.

Trains would run approximately every 15 minutes during peak travel periods and about every 30 minutes at other times of the day. Rail stations would be placed about every five miles to maintain travel times that are more competitive with the automobile since closer station spacing would substantially reduce average train speeds. Proposed rail stations would be sited close to existing rail stations for both the Blue Line and the Green Line to allow for transfers between the different rail systems. Alternative 12 would also provide for bus shuttle service as well as ample parking at the new rail stations.

4.3 Alternatives Screening

4.3.1 Approach / Screening Criteria

During alternatives screening, the Initial Set of Alternatives underwent a preliminary evaluation. The purpose of the preliminary evaluation was to provide decision-makers with the technical information that they would need to help identify those alternatives that are most competitive and that should, therefore, be carried forward for further study and evaluation in the I-710 Major Corridor Study. Alternatives or elements of alternatives that were determined by the TAC to have a lesser chance of becoming the Locally Preferred Strategy were screened out during this process.

An array of screening criteria was developed to gauge the performance of the alternatives in light of the purpose and need for improvements that are described in Section 3.2 of this report. Both qualitative and quantitative measures were used to elicit comparative information on the different transportation modes and improvements that comprised the Initial Set of Alternatives. On March 20, 2002, the proposed screening criteria and methodology were discussed and reviewed by the TAC. See technical memorandum called "I-710 Major Corridor Study Screening Methodology" shown in Appendix H. The screening criteria and related measures used in the I-710 Study to narrow the range of alternatives are summarized as follows:

Mobility
- Travel demand estimates for vehicles, trucks
- Levels of service (volume / capacity) on major routes in the Study Area
- Travel time savings for users of I-710
- Estimated rail/transit ridership
- Improvements in system capacity as measured by the change in volume / capacity across screenlines

Safety
- Estimated reduction in the number of accidents on I-710
- Safety improvements attributable to upgrades in facility type, geometric improvements, access management

Cost
- Estimated capital cost
- Estimated cost per mile

Right-of-Way Impact
- Estimated level of right-of-way impact (in acres)

Environmental Concerns
- Water resources/LA River Impacts
- Visual Impacts
- Noise Impacts
- Environmental Justice Concerns
- Community Cohesion Issues

Public / Community Support

- Assessment of public and community support of alternatives based on key issues

During alternatives screening, it was necessary to focus the analytical effort on key questions and those technical issues that highlight the major differences among the alternatives so that their relative benefits, costs, and impacts could be clearly understood. In certain cases, the predicted benefits, costs, and impacts among some of the proposed improvements were either similar or the differences were relatively small, particularly at this level of project definition. During screening, these smaller or operational improvements were grouped together in logical packages so that their combined effects could be examined or deferred to the more detailed stage of Alternatives Evaluation. Examples of where this occurred included the following: TSM/TDM improvements (e.g., operational strategies associated with goods movement, transit improvements, intelligent transportation systems); interchange modifications; and arterial improvements. The bulk of the screening effort was devoted to identifying "order of magnitude" differences among the proposed transportation concepts of each of the alternatives and answering key questions.

4.3.2 Screening Analysis

In the technical screening process, the screening criteria were applied to the build alternatives included in the Initial Set of Alternatives. The objective of this task was to assess the relative performance of the alternatives based on a uniform set of measures in order to provide an "apples to apples" comparison. The technical screening analysis was structured to produce evaluative information necessary to choose among alternatives or among certain transportation elements of the alternatives rather than to predict the future benefits, costs, or impacts of any given alternative. Where possible, screening measures were utilized that allowed for the comparison of different transportation modes. In some cases, the screening factors were mode specific in that they were used to distinguish among different alignments or features of a particular transportation mode. For example, the level of improvement in roadway congestion as measured by volume to capacity ratios was most applicable to the roadway elements of the alternatives, whereas estimated ridership and carpool demand were most pertinent to the transit, rail, and HOV elements of the alternatives. The ability of the different alternatives to shift traffic into alternative modes of transportation or off of the existing travel lanes of I-710 was another important aspect of the screening analysis. In addition, the screening analysis focused on the build alternatives (Alternatives 3 – 8), as both the No Build Alternative (Alternative 1) and the TSM/TDM Alternative (Alternative 2) are normally carried forward into the next phase of study (Alternatives Evaluation) for purposes of consistency with regional and federal planning requirements.

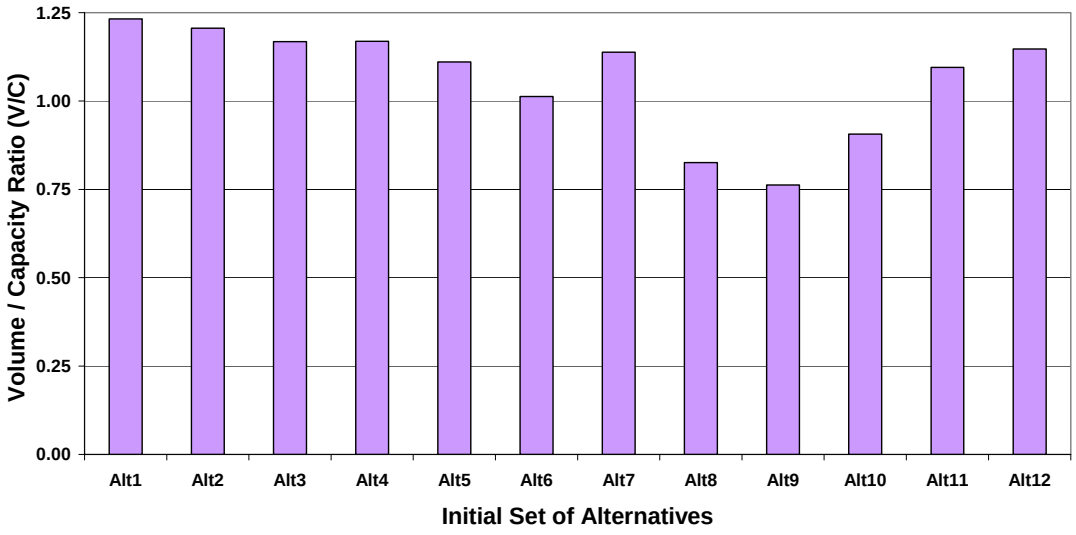
The following discussion highlights some of the principal screening activities and technical findings that describe the overall performance of each build alternative based on the screening criteria that were judged to be most relevant to the decision at hand. Whereas all the screening criteria were important, screening analysis for the I-710 Study focused very closely on estimated right-of-way impacts, safety, environmental and community concerns, and anticipated mobility benefits relative to cost.

Mobility Benefits

In the screening analysis, outputs from SCAG's regional travel demand forecast model for the future year condition (2025) was utilized as well as projected increases in heavy duty truck trips into and out of the Ports of Los Angeles and Long Beach. The regional forecast model accounts for future changes to the transportation infrastructure (planned and committed transportation projects) in the I-710 Study Area as well as demographic changes such as future employment and population growth. Due to schedule and budget constraints, travel demand forecast runs were not conducted for the Initial Set of Alternatives. Rather, sketch planning tools were used to redistribute future year travel demand based on the proposed capacity changes and transportation facility improvements associated with the proposed alternatives.

Figure 4.3-1 portrays the effect that each of the alternatives has on level of service on the I-710 freeway as measured by the average volume/capacity ratio on the southbound travel lanes in the am peak period in the Year 2025. Generally speaking, this measure illustrates where the highest levels of congestion are projected to occur. A high volume-to-capacity ratio (v/c) indicates a congestion problem. Figure 4.3-1 indicates that if no action is taken - Alternative 1 - the average v/c ratio on I-710 would be about 1.23, well over the design capacity of the freeway. A v/c ratio over 1.00 means that the freeway is operating at full capacity (LOS F). According to metropolitan planning guidelines, a v/c ratio of 0.9 or less (LOS E or better) is desirable in urban areas such as Los Angeles County, but not always achievable.

Figure 4.3-1
Volume/Capacity Ratios on I-710 in the AM Peak Period



Source: Kaku Associates, Inc. and Cambridge Systematics, Inc., Data Analysis Files, April 2002.

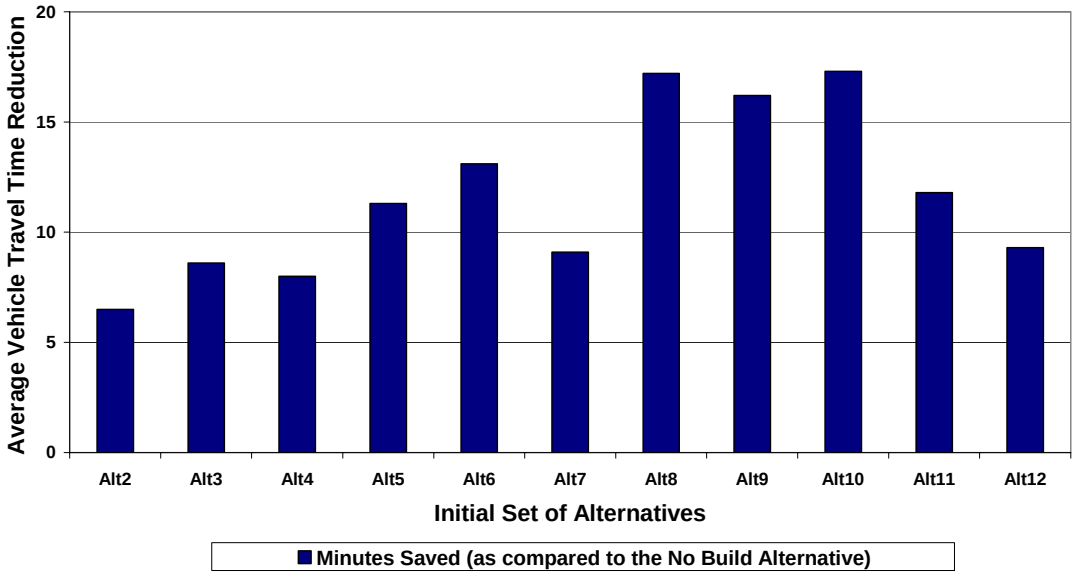
Figure 4.3-1 shows that only three alternatives (Alternatives 8, 9, and 10) have the potential to improve the level of service on I-710 to a v/c ratio below 1.00. These three alternatives provide a great deal of roadway capacity along the full length of I-710. In addition to added travel

lanes, Alternatives 9 and 10 contain design features that separate cars from trucks. The carpool lanes proposed under Alternative 11 do not improve level of service on I-710 as much as Alternatives 9 and 10, mostly because the number of vehicles that are expected to use the carpool lanes in Alternative 11 are not as high as those vehicles using the special purpose lanes in Alternative 9 (truck lanes) and Alternative 10 (express lanes).

Alternative 9 performs the best under this measure because heavy duty trucks use up more roadway capacity compared to autos and separating trucks from general purpose traffic by providing a separate truck facility has a more observable effect on I-710's travel lanes.

Figure 4.3-2, below, addresses the concept of travel time savings in the I-710 Corridor. If a motorist were to travel the full 20-mile length of I-710 in the southbound direction in the am peak period, Figure 4.3-2 shows the number of minutes that would be saved under each of the alternatives compared to the No Build Alternative for the typical motorist (i.e., general purpose lanes). This measure directly captures the benefit attributable to the individual user of I-710. Alternatives 8, 9, and 10 would provide the greatest travel time savings per trip compared to the other alternatives at 17.2, 16.2, and 17.3 minutes saved, respectively. This finding is generally consistent with the level of service results shown in Figure 4.3-1.

Figure 4.3-2
Travel Time Savings (Minutes)

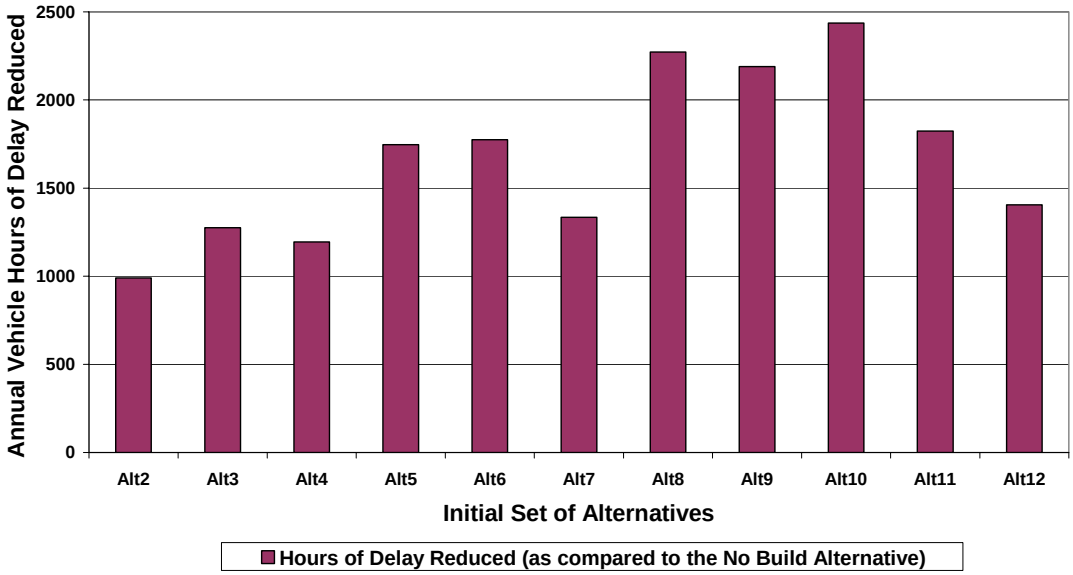


Source: Kaku Associates, Inc. and Cambridge Systematics, Inc., Data Analysis Files, April 2002.

Figure 4.3-3 on the next page looks at the estimated reduction in recurrent traffic congestion over a full year as measured by vehicle hours of delay. Recurrent congestion is traffic congestion that occurs regularly on I-710 during peak periods. In this case, the am peak period is shown. Each of the alternatives is compared to the No Build condition. Again, Alternatives 8, 9, and 10 perform the best with regard to their potential ability to relieve recurrent traffic congestion overall. However, Alternatives 5, 6, and 11 follow next and are

more closely matched to each other under this mobility measure. Both Alternatives 5 and 11 include carpool lanes, which serve to manage congestion during the commute hours as well as improve the person-carrying capacity of the freeway facility.

Figure 4.3-3
Estimated Delay Reduction (Thousands of Hours)



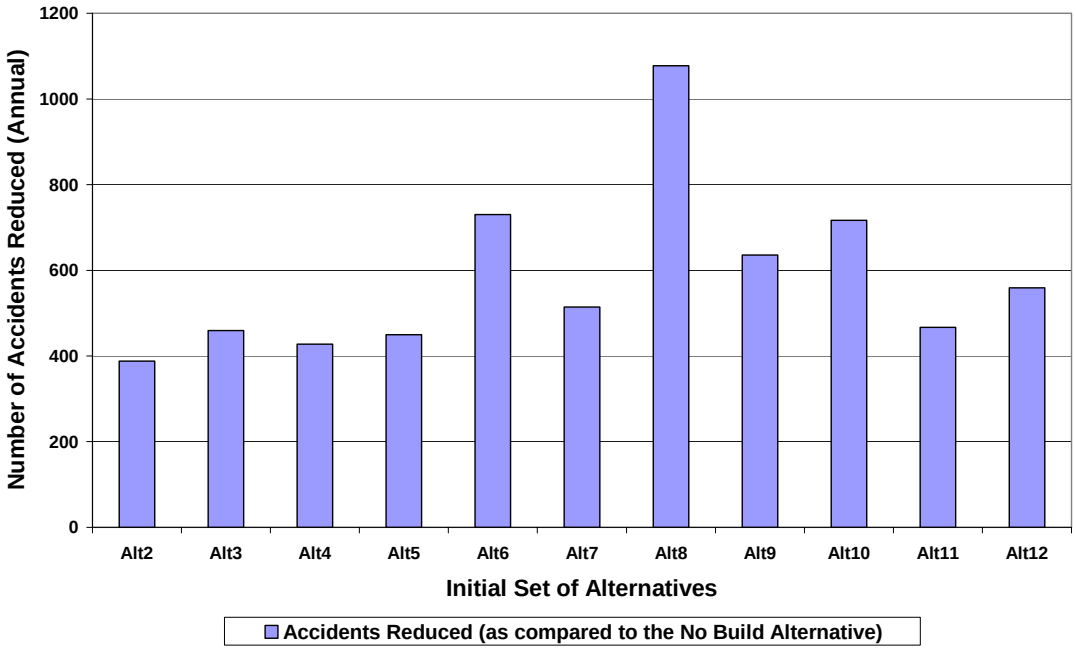
Source: Kaku Associates, Inc. and Cambridge Systematics, Inc., Data Analysis Files, April 2002.

Safety

Figure 4.3-4 is a measure that quantifies the estimated safety benefits attributable to each of the alternatives as compared to the No Build Alternative. This figure illustrates the number of accidents that would be reduced during a one-year period presuming Year 2025 travel conditions. The estimated accident reduction calculation takes into account the effects of improvements in non-recurrent congestion as well as day-to-day traffic congestion on I-710.

Figure 4.3-4 shows that Alternative 8 has the greatest potential to reduce accidents on I-710, followed by Alternatives 6, 10, and 9. Alternative 8 would provide greatest amount of general purpose roadway capacity compared to the other alternatives. This serves to distribute traffic more evenly across all lanes of traffic compared to the other alternatives. In addition, the number of physical conflict points (ingress/egress points for truck, carpool, and express lanes) are not present in Alternatives 6 and 8 compared to Alternatives 5, 7, 9, 10, and 11. Alternatives 9 and 10 also do relatively well due to the high degree of separation between trucks and autos provided by the exclusive truck (Alt. 9) or express lanes (Alt. 10), particularly at the local interchanges along I-710. For a detailed explanation of the methodology utilized for the Safety analysis see technical memorandum called “I-710 Major Corridor Study – IDAS Parameters, Rates” shown in Appendix N of this report.

Figure 4.3-4
Estimated Accident Reduction



Source: Cambridge Systematics, Inc., Data Analysis Files, April 2002.

Potential Right-of-Way Impacts

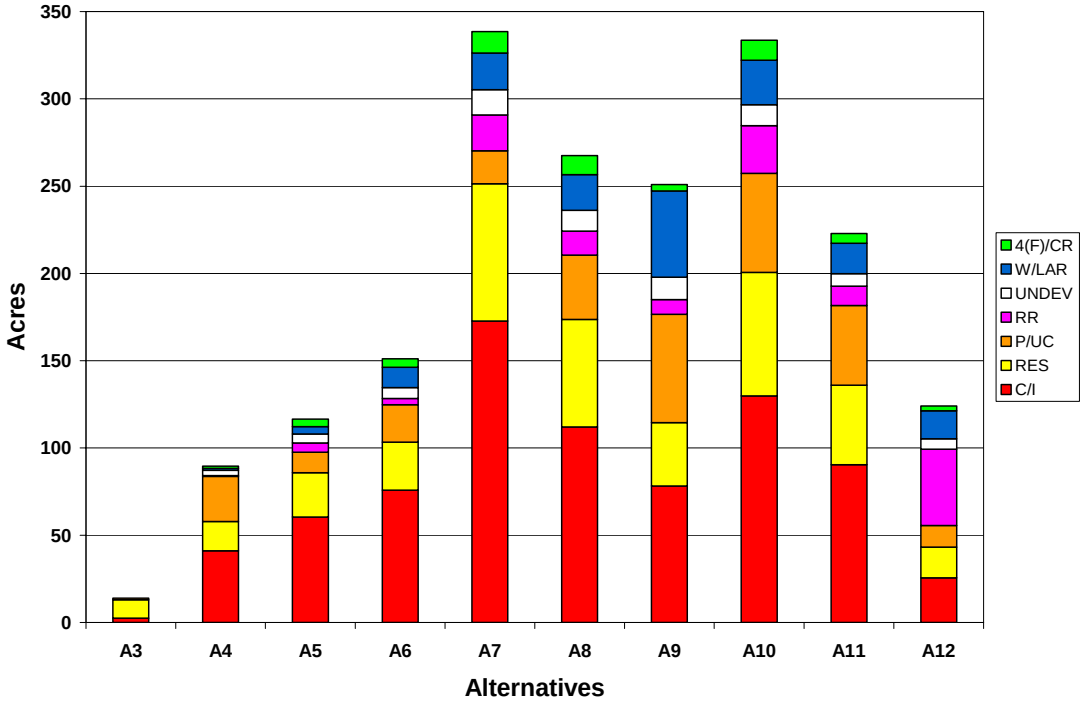
Figure 4.3-5 portrays the potential right-of-way impact of each of the build alternatives compared to the No Build Alternative. Alternative 2 is not expected to result in any right-of-way impacts as the proposed improvements in the TSM/TDM Alternative are either operational, policy-oriented, or are expected to occur exclusively within state right-of-way.

In order to estimate right-of-way impacts, a footprint based on a typical cross section was developed for the proposed features inherent to each build alternative, depending upon the proposed facility (added travel lanes, carpool lanes, truck lanes, interchange modifications, high speed passenger rail) and its application (at-grade, elevated on structure, in freeway right-of-way, or adjacent to I-710). In most cases, the principal consideration was whether or not the proposed improvement could be accommodated in existing public right-of-way; or if it would require a roadway widening; or if it would result in a new roadway alignment altogether.

Using geographic information systems (GIS) analysis techniques and aerial photography, the proposed alignments for the alternatives were drawn. As part of this task, land uses that could potentially be affected by the proposed alternatives were identified and organized into seven land use categories for reporting purposes: (1) commercial/industrial; (2) residential; (3) power/utility corridor; (4) railroad use; (5) undeveloped property; (6) particularly sensitive natural and community resources (e.g., parks, green space, schools, hospitals, or cemeteries); and water resources/LA River. In a few cases, there was overlap between the types of land

use among categories – for example, undisturbed land and a sensitive natural resource. In these cases, the land was given the most sensitive designation of the categories.

Figure 4.3-5
Estimated Land Use Impacts



Source: Parsons Brinckerhoff, Data Analysis Files, May 2002.

The footprint for each alternative was then overlaid upon the land use coverages and the amount of new land that would need to be acquired for each alternative was calculated based on the difference between the new footprint and the existing public right-of-way. The detailed results of the right-of-way analysis are presented in Appendix I of this report.

According to Figure 4.3-5, the low build alternatives (Alternatives 3 and 4) perform the best overall with regard to potential right-of-way impacts followed by Alternatives 5, 12. On the other hand, Alternatives 7 and 10 are the worst alternatives, by far, as they are the most intrusive. The truck bypass lanes and exclusive truck lanes proposed in Alternative 7 would be located outside the existing local and freeway interchanges on I-710 in areas where there is minimal state right-of-way available. In Alternative 10, four new travel lanes, plus inside shoulders, would be added, largely at-grade, which would result in extensive freeway widening along the I-710 corridor to accommodate the much wider mainline cross-section. Alternatives 8, 9, and 11 would also required substantial land acquisition beyond the existing state right-of-way line due to both interchange reconfigurations and added travel lanes.

Inasmuch as right-of-way impact is highly correlated to other environmental issues such as noise, environmental justice, and community cohesiveness, Alternatives 7 through 11 pose serious environmental concerns as well.

Estimated Cost

Table 4.3-1 provides a summary of the estimated capital cost in current year dollars for the build alternatives in the Initial Set as compared to the No Build Alternative.

Table 4.3-1
Summary of Capital Costs (in millions)

Alternative	Total Cost Estimate	Cost per Mile
Alternative 3 Low General Purpose Alternative	$ 689	$ 35.3
Alternative 4 Low Truck Alternative	$ 498	$ 25.5
Alternative 5 Medium HOV Alternative	$ 1,094	$ 58.2
Alternative 6 Medium General Purpose Alternative	$ 1,168	$ 67.1
Alternative 7 Medium Truck Alternative	$ 1,164	$ 85.3
Alternative 8 High General Purpose Alternative	$ 1,696	$ 83.1
Alternative 9 High Truck Alternative	$ 2,166	$ 124.5
Alternative 10 High Goods Movement Alternative	$ 3,066	$ 137.5
Alternative 11 High HOV Alternative	$ 2,659	$ 141.4
Alternative 12 High Rail Alternative	$ 3,542	$ 149.4

Source: Parsons Brinckerhoff, Data Analysis Files, May 2002

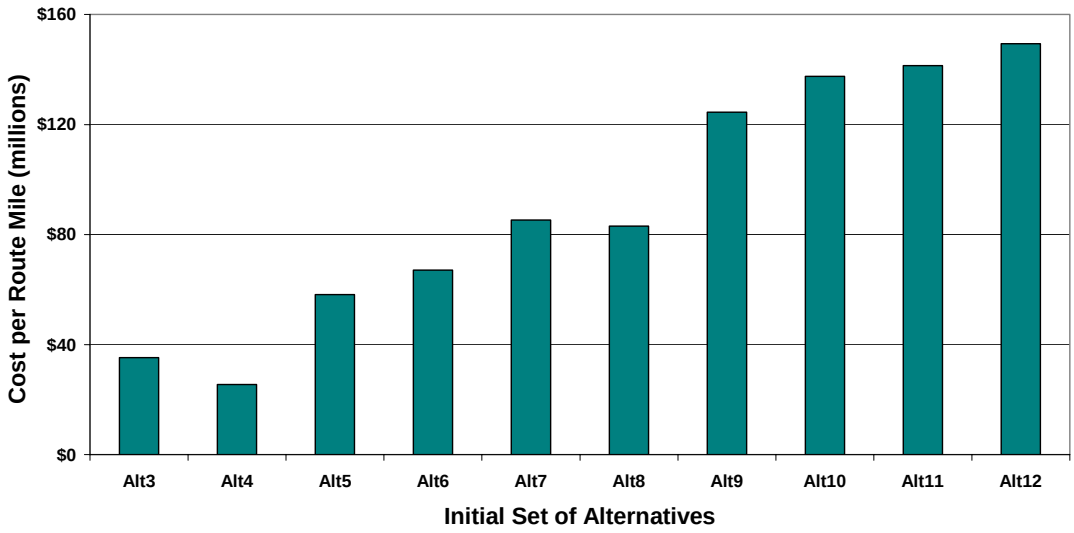
Table 4.3-1 also shows estimated capital costs on a per mile basis. Generally, there is a positive correlation between the number of route miles proposed in each alternative and capital cost. Normalizing the cost data per route mile provides an additional indication of what transportation elements or segments tend to be more costly compared to others.

In the screening analysis conducted for the I-710 Study, capital costs largely represent a major investment in the existing transportation infrastructure. Examples of these investments include arterial roadway widenings, new travel lanes, interchange improvements, truck inspection facilities or added track for the passenger rail line. In addition, the capital costs denote the purchase of physical assets with a life of five years or more – in this case, new bus and rail vehicles. For all of the alternatives, the cost to acquire needed right-of-way was included in the overall estimate. In the screening analysis, efforts were made to account for the major expenses that would illustrate or highlight significant cost differences between the transportation options. Smaller or detailed capital expenses are accounted for in the contingency and "add on" cost categories for each alternative. See Appendix J for a more detailed breakdown of the estimated capital costs for the different alternatives.

The Initial Set of Alternatives represent a range of potential costs without any major gaps. In general terms, the high build alternatives are more costly compared to the medium build alternatives, which are, in turn, more costly than the low build alternatives. The alternatives that are estimated to result in the highest total capital cost are Alternatives 10 and 12, both of which are over $3 billion.

On a per mile basis, there is a noticeable step up in cost between Alternative 8 ($83.1 million per mile) and Alternative 9 ($ 124.5 million per mile). See Figure 4.3-6.

Figure 4.3-6
Average Cost per Mile (in millions)



Source: Parsons Brinckerhoff, Data Analysis Files, May 2002

Summary Screening Evaluation

Table 4.3-2 arrays all of the technical screening results on a single page. In some cases quantitative measures were used to rate the alternatives (mobility benefits, right-of-way impacts, and costs) and in other cases a qualitative measure was used to rank the build alternatives. The top three performing alternatives for each measure are highlighted in pink. These screening findings were presented and discussed with the TAC on May 29, 2002.

Table 4.3-2
Alternatives Screening Evaluation Matrix

Evaluation Measures	Alternative 1 No Build	Alternative 2 TSM/TDM	Alternative 3 Low GP	Alternative 4 Low Truck	Alternative 5 Medium HOV	Alternative 6 Medium GP	Alternative 7 Medium Truck	Alternative 8 High GP	Alternative 9 High Truck	Alternative 10 High Goods Movement	Alternative 11 High HOV	Alternative 12 High Rail
Mobility												
% Vehicles Shifted from I-710 Mixed Flow Lanes in the AM Peak Period (% PCEs Shifted) *compared to No Build Alternative, (+) quantitative measure*	N/A	6% (11%)	6% (11%)	6% (11%)	15% (17%)	6% (11%)	6% (11%)	6% (11%)	19% (35%)	37% (36%)	16% (18%)	10% (14%)
% Persons Shifted from I-710 Mixed Flow Lanes in the AM Peak Period *compared to No Build Alternative, (+) quantitative measure*	N/A	0%	0%	0%	21%	0%	0%	0%	0%	40%	24%	4%
Average V/C Ratio in the AM Peak Period, I-710 SB Mixed Flow Lanes *(-) quantitative measure*	1.23	1.21	1.17	1.17	1.11	1.01	1.14	0.83	0.76	0.91	1.09	1.15
Minutes Saved, Average Vehicle Travel Time, I-710 SB Mixed Flow Lanes, AM Peak Period *compared to No Build Alternative, (+) quantitative measure, in minutes*	N/A	6.5	8.6	8.0	11.3	13.1	9.1	17.2	16.2	17.3	11.8	9.3
Reduction in Recurrent Vehicle Hours of Delay, I-710 SB Mixed Flow Lanes, AM Peak Period *compared to No Build Alternative, (+) quantitative measure, in thousands of hours, annualized*	N/A	990	1,275	1,194	1,747	1,775	1,334	2,272	2,189	2,436	1,824	1,405
Reduction in Non-Recurrent Vehicle Hours of Delay, I-710 SB Mixed Flow Lanes, Daily *compared to No Build Alternative, (+) quantitative measure, in thousands of hours, annualized*	N/A	12	27	26	34	70	30	77	70	66	35	29
Average V/C Ratio in the AM Peak Period, Screenline of North-South Arterials in the Study Area *(-) quantitative measure*	0.57	0.57	0.46	0.57	0.57	0.57	0.57	0.57	0.57	0.49	0.57	0.57
Average V/C Ratio in the AM Peak Period, Screenline of East-West Arterials in the Study Area *(-) quantitative measure*	1.04	1.04	1.04	0.69	1.04	1.04	0.70	1.04	1.04	1.04	1.04	1.04
Safety												
Reduction in Annual Number of Accidents on I-710, All Lanes (% Reduction of Accidents) *compared to No Build Alternative, (+) quantitative measure*	N/A	388 (10%)	459 (12%)	428 (11%)	450 (12%)	730 (19%)	514 (14%)	1078 (29%)	636 (17%)	717 (19%)	467 (13%)	559 (15%)
Qualitative Safety Assessment (Design Perspective) *(+) qualitative measure*	0	0	2	4	7	7	6	9	6	9	9	6
Environment												
Total ROW Impact, in Acres *(-) quantitative measure*	0	0	13.9	89.5	116.5	151.1	338.5	267.5	250.9	333.6	222.8	124.0
Residential ROW Impact, in Acres *(-) quantitative measure*	0	0	10.6	16.8	25.3	27.5	78.7	61.6	36.3	70.8	45.6	17.7
Commercial/Industrial ROW Impact, in Acres *(-) quantitative measure*	0	0	2.5	41.1	60.4	75.9	172.7	112.1	78.2	129.8	90.4	25.6
Section 4(f)/Community Resource ROW Impact, in Acres *(-) quantitative measure*	0	0	0	1.2	4.3	4.8	12.2	10.9	3.7	11.5	5.6	2.6
Water/Los Angeles River ROW Impact, in Acres *(-) quantitative measure*	0	0	0	1.1	4.3	11.7	21	20.5	49.4	25.4	17.3	16.1
Assessment of Relative Visual Impact *(-) qualitative measure*	0	0	2	3	4	4	8	5	10	8	9	6
Assessment of Relative Noise Impact *(-) qualitative measure*	0	0	2	3	6	5	6	6	10	8	9	6
Assessment of Relative Environmental Justice Impact *(-) qualitative measure*	0	0	1	2	4	5	10	8	6	9	7	3
Assessment of Relative Community Cohesion Impact *(-) qualitative measure*	0	0	1	2	8	8	8	9	8	10	8	2
Cost												
Total Estimated Cost ($ millions) *compared to No Build Alternative, (-) quantitative measure*	N/A	TBD*	$689.1	$498.0	$1,094.4	$1,168.3	$1,663.5	$1,695.8	$2,166.2	$3,065.6	$2,659.0	$3,541.9
Average Cost per Mile ($ millions) *compared to No Build Alternative, (-) quantitative measure*	N/A	N/A	$35.3	$25.5	$58.2	$67.1	$85.3	$83.1	$124.5	$137.5	$141.4	$149.4
Constructability												
Qualitative Assessment of Ease of Construction *(+) qualitative measure*	N/A	10	9	7	7	6	1	5	2	4	4	6

* To be determined, but by definition, the cost of the TSM Alternative is significantly less than the other alternatives and included in all of the other alternatives.
(+) = positive impact or effect (the larger the value, the better the alternative)
(-) = negative impact or effect (the smaller the value, the better the alternative)

= **Best Performance Rating (one of top three) of the Build Alternatives**

Source: Parsons Brinckerhoff, I-710 Technical Advisory Committee Meeting, May 29, 2002.

4.3.3 Community Input on the Initial Set of Alternatives

Public outreach during alternatives screening took place during the months of February, March, April, and May of 2002 and consisted of elected official briefings, agency briefings, community presentations and roundtable discussions. This effort presented opportunities for the study team to engage the local communities in discussions regarding the Initial Alternatives.

No one alternative as it was presented was favored by the majority of participants. Rather, certain elements of the different alternatives were noted as being favorable or unfavorable. Following is a summary of some of the comments heard on the Initial Set of Alternatives and the elements in each. Added information can be found in the *I-710 Study Value Analysis Report,* prepared by Consensus Planning Group, June 2002., and available for reference with the MTA.

Alternative 1 – No Build Alternative

This alternative was viewed to be inadequate in every respect since almost all agreed that something must be done to improve the I-710 Freeway. The current Caltrans repaving project received positive reactions and addresses the poor road conditions today but does nothing to address the congestion believed by many to be caused by large volumes of trucks traveling in and out of the ports. This "do nothing" alternative was considered unacceptable to nearly all participants since it ignores all growth projections, especially the amount of growth that the ports are expecting as a result of their own plans to expand.

Alternative 2 – TSM/TDM Alternative

Like Alternative 1, many felt that Alternative 2 is at best, a short-term improvement that does not address the real problems of the I-710 Freeway. The two elements of Alternative 2 that received the greatest level of support from most community members and elected official offices were the goods movement strategy to modify the hours of port operations and improving aesthetics of the I-710. Comments regarding the modification of port hours and beautifying the Freeway were heard at nearly all of the meetings. Many were not aware that these elements were a part of the TSM/TDM Alternative.

Alternative 3 – Low General Purpose Alternative

As a stand-alone alternative, several respondents indicated that only improving the north/south arterials in the I-710 Study Area does not do enough to address the problems of the I-710 freeway. A few stated, however, that the arterial improvements designated in Alternative 3 need to be made in addition to any alternative that is selected to improve the I-710.

Many even suggested that prior to any improvements being made on the I-710 mainline, these arterials must be improved to address the additional traffic that would result if I-710 is to undergo any construction activities. Many of the cities requested that particular arterials in their communities be included in Alternative 3. Each had recommendations as to which arterials should be improved. The most commonly mentioned arterials included: Atlantic/Bandini, Firestone Boulevard, Washington Boulevard, Slauson Avenue, and Imperial Highway. Some of these streets are currently being repaired or improved but the cities believe

that the current improvements will not address all the problems that will still occur in future years.

Positive comments were received regarding the partial interchange improvements at the I-5/I-710. The right-side ramps were viewed as a major safety improvement for everyone traveling on I-710.

Alternative 4 – Low Truck Alternative

No significant amount of comments were made regarding the addition of collector/distributor lanes but those that did comment, viewed this as a positive improvement. The truck inspection station received the most attention in Alternative 4. The location of the facility as it was presented in Alternative 4 was not favored. Most felt that the inspection site should be located closer to the ports to be effective and prevent trucks from avoiding the facility by using arterial streets or other areas that would impact the communities. The inspection facility should include a weigh station, as well, since most believe that trucks are overloaded, resulting in the destruction of the pavement on the Freeway.

Improving the I-710/I-405 interchange was well received since many had felt that this interchange is very poorly designed and dangerous. The City of Carson voiced some concerns about this improvement, since there are residential communities in this area.

Alternative 5 – Medium HOV Alternative

The majority of individuals commenting on this alternative felt that carpool lanes will not improve the conditions of the I-710 Freeway and adding carpool lanes would be a loss of valuable space and resources. They felt that adding mixed-use lanes would serve this Corridor better.

A small number of elected official offices however, did support HOV lanes and were open to the idea of enforcing these lanes during peak periods only.

Alternative 6 -- Medium General Purpose Alternative

Only positive comments were heard regarding the addition of a Slauson interchange. It was believed that creation of this interchange would take pressures off of arterials such as Bandini and Firestone.

The addition of a mixed-flow lane on I-710 was well received. The majority of individuals felt that it was a positive improvement and had the best chance of actually being implemented.

Alternative 7 – Medium Truck Alternative

The truck-bypass lanes received mixed responses. Those reluctant to fully support this concept had concerns regarding the additional weave and merge situations between cars and trucks and felt that any time a merge is added, the likelihood of accidents increases. They suggested having bypass lanes, but fewer than what is currently proposed. Alternative 7 was supported mainly by trucking and transportation businesses and interests.

Alternative 8 – High General Purpose Alternative

Comments were all generally positive in response to the addition of two mixed-flow lanes. This alternative was viewed as having the greatest potential for improving the service on the I-710 freeway for all users.

Alternative 9 – High Truck Alternative

Those favoring this concept were pleased that it separates cars and trucks and uses less right-of-way than at-grade widening. Many concerns were voiced however, with trucks being on the elevated level and whether the structure would be able to sustain a major earthquake. The potential of trucks falling over concerned many and some felt the noise and pollution levels would increase. Support for this concept was received from both elected officials and community members since most felt that an elevated configuration was preferable to massive land acquisitions. Some felt that the elevated lanes should be opened for mixed-use during non-peak hours.

A few people felt that the amount of money required to build this alternative would preclude this from ever being implemented.

Alternative 10 – High Goods Movement Alternative

Many felt positively about the concept of separating cars and trucks but the width of this alternative alarmed those living and doing business near the I-710 freeway. While the "dual roadway" facility was viewed as unfavorable for the severity of the potential right-of-way impacts, this element was urged to be carried forward as part of the alternatives chosen for further evaluation to continue to refine this concept. However, some respondents warned that community opposition may be received and therefore this alternative would likely not survive as a recommendation for a Locally Preferred Strategy.

The Terminal Island (SR-103) extension to the I-405, and the SR-47 connector to Alameda Street was well received by the majority of participants, but not all respondents. This element allows trucks an option to avoid the I-710 and get directly onto the I-405 or Alameda Street. The addition of a near-dock facility in Alternative 10 also drew favorable responses.

Alternative 11 – High HOV Alternative

Like Alternative 9, the concept of an elevated roadway in the existing median of I-710 was favored over extensive right-of-way impacts. As with Alternative 5, implementation of HOV lanes rather than general purpose or truck lanes was opposed by many. The HOV lanes were not believed to fully address the safety and congestion problems on the freeway. However, many stakeholders indicated that it would be safer to have cars on the elevated structure, with trucks on the bottom.

Alternative 12 – High Rail Alternative

The high speed rail concept of Alternative 12 drew unfavorable responses from many of the participants. While several agreed that alternatives to the automobile should be available, this particular system in this particular area does not directly respond to the problems on the I-710 freeway nor does it address the goods movement aspect of the I-710 Study Area. It was

viewed as too costly to build and not as effective as some of the other alternatives. Most are relatively comfortable with the Blue Line and feel that rather than creating an entirely new rail system, the Blue Line should continue to expand and improve the level and timeliness of its service.

Overarching Comments

Truckers, auto drivers, and community members all agreed that trucks and cars must be separated. Many participants stated that the alternative chosen at the end of the study must meet this criterion in order to truly address the problems of the I-710 Freeway. The comments received during the alterantives screening phase of outreach suggest that the alternatives that are carried forward for further evaluation should be combinations of the different elements presented in the initial set of twelve alternatives. The general consensus was that Alternatives 1 through 7 are merely "band-aid" fixes and the only way to solve the problems of the I-710 is to seriously consider the high-build alternatives.

If a high-build alternative is recommended, several respondents said that the I-710 Study should also consider elements such as toll roads for trucks, which were favored by most stakeholders but opposed by the trucking industry. Trucking interests feel that imposing tolls would mean that they are paying for use of the I-710 facility twice. On the other hand, community members feel that trucks are responsible for the condition of the freeway, as well as other external impacts such as air pollution. But, truckers should not be the only ones who pay a price for using the I-710 facility. Many participants felt that the ports are directly responsible for the volume of trucks on the freeway and that they should work with the local agencies to identify ways to change the way they operate, especially if they plan on expanding. Community members were particularly negative towards the ports, believing that industry is being accommodated at the expense of the local communities. They stated that the amount of traffic, pollution and other negative health impacts in the I-710 Corridor is increasing.

4.4 Technical Advisory Committee Recommendation

The I-710 Technical Advisory Committee deliberated over the technical screening results as well as the summary reports of the public input on the Initial Set of Alternatives. Several of the TAC members also attended public and community meetings that took place in their respective jurisdictions. Most of the debate centered on which three build alternatives should be carried forward for further study, given that both the No Build and the TSM/TDM Alternatives are automatically included in the reduced set of alternatives for consistency with federal planning requirements. The TAC did not limit itself to selecting stand-alone alternatives from the Initial Set of Alternatives. Rather, the discussion was divided into two general phases: (1) selection of a mainline design concept and scope for each alternative; and (2) identification of discrete transportation elements that should be packaged with each alternative.

Mainline Design Concept and Scope

The mainline design concept refers to the type of transportation facility identified, such as a freeway, HOV lanes, or a passenger rail line. The design scope is the design aspects that affect the facility's magnitude and extent, such as the number of lanes or tracks as well as the facility's length. The scope also refers to the general location of the facility.

With regard to the design concept and scope, the I-710 attempted to identify three different build alternatives that fulfilled different aspects of purpose and need in the I-710 Corridor. The TAC also sought to select those mainline concepts that would bring the greatest benefit at the lowest cost and with the fewest environmental concerns. To that end, Alternatives 3 and 4 were eliminated fairly early as these alternatives did not bring sufficient mobility and safety benefits as stand-alone alternatives compared to other choices. In other words, Alternatives 3 and 4 did not do enough to fix the problems on I-710.

Alternative 12 was screened out next as the potential ridership and travel benefits did not appear to justify the high cost of this alternative. The TAC felt that this alternative had potential, but perhaps at some future date, well after 2025. Alternative 10 was also screened out, despite its mobility benefits, because the anticipated right-of-way impacts were beyond what the TAC members felt that the communities along I-710 could possibly tolerate.

Further scrutiny was applied to the remaining alternatives: Alternatives 5, 6, 7, 8, 9, and 11. The TAC selected Alternative 9 for further study because this alternative did the most to fully separate cars from heavy duty trucks on I-710 and also because it performed well with regard to safety and other mobility benefits. Alternative 6 was selected next and combined with several transportation elements from Alternative 7 to form a new mainline design concept and scope in an effort to capture the mainline capacity improvements contained in Alternative 6 and many of the truck management features (exclusive truck ramps, truck bypass lanes) in Alternative 7. Alternative 7 was then eliminated as a stand-alone alternative. Since several of the TAC members (city representatives) felt that added general purpose capacity was needed to solve the future congestion problem on I-710 and other TAC members (regional agencies) wanted to continue to evaluate HOV lanes, elements of Alternative 8 (general purpose lanes) and Alternative 11 (elevated HOV lanes) were combined to form a new design concept and scope. Alternative 5 was then eliminated from further consideration as this alternative did not address the truck problems on I-710 as well as other alternatives and also because the carpool component was now included in the newly formed Alternative 8/11.

Table 4.4-1 summarizes the actions taken by the TAC on the Initial Alternatives in order to develop their recommendations on the best mainline concepts for the Final Set of Alternatives.

Table 4.4-1
TAC Recommendations for Mainline Concepts

Initial Alternatives	TAC Recommendation
Alternative 3 Low General Purpose Alternative	Eliminate
Alternative 4 Low Truck Alternative	Eliminate
Alternative 5 Medium HOV Alternative	Eliminate
Alternative 6 Medium General Purpose Alternative	Select
Alternative 7 Medium Truck Alternative	Eliminate
Alternative 8 High General Purpose Alternative	Select / Combine with Alt. 11
Alternative 9 High Truck Alternative	Select
Alternative 10 High Goods Movement Alternative	Eliminate
Alternative 11 High HOV Alternative	Select / Combine with Alt. 8
Alternative 12 High Rail Alternative	Eliminate

Source: Parsons Brinckerhoff, I-710 Technical Advisory Committee Meetings, June 5 & 12, 2002.

Recommended Transportation Elements

During the second step in forming their recommendations, the TAC culled the best transportation elements from the Initial Set of Alternatives for packaging into the Final Set of Alternatives for further study. These transportation elements differ from the mainline design concepts and include items such as truck inspection facilities or interchange modifications or street arterial capacity improvements.

Table 4.4-2 illustrates the actions taken by the TAC for each of these design elements. The TAC elected to eliminate only a few of these discrete transportation elements. In some cases, tranportation elements were eliminated because they were judged to be too intrusive to neighboring communities (e.g., truck ramps, direct HOV connectors) as indicated by the ROW impact analysis and environmental screening analysis. In other cases (e.g., near-dock intermodal facility, truck-only ITS improvements), transportation elements were eliminated from further study because the TAC felt that these improvements were already being pursued under other, largely private initiatives.

In effect, the majority of the transportation features in the Initial Set of Alternatives were carried into the Final Set of Alternatives.

Table 4.4-2
TAC Recommendations for Transportation Elements

Transportation Element	From	Action	To
Full Grid of Arterials	Alt. 3	Keep	Alt. 6
North-South Arterials Only	Alt. 10	Keep	Alt. 8/11
East-West Arterials Only	Alt. 4	Keep	Alt. 9
Truck-Only ITS Improvements	Alt. 4	Drop	-
Truck Inspection Facility	Alt. 4	Keep	Alt. 6
Collector Distributor System between Atlantic /Bandini and I-5	Alt. 4	Keep	Alt. 6
Truck Bypass Lanes	Alt. 4	Keep	Alt. 6
Direct Truck Ramps: Washingtion Blvd., PCH	Alt. 7	Keep	Alt. 6
Direct Truck Ramps: Atlantic Blvd., Bandini Blvd., Florence Ave., Willow St.	Alt. 7	Drop	-
T.I. Freeway Extension to I-405	Alt. 10	Keep	Alt. 6
T.I. Freeway Connector to Alameda St.	Alt. 10	Keep	Alt. 8/11
Truck Staging Areas	Alt. 10	Drop	-
New Near Dock Intermodal Facility	Alt. 10	Drop	-
Truck Land Use Management Program	Alt. 10	Drop	-
I-710 Auxiliary Lane Improvements	Alt. 9	Keep	Alt. 9
Direct HOV Connector at I-405	Alt. 11	Keep	Alt. 8/11
Direct HOV Connectors at I-5, SR-91	Alt. 11	Drop	-
Express Bus Service on I-710	Alts. 5, 11	Keep	Alt. 8/11
Slauson Interchange	Alts. 6, 8	Keep	Alts. 6, 9
Redesign 10 Local Interchanges	Alt. 8	Keep	Alts. 6
Redesign 13 Local Interchanges	Alt. 10	Keep	Alt. 8/11
Partial Redesign of I-5 Interchange	Alt. 4	Keep	Alt. 6
Redesign of I-405, SR-91, I-5 Interchanges	Varies	Keep	Alts. 9, 8/11

Source: Parsons Brinckerhoff, I-710 Technical Advisory Committee Meetings, June 5 & 12, 2002.

Issues for Further Consideration

In their discussion, the TAC members identified several items for further consideration in subsequent phases of the I-710 Major Corridor Study.

- The combined design concepts for some of the alternatives (e.g., Alternative 8/11), as well as all of the desired transportation elements, resulted in three, very robust, and potentially costly build alternatives in the final set. Some TAC members were concerned that there were no fall back options (i.e., alternatives with only a modest amount of new transportation capacity) in the Final Set of Alternatives. In order to respond to this concern, it was determined that the physical aspects of the different transportation elements of these alternatives would be individually analyzed during Alternatives Evaluation to the greatest extent possible. This would provide information to decision-makers so that these design features can easily be eliminated if the right-of-way impacts, environmental impacts, or costs turn out to be higher than the communities along the I-710 Corridor would find acceptable.

- The existing utility corridors alongside I-710 should be used for new travel lanes to the greatest extent feasible, so as to avoid right-of-way impacts to businesses and homes.

- Impacts to the LA River that would result in flow or capacity changes of the newly rebuilt river channel should be avoided.

- Conceptual drawings for the I-710 truck lanes (Alternative 9) should not include long stretches where the truck lanes are elevated over the general purpose lanes.

OPC Approval

On June 27, 2002, the I-710 Oversight Policy Committee reviewed and approved the TAC's recommendations for the Final Set of Alternatives with one point of clarification. Even though Alternative 12 was eliminated as a stand-alone alternative, the OPC did not wish to preclude its future development in the I-710 Corridor. As a result, the description of the HOV element of the High General Purpose / High HOV Alternative was revised to state that that they would be designed such that they could be converted to support a future rail line.

4.5 Final Set of Alternatives

As a result of the screening analysis conducted between March and May of 2002 and after extensive review and scrutiny by the TAC throughout the month of June 2002, five alternatives were approved by the OPC for detailed evaluation in the I-710 Major Corridor Study. For clarity and to avoid confusion with the Initial Set of Alternatives, the five remaining alternatives were relabeled "A" through "E" as follows:

Alternative A	No Build Alternative
Alternative B	Transportation Systems Management / Transportation Demand Management (TSM/TDM) Alternative
Alternative C	Medium General Purpose / Medium Truck Alternative
Alternative D	High General Purpose / High HOV Alternative
Alternative E	High Truck Alternative

This section provides an overview of the Final Set of Alternatives that was approved by the OPC in June 2002 for more detailed evaluation. These five alternatives are conceptual in scope and were subjected to further refinements in the I-710 Study analysis (see Section 5.1). The physical and operational characteristics of each alternative are described in the following pages. It is important to note that these alternatives continued to evolve throughout the course of the I-710 Study as more detailed assessments of these alternatives were performed and also to respond to public and community comments and concerns.

The Final Set of Alternatives is structured in a manner similar to the Initial Set of Alternatives, except that they are fewer in number. As a reminder, the No Build Alternative (Alternative A) is included in the other four alternatives as background as it represents future conditions in the I-710 Study Area. The five alternatives were all evaluated assuming a future year context (Year 2025). The TSM/TDM Alternative (Alternative B) was incorporated into the descriptions of the three remaining build alternatives (Alternatives C, D, and E). Maps that highlight the capital improvements associated with the build alternatives (Alternatives C – E) are provided on the following pages. However, the physical elements of the No Build Alternative are deliberately not shown on the maps for Alternatives C, D, and E so as to avoid any confusion between the

proposed build elements associated with each of these alternatives and the transportation improvements that are already funded and committed for the I-710 Study Area.

Alternative A - No Build Alternative

The No Build Alternative represents future travel conditions in the I-710 Study Area if no additional improvements are recommended by the I-710 Study beyond what is already planned to take place. The No Build Alternative consists of those transportation projects that are already planned or committed for the Year 2025, the planning horizon year for the I-710 Study. In general terms, "committed" means that the project has obtained environmental clearance and/or sufficient funding has been programmed for construction or implementation. Consequently, the No Build Alternative is a stand-alone alternative that represents future travel conditions in the I-710 Study Area if no action is taken. It is also the baseline against which candidate transportation alternatives proposed for the I-710 Study are assessed.

The following is a summarized list of some of the major transportation improvements that are planned and committed in the I-710 Study Area. Taken together with the existing transportation infrastructure, these projects form the background for the future transportation network for the I-710 Study Area. In a few cases, some projects are currently in construction or they have recently been completed. These projects are are noted with an (*).

Freeway System

- I-710, from Ocean Boulevard to I-10, pavement and median rehabilitation, selected bridge widenings (no additional capacity)
- I-710, at Atlantic Boulevard/Bandini Boulevard, interchange modifications
- I-710, at Firestone Boulevard, interchange modification (NB side)
- I-5, Orange County Line to I-710, add two HOV lanes
- I-605, Orange County Line to South Street, add two HOV lanes*
- I-605, Telegraph Road to I-10, add two HOV lanes*
- I-405, I-110 to I-710, add two HOV lanes*
- SR-60, I-605 to I-215, add two HOV lanes
- SR-47, at Ocean Boulevard, interchange improvement

Roadway System

- Alameda Street/Henry Ford Avenue, SR-47 ramps to SR-91 ramps, widen to six lanes*
- Alamitos Avenue, Ocean Boulevard to Pacific Coast Highway, widen from four to six lanes
- Gerald Desmond Bridge, widen from four lanes to five lanes (climbing lane)*
- New Four-Lane Connector Road to Del Amo Boulevard, Avalon Boulevard to Main Street (@ I-405 junction)
- Del Amo Boulevard, Main Street to Vermont Avenue, widen from two to six lanes
- Sepulveda Boulevard, Alameda Street to Carson City Limits, widen from two to four lanes
- Ocean Boulevard/Seaside Avenue, Gerald Desmond Bridge to Vincent Thomas Bridge, widen from four to six lanes*
- Atlantic Boulevard, Olympic to Whittier, widen from four lanes to six lanes
- Phase I (approx. 31) and Phase II (approx. 45) intersection improvements for most "truck-impacted" intersections.

- Signal system upgrades and signal synchronization for several major arterials throughout the I-710 Study Area.

Rail / Transit

- Alameda Corridor, LA/LB Ports to approx. Washington Boulevard, construct double track freight rail expressway, grade separations*
- Pasadena "Gold" Line, Union Station to Sierra Madre Villa, new LRT line*
- Los Angeles Blue Line, downtown Long Beach to Union Station, platform and operational improvements to existing line*
- Eastside Transit Corridor, Union Station to Beverly/Atlantic, new LRT line
- Green Line, miscellaneous capital and operational improvements to existing line
- Bus Service Improvements, miscellaneous operational improvements to existing systems (approx. 20% increase in service levels)

Alternative B – TSM/TDM Alternative

The Transportation Systems Management/Transportation Demand Management (TSM/TDM) Alternative largely consists of operational investments, policies, and actions aimed at improving goods movement, passenger auto and transit travel, and reducing the environmental impacts of transportation facilities and operations in the Study Area. Specific improvements included in the TSM/TDM Alternative are detailed as follows. Added explanation of how some of the goods movement strategies would operate are provided in Appendix K of this report.

Mainlines on I-710

- additional ramp metering
- aesthetics (landscaping and hardscape treatments along I-710)
- continuous high-mast illumination
- improved signage on I-710

Interchanges/Arterials

- I-710 ramp terminus/arterial improvements
  - for example, curb and gutter, including aesthetics improvements
  - mostly in state right-of-way
- implement parking restrictions on major parallel arterials during peak periods

Goods Movement

- empty container management through policies and incentives
- expanded drayage truck emission reduction program
- extended gate hours at the ports
  - move toward 24 hour / 7 days a week operations
  - incentives / disincentives (emphasize policy recommendations, not mandate)
  - include all entities in the supply chain

Transit

- additional Blue/Green Line feeder bus shuttles
- enhanced community service (local circulators)

Intelligent Transportation Systems (ITS)

- expand ITS Corridors
  - expand "depth" of ITS coverage on two identified ITS corridors (I-710/Atlantic; I-105 Corridor)
  - emphasize system connectivity

Alternative C - Medium General Purpose / Medium Truck Alternative

Alternative C is a major capital investment to the I-710 Corridor focused on improving safety and eliminating operational bottlenecks on I-710 for all vehicle types as well as selected improvements to manage the flow of heavy-duty trucks within the corridor. See Figure 4.5-1. Alternative C also emphasizes capacity improvements to the most deficient arterials serving as feeders or alternate routes to I-710. By definition, Alternative C incorporates all of the operational and policy improvements proposed in the TSM/TDM Alternative. In addition, Alternative C includes the following physical elements.

I-710 Mainlines

- add one mixed flow lane in each direction for selected I-710 segments
  - Shoemaker Bridge Complex to I-405 (I-710 becomes 4 lanes in each direction)
  - Imperial Hwy. to Atlantic Blvd. (I-710 becomes 5 lanes in each direction)
- improve mainlines to design standards
  - 12' travel lanes
  - 12' right shoulder
- add a continuous collector-distributor system between Atlantic Blvd. and I-5
- add a truck inspection facility adjacent to NB I-710 between Del Amo Blvd. and Long Beach Blvd.
- add truck bypass facilities at three freeway-to-freeway interchanges: I-405/I-710; SR-91/I-710; I-105/I-710
- add truck ramps to selected interchanges with high truck volumes: WB Pacific Coast Highway and WB Washington Blvd.

I-710 Interchanges

- add a right-side freeway connector ramp at the I-5/I-710[a] interchange to be used primarily by trucks and retain the left-side connector to be used primarily by autos (NB I-710 to NB I-5)
- eliminate design deficiencies at the I-405/I-710 freeway-to-freeway interchange
- eliminate design deficiencies at eight local interchanges[b]
- add one new interchange (Slauson)

Terminal Island Freeway (SR-47/SR-103)

- extend the Terminal Island Freeway (SR-103) to I-405, by adding an elevated, four-lane facility (two lanes in each direction) that would be used primarily by trucks

Arterials

- arterial capacity enhancements to 10 major arterials[c] by adding one lane in each direction
  - consists of either spot widenings to eliminate chokepoints/bottlenecks, restriping, and removal of on-street parking; or roadway widening

Figure 4.5-1

Alternative C
Medium General Purpose /
Medium Truck Alternative

LEGEND

- Add One Mixed Flow Lane (Each Direction)
- Interchange Improvement
- Extended Collector Distributor System
- New Interchange
- Arterial Capacity Enhancement
- Truck Inspection Facility
- Truck Ramps
- Truck Bypass Lanes
- Freeway Extension

Preliminary Concepts, Subject to Change

Source: Final Set of Alternatives, Parsons Brinckerhoff, June 27, 2002.

- provision of off-street parking, as needed, to replace loss of on-street parking due to restriping
- includes access management improvements (raised medians, elimination/consolidation of driveways and smaller streets)

Notes for Alternative C
a. Requires coordination with I-5 Corridor Improvements
b. Anaheim; Pacific Coast Highway; Willow; Del Amo; Imperial; Florence; Atlantic/Bandini; Washington
c. Atlantic Blvd.; Cherry Ave./Garfield Ave.; Eastern Ave.; Long Beach Blvd.; Paramount Blvd.; Pacific Coast Highway; Willow St.; Del Amo Blvd.; Firestone Blvd.; Florence Ave.

Alternative D - High General Purpose / High HOV Alternative

Alternative D is a high level of capital investment in the I-710 Study Area focused on improving safety and increasing roadway capacity to address the high traffic volumes along the full length of the I-710 Corridor for all vehicle types as well as improving the travel time and attractiveness of carpools to increase the person-carrying capacity of the regional transportation system. Alternative D includes all of the proposed TSM/TDM improvements listed in Alternative B. The transportation elements that comprise Alternative D are listed as follows. A map of Alternative D is provided in Figure 4.5-2.

I-710 Mainlines

- add 2 mixed flow lanes in each direction to I-710 from:
  - Shoemaker Bridge Complex to I-405 (I-710 becomes approximately 5 lanes in each direction)
  - Imperial Hwy. to Atlantic Blvd. (I-710 becomes approximately 6 lanes in each direction)
- add 1 mixed flow lane in each direction to the remaining I-710 segments
- add an exclusive HOV facility[a] for carpools and buses
  - 4 lanes (2 HOV lanes in each direction) from the Shoemaker Bridge Complex to SR-60
  - generally elevated, however, profile would be adjusted as needed depending upon best fit in I-710 right-of-way
  - alignment generally located in the median of I-710
  - dedicated ingress/egress points to facility for high occupancy vehicles at selected locations (approx. every 3-4 miles)
  - HOV lanes would operate 24 hours/7 days per week and assume a 2+ occupancy requirement
- improve I-710 mainlines to design standards
  - 12' travel lanes
  - 12' right shoulder

I-710 Interchanges

- eliminate design deficiencies at three freeway-to-freeway interchanges: I-405/I-710, SR-91/I-710; I-5/I-710[b]
- eliminate design deficiencies at ten local interchanges[c]
- include direct HOV connectors at the I-405/I-710 interchange (NB I-405 to NB I-710; SB I-710 to SB I-405)

Figure 4.5-2

Source: Final Set of Alternatives, Parsons Brinckerhoff, June 27, 2002.

Terminal Island Freeway (SR-47/SR-103)

- add four-lane viaduct connector, between SR-47 and Alameda Street

Transit

- add express bus service on the proposed HOV lanes

Arterials

- arterial capacity enhancements to four major arterials[d] by adding one lane in each direction to those parallel arterials close to I-710
  - consists of either spot widenings to eliminate chokepoints/bottlenecks, restriping, and removal of on-street parking; or roadway widening
  - provision of off-street parking, as needed, to replace loss of on-street parking due to restriping
  - includes access management improvements (raised medians, elimination/consolidation of driveways and smaller streets)

Notes for Alternative D

a. The exclusive 4-lane HOV facility would be designed and constructed so as to not preclude its future development as a high speed rail line between Long Beach and downtown Los Angeles.
b. Requires coordination with I-5 Corridor Improvements
c. Anaheim; Pacific Coast Highway; Willow; Del Amo; Long Beach Blvd; Rosecrans; Imperial; Florence; Atlantic/Bandini; Washington
d. Atlantic Blvd., Cherry Ave./Garfield Ave., Eastern Ave., Long Beach Blvd.

Alternative E - High Truck Alternative

Alternative E would entail a high level of capital investment in the I-710 Corridor focused on: improving safety; increasing capacity for growing heavy duty truck demand; improving reliability of travel times; and reducing points of conflict between autos and trucks to the greatest extent possible. See Figure 4.5-3 for a map of Alternative E. As with the other build alternatives, Alternative E includes the TSM/TDM strategies recommended in Alternative B. In addition, Alternative E entails the following proposed transportation improvements:

Mainline Facility

- construct an exclusive truck facility
  - 4 lanes (2 in each direction) between SR-91 and SR-60
  - 6 lanes (3 in each direction) between Ocean and SR-91
- proposed truck facility would be generally elevated, however, the profile would ultimately be determined based on need to minimize grades and best fit to minimize need for additional right-of-way
- provide dedicated ingress/egress points for trucks at selected locations (approximately every 3-4 miles)
- horizontal alignment of truckway could be in the median or adjacent to I-710 in state, LA River, or power line right-of-way depending upon best fit
- consider a tolling option for users of the truck facility
- provide extensive auxiliary lane improvements along existing I-710 travel lanes
- improve existing I-710 travel lanes to design standards
  - 12' travel lanes
  - 12' right shoulder

Figure 4.5-3

Alternative E
High Truck Alternative

Source: Final Set of Alternatives, Parsons Brinckerhoff, June 27, 2002.

I-710 Interchanges

- eliminate design deficiencies at I-5/I-710[a]; SR-91/I-710; and I-405/I-710
- add one new interchange (Slauson)

Arterials

- arterial capacity enhancements to arterials that lead to I-710 and that carry very high truck volumes by adding one lane in each direction: Ocean Blvd.; Pacific Coast Highway; Florence Ave.; Bandini Blvd.; Washington Blvd.
  - consists of either spot widenings to eliminate chokepoints/bottlenecks, restriping, and removal of on-street parking; or roadway widening
  - provision of off-street parking, as needed, to replace loss of on-street parking due to restriping
  - includes access management improvements (raised medians, elimination/consolidation of driveways and smaller streets)

Notes for Alternative E

a. Requires coordination with I-5 Corridor Improvements