Summary Floodplain Encroachment Report

Prepared for

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

Metro
Los Angeles County
Metropolitan Transportation Authority

February 25, 2014

STATE ROUTE 710 NORTH STUDY

SUMMARY FLOODPLAIN ENCROACHMENT REPORT

LOS ANGELES COUNTY, CALIFORNIA

CALIFORNIA DEPARTMENT OF TRANSPORTATION DISTRICT 7

E.A. 187900

EFIS 0700000191

07-LA-710 (SR 710)

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February 25, 2014

Contents

Tables

Figures

Acronyms and Abbreviations

ATM	Active Traffic Management
BRT	Bus Rapid Transit
Cal State LA	California State University, Los Angeles
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CMS	changeable message signs
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EO	Executive Order
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRMs	Flood Insurance Rate Maps
ft	feet
FTIP	Federal Transportation Improvement Program
I-5	Interstate 5
I-10	Interstate 10
I-105	Interstate 105
I-110	Interstate 110
I-210	Interstate 210
I-405	Interstate 405
I-605	Interstate 605
I-710	Interstate 710
IEN	Information Exchange Network
LACDPW	Los Angeles County Department of Public Works
LARWQCB	Los Angeles Regional Water Quality Control Board
LRT	Light Rail Transit
LRTP	Long Range Transportation Plan
Metro	Los Angeles County Metropolitan Transportation Authority
mi	miles
mph	miles per hour
MSA	Metropolitan Statistical Area
NAVD	North American Vertical Datum
NEPA	National Environmental Policy Act

O&M	operations and maintenance
RCB	reinforced concrete box
RCC	reinforced concrete channel
ROW	right of way
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
SCAG	Southern California Association of Governments
SER	Standard Environmental Reference
SFER	Summary Floodplain Encroachment Report
SR 2	State Route 2
SR 22	State Route 22
SR 57	State Route 57
SR 60	State Route 60
SR 91	State Route 91
SR 110	State Route 110
SR 118	State Route 118
SR 134	State Route 134
SR 170	State Route 170
SR 710	State Route 710
TAP	Transit Access Pass
TDM	Transportation Demand Management
TSM	Transportation System Management
US-101	United States Route 101

1. Introduction

The California Department of Transportation (Caltrans), in cooperation with the Los Angeles County Metropolitan Transportation Authority (Metro) proposes transportation improvements to improve mobility and relieve congestion in the area between State Route 2 (SR 2) and Interstates 5, 10, 210 and 605 (I-5, I-10, I-210, and I-605, respectively) in east/northeast Los Angeles and the western San Gabriel Valley. The study area for the State Route 710 (SR 710) North Study is approximately 100 square miles and generally bounded by I-210 on the north, I-605 on the east, I-10 on the south, and I-5 and SR 2 on the west (Figure 2-1). Caltrans is the Lead Agency under the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA).

This Summary Floodplain Encroachment Report is prepared to support the Draft Environmental Impact Report (EIR)/Draft Environmental Impact Statement (EIS) for the SR 710 North Study. A floodplain report is required by the Federal Highway Administration (FHWA) when a preliminary environmental study indicates a project may encroach on a National Flood Insurance Program base (100-year) floodplain (Caltrans, 2013).

For projects that do not involve a significant encroachment, are not inconsistent with existing watershed and floodplain management programs, and/or do not result in incompatible floodplain development, a Summary Floodplain Encroachment Report (SFER) may be used to summarize the floodplain evaluation (Caltrans, 2013). The SR 710 North Study would not involve a significant encroachment into the 100-year base floodplain, would not be inconsistent with existing watershed and floodplain management programs, and would not result in incompatible floodplain development. These findings are summarized in this SFER.

2. Project Description

2.1 Introduction

The California Department of Transportation (Caltrans), in cooperation with the Los Angeles County Metropolitan Transportation Authority (Metro) proposes transportation improvements to improve mobility and relieve congestion in the area between State Route 2 (SR 2) and Interstates 5, 10, 210 and 605 (I-5, I-10, I-210, and I-605, respectively) in east/northeast Los Angeles and the western San Gabriel Valley. The study area for the State Route 710 (SR 710) North Study as depicted on Figure 2-1 is approximately 100 square miles and generally bounded by I-210 on the north, I-605 on the east, I-10 on the south, and I-5 and SR 2 on the west. Caltrans is the Lead Agency under the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA).

2.2 Purpose and Need

2.2.1 Purpose of the Project

Due to the lack of continuous north-south transportation facilities in the study area, there is congestion on freeways, cut-through traffic that affects local streets, and low-frequency transit operations in the study area. Therefore, the following project purpose has been established.

The purpose of the proposed action is to effectively and efficiently accommodate regional and local north-south travel demands in the study area of the western San Gabriel Valley and east/northeast Los Angeles, including the following considerations:

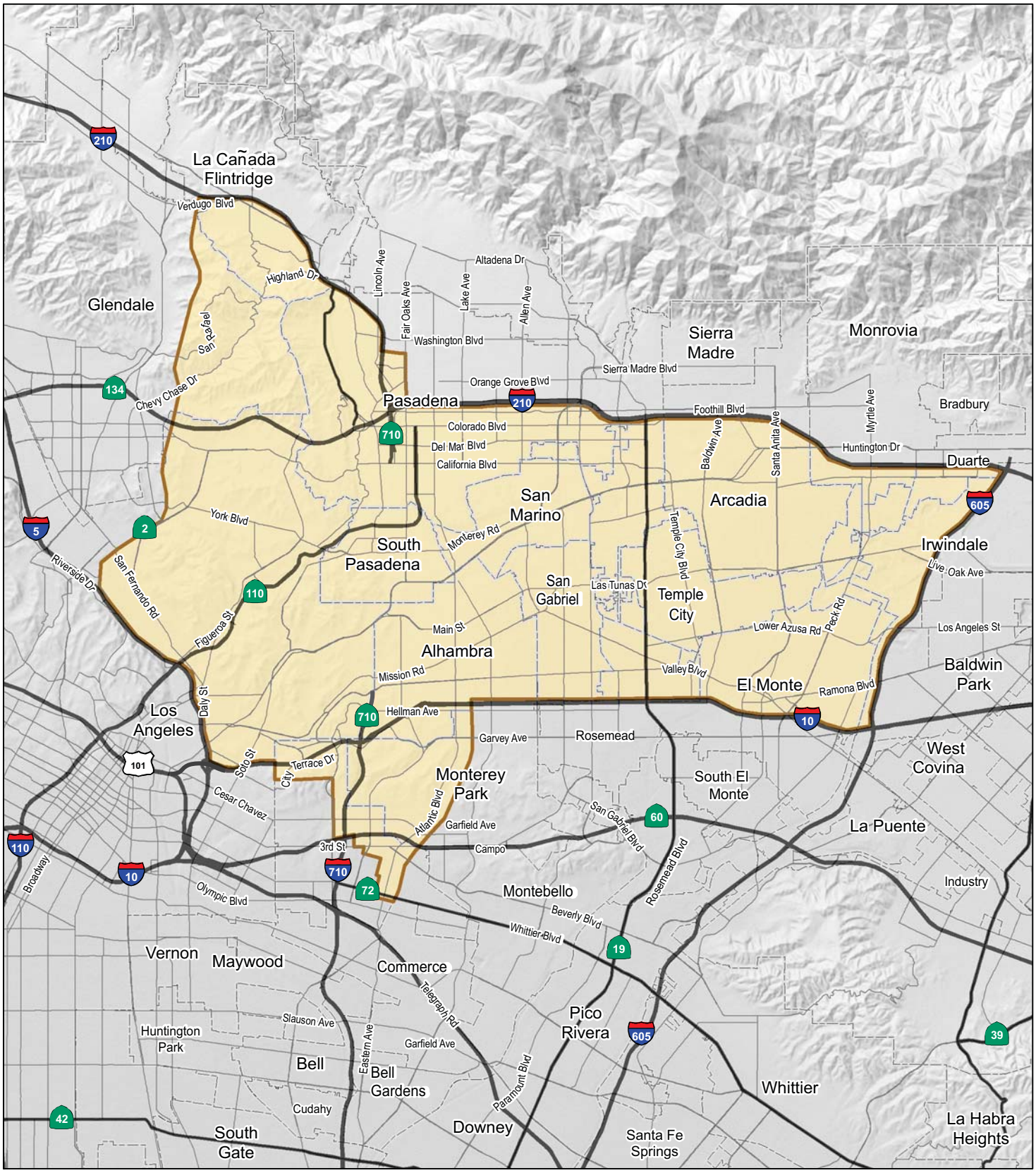
- Improve efficiency of the existing regional freeway and transit networks.
- Reduce congestion on local arterials adversely affected due to accommodating regional traffic volumes.
- Minimize environmental impacts related to mobile sources.

2.2.2 Need for the Project

The study area is centrally located within the extended urbanized area of Southern California. With few exceptions, the area from Santa Clarita in the north to San Clemente in the south (a distance of approximately 90 miles [mi]) is continuously urbanized. Physical features such as the San Gabriel Mountains and Angeles National Forest on the north, and the Puente Hills and Cleveland National Forest on the south, have concentrated urban activity between the Pacific Ocean and these physical constraints. This urbanized area functions as a single social and economic region that is identified by the Census Bureau as the Los Angeles-Long Beach-Santa Ana Metropolitan Statistical Area (MSA).

There are seven major east-west freeway routes:

- State Route 118 (SR 118)
- United States Route 101 (US-101)/State Route 134 (SR 134)/I-210
- I-10
- State Route 60 (SR 60)



LEGEND

SR 710 North Study Area

FIGURE 2-1

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MILES

SOURCE: ESRI (2008); LSA (2013)

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SR 710 North Study

Project Location

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

- Interstate 105 (I-105)
- State Route 91 (SR 91)
- State Route 22 (SR 22)

There are seven major north-south freeway routes:

- Interstate 405 (I-405)
- US-101/State Route 170 (SR 170)
- I-5
- Interstate 110 (I-110)/State Route 110 (SR 110)
- Interstate 710 (I-710)
- I-605
- State Route 57 (SR 57)

All of these major routes are located in the central portion of the Los Angeles-Long Beach-Santa Ana MSA. Of the seven north-south routes, four are located partially within the study area (I-5, I-110/SR 110, I-710, and I-605), two of which (I-110/SR 110 and I-710) terminate within the study area without connecting to another freeway. As a result, a substantial amount of north-south regional travel demand is concentrated on a few freeways, or diverted to local streets within the study area. This effect is exacerbated by the overall southwest-to-northeast orientation of I-605, which makes it an unappealing route for traffic between the southern part of the region and the urbanized areas to the northwest in the San Fernando Valley, the Santa Clarita Valley, and the Arroyo-Verdugo region.

The lack of continuous north-south transportation facilities in the study area has the following consequences, which have been identified as the elements of need for the project:

- Degradation of the overall efficiency of the larger regional transportation system
- Congestion on freeways in the study area
- Congestion on the local streets in the study area
- Poor transit operations within the study area

2.3 Alternatives

The proposed alternatives include the No Build Alternative, the Transportation System Management/ Transportation Demand Management (TSM/TDM) Alternative, the Bus Rapid Transit (BRT) Alternative, the Light Rail Transit (LRT) Alternative, and the Freeway Tunnel Alternative. These alternatives are each discussed below.

2.3.1 No Build Alternative

The No Build Alternative includes projects/planned improvements through 2035 that are contained in the Federal Transportation Improvement Program (FTIP), as listed in the Southern California Association of Governments (SCAG) 2012 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), Measure R, and the funded portion of Metro's 2009 Long Range Transportation Plan (LRTP).

The No Build Alternative does not include any planned improvements to the SR 710 Corridor. Figure 2-2 illustrates the projects in the No Build Alternative.

2.3.2 Transportation System Management/Transportation Demand Management (TSM/TDM) Alternative

The TSM/TDM Alternative consists of strategies and improvements to increase efficiency and capacity for all modes in the transportation system with lower capital cost investments and/or lower potential impacts. The TSM/TDM Alternative is designed to maximize the efficiency of the existing transportation system by improving capacity and reducing the effects of bottlenecks and chokepoints. Components of the TSM/TDM Alternative are shown on Figure 2-3. TSM strategies increase the efficiency of existing facilities (i.e., TSM strategies are actions that increase the number of vehicle trips which a facility can carry without increasing the number of through lanes).

2.3.2.1 Transportation System Management

TSM strategies include Intelligent Transportation Systems (ITS), local street and intersection improvements, and Active Traffic Management (ATM):

- **ITS Improvements:** ITS improvements include traffic signal upgrades, synchronization and transit prioritization, arterial changeable message signs (CMS), and arterial video and speed data collection systems. The TSM/TDM Alternative includes signal optimization on corridors with signal coordination hardware already installed by Metro's Traffic Signal Synchronization Program (TSSP). These corridors include Del Mar Avenue, Rosemead Boulevard, Temple City Boulevard, Santa Anita Avenue, Fair Oaks Avenue, Fremont Avenue, and Peck Road. The only remaining major north-south corridor in the San Gabriel Valley in which TSSP has not been implemented is Garfield Avenue; therefore, TSSP on this corridor is included in the TSM/TDM Alternative. The locations are shown in Table 2.1. The following provide a further explanation of the ITS elements listed above:
  - Traffic signal upgrades include turn arrows, vehicle and/or bicycle detection, pedestrian countdown timers, incorporation into regional management traffic center for real-time monitoring of traffic and updating of signal timing.
  - Synchronization is accomplished through signal coordination to optimize travel times and reduce delay.
  - Transit signal prioritization includes adjusting signal times for transit vehicles to optimize travel times for public transit riders.
  - Arterial CMS are used to alert travelers about unusual road conditions, special event traffic, accident detours, and other incidents.
  - Video and speed data collection includes cameras and other vehicle detection systems that are connected to a central monitoring location, allowing for faster detection and response to traffic incidents and other unusual traffic conditions.

SR 710 North – No Build Alternative (DRAFT)
2035 Programmed Projects

- 1AL04-LAF3125
- 1C0401
- 1HL08D01-LA0G138
- 1HL08D01-LA0G139
- 1TR0404
- 1TR0705
- 1TR1011
- 7120010
- High Speed Rail
- LA000357
- LA000358
- LA000548
- LA01342
- LA0B408
- LA0B7234
- LA0B875
- LA0C8012
- LA0C8046
- LA0C8054
- LA0C8055
- LA0C8063
- LA0C8064
- LA0C8087
- LA0D198
- LA0D31
- LA0D328
- LA0D441
- LA0D442
- LA0F003
- LA0F021
- LA0F098
- LA0G626
- LA29202W
- LA29212XY
- LA960018
- LA996425
- LAE0039
- LAE2515
- LAE2517
- LAE3085
- LAF1197
- LAF1455
- UT101
- Rail

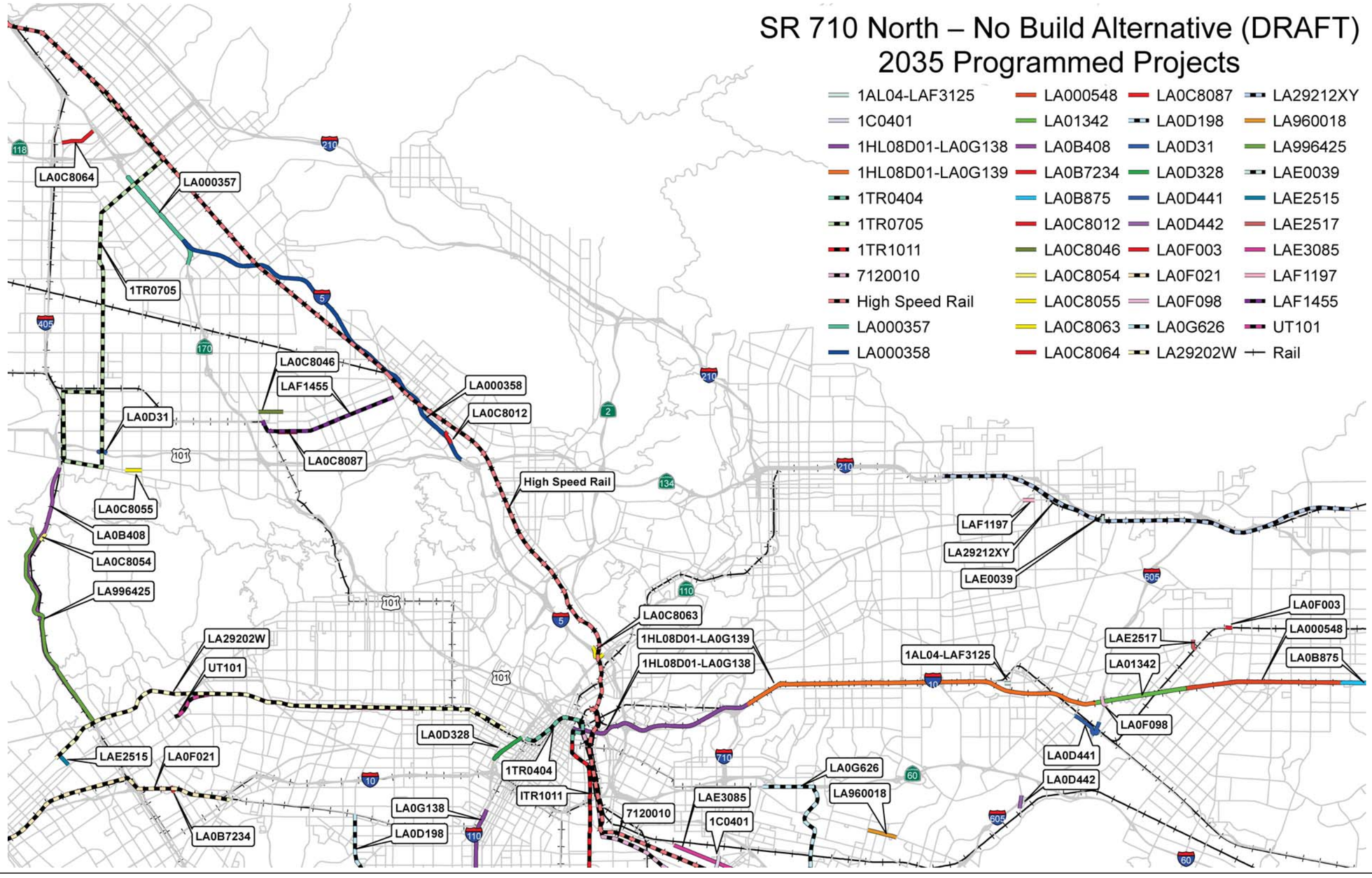

FIGURE 2-2

NOT TO SCALE

SOURCE: CH2M HILL (2013)

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SR 710 North Study

No Build Alternative

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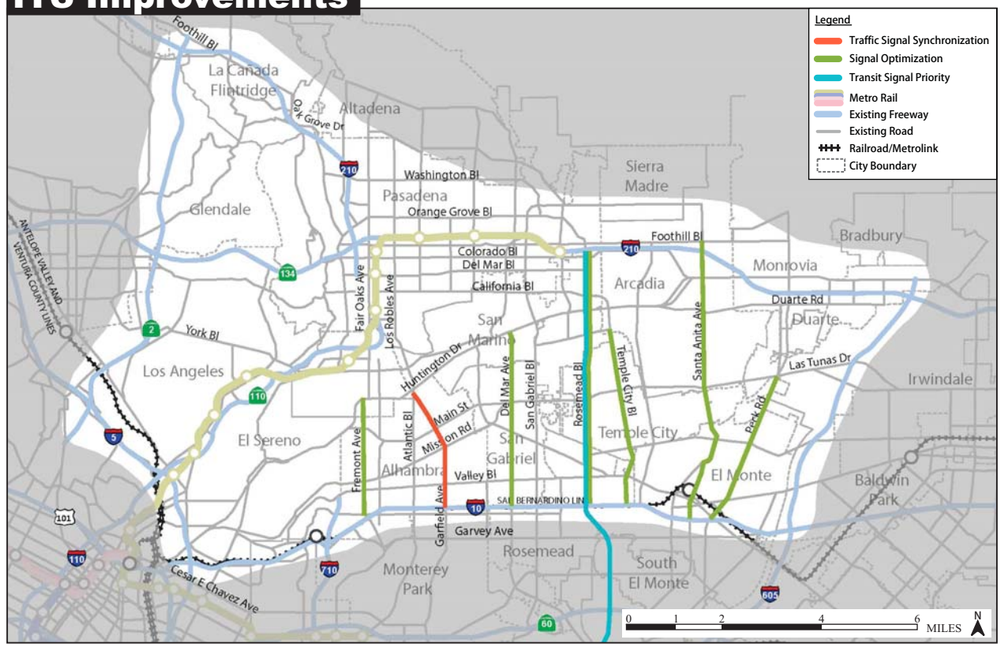
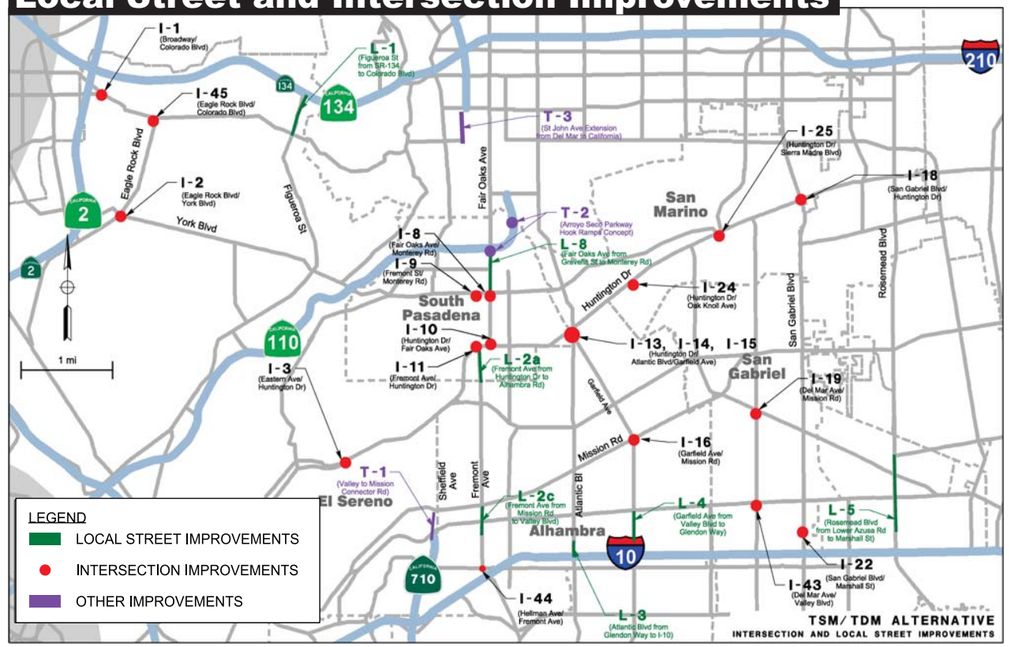
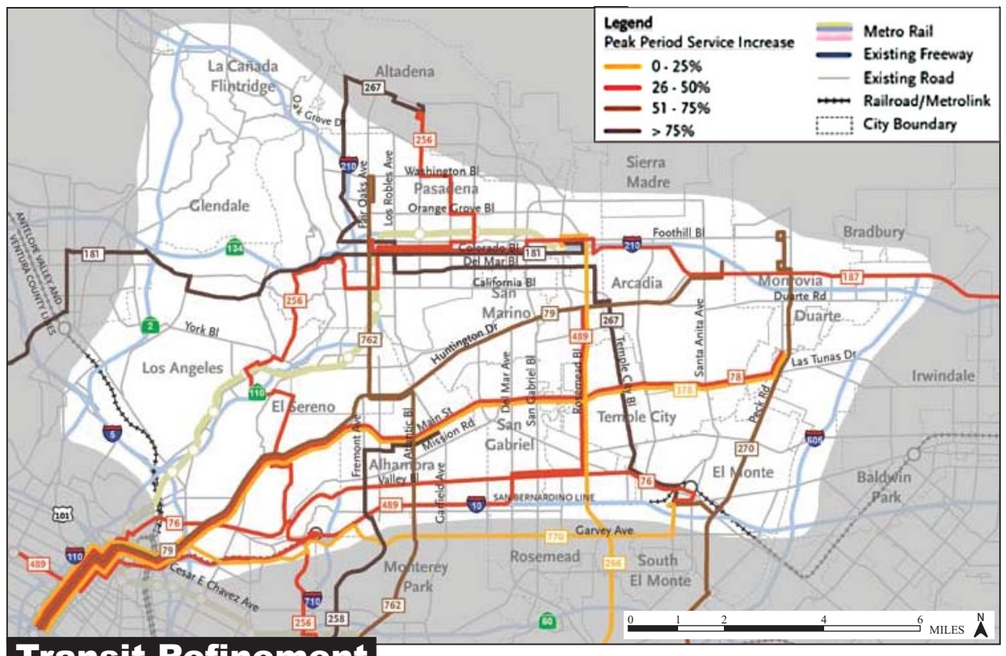
ITS Improvements

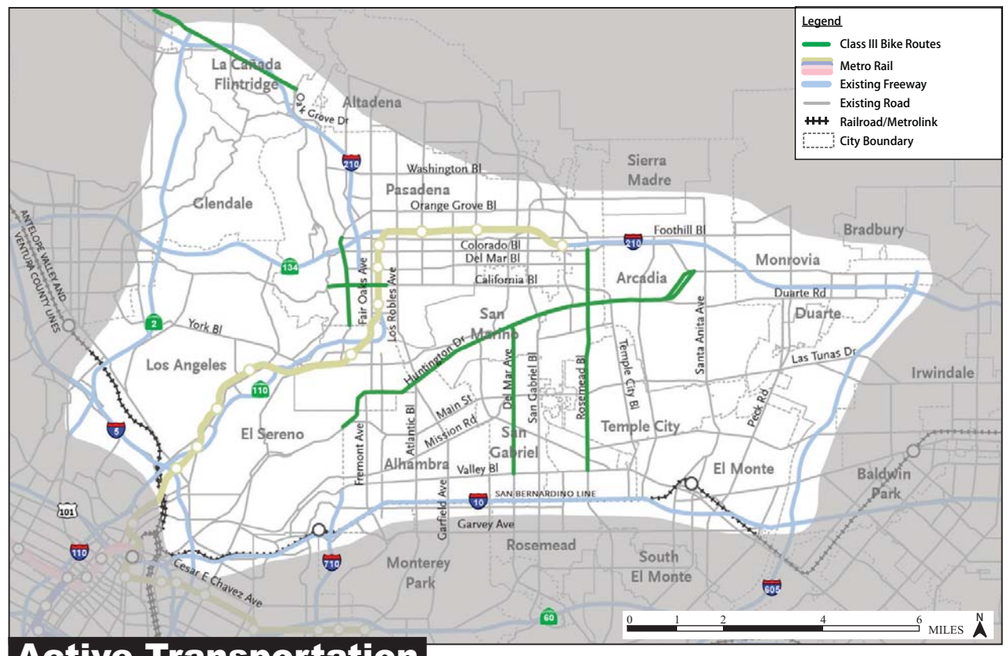


Local Street and Intersection Improvements





Transit Refinement



Active Transportation

FIGURE 2-3

SR 710 North Study
TSM/TDM Alternative
07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: CH2M HILL (2013)
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TABLE 2.1:
TSM/TDM Alternative Elements

ID No.	Description	Location
ITS Improvements		
ITS-1	Transit Signal Priority	Rosemead Boulevard (from Foothill Boulevard to Del Amo Boulevard)
ITS-2	Install Video Detection System on SR 110	SR 110 north of US-101
ITS-3	Install Video Detection System at Intersections	At key locations in study area
ITS-4	Arterial Speed Data Collection	On key north/south arterials
ITS-5	Install Arterial CMS	At key locations in study area
ITS-6	Traffic Signal Synchronization on Garfield Avenue	Huntington Drive to I-10
ITS-7	Signal optimization on Del Mar Avenue	Huntington Drive to I-10
ITS-8	Signal optimization on Rosemead Boulevard	Foothill Boulevard to I-10
ITS-9	Signal optimization on Temple City Boulevard	Duarte Road to I-10
ITS-10	Signal optimization on Santa Anita Avenue	Foothill Boulevard to I-10
ITS-11	Signal optimization on Peck Road	Live Oak Avenue to I-10
ITS-12	Signal optimization on Fremont Avenue	Huntington Drive to I-10

CMS = changeable message signs
I-10 = Interstate 10
ITS = Intelligent Transportation Systems
SR 110 = State Route 110
TDM = Transportation Demand Management
TSM = Transportation System Management
US-101 = United States Route 101

- **Local Street and Intersection Improvements:** The local street and intersection improvements are within the Cities of Los Angeles, Pasadena, South Pasadena, Alhambra, San Gabriel, Rosemead, and San Marino. Table 2.2 outlines the location of the proposed improvements to local streets, intersections, and freeway ramps as well as two new local roadways.
- **Active Traffic Management:** ATM technology and strategies are also included in the TSM/TDM Alternative. The major elements of ATM are arterial speed data collection and CMS. Data on arterial speeds would be collected and distributed through Los Angeles County's Information Exchange Network (IEN). Many technologies are available for speed data collection or the data could be purchased from a third-party provider. Travel time data collected through this effort could be provided to navigation system providers for distribution to the traveling public. In addition, arterial CMS or "trailblazer" message signs would be installed at key locations to make travel time and other traffic data available to the public.

2.3.2.2 Transportation Demand Management

TDM strategies focus on regional means of reducing the number of vehicle trips and vehicle miles traveled as well as increasing vehicle occupancy. TDM strategies facilitate higher vehicle occupancy or reduce traffic congestion by expanding the traveler's transportation options in terms of travel method, travel time, travel route, travel costs, and the quality and convenience of the travel experience. The TDM strategies include reducing the demand for travel during peak periods, reducing the use of motor vehicles, shifting the use of motor vehicles to uncongested times of the day, encouraging rideshare and transit use, eliminating trips (i.e., telecommuting), and improved transportation options. The TDM strategies include expanded bus service, bus service improvements, and bicycle improvements:

TABLE 2.2:
Local Street and Intersection Improvements of the TSM/TDM Alternative

ID No.	Description	Location
Local Street Improvements		
L-1	Figueroa Street from SR 134 to Colorado Boulevard	City of Los Angeles (Eagle Rock)
L-2a	Fremont Avenue from Huntington Drive to Alhambra Road	City of South Pasadena
L-2c	Fremont Avenue from Mission Road to Valley Boulevard	City of Alhambra
L-3	Atlantic Boulevard from Glendon Way to I-10	City of Alhambra
L-4	Garfield Avenue from Valley Boulevard to Glendon Way	City of Alhambra
L-5	Rosemead Boulevard from Lower Azusa Road to Marshall Street	City of Rosemead
L-8	Fair Oaks Avenue from Grevelia Street to Monterey Road	City of South Pasadena
Intersection Improvements		
I-1	West Broadway/Colorado Boulevard	City of Los Angeles (Eagle Rock)
I-2	Eagle Rock Boulevard/York Boulevard	City of Los Angeles (Eagle Rock)
I-3	Eastern Avenue/Huntington Drive	City of Los Angeles (El Sereno)
I-8	Fair Oaks Avenue/Monterey Road	City of South Pasadena
I-9	Fremont Street/Monterey Road	City of South Pasadena
I-10	Huntington Drive/Fair Oaks Avenue	City of South Pasadena
I-11	Fremont Avenue/Huntington Drive	City of South Pasadena
I-13	Huntington Drive/Garfield Avenue	Cities of Alhambra/South Pasadena/San Marino
I-14	Huntington Drive/Atlantic Boulevard	Cities of Alhambra/South Pasadena/San Marino
I-15	Atlantic Boulevard/Garfield Avenue	Cities of Alhambra/South Pasadena/San Marino
I-16	Garfield Avenue/Mission Road	City of Alhambra
I-18	San Gabriel Boulevard/Huntington Drive	City of San Marino/Unincorporated Los Angeles County (East Pasadena/East San Gabriel)
I-19	Del Mar Avenue/Mission Road	City of San Gabriel
I-22	San Gabriel Boulevard/Marshall Street	City of San Gabriel
I-24	Huntington Drive/Oak Knoll Avenue	City of San Marino
I-25	Huntington Drive/San Marino Avenue	City of San Marino
I-43	Del Mar Avenue/Valley Boulevard	City of San Gabriel
I-44	Hellman Avenue/Fremont Avenue	City of Alhambra
I-45	Eagle Rock Boulevard/Colorado Boulevard	City of Los Angeles (Eagle Rock)
Other Road Improvements		
T-1	Valley Boulevard to Mission Road Connector Road	Cities of Alhambra/Los Angeles (El Sereno)
T-2	SR 110/Fair Oaks Avenue Hook Ramps	Cities of South Pasadena/Pasadena
T-3	St. John Avenue Extension between Del Mar Boulevard and California Avenue	City of Pasadena

I-10 = Interstate 10
I-710 = Interstate 710
NB = northbound
SB = southbound
SR 110 = State Route 110
SR 134 = State Route 134
TDM = Transportation Demand Management
TSM = Transportation System Management

- **Expanded Bus Service and Bus Service Improvements:** Transit service improvements included in the TSM/TDM Alternative are summarized in Tables 2.3 and 2.4 and illustrated on Figure 2-3. The transit service improvements enhance bus headways between 10 and 30 minutes during the peak hour and 15 to 60 minutes during the off-peak period. Bus headways are the amount of time between consecutive bus trips (traveling in the same direction) on the bus route. Some of the bus service enhancements almost double existing bus service.
- **Bicycle Facility Improvements:** The bicycle facility improvements include on-street Class III bicycle facilities that support access to transit facilities through the study area and expansion of bicycle parking facilities at existing Metro Gold Line stations. Proposed bicycle facility improvements are outlined in Table 2.4.

TABLE 2.3:
Transit Refinements of the TSM/TDM Alternative

Bus Route	Operator	Route Type	Route Description	Existing Headways		Enhanced Headways	
				Peak	Off-Peak	Peak	Off-Peak
70	Metro	Local	From Downtown Los Angeles to El Monte via Garvey Avenue	10-12	15	10	15
770	Metro	Rapid	From Downtown Los Angeles to El Monte via Garvey Avenue/Cesar Chavez Avenue	10-13	15	10	15
76	Metro	Local	From Downtown Los Angeles to El Monte via Valley Boulevard	12-15	16	10	15
78	Metro	Local	From Downtown Los Angeles to Irwindale via Las Tunas Drive	10-20	16-40	10	15
378	Metro	Limited	From Downtown Los Angeles to Irwindale via Las Tunas Drive	18-23	-	20	30
79	Metro	Local	From Downtown Los Angeles to Santa Anita via Huntington Drive	20-30	40-45	15	30
180	Metro	Local	From Hollywood to Altadena via Los Feliz/Colorado Boulevard	30	30-32	15	30
181	Metro	Local	From Hollywood to Pasadena via Los Feliz/Colorado Boulevard	30	30-32	15	30
256	Metro	Local	From Commerce to Altadena via Hill Avenue/Avenue 64/Eastern Avenue	45	45	30	40
258	Metro	Local	From Paramount to Alhambra via Fremont Avenue/ Eastern Avenue	48	45-55	20	30
260	Metro	Local	From Compton to Altadena via Fair Oaks Avenue/ Atlantic Boulevard	16-20	24-60	15	30
762[1]	Metro	Rapid	From Compton to Altadena via Atlantic Boulevard	25	30-60	15	30
266	Metro	Local	From Lakewood to Pasadena via Rosemead Boulevard/Lakewood Boulevard	30-35	40-45	15	30
267	Metro	Local	From El Monte to Pasadena via Temple City Boulevard/Del Mar Boulevard	30	30	15	30
485	Metro	Express	From Union Station to Altadena via Fremont/Lake Avenue	40	60	30	60
487	Metro	Express	From Westlake to El Monte via Santa Anita Avenue/ Sierra Madre Boulevard/San Gabriel Boulevard	18-30	45	15	30
489	Metro	Express	From Westlake to East San Gabriel via Rosemead Boulevard	18-20	-	15	-
270	Metro	Local	From Norwalk to Monrovia via Workman Mill/Peck Road	40-60	60	30	60
780	Metro	Rapid	From West LA to Pasadena via Fairfax Avenue/ Hollywood Boulevard/Colorado Boulevard	10-15	22-25	10	20
187	Foothill	Local	From Pasadena to Montclair via Colorado Boulevard/ Huntington Drive/Foothill Boulevard	20	20	15	15

[1] This route would not be included as part of the BRT Alternative because the BRT Alternative would replace this service.
BRT = Bus Rapid Transit
Express = Express Bus
Foothill = Foothill Transit
Metro = Los Angeles County Metropolitan Transportation Authority
Rapid = Bus Rapid Transit
TDM = Transportation Demand Management
TSM = Transportation System Management

TABLE 2.4:
Active Transportation and Bus Enhancements of the TSM/TDM Alternative

ID No.	Description	Location
Bus Service Improvements		
Bus-1	Additional bus service	See Table 2.3 and Figure 2-3
Bus-2	Bus stop enhancements	Along routes listed in Table 2.3
Bicycle Facility Improvements		
Bike-1	Rosemead Boulevard bike route (Class III)	Colorado Boulevard to Valley Boulevard (through Los Angeles County, Temple City, Rosemead)
Bike-2	Del Mar Avenue bike route (Class III)	Huntington Drive to Valley Boulevard (through San Marino, San Gabriel)
Bike-3	Huntington Drive bike route (Class III)	Mission Road to Santa Anita Avenue (through the City of Los Angeles, South Pasadena, San Marino, Alhambra, Los Angeles County, Arcadia)
Bike-4	Foothill Boulevard bike route (Class III)	In La Cañada Flintridge
Bike-5	Orange Grove bike route (Class III)	Walnut Street to Columbia Street (in Pasadena)
Bike-6	California Boulevard bike route (Class III)	Grand Avenue to Marengo Avenue (in Pasadena)
Bike-7	Add bike parking at transit stations	Metro Gold Line stations
Bike-8	Improve bicycle detection at existing intersections	Along bike routes in study area

Metro = Los Angeles County Metropolitan Transportation Authority
TDM = Transportation Demand Management
TSM = Transportation System Management

2.3.3 Bus Rapid Transit (BRT) Alternative

The BRT Alternative would provide high-speed, high-frequency bus service through a combination of new, dedicated, and existing bus lanes, and mixed-flow traffic lanes to key destinations between East Los Angeles and Pasadena. The proposed route length is approximately 12 mi. Figure 2-4 illustrates the BRT Alternative.

The BRT Alternative includes the BRT trunk line arterial street and station improvements, frequent bus service, new bus feeder services, and enhanced connecting bus services. BRT includes bus enhancements identified in the TSM/TDM Alternative, except for improvements to Route 762.

Buses are expected to operate every 10 minutes during peak hours and every 20 minutes during off-peak hours. The BRT service would generally replace, within the study area, the existing Metro Route 762 service. The 12 mi route would begin at Atlantic Boulevard and Whittier Boulevard to the south, follow Atlantic Boulevard, Huntington Drive, Fair Oaks Avenue, Del Mar Boulevard, and end with a terminal loop in Pasadena to the north. Buses operating in the corridor would be given transit signal priority from a baseline transit signal priority project that will be implemented separately by Metro.

Where feasible, buses would run in dedicated bus lanes adjacent to the curb, either in one direction or both directions, during peak periods. The new dedicated bus lanes would generally be created within the existing street rights of way (ROW) through a variety of methods that include restriping the roadway, restricted on-street parking during peak periods, narrowing medians, planted parkways, or sidewalks. Buses would share existing lanes with other traffic in cases where there is not enough ROW. The exclusive lanes would be exclusive to buses and right-turning traffic during a.m. and p.m. peak hours only. At other times of day, the exclusive lanes would be available for on-street parking use.

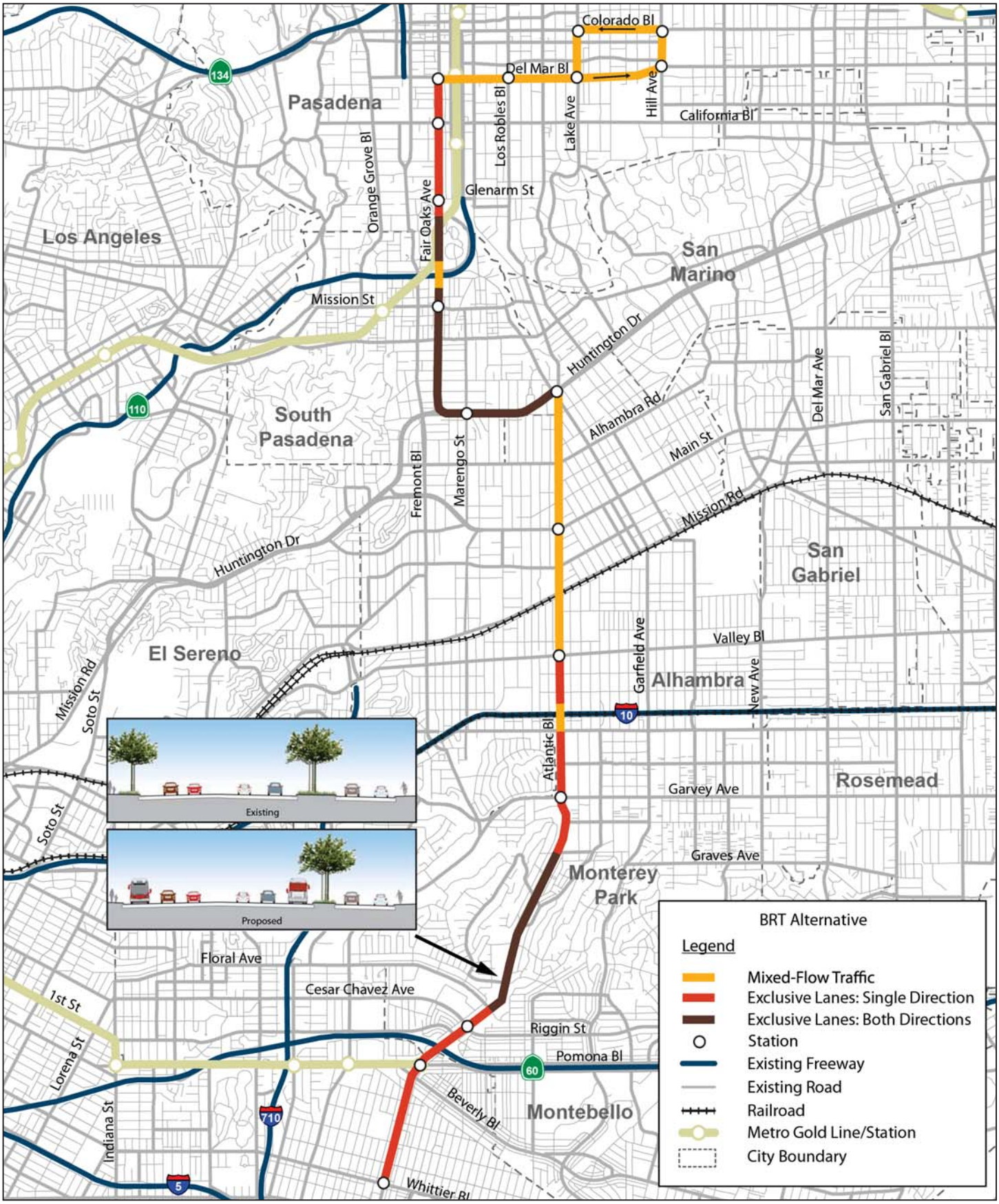

FIGURE 2-4

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SOURCE: CH2M HILL (2013)

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SR 710 North Study

BRT Alternative

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

A total of 17 BRT stations with amenities would be placed on average, at approximately 0.8 mi intervals at major activity centers and cross streets. Typical station amenities would include new shelters, branding elements, seating, wind screens, leaning rails, variable message signs (next bus information), lighting, bus waiting signals, trash receptacles, and stop markers. Some of these stops will be combined with existing stops, while in some cases, new stops for BRT will be provided. The BRT service would include 60-foot (ft) articulated buses with three doors, and would have the latest fare collection technology such as on-board smart card (Transit Access Pass [TAP] card) readers to reduce dwell times at stations. The BRT stops would be provided at the following 17 locations:

- Atlantic Boulevard at Whittier Boulevard
- Atlantic Boulevard between Pomona Boulevard and Beverly Boulevard
- Atlantic Boulevard at Cesar Chavez Avenue/Riggin Street
- Atlantic Boulevard at Garvey Avenue
- Atlantic Boulevard at Valley Boulevard
- Atlantic Boulevard at Main Street
- Huntington Drive at Garfield Avenue
- Huntington Drive at Marengo Avenue
- Fair Oaks Avenue at Mission Street
- Fair Oaks Avenue at Glenarm Street
- Fair Oaks Avenue at California Boulevard
- Fair Oaks Avenue at Del Mar Boulevard
- Del Mar Boulevard at Los Robles Avenue
- Del Mar Boulevard at Lake Avenue
- Del Mar Boulevard at Hill Avenue (single direction only)
- Colorado Boulevard at Hill Avenue (single direction only)
- Colorado Boulevard at Lake Avenue (single direction only)

Additionally, this alternative would include bus feeder routes that would connect additional destinations with the BRT mainline. Two bus feeder routes are proposed: one that would run along Colorado Boulevard, Rosemead Boulevard, and Valley Boulevard to the El Monte transit station; and another bus feeder route that would travel from Atlantic Boulevard near the Gold Line station to the Metrolink stations in the City of Commerce and Montebello via Beverly Boulevard and Garfield Avenue. In addition, other existing bus services in the study area would be increased in frequency and/or span of service. The El Sol shuttle improvements are an existing bus service that would be increased in frequency. The headways on the El Sol shuttle "City Terrace/East Los Angeles College (ELAC)" route that connect ELAC to the proposed Floral Station would be reduced from 60 minutes to 15 minutes.

The TSM/TDM Alternative improvements would also be constructed as part of the BRT Alternative, except as noted below. These improvements would provide the additional enhancements to maximize the efficiency of the existing transportation system by improving capacity and reducing the effects of

bottlenecks and chokepoints. Local Street Improvements L-8 (Fair Oaks Avenue from Grevelia Street to Monterey Road) and the reversible lane component of L-3 (Atlantic Boulevard from Glendon Way to I-10) would not be constructed with the BRT Alternative.

2.3.4 Light Rail Transit (LRT) Alternative

The LRT Alternative would include passenger rail operated along a dedicated guideway, similar to other Metro light rail lines. The LRT alignment is approximately 7.5 mi long, with 3 mi of aerial segments and 4.5 mi of bored tunnel segments. Figure 2-5 illustrates the LRT Alternative.

The LRT Alternative would begin at an aerial station on Mednik Avenue adjacent to the existing East Los Angeles Civic Center Station on the Metro Gold Line. The alignment would remain elevated as it travels north on Mednik Avenue, west on Floral Drive, north across Corporate Center Drive, and then along the west side of I-710, primarily in Caltrans ROW, to a station adjacent to the California State University, Los Angeles (Cal State LA). The alignment would descend into a tunnel south of Valley Boulevard and travel northeast to Fremont Avenue, north under Fremont Avenue, and easterly to Fair Oaks Avenue. The alignment would then cross under SR 110 and end at an underground station beneath Raymond Avenue adjacent to the existing Fillmore Station on the Metro Gold Line.

Two directional tunnels are proposed with tunnel diameters approximately 20 ft each, located approximately 60 ft below the ground surface. Other supporting tunnel systems include emergency evacuation cross passages for pedestrians, a ventilation system consisting of exhaust fans at each portal and an exhaust duct along the entire length of the tunnel, fire detection and suppression systems, communications and surveillance systems, and 24-hour monitoring, similar to the existing LRT system.

Trains would operate at speeds of up to 65 miles per hour (mph) approximately every 5 minutes during peak hours and 10 minutes during off-peak hours.

Seven stations would be located along the LRT alignment at Mednik Avenue in East Los Angeles, Floral Drive in Monterey Park, Cal State LA, Fremont Avenue in Alhambra, Huntington Drive in South Pasadena, Mission Street in South Pasadena, and Fillmore Street in Pasadena. The Fremont Avenue Station, the Huntington Drive Station, the Mission Street Station, and the Fillmore Street Station would be underground stations. New Park-and-Ride facilities would be provided at all of the proposed stations except for the Mednik Avenue, Cal State LA, and Fillmore Street stations.

A maintenance yard to clean, maintain, and store light rail vehicles would be located on both sides of Valley Boulevard at the terminus of SR 710. A track spur from the LRT mainline to the maintenance yard would cross above Valley Boulevard.

Two bus feeder services would be provided. One would travel from the Commerce Station on the Orange County Metrolink line and the Montebello Station on the Riverside Metrolink line to the Floral Station, via East Los Angeles College. The other would travel from the El Monte Bus Station to the Fillmore Station via Rosemead and Colorado Boulevards. In addition, other existing bus services in the study area would be increased in frequency and/or span of service.

As part of the LRT Alternative, the I-710 northbound off-ramp at Valley Boulevard would be modified.

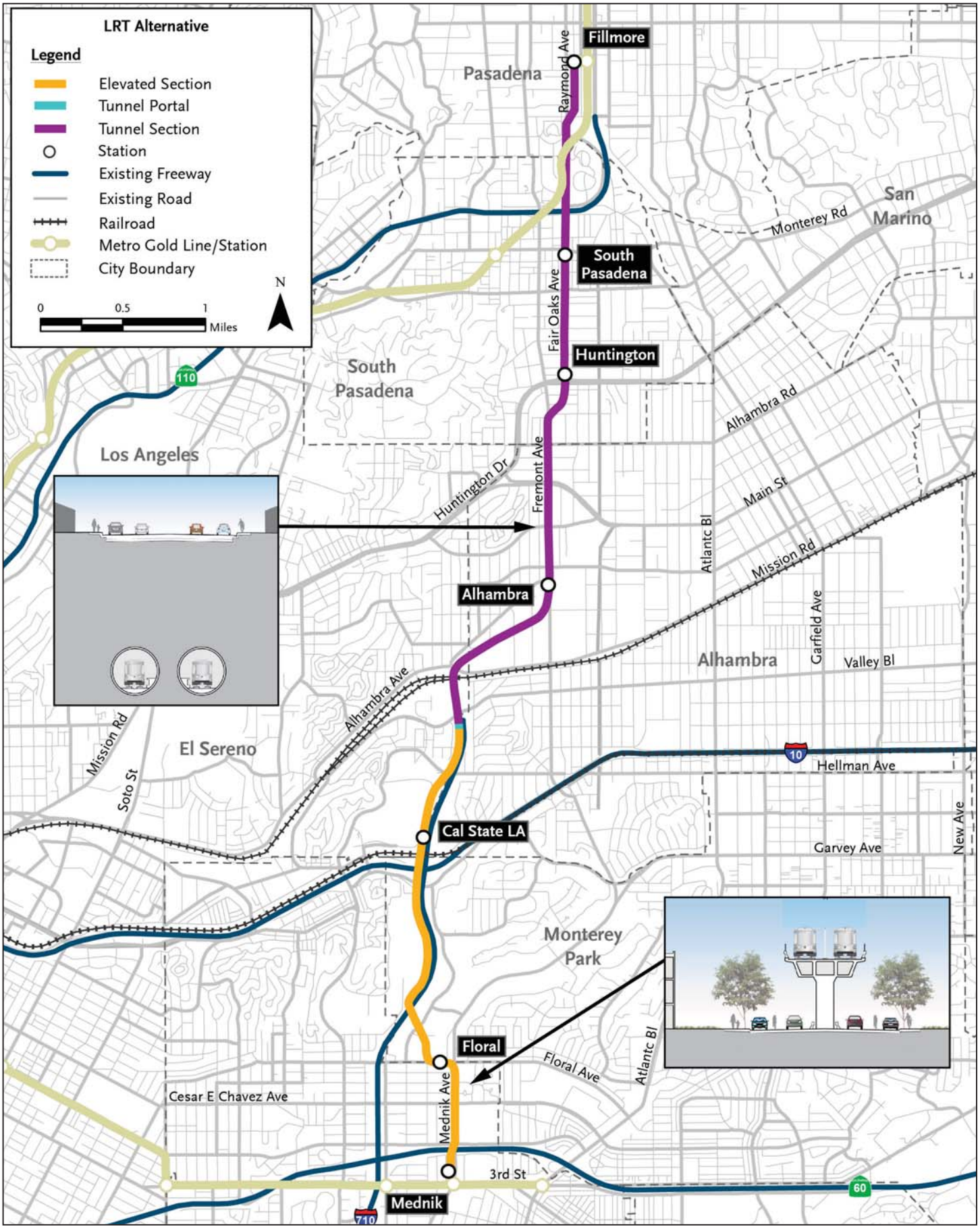

FIGURE 2-5

SR 710 North Study
LRT Alternative
07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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MILES

SOURCE: AECOM (2013)

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The TSM/TDM Alternative improvements would also be constructed as part of the LRT Alternative. These improvements would provide the additional enhancements to maximize the efficiency of the existing transportation system by improving capacity and reducing the effects of bottlenecks and chokepoints. The only component of the TSM/TDM Alternative improvements that would not be constructed with the LRT Alternative is Other Road Improvement T-1 (Valley Boulevard to Mission Road Connector Road).

2.3.5 Freeway Tunnel Alternative

The alignment for the Freeway Tunnel Alternative starts at the existing southern stub of SR 710 in Alhambra, just north of I-10, and connects to the existing northern stub of SR 710, south of the I-210/ SR 134 interchange in Pasadena. The Freeway Tunnel Alternative would include the following tunnel support systems: emergency evacuation for pedestrians and vehicles, air scrubbers, a ventilation system consisting of exhaust fans at each portal, an exhaust duct along the entire length of the tunnel and jet fans within the traffic area of the tunnel, fire detection and suppression systems, communications and surveillance systems, and 24-hour monitoring. An operations and maintenance (O&M) building would be constructed at the northern and southern ends of the tunnel. There would be no operational restrictions for the tunnel, with the exception of vehicles carrying flammable or hazardous materials. As part of both design variations of the Freeway Tunnel Alternative, the I-710 northbound off-ramp and southbound on-ramp at Valley Boulevard would be modified.

The TSM/TDM Alternative improvements would also be constructed as part of the Freeway Tunnel Alternative, including either the dual-bore or single-bore design variations. These improvements would provide the additional enhancements to maximize the efficiency of the existing transportation system by improving capacity and reducing the effects of bottlenecks and chokepoints. The only components of the TSM/TDM Alternative improvements that would not be constructed with the Freeway Tunnel Alternative are Other Road Improvements T-1 (Valley Boulevard to Mission Road Connector Road) and T-3 (St. John Avenue Extension between Del Mar Boulevard and California Boulevard).

2.3.5.1 Design Variations

The Freeway Tunnel Alternative includes two design variations. These variations relate to the number of tunnels constructed. The dual-bore design variation includes two tunnels that independently convey northbound and southbound vehicles. The single-bore design variation includes one tunnel that carries both northbound and southbound vehicles. Figure 2-6 illustrates the dual-bore and single-bore tunnel design variations for the Freeway Tunnel Alternative. Each of these design variations is described below.

- **Dual-Bore Tunnel:** The dual-bore tunnel design variation is approximately 6.3 mi long, with 4.2 mi of bored tunnel, 0.7 mi of cut-and-cover tunnel, and 1.4 mi of at-grade segments. The dual-bore tunnel design variation would consist of two side-by-side tunnels (the east tunnel would convey northbound traffic, and the west tunnel would convey southbound traffic). Each tunnel would have two levels with traffic traveling in the same direction. Each tunnel would consist of two lanes of traffic on each level, traveling in one direction, for a total of four lanes in each tunnel. The eastern tunnel would be constructed for northbound traffic, and the western tunnel would be constructed for southbound traffic. Each bored tunnel would have an outside diameter of approximately 58.5 ft and would be located approximately 120 to 250 ft below the ground surface. Vehicle cross passages would be provided throughout this tunnel variation that would connect one tunnel to the other tunnel for use in an emergency situation. Figure 2-6 illustrates the dual-bore tunnel variation of the Freeway Tunnel Alternative.

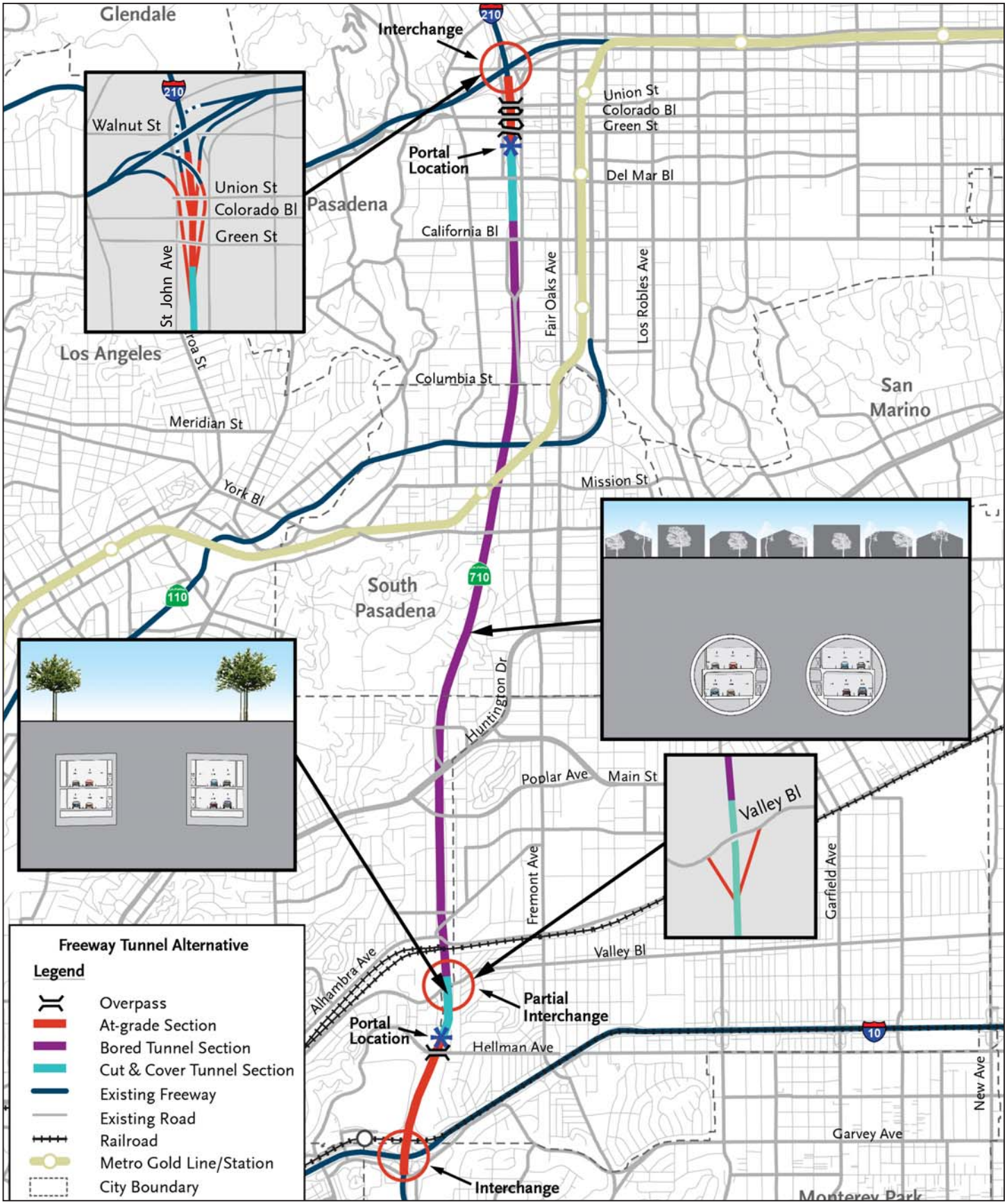

FIGURE 2-6

SR 710 North Study
Freeway Tunnel Alternative
Single and Dual Bore
07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

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MILES

SOURCE: CH2M HILL (2013)

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Short segments of cut-and-cover tunnels would be located at the south and north termini to provide access via portals to the bored tunnels. The portal at the southern terminus would be located south of Valley Boulevard. The portal at the northern terminus would be located north of Del Mar Boulevard. No intermediate interchanges are planned for the tunnel.

- **Single-Bore Tunnel:** The single-bore tunnel design variation is also approximately 6.3 mi long, with 4.2 mi of bored tunnel, 0.7 mi of cut-and-cover tunnel, and 1.4 mi of at-grade segments. The single-bore tunnel design variation would consist of one tunnel with two levels. Each level would have two lanes of traffic traveling in one direction. The northbound traffic would traverse the upper level, and the southbound traffic would traverse the lower level. The single-bore tunnel would provide a total of four lanes. The single-bore tunnel would also have an outside diameter of approximately 58.5 ft and would be located approximately 120 to 250 ft below the ground surface. The single-bore tunnel would be in the same location as the northbound tunnel in the dual-bore tunnel design variation. Figure 2-7 illustrates the single-bore tunnel variation cross section of the Freeway Tunnel Alternative.

2.3.5.2 Operational Variations

There were three different parameters related to the operational variations of the Freeway Tunnel Alternative:

- **Tolling:** Tolls could be charged for vehicles using the tunnel, or it could be free for all drivers (a conventional freeway).
- **Trucks:** Trucks could be prohibited or allowed.
- **Express Bus:** A dedicated Express Bus could be operated using the tunnel. The Express Bus route would start at the Commerce Station on the Orange County Metrolink line, and then serve the Montebello Station on the Riverside Metrolink line and East Los Angeles College before entering I-710 at Floral Drive. The bus would travel north to Pasadena via the proposed freeway tunnel, making a loop serving Pasadena City College, the California Institute of Technology, and downtown Pasadena before re-entering the freeway and making the reverse trip.

The following operational variations have been studied for the Freeway Tunnel Alternative:

- **Freeway Tunnel Alternative without Tolls:** The facility would operate as a conventional freeway with lanes open to all vehicles. Trucks would be allowed and there would be no Express Bus service. This operational variation would be considered for only the dual-bore tunnel design variation.
- **Freeway Tunnel Alternative with Trucks Excluded:** The facility would operate as a conventional freeway; however, trucks would be excluded from using the tunnel. There would be no Express Bus service. Signs would be provided along I-210, SR 134, I-710, and I-10 to provide advance notice of the truck restriction. This operational variation would be considered for the dual-bore tunnel only.
- **Freeway Tunnel Alternative with Tolls:** All vehicles, including trucks, using the tunnel would be tolled. There would be no Express Bus service. This operational variation would be considered for both the dual- and single-bore tunnels described above.
- **Freeway Tunnel Alternative with Trucks Excluded and with Tolls:** The facility would be tolled for all automobiles. There would be no Express Bus service. Trucks would be excluded from using the tunnel. Signs would be provided along I-210, SR 134, I-710, and I-10 to provide advance notice of the truck restriction. This operational variation would be considered for the single-bore tunnel only.

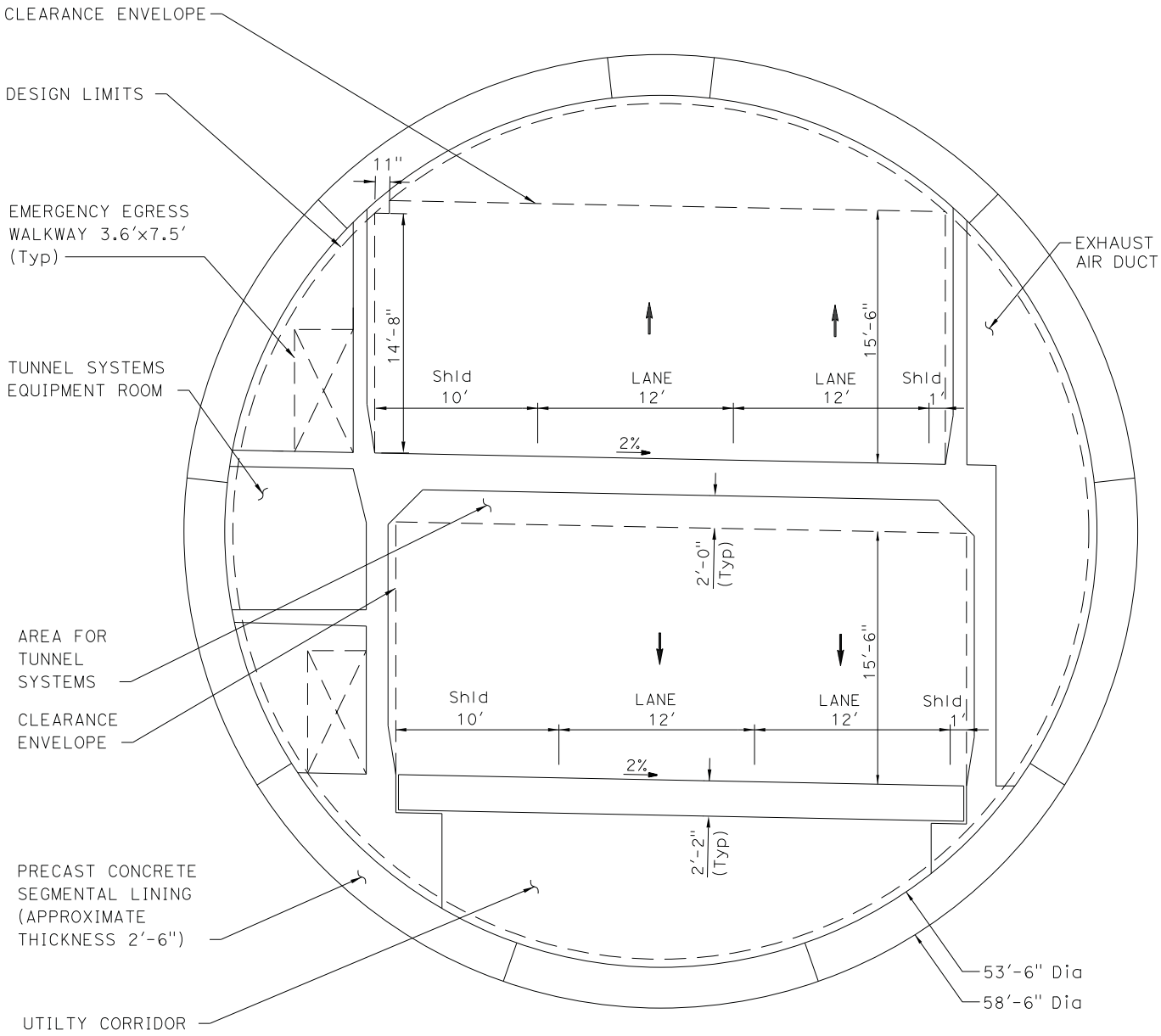

FIGURE 2-7

SR 710 North Study
Freeway Tunnel Alternative
Single Bore Cross Section
07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

SOURCE: CH2M HILL (2014)

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- **Freeway Tunnel Alternative with Toll and Express Bus:** The freeway tunnel would operate as a tolled facility and include an Express Bus component. The Express Bus would be allowed in any of the travel lanes in the tunnel; no bus-restricted lanes would be provided. Trucks would be permitted. This operational variation would be considered for the single-bore tunnel only.

3. Summary Floodplain Encroachment Report

Dist. 07 **Co.** LA **Rte.** 710 **P.M.** PM 26.7/32.1
Project No.: E.A. 187900/EFIS 0700000191 **Bridge No.** N/A
Limits: SR 2, I-5, I-10, I-210, and I-605
Floodplain Description: Laguna Regulating Basin and Dorchester Avenue Storm Drain (Dorchester Channel, also referred to as Laguna Channel).

		No	Yes
1.	Is the proposed action a longitudinal encroachment of the base floodplain?		X
2.	Are the risks associated with the implementation of the proposed action significant?	X	
3.	Will the proposed action support probable incompatible floodplain development?	X	
4.	Are there any significant impacts on natural and beneficial floodplain values?	X	
5.	Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.	X	
6.	Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).	X	
7.	Are Location Hydraulic Studies that document the above answers on file? If not explain.		X

PREPARED BY:

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4. Regulatory Background

Executive Order (EO) 11988, Floodplain Management, places special importance on floodplains and directs federal agencies to avoid conducting, allowing, or supporting actions on a floodplain wherever there is a practicable alternative. If an action results in development within a floodplain, agencies are required to minimize potential harm to people and property and to natural and beneficial floodplain values. The Federal Highway Administration (FHWA) requirements for compliance are outlined in 23 Code of Federal Regulations (CFR), Section 650, Subpart A.

In order to comply, the following must be analyzed:

- The practicability of alternatives to any longitudinal encroachments
- Risks of the action
- Impacts on natural and beneficial floodplain values
- Support of incompatible floodplain development
- Measures to minimize floodplain impacts and to preserve/restore any beneficial floodplain values impacted by the project

The Federal Emergency Management Agency (FEMA) has prepared Flood Insurance Rate Maps (FIRMs) that delineate flood zones based on estimated flood risk. These zones are located in a 100-year floodplain, or in an area of 1 percent annual chance of flood hazard in a community. Zone A is the FEMA designation for areas of 100-year flood where base flood elevations and flood hazard factors have not been determined. Zones A1–A30, AE, AH, and AO are the designations for areas of the 100-year flood in which base flood elevations and flood hazard factors have been determined. Zones B and X are the designations for areas between the limits of the 100-year and 500-year floodplains. Zones C and X are the designations for areas determined to be outside the 500-year floodplain. Zone D is the designation for areas with possible but undetermined flood hazards. Zone AR constitutes areas with a temporary increased flood risk due to the building or restoration of a flood control system. Zone A99 is the designation for areas within a 100-year floodplain that will be protected by a flood control system under construction. Zones V, VE, and V1–V30 are coastal flood zones.

The FEMA FIRMs also designate floodway areas, which are defined as the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 100-year storm can be carried without substantial increases in flood heights.

An “encroachment” is defined as an action within the limits of the 100-year floodplain. The 44 CFR Section 60.3(c)(10) requires that an encroachment not increase the water surface elevation of the base flood by more than 1 ft.

A “significant encroachment,” as defined in 23 CFR Section 650.105(q) is a highway encroachment that would result in: (1) a significant potential for interruption or termination of a transportation facility that is needed for emergency vehicles or provides a community’s only evacuation, (2) a significant risk (to life or property), or (3) a significant adverse impact on natural and beneficial floodplain values. A “significant” effect under the California Environmental Quality Act (CEQA) is a substantial, or potentially substantial, adverse change.

5. Watershed Description

The project study area is located in Los Angeles County within the Los Angeles River Watershed. The Los Angeles River Watershed is part of the larger Los Angeles-San Gabriel Hydrologic Unit. The Los Angeles-San Gabriel Hydrologic Unit is divided into hydrologic areas and subareas. The project study area lies within the Los Angeles-San Gabriel Hydrologic Unit, the Raymond, Coastal Plain, and San Fernando Hydrologic Areas, and the Pasadena, Central Split, and Eagle Rock Hydrologic Subareas (LARWQCB, 1995).

The Los Angeles-San Gabriel Hydrologic Unit covers approximately 1,608 square miles of Los Angeles County and small areas of Ventura County (LARWQCB, 1995). The Los Angeles River Watershed is approximately 834 square miles and is one of the largest watersheds in the region (LACDPW, 2013). The eastern portion of the watershed spans from the Santa Monica Mountains to the Simi Hills and in the west from the Santa Susana Mountains to the San Gabriel Mountains. The watershed encompasses and is shaped by the path of the Los Angeles River, which flows from its headwaters in the mountains eastward to the northern corner of Griffith Park. Here the channel turns southward through the Glendale Narrows before it flows across the coastal plain and into San Pedro Bay near Long Beach. While the Los Angeles River was once an uncontrolled, meandering river, it is now predominantly a major flood protection waterway (LACDPW, 2013).

6. Floodplain Description

There are no published Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) for the area that includes the Laguna Regulating Basin and Dorchester Channel floodplains. Information about the floodplains of these two facilities is based on available engineering documents (e.g., As-Built plans) and design reports gathered from the Los Angeles County Department of Public Works and the California Department of Transportation (Caltrans) (CH2M HILL, 2014a). Both facilities are owned and maintained by the Los Angeles County Department of Public Works and Los Angeles County Flood Control District (CH2M HILL, 2014a). Figure 6-1 presents an overview of the Laguna Regulating Basin and Dorchester Channel floodplains. In lieu of a federally established floodplain, the floodplains for Laguna Regulating Basin and Dorchester Channel are defined in this section for the purpose of evaluating floodplain impacts.

Several Build Alternatives are being considered to improve mobility and relieve congestion as part of the State Route 710 (SR 710) North Study, including the TSM/TDM Alternative, BRT Alternative, LRT Alternative, and the Freeway Tunnel Alternative. The TSM/TDM, BRT, and LRT Alternatives do not encroach into any floodplains. The single-bore Freeway Tunnel Alternative design variation alignment crosses the Laguna Regulating Basin floodplain. The dual-bore Freeway Tunnel Alternative design variation alignment crosses the Laguna Regulating Basin floodplain and Dorchester Avenue Storm Drain (Dorchester Channel) floodplain. These floodplains are described in detail below.

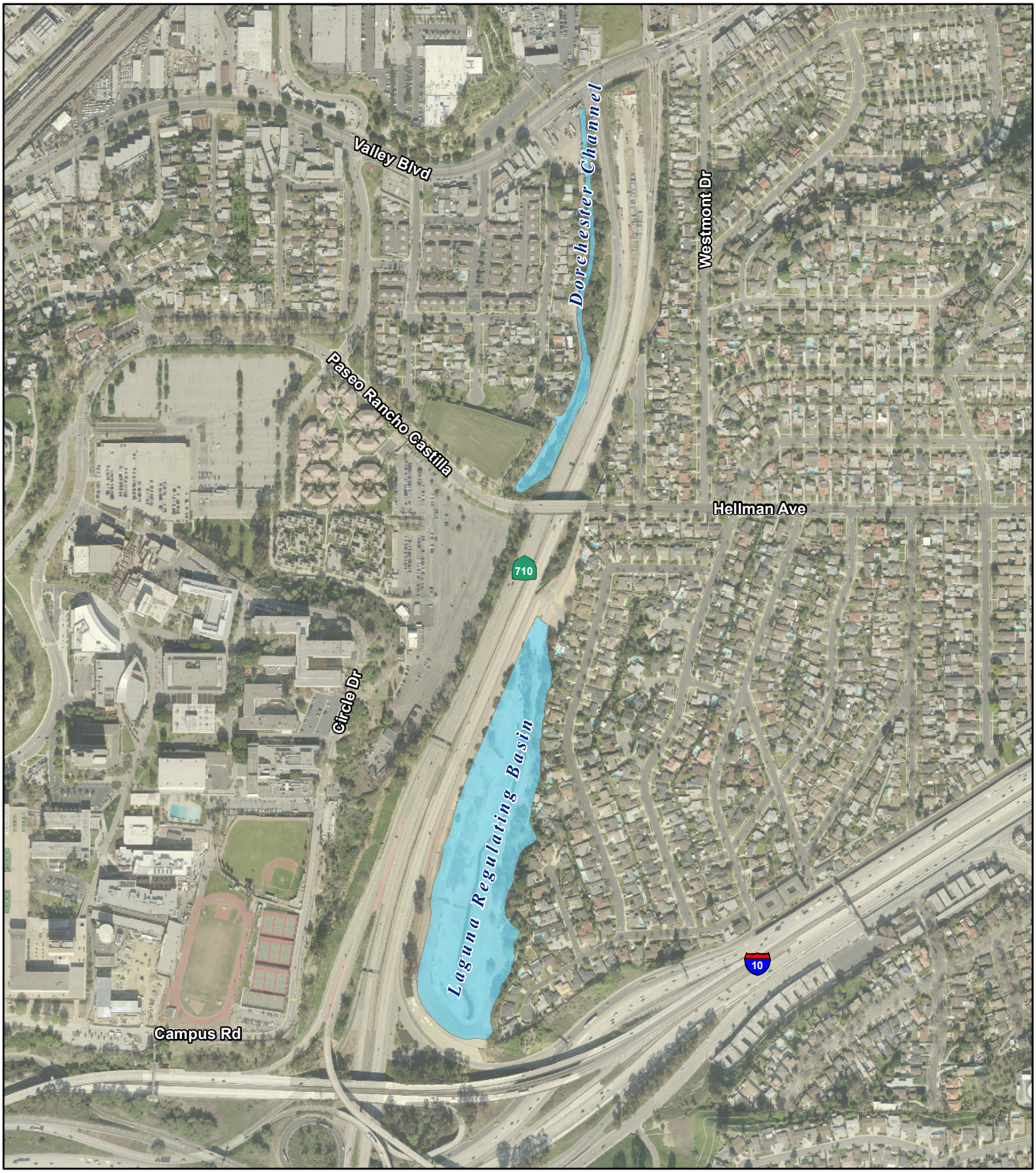
6.1 Laguna Regulating Basin

The Laguna Regulating Basin collects runoff from the watersheds north of Interstate 10 (I-10), including the communities of Alhambra, Monterey Hills, and South Pasadena. The Dorchester Channel drains into the Laguna Regulating Basin. The Laguna Regulating Basin drains through several channel systems and eventually discharges into the Los Angeles River in the City of Vernon.

Available information to establish the flood of record for the combined Dorchester Channel and Laguna Regulating Basin is limited. The Los Angeles Department of Public Works indicated there has never been an overtopping flood in the Basin since it was constructed, even during wet years (CH2M HILL, 2014b). Therefore, the highest possible inundated area prior to spillway activity is assumed to be the basis for analyzing impacts to the existing floodplain. The spillway crest elevation is at 318.0 feet (ft) (North Atlantic Vertical Datum [NAVD] 1983), and an overtopping flood would rise above this elevation. Given there is no record of an overtopping flood (i.e., spillway activity), this condition is an extreme event with a return frequency likely to be greater than 100 years.

6.2 Dorchester Avenue Storm Drain (Dorchester Channel)

The Dorchester Channel collects runoff from the watersheds north of I-10, including the communities of Alhambra, Monterey Hills, and South Pasadena. The Dorchester Channel drains into the Laguna Regulating Basin. The Laguna Regulating Basin drains through several channel systems and eventually discharges into the Los Angeles River in the City of Vernon.



LEGEND

Existing Floodplain

FIGURE 6-1

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FEET

SOURCE: LARIAC (2010); CH2M Hill (2013)

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SR 710 North Study

Floodplain Overview

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

The data available for Dorchester Channel indicate that design flows for this system were based on a 50-year frequency in accordance with Los Angeles County methodology, also known as the Capital Flood. In Los Angeles County, the Capital Flood is used for the purpose of floodplain evaluations (LACDPW, Hydrology Manual 2006).

7. Technical References

The following technical report was used to support the conclusions of this Summary Floodplain Encroachment Report (SFER).

- *Location Hydraulic Study – SR 710 North Study* (February 2014)

8. Supporting Text

The *Location Hydraulic Study* for the State Route 710 (SR 710) North Study was used to support the conclusions of this Summary Floodplain Encroachment Report (SFER). Of the Build Alternatives being considered, the No Build, TSM/TDM, BRT, and LRT Alternatives do not encroach into any floodplains. The single-bore Freeway Tunnel Alternative design variation alignment crosses the Laguna Regulating Basin floodplain. The dual-bore Freeway Tunnel Alternative design variation alignment crosses the Laguna Regulating Basin floodplain and Dorchester Avenue Storm Drain (Dorchester Channel) floodplain. Therefore, the assessment below addresses the floodplain impacts to the drainage features for both the single-bore and dual-bore Freeway Tunnel Alternative design variations.

Both the single-bore and dual-bore Freeway Tunnel Alternative design variations would start at the existing SR 710 in Monterey Park, south of Interstate 10 (I-10), and connect to the existing northern stub of SR 710, south of the Interstate 210/State Route 134 (I-210/SR 134) interchange in Pasadena. Short segments of cut-and-cover tunnels would be located at the south and north termini to provide access via portals to the bored tunnels. The access to the south portal for both the single-bore and dual-bore Freeway Tunnel Alternative design variations would require widening of the freeway approaches.

1. Is the proposed action a longitudinal encroachment of the base floodplain?

Laguna Regulating Basin. The widening of the freeway associated with the single-bore and dual-bore Freeway Tunnel Alternative design variations would involve a longitudinal encroachment[1] within the floodplain of the Laguna Regulating Basin. The longitudinal encroachment into the Laguna Regulating Basin would be up to 20 feet (ft) wide and 700 ft long along the Laguna Regulating Basin's western boundary, on the east side of the new freeway (Figure 8-1). Widening SR 710 in this location would be accomplished by placing it on a bridge structure. The bridge structure would be supported by piers that would be placed in the floodplain. The area under the bridge would be excavated. By using a bridge structure to widen SR 710 in this location, the storage volume of the Laguna Regulating Basin would not be reduced. The additional excavation that would be required under the bridge structure would result in slight modifications to the floodplain boundary, but the base floodplain elevation would not change.

There is an existing maintenance road along the west side of the Laguna Regulating Basin. Because of the widening of SR 710 in this location, it would be necessary to replace the existing maintenance road with a new entrance and maintenance vehicle pull-out area. The new entrance road and maintenance vehicle pull-out area would be constructed on top of a berm that is outside the current floodplain boundary and therefore would not affect the existing floodplain boundary and would not constitute a longitudinal encroachment.

The longitudinal encroachment along the western boundary of the Laguna Regulating Basin is necessary to reduce impacts to existing right of way (ROW), slope easements, channel structures, land uses, hydrology, and potential geotechnical and seismic issues. As noted above, the longitudinal encroachment involves the construction of an elevated bridge structure to accommodate the widening of SR 710. The bridge structure would be supported by piers that would be placed in the floodplain. The area under the bridge would be excavated. By using a bridge structure to widen SR 710 at this location,

[1] A longitudinal encroachment is the construction, placement of fill, or similar alteration of topography within the limits of the base floodplain that is parallel to the direction of flow and may reduce the area available to convey floodwaters.

LEGEND

Existing Floodplain

Proposed Floodplain

FIGURE 8-1

SR 710 North Study

Existing and Proposed Floodplain
Laguna Regulating Basin

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

N

0 150 300
FEET

SOURCE: LARIAC (2010); CH2M Hill (2013)

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the floodplain encroachment would not reduce the storage volume of the Laguna Regulating Basin; therefore, in the proposed project condition, the base floodplain elevation would not change. Therefore, no alternatives are required.

Dorchester Avenue Storm Drain (Dorchester Channel). The single-bore Tunnel Freeway Alternative design variation would not encroach into Dorchester Channel. The widening of the freeway, for the dual-bore Freeway Tunnel Alternative design variation only, would encroach into the Dorchester Channel on the west side of the new freeway (Figure 8-2). The new freeway would affect approximately 728 ft at the southern end of the reinforced concrete channel (RCC) and approximately 267 ft at the northern end of the RCC. The dual-bore Freeway Tunnel Alternative design variation would raise the SR 710 roadway profile along the west side of the roadway and fill into the sunken channel, which would result in a narrowing of the floodplain boundary for approximately 650 ft in a section of the Dorchester Channel north of Hellman Avenue. Where Dorchester Channel would be impacted, the existing 20 ft by 14 ft RCC would be replaced with a double 9.67 ft x 14 ft reinforced concrete box (RCB) along the original channel alignment. The RCC would be replaced with an RCB in the following two locations:

- 59 ft north of Hellman Avenue (for approximately 728 ft)
- 246 ft north of the first box (for approximately 267 ft)

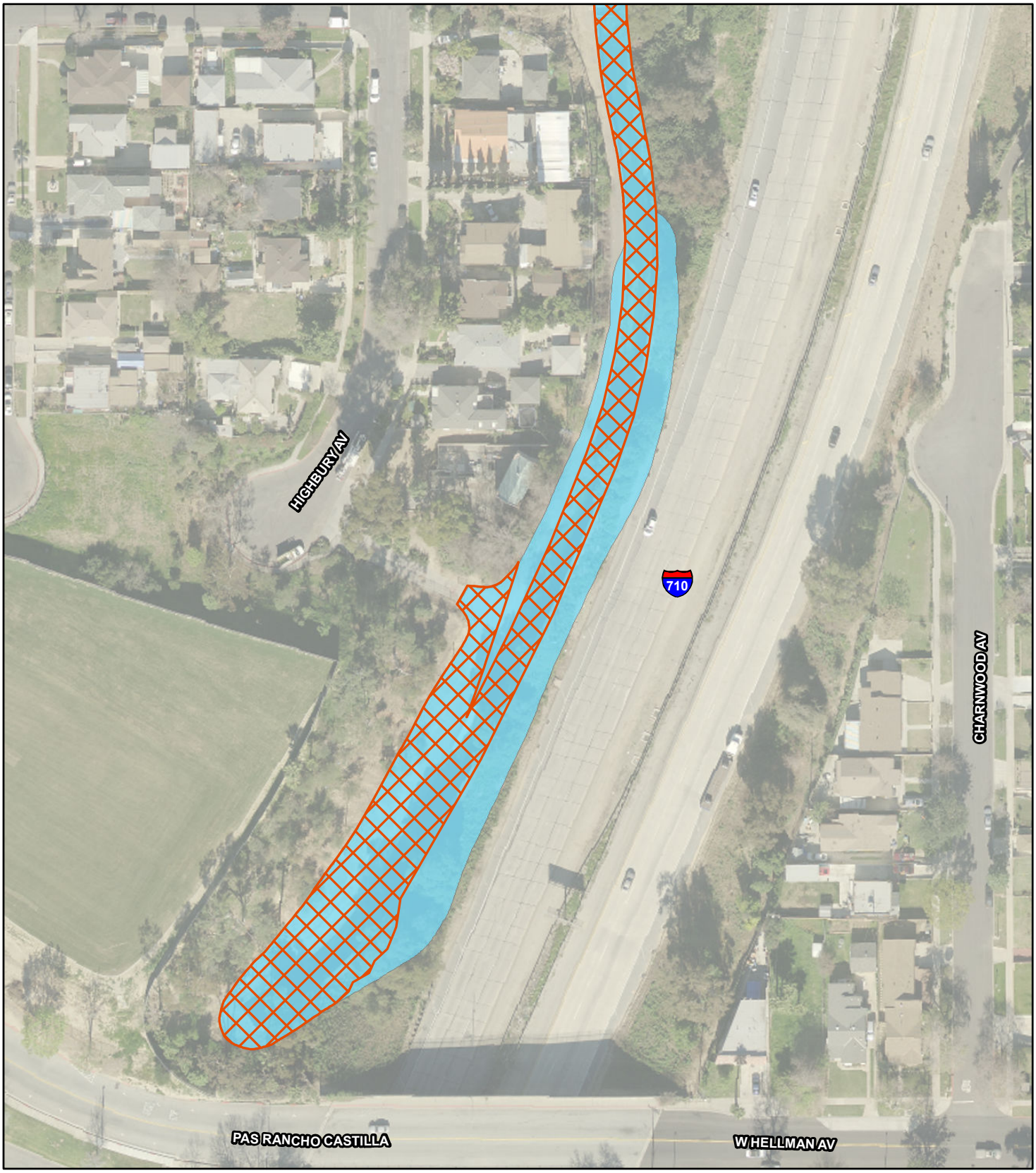
Fill would be placed above the new RCBs. The floodplain boundary would only be affected for about 650 ft at the southern end of the channel from 59 ft north of Hellman Avenue (Figure 8-2).

The dual-bore Freeway Tunnel Alternative design variation minimizes the longitudinal encroachment within the floodplain of the Dorchester Channel. Other design variations considered for this Alternative would have required geometric modifications to the horizontal or vertical alignment, or realignment of the freeway mainline. Those design variations would induce more severe impacts to existing ROW, land uses, and hydrology east of the Freeway. Therefore alternatives to the longitudinal encroachment are not feasible.

2. Are the risks associated with the implementation of the proposed action significant?

Laguna Regulating Basin. Both the single-bore and dual-bore Freeway Tunnel Alternative design variations would encroach horizontally into the west side of the Laguna Regulating Basin. The encroachment would result in slight modifications to the floodplain boundary, but the base floodplain elevation would not change. Furthermore, it is possible that the excavation for the bridge structure would increase and not decrease the basin storage volume. Therefore, there would be no increased flood risk and no significant risk to life or property associated with implementation of the single-bore and dual-bore Freeway Tunnel Alternative design variations.

The longitudinal encroachment would also affect the existing maintenance road along the west side of the Laguna Regulating Basin. The existing maintenance road would be constructed in an area that is outside the current floodplain boundary and therefore would not affect the existing floodplain boundary. Therefore, there would be no increased flood risk and no significant risk to life or property associated with implementation of the single-bore and dual-bore Freeway Tunnel Alternative design variations. Based on the assessment of level of risk in the *Location Hydraulic Study*, the longitudinal encroachment into the Laguna Regulating Basin is considered “low” risk.



LEGEND

Existing Floodplain

Proposed Floodplain

FIGURE 8-2

SR 710 North Study

Existing and Proposed Floodplain
Dorchester Channel

07-LA-710 (SR 710)
EA 187900
EFIS 0700000191

0 50 100
FEET

SOURCE: LARIAC (2010); CH2M Hill (2013)

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Dorchester Avenue Storm Drain (Dorchester Channel). The encroachment into Dorchester Channel from the dual-bore Freeway Tunnel Alternative design variation would require construction of a new RCB that would increase the water surface elevation in the channel. The increase in water surface elevation would range from a minimum of 0.25 ft to a maximum increase of 2.11 ft. The maximum increase in the water surface elevation would occur approximately 235 ft upstream of the Hellman Avenue crossing. The water surface elevation in the upstream channel would not be altered. While the water surface elevation within the RCB would change, it would still be contained within the RCB, and the minimum capacity of Dorchester Channel would be maintained. Therefore, there would be no increased flood risk to the upstream community, and no significant risk to life or property would occur.

Based on the assessment of level of risk in the *Location Hydraulic Study*, the encroachments in the Dorchester Channel are considered "low" risk.

The minor change in water surface elevation in Dorchester Channel would not result in any significant change in flood risks or damage and does not have significant potential for interruption or termination of emergency service or emergency routes. Therefore, the proposed encroachment into the Laguna Regulating Basin and Dorchester Channel is not significant.

3. Will the proposed action support probable incompatible floodplain development?

The areas surrounding the Laguna Regulating Basin floodplain and Dorchester Channel floodplain are already developed. Additionally, the Freeway Tunnel Alternative single-bore and dual-bore tunnel design variations would lessen the impacts to the existing roadway network as the area continues to be developed or redeveloped. The Freeway Tunnel Alternative single-bore and dual-bore tunnel design variations and future development in the area would have some physical effect on the floodplain, but the single-bore and dual-bore tunnel design variations and future non-project-related development would comply with policies in the General Plans of the Cities of Alhambra, Monterey Park, Pasadena, Rosemead, San Gabriel, San Marino, and South Pasadena, and the County of Los Angeles. Therefore, the single-bore and dual-bore Freeway Tunnel Alternative design variations would not support probable incompatible floodplain development.

4. Are there significant impacts on natural and beneficial floodplain values?

Natural and beneficial floodplain values include, but are not limited to, fish, wildlife, plans, open space, natural beauty, scientific study, outdoor recreation, agriculture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge. Beneficial uses for surface waters are defined in the Los Angeles Regional Water Quality Control Board (RWQCB) Basin Plan as various ways that water can be used for the benefit of people and/or wildlife. Examples of beneficial uses include municipal and domestic water supply, agricultural water supply, industrial service supplies, industrial process supply, groundwater recharge, water contact recreation, non-contact water recreation, warm freshwater habitat, cold freshwater habitat, wildlife habitat, spawning habitat, and rare, threatened, or endangered species habitat. Neither Dorchester Channel nor the Laguna Regulating Basin is listed in the Los Angeles RWQCB Basin Plan as having any beneficial uses. The Dorchester Channel is a constructed storm drain system in a developed urban area. Because it is an engineered waterway with a concrete bottom and little or no vegetation, the open space, natural beauty and outdoor recreational values of Dorchester Channel are limited. It also has limited value to support fish, wildlife, and plant habitat. The Laguna Regulating Basin is an engineered detention basin with an earthen bottom. Some opportunistic vegetation was recorded within the detention basin but no wetland or riparian vegetation was observed (Sapphos Environmental, 2013). Therefore, the Laguna Regulating Basin has limited value to support

fish, wildlife, and plant habitat. Furthermore, the open space, natural beauty and outdoor recreational values of the Laguna Regulating Basin are limited. Therefore, implementation of the proposed project would not result in significant impacts to the natural and beneficial floodplain values of Dorchester Channel or the Laguna Regulating Basin.

5. Routine construction procedures are required to minimize impacts on the floodplain. Are there special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.

The single-bore and dual-bore Freeway Tunnel Alternative design variations would construct the widened SR 710 on elevated structures and would minimize grading impacts to the Laguna Regulating Basin floodplain by returning all disturbed slopes to their existing lines and grade. As noted above, the Laguna Regulating Basin and Dorchester Channel possess limited natural and beneficial floodplain values. Therefore, there are no special mitigation measures necessary to minimize impacts to these waterways.

6. Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR Section 650.105(q)?

A "significant encroachment," as defined in 23 CFR Section 650.105(q) is a highway encroachment that would result in: (1) a significant potential for interruption or termination of a transportation facility that is needed for emergency vehicles or provides a community's only evacuation route, (2) a significant risk (to life or property), or (3) a significant adverse impact on natural and beneficial floodplain values. The proposed action does not constitute a significant floodplain encroachment as defined in 23 CFR Section 650.105(q). The implementation of the proposed project would not change the capacity of the Dorchester Channel to carry water or the Laguna Regulating Basin to store water. The proposed Freeway Tunnel Alternative single-bore and dual-bore tunnel design variations would result in a nominal reduction of the floodplain boundaries associated with the Dorchester Channel and Laguna Regulating Basin. This nominal reduction in the floodplain area would not result in an increase in the water surface elevation in the Laguna Regulating Basin and would result in only a minor increase in water surface elevation in Dorchester Channel (see Response No. 2). The minor change in water surface elevation in Dorchester Channel would not result in any significant change in flood risks or damage, and does not have significant potential for interruption or termination of emergency service or emergency routes. Therefore, the proposed encroachment into the Laguna Regulating Basin and Dorchester Channel is not significant.

7. Is the *Location Hydraulic Study* that documents the above answers on file in the agency's office? If not, explain.

A *Location Hydraulic Study* was prepared for the SR 710 North Study. The *Location Hydraulic Study* contains the requisite information as described in Chapter 17 of the California Department of Transportation (Caltrans) Standard Environmental Reference (SER) and in 23 CFR, Section 650A, Section 650.111(b)(c).

9. References

California Department of Transportation (Caltrans). Standard Environmental Reference, Volume 1, Chapter 17, Floodplains, http://www.dot.ca.gov/ser/vol1/sec3/special/ch17flood/chap17.htm#topic, accessed December 3, 2013.

CH2M HILL. February 2014a. *Location Hydraulic Study – SR 710 North Study*.

CH2M HILL. February 2014b. *Location Hydraulic Study – SR 710 North Study*, Appendix A, Meeting Summary Notes, dated April 3, 2013.

Los Angeles County Department of Public Works (LACDPW). Los Angeles River Watershed, http://www.ladpw.org/wmd/watershed/la/, accessed October 2013.

Los Angeles Regional Water Quality Control Board (LARWQCB). 1995. Basin Plan, http://www.waterboards.ca.gov/rwqcb4/water_issues/programs/basin_plan/electronics_documents/bp1_introduction.pdf, accessed October 2013.

Sapphos Environmental, Inc. October 2013. *SR 710 North Study Jurisdictional Delineation Report*.