

APPENDIX G

Initial Set of Alternatives, Parsons
Brinckerhoff, Inc., March 2002



Initial Set of Alternatives

March 2002

Initial Set of Alternatives - Draft

The Initial Set of Alternatives proposed for the I-710 Major Corridor Study is summarized below. These alternatives are the result of a series of workshops conducted throughout January and February 2002 with the project team, representatives from participating agencies, and the Technical Advisory Committee (TAC). The alternatives are multimodal, include both capital improvements and operational strategies, and are structured to illustrate the full range of options so that their respective trade-offs in terms of costs, transportation benefits, and other impacts may be understood. Detailed descriptions of each alternative are provided on the following pages.

- Alternative 1 - No Build Alternative
- Alternative 2 - 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

Framework for Alternatives Development

The following guidelines were used to develop the Initial Set of Alternatives:

- Alternatives are conceptual in scope.
- Alternatives should respond to the purpose and need for improvements developed for the I-710 Major Corridor Study.
- The alternatives should encompass an appropriate range of options, without major gaps in the likely costs of the alternatives. The number of alternatives should be manageable.
- The alternatives should include all reasonable modes and alignments, but only those that are reasonable. The conceptual alternatives should include all options that have a reasonable chance of becoming the locally preferred strategy (LPS).
- Each alternative should be significantly different from other alternatives. The conceptual alternatives should be designed to address differing study goals and objectives.
- The conceptual alternatives should include the No Build and TSM future baseline options.

The conceptual 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 accommodate growing truck demand.

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

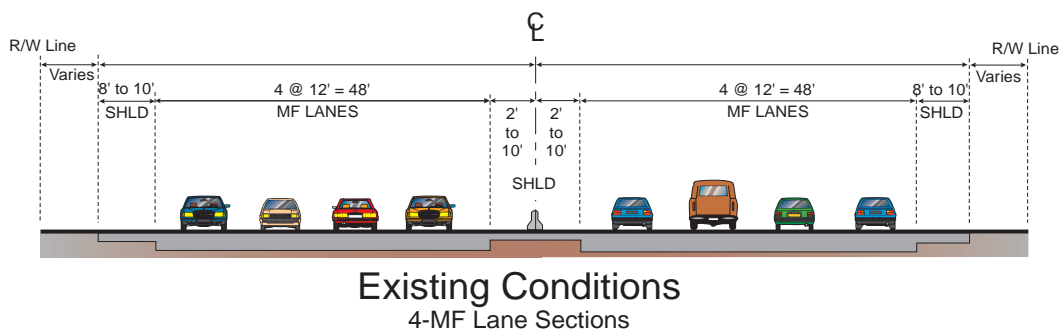
Notes on Alternative Descriptions

By definition, all of the No Build transportation improvements are incorporated in all of the proposed alternatives. In addition, the TSM/TDM Alternative improvements are included in all of the build alternatives (Alternatives 3-12) by design. This means that operational strategies such as added transit service, access management, and intelligent transportation systems (ITS) are included in the proposed build alternatives to maximize the efficiencies of the various major capital investments.

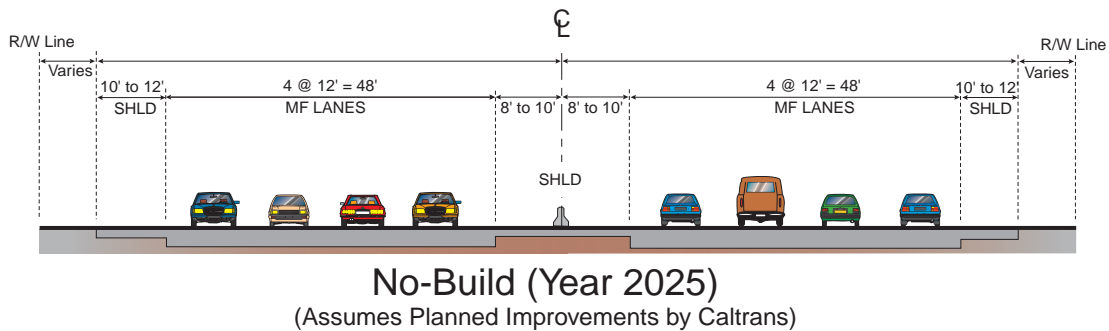
At this stage in the I-710 Study, the alternatives are still highly conceptual. The locations of facilities such as exclusive truck ramps, collector-distributor systems, alignments of viaduct facilities, and points of ingress/egress as shown on the following maps are approximate only.

The cross sections shown for each alternative are illustrative. Each cross section is intended to represent the most typical case for each alternative and at the same time highlight the major differences among the proposed alternatives. In actuality, the cross sections vary along the full length of the I-710 corridor depending upon existing geometrics and the types of improvements proposed for each segment of I-710 under the various alternatives. The typical cross sections show only the mainline through lanes. Ramps and auxiliary lanes are not shown.

A typical cross section that best represents existing conditions for I-710 is shown below.



A typical cross section that best represents future conditions on I-710 (Year 2025) is shown below. This takes into account the pavement and median rehabilitation projects that are already planned and committed for I-710. [See the text description of Alternative 1, No Build Alternative, on the following page.]



Alternative 1

No Build Alternative

Purpose of Concept

The No Build Alternative consists of those transportation projects that are already planned and committed for 2025, the planning horizon year for the I-710 Major Corridor Study. Consequently, the No Build Alternative represents future travel conditions in the I-710 Study Area and it is the baseline against which candidate transportation alternatives proposed for the I-710 Study will be assessed.

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)

Note: (*) indicates projects that are currently under construction or that have recently been implemented.

Alternative 2

TSM/TDM Alternative

Purpose of Concept

The 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.

Mainlines on I-710

- additional ramp metering
- aesthetics
- 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 ROW
- parking restrictions on major parallel arterials during peak periods

Goods Movement Strategies

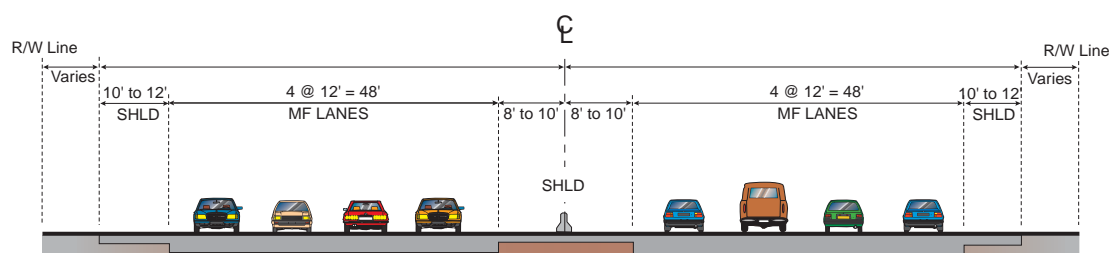
- empty container management through policies and incentives
- expanded drayage truck emission reduction program
- extended gate hours at the ports
 - move toward 24 hour / 7 days a week operations
 - emphasize policy recommendations, not mandate
 - include all entities in the supply chain

Transit

- additional Blue/Green line feeder 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



Remain 4 Mixed Flow Lanes
(Same as Year 2025 Future Conditions)

Alternative 3 Low General Purpose Alternative

Purpose of Concept

Some capital investment in roadway facilities within the Study Area to improve traffic flow and safety for all vehicle types, focusing on the most deficient arterials serving as feeders or alternate routes to I-710.

Interchanges

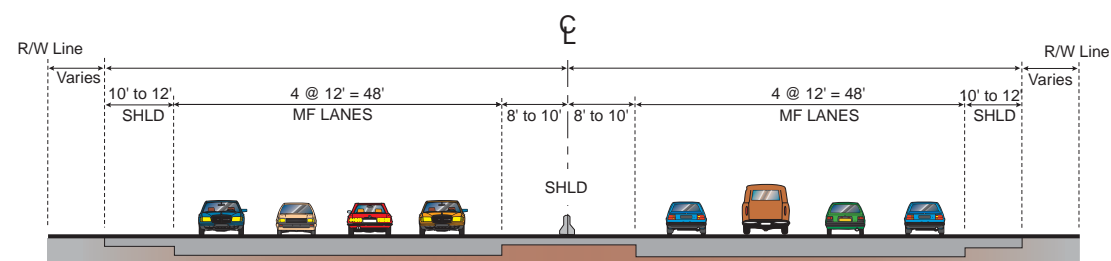
- partially address I-5/I-710^a design deficiencies for general purpose traffic by improving the NB I-710 to NB I-5 and SB I-5 to SB I-710 connectors (remove left-side ramps and build right-side entrance/exit ramps)
- eliminate design deficiencies at I-710/Florence Ave.
- eliminate design deficiencies at I-710/Imperial Blvd.

Arterials

- Arterial Capacity Enhancements to 10 major arterials^b
 - consists of: spot widenings to eliminate chokepoints/bottlenecks; restriping; and removal of on-street parking / provision of off-street parking
 - access management (raised medians, elimination/consolidation driveways and smaller streets)

Notes

- a. requires coordination with I-5 Corridor Improvements
- b. Atlantic Blvd.; Cherry Ave./Garfield Ave.; Eastern Ave.; Long Beach Blvd.; Paramount Blvd.; Pacific Coast Highway; Willow St.; Del Amo Blvd.; Florence Ave.; Firestone Blvd.



Remain 4 Mixed Flow Lanes
(Same as Year 2025 Future Conditions)

Alternative 3 Low General Purpose Alternative

LEGEND

- Arterial Capacity Enhancement (represented by a yellow line)
- Partial Interchange Improvement (represented by a dashed red circle)
- Interchange Improvement (represented by a solid red circle)



Alternative 4 Low Truck Alternative

Purpose of Concept

Some capital investment to I-710 and selected arterials focused on improving safety and managing the flow of heavy-duty trucks within the corridor.

Mainline

- add collector/distributor lanes from Atlantic/Bandini to I-5
- add Truck Inspection facility adjacent to NB I-710 between Del Amo Blvd. and Long Beach Blvd.

Interchanges

- add truck-only connector ramps at I-5/I-710 interchange^a (NB I-710 to NB I-5 and SB I-5 to SB I-710)
- eliminate design deficiencies at I-405/I-710 interchange

Intelligent Transportation Systems (ITS)

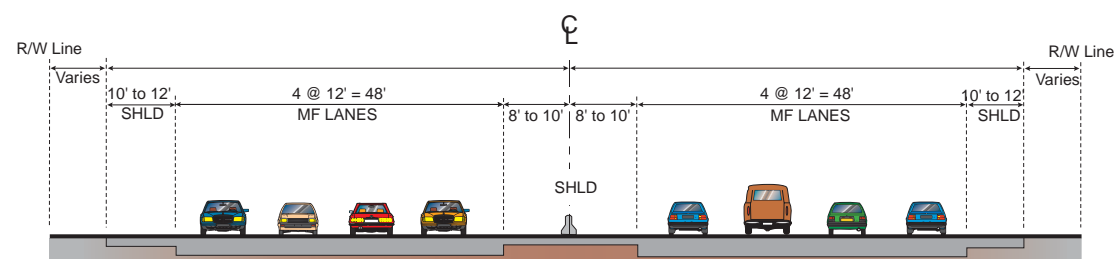
- provide ITS improvements that address trucks
 - incident detection/management (tie in w/Ports ITS)^b
 - private sector systems enhancement

Arterials

- arterial capacity enhancements to arterials that carry very high truck volumes: Ocean Blvd.; Pacific Coast Highway; Florence Ave.; Atlantic Blvd.; Bandini Blvd.; Washington Blvd.

Notes

- a. requires coordination with I-5 Corridor Improvements
- b. approximately 80% of this is already funded under the No Build Alternative

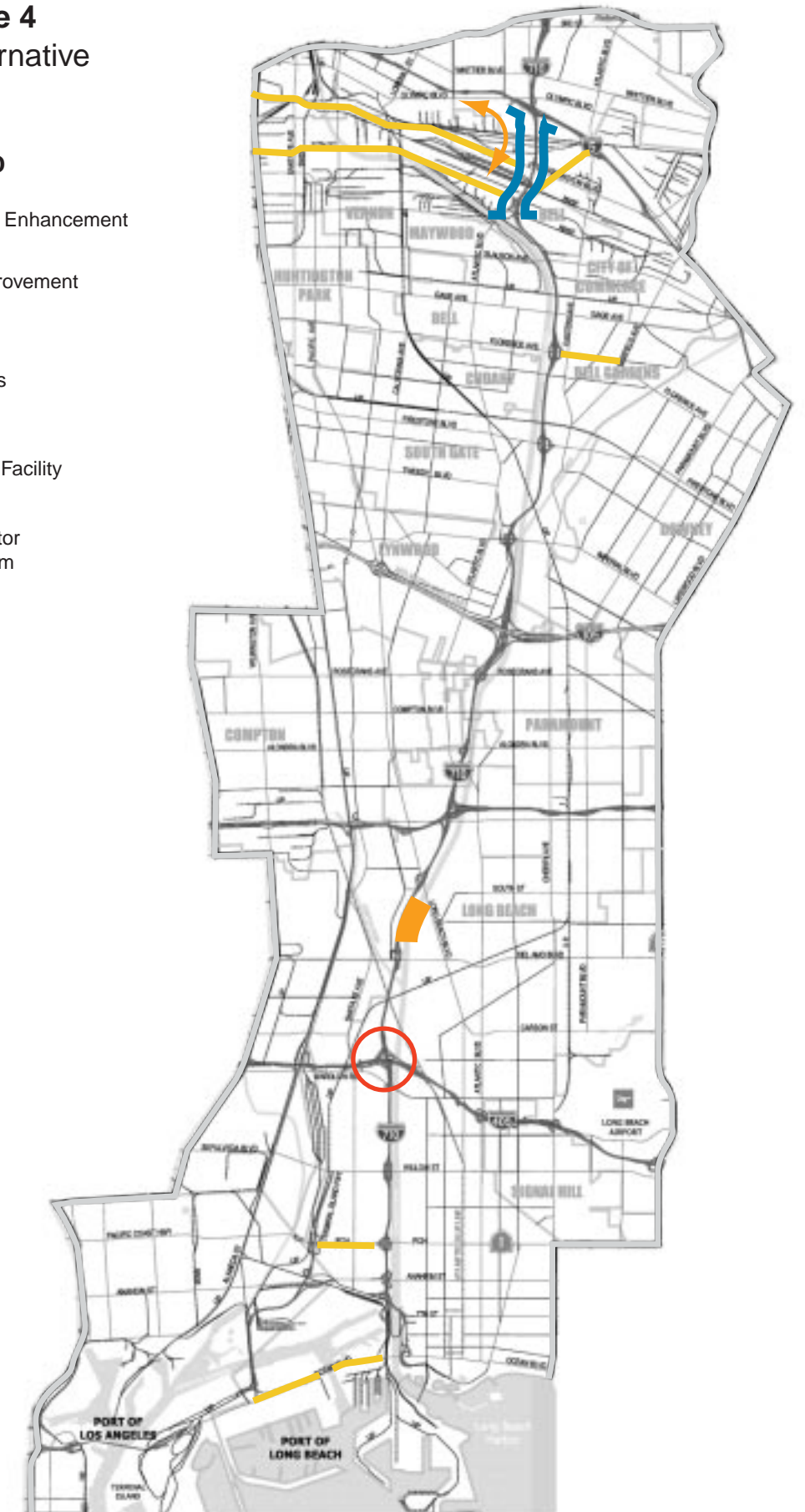


Remain 4 Mixed Flow Lanes
(Same as Year 2025 Future Conditions)

Alternative 4 Low Truck Alternative

LEGEND

- Arterial Capacity Enhancement
- Interchange Improvement
- ↪ Truck Connectors
- Truck Inspection Facility
- || Extended Collector Distributor System



Alternative 5 Medium HOV Alternative

Purpose of Concept

Mid-range capital cost investment to I-710 focused on improving the travel time and hence attractiveness of high occupancy vehicles, including buses, to help increase the person-carrying capacity of I-710.

Mainline

- add HOV lane in each direction from 7th Street to SR-60
- at-grade
- 4' buffer separation between HOV lane and adjacent mixed flow lanes
- HOV lanes would operate 24 hours/7 days per week and assume a 2+ occupancy requirement
- improve mainlines to design standards
 - 12' travel lanes
 - 12' right shoulder
- provide HOV lane ingress/egress for most all interchange locations (approx. 1-mile spacing)

Interchanges

- address deficiencies of I-5/I-710 interchange^a (replace left-side ingress/egress with right-side ramps; add missing movements)
- include direct HOV connectors at I-5/I-710^a interchange (NB I-710 to NB I-5, SB I-5 to SB I-710)

Transit

- add express bus service on I-710

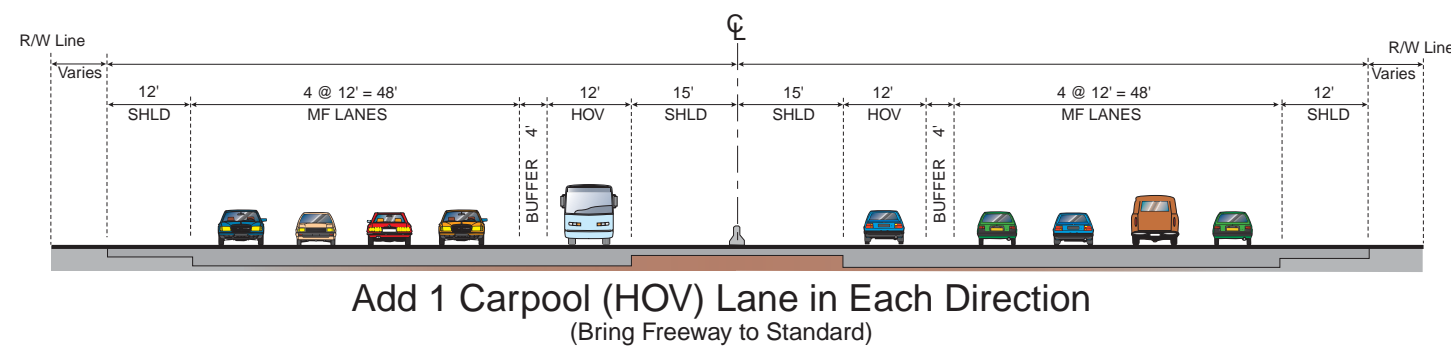
Notes

- a. requires coordination with I-5 Corridor Improvements

Alternative 5 Medium HOV Alternative

LEGEND

- ||||| One HOV Lane (Each Direction)
- Interchange Improvement
- ↻ Direct HOV Connector



Alternative 6 Medium General Purpose Alternative

Purpose of Concept

Mid-range capital investment to I-710 focused on improving safety and eliminating operational bottlenecks on I-710 for all vehicle types.

Mainlines

- add one mixed flow lane in each direction for selected I-710 segments
 - Ocean Blvd. to I-405 (I-710 becomes 4 lanes in each dir.)
 - Imperial Hwy. to Atlantic Blvd. (I-710 becomes 5 lanes in each dir.)
- improve mainlines to design standards
 - 12' travel lanes
 - 12' right shoulder
- continuous collector-distributor system between Atlantic Blvd. and I-5

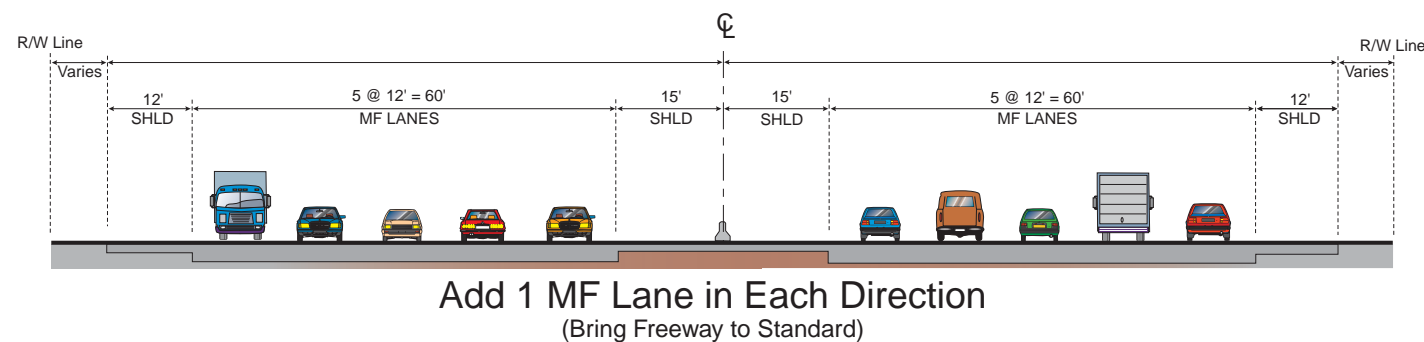
Interchanges

- eliminate design deficiencies at three freeway-to-freeway interchanges: I-405/I-710, SR-91/I-710; I-5/I-710^a
- eliminate design deficiencies at 10 local interchanges^b
- add one new interchange (Slauson)

Notes

a. requires coordination with I-5 Corridor Improvements

b. Anaheim; Pacific Coast Highway; Willow; Del Amo; Long Beach Blvd; Rosecrans; Imperial; Florence; Atlantic/Bandini; Washington



Alternative 6 Medium General Purpose Alternative

LEGEND

- ■ ■ ■ ■ Add One Mixed Flow Lane (Each Direction)
- Interchange Improvement
- || Extended Collector Distributor System
- ◇ New Interchange



Alternative 7 Medium Truck Alternative

Purpose of Concept

Mid-range capital investment focused on improving safety, reliability of travel, and access to I-710, particularly for heavy-duty trucks.

Mainlines

- no new travel lanes on I-710 but improve mainlines to design standards friendly to trucks
 - 14' travel lanes for two right lanes
 - 12' shoulders
- extensive auxiliary lane improvements

Interchanges

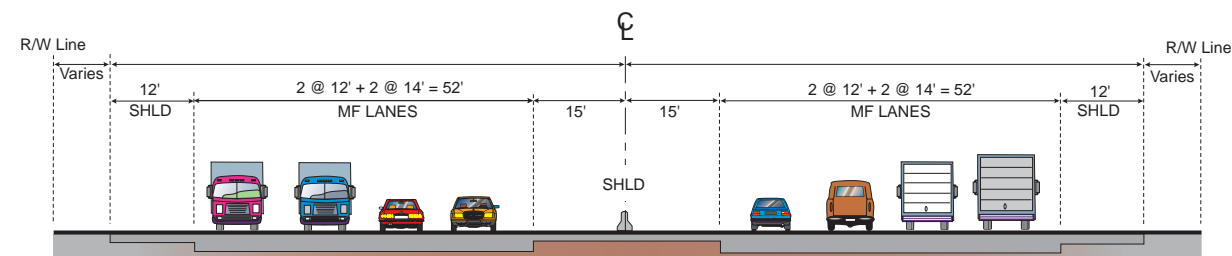
- eliminate design deficiencies at three freeway-to-freeway interchanges: I-5/I-710^a; I-405/I-710; SR-91/I-710
- add truck bypass facilities at three freeway-to-freeway interchanges (I-105/I-710; I-405/I-710; SR-91/I-710)
- add truck ramps to selected interchanges with high truck volumes^b
- provision for 2-lane ramps to accommodate trucks
- ramp design: 14' lanes / radii / geometrics / design speeds / sight distances

Arterials

- arterial capacity enhancements to arterials that carry very high truck volumes: Pacific Coast Highway; Willow St.; Florence Ave.; Atlantic Blvd.; Bandini Blvd.; Washington Blvd.

Notes

- requires coordination with I-5 Corridor Improvements
- Willow, Pacific Coast Highway, Florence, Atlantic/Bandini, Washington



Remain 4 MF Lanes
(Bring Freeway to Truck Standard)

Alternative 7 Medium Truck Alternative

LEGEND

- Arterial Capacity Enhancement
- Interchange Improvement
- Direct Truck Ramps
- Truck Bypass Lanes



Alternative 8 High General Purpose Alternative

Purpose of Concept

High level of capital investment focused on improving safety and increasing capacity to address the high traffic volumes along the full length of I-710 for all vehicle types.

Mainlines

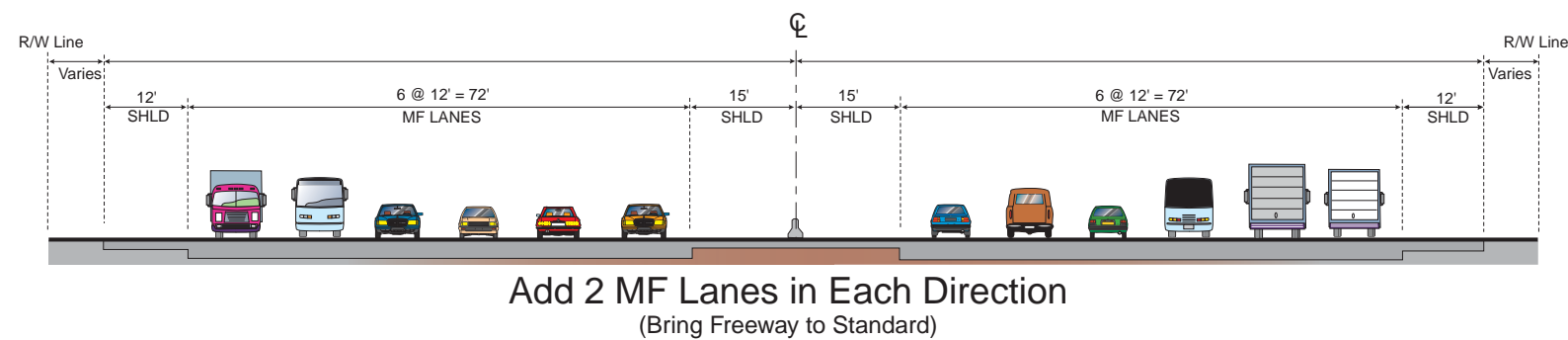
- add 2 mixed flow lanes in each direction to I-710 at:
 - Ocean Blvd. to I-405 (I-710 becomes approx. 5 lanes in each dir.)
 - Imperial Hwy. to Atlantic Blvd. (I-710 becomes approx. 6 lanes in each dir.)
- add 1 mixed flow lane to remaining I-710 segments
- improve mainlines to design standards
 - 12' travel lanes
 - 12' right shoulder
- extensive auxiliary lane improvements

Interchanges

- eliminate design deficiencies at three freeway-to-freeway interchanges: I-405/I-710, SR-91/I-710; I-5/I-710^a
- eliminate design deficiencies at 10 local interchanges^b
- add one new interchange (Slauson)

Notes

- a. requires coordination with I-5 Corridor Improvements
- b. Anaheim; Pacific Coast Highway; Willow; Del Amo; Long Beach Blvd; Rosecrans; Imperial; Florence; Atlantic/Bandini; Washington



Alternative 8 High General Purpose Alternative

LEGEND

- Add Two Mixed Flow Lanes (Each Direction)
- ▨ Add One Mixed Flow Lane (Each Direction)
- Interchange Improvement
- ◇ New Interchange



Alternative 9 High Truck Alternative

Purpose of Concept

High level of capital investment focused on increasing capacity to address growing demand on I-710, improving reliability of travel, and reducing points of conflict between autos and heavy-duty trucks.

Mainline Facility

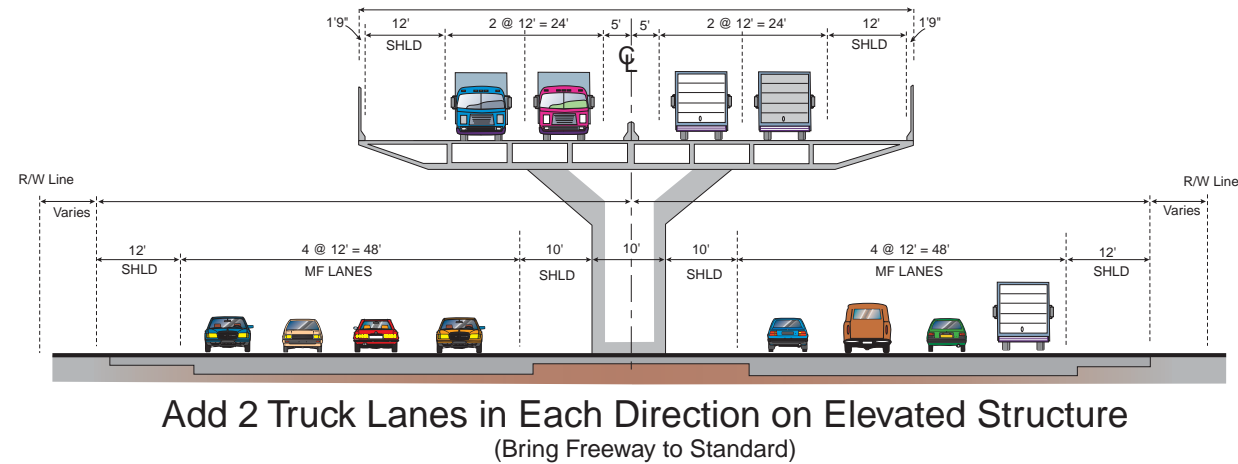
- exclusive truck facility
 - 4 lanes (2 in each direction) between SR-91 and SR-60
 - 6 lanes (3 in each direction) between 7th Street and SR-91
- generally elevated, however, profile will ultimately be determined based on need to minimize grades and best fit to minimize need for additional ROW
- dedicated ingress/egress points for trucks at selected locations (approx. every 3-4 miles)
- horizontal alignment could be in the median or adjacent to I-710 in state ROW, on LA Flood Control District property, or on Southern California Edison property, depending upon best fit
- consider tolling suboption
- improve I-710 mainlines to design standards
 - 12' travel lanes
 - 12' right shoulder

Interchanges

- eliminate design deficiencies at I-5/I-710^a; SR-91/I-710; and I-405/I-710

Notes

- a. requires coordination with I-5 Corridor Improvements



Alternative 9 High Truck Alternative

LEGEND

- Exclusive Truck Facility (4 Lanes)
- Exclusive Truck Facility (6 Lanes)
- Interchange Improvement
- Approx. Truck Ingress/Egress Location



Alternative 10 High Goods Movement Alternative

Purpose of Concept

High level of capital investment focused on addressing high travel demand for goods movement on a system-wide basis throughout the I-710 Study Area. Includes additional capacity to help separate truck and auto moves, new facilities to manage truck demand, and safety/design improvements on I-710.

I-710 Mainline

- Barrier-Separated Dual Roadway Facility
 - add 2 lanes in each direction for autos in the median from 7th Street to SR-60
 - dedicated ingress/egress to dual roadway facility for autos at selected locations (approx. every 3-4 miles)
 - remaining lanes (3-5) to be used for mixed flow traffic
 - mostly at grade
 - consider toll suboption for new lanes
- improve mainlines to design standards
 - 12' travel lanes
 - 12' right shoulder

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

- extend Terminal Island Freeway (SR-103) to I-405, by adding an elevated, two-lane facility for trucks-only
- add four-lane viaduct connector, between SR-47 and Alameda Street

I-710 Interchanges

- eliminate design deficiencies at three freeway-to-freeway interchanges: I-405/I-710, SR-91/I-710; I-5/I-710^a
- eliminate design deficiencies at 10 local interchanges^b

Systemwide Goods Movement Improvements

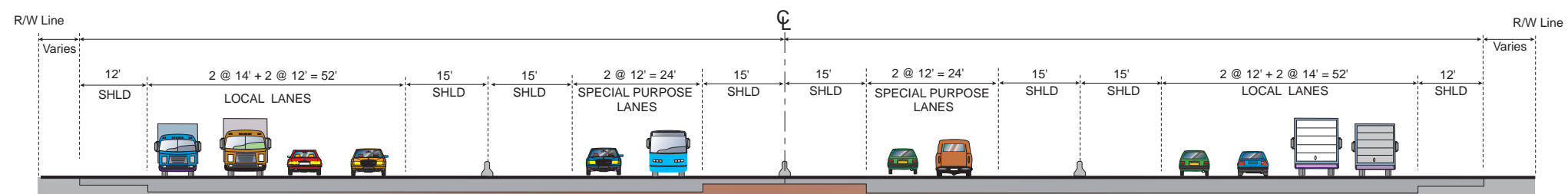
- add staging areas for trucks
- add new near dock intermodal rail facility
- truck land use management program (incentive zones)

Arterials

- increase capacity on major parallel arterials close to I-710^c

Notes

- requires coordination with I-5 Corridor Improvements
- Anaheim; Pacific Coast Highway; Willow; Del Amo; Long Beach Blvd; Rosecrans; Imperial; Florence; Atlantic/Bandini; Washington
- Atlantic Blvd., Cherry Ave./Garfield Ave., Eastern Ave., Long Beach Blvd.



Dual Roadway Concept Add 2 Special Purpose Lanes
(Bring Freeway to Standard)

Alternative 10 High Goods Movement Alternative

LEGEND

- Dual Roadway Facility
- Exclusive Truck Facility
- Arterial Capacity Enhancement
- Interchange Improvement
- New Interchange
- Approx. Vehicle Ingress/Egress Location



Alternative 11 High HOV Alternative

Purpose of Concept

High level of capital investment focused on improving travel time and hence attractiveness of high occupancy vehicles, including buses, to help increase the person-carrying capacity of I-710 as well as safety.

Mainline Facility

- exclusive HOV facility (carpools and buses)
- 4 lanes (2 HOV lanes in each direction) from 7th Street to SR-60
- generally elevated, however, profile will be adjusted as needed depending upon best fit in I-710 ROW
- alignment generally located in the median of I-710
- dedicated ingress/egress points to facility 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 mainlines to design standards
 - 12' travel lanes
 - 12' right shoulder

Interchanges

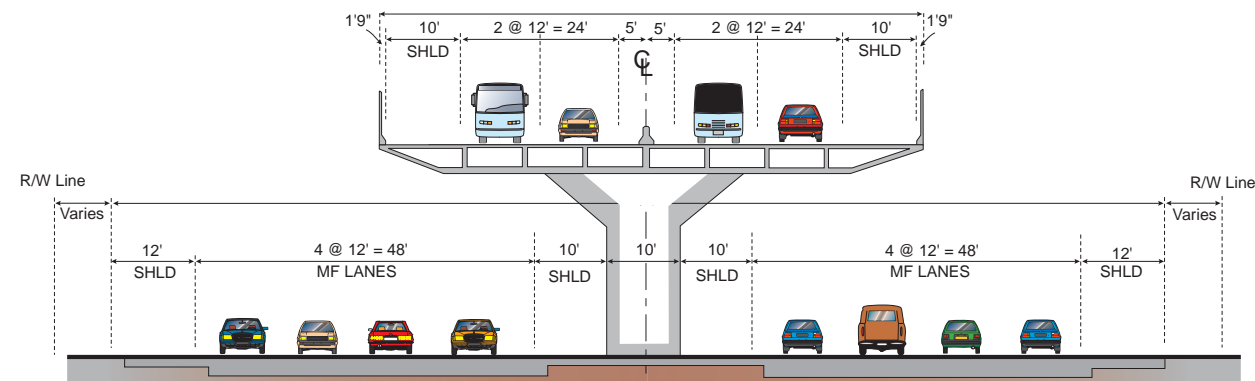
- eliminate design deficiencies at three freeway-to-freeway interchanges: I-405/I-710, SR-91/I-710; I-5/I-710^a
- include direct HOV connectors at:
 - I-405/I-710 interchange (NB I-405 to NB I-710, SB I-710 to SB I-405)
 - SR-91/I-710 interchange (NB I-710 to EB SR-91, WB SR-91 to SB I-710; SB I-710 to EB SR-91, WB SR-91 to NB I-710)
 - I-5/I-710^a interchange (NB I-710 to NB I-5, SB I-5 to SB I-710)

Transit

- add express bus service on I-710

Notes

- a. requires coordination with I-5 Corridor Improvements



Add 2 Carpool (HOV) Lanes in Each Direction on Elevated Structure
(Bring Freeway to Standard)

Alternative 11 High HOV Alternative

LEGEND

- ■ ■ Elevated HOV Facility
- Interchange Improvement
- ↻ Direct HOV Connector
- Approx. HOV Ingress/Egress Location



Alternative 12 High Rail Alternative

Purpose of Concept

High level of capital investment focused on improving travel time and hence attractiveness of rail transit to increase transit ridership and thereby help increase the person carrying capacity of the I-710 as well as improve mobility for the transit dependent.

Mainline Rail Facility

- Exclusive double track transit facility^a
- General at-grade, however profile will be adjusted as needed depending upon best fit in I-710 and UPRR ROW
- Alignment generally located in median of I-710 and along UPRR ROW
- Stations at selected locations for access and to maintain higher average speed (approx. every 5 miles), including connections with the Blue and Green lines

I-710 Mainline

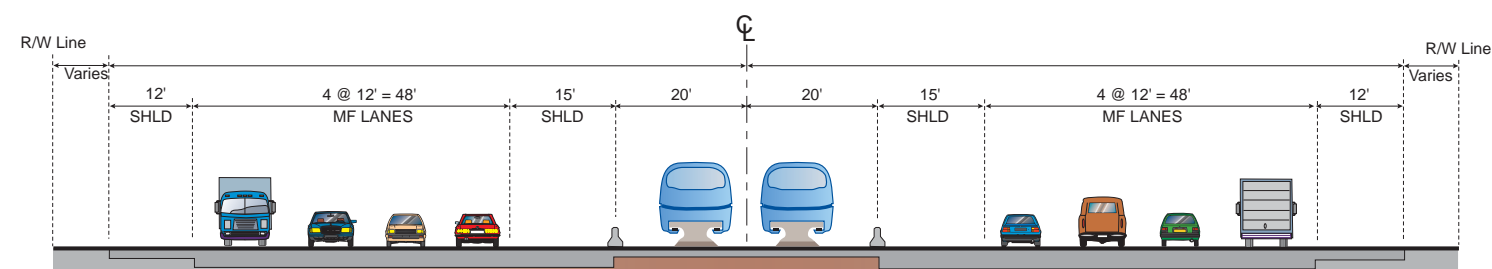
- Improve mainlines to design standards
 - 12' travel lanes
 - 12' right shoulder

Transit

- Add high speed rail transit service to I-710 Study Area between downtown Long Beach and Union Station in Los Angeles
 - Approximate peak period headway of 15 minutes
 - Approximate off-peak headways of 30 minutes
- Add feeder bus service to proposed high speed rail stations

Notes

a. Transit technology has not been determined, but would be consistent with the regional high speed ground transportation system currently under study.



Add High Speed Rail in Each Direction
(Bring Freeway to Standard)

Alternative 12 High Rail Alternative

LEGEND

- ++++ High Speed Rail
- ★ Station Location

