07 - LA - 105 – R0.5/R18.1
07 - LA - 110 – R13.8/R14.8
EA 07-31450 – EFIS 0715000122 – PPNO 4858
20.XX.075.600 – State Local Partnership Fund
April/2020

Draft Project Report

To

Authorize Public Release of the Draft Environmental Document

On Route	Interstate (I-) 105
Between	Imperial Highway and Sepulveda Boulevard Intersection, West of I-405 in the City of Los Angeles (07-LA-105 – R0.5)
And	Studebaker Road, East of I-605 in the City of Norwalk (07 - LA - 105 – R18.1)

And

On Route	I-110
Between	I-105 Separation in the City of Los Angeles (07-LA-110 – R13.8)
And	103rd Street in the City of Los Angeles (07-LA-110 – R14.8)

I have reviewed the right-of-way information contained in this report and the Right-of-Way Data Sheet attached hereto, completed by Los Angeles County Metropolitan Transportation Authority (Metro) and Consultants WSP and Epic Land Solutions, Inc., and find the data to be complete to form and procedures. No inference or assertions are made as to the validity of the data or the values implied by the Right-of-Way Data Sheet.

Dan Murdoch

Andrew P. Nierenberg, *DEPUTY DISTRICT DIRECTOR, Acting Right of Way*

APPROVAL RECOMMENDED:

Philbert Wong, *PROJECT SPONSOR, Los Angeles County Metropolitan Transportation Authority, Accepts Risks Identified in this PR and Attached Risk Register*

APPROVAL RECOMMENDED:

Mohammed Chowdhury, *PROJECT MANAGER, Office of Program and Project Management*

PROJECT APPROVED:

John Bulinski, *DISTRICT DIRECTOR*
Caltrans District 7

5/26/2020
DATE

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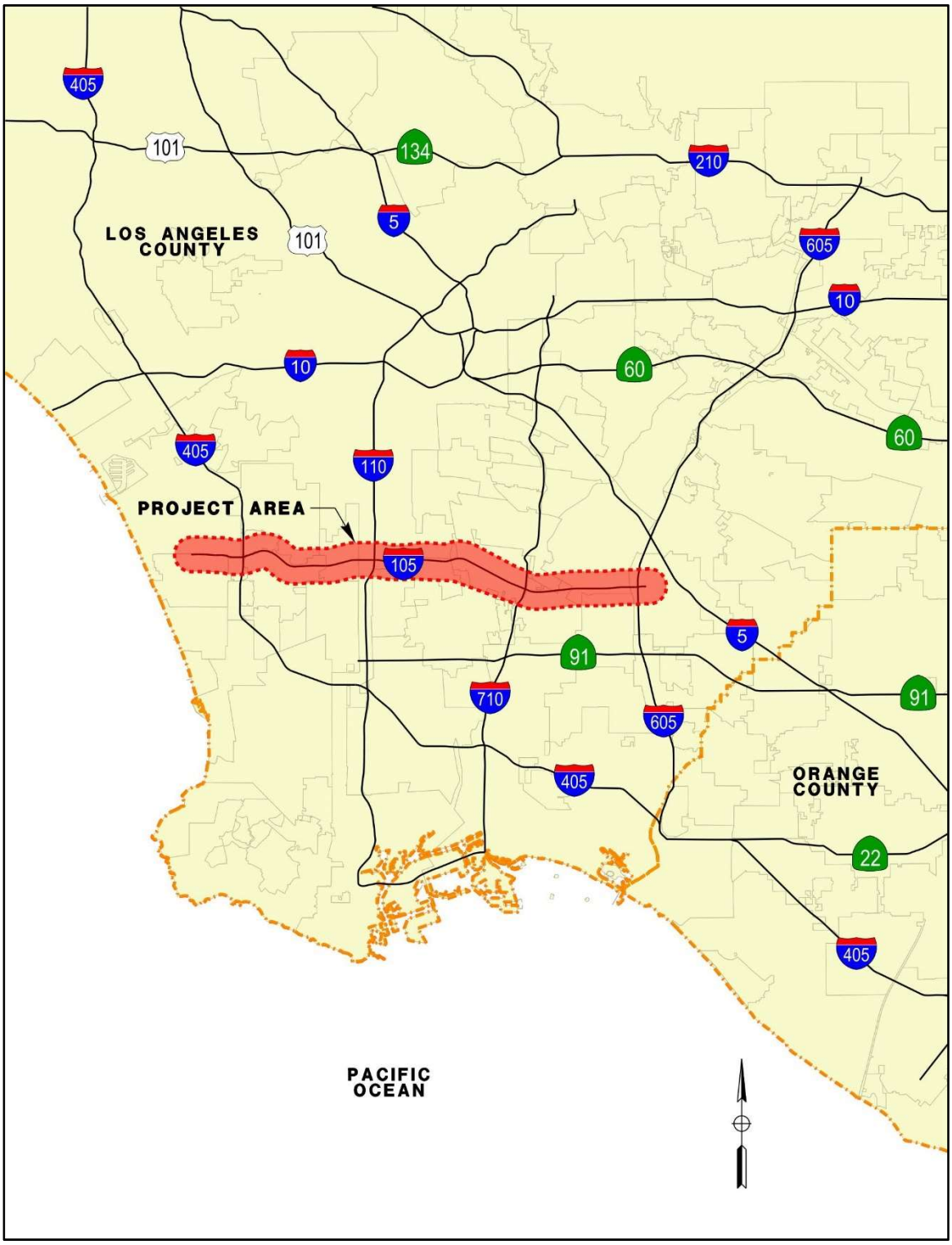
Vicinity Map



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This Draft Project Report has been prepared under the direction of the following registered civil engineer. The registered civil engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based.

Jeffery Fromhertz, P.E., REGISTERED CIVIL ENGINEER,
WSP, On behalf of Los Angeles County Metropolitan Transportation Authority

4/20/20
DATE

REGISTERED PROFESSIONAL ENGINEER
Jeffery Fromhertz
No. C47295
Exp. 12/31/2021
CIVIL
STATE OF CALIFORNIA

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1. INTRODUCTION

The Los Angeles County Metropolitan Transportation Authority (Metro), in cooperation with the California Department of Transportation (Caltrans) District 7, proposes to enhance operations and improve trip reliability and travel times, improve traffic flow, and sustain and manage mobility within the Interstate (I-) 105 corridor.

The Project improvement limits include I-105 from Imperial Highway/Sepulveda Boulevard Intersection (west of I-405) in the City of Los Angeles, to Studebaker Road (east of I-605) in the City of Norwalk, in Los Angeles County, California and I-110 from the I-105 Separation in the City of Los Angeles, to 103rd Street in the City of Los Angeles. The Project traverses the cities of El Segundo, Inglewood, Hawthorne, Los Angeles, Lynwood, South Gate, Paramount, Downey, Norwalk, and unincorporated areas of Los Angeles County.

The I-105 Project improvements include implementing one or two ExpressLanes[1] in each direction between I-405 and I-605. The I-110 Project improvements include implementing associated signage and tolling infrastructure required by the Build Alternatives. The Project will also require replacing several dual-post signs on Studebaker Road, the limits of which extend 200-feet North and 300-feet South of the I-105/Studebaker Road Intersection. This Draft Project Report includes two Build Alternatives and one No-Build Alternative.

- *Alternative 1 – No-Build Alternative: Existing Conditions*
- *Alternative 2 – Build Alternative: Convert Existing High Occupancy Vehicle (HOV) Lane to One ExpressLane (Standard Lane and Shoulder Widths)*
- *Alternative 3 – Build Alternative: Convert Existing HOV Lane to Two ExpressLanes (Non-standard Lane and Shoulder Widths)*

Table 1-1 is a summary of the Project information. This Draft Project Report will serve as the programming document for the remaining support and capital components of the Build Alternatives. For the cost estimate summary, see Attachment D. The Final Project Report and Environmental Document will serve as the approval mechanisms for the "preferred" alternative.

[1] *ExpressLane—the term "ExpressLane" used in this document is intended for the managed lanes to be high occupancy toll (HOT) lanes with discounts for HOV. In no case is the intent for the lanes to be operated differently than HOT lanes.*

Table 1-1: Project Information

Project Limits	07 - LA – 105 R0.5/R18.1 07 - LA – 110 R13.8/R14.8				
Number of Alternatives	3 (1 No-Build Alternative & 2 Build Alternatives)				
Alternatives	**Alternative 1 – No Build**	**Alternative 2 – Build**		**Alternative 3 – Build**	
		Current Cost Estimate	Escalated Cost Estimate	Current Cost Estimate	Escalated Cost Estimate
Capital Outlay Support	$0	$47,472,000	$62,011,000	$77,146,000	$100,653,000
Capital Outlay Construction	$0	$314,977,201	$411,633,939	$505,738,016	$660,933,335
Capital Outlay Right-of-Way	$0	$0	$0	$1,577,067	$1,844,945
Funding Source	N/A	Combination of Federal, State, and Local			
Funding Year	N/A	2024/2028		2024/2028	
Type of Facility	N/A	8-lane freeway			
Number of Structures (Bridges)	N/A	11		21	
Environmental Determination or Document	N/A	Environmental Impact Report (EIR) [CEQA] / Environmental Assessment (EA) [NEPA]			
Legal Description	N/A	In Los Angeles County, on I-105 between Sepulveda Blvd/ Imperial Highway Intersection and Studebaker Rd and on I-110 between I-105 Separation and 103rd St			
Project Development Category	N/A	4A			

Notes: * Values rounded accordingly; see Attachment D for cost breakdown.
Blvd = Boulevard; CEQA = California Environmental Quality Act; I- = Interstate; LA = Los Angeles; NEPA = National Environmental Policy Act; Rd = Road; St = Street

Caltrans will provide oversight and Independent Quality Assurance (IQA), Environmental Document Quality Control (EDQC), and owner/operator approvals for portions of work within the existing and proposed State Highway System (SHS) right-of-way for the Project. Caltrans would be the lead agency for required National Environmental Policy Act (NEPA) approval, as delegated by the Federal Highway Administration (FHWA), and the lead agency for required California Environmental Quality Act (CEQA) approval. Project environmental studies began in January 2018 with the Project Approval and Environmental Document (PA&ED) phase scheduled to be completed by Summer 2020. Construction could begin as early as July 2024 with a duration dependent on Project phasing and funding.

Funding is expected to be provided through a combination of funds, including potential federal, state, and local funding sources, in addition to potential Toll Revenue Bond funds and Transportation Infrastructure Finance and Innovation Act (TIFIA) funding.

The Build Alternatives have a Project Development Category 4A because they will potentially increase traffic capacity.

The Build Alternatives do not satisfy the criteria listed in 40 CFR 93.123(b) and was concurred by Southern California Association of Governments' (SCAG), FHWA, and the United States Environmental Protection Agency (U.S. EPA), as "not of air quality concern for particulate matters" (SCAG Working Group Meeting held June 25, 2019 for the Federal Transportation Improvement Plan [FTIP] ID LA0G1324).

For jointly completing the PA&ED efforts, Metro has entered into a Cooperative Agreement with Caltrans, effective October 2017. The Cooperative Agreement outlines Project roles and responsibilities.

Other approvals required are:

- I-105 is part of the California Freeway and Expressway System, and National Interstate System. Therefore, the FHWA must be consulted and will have approval authority over critical design elements.
- Due to its unique tolling component, the California Transportation Commission (CTC) must grant tolling authority prior to the construction of the Project in order to implement ExpressLanes on the I-105.

FHWA and CTC approvals of the Project are critical to the timely delivery of the Project.

Anticipated permits and agency-specific coordination to be required by the Project are detailed in Sections 7 and 11, respectively.

See Attachment A for the Project location map.

See Attachments B and C for Lane Diagrams, and Layouts and Typical Cross Sections, respectively.

See Attachment D for the cost estimate for specific work items included for each Build Alternative.

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2. RECOMMENDATION

It is recommended that the Draft Environmental Document for the project Build Alternatives described in this Draft Project Report be approved to publicly circulate and to proceed to the public outreach phase of the project development process based on the viable alternatives developed.

During the preparation of the Draft Environmental Document, the affected local agencies were consulted with respect to the proposed alternatives, their views have been considered, and the local agencies are in general accordance with the plan as presented.

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3. BACKGROUND

Description of the facility and Project proponents, Project sponsors and local and regional agency involvement in the development of the alternatives, and actions/commitments taken place to date regarding the proposed Project are summarized below.

3A. Project History

The I-105 freeway (Glenn Anderson Freeway, also referred to as the Century Freeway Transitway) is a pivotal east-west commuter corridor in the southern part of Los Angeles County, California, which currently runs from the City of El Segundo (west of I-405) to the City of Norwalk (east of I-605), connecting the I-405, I-110, and the freight heavy I-710 and I-605 freeways. The I-105 freeway provides a direct link to the Los Angeles International Airport and access to job centers along the corridors that are located in multiple jurisdictions. The I-105 corridor is designated as part of the National Highway System and California Freeway and Expressway System and has been recognized as an essential link in a multi-modal transportation network. I-I05 is also on the National Network for Surface Transportation Assistance Act Trucks and Subsystem of Highway for the Movement of Extra Legal Permit Loads. The Metro Green Line Light Rail Transit (LRT) corridor runs in the median of I-105 for the majority of the route, providing rapid transit through South Los Angeles towards the Los Angeles International Airport. Stations are in place at several interchanges along the I-105 corridor, providing easy access to bus corridors along local roadways. In addition, there are several local roadways paralleling I-105 that provide alternative routes to commuters wishing to avoid peak hour congestion on the freeway.

The I-105 corridor general purpose lanes currently experience recurring congestion and heavy demand during peak commute hours that exceeds the freeway's maximum operational capacity. In addition, sections of the eastbound and westbound I-105 HOV lanes are classified as degraded as defined by federal standards. This means speeds during peak periods on the HOV lanes are less than 45 miles per hour more than 10 percent of the time over a consecutive 180-day period during morning or evening weekday peak hour periods.

The I-105 ExpressLane Project corridor has been included in financially-constrained portion of the adopted SCAG 2016-2040 Regional Transportation Plan/Sustainability Communities Strategy (RTP/SCS) [RTP ID 1162S011]. Additionally, the Project is included as a Tier 1 priority corridor in the Metro 2017 Countywide ExpressLanes Strategic Plan, representing the first of a network of new ExpressLanes facilities in Los Angeles County.

A Project Study Report-Project Development Support (PSR-PDS) was developed and completed for the Project, subsequently approved by Caltrans in September 2015. The PSR-PDS served as the Project Initiation Document for the Project. The PSR-PDS identified three Build Alternatives and one No-Build Alternative. The proposed alternatives described in this Draft Project Report build upon the

alternatives presented in the PSR-PDS and have been expanded to incorporate results and feedback from the technical advisory committees, traffic analysis, environmental technical studies, and public input.

3B. Community Interaction

The PA&ED process for the Project includes extensive public involvement as well as participation by municipalities along the corridor in the form of attendance at periodic project update briefings with elected offices, agency staff, key stakeholders, and other interested parties. A total of thirty briefings have been conducted throughout the life of the project in the form of briefings and/or presentations to elected offices, agency staff, neighborhood councils, and other stakeholders. Additionally, a variety of outreach meetings and methods have been conducted in order to offer variety of forums and opportunities for stakeholder involvement. Outreach activities have included three Public Scoping Meetings (Winter 2018), two Community Update Meetings (Spring 2019), three Stakeholder Roundtable Meetings (two in Fall 2018 and one in Spring 2019), one Business Roundtable Meeting (Summer 2019), California Transportation Commission Hearing (Fall 2019), and a variety of information booths at community events and pop-up tables at popular destinations along the corridor. As shown below, an ongoing community outreach program has been established that will continue throughout the ensuing development phase of the Project.

Community interaction carried out during the PA&ED phase of the project is summarized in Table 3-1.

Table 3-1: Community Interaction

No	Date	Type	Location / Event
2018 Community Interaction			
1	February 8 and 23, 2018	Presentation	Gateway Cities COG Transportation Summit
2	February 12, 2018	Presentation	SB COG Transportation Committee
3	March 5, 2018	Presentation	Los Angeles / Westchester Neighborhood Council
4	March 13, 2018	Presentation	Los Angeles / LAX Gateway Business Improvement District Board Meeting
5	March 21, 2018	Public Scoping Meeting #1	Lennox (Lennox Park – Community Room)
6	March 22, 2018	Public Scoping Meeting #2	Los Angeles (Watts Labor Community Action Committee – Phoenix Hall)
7	March 22, 23 and 25, 2018	Community Event Pop-Up	South Gate / Azalea Festival
8	March 24, 2018	Public Scoping Meeting #3	Paramount (Paramount Community Center)
9	April 6, 2018	Presentation	El Segundo / Business Group Briefing
10	April 16, 2018	Presentation	Los Angeles / Southwest Neighborhood Council

Table 3-1: Community Interaction (continued)

No	Date	Type	Location / Event
11	May 24, 2018	Presentation	Gateway Cities COG Strategic Transportation Plan Committee
12	June 6, 2018	Presentation	Gateway Cities COG Transportation Committee
13	June 6, 2018	Presentation	Gateway Cities COG Board Meeting
14	October 28, 2018	Community Event Pop-Up	Downey / Día de los Muertos
15	October 31, 2018	Community Event Pop-Up	South Gate / Halloween Haunt
16	November 2 and 3, 2018	Community Event Pop-Up	Lynwood / Fall Festival
17	November 27, 2018	Stakeholder Roundtable Meeting* / Western Region	West Athens
18	November 29, 2018	Stakeholder Roundtable Meeting* / Eastern Region	Downey
19	December 1, 2018	Community Event Pop-Up	Norwalk / SnowFest & Tree Lighting Ceremony
20	December 2, 2018	Community Event Pop-Up	Downey / Downey Christmas Parade
21	December 8, 2018	Community Event Pop-Up	Paramount / Breakfast with Santa
22	December 8 and 9, 2018	Community Event Pop-Up	Lynwood / Fieston Navideño
23	December 13, 2018	Community Event Pop-Up	El Segundo / Farmer's Market
24	December 20, 2018	Community Event Pop-Up	Hawthorne / Winter Wonderland Spectacular
2019 Community Interaction			
25	January 12, 2019	Information Table (Community Meeting for Metro's NextGen Project)	Bell / NextGen Community Meeting (I-105 material distributed)
26	January 19, 2019	Community Event Pop-Up	Inglewood / Martin Luther King Jr. Parade
27	January 23, 2019	Information Table (hosted by Metro NextGen Project)	Compton / Metro NextGen Community Meeting (I-105 material distributed)
28	February 7, 2019	Presentation	Los Angeles / LAX Coastal Chamber of Commerce
29	February 11, 2019	Presentation	El Segundo / Chamber of Commerce
30	February 19, 2019	Presentation	Los Angeles / Watts/Willowbrook Small Business Roundtable
31	March 21, 2019	Stakeholder Roundtable Meeting* / Joint Regions	Lynwood / Round 2
32	March 23 and 24, 2019	Community Event Pop-Up	South Gate / Azalea Festival Carnival
33	April 2, 2019	Community Event Pop-Up	Norwalk / I-105 Green Line Norwalk Station (morning)
34	April 2, 2019	Community Event Pop-Up	Downey / I-105 Green Line Lakewood Station (morning)
35	April 4, 2019	Community Event Pop-Up	Los Angeles / I-105 Green Line Harbor Transit Way Station (morning)

Table 3-1: Community Interaction (continued)

No	Date	Type	Location / Event
36	April 4, 2019	Community Event Pop-Up	Los Angeles / I-105 Green Line Aviation Station (morning)
37	April 8, 2019	Community Update Meeting #1	Downey / Rancho Los Amigos National Rehabilitation Outpatient Building
38	April 10, 2019	Community Update Meeting #2	Hawthorne / Hawthorne Memorial Center
39	April 13, 2019	Community Event Pop-Up	Paramount / Eco-Friendly Event
40	April 13, 2019	Community Event Pop-Up	Hawthorne / Bunny Breakfast
41	April 20, 2019	Community Event Pop-Up	Los Angeles / Macedonia Baptist Church Easter SpringFest
42	May 4, 2019	Community Event Pop-Up	Downey / 26th Annual Downey Street Faire
43	May 10, 2019	Community Event Pop-Up	South Gate / Health Fair
44	May 11, 2019	Community Event Pop-Up	South Gate / Spring Fit 5K
45	June 4, 2019	Presentation	Westchester / Neighborhood Council of Westchester/Playa
46	June 14 – 16, 2019	Community Event Pop-Up	Vermont/Vista / Ascension Carnival 2019
47	June 29, 2019	Information Table	Los Angeles / LA Stadium
48	July 12, 2019	Presentation	Inglewood / South Bay Service Councils
49	August 8, 2019	Community Event Pop-Up (led by Metro WSAB Project)	Bellflower / Bellflower Summer Streetfest
50	August 15, 2019	Community Event Pop-Up (led by Metro WSAB Project)	Paramount Summer Concerts
51	August 21, 2019	Community Event Pop-Up (led by Metro WSAB Project)	Los Angeles / Los Angeles Southwest College
52	August 28, 2019	Business Roundtable	West Athens / Business Roundtable Kick-off
53	September 9, 2019	Presentation	El Monte / San Gabriel Valley Service Council
54	September 25, 2019	Public Hearing	Lynwood / CTC Hearing for Metro's Request for Tolling I-105
55	October 19, 2019	Community Event Pop-Up	South Gate / Family Day in the Park
56	October 21, 2019	Presentation	FuturePorts Board of Directors
57	October 26, 2019	Community Event Pop-Up	Hawthorne / Annual Fun Run & Health Fair
58	October 31, 2019	Community Event Pop-Up	Paramount / Halloween Festival
59	November 3, 2019	Community Event Pop-Up	South Gate / Dia De Los Muertos
60	November 14, 2019	Presentation	Los Angeles / Metro Gateway Cities Service Council
61	November 21, 2019	Community Event Pop-Up	El Segundo / Farmer's Market
62	December 1, 2019	Community Event Pop-Up (led by Metro WSAB Project)	Downey / Christmas Parade & Elf Run 5k

Table 3-1: Community Interaction (continued)

No	Date	Type	Location / Event
63	December 6, 2019	Community Event Pop-Up (led by Metro WSAB Project)	Bellflower / Tree Lighting Ceremony
64	December 7, 2019	Community Event Pop-Up (led by Metro WSAB Project)	Norwalk's / SnowFest & Tree Lighting Ceremony
65	December 8, 2019	Community Event Pop-Up	South Gate /Children's Christmas Lane Parade and Festival
66	December 14, 2019	Community Event Pop-Up	Paramount / Breakfast with Santa
67	December 21, 2019	Community Event Pop-Up	Hawthorne / Winter Wonderland
2020 Community Interaction			
68	January 18, 2020	Community Event Pop-Up	Inglewood / Martin Luther King Festival

Notes: *Stakeholder Roundtable Meetings were intended to engage community leaders and allow them to act as a conduit to the stakeholders they represent to share information and provide feedback. Invitees included academic institutions, business associations, major employers, and community organizations.
COG = Council of Governments; SB = San Bernardino; I- = Interstate; LAX = Los Angeles International Airport

Right-of-way acquisition is anticipated for the viable Build Alternatives. The Project will initiate communication with property owners after the completion of the PA&ED phase.

Scoping and Community Meetings

Metro hosted one agency scoping meeting and three public scoping meetings along the I-105 corridor in March 2018 to solicit input from the community on the proposed Build Alternatives and Project. Meeting No. 2, held on March 22, 2018, was also a live webcast. Formal public comments were accepted during the scoping period and were documented and reviewed by the Project team.

A total of forty-nine comments were received from the general public and ten from local agencies in response to information provided at the Scoping Meetings. The comments cover a range of topics including right-of-way acquisition, noise impacts, construction disturbances and vibration, mass transit options, tolling, and funding of the Project. Of the comments received, twenty-six expressed concerns for "toll cheating," income inequality or the ineffectiveness of existing toll lanes, and provided general feedback about tolling, or asked questions about how tolling would be monitored. Three comments expressed concerns regarding current traffic and transportation conditions, with some comments including the concern for how toll lanes were being used, restricting hours that trucks can use freeways, income inequality, or the ineffectiveness of existing toll lanes, and provided general feedback about tolling, or asked questions about how tolling would be monitored. Three comments expressed concerns regarding right-of-way acquisition. Two comments requested larger electronic display signs with toll lane information. There was one comment that expressed concerns regarding increased noise level and general support for sound walls along the corridor. The rest of the comments received were general

comments or questions about the toll lanes, including requests to be added to the Project mailing list or for additional Project information.

In addition, two Community Update Meetings were held in April 2019 to share the latest Project updates and to provide an opportunity for further public feedback prior to the release of the Draft Environmental Document. Discussion items included an update on the alternatives under consideration, possible design features, the Traffic and Revenue (T&R) study, environmental considerations, and the Concept of Operations (ConOps) plan. A total of sixteen comments were received from the general public in response to information provided at the Community Update Meetings. Two of the comments were supportive of the ExpressLanes system and the new Project. The remainder of the comments were either in opposition to paying to use the new lanes, concerns about the inequality of the lanes or questions about how the money generated from the toll lanes is distributed to local communities.

Additionally, feedback was received through a stakeholder survey that was published on September 26, 2018 and ran through April 26, 2019, with a total of 436 participants taking the survey. A majority (68-percent) of the public who participated in the survey indicated they used the I-105 corridor at least two or three times per week and 54-percent of participants indicated they traveled the corridor to get to work. Additionally, 76-percent of respondents indicated they were familiar with existing ExpressLanes (75-percent). A majority of stakeholders who took the survey had already learned about the I-105 ExpressLanes Project through event booths (34-percent), social media (13-percent), newspapers (11-percent), mailed notices (18-percent), eblast communication (80-percent), word of mouth (8-percent), and other (18-percent).

Public Hearings

Public Hearings are anticipated to be held in mid 2020, in conjunction with circulation of the Draft Project Report and Draft Environmental Document. During this time, public comments will be solicited and input/concerns from the community and special interest groups regarding the project will be discussed.

3C. Existing Facility

Within the Project limits:

- I-105 spans 18.1 miles and is designed as a six-lane highway, with auxiliary lanes between most on-ramps and off-ramps, an HOV lane in each direction, and an exclusive median transit way for LRT and HOV;
- I-105 right-of-way spans roughly 320-feet, with wider widths to accommodate interchanges and transit stations;
- Existing I-105 General Purpose and HOV lane widths are typically 12-feet, with 10-foot wide interior and exterior shoulders; in addition, a 2 to 4-foot painted buffer exists between the General Purpose and HOV lanes;
- I-105 posted speed is 65 miles per hour;

- I-105 runs parallel to Imperial Highway and State Route (SR-) 91, linking Los Angeles International Airport, and functions as a major-collector distributor route feeding north-south routes I-405, I-110, I-710, I-605, as well as local streets;
- A HOV Direct Connector currently exists between the I-105 HOV and I-110 ExpressLanes providing direct ExpressLanes connectivity into downtown Los Angeles;
- I-105 traverses the South Bay and Gateway Cities of El Segundo, Hawthorne, Inglewood, Los Angeles, Lynwood, South Gate, Paramount, Downey, and Norwalk, and the unincorporated communities of Willowbrook and Lennox in Los Angeles County.
- I-105 is owned and maintained by Caltrans;
- There are four freeway-to-freeway interchanges (I-405, I-110, I-710 and I-605);
- The Metro Green Line LRT corridor runs in the median of I-105 for the majority of the route; the right-of-way is owned by Caltrans with the median and transit stations operated and maintained by Metro (refer to Section 7B);
- I-110 spans one mile and is primarily designed as a six-lane highway, which includes a 7-story ramp that connects the I-105 HOV lanes to the I-110 Northbound HOT lanes;
- I-110 traverses the City of Los Angeles, in Los Angeles County; and
- I-110 is owned and maintained by Caltrans.

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4. PURPOSE AND NEED

Purpose

The purpose of the Project is to improve existing congestion, and thus enhance traffic operations and mobility on I-105. The proposed improvements along the I-105 corridor will accomplish the following objectives:

- Enhance operations and improve trip reliability, and travel times within the corridor
- Improve the traffic flow by reducing the congested areas and therefore, offering the motorist a faster and reliable commute
- Sustain and manage mobility within the corridor to include other transportation options such as ExpressLanes

Need

Deficiencies on I-105 within the Project limits are summarized below:

- Current daily traffic demand on some sections of I-105 exceeds capacity due to heavy traffic on both weekdays and weekends
- The existing traffic of the mixed flow and HOV lanes of the I-105 exceeds the capacity; thus, future operating conditions will be further deteriorated
- According to the *2017 California High-Occupancy Vehicle Facilities Degradation Report and Action Plan* (Caltrans, 2018), the existing I-105 HOV facilities are degraded and the travel speed is below 45 miles per hour (mph) during peak periods

4A. Problem, Deficiencies, Justification

Current Freeway Mainline Performance

A Current Conditions Technical Memorandum (WSP, 2019; provided under separate cover) which evaluated the current operations along the I-105 corridor was developed and completed in support of the Project.

The I-105 corridor serves 62,000 to 117,000 Annual Average Daily Traffic (ADT) in the General Purpose lanes in each travel direction. In the I-105 HOV lanes, the eastbound direction carries 11,000 and 22,000 daily traffic volumes, while the westbound carries 5,000 to 20,000 daily traffic volumes. The highest demands for both the General Purpose lanes and HOV lanes occur near the Crenshaw Boulevard interchange. There are several areas along the I-105 corridor that are currently operating at oversaturated conditions, typically worse in the eastbound direction due to a number of bottlenecks:

- The most severe bottleneck on the corridor occurs just west of the I-710 Interchange between the Long Beach Boulevard On-Ramp and the I-710 Off-Ramps. This bottleneck typically overwhelms the upstream bottlenecks at Wilmington Avenue and the queuing contributes to congestion on the I-110 Southbound to Eastbound I-105 Connector Ramp. The demand exceeds the capacity for the entirety of the PM peak period at this location.

- There are two major bottlenecks east of the I-710 Interchange. The I-605 Northbound Connector Ramp forms a major bottleneck at the eastern end of the corridor that occurs during both the AM and PM peak periods. This bottleneck is caused by the higher demand exceeding the available capacity of the northbound connector ramp, the queuing from the heavy congestion, and the slower speeds along the northbound I-605 mainline (at the connector on-ramp). Interactions between the Paramount Boulevard On-Ramp and the Lakewood Boulevard Off-Ramp also form a major bottleneck east of the I-710 Interchange that persists throughout most of the day. This bottleneck is caused by the additional demand from the on-ramp merge and the weaving conflict with the off-ramp that persists throughout most of the day.
- West of the I-110 freeway at Crenshaw Boulevard is the third most congested bottleneck location on the corridor. The auxiliary lane from the Hawthorne Boulevard/Imperial Highway On-Ramp to the Crenshaw Boulevard/120th Street Off-Ramps ends, leading to a drop in overall capacity. There are also two closely spaced, high volume on-ramps (>10,000 ADT) at West 120th Street, and the eastbound on from Northbound Crenshaw Boulevard. There is a moderate bottleneck near the I-405 Southbound On-Ramp during the PM peak period due to the high-volume connector ramp that carries more than 30,000 ADT. This bottleneck is overwhelmed by the Crenshaw Boulevard On-Ramp bottleneck downstream.
- Bottlenecks in the westbound direction of the I-105 are smaller and less congested than the eastbound direction. The most congested westbound bottleneck occurs at the Crenshaw Boulevard On-Ramp due in part to its high ramp flows. The second biggest bottleneck in this direction occurs at the interaction between the connector ramps from the Southbound I-710 On-Ramps to the Long Beach Boulevard Off-Ramps. Contributing to this bottleneck is the lane drop just west of the Long Beach Boulevard Off-Ramp.

Travel speed for the eastbound section between I-405 and I-605 is below 30 mph during the PM peak period, while travel speed for the westbound section between Bellflower Boulevard and Crenshaw Boulevard is below 40 mph during the AM peak period.

The HOV analysis identified multiple locations with HOV lanes operating at Level of Service (LOS) F. This is caused by congestion in the mainline traffic and by the HOV lane bottlenecks. HOV congestion is typically worse in the eastbound direction also due to a number of bottlenecks:

- The most severe bottleneck on the corridor occurs in the eastbound facility just east of the I-110 Interchange. This bottleneck occurs because the I-110 ExpressLanes Direct Connector Ramp traffic merges with the I-105 HOV lane traffic, where the facility capacity cannot handle the additional demand from the ramp.
- Likewise, the main bottleneck in the westbound direction is at the ExpressLanes Direct Connector Ramp merge with the HOV lane. Again, the demand from the two lanes merging into one exceed the capacity of the HOV lane.
- Another major bottleneck is on the eastbound facility that occurs between the Hawthorne Boulevard On-Ramp and Crenshaw Boulevard/120th Street Off-Ramp at

the HOV ingress/egress location. Due to the congestion on the mainline, traffic slows to exit, while slow traffic from the mainline enters the HOV lane.

The results of the existing peak hour performance analysis preformed on the current ramp and adjacent arterial intersections located within the Project limits showed about half of all intersections studied (23 in the AM peak period and 27 in the PM peak period) have LOS D or worse. LOS D is considered the threshold for acceptable level of service.

The proposed improvements to the I-105 corridor are needed in order to address the identified problems and deficiencies. The proposed improvements would improve capacity of the managed lanes that allows for more flexibility in the traffic movement and higher efficiencies, enabling the corridor to maximize productivity and travel reliability.

4B. Regional and System Planning

The Project is consistent with planning efforts at all levels of government. Note that agreements, as identified in Sections 7B, 7D, and 7E, will be prepared/updated to delineate responsibilities once a "preferred" alternative is selected.

Corridor Overview

I-105 is part of the National Highway System, the Interstate Highway System and the California Freeway and Expressway System. I-105 is also on the National Network for Surface Transportation Assistance Act Trucks and Subsystem of Highway for the Movement of Extra Legal Permit Loads.

Freeway-to-freeway interchanges, along with local road interchanges, within the Project limits are summarized in Section 5A. Modification of local road interchanges will have minimal impact to the Project. However, understanding of these planned projects will allow access points to be configured to ensure compatibility with the associated interchange improvements.

System Planning

System Planning is the long-range transportation planning process for Caltrans. The System Planning process fulfills Caltrans' statutory responsibility as owner/operator of the SHS (Gov. Code §65086) by evaluating conditions and recommending enhancements to the SHS. Through System Planning, Caltrans focuses on developing an integrated multimodal transportation system that meets Caltrans' goals of safety and health, stewardship and efficiency, sustainability, livability, and economy, system performance, and organizational excellence. The System Planning process is primarily composed of four parts: District System Management Plan (DSMP); Transportation Concept Report (TCR); Corridor System Management Plan (CSMP); and the DSMP Project List.

Within the Caltrans 2017 District 7 DSMP and DSMP Project List, the Project is identified with the following description: "I-105: Add HOT Lane on I-105 from I-405 to I-605".

The Project is included in the TCR as part of the long-range projects for I-105 corridor within the Project limits. Based on the 2014 TCR, additional lanes are required to obtain LOS D in year 2035. While the I-105 TCR identifies an additional one to two general purpose lanes in each direction to adhere to a LOS D in the forecast year of 2035, it also acknowledges the difficulty faced by Caltrans and various Metropolitan Planning Organizations (MPO's) to continue to add more general purpose lanes to the SHS. This Project aims to decrease congestion and enhance traffic operations on the corridor by improving trip reliability, decreasing travel times, and improving traffic flow.

A CSMP for the I-105 corridor has not been developed.

State Planning

The Federal State Transportation Improvement Program (FSTIP) and the FTIP carry out the California Transportation Plan. The FSTIP is programmed by CTC from the FTIPs prepared by the regional MPOs. The Project is currently included in the federally-adopted 2019 FTIP and it is included in the 2017 California FSTIP.

The Project is locally funded in the FTIP and FSTIP; therefore, no Statewide Transportation Improvement Program (STIP) dollars are programmed for it nor does it need to be included in the STIP.

Regional Planning

SCAG is the federally designated MPO for the six-county region, which includes Imperial, Los Angeles, Orange, Riverside, San Bernardino and Ventura Counties. As the MPO, SCAG is required to adopt and update an RTP at least every four years. The Project is included in the SCAG 2016-2040 RTP/SCS.

As part of the SCAG 2016 RTP/SCS, the Project is part of the region's Sustainable Communities Strategy (SCS) required under SB 375 to reduce greenhouse gas (GHG) emissions due to passenger vehicles. The population and employment growth served by the Project is identified in the SCS. The SCS also includes the Project in its transportation network designed to reduce regional vehicle miles traveled and GHG emissions. SCAG is in the process of preparing an update to their RTP/SCS. The Project is being carried over into the modeling for SCAG's 2020 RTP/SCS.

SCAG also prepares and implements the FTIP. The Project was originally programmed and modeled as part of the SCAG 2017 FTIP and is currently shown on the adopted SCAG 2019 FTIP.

Within the SCAG 2016-2040 RTP/SCS, the Project is identified as Project ID 1162S011 with the following description: "I-105 ExpressLane from I-405 to I-605".

Within the SCAG 2019 FTIP, the Project is identified as Project ID LA0G1324 with the following description: "Route 105: In Los Angeles County, in various Cities, between Imperial Highway and I-605, Preparation of PA&ED for potential implementation of ExpressLanes".

Metro has extensive experience operating ExpressLanes on the I-110 and I-10 freeways, which have been in operation since November 2012 and February 2013, respectively. In November 2014, the Metro Board of Directors requested the preparation of an ExpressLanes Strategic Plan for the County which identified corridors that could benefit from implementation of ExpressLanes. The Strategic Plan identified three tiers of projects: Tier 1 (near-term), Tier 2 (mid-term) and Tier 3 (long-term). Tier 1 projects include the I-105, an extension of the existing I-10 ExpressLanes, I-405, and I-605. The I-105 ExpressLanes Project is included as a Tier 1 priority corridor in the Metro 2017 Countywide ExpressLanes Strategic Plan, representing the first of a network of new ExpressLanes facilities in Los Angeles County. Subsequent to the Project's CTC Toll Facility Application, Metro intends to request tolling authority for the remaining Tier 1 projects identified in the Strategic Plan. In the future, Metro may also request tolling authority for Tier 2 projects identified in the Strategic Plan, which will ultimately create an interconnected network of ExpressLanes that would provide regional synergies and benefits. The I-105 ExpressLanes Project is identified as a Tier 1 project for implementation within 5-10 years.

Local Planning

The Project corridor traverses nine cities and unincorporated areas of Los Angeles County, including Downey, El Segundo, Hawthorne, Inglewood, Los Angeles, Lynwood, Norwalk, Paramount, and South Gate.

The I-105 ExpressLanes Project is included in the Measure M expenditure plan approved by Los Angeles County voters in 2016 and is in Metro's Twenty-Eight by '28 initiative to construct twenty eight projects by the 2028 Los Angeles Olympics.

Transit Operator Planning

Over the next 10 years, Metro plans to invest $88.2 billion in transit infrastructure projects, highway projects, carpool projects, and local improvement projects (SRTP, 2014). There are several transit projects being constructed in close proximity to the Project, as shown in Table 5-79, including the West Santa Ana Branch (WSAB) Project, which aim to increase transit ridership and provide enhanced coordination between the separate modes of travel in Los Angeles County.

4C. Traffic

Operational and safety performance deficiencies and impacts (needs), based on the review, evaluation, and analysis of current (Design Year 2017) and proposed (Design Years 2027 and 2047) infrastructure, operating conditions, and traffic and collision performance data, and a reliable estimate of how the improved highway infrastructure will perform are presented in the Traffic Study Report (provided under separate cover), prepared to accompany this Draft Project Report. As part of the environmental clearance process, information in the Traffic Study Report will be used to identify significant traffic impacts of the proposed Project alternatives (Section 5). This allows for a determination as to whether the scope is adequate, whether the Project "purpose and need" will be met, and the cost-effectiveness of the investment.

Existing traffic volumes and traffic data were obtained in 2017 from various sources, including Caltrans Performance Measurement System (PeMS) database, INRIX, and actual field data. The future traffic forecast is based on the SCAG Regional Travel Demand Model (RTDM) that was used to estimate future traffic volumes by vehicle class (e.g., drive-alone autos, shared-ride vehicles, trucks) for the network of roadways covering the project area.

The Traffic Study Report (provided under separate cover) includes one No-Build and two Build Alternatives. Alternative descriptions are included in Section 5 of this Draft Project Report, accordingly.

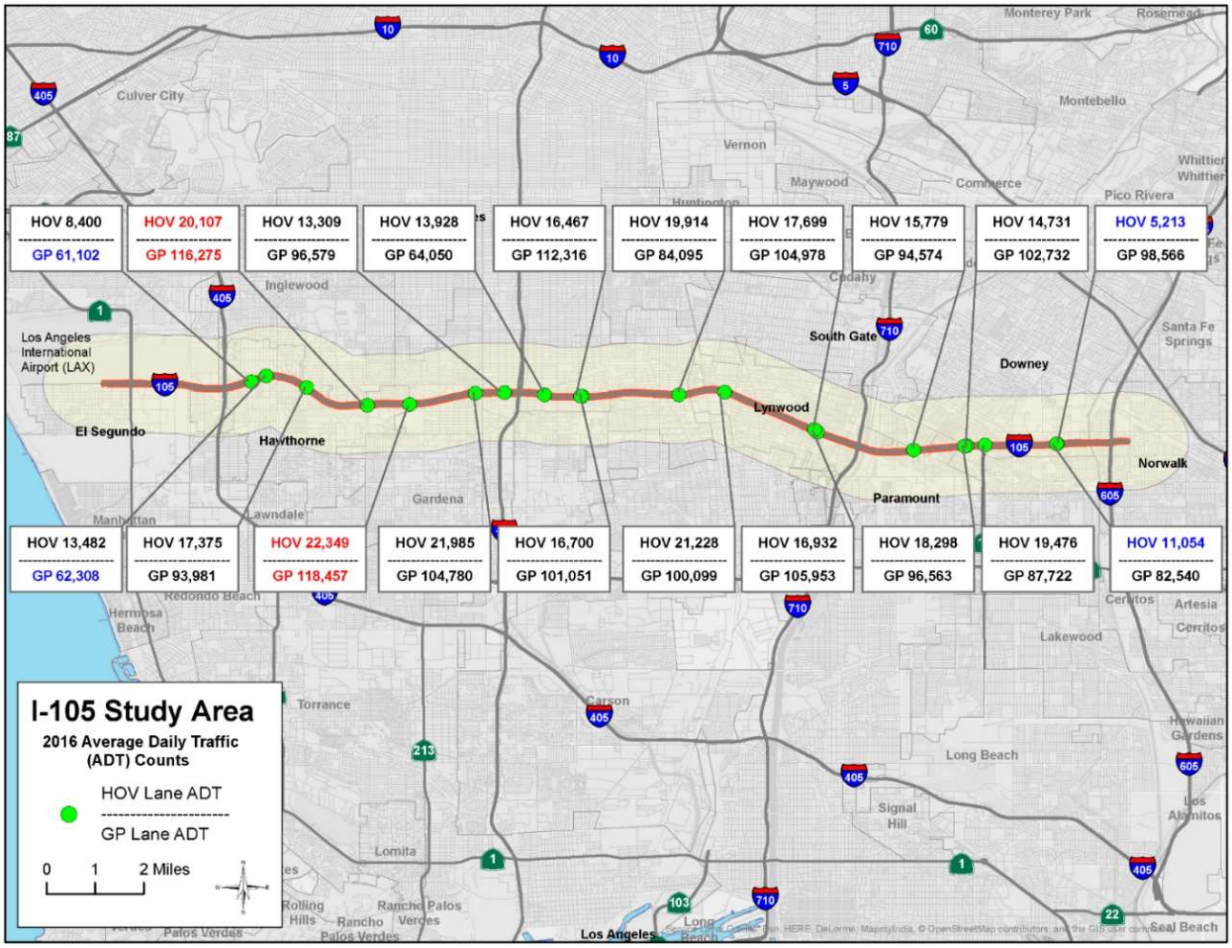
Preliminary assessments and key findings of the Traffic Study Report are summarized herein.

Existing Conditions Traffic Analysis Summary

Mainline

The existing ADT for the freeway General Purpose and HOV lanes is illustrated in Figure 4-1. There are approximately 4-percent of truck volumes on the freeway segments west of I-710 and approximately 10-percent of truck volumes east of I-710. The existing freeway general purpose lane segments peak hour volumes and LOS results for westbound and eastbound I-105 are shown in Table 4-1 through Table 4-4, respectively. With the current configuration, there is insufficient capacity on the I-105 to accommodate existing travel demands. Several areas along the I-105 corridor are currently operating at oversaturated conditions (LOS F). Volume is generally higher in the eastbound direction than in the westbound direction and the eastbound PM peak period has the most number of segments operating at LOS F.

Figure 4-1: I-105 Freeway General Purpose and HOV Lanes ADT – Existing (2017)



Source: Traffic Study Report (provided under separate cover)

Table 4-1: I-105 Eastbound General Purpose Lanes Mainline Analysis Results—Existing (2017)

Location	Segment Analysis	AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between I-405 & Hawthorne Blvd / Prairie Ave Off-Ramp	Basic	5,189	20.7	C	3,483	-	**F***
Between Prairie Ave Off-Ramp & On-Ramp	Basic	5,075	30.2	D	4,012	-	**F***
Between Prairie Ave & Crenshaw Blvd / 120th St	Basic	5,032	28.8	D	4,500	-	**F***
Between Crenshaw Blvd & Vermont Ave	Basic	6,233	28.3	D	6,251	-	**F***
Between Normandie OC & Vermont Off-Ramp	Basic	6,233	22.7	C	6,251	-	**F***
Between I-110 Off-Ramp & Hoover St On-Ramp	Basic	3,755	20.0	C	2,414	-	**F***
Between Central Ave Off-Ramp & On-Ramp	Basic	4,640	27.7	D	3,073	-	**F***
Between Wilmington Ave Off-Ramp & On-Ramp	Basic	4,773	26.7	D	4,269	-	**F***
Between Wilmington Ave & Long Beach Blvd	Basic	5,266	30.5	D	4,697	-	**F***
Between Long Beach Blvd Off-Ramp & On-Ramp	Basic	4,282	23.2	C	4,065	-	**F***
Between Long Beach Blvd & I-710	Basic	5,793	34.0	D	5,241	-	**F***
Between I-710 Off-Ramp & On-Ramp	Basic	3,725	19.9	C	2,916	24.4	C
Between Garfield Ave & Grove St	Basic	2,830	15.1	B	2,206	13.1	B
Between Grove St OC & Paramount Blvd OC	Basic	4,793	-	**F***	4,548	-	**F***
Between Paramount Blvd & Lakewood Blvd	Basic	4,583	27.2	D	4,197	-	**F***
Between Lakewood Blvd & Bellflower Blvd	Basic	4,105	23.6	C	3,676	-	**F***

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds.
Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; I- = Interstate; LOS = Level of Service; OC = Overcrossing; St = Street

Table 4-2: I-105 Eastbound General Purpose Lanes Merge/Diverge/Weave Analysis—Existing (2017)

Location	Segment Analysis	AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Imperial Hwy On-Ramp	Merge	3,451	20.2	C	2,578	-	**F***
I-405 NB On-Ramp	Merge	3,240	19.0	C	2,578	-	**F***
I-405 SB On-Ramp	Merge	5,189	20.7	C	3,547	-	**F****
Prairie Ave Off-Ramp	Diverge	5,189	30.1	D	3,547	-	**F***
Hawthorne Blvd / Imperial Hwy On-Ramp to Crenshaw Blvd / 120th Off-Ramp	Weave	5,838	29.5	D	4,890	-	**F***
Crenshaw Blvd / 120th St On-Ramp	Merge	5,873	37.5	D	5,186	-	**F***
Crenshaw Blvd / 120th St On-Ramp (NB)	Merge	6,233	28.3	D	6,119	-	**F****
Vermont Ave Off-Ramp	Diverge	6,233	22.7	C	6,119	-	**F***
I-110 Off-Ramp	Diverge	5,556	19.2	C	5,041	-	**F***
Hoover St On-Ramp	Merge	4,427	26.4	C	2,485	-	**F***
I-110 On-Ramp to Central Ave Off-Ramp	Weave	5,757	26.6	C	4,168	-	**F***
Central Ave On-Ramp to Wilmington Ave Off-Ramp	Weave	5,533	29.8	D	4,001	-	**F***
Wilmington Ave On-Ramp	Merge	5,613	34.7	D	4,643	-	**F****
Long Beach Blvd Off-Ramp	Diverge	5,266	31.0	D	4,643	-	**F***
SB Long Beach Blvd On-Ramp	Merge	5,043	30.5	D	4,704	-	**F***
NB Long Beach Blvd On-Ramp	Merge	5,793	22.6	C	5,271	-	**F***
I-710 Off-Ramp	Diverge	5,793	35.3	E	5,271	-	**F****
Garfield Ave Off-Ramp	Diverge	3,725	22.0	C	2,987	18.7	B
I-710 NB On-Ramp	Merge	4,045	-	**F***	3,624	-	**F***
I-710 SB On-Ramp	Merge	4,793	-	**F***	4,670	-	**F***
Paramount Blvd On-Ramp	Merge	5,214	-	**F***	4,878	-	**F****
Lakewood Blvd Off-Ramp	Diverge	4,854	-	**F****	4,329	-	**F***
SB Lakewood Blvd On-Ramp	Merge	4,798	22.1	C	4,357	-	**F***
NB Lakewood Blvd On-Ramp	Weave	5,015	27.5	C	4,492	-	**F***
Bellflower Blvd On-Ramp	Merge	4,665	21.7	C	4,535	-	**F***
I-605 Off-Ramp	Diverge	4,665	19.7	C	4,535	-	**F****

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds.
Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; Hwy = Highway; I- = Interstate; LOS = Level of Service; NB = Northbound; SB = Southbound; St = Street

Table 4-3: I-105 Westbound General Purpose Lanes Mainline Analysis—Existing (2017)

Location	Analysis Segment	AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between Bellflower Blvd & Lakewood Blvd	Basic	5,258	22.5	C	5,373	20.2	C
Between Lakewood Blvd Off-Ramp & On-Ramp	Basic	4,794	-	**F***	4,598	-	**F***
Between Paramount Blvd Off-Ramp & On-Ramp	Basic	5,060	34.1	D	4,729	30.6	D
Between Paramount Blvd & I-710	Basic	5,060	24.6	C	4,729	22.3	C
Between I-710 Off-Ramp & Garfield Ave On-Ramp	Basic	1,591	-	**F***	1,184	13.8	B
Between I-710 Off-Ramp & SB On-Ramp	Basic	2,343	-	**F***	1,766	-	**F***
Between I-710 NB On-Ramp & Gertrude Dr UC	Basic	4,835	-	**F***	5,435	-	**F***
Between Gertrude Dr UC & Long Beach Blvd	Basic	4,835	-	**F***	5,435	-	**F***
Between Long Beach Blvd Off-Ramp & On-Ramp	Basic	3,968	-	**F***	4,310	-	**F***
Between State St UC & Alameda St	Basic	5,040	-	**F***	5,291	31.1	D
Between Imperial Hwy Off-Ramp & On-Ramp	Basic	4,187	-	**F***	4,199	23.7	C
Between Imperial Hwy & Central Ave	Basic	5,343	-	**F***	5,357	31.8	D
Between Central Ave Off-Ramp & On-Ramp	Basic	4,874	27.5	D	4,619	27.3	D
Between Stanford Ave UC & Avalon Blvd UC	Basic	5,854	23.1	C	5,771	23.5	C
Between Avalon UC & San Pedro St UC	Basic	5,854	-	**F***	5,771	19.9	C
Between I-110 Off-Ramp & Hoover St	Basic	3,134	-	**F***	3,315	20.9	C
Between Vermont Ave Off-Ramp & On-Ramp	Basic	4,030	-	**F***	4,301	23.3	C
Between Vermont Ave & Crenshaw Blvd	Basic	6,551	-	**F***	6,315	25.4	C
Between Crenshaw Blvd Off-Ramp & On-Ramp	Basic	5,421	-	**F***	4,463	26.5	D
Between Prairie Ave / Hawthorne Blvd Off-Ramp & Imperial Hwy On-Ramp	Basic	6,679	-	**F****	4,720	28.5	D
Between Imperial Hwy & I-405	Basic	6,008	-	**F***	4,865	18.0	B
Between I-405 Off-Ramp & La Cienega Blvd	Basic	4,698	-	**F***	1,476	7.4	A

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds.
Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; Dr = Drive; Hwy = Highway; I- = Interstate; LOS = Level of Service; NB = Northbound; SB = Southbound; St = Street; UC = Undercrossing

Table 4-4: I-105 Westbound General Purpose Lanes Merge/Diverge/Weave Analysis Results—Existing (2017)

Location	Analysis Segment	AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
I-605 On-Ramp	Merge	6,192	27.8	D	5,891	26.4	C
Bellflower Blvd Off-Ramp	Diverge	6,192	28.1	D	5,891	22.2	C
Bellflower Blvd On-Ramp to Lakewood Blvd Off-Ramp	Weave	5,761	-	**F***	5,932	-	**F***
Lakewood Blvd On-Ramp	Merge	5,754	-	**F****	5,536	-	**F****
Paramount Blvd Off-Ramp	Diverge	5,754	40.4	D	5,536	32.4	D
I-710 Off-Ramp	Diverge	5,060	-	**F***	4,729	17.4	B
Garfield Ave On-Ramp	Merge	2,343	-	**F***	1,766	13.7	B
I-710 SB On-Ramp	Merge	2,984	-	**F***	2,658	-	**F***
I-710 NB On-Ramp	Merge	4,835	-	**F***	5,435	-	**F***
Long Beach Blvd Off-Ramp	Diverge	4,835	-	**F***	5,435	-	**F***
NB Long Beach Blvd On-Ramp	Merge	4,243	-	**F***	4,468	-	**F***
SB Long Beach Blvd On-Ramp	Merge	5,040	-	**F****	5,291	-	**F****
Imperial Hwy Off-Ramp	Diverge	5,040	-	**F***	5,291	31.3	D
Imperial Hwy On-Ramp	Merge	5,343	-	**F***	5,357	33.0	D
Central Ave Off-Ramp	Diverge	5,343	-	**F****	5,357	31.8	D
Central Ave On-Ramp	Merge	5,854	23.1	C	5,771	23.5	C
I-110 Off-Ramp	Diverge	5,854	-	**F***	5,771	19.9	C
I-110 NB On-Ramp	Weave	4,761	-	**F***	5,034	27.4	C
I-110 SB On-Ramp	Merge	4,957	-	**F****	5,530	24.0	C
Vermont Ave On-Ramp	Merge	6,102	-	**F***	6,131	24.9	C
Crenshaw Blvd Off-Ramp	Diverge	6,065	-	**F***	5,847	23.2	C
NB Crenshaw Blvd On-Ramp	Merge	6,479	-	**F****	5,058	21.5	C
SB Crenshaw Blvd On-Ramp to Prairie Ave / Hawthorne Blvd Off-Ramp	Weave	6,867	-	**F***	5,202	26.6	C
Imperial Hwy On-Ramp	Merge	6,008	-	**F***	4,865	22.4	C
I-405 Off-Ramp	Diverge	4,192	-	**F***	2,644	38.0	E

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds.
Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; Hwy = Highway; I- = Interstate; LOS = Level of Service;
NB = Northbound; SB = Southbound

The existing HOV lanes also experience congestion during the peak hours. The existing freeway HOV lane peak hour volumes and LOS results are summarized in Table 4-5 and Table 4-6, respectively. There are multiple locations with LOS F caused by high demand and HOV lane bottlenecks, particularly at the I-110/I-105 Interchange. Similar to the general purpose lanes, HOV congestion is typically worse in the eastbound direction in the afternoon.

Table 4-5: I-105 Eastbound HOV Lane Conditions—Existing (2017)

Location	Segment Type	AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between e/o Aviation Blvd & Inglewood Ave	Access	337	5.2	A	962	-	F*
Between Inglewood Ave & Hawthorne Blvd Access	Basic	337	5.2	A	962	-	F*
Between Hawthorne Blvd & Prairie Ave	Access	640	9.9	A	1,209	-	F*
Between Prairie Ave Access & Crenshaw Blvd	Basic	640	9.9	A	1,209	-	F*
Between Crenshaw Blvd & Crenshaw Blvd Access	Basic	665	10.2	A	1,307	-	F*
Between Crenshaw Blvd & Western Ave	Access	1,134	17.4	B	1,325	-	F*
Between Western Ave Access & Vermont Ave	Basic	1,134	17.4	B	1,325	-	F*
Between Vermont Ave & NB I-110 Off-Ramp	Diverge	1,230	18.9	C	1,296	-	F*
Between I-110 Off-Ramp & I-110 On-Ramp	Basic	1,230	18.9	C	1,296	-	F*
Between I-110 On-Ramp & Central Ave Access	Merge	658	10.1	A	1,324	-	F*
Between w/o & e/o Central Ave	Access	510	7.9	A	1,384	-	F*
Between Central Ave Access & Wilmington Ave	Basic	510	7.9	A	1,384	-	F*
Between Wilmington Ave & Alameda St	Basic	1,042	16.0	B	1,632	-	F*
Between Alameda St & Long Beach Blvd Access	Basic	1,015	17.8	B	1,439	36.0	E
Between w/o & e/o Long Beach Blvd	Access	1,011	17.7	B	1,279	26.1	D
Between Long Beach Blvd Access & Gertrude Dr	Basic	1,011	16.6	B	1,279	26.1	D
Between Gertrude Dr & I-710	Basic	1,010	16.6	B	1,234	25.2	C
Between I-710 & Garfield Ave	Basic	1,010	15.1	B	1,234	22.0	C
Between Garfield Ave & I-710	Basic	1,010	22.0	C	1,234	22.0	C
Between I-710 & Grove St	Basic	1,010	23.5	C	1,234	-	F*
Between Grove St OC & Paramount Blvd OC	Basic	1,245	29.0	D	1,327	-	F*

Table 4-5: I-105 Eastbound HOV Lane Conditions—Existing (2017) (continued)

Location	Segment Type	AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between Paramount Blvd & Downey Ave	Access	1,245	29.0	D	1,327	-	**F***
Between Downey Ave Access & Lakewood Blvd	Basic	1,199	27.9	D	1,263	33.2	D
Between Lakewood Blvd & Bellflower Blvd Access	Basic	1,546	28.1	D	1,514	39.8	E
Between w/o & e/o Bellflower Blvd	Access	1,546	-	**F***	1,514	39.8	E
Between Bellflower Blvd Access & I-605	Basic	1,250	-	**F****	1,309	-	**F****

Source: Traffic Study Report (provided under separate cover)
Notes: LOS based on 2016 HCM (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds. Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; Dr = Drive; I- = Interstate; LOS = Level of Service; NB = Northbound; OC = Overcrossing; St = Street

Table 4-6: I-105 Westbound HOV Lane Conditions—Existing (2017)

Location	Segment Type	AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between I-605 & Bellflower Blvd Access	Basic	300	10.9	A	300	5.5	A
Between e/o & w/o Bellflower Blvd	Access	679	14.1	B	335	5.9	A
Between Bellflower Blvd Access & Lakewood Blvd	Basic	679	14.1	B	335	6.6	A
Between Lakewood Blvd & Paramount Blvd	Basic	1,173 (1,295)	20.9 (23.1)	C (C)	1,017	15.9	B
Between Paramount Blvd & e/o I-710	Basic	1,157	20.7	C	1,091	15.8	B
Between e/o & w/o I-710	Basic	777	21.6	D	903	17.7	B
Between w/o I-710 & Harris Ave Access	Basic	1,255	-	**F***	1,183	29.6	D
Between Harris Ave & Gertrude Dr	Access	1,255	-	**F***	1,183	19.7	C
Between Gertrude Dr Access & Long Beach Blvd	Basic	1,255	-	**F***	1,183	19.7	C
Between Long Beach Blvd & State St	Basic	1,361	-	**F****	1,092	18.2	C
Between State St UC & Imperial Hwy	Basic	1,361	40.0	E	1,092	17.1	B
Between Imperial Hwy & Central Ave Access	Basic	1,292	40.0	E	946	15.0	B
Between e/o & w/o Central Ave	Access	1,188	-	**F***	791	12.0	B
Between Central Ave Access & Avalon Blvd	Basic	1,123	-	**F***	774	11.7	B
Between Avalon Blvd & I-110 Off-Ramp (DAR)	Diverge	818	-	**F***	681	10.5	A

Table 4-6: I-105 Westbound HOV Lane Conditions—Existing (2017) (continued)

Location	Segment Type	AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between I-110 Off-Ramp (DAR) & I-110 On-Ramp (DAR)	Basic	753	-	**F***	613	9.4	A
Between I-110 On-Ramp (DAR) & Vermont Ave	Merge	753	-	**F***	613	9.1	A
Between Vermont Ave & Western Ave Access	Basic	1,449	-	**F***	1,388	20.7	C
Between e/o & w/o Western Ave	Access	1,421	-	**F***	1,089	16.0	C
Between Western Ave Access & Crenshaw Blvd	Basic	1,572	-	**F***	835	12.3	B
Between Crenshaw Blvd & Prairie Ave Access	Basic	1,572	31.4	D	835	12.3	B
Between Prairie Ave & Hawthorne Blvd	Access	1,572	36.6	E	835	14.2	B
Between Hawthorne Blvd Access & I-405	Basic	1,398	25.0	C	629	9.3	A
Between I-405 & Aviation Blvd	Basic	825	13.5	B	329	9.5	A

Source: Traffic Study Report (provided under separate cover)
Notes: LOS based on 2016 HCM (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds.
Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; DAR = Direct Access Ramp; Dr = Drive; Hwy = Highway; I- = Interstate; LOS = Level of Service; St = Street; UC = Undercrossing

Ramp/Interchange Ramps

Traffic analysis of the existing freeway ramp conditions is summarized in Table 4-7 and Table 4-8. Most of the ramp locations have demands that are within the available capacities, with the exception of a few locations with volumes approaching the capacity. There is one location that is currently operating deficiently: Eastbound 105 at Atwood Way/Douglas Street On-Ramp where the demand exceeds the capacity of the ramp.

Table 4-7: I-105 Freeway Eastbound Ramp Conditions—Existing (2017)

Int. #	Location	Type	Number of Ramp Lanes	Existing			
				AM Peak Hour		PM Peak Hour	
				Volume	V/C	Volume	V/C
-	Sepulveda Blvd / Imperial Hwy Off	Off-Ramp	2	465	0.16	486	0.16
-	Sepulveda Blvd On (SB)	On-Ramp	2	1,543	0.51	2,446	**0.82**
-	Imperial Hwy On (EB)	On-Ramp	1	581	0.39	1,174	**0.78**
-	Atwood Way/Douglas St On (SB)	On-Ramp	1	344	0.23	1,548	**1.03**
-	I-405 Fwy-Fwy Off (NB & SB)	Off-Ramp	2	1,274	0.35	2,991	**0.83**
4	Imperial Hwy On	On-Ramp	1	722	0.48	629	0.42
-	I-405 Fwy-Fwy On (NB)	On-Ramp	1	1,108	0.62	507	0.28
-	Fwy-Fwy On (SB)	On-Ramp	2	1,949	0.54	942	0.26
9	Prairie Ave Off	Off-Ramp	1	404	0.27	584	0.39
7	Hawthorne Blvd / Imperial Hwy On	On-Ramp	2	763	0.25	898	0.30
11	Crenshaw Blvd / 120th St Off	Off-Ramp	1	751	0.50	328	0.22
11	Crenshaw Blvd / 120th St On	On-Ramp	1	841	0.56	750	0.50
11	Crenshaw Blvd / 120th St On (NB)	On-Ramp	1	772	0.51	833	0.56
17	Vermont Ave Off	Off-Ramp	1	654	0.44	680	0.45
-	I-110 Fwy-Fwy Off (GP) (NB) & SB)	Off-Ramp	2	1,801	0.50	2,800	**0.78**
-	I-110 Fwy-Fwy Off (ML) (NB)	Off-Ramp	1	734	0.41	688	0.38
-	Hoover St On	On-Ramp	1	672	0.45	233	0.16
-	I-110 Fwy-Fwy On (ML) (NB)	On-Ramp	1	162	0.09	716	0.40
-	I-110 Fwy-Fwy On (NB & SB)	On-Ramp	2	1,980	0.55	1,441	0.40
21	Central Ave Off	Off-Ramp	1	1,457	**0.97**	1,009	0.67
21	Central Ave On	On-Ramp	1	893	0.60	1,183	**0.79**
24	Wilmington Ave Off	Off-Ramp	1	887	0.59	450	0.30
24	Wilmington Ave On	On-Ramp	1	840	0.56	968	0.65
30	Long Beach Blvd Off	Off-Ramp	1	1,045	0.70	480	0.32
-	Long Beach Blvd On (SB)	On-Ramp	1	761	0.51	676	0.45
-	Long Beach Blvd On (NB)	On-Ramp	1	533	0.36	486	0.32
-	I-710 Fwy-Fwy Off (NB & SB)	Off-Ramp	2	2,068	0.57	2,325	0.65
32	Garfield Ave Off	Off-Ramp	2	895	0.30	710	0.24
-	I-710 Fwy-Fwy On (NB)	On-Ramp	2	1,215	0.34	1,263	0.35
-	I-710 Fwy-Fwy On (SB)	On-Ramp	2	960	0.27	618	0.17
36	Paramount Blvd On	On-Ramp	1	663	0.44	448	0.30
39	Lakewood Blvd Off	Off-Ramp	1	1,042	0.69	749	0.50
-	Lakewood Blvd On (SB)	On-Ramp	1	215	0.14	160	0.11
-	Lakewood Blvd On (NB)	On-Ramp	1	217	0.14	135	0.09
43	Bellflower Blvd Off	Off-Ramp	1	910	0.61	816	0.54

Table 4-7: I-105 Freeway Eastbound Ramp Conditions—Existing (2017) (continued)

Int. #	Location	Type	Number of Ramp Lanes	Existing			
				AM Peak Hour		PM Peak Hour	
				Volume	V/C	Volume	V/C
43	Bellflower Blvd On	On-Ramp	2	560	0.19	859	0.29
-	I-605 Fwy-Fwy Off (NB & SB)	Off-Ramp	4	3,841	0.53	3,870	0.54
-	Park-and-Ride Lot Off	Off-Ramp	1	133	0.09	100	0.07
-	Hoxie Ave On	On-Ramp	2	126	0.08	240	0.16

Source: Traffic Study Report (provided under separate cover)
Notes: Ave = Avenue; Blvd = Boulevard; EB = Eastbound; Fwy = Freeway; GP = General Purpose; Hwy = Highway; I- Interstate; ML = Managed Lanes; NB = Northbound; SB = Southbound; St = Street

Table 4-8: I-105 Freeway Westbound Ramp Conditions—Existing (2017)

Int. #	Location	Type	Number of Ramp Lanes	Existing			
				AM Peak Hour		PM Peak Hour	
				Volume	V/C	Volume	V/C
-	Sepulveda Blvd Off (SB)	Off-Ramp	1	583	0.39	551	0.37
1	Sepulveda Blvd Off (NB)	Off-Ramp	2	2,228	**0.74**	1,716	0.57
-	Nash St Off (SB)	Off-Ramp	1	1,328	**0.89**	559	0.37
-	I-405 Fwy-Fwy On (NB & SB)	On-Ramp	2	2,123	0.59	1,650	0.46
4	Imperial Hwy Off	Off-Ramp	1	1,376	**0.92**	615	0.41
-	I-405 Fwy-Fwy Off (NB & SB)	Off-Ramp	3	3,208	0.59	4,120	**0.76**
8	Imperial Hwy On	On-Ramp	1	1,191	**0.79**	532	0.35
9	Prairie Ave Hawthorne Blvd Off	Off-Ramp	2	188	0.06	482	0.16
-	Crenshaw Blvd On (SB)	On-Ramp	1	388	0.26	144	0.10
-	Crenshaw Blvd On (NB)	On-Ramp	1	1,058	**0.71**	595	0.40
13	Crenshaw Blvd Off	Off-Ramp	2	644	0.21	1,384	0.46
16	Vermont Ave On	On-Ramp	1	1,145	**0.76**	601	0.40
-	I-110 Fwy-Fwy On (GP) (SB)	On-Ramp	1	801	0.45	1,148	0.64
16	Vermont Ave Off	Off-Ramp	1	731	0.49	733	0.49
-	I-110 Fwy-Fwy On (GP) (NB)	On-Ramp	1	1,107	0.62	1,124	0.62
-	I-110 Fwy-Fwy On (ML) (SB)	On-Ramp	1	708	0.39	751	0.42
-	I-110 Fwy-Fwy Off (ML) (SB)	Off-Ramp	1	332	0.18	181	0.10
-	I-110 Fwy-Fwy Off (GP) (NB & SB)	Off-Ramp	2	2,892	**0.80**	1,887	0.52
20	Central Ave On	On-Ramp	1	818	0.55	918	0.61
20	Central Ave Off	Off-Ramp	1	588	0.39	819	0.55
26	Imperial Hwy On	On-Ramp	1	1,152	**0.77**	1,003	0.67
2	Imperial Hwy Off	Off-Ramp	1	758	0.51	929	0.62

Table 4-8: I-105 Freeway Westbound Ramp Conditions—Existing (2017) (continued)

Int. #	Location	Type	Number of Ramp Lanes	Existing			
				AM Peak Hour		PM Peak Hour	
				Volume	V/C	Volume	V/C
29	Long Beach Blvd On (SB)	On-Ramp	1	651	0.43	569	0.38
29	Long Beach Blvd On (NB)	On-Ramp	1	448	0.30	347	0.23
29	Long Beach Blvd Off	Off-Ramp	1	867	0.58	1,125	**0.75**
-	I-710 Fwy-Fwy On (NB)	On-Ramp	1	1,702	**0.95**	1,407	**0.78**
-	I-710 Fwy-Fwy On (SB)	On-Ramp	2	641	0.18	892	0.25
31	Garfield Ave On	On-Ramp	2	752	0.25	582	0.19
-	I-710 Fwy-Fwy (NB & SB)	Off-Ramp	2	2,762	**0.77**	2,503	**0.70**
35	Paramount Blvd Off	Off-Ramp	1	478	0.32	587	0.39
39	Lakewood Blvd On	On-Ramp	1	567	0.38	971	0.65
39	Lakewood Blvd Off	Off-Ramp	1	685	0.46	685	0.46
42	Bellflower Blvd On	On-Ramp	1	503	0.34	559	0.37
42	Bellflower Blvd Off	Off-Ramp	1	934	0.62	533	0.36
-	I-605 Fwy-Fwy On (NB & SB)	On-Ramp	4	4,814	0.67	5,491	**0.76**
48	Imperial Hwy On	On-Ramp	1	625	0.42	411	0.27
-	Hoxie Ave On	On-Ramp	1	105	0.07	97	0.06
-	Hoxie Ave Off	Off-Ramp	1	69	0.05	52	0.03

Source: Traffic Study Report (provided under separate cover)
Notes: Ave = Avenue; Blvd = Boulevard; Fwy = Freeway; GP = General Purpose; Hwy = Highway; I- = Interstate; ML = Managed Lanes; NB = Northbound; SB = Southbound; St = Street
Red and bold denotes LOS E or worse.

Queuing analysis was performed at the off-ramp terminals using Synchro to determine the queues based on the intersection analysis. Table 4-9 and Table 4-10 include the approximate ramp length and the 95th percentile queue length as reported in the output files for the longest queue and the corresponding movement. The # sign indicates that the volume for the 95th percentile cycle could result in excessive queueing, exceeding the turn bay storage capacity that could potentially block other movements. However, this may only occur approximately 5 percent of the time as 95 percent of the time, lower volumes will allow the queue to dissipate. None of the locations has queuing extending the length of the ramp.

Table 4-9: I-105 Eastbound Freeway Off-Ramp Queueing—Existing (2017)

Int. #	Ramp Location	Ramp Length (ft)	Existing 2017	
			95% Queue Length (ft) AM	95% Queue Length (ft) PM
9	Prairie Ave Off	2,589	157 (Left)	#643 (Thru)
11	Crenshaw Blvd / 120th St Off	1,827	#537 (Left)	162 (Left)
17	Vermont Ave Off	1,149	#362 (Thru)	#403 (Thru)
21	Central Ave Off	1,690	#540 (Left)	#373 (Thru)
24	Wilmington Ave Off	1,830	#472 (Left)	#281 (Left)
30	Long Beach Blvd Off	1,501	#324 (Left)	127 (Left)
32	Garfield Ave Off	3,061	#333 (Right)	258 (Thru)
39	Lakewood Blvd Off	1,682	#549 (Left)	#315 (Left)
43	Bellflower Blvd Off	1,878	#242 (Thru)	#228 (Thru)
48	Studebaker Rd Off	572	228 (Left)	#405 (Right)

Source: Traffic Study Report (provided under separate cover)
Notes: # 95th percentile volume exceeds capacity of the storage bay, which could potentially block other movements.
Ave = Avenue; Blvd = Boulevard; ft = feet; Rd = Road; St = Street

Table 4-10: I-105 Westbound Freeway Off-Ramp Queueing—Existing (2017)

Int. #	Ramp Location	Ramp Length (ft)	Existing 2017	
			95% Queue Length (ft) AM	95% Queue Length (ft) PM
1	Sepulveda Blvd Off (NB)	1,740	#1462 (Thru)	#1052 (Thru)
4	Imperial Hwy Off	1,576	407 (Left)	201 (Left)
6	Hawthorne Blvd Off	4,107	170 (Left)	221 (Left)
9	Prairie Ave Off	3,054	157 (Left)	#643 (Thru)
13	Crenshaw Blvd Off	1,802	296 (Thru)	#780 (Thru)
16	Vermont Ave Off	1,266	#337 (Thru)	#375 (Thru)
20	Central Ave Off	1,058	160 (Thru)	#256 (Left)
26	Imperial Hwy Off	996	#366 (Left)	#380 (Left)
29	Long Beach Blvd Off	1,663	#200 (Thru)	#255 (Right)
35	Paramount Blvd Off	1,182	260 (Thru)	213 (Thru)
39	Lakewood Blvd Off	1,688	#505 (Thru)	#369 (Thru)
42	Bellflower Blvd Off	1,270	149 (Left)	140 (Left)

Source: Traffic Study Report (provided under separate cover)
Notes: # 95th percentile volume exceeds capacity of the storage bay, which could potentially block other movements
Ave = Avenue; Blvd = Boulevard; ft = feet; Hwy = Highway; NB = Northbound

Intersections

Existing peak hour performance results for the study area intersections are summarized in Table 4-11. The analysis showed about half of all intersections studied (23 in the AM peak period and 27 in the PM peak period) have LOS D or worse. LOS D is considered the threshold for acceptable level of service.

Table 4-11: Project Study Area Intersection Performance—Existing (2017)

Location	Intersection	Control Type	Existing Conditions			
			AM Peak Hour		PM Peak Hour	
			LOS	Delay (sec)	LOS	Delay (sec)
1	I-105 WB Off-Ramp / NB Sepulveda Blvd	Signalized	**F**	**117.8**	**E**	**60.2**
2	Sepulveda Blvd / Imperial Hwy	Signalized	D	47.2	**E**	**70.1**
3	Aviation Boulevard / Imperial Hwy	Signalized	**E**	**78.3**	**E**	**72.6**
4	I-105 WB Off- & I-105 EB On-Ramp / Imperial Hwy	Signalized	C	26.8	B	11
5	La Cienega Blvd / Imperial Hwy	Signalized	D	38.8	D	42.9
6	Hawthorne Blvd / I-105 WB Off-Ramp	Signalized	B	13.5	B	17.5
7	Hawthorne Blvd / Imperial Hwy	Signalized	C	29.2	D	45.2
8	I-105 EB On-Ramp / Imperial Hwy (Freeman)	Signalized	C	27.4	C	27.7
9	Prairie Ave / I-105 WB Off-Ramp	Signalized	B	17.9	**F**	**123.6**
10	Prairie Ave / Imperial Hwy	Signalized	**E**	**69.5**	**F**	**196.5**
11	I-105 EB Ramps / 120th St	Signalized	**E**	**69.5**	D	46
12	Crenshaw Blvd / Imperial Hwy	Signalized	D	38.2	D	46.5
13	Crenshaw Blvd / I-105 WB Off-Ramp	Signalized	C	25.5	D	36.8
14	Crenshaw Blvd / 120th St	Signalized	D	39.4	D	39.3
15	Vermont Ave / Imperial Hwy	Signalized	D	48.6	**E**	**58.7**
16	Vermont Ave / I-105 WB Ramps	Signalized	C	26.9	B	18.3
17	Vermont Ave / I-105 EB Off-Ramp	Signalized	C	25.3	C	20.8
18	Vermont Ave / 120th St	Signalized	C	23.9	C	23.6
19	Central Ave / Imperial Hwy	Signalized	**F**	**92.7**	D	43.2
20	Central Ave / I-105 WB Ramps	Signalized	B	19.4	C	23.3
21	Central Ave / I-105 EB Ramps	Signalized	C	27.2	C	23.7
22	Central Ave / 120th St	Signalized	D	35.1	D	35.7
23	Wilmington Ave / Imperial Hwy	Signalized	B	16.1	B	18.1
24	Wilmington Ave / I-105 EB Ramps	Signalized	**E**	**67.6**	C	27.9
25	Wilmington Ave / East 120th St	Signalized	B	17.3	B	16.3
26	I-105 WB Ramps / Imperial Hwy	Signalized	**F**	**165.1**	**F**	**103.4**
27	Mona Blvd / Imperial Hwy	Signalized	D	49.6	D	41.7
28	Long Beach Blvd / Imperial Hwy	Signalized	D	39.4	D	36.5

Table 4-11: Project Study Area Intersection Performance—Existing (2017) (continued)

Location	Intersection	Control Type	Existing Conditions			
			AM Peak Hour		PM Peak Hour	
			LOS	Delay (sec)	LOS	Delay (sec)
29	Long Beach Blvd / I-105 WB Off-Ramp	Signalized	B	14.6	B	18.8
30	Long Beach Blvd / I-105 EB Off-Ramp	Signalized	C	23.4	B	16.4
31	Garfield Ave / I-105 WB On-Ramp	Signalized	C	20.2	B	16.7
32	Garfield Ave / I-105 EB Off-Ramp	Signalized	C	28	C	25.6
33	Garfield Ave / Rosecrans Ave	Signalized	D	51.7	D	47.8
34	Paramount Blvd / Imperial Hwy	Signalized	C	29.4	D	36.3
35	Paramount Blvd / I-105 WB Off-Ramp	Signalized	C	25.5	B	17.3
36	Paramount Blvd / I-105 EB On-Ramp	Signalized	C	21.4	C	20.1
37	Paramount Blvd / Rosecrans Ave	Signalized	D	49.6	**E**	**66.3**
38	Lakewood Blvd / Imperial Hwy	Signalized	C	24	C	30.9
39	Lakewood Blvd / I-105 EB Off-Ramp & WB Ramps	Signalized	**F**	**152.6**	**E**	**55.1**
40	Lakewood Blvd / Rosecrans Ave	Signalized	C	27.4	D	44.1
41	Bellflower Blvd / Imperial Hwy	Signalized	C	27.9	C	27.4
42	Bellflower Blvd / I-105 WB Ramps	Signalized	B	18.1	B	16.9
43	Bellflower Blvd / I-105 EB Ramps	Signalized	B	19.8	C	20.5
44	Bellflower Blvd / Rosecrans Ave	Signalized	D	37.2	C	31
45	Woodruff Ave / Imperial Hwy	Signalized	C	33.2	D	51.5
46	Hoxie Ave / Imperial Hwy	Signalized	D	42.7	**E**	**60.2**
47	Studebaker Rd / Imperial Hwy	Signalized	**E**	**60.2**	D	50.6
48	Studebaker Rd / I-105 WB On-Ramp & EB Off-Ramp	Signalized	**E**	**75.8**	**F**	**97.5**
49	Studebaker Rd / Rosecrans Ave	Signalized	D	42.7	D	48.5

Source: Traffic Study Report (provided under separate cover)
Notes: Ave = Avenue; Blvd = Boulevard; EB = Eastbound; Hwy = Highway; I- = Interstate; LOS = Level of Service; NB = Northbound; Rd = Road; sec = second; St = Street; WB = Westbound
Red and bold denotes LOS E or worse.

Collision Data

An analysis of freeway mainline and ramp collision history was performed using the Caltrans Traffic Accident Surveillance and Analysis System (TASAS) for a three-year period from April 1, 2016 to March 31, 2019 and is provided under separate cover . The TASAS information, which was collected from Caltrans, summarizes accident histories along Caltrans facilities and provides information such as accident rates, number of accidents/collisions, potential accident investigation locations, primary collision factor, and collision type. Table 4-12 and Table 4-13 summarize the accident rates on the freeway mainline segments and Table 4-14 and Table 4-15 are for the freeway-to-freeway ramp and the freeway-to-arterial ramp interchanges. Freeway collision types are summarized in Table 4-16 through Table 4-19.

In the eastbound direction of the I-105 freeway mainline, a total of 12 mainline segments had an actual accident rate that is higher than the statewide average accident rate. Similarly, in the westbound direction of the I-105 freeway mainline, a total of 11 mainline segments had an actual accident rate that is higher than the statewide average accident rate. Based on a review of the detailed accident data, the predominant accident type is rear ends and the most common contributing factor is speeding. Most of the accidents are taking place in the right, interior, and left lanes of the freeway mainline. These are considered congestion related accidents that occur due to the formation of vehicular queues resulting from congested traffic operating conditions and stop-and-go traffic flow patterns.

A total of 99 freeway-to-freeway and freeway-to-arterial ramp interchanges were evaluated. Of these, 64 interchange locations had an actual accident rate that is higher than the statewide average accident rate. Based on a review of the detailed accident data, most of the accidents occur on the ramp or at the ramp exit area. The ramp exit area is located near or at the ramp terminus intersection for off-ramps and near or at the gore of the merger area for on-ramps. The predominant accident type is rear ends and the most common contributing factor is speeding. These are considered congestion related accidents that occur due to vehicular queuing because of slowing down and stop-and-go traffic flow conditions.

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Table 4-12: I-105 Eastbound General Purpose Lanes TASAS Table B—Existing (April 2016 to March 2019)

						Accident Rates					
						Actual			Statewide Average		
District— County— Route	Location Description	From PM	To PM	Direction	Total Accidents	FAT	F+I	TOT	FAT	F+I	TOT
07 – LA – 105	Begin Fwy to Junction Route 1 IC	0.000	0.500	EB	3	0.000	0.06	0.18	0.006	0.32	0.81
07 – LA – 105	Junction Route 1 IC to Douglas St IC	0.500	1.244	EB	23	0.000	0.25	0.48	0.004	0.29	0.89
07 – LA – 105	Douglas St IC to Junction Route 405 IC	1.244	2.106	EB	48	0.000	0.22	0.67	0.004	0.28	0.88
07 – LA – 105	Junction Route 405 IC to Hawthorne Blvd IC	2.106	3.053	EB	164	0.000	**0.43**	**1.40**	0.004	0.30	0.94
07 – LA – 105	Hawthorne Blvd IC to Crenshaw Blvd IC	3.053	4.705	EB	254	0.000	**0.35**	**1.14**	0.004	0.33	1.07
07 – LA – 105	Crenshaw Blvd IC to Vermont Ave IC	4.705	6.766	EB	210	0.000	0.24	0.69	0.005	0.35	1.11
07 – LA – 105	Vermont Ave IC to Junction Route 110 IC	6.766	7.386	EB	117	**0.012**	**0.47**	**1.37**	0.003	0.32	1.04
07 – LA – 105	Junction Route 110 IC to Central Ave IC	7.386	8.903	EB	271	**0.015**	**0.41**	**1.33**	0.003	0.31	1.02
07 – LA – 105	Central Ave IC to Wilmington Ave IC	8.903	9.775	EB	148	0.000	**0.39**	**1.35**	0.005	0.31	0.97
07 – LA – 105	Wilmington Ave IC to Long Beach Blvd IC	9.775	11.506	EB	256	0.000	**0.43**	**1.21**	0.004	0.32	1.02
07 – LA – 105	Long Beach Blvd IC to Junction Route 710 IC	11.506	13.471	EB	199	0.000	**0.32**	0.90	0.003	0.30	0.97
07 – LA – 105	Junction Route 710 IC to Paramount Blvd IC	13.471	14.650	EB	203	0.000	**0.45**	**1.60**	0.002	0.25	0.80
07 – LA – 105	Paramount Blvd IC to Lakewood Blvd IC	14.650	15.763	EB	213	**0.007**	**0.45**	**1.59**	0.004	0.33	1.06
07 – LA – 105	Lakewood Blvd IC to Bellflower Blvd IC	15.763	16.639	EB	207	0.000	**0.64**	**2.01**	0.003	0.29	0.94
07 – LA – 105	Bellflower Blvd IC to Junction Route 605 IC	16.639	17.823	EB	228	0.000	**0.56**	**1.64**	0.008	0.44	1.36
07 – LA – 105	Junction Route 605 IC to Studebaker Rd IC	17.823	18.145	EB	29	0.000	**3.75**	**8.36**	0.005	0.24	0.59

Source: Caltrans TASAS
Notes: Ave = Avenue; Blvd = Boulevard; EB = Eastbound; Fwy = Freeway; IC = Interchange; LA = Los Angeles; Rd = Road; St = Street
Highlighted cell indicates that the accident rate is higher than statewide averages.

Table 4-13: I-105 Westbound General Purpose Lanes TASAS Table B—Existing (April 2016 to March 2019)

						Accident Rates					
						Actual			Statewide Average		
District— County— Route	Location Description	From PM	To PM	Direction	Total Accidents	FAT	F+I	TOT	FAT	F+I	TOT
07 – LA – 105	Begin Fwy to Junction Route 1 IC	0.000	0.500	WB	8	**0.060**	0.30	0.48	0.006	0.32	0.81
07 – LA – 105	Junction Route 1 IC to Douglas St IC	0.500	1.244	WB	219	0.000	**1.63**	**4.52**	0.004	0.29	0.89
07 – LA – 105	Douglas St IC to Junction Route 405 IC	1.244	2.106	WB	45	0.000	0.18	0.63	0.004	0.28	0.88
07 – LA – 105	Junction Route 405 IC to Hawthorne Blvd IC	2.106	3.053	WB	62	0.000	0.13	0.53	0.004	0.30	0.94
07 – LA – 105	Hawthorne Blvd IC to Crenshaw Blvd IC	3.053	4.705	WB	104	0.000	0.14	0.47	0.004	0.33	1.07
07 – LA – 105	Crenshaw Blvd IC to Vermont Ave IC	4.705	6.766	WB	603	0.003	**0.66**	**1.97**	0.005	0.35	1.11
07 – LA – 105	Vermont Ave IC to Junction Route 110 IC	6.766	7.386	WB	105	0.000	**0.56**	**1.23**	0.003	0.32	1.04
07 – LA – 105	Junction Route 110 IC to Central Ave IC	7.386	8.903	WB	152	0.000	**0.32**	0.74	0.003	0.31	1.02
07 – LA – 105	Central Ave IC to Wilmington Ave IC	8.903	9.775	WB	113	**0.018**	**0.34**	**1.03**	0.005	0.31	0.97
07 – LA – 105	Wilmington Ave IC to Long Beach Blvd IC	9.775	11.506	WB	209	0.000	**0.37**	0.99	0.004	0.32	1.02
07 – LA – 105	Long Beach Blvd IC to Junction Route 710 IC	11.506	13.471	WB	361	0.000	**0.58**	**1.64**	0.003	0.30	0.97
07 – LA – 105	Junction Route 710 IC to Paramount Blvd IC	13.471	14.650	WB	118	0.000	**0.35**	**0.93**	0.002	0.24	0.80
07 – LA – 105	Paramount Blvd IC to Lakewood Blvd IC	14.650	15.763	WB	115	0.000	0.27	0.86	0.004	0.33	1.06
07 – LA – 105	Lakewood Blvd IC to Bellflower Blvd IC	15.763	16.639	WB	118	0.000	0.32	**1.14**	0.003	0.39	0.94
07 – LA – 105	Bellflower Blvd IC to Junction Route 605 IC	16.639	17.823	WB	98	0.000	0.22	0.70	0.008	0.44	1.36
07 – LA – 105	Junction Route 605 IC to Studebaker Rd IC	17.823	18.145	WB	4	0.000	**0.58**	**1.15**	0.005	0.24	0.59

Source: Caltrans TASAS
Notes: Ave = Avenue; Blvd = Boulevard; Fwy = Freeway; IC = Interchange; LA = Los Angeles; Rd = Road; St = Street; WB = Westbound
Highlighted cell indicates that the accident rate is higher than statewide averages.

Table 4-14: I-105 Eastbound Freeway Ramps TASAS Table B—Existing (April 2016 to March 2019)

						Accident Rates					
						Actual			Statewide Average		
District— County— Route	Location Description	PM	Direction	On/Off Ramp	Total Accidents	FAT	F+I	TOT	FAT	F+I	TOT
07 – LA – 105	EB Off-Ramp to Sepulveda Blvd / Imperial Hwy	0.282	EB	Off	2	0.000	0.00	**0.26**	0.002	0.08	0.25
07 – LA – 105	WB/EB On-Ramp from SB Sepulveda Blvd	0.485	EB	On	6	0.000	0.05	0.15	0.002	0.08	0.25
07 – LA – 105	Segment EB On-Ramp from SB Sepulveda Blvd	0.540	EB	On	3	0.000	0.03	0.09	0.002	0.13	0.39
07 – LA – 105	EB On-Ramp from EB Imperial Hwy	0.951	EB	On	5	0.000	**0.11**	0.28	0.003	0.10	0.28
07 – LA – 105	EB On-Ramp from SB Douglas St	1.164	EB	On	6	0.000	**0.38**	**1.14**	0.003	0.23	0.71
07 – LA – 105	EB Off-Ramp to Route 405	1.631	EB	Off	3	0.000	0.04	0.11	0.002	0.08	0.25
07 – LA – 105	EB On-Ramp from Imperial Hwy	1.958	EB	On	8	0.000	**0.17**	**0.67**	0.001	0.14	0.48
07 – LA – 105	EB On-Ramp from NB Route 405	2.332	EB	On	4	0.000	0.06	0.23	0.002	0.11	0.32
07 – LA – 105	EB On-Ramp from SB Route 405	2.576	EB	On	35	**0.030**	**0.36**	**1.06**	0.002	0.13	0.39
07 – LA – 105	EB Off-Ramp to Prairie Ave	3.123	EB	Off	13	0.000	**0.51**	**1.32**	0.003	0.15	0.45
07 – LA – 105	Segment EB On-Ramp from SB Hawthorne Blvd	3.545	EB	On	30	0.000	**0.75**	**3.75**	0.003	0.23	0.71
07 – LA – 105	Segment EB On-Ramp from Imperial Hwy	3.546	EB	On	20	0.000	**0.58**	**1.46**	0.001	0.14	0.48
07 – LA – 105	EB On-Ramp from Hawthorne Blvd / Imperial Hwy	3.710	EB	On	5	0.000	0.00	**0.65**	0.001	0.06	0.20
07 – LA – 105	EB Off-Ramp to Crenshaw Blvd / 120th St	4.308	EB	Off	10	0.000	**0.45**	**0.90**	0.002	0.23	0.78
07 – LA – 105	EB On-Ramp from Crenshaw Blvd / 120th St	4.684	EB	On	22	0.000	**0.55**	**1.72**	0.001	0.14	0.48
07 – LA – 105	EB On-Ramp from NB Crenshaw Blvd	4.973	EB	On	18	0.000	**0.25**	**1.51**	0.003	0.19	0.56
07 – LA – 105	EB Off-Ramp to Vermont Ave	6.561	EB	Off	5	0.000	0.10	0.48	0.004	0.32	0.92
07 – LA – 105	EB Off-Ramp to Route 110	6.992	EB	Off	12	0.000	**0.15**	0.25	0.002	0.08	0.25
07 – LA – 105	EB 105 HOV Off-Ramp to NB 110 HOV	7.055	EB	Off	4	0.000	**0.20**	**0.40**	0.002	0.08	0.25
07 – LA – 105	Segment EB Off-Ramp to NB Route 110	7.196	EB	Off	15	0.000	**0.18**	**1.32**	0.003	0.15	0.45

Table 4-14: I-105 Eastbound Freeway Ramps TASAS Table B—Existing (April 2016 to March 2019) (continued)

						Accident Rates					
						Actual			Statewide Average		
District— County— Route	Location Description	PM	Direction	On/Off Ramp	Total Accidents	FAT	F+I	TOT	FAT	F+I	TOT
07 – LA – 105	Segment EB Off-Ramp to SB Route 110	7.197	EB	Off	5	0.000	0.05	0.24	0.003	0.12	0.37
07 – LA – 105	EB On-Ramp from Hoover St	7.212	EB	On	2	0.000	0.13	0.25	0.002	0.21	0.60
07 – LA – 105	Segment EB On-Ramp from SB Route 110	7.519	EB	On	22	0.000	**0.30**	**1.12**	0.002	0.13	0.39
07 – LA – 105	EB On-Ramp from Route 110	7.815	EB	On	12	0.000	0.02	**0.27**	0.001	0.06	0.20
07 – LA – 105	EB Off-Ramp to Central Ave	8.697	EB	Off	26	0.000	**0.39**	**1.14**	0.004	0.32	0.92
07 – LA – 105	EB On-Ramp from Central Ave	9.116	EB	On	10	0.000	**0.34**	**0.85**	0.002	0.21	0.60
07 – LA – 105	EB Off-Ramp to Wilmington Ave	9.630	EB	Off	18	0.000	0.32	**1.91**	0.004	0.32	0.92
07 – LA – 105	EB On-Ramp from Wilmington Ave	9.881	EB	On	12	0.000	**0.47**	**1.14**	0.001	0.23	0.67
07 – LA – 105	EB Off-Ramp to Long Beach Blvd	11.414	EB	Off	15	0.000	0.14	0.71	0.004	0.32	0.92
07 – LA – 105	EB On-Ramp from SB Long Beach Blvd	11.746	EB	On	11	0.000	0.09	**0.97**	0.003	0.23	0.71
07 – LA – 105	EB On-Ramp from NB Long Beach Blvd	11.945	EB	On	9	0.000	**0.48**	**1.43**	0.003	0.19	0.56
07 – LA – 105	EB Off-Ramp to Route 710	12.998	EB	Off	8	0.000	0.08	0.22	0.002	0.08	0.25
07 – LA – 105	EB Off-Ramp to Garfield Ave	13.608	EB	Off	8	0.000	**0.18**	**0.72**	0.001	0.06	0.17
07 – LA – 105	EB On-Ramp from NB Route 710	13.809	EB	On	2	0.000	0.00	0.12	0.002	0.11	0.32
07 – LA – 105	Segment Garfield Ave from NB Route 710 / EB Route 105	13.810	EB	On	10	0.000	**0.25**	**0.61**	0.002	0.08	0.25
07 – LA – 105	Segment EB Off-Ramp to Garfield Ave from SB Route 710	13.818	EB	Off	1	0.000	**0.21**	**0.21**	0.001	0.06	0.17
07 – LA – 105	EB On-Ramp from SB Route 710	13.861	EB	On	0	0.000	0.00	0.00	0.000	0.04	0.12
07 – LA – 105	Segment EB Off-Ramp to Garfield Ave from Route 105 / Route 710	13.934	EB	Off	15	0.000	**0.14**	**0.71**	0.002	0.08	0.25
07 – LA – 105	EB Frontage Rd – Garfield Ave to Paramount Blvd	14.128	EB	N/A	4	0.000	**9.01**	**36.04**	0.001	0.18	0.65

Table 4-14: I-105 Eastbound Freeway Ramps TASAS Table B—Existing (April 2016 to March 2019) (continued)

						Accident Rates					
						Actual			Statewide Average		
07 – LA – 105	EB On-Ramp from Paramount Blvd	14.901	EB	On	4	0.000	0.09	**0.36**	0.003	0.10	0.28
07 – LA – 105	EB Off-Ramp to Lakewood Blvd	15.515	EB	Off	18	0.000	0.29	**1.06**	0.004	0.32	0.92
07 – LA – 105	EB On-Ramp from SB Lakewood Blvd	15.771	EB	On	5	0.000	**0.57**	**1.43**	0.003	0.23	0.71
07 – LA – 105	EB On-Ramp from NB Lakewood Blvd	15.949	EB	On	3	0.000	**0.47**	**0.70**	0.003	0.19	0.56
07 – LA – 105	EB Off-Ramp to Bellflower Blvd	16.379	EB	Off	9	0.000	**0.59**	0.89	0.004	0.32	0.92
07 – LA – 105	EB On-Ramp from Bellflower Blvd	16.864	EB	On	7	0.000	0.00	**0.91**	0.002	0.21	0.60
07 – LA – 105	EB Off-Ramp to Route 605 / Rosecrans Ave / Firestone Blvd	17.390	EB	Off	9	0.000	0.06	**0.28**	0.002	0.08	0.25
07 – LA – 105	Segment EB Off-Ramp to NB Route 605 / Firestone Blvd	17.565	EB	Off	7	0.000	**0.38**	**0.57**	0.003	0.15	0.45
07 – LA – 105	Segment EB Off-Ramp to SB Route 605 / Rosecrans Ave	17.566	EB	Off	19	0.000	**0.15**	**0.41**	0.003	0.12	0.37
07 – LA – 105	EB Off-Ramp to Park-and-Ride Lot	17.633	EB	Off	3	0.000	0.00	**1.94**	0.003	0.24	0.69
07 – LA – 105	EB On-Ramp from Hoxie Ave	17.993	EB	On	1	0.000	**0.53**	0.53	0.002	0.21	0.60

Source: Caltrans TASAS
Notes: Ave = Avenue; Blvd = Boulevard; EB = Eastbound; HOV = High Occupancy Vehicle; Hwy = Highway; LA = Los Angeles; NB = Northbound; Rd = Road; SB = Southbound; St = Street; WB = Westbound
Highlighted cell indicates that the accident rate is higher than statewide averages.

Table 4-15: I-105 Westbound Freeway Ramps TASAS Table B—Existing (April 2016 to March 2019)

						Accident Rates					
						Actual			Statewide Average		
District— County— Route	Location Description	PM	Direction	On/Off Ramp	Total Accidents	FAT	F+I	TOT	FAT	F+I	TOT
07 – LA – 105	WB On-Ramp from SB Sepulveda Blvd / Imperial Hwy	0.278	WB	On	0	0.000	0.00	0.00	0.001	0.06	0.20
07 – LA – 105	Segment WB On-Ramp from WB Imperial Hwy	0.351	WB	On	0	0.000	0.00	0.00	0.002	0.21	0.60
07 – LA – 105	WB/EB On-Ramp from SB Sepulveda Blvd	0.485	WB	On	6	0.000	0.05	0.15	0.002	0.08	0.25
07 – LA – 105	WB Off-Ramp to SB Sepulveda Blvd	0.547	WB	Off	7	0.000	0.00	**0.78**	0.004	0.21	0.70
07 – LA – 105	WB Off-Ramp to NB Sepulveda Blvd	0.740	WB	Off	12	0.000	0.09	0.34	0.003	0.24	0.69
07 – LA – 105	WB Off-Ramp to SB Nash St	0.985	WB	Off	12	0.000	0.25	**1.00**	0.004	0.30	0.93
07 – LA – 105	WB On-Ramp from Route 405	1.627	WB	On	3	0.000	0.04	0.12	0.001	0.06	0.20
07 – LA – 105	Segment WB On-Ramp from SB Route 405	1.934	WB	On	6	**0.079**	**0.32**	**0.47**	0.002	0.11	0.32
07 – LA – 105	Segment WB On-Ramp from NB Route 405	1.935	WB	On	1	0.000	0.00	0.06	0.002	0.13	0.39
07 – LA – 105	WB Off-Ramp to Imperial Hwy	1.959	WB	Off	19	0.000	**0.28**	**1.80**	0.002	0.23	0.78
07 – LA – 105	WB Off-Ramp to Route 405	2.556	WB	Off	12	0.000	0.05	0.20	0.002	0.08	0.25
07 – LA – 105	WB On-Ramp from Imperial Hwy	3.360	WB	On	20	0.000	**0.37**	**1.83**	0.002	0.21	0.60
07 – LA – 105	Segment WB Off-Ramp to Hawthorne Blvd	3.559	WB	Off	17	**0.072**	**0.50**	**1.22**	0.004	0.32	0.92
07 – LA – 105	Segment WB Off-Ramp to Prairie Ave	3.560	WB	Off	6	0.000	0.12	0.73	0.004	0.30	0.93
07 – LA – 105	WB Off-Ramp to Prairie Ave / Hawthorne Blvd	3.756	WB	Off	5	0.000	**0.25**	**0.63**	0.002	0.08	0.25
07 – LA – 105	WB On-Ramp from SB Crenshaw Blvd	4.519	WB	On	4	0.000	0.00	**1.19**	0.003	0.19	0.56
07 – LA – 105	WB On-Ramp from NB Crenshaw Blvd	4.726	WB	On	7	0.000	**0.42**	**0.98**	0.003	0.23	0.71
07 – LA – 105	WB Off-Ramp to Crenshaw Blvd	4.940	WB	Off	18	0.000	0.26	0.77	0.004	0.32	0.92
07 – LA – 105	WB On-Ramp from Vermont Ave	6.529	WB	On	13	0.000	**0.28**	**1.23**	0.002	0.21	0.60
07 – LA – 105	WB On-Ramp from SB Route 110	6.809	WB	On	15	**0.038**	0.11	**0.57**	0.002	0.11	0.32
07 – LA – 105	WB Off-Ramp to Vermont Ave	6.948	WB	Off	15	0.000	**0.68**	**1.71**	0.004	0.32	0.92
07 – LA – 105	WB 105 HOV On-Ramp from SB 110 HOV	7.054	WB	On	6	0.000	**0.20**	**0.59**	0.001	0.06	0.20

Table 4-15: I-105 Westbound Freeway Ramps TASAS Table B—Existing (April 2016 to March 2019) (continued)

						Accident Rates					
						Actual			Statewide Average		
District— County— Route	Location Description	PM	Direction	On/Off Ramp	Total Accidents	FAT	F+I	TOT	FAT	F+I	TOT
07 – LA – 105	WB On-Ramp from NB Route 110	7.435	WB	On	18	0.000	**0.27**	**0.82**	0.003	0.18	0.61
07 – LA – 105	Segment WB Off-Ramp to NB Route 110	7.608	WB	Off	8	0.000	**0.13**	0.34	0.003	0.12	0.37
07 – LA – 105	Segment WB Off-Ramp to SB Route 110	7.609	WB	Off	6	0.000	**0.17**	0.33	0.003	0.15	0.45
07 – LA – 105	WB Off-Ramp to Route 110	7.785	WB	Off	5	0.000	0.02	0.12	0.002	0.08	0.25
07 – LA – 105	WB On-Ramp from Central Ave	8.764	WB	On	6	0.000	0.11	0.33	0.002	0.21	0.60
07 – LA – 105	WB Off-Ramp to Central Ave	9.089	WB	Off	8	0.000	0.20	0.82	0.004	0.32	0.92
07 – LA – 105	WB On-Ramp from Imperial Hwy	9.954	WB	On	15	0.000	**0.38**	**0.95**	0.001	0.14	0.48
07 – LA – 105	WB Off-Ramp to Imperial Hwy	10.235	WB	Off	11	0.000	0.13	0.69	0.002	0.23	0.78
07 – LA – 105	WB On-Ramp from SB Long Beach Blvd	11.372	WB	On	7	0.000	0.08	0.53	0.003	0.19	0.56
07 – LA – 105	WB On-Ramp from NB Long Beach Blvd	11.492	WB	On	9	0.000	**0.31**	**0.93**	0.003	0.23	0.71
07 – LA – 105	WB Off-Ramp to Long Beach Blvd	11.762	WB	Off	17	0.000	**0.44**	**3.78**	0.004	0.32	0.92
07 – LA – 105	WB On-Ramp from NB Route 710	13.018	WB	On	6	0.000	0.05	0.30	0.002	0.13	0.39
07 – LA – 105	WB On-Ramp from SB Route 710	13.209	WB	On	23	0.000	**0.18**	**1.05**	0.002	0.11	0.32
07 – LA – 105	WB On-Ramp from Garfield Ave	13.794	WB	On	1	0.000	0.00	0.09	0.002	0.13	0.39
07 – LA – 105	WB Off-Ramp to Route 710	13.985	WB	Off	38	**0.021**	**0.32**	**0.80**	0.002	0.08	0.25
07 – LA – 105	Segment WB On-Ramp from Garfield Ave to Route 710	13.999	WB	On	0	0.000	0.00	0.00	0.000	0.04	0.12
07 – LA – 105	Segment WB On-Ramp from Garfield Ave to WB Route 105	14.000	WB	On	18	0.000	**0.28**	**0.99**	0.001	0.06	0.20
07 – LA – 105	WB Frontage Rd – Paramount Blvd to Garfield Ave	14.664	WB	N/A	1	0.000	0.00	**9.01**	0.001	0.18	0.65
07 – LA – 105	WB Off-Ramp to Paramount Blvd	14.937	WB	Off	2	0.000	0.00	0.15	0.003	0.09	0.25

Table 4-15: I-105 Westbound Freeway Ramps TASAS Table B—Existing (April 2016 to March 2019) (continued)

						Accident Rates					
						Actual			Statewide Average		
07 – LA – 105	WB On-Ramp from Lakewood Blvd	15.579	WB	On	12	0.000	0.18	**1.10**	0.002	0.21	0.60
07 – LA – 105	WB Off-Ramp to Lakewood Blvd	15.968	WB	Off	14	0.000	**0.56**	**1.57**	0.004	0.32	0.92
07 – LA – 105	WB On-Ramp from Bellflower Blvd	16.425	WB	On	3	0.000	0.00	0.39	0.002	0.21	0.60
07 – LA – 105	WB Off-Ramp to Bellflower Blvd	16.847	WB	Off	6	0.000	0.29	0.59	0.004	0.32	0.92
07 – LA – 105	WB On-ramp from Route 605 / Rosecrans Ave	17.399	WB	On	4	0.000	0.02	0.04	0.001	0.06	0.20
07 – LA – 105	Segment WB On-Ramp from SB Route 605	17.583	WB	On	14	0.000	0.06	0.26	0.002	0.11	0.32
07 – LA – 105	WB On-Ramp from Imperial Hwy	17.691	WB	On	0	0.000	0.00	0.00	0.002	0.11	0.32
07 – LA – 105	WB On-Ramp from Hoxie Ave	17.844	WB	On	0	0.000	0.00	0.47	0.002	0.21	0.60
07 – LA – 105	WB Off-Ramp to Hoxie Ave	18.015	WB	Off	0	0.000	0.00	0.00	0.004	0.32	0.92

Source: Caltrans TASAS

Notes: Ave = Avenue; Blvd = Boulevard; EB = Eastbound; HOV = High Occupancy Vehicle; Hwy = Highway; LA = Los Angeles; NB = Northbound; Rd = Road; SB = Southbound; St = Street; WB = Westbound
Highlighted cell indicates that the accident rate is higher than statewide averages.

Table 4-16: I-105 Eastbound Freeway Mainline Collision Type—Existing (April 2016 to March 2019)

Location Description	From PM	To PM	Head On	Sideswipe	Rear End	Broadside	Hit Object	Overturn	Auto-Peds	Other	Not Stated
Begin Fwy to Junction Route 1 IC	0.000	0.500	0.0	33.3	33.3	0.0	33.3	0.0	0.0	0.0	0.0
Junction Route 1 IC to Douglas St IC	0.500	1.244	0.0	26.1	56.5	0.0	8.7	8.7	0.0	0.0	0.0
Douglas St IC to Junction Route 405 IC	1.244	2.106	2.1	43.8	35.4	0.0	18.8	0.0	0.0	0.0	0.0
Junction Route 405 IC to Hawthorne Blvd IC	2.106	3.053	0.0	31.7	59.1	1.2	6.1	1.8	0.0	0.0	0.0
Hawthorne Blvd IC to Crenshaw Blvd IC	3.053	4.705	0.4	24.8	64.6	0.8	7.5	1.6	0.0	0.4	0.0
Crenshaw Blvd IC to Vermont Ave IC	4.705	6.766	0.0	27.1	55.2	1.4	11.9	2.9	0.0	1.4	0.0
Vermont Ave IC to Junction Route 110 IC	6.766	7.386	0.9	28.2	63.2	0.9	6.8	0.0	0.0	0.0	0.0
Junction Route 110 IC to Central Ave IC	7.386	8.903	0.4	25.5	62.0	1.5	7.0	3.0	0.7	0.0	0.0
Central Ave IC to Wilmington Ave IC	8.903	9.775	0.0	17.6	75.0	2.0	4.7	0.0	0.0	0.7	0.0
Wilmington Ave IC to Long Beach Blvd IC	9.775	11.506	0.0	21.1	62.9	3.5	9.8	2.0	0.0	0.8	0.0
Long Beach Blvd IC to Junction Route 710 IC	11.506	13.471	1.0	27.1	63.3	2.0	6.5	0.0	0.0	0.0	0.0
Junction Route 710 IC to Paramount Blvd IC	13.471	14.650	0.5	27.1	66.0	0.5	5.4	0.5	0.0	0.0	0.0
Paramount Blvd IC to Lakewood Blvd IC	14.650	15.763	0.5	22.1	70.9	0.9	3.3	1.4	0.5	0.5	0.0
Lakewood Blvd IC to Bellflower Blvd IC	15.763	16.639	0.0	12.6	81.6	1.9	2.4	1.4	0.0	0.0	0.0
Bellflower Blvd IC to Junction Route 605 IC	16.639	17.823	0.0	21.1	71.9	0.0	4.8	1.8	0.0	0.4	0.0
Junction Route 605 IC to Studebaker Rd IC	17.823	18.145	0.0	13.6	81.8	0.0	4.5	0.0	0.0	0.0	0.0

Source: Caltrans TASAS
Notes: Ave = Avenue; Blvd = Boulevard; Fwy = Freeway; IC = Interchange; Rd = Road; St = Street

Table 4-17: I-105 Eastbound Freeway Mainline Collision Factor—Existing (April 2016 to March 2019)

Location Description	From PM	To PM	Influence of Alcohol	Follow Too Close	Failure to Yield	Improper Turn	Speeding	Other Violations	Improper Driving	Other Than Driver	Unknown	Not Stated	Invalid
Begin Fwy to Junction Route 1 IC	0.000	0.500	0.0	0.0	0.0	66.7	33.3	0.0	0.0	0.0	0.0	0.0	0.0
Junction Route 1 IC to Douglas St IC	0.500	1.244	4.3	0.0	0.0	26.1	60.9	0.0	0.0	4.3	4.3	0.0	0.0
Douglas St IC to Junction Route 405 IC	1.244	2.106	2.1	0.0	0.0	22.9	41.7	27.1	0.0	4.2	2.1	0.0	0.0
Junction Route 405 IC to Hawthorne Blvd IC	2.106	3.053	4.9	0.6	0.0	21.3	55.5	17.1	0.0	0.6	0.0	0.0	0.0
Hawthorne Blvd IC to Crenshaw Blvd IC	3.053	4.705	3.5	0.0	0.0	18.1	61.8	15.0	0.0	0.8	0.8	0.0	0.0
Crenshaw Blvd IC to Vermont Ave IC	4.705	6.766	3.8	0.0	0.0	24.8	53.8	13.3	0.0	3.3	1.0	0.0	0.0
Vermont Ave IC to Junction Route 110 IC	6.766	7.386	6.8	0.0	0.0	5.1	52.1	31.6	0.0	0.9	3.4	0.0	0.0
Junction Route 110 IC to Central Ave IC	7.386	8.903	3.3	0.4	0.4	5.9	60.1	27.3	0.0	1.1	1.5	0.0	0.0
Central Ave IC to Wilmington Ave IC	8.903	9.775	4.7	0.0	0.0	4.1	71.6	17.6	0.0	1.4	0.7	0.0	0.0
Wilmington Ave IC to Long Beach Blvd IC	9.775	11.506	4.3	0.4	0.0	9.4	62.5	20.7	0.0	0.0	2.7	0.0	0.0
Long Beach Blvd IC to Junction Route 710 IC	11.506	13.471	3.5	2.0	0.0	6.5	61.3	25.1	0.0	1.5	0.0	0.0	0.0

Table 4-17: I-105 Eastbound Freeway Mainline Collision Factor—Existing (April 2016 to March 2019) (continued)

Location Description	From PM	To PM	Influence of Alcohol	Follow Too Close	Failure to Yield	Improper Turn	Speeding	Other Violations	Improper Driving	Other Than Driver	Unknown	Not Stated	Invalid
Junction Route 710 IC to Paramount Blvd IC	13.471	14.650	2.0	3.9	0.0	18.7	56.7	14.8	0.5	2.5	1.0	0.0	0.0
Paramount Blvd IC to Lakewood Blvd IC	14.650	15.763	5.6	0.0	0.5	10.8	63.8	16.4	0.0	1.4	1.4	0.0	0.0
Lakewood Blvd IC to Bellflower Blvd IC	15.763	16.639	2.4	0.0	0.0	6.8	78.3	10.1	0.0	1.0	1.4	0.0	0.0
Bellflower Blvd IC to Junction Route 605 IC	16.639	17.823	0.9	0.4	0.0	14.0	64.0	17.1	0.0	1.3	2.2	0.0	0.0
Junction Route 605 IC to Studebaker Rd IC	17.823	18.145	9.1	0.0	0.0	4.5	68.2	18.2	0.0	0.0	0.0	0.0	0.0

Source: Caltrans TASAS
Notes: Ave = Avenue; Blvd = Boulevard; Fwy = Freeway; IC = Interchange; Rd = Road; St = Street

Table 4-18: I-105 Westbound Freeway Mainline Collision Type—Existing (April 2016 to March 2019)

Location Description	From PM	To PM	Head On	Sideswipe	Rear End	Broadside	Hit Object	Overturn	Auto-Peds	Other	Not Stated
Begin Fwy to Junction Route 1 IC	0.000	0.500	0.0	0.0	40.0	20.0	20.0	0.0	20.0	0.0	0.0
Junction Route 1 IC to Douglas St IC	0.500	1.244	0.4	14.2	76.3	0.4	7.8	0.4	0.0	0.4	0.0
Douglas St IC to Junction Route 405 IC	1.244	2.106	0.0	37.8	44.4	2.2	13.3	0.0	0.0	2.2	0.0
Junction Route 405 IC to Hawthorne Blvd IC	2.106	3.053	0.0	27.4	45.2	3.2	21.0	3.2	0.0	0.0	0.0
Hawthorne Blvd IC to Crenshaw Blvd IC	3.053	4.705	1.0	29.8	44.2	2.9	17.3	3.8	1.0	0.0	0.0
Crenshaw Blvd IC to Vermont Ave IC	4.705	6.766	0.3	15.4	76.0	1.3	5.0	1.2	0.3	0.5	0.0
Vermont Ave IC to Junction Route 110 IC	6.766	7.386	0.0	24.8	63.8	1.9	3.8	4.8	0.0	1.0	0.0
Junction Route 110 IC to Central Ave IC	7.386	8.903	0.0	30.3	56.6	0.6	9.9	2.0	0.6	0.0	0.0
Central Ave IC to Wilmington Ave IC	8.903	9.775	0.0	27.4	61.1	1.8	6.2	3.5	0.0	0.0	0.0
Wilmington Ave IC to Long Beach Blvd IC	9.775	11.506	0.0	19.2	67.8	0.7	10.3	2.1	0.0	0.0	0.0
Long Beach Blvd IC to Junction Route 710 IC	11.506	13.471	0.0	18.6	76.5	0.0	3.3	1.4	0.0	0.3	0.0
Junction Route 710 IC to Paramount Blvd IC	13.471	14.650	0.0	22.9	67.8	0.0	8.5	0.8	0.0	0.0	0.0
Paramount Blvd IC to Lakewood Blvd IC	14.650	15.763	1.7	18.3	71.3	1.7	5.2	1.7	0.0	0.0	0.0
Lakewood Blvd IC to Bellflower Blvd IC	15.763	16.639	0.0	18.6	70.3	0.9	9.3	0.0	0.0	0.9	0.0
Bellflower Blvd IC to Junction Route 605 IC	16.639	17.823	0.0	24.5	63.3	0.0	7.1	3.1	0.0	2.0	0.0
Junction Route 605 IC to Studebaker Rd IC	17.823	18.145	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Caltrans TASAS
Notes; Ave = Avenue; Blvd = Boulevard; Fwy = Freeway; IC = Interchange; Rd = Road; St = Street

Table 4-19: I-105 Westbound Freeway Mainline Collision Factor—Existing (April 2016 to March 2019)

Location Description	From PM	To PM	Influence of Alcohol	Follow Too Close	Failure to Yield	Improper Turn	Speeding	Other Violations	Improper Driving	Other Than Driver	Unknown	Not Stated	Invalid
Begin Fwy to Junction Route 1 IC	0.000	0.500	0.0	0.0	0.0	20.0	40.0	40.0	0.0	0.0	0.0	0.0	0.0
Junction Route 1 IC to Douglas St IC	0.500	1.244	1.8	0.0	0.0	11.9	77.6	7.3	0.0	0.5	0.9	0.0	0.0
Douglas St IC to Junction Route 405 IC	1.244	2.106	0.0	0.0	0.0	31.1	42.2	22.2	0.0	2.2	2.2	0.0	0.0
Junction Route 405 IC to Hawthorne Blvd IC	2.106	3.053	3.2	0.0	0.0	30.6	46.8	16.1	0.0	3.2	0.0	0.0	0.0
Hawthorne Blvd IC to Crenshaw Blvd IC	3.053	4.705	0.0	0.0	0.0	38.5	39.4	16.3	0.0	5.8	0.0	0.0	0.0
Crenshaw Blvd IC to Vermont Ave IC	4.705	6.766	1.5	0.2	0.3	15.1	71.0	9.6	0.0	1.8	0.5	0.0	0.0
Vermont Ave IC to Junction Route 110 IC	6.766	7.386	1.0	0.0	0.0	2.9	56.2	35.2	0.0	2.9	1.9	0.0	0.0
Junction Route 110 IC to Central Ave IC	7.386	8.903	3.3	0.7	0.7	3.9	51.3	36.2	0.0	3.3	0.7	0.0	0.0
Central Ave IC to Wilmington Ave IC	8.903	9.775	2.7	0.0	0.0	8.0	60.2	26.5	0.0	1.8	0.9	0.0	0.0
Wilmington Ave IC to Long Beach Blvd IC	9.775	11.506	4.1	2.1	0.7	4.8	65.8	20.5	0.0	1.4	0.7	0.0	0.0
Long Beach Blvd IC to Junction Route 710 IC	11.506	13.471	3.0	1.4	0.0	6.4	70.1	17.2	0.0	0.8	1.1	0.0	0.0

Table 4-19: I-105 Westbound Freeway Mainline Collision Factor—Existing (April 2016 to March 2019) (continued)

Location Description	From PM	To PM	Influence of Alcohol	Follow Too Close	Failure to Yield	Improper Turn	Speeding	Other Violations	Improper Driving	Other Than Driver	Unknown	Not Stated	Invalid
Junction Route 710 IC to Paramount Blvd IC	13.471	14.650	4.2	4.2	0.0	12.7	58.5	19.5	0.0	0.8	0.0	0.0	0.0
Paramount Blvd IC to Lakewood Blvd IC	14.650	15.763	7.0	0.0	0.0	11.3	68.7	11.3	0.0	0.9	0.9	0.0	0.0
Lakewood Blvd IC to Bellflower Blvd IC	15.763	16.639	5.9	0.0	0.0	11.9	63.6	16.1	0.0	2.5	0.0	0.0	0.0
Bellflower Blvd IC to Junction Route 605 IC	16.639	17.823	1.0	0.0	0.0	20.4	60.2	16.3	0.0	2.0	0.0	0.0	0.0
Junction Route 605 IC to Studebaker Rd IC	17.823	18.145	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Caltrans TASAS
Notes; Ave = Avenue; Blvd = Boulevard; Fwy = Freeway; IC = Interchange; Rd = Road; St = Street

5. ALTERNATIVES

The Project improvements include implementation of ExpressLanes on the I-105 from Imperial Highway/Sepulveda Boulevard Intersection (west of I-405) in the City of Los Angeles, to Studebaker Road (east of I-605) in the City of Norwalk, in Los Angeles County, and I-110 from the I-105 Separation in the City of Los Angeles, to 103rd Street in the City of Los Angeles. The Project seeks to convert the existing I-105 HOV lanes to ExpressLanes, addressing existing degradation of the HOV lanes by deploying dynamic pricing as a means to optimize existing capacity thereby offering greater travel time reliability and enhanced mobility choice to travelers. Project improvements to the I-110 corridor include implementing associated signage required by the Build Alternatives. The Project intends to incorporate Context Sensitive Solutions, where applicable, that integrate and consider community, aesthetic, multimodal and environmental values with transportation safety, maintenance, and performance goals. The Project is expected to yield mobility benefits to commuters and freight traffic alike, through reduced travel times, increased vehicle and passenger throughput and reliability, and reduce delay through active traffic management to optimize freeway speeds throughout the corridor.

Based on the conceptual analysis and preliminary engineering studies, two Build Alternatives are proposed in addition to a "No-Build" Alternative. A brief discussion of alternatives considered but rejected from further consideration of this Project is also included for reference. As the Project progresses through the project development cycle, viable alternatives will continue to be evaluated and refined based on input from the community, stakeholders, and local jurisdictions. The Final Project Report and Environmental Document will serve as the approval mechanisms for the "preferred" alternative.

5A. Viable Alternatives

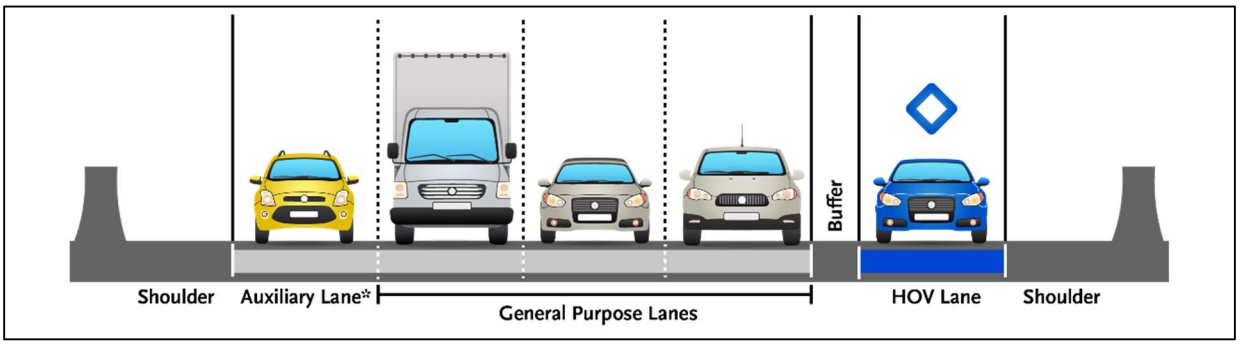
The Layouts and Typical Cross Sections for each of the viable alternatives are found in Attachment C.

Alternative 1 – No-Build Alternative: Existing Conditions

Alternative 1, the No-Build Alternative, does not include improvements to the existing lane configurations for I-105. Figure 5-1 illustrates a typical cross section for the I-105 existing conditions.

Under the No-Build Alternative, no additional travel lanes or ramp improvements would occur. This alternative includes other projects on the financially-constrained project list in the adopted SCAG 2016-2040 RTP/SCS in the Project limits on I-105. Additional land areas would not be impacted, and existing and projected traffic congestion would not be alleviated beyond that associated with other projects in approved regional transportation plans. The No-Build Alternative does not include any of the features considered during the conceptual analysis and preliminary engineering stage of the Project. That is, it does not address the current traffic demand, which will increase in the future. The No-Build Alternative does not meet the established purpose and need of the Project outlined in Section 4; it only provides a baseline for comparison with the Build Alternatives.

Figure 5-1: Cross Section for No-Build Alternative: Existing Conditions



Source: Metro, 2019
Note: *Auxiliary Lane is only in certain location on I-105 see Attachment B for locations.

Design Year (2027 and 2047) No-Build Alternative (Alternative 1) Traffic Operations Analysis Summary

Analysis of the future No-Build Alternative conditions on the I-105 freeway was conducted using the outputs from the travel demand model for Design Years 2027 and 2047.

Mainline

In 2027, the corridor is forecast to carry 179,000 to 186,000 ADT in general purpose lanes and 39,000 to 43,000 ADT in managed lane. There is approximately 6-percent truck volume in the corridor. By 2047, daily traffic will increase to 193,000 and 45,000 in the general purpose and managed lanes, respectively. Truck volume will also increase by one-percent in 2047.

The peak hour volumes and LOS for the 2027 and 2047 No-Build Alternative 1 for freeway general purpose lanes segments for both eastbound and westbound directions are summarized in Table 5-1 through Table 5-8. In the peak travel direction, the corridor is projected to grow by approximately 3-percent in the AM peak period and 3- to 8-percent in the PM peak period.

There are several areas along I-105 that are currently operating at oversaturated conditions (LOS F). A bottleneck at the I-710 interchange develops in 2027 and expands in 2047, causing the eastbound general purpose lanes to degrade during the AM peak hour. Additionally, a bottleneck in the eastbound direction forms at the I-605 Interchange and queues back to an existing bottleneck at Lakewood Boulevard. During the PM peak hour, the eastbound general purpose lanes become completely degraded to LOS F between the I-405 and I-605. During the AM peak hour, nearly the full length of the westbound traffic between I-605 and I-405 will become degraded by 2027.

Table 5-1: I-105 Eastbound General Purpose Lanes Mainline Analysis—Alternative 1 (2027)

Location	Segment Type	2027 No-Build (Alternative 1)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between I-405 & Hawthorne Blvd / Prairie Ave Off-Ramp	Basic	4,796	20.9	C	2,856	-	**F***
Between Prairie Ave Off-Ramp & On-ramp	Basic	4,086	30.2	D	3,945	-	**F***
Between Prairie Ave & Crenshaw Blvd / 120th St	Basic	4,661	28.8	D	4,791	-	**F***
Between Crenshaw Blvd & Vermont Ave	Basic	5,818	28.3	D	6,379	-	**F***
Between Normandie OC & Vermont Off-Ramp	Basic	5,818	22.4	C	6,379	-	**F***
Between I-110 Off-Ramp & Hoover St On-Ramp	Basic	3,611	20.0	C	4,620	-	**F***
Between Central Ave Off-Ramp & On-Ramp	Basic	5,187	28.0	D	3,328	-	**F***
Between Wilmington Ave Off-Ramp & On-Ramp	Basic	4,876	27.5	D	4,766	-	**F***
Between Wilmington Ave & Long Beach Blvd	Basic	5,402	35.6	E	4,235	-	**F***
Between Long Beach Blvd Off-Ramp & On-Ramp	Basic	4,921	27.8	D	5,028	-	**F***
Between Long Beach Blvd & I-710	Basic	5,254	42.4	E	4,365	-	**F***
Between I-710 Off-Ramp & On-ramp	Basic	4,123	22.2	C	5,062	-	**F***
Between Garfield Ave & Grove St	Basic	4,099	17.2	B	3,857	-	**F***
Between Grove St OC & Paramount Blvd OC	Basic	5,294	-	**F***	5,787	-	**F***
Between Paramount Blvd & Lakewood Blvd	Basic	4,812	-	**F***	5,191	-	**F***
Between Lakewood Blvd & Bellflower Blvd	Basic	4,298	-	**F***	4,596	-	**F***

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds.
Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; I- = Interstate; LOS = Level of Service; OC = Overcrossing; St = Street

Table 5-2: I-105 Eastbound General Purpose Lanes Merge/Diverge/Weave Analysis—Alternative 1 (2027)

Location	Segment Type	2027 No-Build (Alternative 1)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Imperial Hwy On-Ramp	Merge	2,475	20.5	C	3,350	-	**F***
I-405 NB On-Ramp	Merge	3,275	19.3	C	3,117	-	**F***
I-405 SB On-Ramp	Merge	4,796	20.9	C	2,856	-	**F***
Prairie Ave Off-Ramp	Diverge	4,502	30.1	D	3,825	-	**F***
Hawthorne Blvd / Imperial Hwy On-Ramp to Crenshaw Blvd / 120th St Off-Ramp	Weave	5,102	26.8	D	5,521	-	**F***
Crenshaw Blvd / 120th St On-Ramp	Merge	5,050	37.5	D	7,097	-	**F****
Crenshaw Blvd / 120th St On-Ramp (NB)	Merge	5,818	28.3	D	6,379	-	**F***
Vermont Ave Off-Ramp	Diverge	5,769	22.4	C	8,015	-	**F***
I-110 Off-Ramp	Diverge	5,368	19.0	C	7,957	-	**F***
Hoover St On-Ramp	Merge	4,228	25.6	C	3,751	-	**F***
I-110 On-Ramp to Central Ave Off-Ramp	Weave	6,119	26.6	D	4,650	-	**F***
Central Ave On-Ramp to Wilmington Ave Off-Ramp	Weave	5,839	31.7	D	4,877	-	**F***
Wilmington Ave On-Ramp	Merge	5,402	35.6	D	4,235	-	**F***
Long Beach Blvd Off-Ramp	Diverge	5,402	32.2	D	4,235	-	**F***
SB Long Beach Blvd On-Ramp	Merge	4,967	35.2	D	4,535	-	**F***
NB Long Beach Blvd On-Ramp	Merge	5,254	25.8	C	4,365	-	**F***
I-710 Off-Ramp	Diverge	5,330	-	**F****	4,354	-	**F***
Garfield Ave Off-Ramp	Diverge	4,123	24.4	C	5,062	-	**F***
I-710 NB On-Ramp	Merge	5,246	-	**F***	5,609	-	**F***
I-710SB On-Ramp	Merge	5,294	-	**F***	5,787	-	**F***
Paramount Blvd On-Ramp	Merge	5,334	-	**F***	4,909	-	**F***
Lakewood Blvd Off-Ramp	Diverge	5,334	-	**F***	4,909	-	**F***
SB Lakewood Blvd On-Ramp	Merge	4,841	-	**F***	5,657	-	**F***
NB Lakewood Blvd On-Ramp	Weave	4,687	-	**F***	4,970	-	**F***
Bellflower Blvd On-Ramp	Merge	3,957	-	**F***	4,102	-	**F***
I-605 Off-Ramp	Diverge	3,957	-	**F****	4,102	-	**F****

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds.
Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; Hwy = Highway; I- = Interstate; LOS = Level of Service; NB = Northbound; SB = Southbound; St = Street

Table 5-3: I-105 Eastbound General Purpose Lanes Mainline Analysis—Alternative 1 (2047)

Location	Segment Type	2047 No-Build (Alternative 1)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between I-405 & Hawthorne Blvd / Prairie Ave Off-Ramp	Basic	4,949	30.1	D	2,379	-	**F***
Between Prairie Ave Off-Ramp & On-ramp	Basic	4,365	26.8	D	3,403	-	**F***
Between Prairie Ave & Crenshaw Blvd / 120th St	Basic	4,944	28.8	D	4,161	-	**F***
Between Crenshaw Blvd & Vermont Ave	Basic	6,104	28.3	D	5,744	-	**F***
Between Normandie OC & Vermont Off-Ramp	Basic	6,104	22.4	D	5,744	-	**F***
Between I-110 Off-Ramp & Hoover St On-Ramp	Basic	3,954	21.2	C	4,226	-	**F***
Between Central Ave Off-Ramp & On-Ramp	Basic	5,404	32.2	D	2,984	-	**F***
Between Wilmington Ave Off-Ramp & On-Ramp	Basic	5,069	32.3	D	4,355	-	**F***
Between Wilmington Ave & Long Beach Blvd	Basic	5,335	35.6	E	3,900	-	**F***
Between Long Beach Blvd Off-Ramp & On-Ramp	Basic	5,144	33.0	D	4,808	-	**F***
Between Long Beach Blvd & I-710	Basic	5,451	-	**F***	4,278	-	**F***
Between I-710 Off-Ramp & On-ramp	Basic	4,323	23.5	C	5,026	-	**F***
Between Garfield Ave & Grove St	Basic	4,295	18.3	C	3,833	-	**F***
Between Grove St OC & Paramount Blvd OC	Basic	5,600	-	**F***	5,810	-	**F***
Between Paramount Blvd & Lakewood Blvd	Basic	5,600	-	**F***	5,810	-	**F***
Between Lakewood Blvd & Bellflower Blvd	Basic	5,028	-	**F***	4,835	-	**F***
Between I-405 SB On-Ramp & Prairie Off-Ramp	Basic	3,357	-	**F***	4,144	-	**F***

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds.
Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; I- = Interstate; LOS = Level of Service; OC = Overcrossing; St = Street

Table 5-4: I-105 Eastbound General Purpose Lanes Merge/Diverge/Weave Analysis—Alternative 1 (2047)

Location	Segment Type	2047 No-Build (Alternative 1)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Imperial Hwy On-Ramp	Merge	2,555	20.2	C	2,927	-	**F***
I-405 NB On-Ramp	Merge	3,365	19.0	C	2,646	-	**F***
I-405 SB On-Ramp	Merge	4,949	20.7	C	2,379	-	**F***
Prairie Ave Off-Ramp	Diverge	4,632	30.2	D	3,052	-	**F***
Hawthorne Blvd / Imperial Hwy On-Ramp to Crenshaw Blvd / 120th St Off-Ramp	Weave	5,388	29.4	D	4,717	-	**F***
Crenshaw Blvd / 120th St On-Ramp	Merge	5,361	37.5	E	7,018	-	**F***
Crenshaw Blvd / 120th St On-Ramp (NB)	Merge	6,104	28.3	D	5,744	-	**F***
Vermont Ave Off-Ramp	Diverge	6,013	22.4	C	7,872	-	**F***
I-110 Off-Ramp	Diverge	5,538	19.0	C	7,826	-	**F***
Hoover St On-Ramp	Merge	4,545	26.4	C	3,472	-	**F***
I-110 On-Ramp to Central Ave Off-Ramp	Weave	6,483	27.8	C	4,172	-	**F***
Central Ave On-Ramp to Wilmington Ave Off-Ramp	Weave	6,019	34.7	D	4,461	-	**F***
Wilmington Ave On-Ramp	Merge	5,335	31.7	D	3,900	-	**F***
Long Beach Blvd Off-Ramp	Diverge	5,335	30.7	D	3,900	-	**F***
SB Long Beach Blvd On-Ramp	Merge	5,195	-	**F***	4,406	-	**F***
NB Long Beach Blvd On-Ramp	Merge	5,451	-	**F***	4,278	-	**F***
I-710 Off-Ramp	Diverge	5,530	-	**F****	4,267	-	**F***
Garfield Ave Off-Ramp	Diverge	4,323	25.9	C	5,026	-	**F***
I-710NB On-Ramp	Merge	5,501	-	**F***	5,606	-	**F***
I-710 SB On-Ramp	Merge	5,600	-	**F***	5,810	-	**F***
Paramount Blvd On-Ramp	Merge	4,950	-	**F***	4,641	-	**F***
Lakewood Blvd Off-Ramp	Diverge	4,950	-	**F***	4,641	-	**F***
SB Lakewood Blvd On-Ramp	Merge	5,059	-	**F***	5,879	-	**F***
NB Lakewood Blvd On-Ramp	Weave	4,230	-	**F***	4,569	-	**F***
Bellflower Blvd On-Ramp	Merge	2,981	-	**F***	3,644	-	**F***
I-605 Off-Ramp	Diverge	2,981	-	**F****	3,644	-	**F****

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds.
Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; Hwy = Highway; I- = Interstate; LOS = Level of Service; NB = Northbound; SB = Southbound; St = Street

Table 5-5: I-105 Westbound General Purpose Lanes Mainline Analysis—Alternative 1 (2027)

Location	Segment Type	2027 No-Build (Alternative 1)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between Bellflower Blvd & Lakewood Blvd	Basic	5,101	-	**F***	6,257	25.1	C
Between Lakewood Blvd Off-Ramp & On-Ramp	Basic	5,197	-	**F***	5,172	-	**F***
Between Paramount Blvd Off-Ramp & On-Ramp	Basic	5,990	35.9	E	5,320	30.6	D
Between Paramount Blvd & I-710	Basic	6,051	20.4	C	5,379	22.3	C
Between I-710 Off-Ramp & Garfield Ave On-Ramp	Basic	5,399	-	**F***	4,118	13.8	B
Between I-710 Off-Ramp & SB On-Ramp	Basic	4,848	-	**F***	4,431	-	**F***
Between I-710 NB On-Ramp & Gertrude Dr UC	Basic	4,862	-	**F***	4,901	-	**F***
Between Gertrude Dr UC & Long Beach Blvd	Basic	2,958	-	**F***	2,342	-	**F***
Between Long Beach Blvd Off-Ramp & On-Ramp	Basic	4,718	-	**F***	3,982	-	**F***
Between State St UC & Alameda St	Basic	4,154	-	**F***	4,736	28.8	D
Between Imperial Hwy Off-Ramp & On-Ramp	Basic	5,028	-	**F***	3,864	22.1	C
Between Imperial Hwy & Central Ave	Basic	4,066	-	**F***	4,599	29.5	D
Between Central Ave Off-Ramp & On-Ramp	Basic	4,478	-	**F***	3,901	27.5	D
Between Stanford Ave UC & Avalon Blvd UC	Basic	5,431	-	**F***	4,790	23.6	C
Between Avalon UC & San Pedro St UC	Basic	5,334	-	**F***	4,804	20.0	C
Between I-110 Off-Ramp & Hoover St	Basic	3,642	-	**F***	3,635	20.9	C
Between Vermont Ave Off-Ramp & On-Ramp	Basic	3,256	-	**F***	4,104	21.6	C
Between Vermont Ave & Crenshaw Blvd	Basic	4,115	-	**F***	5,514	25.2	C
Between Crenshaw Blvd Off-Ramp & On-Ramp	Basic	5,200	-	**F***	3,983	32.8	D
Between Prairie Ave / Hawthorne Blvd Off-Ramp & Imperial Hwy On-Ramp	Basic	5,469	-	**F****	3,792	20.3	C
Between Imperial Hwy & I-405	Basic	6,330	-	**F***	4,506	18.0	C
Between I-405 Off-Ramp & La Cienega Blvd	Basic	3,742	-	**F***	872	7.3	A

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds.
Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; Dr = Drive; Hwy = Highway; I- = Interstate; LOS = Level of Service; NB = Northbound; SB = Southbound; St = Street; UC = Undercrossing

Table 5-6: I-105 Westbound General Purpose Lanes Merge/Diverge/Weave Analysis—Alternative 1 (2027)

Location	Segment Type	2027 No-Build (Alternative 1)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
I-605 On-Ramp	Merge	5,101	-	**F***	6,257	33.6	D
Bellflower Blvd Off-Ramp	Diverge	5,101	-	**F***	6,257	28.5	D
Bellflower Blvd On-Ramp to Lakewood Blvd Off-Ramp	Weave	4,271	-	**F***	5,518	-	**F***
Lakewood Blvd On-Ramp	Merge	4,528	-	**F***	5,250	-	**F****
Paramount Blvd Off-Ramp	Diverge	4,528	-	**F****	5,250	37.3	D
I-710 Off-Ramp	Diverge	6,051	-	**F***	5,379	17.4	B
Garfield Ave On-Ramp	Merge	4,848	-	**F***	4,431	13.7	B
I-710 SB On-Ramp	Merge	4,191	-	**F***	5,111	-	**F***
I-710 NB On-Ramp	Merge	4,862	-	**F***	4,901	-	**F***
Long Beach Blvd Off-Ramp	Diverge	2,958	-	**F***	2,342	-	**F***
NB Long Beach Blvd On-Ramp	Merge	6,100	-	**F***	4,343	-	**F***
SB Long Beach Blvd On-Ramp	Merge	4,154	-	**F***	4,736	-	**F****
Imperial Hwy Off-Ramp	Diverge	4,154	-	**F***	4,736	29.8	D
Imperial Hwy On-Ramp	Merge	4,066	-	**F***	4,599	31.2	D
Central Ave Off-Ramp	Diverge	4,066	-	**F***	4,599	30.1	D
Central Ave On-Ramp	Merge	5,431	-	**F***	4,790	23.6	C
I-110 Off-Ramp	Diverge	5,334	-	**F***	4,804	20.0	C
I-110 NB On-Ramp	Weave	3,863	-	**F***	4,896	25.6	C
I-110 SB On-Ramp	Merge	4,270	-	**F***	4,985	22.7	C
Vermont Ave On-Ramp	Merge	4,115	-	**F***	5,514	24.8	C
Crenshaw Blvd Off-Ramp	Diverge	4,237	-	**F***	5,469	23.1	C
NB Crenshaw Blvd On-Ramp	Merge	4,865	-	**F****	4,338	24.9	C
SB Crenshaw Blvd On-Ramp to Prairie Ave / Hawthorne Blvd Off-Ramp	Weave	6,070	-	**F***	4,523	30.6	D
Imperial Hwy On-Ramp	Merge	6,330	-	F*	4,506	22.4	C
I-405 Off-Ramp	Diverge	6,330	-	**F***	4,506	38.0	E

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds.
Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; Hwy = Highway; I- = Interstate; LOS = Level of Service; NB = Northbound; SB = Southbound

Table 5-7: I-105 Westbound General Purpose Lanes Mainline Analysis—Alternative 1 (2047)

Location	Segment Type	2047 No-Build (Alternative 1)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between Bellflower Blvd & Lakewood Blvd	Basic	5,166	-	**F***	5,979	23.0	C
Between Lakewood Blvd Off-Ramp & On-Ramp	Basic	5,209	-	**F***	5,319	-	**F***
Between Paramount Blvd Off-Ramp & On-Ramp	Basic	5,776	**40.8**	**E**	5,498	**36.1**	**E**
Between Paramount Blvd & I-710	Basic	5,835	28.6	D	5,558	25.8	C
Between I-710 Off-Ramp & Garfield Ave On-Ramp	Basic	4,988	-	**F***	4,176	24.1	C
Between I-710 Off-Ramp & SB On-Ramp	Basic	5,336	-	**F***	4,493	-	**F***
Between I-710 NB On-Ramp & Gertrude Dr UC	Basic	5,392	-	**F***	4,427	-	**F***
Between Gertrude Dr UC & Long Beach Blvd	Basic	3,591	-	**F***	1,929	-	**F***
Between Long Beach Blvd Off-Ramp & On-Ramp	Basic	5,226	-	**F***	4,240	-	**F***
Between State St UC & Alameda St	Basic	4,620	-	**F***	5,011	31.1	D
Between Imperial Hwy Off-Ramp & On-Ramp	Basic	5,455	-	**F***	4,223	23.6	C
Between Imperial Hwy & Central Ave	Basic	4,520	-	**F***	4,930	31.8	D
Between Central Ave Off-Ramp & On-Ramp	Basic	5,011	-	**F***	4,265	27.3	D
Between Stanford Ave UC & Avalon Blvd UC	Basic	5,836	-	**F***	5,151	23.6	C
Between Avalon UC & San Pedro St UC	Basic	5,731	-	**F***	5,166	20.0	C
Between I-110 Off-Ramp & Hoover St	Basic	4,317	-	**F***	3,815	20.9	C
Between Vermont Ave Off-Ramp & On-Ramp	Basic	3,859	-	**F***	4,638	23.4	C
Between Vermont Ave & Crenshaw Blvd	Basic	4,392	-	**F***	6,008	25.5	C
Between Crenshaw Blvd Off-Ramp & On-Ramp	Basic	5,197	-	**F***	4,514	28.2	D
Between Prairie Ave / Hawthorne Blvd Off-Ramp & Imperial Hwy On-Ramp	Basic	5,143	-	**F****	4,246	30.5	D
Between Imperial Hwy & I-405	Basic	6,564	-	**F***	5,495	18.9	C
Between I-405 Off-Ramp & La Cienega Blvd	Basic	3,893	-	**F***	1,463	12.1	B

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds.
Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; Dr = Drive; Hwy = Highway; I- = Interstate; LOS = Level of Service; NB = Northbound; SB = Southbound; St = Street; UC = Undercrossing

Table 5-8: I-105 Westbound General Purpose Lanes Merge/Diverge/Weave Analysis—Alternative 1 (2047)

Location	Segment Type	2047 No-Build (Alternative 1)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
I-605 On-Ramp	Merge	5,165	-	**F***	5,978	32.8	D
Bellflower Blvd Off-Ramp	Diverge	5,165	-	**F***	5,978	28.6	D
Bellflower Blvd On-Ramp to Lakewood Blvd Off-Ramp	Weave	4,840	-	**F***	5,170	-	**F***
Lakewood Blvd On-Ramp	Merge	5,080	-	**F****	4,840	-	**F***
Paramount Blvd Off-Ramp	Diverge	5,080	40.8	E	4,840	-	**F****
I-710 Off-Ramp	Diverge	5,835	-	**F***	5,558	20.0	C
Garfield Ave On-Ramp	Merge	5,336	-	**F***	4,493	21.9	C
I-710 SB On-Ramp	Merge	4,901	-	**F***	5,236	-	**F***
I-710NB On-Ramp	Merge	5,392	-	**F***	4,427	-	**F***
Long Beach Blvd Off-Ramp	Diverge	3,591	-	**F***	1,929	-	**F***
NB Long Beach Blvd On-Ramp	Merge	5,758	-	**F***	4,633	-	**F***
SB Long Beach Blvd On-Ramp	Merge	4,620	-	**F***	5,011	-	**F****
Imperial Hwy Off-Ramp	Diverge	4,620	-	**F***	5,011	31.3	D
Imperial Hwy On-Ramp	Merge	4,520	-	**F***	4,930	33.0	D
Central Ave Off-Ramp	Diverge	4,520	-	**F***	4,930	31.8	D
Central Ave On-Ramp	Merge	5,836	-	**F***	5,151	23.6	C
I-110 Off-Ramp	Diverge	5,731	-	**F***	5,166	20.0	C
I-110 NB On-Ramp	Weave	4,533	-	**F***	5,386	28.0	D
I-110 SB On-Ramp	Merge	4,688	-	**F***	5,475	24.3	C
Vermont Ave On-Ramp	Merge	4,392	-	**F***	6,008	25.1	C
Crenshaw Blvd Off-Ramp	Diverge	4,017	-	**F***	5,982	26.3	C
NB Crenshaw Blvd On-Ramp	Merge	4,756	-	**F***	4,916	22.6	C
SB Crenshaw Blvd On-Ramp to Prairie Ave / Hawthorne Blvd Off-Ramp	Weave	6,315	-	**F***	5,143	28.1	D
Imperial Hwy On-Ramp	Merge	6,564	-	**F***	5,495	22.5	C
I-405 Off-Ramp	Diverge	6,564	-	**F***	5,495	38.9	E

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds.
Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; Hwy = Highway; I- = Interstate; LOS = Level of Service;
NB = Northbound; SB = Southbound

The HOV lane 2027 operating conditions are presented in Table 5-9 and Table 5-10 while the 2047 operating conditions are presented in Table 5-11 and Table 5-12, respectively. During the AM peak hour, in the eastbound direction, most of the HOV lane is operating at a LOS C or better in 2027 and 2047, except between I-710 and Paramount Boulevard where the HOV lane is LOS E, as it is in current conditions. Additionally, the HOV lane degrades to LOS F between Lakewood Boulevard and I-605 Interchange. During the PM peak hour, in the eastbound direction, HOV lanes from I-405 to I-605 are expected to be operating at a LOS E or F in 2027 and 2047, as volumes approach and exceed capacity. During the 2027 and 2047 AM peak hour in the westbound direction, the facility between I-710 and Crenshaw Boulevard will operate mostly at LOS F, with the a few segments operating at a LOS E. During the PM peak hour, the facility is operating at a LOS D or better for the entire length of the facility in 2027 and 2047, except around the I-710 Interchange where LOS E conditions persist from existing conditions.

Table 5-9: I-105 Eastbound HOV Lanes Peak Hour LOS—Alternative 1 (2027)

Location	Segment Type	2027 No-Build (Alternative 1)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between e/o Aviation Blvd & Inglewood Ave	Access	599	9.3	A	1,550	-	F*
Between Inglewood Ave & Hawthorne Blvd Access	Basic	599	9.5	A	1,550	-	F*
Between Hawthorne Blvd & Prairie Ave	Access	996	16.5	B	1,508	-	F*
Between Prairie Ave Access & Crenshaw Blvd	Basic	996	16.5	B	1,508	-	F*
Between Crenshaw Blvd & Crenshaw Blvd Access	Basic	970	16.0	B	1,513	-	F*
Between Crenshaw Blvd & Western Ave	Access	970	18.7	C	1,513	-	F*
Between Western Ave Access & Vermont Ave	Basic	970	18.7	C	1,513	-	F*
Between Vermont Ave & NB I-110 Off-Ramp	Diverge	1,042	20.5	C	1,525	-	F*
Between I-110 Off-Ramp & I-110 On-Ramp	Basic	696	19.6	C	1,296	-	F*
Between I-110 On-Ramp & Central Ave Access	Merge	1,173	21.0	C	1,324	-	F*
Between w/o & e/o Central Ave	Access	1,271	22.1	C	1,301	-	F*
Between Central Ave Access & Wilmington Ave	Basic	1,270	22.1	C	1,307	-	F*
Between Wilmington Ave & Alameda St	Basic	1,271	22.1	C	1,632	-	F*
Between Alameda St & Long Beach Blvd Access	Basic	1,271	25.1	C	1,439	-	F*
Between w/o & e/o Long Beach Blvd	Access	1,271	22.3	C	1,315	-	F**
Between Long Beach Blvd Access & Gertrude Dr	Basic	1,290	23.3	C	1,599	36.0	E

Table 5-9: I-105 Eastbound HOV Lanes Peak Hour LOS—Alternative 1 (2027) (continued)

Location	Segment Type	2027 No-Build (Alternative 1)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between Gertrude Dr & I-710	Basic	1,290	23.3	C	1,599	36.0	E
Between I-710 & Garfield Ave	Basic	1,290	25.8	C	1,599	36.0	E
Between Garfield Ave & I-710	Basic	1,290	30.0	D	1,599	36.0	E
Between I-710 & Grove St	Basic	1,290	30.0	D	1,599	-	**F***
Between Grove St OC & Paramount Blvd OC	Basic	1,290	-	**F***	1,599	-	**F***
Between Paramount Blvd & Downey Ave	Access	1,290	-	**F***	1,599	-	**F***
Between Downey Ave Access & Lakewood Blvd	Basic	1,107	-	**F***	1,581	-	**F***
Between Lakewood Blvd & Bellflower Blvd Access	Basic	1,107	-	**F***	1,581	-	**F***
Between w/o & e/o Bellflower Blvd	Access	1,396	-	**F****	1,514	-	**F****
Between Bellflower Blvd Access & I-605	Basic	1,396	-	**F***	1,514	-	**F***

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds.
Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; Dr = Drive; I- = Interstate; LOS = Level of Service; NB = Northbound; St = Street; OC = Overcrossing

Table 5-10: I-105 Westbound HOV Lanes Peak Hour LOS—Alternative 1 (2027)

Location	Segment Type	2027 No-Build (Alternative 1)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between I-605 & Bellflower Blvd Access	Basic	1,423	31.2	D	1,387	28.9	D
Between e/o & w/o Bellflower Blvd	Access	1,423	31.2	D	1,376	28.6	D
Between Bellflower Blvd Access & Lakewood Blvd	Basic	1,346	28.0	D	1,411	29.4	D
Between Lakewood Blvd & Paramount Blvd	Basic	1,357	27.4	D	1,412	29.4	D
Between Paramount Blvd & e/o I-710	Basic	1,357	27.4	D	1,412	29.4	D
Between e/o & w/o I-710	Basic	1,375	38.2	E	1,428	29.8	D
Between w/o I-710 & Harris Ave Access	Basic	1,375	-	**F***	1,428	35.7	E
Between Harris Ave & Gertrude Dr	Access	1,517	-	**F***	1,346	26.8	D
Between Gertrude Dr Access & Long Beach Blvd	Basic	1,517	-	**F***	1,346	26.8	D
Between Long Beach Blvd & State St	Basic	1,484	-	**F****	1,329	26.5	D
Between State St UC & Imperial Hwy	Basic	1,484	40.1	E	1,329	26.5	D
Between Imperial Hwy & Central Ave Access	Basic	1,484	40.1	E	1,329	26.5	D
Between e/o & w/o Central Ave	Access	1,484	-	**F***	1,329	26.5	D
Between Central Ave Access & Avalon Blvd	Basic	1,427	-	**F***	1,176	21.3	C
Between Avalon Blvd & I-110 Off-Ramp (DAR)	Diverge	1,406	-	**F***	1,181	21.4	C
Between I-110 Off-Ramp (DAR) & I-110 On-Ramp (DAR)	Basic	1,075	-	**F***	633	9.9	A
Between I-110 On-Ramp (DAR) & Vermont Ave	Merge	1,402	-	**F***	1,044	17.9	B
Between Vermont Ave & Western Ave Access	Basic	1,402	-	**F***	1,044	23.8	C
Between e/o & w/o Western Ave	Access	1,402	-	**F***	1,044	18.7	C
Between Western Ave Access & Crenshaw Blvd	Basic	1,593	-	**F***	1,047	18.1	C
Between Crenshaw Blvd & Prairie Ave Access	Basic	1,593	35.6	E	1,061	18.3	C
Between Prairie Ave & Hawthorne Blvd	Access	1,593	37.0	E	1,061	18.3	C
Between Hawthorne Blvd Access & I-405	Basic	1,136	25.0	C	720	11.4	B
Between I-405 & Aviation Blvd	Basic	1,136	20.2	C	720	11.4	B

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds. Red and bold denotes LOS E or worse.

Ave = Avenue; Blvd = Boulevard; DAR = Direct Access Ramp; Dr = Drive; Hwy = Highway; I- = Interstate; LOS = Level of Service; St = Street

Table 5-11: I-105 Eastbound HOV Lanes Peak Hour LOS—Alternative 1 (2047)

Location	Segment Type	2047 No-Build (Alternative 1)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between e/o Aviation Blvd & Inglewood Ave	Access	601	9.4	A	1,517	-	**F***
Between Inglewood Ave & Hawthorne Blvd Access	Basic	601	9.4	A	1,517	-	**F***
Between Hawthorne Blvd & Prairie Ave	Access	999	16.4	B	1,250	-	**F***
Between Prairie Ave Access & Crenshaw Blvd	Basic	999	16.4	B	1,250	-	**F***
Between Crenshaw Blvd & Crenshaw Blvd Access	Basic	973	16.0	B	1,254	-	**F***
Between Crenshaw Blvd & Western Ave	Access	973	18.6	C	1,254	-	**F***
Between Western Ave Access & Vermont Ave	Basic	973	18.6	C	1,254	-	**F***
Between Vermont Ave & NB I-110 Off-Ramp	Diverge	1,020	20.3	C	1,324	-	**F***
Between I-110 Off-Ramp & I-110 On-Ramp	Basic	698	19.3	C	1,427	-	**F***
Between I-110 On-Ramp & Central Ave Access	Merge	1,169	21.8	C	985	-	**F***
Between w/o & e/o Central Ave	Access	1,257	22.4	C	1,194	-	**F***
Between Central Ave Access & Wilmington Ave	Basic	1,257	22.4	C	1,200	-	**F***
Between Wilmington Ave & Alameda St	Basic	1,257	22.4	C	1,206	-	**F***
Between Alameda St & Long Beach Blvd Access	Basic	1,257	22.4	C	1,208	-	**F***
Between w/o & e/o Long Beach Blvd	Access	1,257	22.4	C	1,208	-	**F****
Between Long Beach Blvd Access & Gertrude Dr	Basic	1,322	24.9	C	1,499	39.2	E
Between Gertrude Dr & I-710	Basic	1,322	24.9	C	1,499	39.2	E
Between I-710 & Garfield Ave	Basic	1,322	24.9	C	1,499	39.2	E
Between Garfield Ave & I-710	Basic	1,323	30.8	D	1,500	39.2	E
Between I-710 & Grove St	Basic	1,323	30.8	D	1,500	-	**F***
Between Grove St OC & Paramount Blvd OC	Basic	1,323	-	**F***	1,500	-	**F***
Between Paramount Blvd & Downey Ave	Access	1,323	-	**F***	1,500	-	**F***
Between Downey Ave Access & Lakewood Blvd	Basic	1,121	-	**F***	1,566	-	**F***
Between Lakewood Blvd & Bellflower Blvd Access	Basic	1,121	-	**F***	1,566	-	**F***
Between w/o & e/o Bellflower Blvd	Access	1,387	-	**F****	1,383	-	**F****
Between Bellflower Blvd Access & I-605	Basic	1,387	-	**F****	1,383	-	**F****

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds.
Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; Dr = Drive; I- = Interstate; LOS = Level of Service; NB = Northbound; St = Street; OC = Overcrossing

Table 5-12: I-105 Westbound HOV Lanes Peak Hour LOS—Alternative 1 (2047)

Location	Segment Type	2047 No-Build (Alternative 1)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between I-605 & Bellflower Blvd Access	Basic	1,345	29.5	D	1,393	29.2	D
Between e/o & w/o Bellflower Blvd	Access	1,345	29.5	D	1,382	28.9	D
Between Bellflower Blvd Access & Lakewood Blvd	Basic	1,567	37.2	E	1,426	30.1	D
Between Lakewood Blvd & Paramount Blvd	Basic	1,580	37.5	E	1,427	30.1	D
Between Paramount Blvd & e/o I-710	Basic	1,580	37.5	E	1,427	30.1	D
Between e/o & w/o I-710	Basic	1,598	44.4	E	1,443	30.4	D
Between w/o I-710 & Harris Ave Access	Basic	1,598	-	**F***	1,443	36.1	E
Between Harris Ave & Gertrude Dr	Access	1,120	-	**F***	1,410	29.4	D
Between Gertrude Dr Access & Long Beach Blvd	Basic	1,120	-	**F***	1,410	29.4	D
Between Long Beach Blvd & State St	Basic	1,097	-	**F****	1,393	29.0	D
Between State St UC & Imperial Hwy	Basic	1,097	-	**F***	1,393	29.0	D
Between Imperial Hwy & Central Ave Access	Basic	1,097	-	**F***	1,393	29.0	D
Between e/o & w/o Central Ave	Access	1,097	-	**F***	1,393	29.0	D
Between Central Ave Access & Avalon Blvd	Basic	1,141	-	**F***	1,242	23.4	C
Between Avalon Blvd & I-110 Off-Ramp (DAR)	Diverge	1,125	-	**F***	1,247	23.5	C
BetweenI-110 Off-Ramp (DAR) & I-110 On-Ramp (DAR)	Basic	1,547	-	**F***	961	15.9	B
Between I-110 On-Ramp (DAR) & Vermont Ave	Merge	1,465	-	**F***	1,111	19.6	C
Between Vermont Ave & Western Ave Access	Basic	1,465	-	**F***	1,111	24.5	C
Between e/o & w/o Western Ave	Access	1,465	-	**F***	1,111	19.6	C
Between Western Ave Access & Crenshaw Blvd	Basic	1,382	-	**F***	1,095	19.3	C
Between Crenshaw Blvd & Prairie Ave Access	Basic	1,382	35.2	E	1,109	19.5	C
Between Prairie Ave & Hawthorne Blvd	Access	1,382	36.6	E	1,109	19.5	C
Between Hawthorne Blvd Access & I-405	Basic	1,163	25.1	D	442	9.9	A
Between I-405 & Aviation Blvd	Basic	1,163	20.9	D	442	7.0	A

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds. Red and bold denotes LOS E or worse.

Ave = Avenue; Blvd = Boulevard; DAR = Direct Access Ramp; Dr = Drive; Hwy = Highway; I- = Interstate; LOS = Level of Service; St = Street

Ramp/Interchanges

The I-105 freeway on- and off-Ramp conditions for the 2027 and 2047 No-Build Alternative are summarized in Table 5-13 and Table 5-14for the eastbound and westbound directions, respectively. Most of the ramp locations have forecasted volumes that are within the available capacities, with the exception of Eastbound I-105 at the Atwood Way/Douglas Street On-Ramp where the demand exceeds the capacity of the ramp.

Table 5-13: I-105 Eastbound Freeway Ramp Conditions—Alternative 1 (2027, 2047)

Int. #	Ramp Location	Type	No. of Ramp Lanes	2027 No—Build (Alternative 1)				2047 No—Build (Alternative 1)			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Vol	V/C	Vol	V/C	Vol	V/C	Vol	V/C
-	Sepulveda Blvd / Imperial Hwy Off	Off-Ramp	2	465	0.16	486	0.16	0.16	0.16	486	0.16
-	Sepulveda Blvd On (SB)	On-Ramp	2	1,543	0.51	2,446	**0.82**	0.51	0.51	2,446	**0.82**
-	Imperial Hwy On (EB)	On-Ramp	1	581	0.39	1,174	**0.78**	0.39	0.39	1,174	**0.78**
-	Atwood Way / Douglas St On (SB)	On-Ramp	1	344	0.23	1,548	**1.03**	0.23	0.23	1,548	**1.03**
-	I-405 Fwy-Fwy Off (NB & SB)	Off-Ramp	2	1,274	0.35	2,991	**0.83**	0.35	0.35	2,991	**0.83**
4	Imperial Hwy On	On-Ramp	1	722	0.48	679	0.45	0.48	0.48	679	0.45
-	I-405 Fwy-Fwy On (NB)	On-Ramp	1	1,108	0.62	548	0.30	0.62	0.62	548	0.30
-	Fwy-Fwy On (SB)	On-Ramp	2	1,949	0.54	1,018	0.28	0.54	0.54	1,018	0.28
9	Prairie Ave Off	Off-Ramp	1	404	0.27	630	0.42	0.27	0.27	630	0.42
7	Hawthorne Blvd / Imperial Hwy On	On-Ramp	2	763	0.25	969	0.32	0.25	0.25	969	0.32
11	Crenshaw Blvd / 120th St Off	Off-Ramp	1	751	0.50	354	0.24	0.50	0.50	354	0.24
11	Crenshaw Blvd / 120th St On	On-Ramp	1	841	0.56	810	0.54	0.56	0.56	810	0.54
11	Crenshaw Blvd / 120th St On (NB)	On-Ramp	1	772	0.51	899	0.60	0.51	0.51	899	0.60
17	Vermont Ave Off	Off-Ramp	1	654	0.44	735	0.49	0.44	0.44	735	0.49
-	I-110 Fwy-Fwy Off (GP) (NB & SB)	Off-Ramp	2	1,801	0.50	3,023	**0.84**	0.50	0.50	3,023	**0.84**
-	I-110 Fwy-Fwy Off (ML) (NB)	Off-Ramp	1	848	0.47	737	0.41	0.47	0.47	737	0.41
-	Hoover St On	On-Ramp	1	672	0.45	252	0.17	0.45	0.45	252	0.17
-	I-110 Fwy-Fwy On (ML) (NB)	On-Ramp	1	167	0.09	732	0.41	0.09	0.09	732	0.41
-	I-110 Fwy-Fwy On (NB & SB)	On-Ramp	2	1,980	0.55	1,478	0.41	0.55	0.55	1,478	0.41
21	Central Ave Off	Off-Ramp	1	1,457	**0.97**	1,035	0.69	**0.97**	0.97	1,035	0.69

Table 5-13: I-105 Eastbound Freeway Ramp Conditions—Alternative 1 (2027, 2047) (continued)

Int. #	Ramp Location	Type	No. of Ramp Lanes	2027 No—Build (Alternative 1)				2047 No—Build (Alternative 1)			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Vol	V/C	Vol	V/C	Vol	V/C	Vol	V/C
21	Central Ave On	On-Ramp	1	893	0.60	1,214	**0.81**	893	0.60	1,214	**0.81**
24	Wilmington Ave Off	Off-Ramp	1	887	0.59	462	0.31	887	0.59	462	0.31
24	Wilmington Ave On	On-Ramp	1	840	0.56	993	0.66	840	0.56	993	0.66
30	Long Beach Blvd Off	Off-Ramp	1	1,045	**0.70**	492	0.33	1,045	**0.70**	492	0.33
-	Long Beach Blvd On (SB)	On-Ramp	1	761	0.51	694	0.46	761	0.51	694	0.46
-	Long Beach Blvd On (NB)	On-Ramp	1	533	0.36	499	0.33	533	0.36	499	0.33
-	I-710 Fwy-Fwy Off (NB & SB)	Off-Ramp	2	2,068	0.57	2,385	0.66	2,068	0.57	2,385	0.66
32	Garfield Ave Off	Off-Ramp	2	895	0.30	730	0.24	895	0.30	730	0.24
-	I-710 Fwy-Fwy On (NB)	On-Ramp	2	1,215	0.34	1,299	0.36	1,215	0.34	1,299	0.36
-	I-710 Fwy-Fwy On (SB)	On-Ramp	2	960	0.27	636	0.18	960	0.27	636	0.18
36	Paramount Blvd On	On-Ramp	1	663	0.44	461	0.31	663	0.44	461	0.31
39	Lakewood Blvd Off	Off-Ramp	1	1,042	0.69	771	0.51	1,042	0.69	771	0.51
-	Lakewood Blvd On (SB)	On-Ramp	1	215	0.14	165	0.11	215	0.14	165	0.11
-	Lakewood Blvd On (NB)	On-Ramp	1	217	0.14	139	0.09	217	0.14	139	0.09
43	Bellflower Blvd Off	Off-Ramp	1	910	0.61	840	0.56	910	0.61	840	0.56
43	Bellflower Blvd On	On-Ramp	2	560	0.19	884	0.29	560	0.19	884	0.29
-	I-605 Fwy-Fwy Off (NB & SB)	Off-Ramp	4	3,841	0.53	3,982	0.55	3,841	0.53	3,982	0.55
-	Park And Ride Lot Off	Off-Ramp	1	133	0.09	100	0.07	133	0.09	100	0.07
-	Hoxie Ave On	On-Ramp	2	126	0.08	240	0.16	126	0.08	240	0.16

Source: Traffic Study Report (provided under separate cover)
Notes: Ave = Avenue; Blvd = Boulevard; EB = Eastbound; Fwy = Freeway; GP = General Purpose; Hwy = Highway; I- = Interstate; ML = Managed Lanes; NB = Northbound; SB = Southbound; St = Street

Table 5-14: I-105 Westbound Freeway Ramp Conditions—Alternative 1 (2027, 2047)

Int. #	Ramp Location	Type	No. of Ramp Lanes	2027 No—Build (Alternative 1)				2047 No—Build (Alternative 1)			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Vol	V/C	Vol	V/C	Vol	V/C	Vol	V/C
-	Sepulveda Blvd Off (SB)	Off-Ramp	1	583	0.39	551	0.37	583	0.39	551	0.37
1	Sepulveda Blvd Off (NB)	Off-Ramp	2	2,228	0.74	1,716	0.57	2228	0.74	1,716	0.57
-	Nash St Off (SB)	Off-Ramp	1	1,328	0.89	559	0.37	1328	0.89	559	0.37
-	I-405 Fwy-Fwy On (NB & SB)	On-Ramp	2	2,123	0.59	1,650	0.46	2,123	0.59	1,650	0.46
4	Imperial Hwy Off	Off-Ramp	1	1,404	0.94	615	0.41	1,409	0.94	640	0.43
-	I-405 Fwy-Fwy Off (NB & SB)	Off-Ramp	3	3,273	0.61	4,120	0.76	3,286	0.61	4,291	0.79
8	Imperial Hwy On	On-Ramp	1	1,216	0.81	532	0.35	1,220	0.81	554	0.37
9	Prairie Ave / Hawthorne Blvd Off	Off-Ramp	2	192	0.06	482	0.16	193	0.06	502	0.17
-	Crenshaw Blvd On (SB)	On-Ramp	1	396	0.26	144	0.10	398	0.27	150	0.10
-	Crenshaw Blvd On (NB)	On-Ramp	1	1,079	0.72	595	0.40	1,083	0.72	620	0.41
13	Crenshaw Blvd Off	Off-Ramp	2	657	0.22	1,384	0.46	659	0.22	1441	0.48
16	Vermont Ave On	On-Ramp	1	1,168	0.78	601	0.40	1,172	0.78	626	0.42
-	I-110 Fwy-Fwy On (GP) (SB)	On-Ramp	1	818	0.45	1,148	0.64	821	0.46	1,195	0.66
16	Vermont Ave Off	Off-Ramp	1	746	0.50	733	0.49	749	0.50	763	0.51
-	I-110 Fwy-Fwy On (GP) (NB)	On-Ramp	1	1,130	0.63	1,124	0.62	1,134	0.63	1,171	0.65
-	I-110 Fwy-Fwy On (ML) (SB)	On-Ramp	1	708	0.39	847	0.47	708	0.39	847	0.47
-	I-110 Fwy-Fwy Off (ML) (SB)	Off-Ramp	1	352	0.20	182	0.10	352	0.20	190	0.11
-	I-110 Fwy-Fwy Off (GP) (NB & SB)	Off-Ramp	2	2,892	0.80	1,887	0.52	2,987	0.83	1,922	0.53
20	Central Ave On	On-Ramp	1	818	0.55	918	0.61	845	0.56	935	0.62
20	Central Ave Off	Off-Ramp	1	588	0.39	819	0.55	607	0.40	834	0.56
26	Imperial Hwy On	On-Ramp	1	1,152	0.77	1,003	0.67	1,189	0.79	1,021	0.68
2	Imperial Hwy Off	Off-Ramp	1	758	0.51	929	0.62	782	0.52	946	0.63
29	Long Beach Blvd On (SB)	On-Ramp	1	651	0.43	569	0.38	673	0.45	579	0.39
29	Long Beach Blvd On (NB)	On-Ramp	1	448	0.30	347	0.23	463	0.31	353	0.24
29	Long Beach Blvd Off	Off-Ramp	1	867	0.58	1,125	0.75	895	0.60	1,146	0.76
-	I-710 Fwy-Fwy On (NB)	On-Ramp	1	1,702	0.95	1,407	0.78	1,758	0.98	1,433	0.80

Table 5-14: I-105 Westbound Freeway Ramp Conditions—Alternative 1 (2027, 2047) (continued)

Int. #	Ramp Location	Type	No. of Ramp Lanes	2027 No—Build (Alternative 1)				2047 No—Build (Alternative 1)			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Vol	V/C	Vol	V/C	Vol	V/C	Vol	V/C
-	I-710 Fwy-Fwy On (SB)	On-Ramp	2	641	0.18	892	0.25	662	0.18	908	0.25
31	Garfield Ave On	On-Ramp	2	752	0.25	582	0.19	772	0.26	582	0.19
-	I-710 Fwy-Fwy (NB & SB)	Off-Ramp	2	2,762	0.77	2,505	0.70	2,839	0.79	2,505	0.70
35	Paramount Blvd Off	Off-Ramp	1	478	0.32	587	0.39	491	0.33	587	0.39
39	Lakewood Blvd On	On-Ramp	1	567	0.38	972	0.65	583	0.39	972	0.65
39	Lakewood Blvd Off	Off-Ramp	1	685	0.46	685	0.46	704	0.47	685	0.46
42	Bellflower Blvd On	On-Ramp	1	503	0.34	559	0.37	517	0.34	559	0.37
42	Bellflower Blvd Off	Off-Ramp	1	934	0.62	533	0.36	960	0.64	533	0.36
-	I-605 Fwy-Fwy On (NB & SB)	On-Ramp	4	4,814	0.67	5,495	0.76	4,948	0.69	5,495	0.76
48	Imperial Hwy On	On-Ramp	1	625	0.42	411	0.27	625	0.42	411	0.27
-	Hoxie Ave On	On-Ramp	1	105	0.07	97	0.06	105	0.07	97	0.06
-	Hoxie Ave Off	Off-Ramp	1	69	0.05	52	0.03	69	0.05	52	0.03

Source: Traffic Study Report (provided under separate cover)
Notes: Ave = Avenue; Blvd = Boulevard; Fwy = Freeway; GP = General Purpose; Hwy = Highway; I- = Interstate; ML = Managed Lanes; NB = Northbound; SB = Southbound; St = Street

Queuing analysis was performed at the off-ramp terminals using Synchro to determine the queues based on the intersection analysis. Table 5-15 and Table 5-16 include the approximate ramp length and the 95th percentile queue length as reported in the output files for the longest queue and the corresponding movement. As shown, off-ramp queueing exceeds storage capacity for six and seven of the eastbound off-ramps during the AM peak hour and the five and six of the westbound off-ramps during the PM peak hour in 2027 and 2047, respectively. However, this may only occur approximately 5 percent of the time as 95 percent of the time, lower volumes will allow the queue to dissipate. None of the locations has queuing extending the length of the ramp.

Table 5-15: I-105 Eastbound Freeway Off-Ramp Queueing—Alternative 1 (2027, 2047)

Int. #	Ramp Location	Ramp Length (ft)	2027 No—Build (Alternative 1)		2047 No—Build (Alternative 1)	
			95% Queue Length (ft) AM	95% Queue Length (ft) PM	95% Queue Length (ft) AM	95% Queue Length (ft) PM
9	Prairie Ave Off	2,589	167 (Left)	#599 (Thru)	167 (Left)	#599 (Thru)
11	Crenshaw Blvd / 120th St Off	1,827	#535 (Left)	#231 (Left)	#535 (Left)	#236 (Left)
17	Vermont Ave Off	1,149	#313 (Thru)	285 (Thru)	#368 (Thru)	296 (Thru)
21	Central Ave Off	1,690	#407 (Thru)	#456 (Thru)	#481 (Left)	#407 (Thru)
24	Wilmington Ave Off	1,830	#415 (Left)	#306 (Left)	#415 (Left)	#306 (Left)
30	Long Beach Blvd Off	1,501	246 (Thru)	140 (Thru)	#271 (Thru)	140 (Thru)
32	Garfield Ave Off	3,061	#335 (Right)	254 (Thru)	#364 (Right)	254 (Thru)
39	Lakewood Blvd Off	1,682	#525 (Left)	#302 (Left)	#525 (Left)	#310 (Left)
43	Bellflower Blvd Off	1,878	196 (Thru)	#268 (Thru)	196 (Thru)	#228 (Thru)
48	Studebaker Rd Off	572	233 (Left)	#477 (Right)	240 (Left)	#514 (Right)

Source: Traffic Study Report (provided under separate cover)
Notes: # 95th percentile volume exceeds capacity of the storage bay, which could potentially block other movements.
Ave = Avenue; Blvd = Boulevard; ft = feet; Rd = Road; St = Street

Table 5-16: I-105 Westbound Freeway Off-Ramp Queueing—Alternative 1 (2027, 2047)

Int. #	Ramp Location	Ramp Length (ft)	2027 No—Build (Alternative 1)		2047 No—Build (Alternative 1)	
			95% Queue Length (ft) AM	95% Queue Length (ft) PM	95% Queue Length (ft) AM	95% Queue Length (ft) PM
1	Sepulveda Blvd Off (NB)	1,740	#1378 (Thru)	#1001 (Thru)	#1389 (Thru)	#1001 (Thru)
4	Imperial Hwy Off	1,576	373 (Left)	206 (Left)	379 (Left)	206 (Left)
6	Hawthorne Blvd Off	4,107	223 (Left)	277 (Left)	234 (Left)	279 (Left)
9	Prairie Ave Off	3,054	167 (Left)	#599 (Thru)	167 (Left)	#599 (Thru)
13	Crenshaw Blvd Off	1,802	340 (Thru)	#720 (Thru)	348 (Thru)	#720 (Thru)
16	Vermont Ave Off	1,266	#410 (Thru)	#348 (Thru)	#472 (Thru)	#349 (Thru)
20	Central Ave Off	1,058	181 (Thru)	226 (Thru)	#205 (Thru)	241 (Left)
26	Imperial Hwy Off	996	#384 (Left)	#402 (Left)	#384 (Left)	#402 (Thru)
29	Long Beach Blvd Off	1,663	137 (Thru)	144 (Thru)	137 (Thru)	147 (Thru)
35	Paramount Blvd Off	1,182	289 (Thru)	228 (Thru)	289 (Thru)	228 (Thru)
39	Lakewood Blvd Off	1,688	#534 (Thru)	#375 (Thru)	#534 (Thru)	#377 (Thru)
42	Bellflower Blvd Off	1,270	#175 (Left)	134 (Left)	#175 (Left)	140 (Left)

Source: Traffic Study Report (provided under separate cover)
Notes: # 95th percentile volume exceeds capacity of the storage bay, which could potentially block other movements.
Ave = Avenue; Blvd = Boulevard; ft = feet; Hwy = Highway; NB = Northbound

Intersections

Table 5-17 and Table 5-18 summarize the AM and PM peak hour performance results for the study area ramp termini and adjacent arterial intersections for the future 2027 and 2047 No-Build Alternative. The No-Build Alternative has 12 intersections in 2027 and 13 intersections in 2047 with LOS E conditions or worse during the AM peak hour. During the PM peak hour, the number of intersections with LOS E conditions or worse increases to 15 in 2027 and 16 in 2047.

Table 5-17: AM Peak Hour Study Intersection Performance—Alternative 1 (2027, 2047)

Location #	Location	2027 No—Build (Alternative 1)		2047 No—Build (Alternative 1)	
		LOS	Delay (sec)	LOS	Delay (sec)
1	I-105 WB Off-Ramp / NB Sepulveda Blvd	**F**	**121.7**	**F**	**123.2**
2	Sepulveda Blvd / Imperial Hwy	D	49.5	D	49.5
3	Aviation Blvd / Imperial Hwy	**E**	**57.5**	**E**	**67.5**
4	I-105 WB Off- & I-105 EB On-Ramp / Imperial Hwy	C	24.9	C	24.8
5	La Cienega Blvd / Imperial Hwy	D	36.4	D	37.1
6	Hawthorne Blvd / I-105 WB Off-Ramp	B	16.1	B	17
7	Hawthorne Blvd / Imperial Hwy	C	25.6	C	29.4
8	I-105 EB On-Ramp/Imperial Hwy (Freeman)	C	27.2	C	27.9
9	Prairie Ave / I-105 WB Off-Ramp	B	18.7	B	18.7
10	Prairie Ave / Imperial Hwy	**F**	**86.3**	**F**	**86.3**
11	I-105 EB Ramps / 120th St	**E**	**70.2**	**E**	**74.4**
12	Crenshaw Blvd / Imperial Hwy	D	38.8	D	46.1
13	Crenshaw Blvd / I-105 WB Off-Ramp	C	28.9	C	27.9
14	Crenshaw Blvd / 120th St	D	49.1	D	49.1
15	Vermont Ave / Imperial Hwy	**E**	**55.8**	**E**	**57.6**
16	Vermont Ave / I-105 WB Ramps	C	28.9	C	28.3
17	Vermont Ave / I-105 EB Off-Ramp	C	24.9	C	27.5
18	Vermont Ave / 120th St	C	24	C	25.2
19	Central Ave / Imperial Hwy	**E**	**65.5**	**E**	**68.2**
20	Central Ave / I-105 WB Ramps	C	20.9	C	22.6
21	Central Ave / I-105 EB Ramps	C	26.9	C	28.2
22	Central Ave / 120th St	D	36.4	D	37.7
23	Wilmington Ave / Imperial Hwy	B	17.6	B	17.4
24	Wilmington Ave / I-105 EB Ramps	D	39.8	D	39.5
25	Wilmington Ave /East 120th St	C	21.1	C	21.2
26	I-105 WB Ramps / Imperial Hwy	**F**	**176.5**	**F**	**178.8**
27	Mona Blvd / Imperial Hwy	**E**	**72.5**	**F**	**106.6**
28	Long Beach Blvd / Imperial Hwy	D	40.7	**E**	**55.1**

Table 5-17: AM Peak Hour Study Intersection Performance—Alternative 1 (2027, 2047) (continued)

Location #	Location	2027 No—Build (Alternative 1)		2047 No—Build (Alternative 1)	
		LOS	Delay (sec)	LOS	Delay (sec)
29	Long Beach Blvd / I-105 WB Off-Ramp	B	14.8	B	14.6
30	Long Beach Blvd / I-105 EB Off-Ramp	C	23.2	C	22.7
31	Garfield Ave / I-105 WB On-Ramp	C	22.1	C	23.6
32	Garfield Ave / I-105 EB Off-Ramp	C	30.8	C	33.7
33	Garfield Ave / Rosecrans Ave	D	53.4	D	53.4
34	Paramount Blvd/ Imperial Hwy	C	29.4	C	30.7
35	Paramount Blvd / I-105 WB Off-Ramp	C	26.4	C	26.4
36	Paramount Blvd / I-105 EB On-Ramp	C	21.1	C	22.8
37	Paramount Blvd / Rosecrans Ave	D	52.8	D	54
38	Lakewood Blvd / Imperial Hwy	C	24.3	C	26.1
39	Lakewood Blvd / I-105 EB Off-Ramp & WB Ramps	**F**	**137.2**	**F**	**136.1**
40	Lakewood Blvd / Rosecrans Ave	C	27.4	C	28
41	Bellflower Blvd / Imperial Hwy	C	28.8	C	30
42	Bellflower Blvd / I-105 WB Ramps	B	18.7	B	18.9
43	Bellflower Blvd / I-105 EB Ramps	B	18.7	B	18.7
44	Bellflower Blvd / Rosecrans Ave	D	37.2	D	35.6
45	Woodruff Ave / Imperial Hwy	D	37.9	D	40.4
46	Hoxie Ave / Imperial Hwy	D	36.5	D	37.1
47	Studebaker Rd / Imperial Hwy	**E**	**68.3**	**E**	**67.5**
48	Studebaker Rd / I-105 WB On-Ramp & EB Off-Ramp	**F**	**88.3**	**F**	**87.7**
49	Studebaker Rd / Rosecrans Ave	D	42.3	D	48.3

Source: Traffic Study Report (provided under separate cover)
Notes: Ave = Avenue; Blvd = Boulevard; EB = Eastbound; Hwy = Highway; I- = Interstate; LOS = Level of Service; sec = second; NB = Northbound; Rd = Road; St = Street; WB = Westbound
Red and bold denotes LOS E or worse.

Table 5-18: PM Peak Hour Study Intersection Performance—Alternative 1 (2027, 2047)

Location #	Location	2027 No—Build (Alternative 1)		2047 No—Build (Alternative 1)	
		LOS	Delay (sec)	LOS	Delay (sec)
1	I-105 WB Off-Ramp / NB Sepulveda Blvd	D	53.3	D	53.3
2	Sepulveda Blvd / Imperial Hwy	**F**	**94.3**	**F**	**100.8**
3	Aviation Blvd / Imperial Hwy	**E**	**65**	**F**	**93.3**
4	I-105 WB Off- & I-105 EB On-Ramp / Imperial Hwy	B	11.1	B	10.5
5	La Cienega Blvd / Imperial Hwy	D	44.1	D	44.8
6	Hawthorne Blvd / I-105 WB Off-Ramp	B	17.9	B	18
7	Hawthorne Blvd / Imperial Hwy	D	46.2	**E**	**58.8**
8	I-105 EB On-Ramp / Imperial Hwy (Freeman)	C	28.4	C	29.6
9	Prairie Ave / I-105 WB Off-Ramp	D	38.6	D	38.6
10	Prairie Ave / Imperial Hwy	**F**	**168.5**	**F**	**168.5**
11	I-105 EB Ramps / 120th St	C	34	C	34.2
12	Crenshaw Blvd / Imperial Hwy	D	46.7	D	47.3
13	Crenshaw Blvd / I-105 WB Off-Ramp	D	39.9	D	39.9
14	Crenshaw Blvd / 120th St	**E**	**55.8**	**E**	**55.8**
15	Vermont Ave / Imperial Hwy	**E**	**57.5**	**E**	**74.4**
16	Vermont Ave / I-105 WB Ramps	B	18	B	17.2
17	Vermont Ave / I-105 EB Off-Ramp	C	21.7	C	21.5
18	Vermont Ave / 120th St	C	24.5	C	28.1
19	Central Ave / Imperial Hwy	**E**	**58.5**	**E**	**58.5**
20	Central Ave / I-105 WB Ramps	C	22.1	C	22.1
21	Central Ave / I-105 EB Ramps	C	26.1	C	25.9
22	Central Ave / 120th St	D	41.1	D	47.2
23	Wilmington Ave / Imperial Hwy	C	24.1	C	24.1
24	Wilmington Ave / I-105 EB Ramps	C	28.5	C	28.5
25	Wilmington Ave / East 120th St	B	17	B	17.6
26	I-105 WB Ramps / Imperial Hwy	**F**	**83.3**	**F**	**83.3**
27	Mona Blvd / Imperial Hwy	**F**	**93.6**	**F**	**93.6**
28	Long Beach Blvd / Imperial Hwy	D	39.4	D	39.8
29	Long Beach Blvd / I-105 WB Off-Ramp	B	19.1	B	19.3
30	Long Beach Blvd / I-105 EB Off-Ramp	B	15.2	B	15.1
31	Garfield Ave / I-105 WB On-Ramp	C	20.2	C	21
32	Garfield Ave / I-105 EB Off-Ramp	D	36.5	D	37.7
33	Garfield Ave / Rosecrans Ave	D	47.6	D	49.1
34	Paramount Blvd / Imperial Hwy	D	37	D	37.9
35	Paramount Blvd / I-105 WB Off-Ramp	B	19.3	B	19.3
36	Paramount Blvd / I-105 EB On-Ramp	C	23.5	C	23.7
37	Paramount Blvd / Rosecrans Ave	D	53.8	D	54.3
38	Lakewood Blvd / Imperial Hwy	C	32.8	C	34.1

Table 5-18: PM Peak Hour Study Intersection Performance—Alternative 1 (2027, 2047) (continued)

Location #	Location	2027 No—Build (Alternative 1)		2047 No—Build (Alternative 1)	
		LOS	Delay (sec)	LOS	Delay (sec)
39	Lakewood Blvd / I-105 EB Off-Ramp & WB Ramps	**E**	**56.9**	**E**	**58.2**
40	Lakewood Blvd / Rosecrans Ave	D	49.1	D	49.1
41	Bellflower Blvd / Imperial Hwy	C	27.2	C	27.2
42	Bellflower Blvd / I-105 WB Ramps	B	17.2	B	17.1
43	Bellflower Blvd / I-105 EB Ramps	C	21.3	C	20.3
44	Bellflower Blvd / Rosecrans Ave	C	30.8	C	30.8
45	Woodruff Ave / Imperial Hwy	D	54.5	D	54.4
46	Hoxie Ave / Imperial Hwy	**E**	**55.8**	**E**	**75.4**
47	Studebaker Rd / Imperial Hwy	**E**	**56.8**	**E**	**62.7**
48	Studebaker Rd / I-105 WB On-Ramp & EB Off-Ramp	**F**	**108.2**	**E**	**77.7**
49	Studebaker Rd / Rosecrans Ave	D	50.5	D	51.4

Source: Traffic Study Report (provided under separate cover)
Notes: Ave = Avenue; Blvd = Boulevard; EB = Eastbound; Hwy = Highway; I- = Interstate; NB = Northbound; Rd = Road; St = Street; WB = Westbound; Red and bold denotes LOS E or worse.

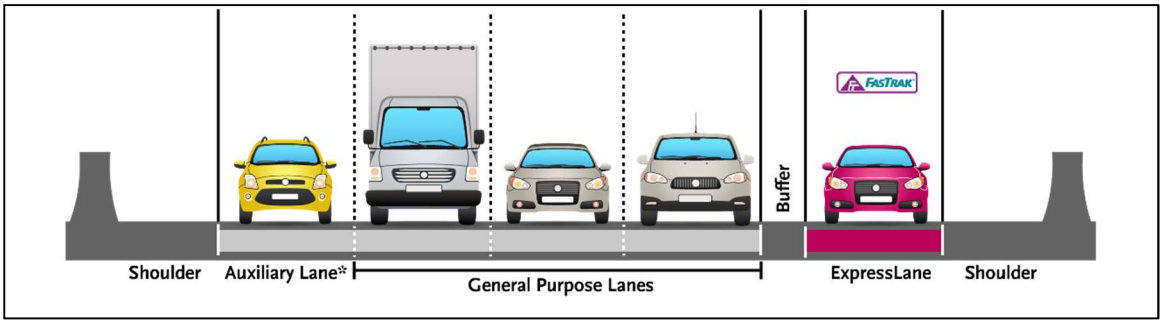
Cost Estimates

There are no costs associated with this alternative, as it leaves the existing conditions as-is.

Alternative 2 – Build Alternative: Convert Existing HOV Lane to One ExpressLane (Standard Lane and Shoulder Widths)

Alternative 2 would convert existing HOV lane to one ExpressLane in each direction with standard lane and shoulder widths (12-foot wide ExpressLane, 12-foot wide general purpose lanes, 12-foot wide auxiliary lanes, 10-foot wide inside and outside shoulders, and 4-foot buffer, respectively). Figure 5-2 illustrates a typical cross section for the proposed Alternative 2.

Figure 5-2: Cross Section for Alternative 2



Source: Metro, 2019
Note: *Auxiliary Lane is only in certain location on I-105; see Attachment B for locations.

Alternative 2 would include the following additional improvements to the identified portion of the corridor:

Proposed Engineering Features

Mainline Improvements

- Restriping the freeway within the existing footprint to create one 12-foot wide ExpressLane, with a 4-foot wide buffer separating the ExpressLane from the general purpose lane.
- Roadway Widening, up to 8-feet in some locations, to the outside to accommodate an additional 12-foot weave lane at ingress/egress locations and to improve or maintain stopping sight distances at curves.
- Non-standard 4-foot inside shoulders and 8-foot outside shoulders, would be implemented where site constraints exist.
- New merge lanes, approximately 300-feet in length, at Eastbound I-105/Paramount Avenue On-Ramp, Eastbound I-105/Bellflower Boulevard On-Ramp, and Westbound I-105/Bellflower Boulevard On-Ramp, to meet Caltrans HDM standards (Figure 504.3A).
- New pavement would be a minimum of 6-feet in width and remaining existing pavement would be a minimum of 6-feet in width to adjacent joints.

Local Improvements

- The I-105 mainline roadway widening by 6-feet in the westbound direction at Central Avenue will reduce existing vertical clearance by 2-inches, from 14’11” to 14’9”.

Bike, Pedestrian, and Sustainability Improvements

- Replace sidewalks, Americans with Disabilities (ADA) ramps, and bikeway connections (as applicable), in accordance with local City or Caltrans standards (as applicable), to accommodate the reprofiling of local arterials (Central Avenue) to satisfy minimum vertical clearance requirements.

Ramp/Interchange Improvements

Alternative 2 would impact some existing ramps and system interchanges. The affected ramps and interchanges and the proposed improvements are summarized in Table 5-19, Table 5-20 and Table 5-21. In general, some existing ramps will be shifted to accommodate outside widening by the Project. Within the Project limits, ramp metering is incorporated into the existing local interchange on ramps, except at: Eastbound On-Ramp from Southbound Sepulveda Boulevard; Eastbound On-Ramp from Eastbound Imperial Highway; Eastbound On-Ramp from Southbound I-110; Eastbound On-Ramp from I-110; Eastbound On-Ramp from Hoxie Avenue; Westbound On-Ramp from Southbound Sepulveda Boulevard/Imperial Highway; Westbound On-Ramp from Southbound I-405; Westbound On-Ramp from Northbound I-405; Westbound I-105 HOV On-Ramp from Southbound I-110 HOV; Westbound On-Ramp from Northbound I-110; Westbound On-Ramp from I-605/Rosecrans; and Westbound On-Ramp from Southbound I-605; Westbound On-Ramp from Imperial; Westbound On-Ramp from Hoxie Avenue. Where ramp improvement requires relocation of the ramp limit line, ramp metering will be re-established. Existing ramp meters and equipment will be reused, where possible. Within

the Project limits, all interchange metered on-ramps between the I-405 and I-605 have an existing HOV bypass lane with no HOV ramp metering. Incorporation of HOV bypass lanes ramp metering will be added to all on-ramps not currently metered. In addition, where there is no ramp improvements and no existing ramp metering, new ramp meters are proposed between I-405 and I-605 as a part of the Project at: Eastbound On-Ramp from Eastbound Imperial Highway; Eastbound On-Ramp from Hoxie Avenue; Westbound On-Ramp from Imperial; Westbound On-Ramp from Hoxie Avenue.

Table 5-19: Existing On-Ramps within the Project Limits—Alternative 2

Location		Post Mile (Approx.)	Ramp Improvements	Ramp Metering	
				Existing	Proposed*
1	Imperial Hwy EB On-Ramp (near California St)	R0.134			
2	Sepulveda Blvd WB On-Ramp	R0.295			
3	Sepulveda Blvd EB On-Ramp	R0.451			
4	Imperial Hwy EB On-Ramp (near Nash St.)	R0.889			X
5	Atwood Way EB On-Ramp	R1.164		X	
6	N&S405-W105 Connector	R1.695			
7	Imperial Hwy EB On-Ramp (Near La Cienega Blvd)	R1.909		X	
8	S405-E105 Connector	R2.531		X	
9	N405-E105 Connector	R2.291		X	
10	Hawthorne Blvd EB On-Ramp	R003.49		X	
11	Imperial Hwy EB On-Ramp (near Prairie Ave)	R003.49		X	
12	Imperial Hwy WB On-Ramp (near Prairie Ave)	R003.49		X	
13	W 120th St EB On-Ramp	R004.60		X	
14	Crenshaw Blvd WB On-Ramp	R004.57		X	
15	Crenshaw Blvd WB Loop On-Ramp	R004.75		X	
16	Crenshaw Blvd EB On-Ramp	R004.93		X	
17	Vermont Ave WB On-Ramp	R006.58		X	
18	S Hoover St EB On-Ramp	R007.13		X	
19	S110-W105 Connector	R007.40		X	
20	S110-W105 Connector (HOV)	R007.23			
21	N110-W105 Connector	R007.43			
22	S110-E105 Connector (HOV)	R007.62			
23	N&S110-E105 Connector	R007.40		X**	

Table 5-19: Existing On-Ramps within the Project Limits—Alternative 2 (continued)

	Location	Post Mile (Approx.)	Ramp Improvements	Ramp Metering	
				Existing	Proposed*
24	Central Ave EB On-Ramp	R009.10	X	X	X
25	Central Ave WB On-Ramp	R008.75	X	X	X
26	Wilmington Ave EB On-Ramp	R009.79		X	
27	Imperial Hwy WB On-Ramp (near Wilmington Ave)	R010.03		X	
28	Long Beach Blvd EB Loop On-Ramp	R011.65		X	
29	Long Beach Blvd EB On-Ramp	R011.65		X	
30	Long Beach Blvd WB Loop On-Ramp	R011.52		X	
31	Long Beach Blvd WB On-Ramp	R011.37		X	
32	N710-W105 Connector	R013.02		X	
33	S710-W105 Connector	R013.25		X	
34	N710-E105 Connector	R013.85		X	
35	S710-E105 Connector	R013.85		X	
36	Paramount Blvd EB On-Ramp	R014.85	X	X	X
37	Garfield Ave WB On-Ramp	R014.03		X	
38	Lakewood Blvd WB On-Ramp	R015.55		X	
39	Lakewood Blvd EB On-Ramp	R015.93		X	
40	Lakewood Blvd EB Loop On-Ramp	R015.71		X	
41	Bellflower Blvd EB On-Ramp	R016.85	X	X	X
42	Bellflower Blvd WB On-Ramp	R016.40	X	X	X
43	N&S605-W105 Connector	R017.42			
44	Imperial Hwy WB On-Ramp (near Hoxie Ave)	R017.72		X	X
45	Hoxie Ave EB On-Ramp	R017.95			X
46	Hoxie Ave WB On-Ramp	R017.88			X
Total Number of On-Ramp Improvements:			**5**		

Notes: * Existing ramp metering to be relocated and/or upgrade to latest equipment requirements.
**Ramps metered separately before joining.
Ave = Avenue; Blvd = Boulevard; E = East; EB = Eastbound; Hwy = Highway; N = North; S = South; W = West; WB = Westbound

Table 5-20: Existing Off-Ramps within the Project Limits—Alternative 2

	Location	Post Mile (Approx.)	Ramp Improvements
1	Imperial Hwy WB Off-Ramp (near California St)	R000.13	
2	Sepulveda Blvd WB Off-Ramp	R000.66	
3	Sepulveda Blvd WB Loop Off-Ramp	R000.48	
4	Sepulveda Blvd EB Off-Ramp	R000.37	
5	N Nash St WB Off-Ramp	R000.99	
6	E105-S405 Connector	R001.77	
7	Imperial Hwy WB Off-Ramp (near La Cienega)	R001.94	
8	W105-N&S405 Connector	R002.52	
9	Hawthorne Blvd WB Off-Ramp	R003.64	
10	S Prairie Ave EB Off-Ramp	R003.21	
11	S Prairie Ave WB Off-Ramp	R003.70	
12	W 120th St EB Off-Ramp	R004.35	X
13	Crenshaw Blvd WB Off-Ramp	R004.89	
14	Vermont Ave EB Off-Ramp	R006.60	
15	Vermont Ave WB Off-Ramp	R006.90	
16	E105-N&S110 Connector	R007.40	
17	W105-N110 Connector (HOV)	R007.97	
18	E105-N110 Connector (HOV)	R007.23	
19	W105-N&S110 Connector	R007.75	
20	Central Ave EB Off-Ramp	R008.75	X
21	Central Ave WB Off-Ramp	R009.10	X
22	Wilmington Ave EB Off-Ramp	R009.60	
23	Imperial Hwy WB Off-Ramp (near Wilmington Ave)	R010.19	
24	Long Beach Blvd EB Off-Ramp	R011.45	
25	Long Beach Blvd WB Off-Ramp	R011.65	
26	E105-N&S710 Connector	R013.10	
27	W105-N&S710 Connector	R014.10	
28	Garfield Ave EB Off-Ramp	R013.76	
29	Paramount Blvd WB Off-Ramp	R014.85	
30	Lakewood Blvd WB Off-Ramp	R015.93	
31	Lakewood Blvd EB Off-Ramp	R015.65	X
32	Bellflower Blvd EB Off-Ramp	R016.40	X
33	Bellflower Blvd WB Off-Ramp	R016.85	X
34	E105-N&S605 Connector	R017.44	
35	Norwalk Metro Station Off-Ramp	R017.67	
36	Hoxie Ave WB Off-Ramp	R017.95	
Total Number of Off-Ramp Improvements:			**6**

Table 5-21: Anticipated Interchange Impacts within the Project Limits—Alternative 2

Location	Post Mile (Approx.)	Interchange Improvements
I-405 / I-105 IC	R002.10	Convert HOV lane to ExpressLane
I-110 / I-105 IC	R007.40	Convert HOV lane to ExpressLane
W105-N110 Connector	R007.40	Convert HOV Connector to ExpressLane Connector
S110-E105 Connector	R007.40	Convert HOV Connector to ExpressLane Connector
E105-N110 Connector	R007.40	Convert HOV Connector to ExpressLane Connector
S110-W105 Connector	R007.40	Convert HOV Connector to ExpressLane Connector
I-110 / I-710 IC	R013.45	Convert HOV lane to ExpressLane

Notes: E = East; HOV = High Occupancy Vehicle; I- = Interstate; IC = Interchange; N = North; S = South; W = West

Incorporation of HOV bypass lanes ramp metering will be added to all on-ramps not currently metered between I-405 and I-605 as part of the Project, therefore a ramp meter policy exception is not required for this project.

Physical modifications of the ramp geometry will not be required where the HOV Direct Connector is converted to an ExpressLanes Connector; however, replacement of signage and the addition of tolling equipment will be required accordingly.

Impact to Structures

Alternative 2 would impact existing structures and create new structures as part of the Project. The affected bridge structures and the proposed improvements are summarized in Table 5-22. Structure Impact Memorandums (Attachment K) have been prepared to accompany this Draft Project Report.

Table 5-22: Anticipated Bridge Structure Impacts within the Project Limits—Alternative 2

Post Mile	Bridge No.	Bridge Name	Westbound (Left)			Eastbound (Right)			Average Width of Widening (Feet)
			Rebuild (R) /New (N)	Outside Widening	Median Widening	Rebuild (R) /New (N)	Outside Widening	Median Widening	
R004.16	53 2518	Dominguez Channel					X		EB 7.3
R004.23	53 2598	Yukon Ave UC					X		EB 6.8
R008.46	53 2478	Stanford Ave UC		X					WB 5.4
R008.94	53 2480	Central Ave UC		X					WB 6.1
R008.98	53 2483	Compton Creek		X					WB 5.5
R009.21	53 2484	Success Ave UC		X			X		WB 3.3 / EB 1.0
R009.38	53 2485	Compton Ave UC					X		EB 4.3
R011.91	53 2494	Fir / Spruce St UC		X					WB 4.7
R012.07	53 2495	Bullis Rd UC		X					WB 7
R012.30	53 2496	Gertrude Dr UC		X					WB 8.1
R012.58	53 2497	Harris Ave UC		X					WB 7.6

Notes: Ave = Avenue; Dr = Drive; Rd = Road; St = Street; UC = Undercrossing

Alternative 2 would impact existing retaining walls and create new retaining walls. Retaining walls will be provided, where required, to minimize and avoid right-of-way acquisition. The affected retaining wall structures and the proposed improvements are summarized in Table 5-23.

Table 5-23: Anticipated Retaining Wall Impacts within the Project Limits—Alternative 2

Location	Post Mile	Retaining Wall Improvements		Maximum Length of Extension (Feet)
		Rebuild (R) /New(N)	Type	
EB I-105 West of Inglewood Ave	R002.46	N	1	94
EB I-105 East of Inglewood Ave	R002.75	N	1	94
EB I-105 West of Hawthorne Blvd	R002.88	N	1	94
WB I-105 Between Inglewood Blvd & Hawthorne Blvd	R002.92	R	1	308
WB I-105 at Hawthorne Blvd	R003.03	N	Tie-Back	284
EB I-105 West of Crenshaw Blvd	R004.58	N	1	94
EB I-105 West of Van Ness Ave	R005.20	N	1	94
WB I-105 between Van Ness Ave OC & Normandie Ave OC	R005.34	R	1	308
WB I-105 between Western Ave OC & Normandie Ave OC	R006.04	N	1	308
WB I-105 East of Normandie Ave	R006.29	N	1	94
WB I-105 East of Vermont Ave	R006.80	N	1	94
EB I-105 East of Hoover St	R007.10	N	1	94
WB I-105 East of Main St	R007.86	N	1	94
EB I-105 East of Main St	R007.94	N	1	94
WB I-105 West of Stanford Ave	R008.34	N*	1	242
WB I-105 Central Ave WB On-Ramp	R008.60	N	1	340
WB I-105 between Central Ave On-Ramp & Central Ave UC	R008.83	N	1	439
WB I-105 between Central Ave UC & Compton Creek	R008.94	N	1	161
WB I-105 between Compton Creek & Central Ave Off-Ramp	R009.04	N	1	362
EB I-105 between Success Ave & Compton Ave	R009.23	N	1	300
EB I-105 between Success Ave & Compton Ave	R009.35	N	1	177
EB I-105 East of Wilmington Ave On-Ramp	R010.04	N	1	94
EB I-105 East of Harris Ave	R012.62	N	1	94
WB I-105 West of I-710	R013.23	N	1	94
EB I-105 West of Garfield Ave	R014.06	N	1	94

Table 5-23: Anticipated Retaining Wall Impacts within the Project Limits—Alternative 2 (continued)

Location	Post Mile	Retaining Wall Improvements		Maximum Length of Extension (Feet)
		Rebuild/New	Type	
EB I-105 between Garfield Ave OC & Paramount Blvd OC	R014.55	R	1	308
EB I-105 at Paramount Blvd OC	R014.64	N	Tie-Back	202
EB I-105 at Downey Ave	R015.08	N	Tie-Back	117
EB I-105 between Downey Ave & Gardendale	R015.17	R	1	308
EB I-105 between Downey Ave & Gardendale ST OC	R015.30	N	1	138
EB I-105 at Laureldale Ave OC	R015.33	N	Tie-Back	77
EB I-105 between Laureldale Ave & Gardendale St OC	R015.34	N	1	213
EB I-105 at Gardendale St OC	R015.38	N	Tie-Back	160
EB I-105 between Gardendale St OC & Barlin Ave OC	R015.41	N	1	212
WB I-105 West of Ardis Ave	R016.19	R	1	308
WB I-105 at Ardis Ave	R016.39	N	Tie-Back	94
WB I-105 at Bellflower Blvd	R016.54	R	1/Tie-Back	1,301/130
EB I-105 at Bellflower Blvd	R016.64	R	1	160
WB I-105 between Dunrobin Ave & Woodruff Ave OC	R017.05	R	1	308
EB I-105 between Dunrobin Ave & Woodruff Ave OC	R017.12	N	Tie-Back	140
WB I-105 between Woodruff Ave OC & San Gabriel River	R017.29	N	1	94
WB I-105 East of San Gabriel River	R017.60	N	1	94

Notes: *Retaining Wall/Sound Wall.
Ave = Avenue; Blvd = Boulevard; EB = Eastbound; I- = Interstate; OC = Overcrossing; St = Street; UC = Undercrossing; WB = Westbound

Noise Barriers

Alternative 2 would impact existing sound walls. The affected sound walls and the proposed improvements are summarized in Table 5-24: Anticipated Sound Wall Impacts within the Project Limits—Alternative 2.

Table 5-24: Anticipated Sound Wall Impacts within the Project Limits—Alternative 2

Location	Post Mile	Sound Wall Improvements			Maximum Length of Extension (Feet)
		Rebuild (R) /New (N)	Extension	Removal	
EB I-105 Between W 118th St & Yukon Ave S	R003.91	R			1,754
WB I-105 Between S Central Ave & East Compton Ave	R009.01	N			2,519
EB I-105 Between Compton Creek & East of Compton Ave	R009.06	R			2,440
WB I-105 Between S Main St and & Central Ave	R007.77	R*			6,017
WB I-105 Imperial Hwy On Ramp	R009.90	N			1,911
WB I-105 Between Imperial Hwy On Ramp & Alameda St	R009.95	N			3,313
WB I-105 between Long Beach Blvd Off-Ramp & Fir St	R011.52	N			2,128
WB I-105 Between Fir St & West of Atlantic Ave	R011.91	R			4,698

Notes: *Retaining Wall/Sound Wall.
Ave = Avenue; Blvd = Boulevard; EB = Eastbound; I- = Interstate; IC = Interchange; St = Street; WB = Westbound

Non-standard Design Features (Design Standards Risk Assessment)

The engineering analysis performed during the PA&ED phase is preliminary and based on a low level of design detail and as such, the list of non-standard features is not comprehensive. As a result, many of the potential nonstandard design features have been identified using engineering judgment and past experiences on similar projects rather than detailed analysis. Likewise, the probability of design exception approval has been assessed using engineering judgment. The design coordinator and District 7 approval authority have been consulted early during the PA&ED phase to discuss potential design exceptions and reassess the probability of design exception approval.

A listing of major existing non-standard design features is included in Table 5-25. Existing Design Standards features to be maintained are included in Attachment E.

Table 5-25: Existing Non-Standard Design Features—Alternative 2

No.	Design Standard from Highway Design Manual Tables 82.1A & 82.1B
1	201.1 (Horizontal Alignment), 203.1 (Stopping Sight Distance)
2	202.2(1) (Superelevation Rate)
3	302.1 (Shoulder Width)
4	309.1 (Horizontal Clearances (Clear Recovery Zone))
5	501.3 (Interchange Spacing)
6	504.2(2) Freeway Entrance
7	504.7 (Minimum Weaving Length)

At this preliminary stage, a design standards risk assessment for the anticipated proposed non-standard design features that do not meet Caltrans Highway Design Manual (HDM) standards are summarized in Table 5-26. Detailed Design Standards Risk Assessment and Justification for Probability Ratings for Alternative 2 is included in Attachment E.

Table 5-26: Design Standards Risk Assessment—Alternative 2

No.	Design Standard from Highway Design Manual Tables 82.1A & 82.1B	Probability of Nonstandard Design Feature Approval (None, Low, Medium, High,)
1	201.1 (Horizontal Alignment), 203.1 (Stopping Sight Distance)	High
2	301.1 (Lane Width)	High
3	302.1 (Shoulder Width)	Medium/High
4	304.1 (Side Slopes)	Medium/High
5	309.2 (Vertical Clearance – Major Structures)	Medium
6	504.3 (Ramps)	High
7	N/A (HOV Guidelines)	High

Notes: HOV = High Occupancy Vehicle; N/A = Not Applicable

Right-of-Way Data

Additional right-of-way (e.g., full acquisition, partial acquisition, aerial easements, etc.) is not anticipated for the construction of Alternative 2.

Storm Water best management practices (BMPs) and existing utility conflicts shall be considered which may potentially require drainage easements, temporary construction easements and/or utility easements which will be confirmed for the "preferred" alternative.

Right-of-Way Data Sheets are included in Attachment G.

Utility and Other Owner Involvement

Both underground and above ground utility conflicts are anticipated within the Project area. Based on as-built plans obtained from Caltrans for portions of study area and available

utility as-built plans provided by various utility owners and field visits for undeveloped portions of the study area, the anticipated utility impacts within the Project limits are summarized in Table 5-27 and detailed in Attachments F and G.

Positive location will be performed for underground utilities in the Project vicinity that may be in close proximity or conflict with proposed improvements as determined from as-built plans and utility company records.

Relocation or addition of towers are not anticipated for the existing overhead electrical lines.

Table 5-27: Anticipated Impacts to Utilities within the Study Area—Alternative 2

No.	Location	Utility Owner and/or Contact Name	Wet (W) / Dry (D)	Utility Type(s)	Utility Conflict Description
1	WB I-105 at Truro Ave	SCE	D	Electrical	Remained-in-Place; Pothole to confirm depth
2	WB I-105 at Truro Ave	LACSD	W	Sewer	Remained-in-Place
3	WB I-105 at Truro Ave	SCWC	W	Water	Remained-in-Place
4	Grevillea Ave	Pacific Bell	D	Telecom	Remained-in-Place; Pothole to confirm depth
5	Grevillea Ave	SCG	D	Gas	Remained-in-Place; Pothole to confirm depth
6	Grevillea Ave	LACSD	W	Sewer	Remained-in-Place
7	Bullis Rd UC	LACSD	W	Sewer	Remained-in-Place
8	Bullis Rd UC	SCE	D	Electrical	Remained-in-Place; Pothole to confirm depth
9	Bullis Rd UC	Standard Oil	W	Oil	Remained-in-Place; High Priority
10	Bullis Rd UC	City of Lynwood	W	Water	Remained-in-Place
11	Bullis Rd UC	PT&T	D	Telecom	Remained-in-Place; Pothole to confirm depth
12	Bullis Rd UC	SCG	D	Gas	Remained-in-Place; Pothole to confirm depth
13	Bullis Rd UC	Standard Oil	W	Oil	Remained-in-Place; High Priority
14	Bullis Rd UC	Standard Oil	W	Oil	Remained-in-Place; High Priority
15	Bullis Rd UC	Standard Oil	W	Oil	Remained-in-Place; High Priority
16	Bullis Rd UC	SCE	D	Electrical	Remained-in-Place; High Priority

Table 5-27: Anticipated Impacts to Utilities within the Study Area—Alternative 2 (continued)

No.	Location	Utility Owner and/or Contact Name	Wet (W) / Dry (D)	Utility Type(s)	Utility Conflict Description
17	Harris Ave UC	SCE	D	Electrical	Remained-in-Place; Pothole to confirm depth
18	Harris Ave UC	Rogers Cable	D	Telecom	Remained-in-Place; Pothole to confirm depth
19	Harris Ave UC	City of Lynwood	W	Water	Remained-in-Place
20	Harris Ave UC	City of Lynwood	W	Sewer	Remained-in-Place
21	Façade Ave	LACSD	W	Sewer	Remained-in-Place
22	Façade Ave	City of Paramount	W	Water	Remained-in-Place
23	Façade Ave	LACSD	W	Sewer	Remained-in-Place
24	Arthur Ave	LACSD	W	Sewer	Remained-in-Place
25	Paramount Blvd	Pacific Bell	D	Telecom	Remained-in-Place; Pothole to confirm depth
26	Paramount Blvd	SCG	D	Gas	Remained-in-Place; Pothole to confirm depth
27	Paramount Blvd	SCE	D	Electrical	Remained-in-Place; Pothole to confirm depth
28	Paramount Blvd	LACSD	W	Sewer	Remained-in-Place
29	Downey Ave OC	SCWC	W	Water	Remained-in-Place
30	Downey Ave OC	LACSD	W	Sewer	Remained-in-Place
31	Downey Ave OC	PT&T	D	Telecom	Remained-in-Place; Pothole to confirm depth
32	Downey Ave OC	LACSD	W	Sewer	Remained-in-Place
33	Downey Ave OC	PT&T	D	Telecom	Remained-in-Place; Pothole to confirm depth
34	Downey Ave OC	SCG	D	Gas	Remained-in-Place; Pothole to confirm depth
35	Downey Ave OC	PT&T	D	Telecom	Remained-in-Place; Pothole to confirm depth
36	Downey Ave OC	SCWC	W	Water	Remained-in-Place
37	Downey Ave OC	SCG	D	Gas	Remained-in-Place; Pothole to confirm depth

Notes: Ave = Avenue; Blvd = Boulevard; I- = Interstate; LACSD = Los Angeles County Sanitation District; OC = Overcrossing; PT&T = Pacific Telephone and Telegraph; Rd = Road; SCE = Southern California Edison; SCG = Southern California Gas; SCWC = Southern California Water Collation; UC = Undercrossing; WB = Westbound

Some existing utilities may also be affected, though no major relocations are expected. As-built plans were used to identify other existing utilities and major drainage culverts (diameter greater than 48 inches) and channels within the Project limits. Coordination with the identified utility companies shall be carried out during the Plans, Specifications, and Estimate (PS&E) and construction phases.

Design Year (2027 and 2047) Build Alternatives (Alternatives 2) Traffic Operations Analysis Summary

Analysis of the future Build Alternative 2 conditions on the I-105 freeway was conducted using the outputs from the travel demand model for Design Years 2027 and 2047.

Mainline

In 2027, compared to the No-Build condition, the total corridor travel demand is projected to decrease by approximately 3- to 8- percent in the peak travel direction. Alternative 2 assumes an increase in occupancy policy from HOV 2+ to HOV 3+ for toll free travel. As a result, some HOV 2+ traffic will be shifted to the general purpose lanes. Although some of these vehicles will be replaced by paying SOVs (Single Occupant Vehicles), it does not offset the entire shift. However, daily traffic volume is projected to increase slightly when compared to the No-Build condition. The corridor is forecast to carry 187,000 to 193,000 ADT in general purpose lanes and 42,000 to 47,000 ADT in the ExpressLane. There is approximately 6-percent truck volume in the corridor.

The peak hour volumes and LOS for Alternatives 2 for freeway general purpose lane segments for both eastbound and westbound directions I-105 are summarized in Table 5-28 through Table 5-31. Similar to Alternative 1, by 2027 Alternative 2 in the eastbound direction is projected to be oversaturated and at LOS F from I-405 to I-605 during the PM peak hour.

Table 5-28: I-105 Eastbound General Purpose Lanes Mainline Analysis—Alternative 2 (2027)

Location	Segment Type	2027 Build (Alternative 2)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between I-405 & Hawthorne Blvd / Prairie Ave Off-Ramp	Basic	4,708	26.2	D	2,247	-	**F***
Between Prairie Ave Off-Ramp & On-Ramp	Basic	4,190	23.3	C	3,449	-	**F***
Between Prairie Ave & Crenshaw Blvd / 120th St	Basic	4,774	26.7	D	4,402	-	**F***
Between Crenshaw Blvd & Vermont Ave	Basic	5,988	26.8	D	6,044	-	**F****
Between Normandie OC & Vermont Off-Ramp	Basic	5,988	21.1	C	6,044	-	**F***
Between I-110 Off-Ramp & Hoover St On-Ramp	Basic	3,447	18.9	C	3,938	-	**F***
Between Central Ave Off-Ramp & On-Ramp	Basic	5,218	30.4	D	2,527	-	**F***
Between Wilmington Ave Off-Ramp & On-Ramp	Basic	4,933	25.3	C	4,050	-	**F***
Between Wilmington Ave & Long Beach Blvd	Basic	5,457	32.7	D	3,491	-	**F***
Between Long Beach Blvd Off-Ramp & On-Ramp	Basic	4,959	23.1	C	4,369	-	**F***
Between Long Beach Blvd & I-710	Basic	5,364	34.3	D	4,097	-	**F***
Between I-710 Off-Ramp & On-ramp	Basic	4,125	22.2	C	5,662	-	**F***
Between Garfield Ave & Grove St	Basic	4,132	37.8	E	4,412	-	**F***
Between Grove St OC & Paramount Blvd OC	Basic	5,410	-	**F***	6,398	-	**F***
Between Paramount Blvd & Lakewood Blvd	Basic	4,654	25.0	C	4,881	-	**F****
Between Lakewood Blvd & Bellflower Blvd	Basic	5,515	21.4	C	3,976	-	**F***

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds. Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; I- = Interstate; LOS = Level of Service; OC = Overcrossing; St = Street

Table 5-29: I-105 Eastbound General Purpose Lanes Merge/Diverge/Weave Analysis—Alternative 2 (2027)

Location	Segment Type	2027 Build (Alternative 2)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Imperial Hwy On-Ramp	Merge	2,109	20.5	C	2,716	-	**F***
I-405 NB On-Ramp	Merge	3,100	18.2	C	2,708	-	**F***
I-405 SB On-Ramp	Merge	4,708	20.1	C	2,247	-	**F***
Prairie Ave Off-Ramp	Diverge	4,386	27.1	C	3,352	-	**F***
Hawthorne Blvd / Imperial Hwy On-Ramp to Crenshaw Blvd / 120th St Off-Ramp	Weave	5,204	26.5	C	5,144	-	**F***
Crenshaw Blvd / 120th St On-Ramp	Merge	5,209	34.7	D	7,426	-	**F***
Crenshaw Blvd / 120th St On-Ramp (NB)	Merge	5,988	26.8	D	6,044	-	**F***
Vermont Ave Off-Ramp	Diverge	5,758	21.1	C	8,083	-	**F***
I-110 Off-Ramp	Diverge	5,351	17.9	C	8,030	-	**F***
Hoover St On-Ramp	Merge	4,152	25.0	C	2,914	-	**F***
I-110 On-Ramp to Central Ave Off-Ramp	Weave	6,092	24.9	C	3,955	-	**F***
Central Ave On-Ramp to Wilmington Ave Off-Ramp	Weave	5,933	32.3	D	4,208	-	**F***
Wilmington Ave On-Ramp	Merge	5,457	33.5	D	3,491	-	**F***
Long Beach Blvd Off-Ramp	Diverge	5,457	32.7	D	3,491	-	**F***
SB Long Beach Blvd On-Ramp	Merge	5,051	30.6	D	4,198	-	**F***
NB Long Beach Blvd On-Ramp	Merge	5,364	22.7	C	4,097	-	**F***
I-710 Off-Ramp	Diverge	5,442	35.4	E	4,087	-	**F***
Garfield Ave Off-Ramp	Diverge	4,125	24.5	C	5,662	-	**F***
I-710 NB On-Ramp	Merge	5,331	-	**F***	6,251	-	**F***
I-710 SB On-Ramp	Merge	5,410	-	**F***	6,398	-	**F***
Paramount Blvd On-Ramp	Merge	5,439	-	**F****	4,567	-	**F***
Lakewood Blvd Off-Ramp	Diverge	5,439	36.0	E	4,567	-	**F***
SB Lakewood Blvd On-Ramp	Merge	4,654	19.8	C	6,414	-	**F***
NB Lakewood Blvd On-Ramp	Weave	5,417	26.3	C	4,738	-	**F***
Bellflower Blvd On-Ramp	Merge	5,351	27.3	D	3,462	-	**F***
I-605 Off-Ramp	Diverge	5,351	27.3	D	3,462	-	**F****

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds. Red and bold denotes LOS E or worse.

Ave = Avenue; Blvd = Boulevard; Hwy = Highway; I- = Interstate; LOS = Level of Service; NB = Northbound; SB = Southbound; St = Street

Table 5-30: I-105 Westbound General Purpose Lanes Mainline Analysis—Alternative 2 (2027)

Location	Segment Type	2027 Build (Alternative 2)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between Bellflower Blvd & Lakewood Blvd	Basic	5,411	-	**F***	6,891	-	**F***
Between Lakewood Blvd Off-Ramp & On-Ramp	Basic	5,034	-	**F***	5,706	34.6	D
Between Paramount Blvd Off-Ramp & On-Ramp	Basic	6,659	-	**F****	5,842	27.1	D
Between Paramount Blvd & I-710	Basic	6,746	31.1	D	5,956	30.4	D
Between I-710 Off-Ramp & Garfield Ave On-Ramp	Basic	6,062	-	**F***	4,623	27.6	D
Between I-710 Off-Ramp & SB On-Ramp	Basic	4,561	-	**F***	4,987	-	**F***
Between I-710 NB On-Ramp & Gertrude Dr UC	Basic	4,572	-	**F***	4,662	-	**F***
Between Gertrude Dr UC & Long Beach Blvd	Basic	2,453	-	**F***	1,999	-	**F***
Between Long Beach Blvd Off-Ramp & On-Ramp	Basic	4,267	-	**F***	4,473	-	**F***
Between State St UC & Alameda St	Basic	3,734	-	**F***	5,266	-	**F****
Between Imperial Hwy Off-Ramp & On-Ramp	Basic	4,706	-	**F***	4,338	23.4	C
Between Imperial Hwy & Central Ave	Basic	3,614	-	**F***	5,099	31.6	D
Between Central Ave Off-Ramp & On-Ramp	Basic	4,020	-	**F***	4,367	27.3	D
Between Stanford Ave UC & Avalon Blvd UC	Basic	5,274	-	**F***	5,115	23.6	C
Between Avalon UC & San Pedro St UC	Basic	5,179	-	**F***	5,130	20.0	C
Between I-110 Off-Ramp & Hoover St	Basic	3,306	-	**F***	3,922	22.0	C
Between Vermont Ave Off-Ramp & On-Ramp	Basic	2,884	-	**F***	4,398	23.9	C
Between Vermont Ave & Crenshaw Blvd	Basic	3,859	-	**F***	5,872	24.0	C
Between Crenshaw Blvd Off-Ramp & On-Ramp	Basic	4,954	-	**F***	4,534	26.4	D
Between Prairie Ave / Hawthorne Blvd Off-Ramp & Imperial Hwy On-Ramp	Basic	5,259	-	**F****	4,348	28.7	D
Between Imperial Hwy & I-405	Basic	6,433	21.9	C	4,854	15.8	B
Between I-405 Off-Ramp & La Cienega Blvd	Basic	3,739	17.3	B	1,088	1.7	A

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds. Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; Dr = Drive; Hwy = Highway; I- = Interstate; LOS = Level of Service; NB = Northbound; SB = Southbound; St = Street; UC = Undercrossing

Table 5-31: I-105 Westbound General Purpose Lanes Merge/Diverge/Weave Analysis—Alternative 2 (2027)

Location	Segment Type	2027 Build (Alternative 2)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
I-605 On-Ramp	Merge	5,411	-	**F***	6,891	-	**F***
Bellflower Blvd Off-Ramp	Diverge	5,411	-	**F***	6,891	-	**F***
Bellflower Blvd On-Ramp to Lakewood Blvd Off-Ramp	Weave	3,989	-	**F***	5,363	-	**F****
Lakewood Blvd On-Ramp	Merge	4,249	-	**F***	5,181	34.6	D
Paramount Blvd Off-Ramp	Diverge	4,249	-	**F****	5,181	33.0	D
I-710 Off-Ramp	Diverge	6,746	23.2	C	5,956	22.8	C
Garfield Ave On-Ramp	Merge	4,561	-	**F***	4,987	38.7	E
I-710 SB On-Ramp	Merge	3,878	-	**F***	5,662	-	**F****
I-710 NB On-Ramp	Merge	4,572	-	**F***	4,662	-	**F***
Long Beach Blvd Off-Ramp	Diverge	2,453	-	**F***	1,999	-	**F***
NB Long Beach Blvd On-Ramp	Merge	6,484	-	**F***	4,819	-	**F***
SB Long Beach Blvd On-Ramp	Merge	3,734	-	**F***	5,266	-	**F***
Imperial Hwy Off-Ramp	Diverge	3,734	-	**F***	5,266	31.2	D
Imperial Hwy On-Ramp	Merge	3,614	-	**F***	5,099	32.8	D
Central Ave Off-Ramp	Diverge	3,614	-	**F***	5,099	31.6	D
Central Ave On-Ramp	Merge	5,274	-	**F***	5,115	23.6	C
I-110 Off-Ramp	Diverge	5,179	-	**F***	5,130	20.0	C
I-110 NB On-Ramp	Weave	3,533	-	**F***	5,209	28.6	D
I-110 SB On-Ramp	Merge	3,952	-	**F***	5,347	24.4	C
Vermont Ave On-Ramp	Merge	3,859	-	**F***	5,872	25.9	C
Crenshaw Blvd Off-Ramp	Diverge	3,902	-	**F***	6,049	25.0	C
NB Crenshaw Blvd On-Ramp	Merge	4,573	-	**F***	4,880	21.8	C
SB Crenshaw Blvd On-Ramp to Prairie Ave / Hawthorne Blvd Off-Ramp	Weave	6,756	-	**F***	5,080	27.4	C
Imperial Hwy On-Ramp	Merge	6,433	27.2	C	4,854	19.7	C
I-405 Off-Ramp	Diverge	6,433	33.7	D	4,854	40.6	E

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds. Red and bold denotes LOS E or worse.

Ave = Avenue; Blvd = Boulevard; Hwy = Highway; I- = Interstate; LOS = Level of Service; NB = Northbound; SB = Southbound

In 2047, compared to the 2047 No-Build condition, the total corridor travel demand is projected to decrease by approximately 13 percent in the peak travel direction. The corridor is forecast to carry 188,000 to 199,000 ADT in the general purpose lanes and 42,000 to 47,000 ADT in ExpressLanes. There are approximately 7-percent truck volume in the corridor.

The peak hour volumes and LOS for Alternative 2 for freeway general purpose lane segments for both eastbound and westbound directions I-105 are summarized Table 5-32 through Table 5-35. From 2027 to 2047, the LOS conditions for Alternative 2 worsen primarily in the eastern portion of the corridor near the I-605 interchange. In the westbound direction, Alternative 2 has similar LOS conditions as the No Build Alternative 1 during the AM and PM peak hours.

Table 5-32: I-105 Eastbound General Purpose Lanes Mainline Analysis—Alternative 2 (2047)

Location	Segment Type	2047 Build (Alternative 2)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between I-405 & Hawthorne Blvd / Prairie Ave Off-Ramp	Basic	5,494	30.7	D	1,148	-	**F***
Between Prairie Ave Off-Ramp & On-Ramp	Basic	5,130	26.8	D	2,201	-	**F***
Between Prairie Ave & Crenshaw Blvd / 120th St	Basic	5,895	31.5	D	3,175	-	**F***
Between Crenshaw Blvd & Vermont Ave	Basic	7,110	31.9	D	4,814	-	**F***
Between Normandie OC & Vermont Off-Ramp	Basic	7,110	28.4	D	4,814	-	**F***
Between I-110 Off-Ramp & Hoover St On-Ramp	Basic	4,266	22.8	C	3,154	-	**F***
Between Central Ave Off-Ramp & On-Ramp	Basic	5,847	34.2	D	1,719	-	**F***
Between Wilmington Ave Off-Ramp & On-Ramp	Basic	5,542	34.3	D	3,234	-	**F***
Between Wilmington Ave & Long Beach Blvd	Basic	5,269	30.9	D	2,643	-	**F***
Between Long Beach Blvd Off-Ramp & On-Ramp	Basic	5,352	27.1	D	3,746	-	**F***
Between Long Beach Blvd & I-710	Basic	5,503	**41.7**	**E**	3,536	-	**F***
Between I-710 Off-Ramp & On-ramp	Basic	4,663	22.1	C	5,545	-	**F***
Between Garfield Ave & Grove St	Basic	4,634	20.0	C	4,568	-	**F***
Between Grove St OC & Paramount Blvd OC	Basic	6,172	-	**F***	6,245	-	**F***
Between Paramount Blvd & Lakewood Blvd	Basic	5,328	**40.8**	**E**	3,960	-	**F***
Between Lakewood Blvd & Bellflower Blvd	Basic	4,580	-	**F***	2,998	-	**F***

Source: Traffic Study Report (provided under separate cover)
Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds. Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; I- = Interstate; LOS = Level of Service; OC = Overcrossing; St = Street

Table 5-33: I-105 Eastbound General Purpose Lanes Merge/Diverge/Weave Analysis—Alternative 2 (2047)

Location	Segment Type	2047 Build (Alternative 2)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Imperial Hwy On-Ramp	Merge	2,597	20.9	C	2,242	-	**F***
I-405 NB On-Ramp	Merge	3,713	22.0	C	1,771	-	**F***
I-405 SB On-Ramp	Merge	5,494	22.9	C	1,148	-	**F***
Prairie Ave Off-Ramp	Diverge	5,245	30.7	D	2,142	-	**F***
Hawthorne Blvd / Imperial Hwy On-Ramp to Crenshaw Blvd / 120th St Off-Ramp	Weave	6,349	30.7	D	3,588	-	**F***
Crenshaw Blvd / 120th St On-Ramp	Merge	6,289	**43.6**	**E**	6,329	-	**F***
Crenshaw Blvd / 120th St On-Ramp (NB)	Merge	7,110	31.9	D	4,814	-	**F***
Vermont Ave Off-Ramp	Diverge	6,517	25.7	C	7,328	-	**F***
I-110 Off-Ramp	Diverge	5,942	23.2	C	7,317	-	**F***
Hoover St On-Ramp	Merge	4,886	29.5	D	2,338	-	**F***
I-110 On-Ramp to Central Ave Off-Ramp	Weave	6,717	29.5	D	3,178	-	**F***
Central Ave On-Ramp to Wilmington Ave Off-Ramp	Weave	6,563	**37.0**	**E**	3,295	-	**F***
Wilmington Ave On-Ramp	Merge	5,269	32.2	D	2,643	-	**F***
Long Beach Blvd Off-Ramp	Diverge	5,269	31.8	D	2,643	-	**F***
SB Long Beach Blvd On-Ramp	Merge	5,660	34.7	D	3,683	-	**F***
NB Long Beach Blvd On-Ramp	Merge	5,503	25.6	C	3,536	-	**F***
I-710 Off-Ramp	Diverge	5,582	-	**F***	3,527	-	**F***
Garfield Ave Off-Ramp	Diverge	4,663	28.0	D	5,545	-	**F***
I-710 NB On-Ramp	Merge	5,928	-	**F***	6,518	-	**F***
I-710 SB On-Ramp	Merge	6,172	-	**F***	6,245	-	**F***
Paramount Blvd On-Ramp	Merge	5,121	-	**F***	3,792	-	**F***
Lakewood Blvd Off-Ramp	Diverge	5,121	-	**F****	3,792	-	**F***
SB Lakewood Blvd On-Ramp	Merge	5,361	28.8	D	6,371	-	**F***
NB Lakewood Blvd On-Ramp	Weave	4,472	-	**F***	3,860	-	**F***
Bellflower Blvd On-Ramp	Merge	4,330	-	**F***	2,568	-	**F****
I-605 Off-Ramp	Diverge	4,330	-	**F****	2,568	-	**F***

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds. Red and bold denotes LOS E or worse.

Ave = Avenue; Blvd = Boulevard; Hwy = Highway; I- = Interstate; LOS = Level of Service; NB = Northbound; SB = Southbound; St = Street

Table 5-34: I-105 Westbound General Purpose Lanes Mainline Analysis—Alternative 2 (2047)

Location	Segment Type	2047 Build (Alternative 2)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between Bellflower Blvd & Lakewood Blvd	Basic	5,242	-	**F***	6,293	-	**F***
Between Lakewood Blvd Off-Ramp & On-Ramp	Basic	4,634	-	**F***	5,057	-	**F***
Between Paramount Blvd Off-Ramp & On-Ramp	Basic	6,086	-	**F****	6,246	42.6	E
Between Paramount Blvd & I-710	Basic	7,007	31.1	D	6,315	33.5	D
Between I-710 Off-Ramp & Garfield Ave On-Ramp	Basic	6,175	-	**F***	4,789	-	**F***
Between I-710 Off-Ramp & SB On-Ramp	Basic	4,306	-	**F***	5,110	-	**F***
Between I-710 NB On-Ramp & Gertrude Dr UC	Basic	4,226	-	**F***	4,076	-	**F***
Between Gertrude Dr UC & Long Beach Blvd	Basic	1,684	-	**F***	1,338	-	**F***
Between Long Beach Blvd Off-Ramp & On-Ramp	Basic	3,680	-	**F***	4,763	-	**F****
Between State St UC & Alameda St	Basic	2,761	-	**F***	5,655	35.4	E
Between Imperial Hwy Off-Ramp & On-Ramp	Basic	3,865	-	**F***	4,787	25.8	C
Between Imperial Hwy & Central Ave	Basic	2,730	-	**F***	5,546	35.8	E
Between Central Ave Off-Ramp & On-Ramp	Basic	3,450	-	**F***	4,754	26.5	D
Between Stanford Ave UC & Avalon Blvd UC	Basic	4,319	-	**F***	5,753	23.3	C
Between Avalon UC & San Pedro St UC	Basic	4,242	-	**F***	5,769	19.7	C
Between I-110 Off-Ramp & Hoover St	Basic	3,344	-	**F***	4,177	22.5	C
Between Vermont Ave Off-Ramp & On-Ramp	Basic	2,091	-	**F***	5,220	25.5	C
Between Vermont Ave & Crenshaw Blvd	Basic	2,664	-	**F***	6,680	28.6	D
Between Crenshaw Blvd Off-Ramp & On-Ramp	Basic	4,248	-	**F***	4,873	29.3	D
Between Prairie Ave / Hawthorne Blvd Off-Ramp & Imperial Hwy On-Ramp	Basic	4,213	-	**F****	4,605	32.0	D
Between Imperial Hwy & I-405	Basic	7,325	28.8	D	5,459	16.8	B
Between I-405 Off-Ramp & La Cienega Blvd	Basic	4,315	25.0	D	1,160	3.1	A

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds. Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; Dr = Drive; Hwy = Highway; I- = Interstate; LOS = Level of Service; NB = Northbound; SB = Southbound; St = Street; UC = Undercrossing

Table 5-35: I-105 Westbound General Purpose Lanes Merge/Diverge/Weave Analysis—Alternative 2 (2047)

Location	Segment Type	2047 Build (Alternative 2)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
I-605 On-Ramp	Merge	5,242	-	**F***	6,293	-	**F***
Bellflower Blvd Off-Ramp	Diverge	5,242	-	**F***	6,293	-	**F***
Bellflower Blvd On-Ramp to Lakewood Blvd Off-Ramp	Weave	3,502	-	**F***	4,789	-	**F***
Lakewood Blvd On-Ramp	Merge	3,672	-	**F***	4,399	-	**F***
Paramount Blvd Off-Ramp	Diverge	3,672	-	**F***	4,399	-	**F****
I-710 Off-Ramp	Diverge	7,007	23.2	C	6,315	24.7	C
Garfield Ave On-Ramp	Merge	4,306	-	**F***	5,110	-	**F***
I-710 SB On-Ramp	Merge	3,759	-	**F***	5,914	-	**F***
I-710 NB On-Ramp	Merge	4,226	-	**F***	4,076	-	**F***
Long Beach Blvd Off-Ramp	Diverge	1,684	-	**F***	1,338	-	**F***
NB Long Beach Blvd On-Ramp	Merge	5,871	-	**F***	5,213	20.5	C
SB Long Beach Blvd On-Ramp	Merge	2,761	-	**F***	5,655	25.0	C
Imperial Hwy Off-Ramp	Diverge	2,761	-	**F***	5,655	32.2	D
Imperial Hwy On-Ramp	Merge	2,730	-	**F***	5,546	33.3	D
Central Ave Off-Ramp	Diverge	2,730	-	**F***	5,546	32.2	D
Central Ave On-Ramp	Merge	4,319	-	**F***	5,753	23.3	C
I-110 Off-Ramp	Diverge	4,242	-	**F***	5,769	19.7	C
I-110 NB On-Ramp	Weave	2,867	-	**F***	6,021	30.5	D
I-110 SB On-Ramp	Merge	3,005	-	**F***	6,095	27.1	C
Vermont Ave On-Ramp	Merge	2,664	-	**F***	6,680	27.0	C
Crenshaw Blvd Off-Ramp	Diverge	2,955	-	**F***	6,473	25.6	C
NB Crenshaw Blvd On-Ramp	Merge	3,623	-	**F***	5,347	23.5	C
SB Crenshaw Blvd On-Ramp to Prairie Ave / Hawthorne Blvd Off-Ramp	Weave	5,599	-	**F***	5,621	29.3	D
Imperial Hwy On-Ramp	Merge	7,325	31.8	D	5,459	20.9	C
I-405 Off-Ramp	Diverge	7,325	28.8	D	5,459	41.2	E

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds. Red and bold denotes LOS E or worse.

Ave = Avenue; Blvd = Boulevard; Hwy = Highway; I- = Interstate; LOS = Level of Service; NB = Northbound; SB = Southbound

The peak hour volumes and LOS for Alternatives 2 under 2027 conditions for freeway ExpressLanes are summarized in Table 5-36 and Table 5-37. Alternative 2 has overall better LOS on the managed lanes than the Alternative 1 (No Build) due to the increase in occupancy requirement from HOV 2+ to HOV 3+ for toll free travel as well as active traffic management through pricing in the ExpressLanes. In the eastbound direction the managed lanes are LOS D or better from I-405 to Paramount Blvd where queuing from the I-605 interchange begins, whereas in the No Build Alternative 1 scenario the HOV lane is expected to be degraded to LOS E or LOS F from I-405 to I-605. Similarly, in the westbound, the managed lanes are LOS D or better from Bellflower Blvd to I-405 during the AM and PM peak hours, whereas in the No Build Alternative 1 scenario the HOV lane is projected to be mostly degraded to LOS E or LOS F.

The peak hour volumes and LOS for Alternatives 2 under 2047 conditions for freeway ExpressLanes are summarized in Table 5-36 and Table 5-37. The LOS for Alternative 2 in 2047 is similar to 2027 for the AM and PM peak hours in the eastbound and westbound directions. Overall, Alternative 2 has better LOS on the managed lanes than the No Build.

Table 5-36: I-105 Eastbound ExpressLanes Peak Hour LOS—Alternative 2 (2027)

Location	Segment Type	2027 Build (Alternative 2)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between e/o Aviation Blvd & Inglewood Ave	Access	960	15.5	B	1,246	22.7	C
Between Inglewood Ave & Hawthorne Blvd Access	Basic	960	15.5	B	1,246	22.7	C
Between Hawthorne Blvd & Prairie Ave	Access	1,201	20.0	C	1,301	24.5	C
Between Prairie Ave Access & Crenshaw Blvd	Basic	1,201	20.0	C	1,301	24.5	C
Between Crenshaw Blvd & Crenshaw Blvd Access	Basic	1,170	19.5	C	1,305	24.6	C
Between Crenshaw Blvd & Western Ave	Access	1,170	19.5	C	1,305	24.6	C
Between Western Ave Access & Vermont Ave	Basic	1,170	19.5	C	1,305	24.6	C
Between Vermont Ave & NB I-110 Off-Ramp	Diverge	1,409	25.2	C	1,116	19.2	C
Between I-110 Off-Ramp & I-110 On-Ramp	Basic	1,059	17.1	B	650	10.2	A
Between I-110 On-Ramp & Central Ave Access	Merge	1,518	31.6	D	1,489	31.0	D
Between w/o & e/o Central Ave	Access	1,593	29.5	D	1,340	25.3	C
Between Central Ave Access & Wilmington Ave	Basic	1,592	29.5	D	1,346	25.4	C
Between Wilmington Ave & Alameda St	Basic	1,593	29.5	D	1,353	25.5	C

Table 5-37: I-105 Westbound ExpressLanes Peak Hour LOS—Alternative 2 (2027) (continued)

Location	Segment Type	2027 Build (Alternative 2)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between Alameda St & Long Beach Blvd Access	Basic	1,593	29.5	D	1,355	25.6	C
Between w/o & e/o Long Beach Blvd	Access	1,593	29.5	D	1,355	25.6	C
Between Long Beach Blvd Access & Gertrude Dr	Basic	1,566	30.7	D	1,309	24.2	C
Between Gertrude Dr & I-710	Basic	1,566	30.7	D	1,309	24.2	C
Between I-710 & Garfield Ave	Basic	1,566	30.7	D	1,309	24.2	C
Between Garfield Ave & I-710	Basic	1,566	30.7	D	1,309	24.2	C
Between I-710 & Grove St	Basic	1,566	30.7	D	1,309	24.2	C
Between Grove St & Paramount Blvd	Basic	1,566	-	**F***	1,309	-	**F***
Between Paramount Blvd & Downey Ave	Access	1,566	-	**F***	1,309	-	**F***
Between Downey Ave Access & Lakewood Blvd	Basic	1,585	-	**F***	1,330	-	**F***
Between Lakewood Blvd & Bellflower Blvd Access	Basic	1,585	-	**F***	1,330	-	**F***
Between w/o & e/o Bellflower Blvd	Access	1,288	-	**F****	1,404	-	**F****
Between Bellflower Blvd Access & I-605	Basic	1,288	-	**F***	1,404	27.0	D

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds. Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; Dr = Drive; I- = Interstate; LOS = Level of Service; NB = Northbound; St = Street

Table 5-37: I-105 Westbound ExpressLanes Peak Hour LOS—Alternative 2 (2027)

Location	Segment Type	2027 Build (Alternative 2)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between I-605 & Bellflower Blvd Access	Basic	1,548	34.4	D	1,498	31.2	D
Between e/o & w/o Bellflower Blvd	Access	1,548	34.4	D	1,486	31.0	D
Between Bellflower Blvd Access & Lakewood Blvd	Basic	1,139	19.6	C	1,262	22.9	C
Between Lakewood Blvd & Paramount Blvd	Basic	1,148	19.8	C	1,263	23.0	C
Between Paramount Blvd & e/o I-710	Basic	1,148	19.8	C	1,263	23.0	C
Between e/o & w/o I-710	Basic	1,163	20.1	C	1,277	23.2	C
Between w/o I-710 & Harris Ave Access	Basic	1,163	20.1	C	1,277	23.2	C
Between Harris Ave & Gertrude Dr	Access	1,414	27.2	D	1,209	21.2	C
Between Gertrude Dr Access & Long Beach Blvd	Basic	1,414	27.2	D	1,209	21.2	C
Between Long Beach Blvd & State St	Basic	1,384	26.6	D	1,195	21.0	C
Between State St UC & Imperial Hwy	Basic	1,384	26.6	D	1,195	21.0	C
Between Imperial Hwy & Central Ave Access	Basic	1,384	26.6	D	1,195	21.0	C
Between e/o & w/o Central Ave	Access	1,384	26.6	D	1,195	21.0	C
Between Central Ave Access & Avalon Blvd	Basic	1,552	33.0	D	1,195	21.0	C
Between Avalon Blvd & I-110 Off-Ramp (DAR)	Diverge	1,530	32.6	D	1,200	21.1	C
Between I-110 Off-Ramp (DAR) & I-110 On-Ramp (DAR)	Basic	888	14.3	B	603	9.4	A
Between I-110 On-Ramp (DAR) & Vermont Ave	Merge	1,244	22.6	C	1,052	17.5	B
Between Vermont Ave & Western Ave Access	Basic	1,244	22.6	C	1,052	17.5	B
Between e/o & w/o Western Ave	Access	1,244	22.6	C	1,052	17.5	B
Between Western Ave Access & Crenshaw Blvd	Basic	1,262	22.9	C	840	13.3	B
Between Crenshaw Blvd & Prairie Ave Access	Basic	1,262	22.9	C	851	13.5	B
Between Prairie Ave & Hawthorne Blvd	Access	1,262	22.9	C	851	13.5	B
Between Hawthorne Blvd Access & I-405	Basic	1,389	26.7	D	644	10.1	A
Between I-405 & Aviation Blvd	Basic	1,389	26.7	D	644	10.1	A

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds.

Ave = Avenue; Blvd = Boulevard; DAR = Direct Access Ramp; Dr = Drive; Hwy = Highway; I- = Interstate; LOS = Level of Service; St = Street

Table 5-38: I-105 Eastbound ExpressLanes Peak Hour LOS—Alternative 2 (2047)

Location	Segment Type	2047 Build (Alternative 2)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between e/o Aviation Blvd & Inglewood Ave	Access	907	14.6	B	1,334	24.6	C
Between Inglewood Ave & Hawthorne Blvd Access	Basic	907	14.6	B	1,334	24.6	C
Between Hawthorne Blvd & Prairie Ave	Access	1,053	17.6	B	1,373	25.9	C
Between Prairie Ave Access & Crenshaw Blvd	Basic	1,053	17.6	B	1,373	25.9	C
Between Crenshaw Blvd & Crenshaw Blvd Access	Basic	1,026	17.1	B	1,377	26.0	C
Between Crenshaw Blvd & Western Ave	Access	1,026	17.1	B	1,377	26.0	C
Between Western Ave Access & Vermont Ave	Basic	1,026	17.1	B	1,377	26.0	C
Between Vermont Ave & NB I-110 Off-Ramp	Diverge	1,562	28.9	D	1,383	26.3	D
Between I-110 Off-Ramp & I-110 On-Ramp	Basic	865	14.0	B	943	15.0	B
Between I-110 On-Ramp & Central Ave Access	Merge	1,590	34.0	D	1,540	32.6	D
Between w/o & e/o Central Ave	Access	1,578	29.2	D	1,338	25.2	C
Between Central Ave Access & Wilmington Ave	Basic	1,578	29.2	D	1,345	25.4	C
Between Wilmington Ave & Alameda St	Basic	1,578	29.2	D	1,351	25.5	C
Between Alameda St & Long Beach Blvd Access	Basic	1,578	29.2	D	1,353	25.5	C
Between w/o & e/o Long Beach Blvd	Access	1,578	29.2	D	1,353	25.5	C
B Between Long Beach Blvd Access & Gertrude Dr	Basic	1,458	28.6	D	1,383	25.8	C
Between Gertrude Dr & I-710	Basic	1,458	28.6	D	1,383	25.8	C
Between I-710 & Garfield Ave	Basic	1,458	28.6	D	1,383	25.8	C
Between Garfield Ave & I-710	Basic	1,459	28.6	D	1,383	25.8	C
Between I-710 & Grove St	Basic	1,459	28.6	D	1,383	25.8	C
Between Grove St & Paramount Blvd	Basic	1,459	-	**F***	1,383	-	**F***
Between Paramount Blvd & Downey Ave	Access	1,459	-	**F***	1,383	-	**F***
Between Downey Ave Access & Lakewood Blvd	Basic	1,564	-	**F***	1,311	-	**F***
Between Lakewood Blvd & Bellflower Blvd Access	Basic	1,564	-	**F***	1,311	-	**F***
Between w/o & e/o Bellflower Blvd	Access	1,585	-	**F****	1,311	-	**F****
Between Bellflower Blvd Access & I-605	Basic	1,585	-	**F****	1,311	25.2	C

Source: Traffic Study Report (provided under separate cover)
Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds. Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; Dr = Drive; I- = Interstate; LOS = Level of Service; NB = Northbound; St = Street

Table 5-39: I-105 Westbound ExpressLane Peak Hour LOS—Alternative 2 (2047)

Location	Segment Type	2047 Build (Alternative 2)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between I-605 & Bellflower Blvd Access	Basic	1,499	37.5	E	1,598	36.3	E
Between e/o & w/o Bellflower Blvd	Access	1,503	37.4	E	1,598	35.7	E
Between Bellflower Blvd Access & Lakewood Blvd	Basic	1,255	21.8	C	1,316	23.9	C
Between Lakewood Blvd & Paramount Blvd	Basic	1,265	22.0	C	1,317	23.9	C
Between Paramount Blvd & e/o I-710	Basic	1,265	22.0	C	1,317	23.9	C
Between e/o & w/o I-710	Basic	1,280	22.3	C	1,331	24.2	C
Between w/o I-710 & Harris Ave Access	Basic	1,280	22.3	C	1,331	24.2	C
Between Harris Ave & Gertrude Dr	Access	1,362	26.2	D	1,320	23.5	C
Between Gertrude Dr Access & Long Beach Blvd	Basic	1,362	26.2	D	1,320	23.5	C
Between Long Beach Blvd & State St	Basic	1,333	25.6	C	1,304	23.2	C
Between State St UC & Imperial Hwy	Basic	1,333	25.6	C	1,304	23.2	C
Between Imperial Hwy & Central Ave Access	Basic	1,333	25.6	C	1,304	23.2	C
Between e/o & w/o Central Ave	Access	1,333	25.6	C	1,304	23.2	C
Between Central Ave Access & Avalon Blvd	Basic	1,345	28.6	D	1,094	19.2	C
Between Avalon Blvd & I-110 Off-Ramp (DAR)	Diverge	1,325	28.2	D	1,098	19.3	C
Between I-110 Off-Ramp (DAR) & I-110 On-Ramp (DAR)	Basic	1,124	18.7	C	802	12.5	B
Between I-110 On-Ramp (DAR) & Vermont Ave	Merge	1,221	22.2	C	1,015	16.9	B
Between Vermont Ave & Western Ave Access	Basic	1,221	22.2	C	1,015	16.9	B
Between e/o & w/o Western Ave	Access	1,221	22.2	C	1,015	16.9	B
Between Western Ave Access & Crenshaw Blvd	Basic	1,375	25.7	C	1,151	19.3	C
Between Crenshaw Blvd & Prairie Ave Access	Basic	1,376	25.7	C	1,166	19.6	C
Between Prairie Ave & Hawthorne Blvd	Access	1,376	25.7	C	1,166	19.6	C
Between Hawthorne Blvd Access & I-405	Basic	1,400	26.9	D	842	13.2	B
Between I-405 & Aviation Blvd	Basic	1,400	26.9	D	842	13.2	B

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 HCM (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds. Red and bold denotes LOS E or worse.

Ave = Avenue; Blvd = Boulevard; DAR = Direct Access Ramp; Dr = Drive; Hwy = Highway; I- = Interstate; LOS = Level of Service; St = Street

Ramps/Interchanges

The I-105 freeway on and off ramp conditions for Alternatives 2 for the future year 2027 and 2047 are summarized in Table 5-40 and Table 5-41. Most of the ramp locations have forecasted volumes that are within the available capacities, with the exception the six ramps where demand exceeds the capacity of the ramp. In 2047, there are one additional ramp in the eastbound direction, and two additional ramps in the westbound direction are forecast to have oversaturated condition in 2047.

Table 5-40: I-105 Eastbound Freeway Ramp Conditions—Alternatives 2 (2027 & 2047)

Int. #	Location	Type	No. of Ramp Lanes	2027 Build (Alternative 2)				2047 Build (Alternative 2)			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Vol	V/C	Vol	V/C	Vol	V/C	Vol	V/C
-	Sepulveda Blvd / Imperial Hwy Off	Off-Ramp	2	465	0.16	486	0.16	465	0.16	486	0.16
-	Sepulveda Blvd On (SB)	On-Ramp	2	1,543	0.51	2,446	**0.82**	1,543	0.51	2,446	**0.82**
-	Imperial Hwy On (EB)	On-Ramp	1	581	0.39	1,174	**0.78**	581	0.39	1,174	**0.78**
-	Atwood Way / Douglas St On (SB)	On-Ramp	1	344	0.23	1,548	**1.03**	344	0.23	1,548	**1.03**
-	I-405 Fwy-Fwy Off (NB & SB)	Off-Ramp	2	1,274	0.35	2,991	**0.83**	1,274	0.35	2,991	**0.83**
4	Imperial Hwy On	On-Ramp	1	722	0.48	629	0.42	823	0.55	629	0.42
-	I-405 Fwy-Fwy On (NB)	On-Ramp	1	1,108	0.62	507	0.28	1,263	**0.70**	507	0.28
-	Fwy-Fwy On (SB)	On-Ramp	2	1,949	0.54	942	0.26	2,220	0.62	942	0.26
9	Prairie Ave Off	Off-Ramp	1	404	0.27	584	0.39	460	0.31	584	0.39
7	Hawthorne Blvd / Imperial Hwy On	On-Ramp	2	763	0.25	898	0.30	869	0.29	898	0.30
11	Crenshaw Blvd / 120th St Off	Off-Ramp	1	751	0.50	328	0.22	855	0.57	328	0.22
11	Crenshaw Blvd / 120th St On	On-Ramp	1	841	0.56	750	0.50	958	0.64	750	0.50
11	Crenshaw Blvd / 120th St On (NB)	On-Ramp	1	772	0.51	833	0.56	880	0.59	833	0.56
17	Vermont Ave Off	Off-Ramp	1	654	0.44	680	0.45	745	0.50	680	0.45
-	I-110 Fwy-Fwy Off (GP) (NB & SB)	Off-Ramp	2	1,801	0.50	2,800	**0.78**	2,052	0.57	2,800	**0.78**
-	I-110 Fwy-Fwy Off (ML) (NB)	Off-Ramp	1	1,135	0.63	688	0.38	1,135	0.63	688	0.38
-	Hoover St On	On-Ramp	1	672	0.45	233	0.16	766	0.51	233	0.16
-	I-110 Fwy-Fwy On (ML) (NB)	On-Ramp	1	211	0.12	716	0.40	211	0.12	734	0.41
-	I-110 Fwy-Fwy On (NB & SB)	On-Ramp	2	2,047	0.57	1,441	0.40	2,145	0.60	1,441	0.40
21	Central Ave Off	Off-Ramp	1	1,507	**1.00**	1,009	0.67	1,579	**1.05**	1,009	0.67

Table 5-40: I-105 Eastbound Freeway Ramp Conditions—Alternatives 2 (2027 & 2047) (continued)

Int. #	Location	Type	No. of Ramp Lanes	2027 Build (Alternative 2)				2047 Build (Alternative 2)			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Vol	V/C	Vol	V/C	Vol	V/C	Vol	V/C
21	Central Ave On	On-Ramp	1	923	0.62	1,183	**0.79**	968	0.65	1,183	**0.79**
24	Wilmington Ave Off	Off-Ramp	1	917	0.61	450	0.30	961	0.64	450	0.30
24	Wilmington Ave On	On-Ramp	1	868	0.58	968	0.65	910	0.61	968	0.65
30	Long Beach Blvd Off	Off-Ramp	1	1,081	**0.72**	480	0.32	1,132	**0.75**	480	0.32
-	Long Beach Blvd On (SB)	On-Ramp	1	787	0.52	676	0.45	825	0.55	676	0.45
-	Long Beach Blvd On (NB)	On-Ramp	1	551	0.37	486	0.32	577	0.38	486	0.32
-	I-710 Fwy-Fwy Off (NB & SB)	Off-Ramp	2	2,138	0.59	2,325	0.65	2,241	0.62	2,325	0.65
32	Garfield Ave Off	Off-Ramp	2	979	0.33	710	0.24	979	0.33	710	0.24
-	I-710 Fwy-Fwy On (NB)	On-Ramp	2	1,329	0.37	1,263	0.35	1,329	0.37	1,263	0.35
-	I-710 Fwy-Fwy On (SB)	On-Ramp	2	1,050	0.29	618	0.17	1,050	0.29	618	0.17
36	Paramount Blvd On	On-Ramp	1	725	0.48	448	0.30	725	0.48	448	0.30
39	Lakewood Blvd Off	Off-Ramp	1	1,140	**0.76**	749	0.50	1,140	**0.76**	749	0.50
-	Lakewood Blvd On (SB)	On-Ramp	1	235	0.16	160	0.11	235	0.16	160	0.11
-	Lakewood Blvd On (NB)	On-Ramp	1	237	0.16	135	0.09	237	0.16	135	0.09
43	Bellflower Blvd Off	Off-Ramp	1	995	0.66	816	0.54	995	0.66	816	0.54
43	Bellflower Blvd On	On-Ramp	2	613	0.20	859	0.29	613	0.20	859	0.29
-	I-605 Fwy-Fwy Off (NB & SB)	Off-Ramp	4	4,202	0.58	3,870	0.54	4,202	0.58	3,870	0.54
-	Park And Ride Lot Off	Off-Ramp	1	133	0.09	100	0.07	133	0.09	100	0.07
-	Hoxie Ave On	On-Ramp	2	126	0.08	240	0.16	126	0.08	240	0.16

Source: Traffic Study Report (provided under separate cover)
Notes: Ave = Avenue; Blvd = Boulevard; EB = Eastbound; Fwy = Freeway; GP = General Purpose; Hwy = Highway; I- = Interstate; ML = Managed Lanes; NB = Northbound; SB = Southbound; St = Street
Red and bold denotes LOS E or worse.

Table 5-41: I-105 Westbound Freeway Ramp Conditions—Alternatives 2 (2027 & 2047)

Int. #	Location	Type	No. of Ramp Lanes	2027 Build (Alternative 2)				2047 Build (Alternative 2)			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Vol	V/C	Vol	V/C	Vol	V/C	Vol	V/C
-	Sepulveda Blvd Off (SB)	Off-Ramp	1	583	0.39	551	0.37	583	0.39	551	0.37
1	Sepulveda Blvd Off (NB)	Off-Ramp	2	2,228	**0.74**	1,716	0.57	2228	**0.74**	1716	0.57
-	Nash St Off (SB)	Off-Ramp	1	1,328	**0.89**	559	0.37	1328	**0.89**	559	0.37
-	I-405 Fwy-Fwy On (NB & SB)	On-Ramp	2	2,123	0.59	1,650	0.46	2123	0.59	1650	0.46
4	Imperial Hwy Off	Off-Ramp	1	1,376	**0.92**	615	0.41	1376	**0.92**	688	0.46
-	I-405 Fwy-Fwy Off (NB & SB)	Off-Ramp	3	3,208	0.59	4,120	**0.76**	3208	0.59	4617	**0.86**
8	Imperial Hwy On	On-Ramp	1	1,191	**0.79**	532	0.35	1191	**0.79**	596	0.40
9	Prairie Ave / Hawthorne Blvd Off	Off-Ramp	2	188	0.06	482	0.16	188	0.06	540	0.18
-	Crenshaw Blvd On (SB)	On-Ramp	1	388	0.26	144	0.10	388	0.26	161	0.11
-	Crenshaw Blvd On (NB)	On-Ramp	1	1,058	**0.71**	595	0.40	1058	**0.71**	667	0.44
13	Crenshaw Blvd Off	Off-Ramp	2	644	0.21	1,384	0.46	644	0.21	1551	0.52
16	Vermont Ave On	On-Ramp	1	1,145	**0.76**	601	0.40	1145	**0.76**	673	0.45
-	I-110 Fwy-Fwy On (GP) (SB)	On-Ramp	1	801	0.45	1,148	0.64	801	0.45	1286	**0.71**
16	Vermont Ave Off	Off-Ramp	1	731	0.49	733	0.49	731	0.49	821	0.55
-	I-110 Fwy-Fwy On (GP) (NB)	On-Ramp	1	1,107	0.62	1,124	0.62	1107	0.62	1259	**0.70**
-	I-110 Fwy-Fwy On (ML) (SB)	On-Ramp	1	708	0.39	751	0.42	708	0.39	920	0.51
-	I-110 Fwy-Fwy Off (ML) (SB)	Off-Ramp	1	337	0.19	181	0.10	337	0.19	181	0.10
-	I-110 Fwy-Fwy Off (GP) (NB & SB)	Off-Ramp	2	2,892	**0.80**	1,928	0.54	2892	**0.80**	2024	0.56
20	Central Ave On	On-Ramp	1	818	0.55	938	0.63	818	0.55	985	0.66
20	Central Ave Off	Off-Ramp	1	588	0.39	837	0.56	588	0.39	878	0.59
26	Imperial Hwy On	On-Ramp	1	1,152	**0.77**	1,025	0.68	1152	**0.77**	1076	**0.72**
2	Imperial Hwy Off	Off-Ramp	1	758	0.51	949	0.63	758	0.51	996	0.66
29	Long Beach Blvd On (SB)	On-Ramp	1	651	0.43	581	0.39	651	0.43	610	0.41
29	Long Beach Blvd On (NB)	On-Ramp	1	448	0.30	354	0.24	448	0.30	372	0.25
29	Long Beach Blvd Off	Off-Ramp	1	867	0.58	1,149	**0.77**	867	0.58	1207	**0.80**
-	I-710 Fwy-Fwy On (NB)	On-Ramp	1	1,702	**0.95**	1,437	**0.80**	1702	**0.95**	1509	**0.84**
-	I-710 Fwy-Fwy On (SB)	On-Ramp	2	641	0.18	911	0.25	641	0.18	957	0.27
31	Garfield Ave On	On-Ramp	2	755	0.25	608	0.20	755	0.25	608	0.20

Table 5-41: I-105 Westbound Freeway Ramp Conditions—Alternatives 2 (2027 & 2047) (continued)

Int. #	Location	Type	No. of Ramp Lanes	2027 Build (Alternative 2)				2047 Build (Alternative 2)			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Vol	V/C	Vol	V/C	Vol	V/C	Vol	V/C
-	I-710 Fwy-Fwy (NB & SB)	Off-Ramp	2	2,774	**0.77**	2,617	**0.73**	2774	**0.77**	2617	**0.73**
35	Paramount Blvd Off	Off-Ramp	1	480	0.32	613	0.41	480	0.32	613	0.41
39	Lakewood Blvd On	On-Ramp	1	569	0.38	1,015	0.68	569	0.38	1015	0.68
39	Lakewood Blvd Off	Off-Ramp	1	688	0.46	716	0.48	688	0.46	716	0.48
42	Bellflower Blvd On	On-Ramp	1	505	0.34	584	0.39	505	0.34	584	0.39
42	Bellflower Blvd Off	Off-Ramp	1	938	0.63	557	0.37	938	0.63	557	0.37
-	I-605 Fwy-Fwy On (NB & SB)	On-Ramp	4	4,835	0.67	5,740	**0.80**	4835	0.67	5740	**0.80**
48	Imperial Hwy On	On-Ramp	1	625	0.42	411	0.27	625	0.42	411	0.27
-	Hoxie Ave On	On-Ramp	1	105	0.07	97	0.06	105	0.07	97	0.06
-	Hoxie Ave Off	Off-Ramp	1	69	0.05	52	0.03	69	0.05	52	0.03

Source: Traffic Study Report (provided under separate cover)
Notes: Ave = Avenue; Blvd = Boulevard; Fwy = Freeway; GP = General Purpose; Hwy = Highway; I- = Interstate; ML = Managed Lanes; NB = Northbound; SB = Southbound; St = Street
Red and bold denotes LOS E or worse.

Queuing analysis was performed at the off-ramp terminals using Synchro to determine the queues based on the intersection analysis. Table 5-42 and Table 5-43 include the approximate ramp length and the 95th percentile queue length as reported in the output files for the longest queue and the corresponding movement. In 2027, Alternative 2 has four off-ramps in the westbound direction exceeding turn bay storage capacity during the AM peak hour and seven off-ramps in the eastbound direction for the PM peak hour. In 2047, Alternative 2 has six off-ramps in the westbound direction exceeding storage capacity during the AM peak hour and seven off-ramps in the eastbound direction for the PM peak hour. However, this may only occur approximately 5 percent of the time as 95 percent of the time, lower volumes will allow the queue to dissipate. None of the locations has queuing extending the length of the ramp.

Table 5-42: I-105 Eastbound Freeway Off-Ramp Queueing—Alternatives 2 (2027 & 2047)

Int. #	Ramp Location	Ramp Length (ft)	2027 Build (Alternative 2)		2047 Build (Alternative 2)	
			95% Queue Length (ft) AM	95% Queue Length (ft) PM	95% Queue Length (ft) AM	95% Queue Length (ft) PM
9	Prairie Ave Off	2,589	161 (Left)	#596 (Thru)	163 (Left)	#573 (Thru)
11	Crenshaw Blvd / 120th St Off	1,827	#523 (Left)	#206 (Left)	#611 (Left)	#225 (Left)
17	Vermont Ave Off	1,149	#313 (Thru)	273 (Thru)	#415 (Thru)	289 (Thru)
21	Central Ave Off	1,690	#482 (Left)	#390 (Thru)	#513 (Left)	#390 (Thru)
24	Wilmington Ave Off	1,830	#415 (Left)	#297 (Left)	#397 (Left)	#310 (Left)
30	Long Beach Blvd Off	1,501	248 (Thru)	134 (Thru)	#276 (Thru)	135 (Thru)
32	Garfield Ave Off	3,061	#366 (Right)	250 (Thru)	#365 (Right)	254 (Thru)
39	Lakewood Blvd Off	1,682	#575 (Left)	#291 (Left)	#574 (Left)	#311 (Left)
43	Bellflower Blvd Off	1,878	332 (Thru)	#247 (Thru)	337 (Thru)	#245 (Thru)
48	Studebaker Rd Off	572	234 (Left)	#488 (Right)	230 (Left)	#558 (Right)

Source: Traffic Study Report (provided under separate cover)
Note: # 95th percentile volume exceeds capacity of the storage bay, which could potentially block other movements.
Ave = Avenue; Blvd = Boulevard; ft = feet; I- = Interstate; Rd = Road; St = Street

Table 5-43: I-105 Westbound Freeway Off-Ramp Queueing—Alternatives 2 (2027 & 2047)

Int. #	Ramp Location	Ramp Length (ft)	2027 Build (Alternative 2)		2047 Build (Alternative 2)	
			95% Queue Length (ft) AM	95% Queue Length (ft) PM	95% Queue Length (ft) AM	95% Queue Length (ft) PM
1	Sepulveda Blvd Off (NB)	1,740	#1371 (Thru)	#1001 (Thru)	#1378 (Thru)	#1016 (Thru)
4	Imperial Hwy Off	1,576	368 (Left)	208 (Left)	364 (Left)	224 (Left)
6	Hawthorne Blvd Off	4,107	219 (Left)	277 (Left)	234 (Left)	290 (Left)
9	Prairie Ave Off	3,054	161 (Left)	#596 (Thru)	163 (Left)	#573 (Thru)
13	Crenshaw Blvd Off	1,802	328 (Thru)	#720 (Thru)	480 (Thru)	#805 (Thru)
16	Vermont Ave Off	1,266	#428 (Thru)	#352 (Thru)	#460 (Thru)	#404 (Thru)
20	Central Ave Off	1,058	174 (Thru)	232 (Thru)	#229 (Thru)	#278 (Left)
26	Imperial Hwy Off	996	#384 (Left)	#402 (Left)	#368 (Left)	#414 (Thru)
29	Long Beach Blvd Off	1,663	137 (Thru)	189 (Thru)	131 (Thru)	211 (Thru)
35	Paramount Blvd Off	1,182	288 (Thru)	241 (Thru)	#317 (Thru)	232 (Thru)
39	Lakewood Blvd Off	1,688	#539 (Thru)	#393 (Thru)	#514 (Thru)	#397 (Thru)
42	Bellflower Blvd Off	1,270	250 (Left)	142 (Left)	236 (Left)	142 (Left)

Source: Traffic Study Report (provided under separate cover)
Note: # 95th percentile volume exceeds capacity of the storage bay, which could potentially block other movements.
Ave = Avenue; Blvd = Boulevard; ft = feet; Hwy = Highway; NB = Northbound; Rd = Road; St = Street

Intersections

The peak hour performance results for the study area ramp termini and adjacent arterial intersections for 2027 and 2047 Build Alternatives 2 are summarized in Table 5-44 and Table 5-45. Ten and eleven intersections are expected to operate at LOS E or worse in 2027 during the AM peak hour and during the PM peak hour, respectively.

In 2047, about half of the study intersections are forecasted to have LOS D or worse. Between 2027 and 2047, the number of intersections with LOS D or worse remained steady at 24 during the AM peak period and 27 during the PM peak period.

Table 5-44: AM Peak Hour Study Intersection Performance—Alternative 2 (2027 & 2047)

Location #	Intersection Description	2027 Build (Alternative 2)		2047 Build (Alternative 2)	
		LOS	Delay (sec)	LOS	Delay (sec)
1	I-105 WB Off-Ramp / NB Sepulveda Blvd	**F**	**120.3**	**F**	**123.1**
2	Sepulveda Blvd / Imperial Hwy	D	49.2	D	49.2
3	Aviation Blvd / Imperial Hwy	**E**	**57.6**	**E**	**67.4**
4	I-105 WB Off- & I-105 EB On-Ramp / Imperial Hwy	C	24.8	C	25.6
5	La Cienega Blvd / Imperial Hwy	D	36.5	D	37.7
6	Hawthorne Blvd / I-105 WB Off-Ramp	B	16.1	B	16.9
7	Hawthorne Blvd / Imperial Hwy	C	28.6	C	28.9
8	I-105 EB On-Ramp / Imperial Hwy (Freeman)	C	27.2	C	32.2
9	Prairie Ave / I-105 WB Off-Ramp	B	18.6	B	18.5
10	Prairie Ave / Imperial Hwy	**F**	**86.1**	**F**	**87.2**
11	I-105 EB Ramps / 120th St	**E**	**70.2**	**F**	**81.5**
12	Crenshaw Blvd / Imperial Hwy	D	38.9	D	46.9
13	Crenshaw Blvd / I-105 WB Off-Ramp	C	27.2	C	27.8
14	Crenshaw Blvd / 120th St	D	48.6	D	49
15	Vermont Ave / Imperial Hwy	D	45.5	**E**	**58.6**
16	Vermont Ave / I-105 WB Ramps	C	25.9	C	27.3
17	Vermont Ave / I-105 EB Off-Ramp	C	24.2	C	29.7
18	Vermont Ave /120th St	C	23.2	C	25.2
19	Central Ave / Imperial Hwy	**E**	**69.0**	**E**	**70.9**
20	Central Ave / I-105 WB Ramps	C	20.5	C	22.2
21	Central Ave / I-105 EB Ramps	C	28.5	C	29.1
22	Central Ave / 120th St	D	36.4	D	37.7
23	Wilmington Ave / Imperial Hwy	B	17.6	B	17.4
24	Wilmington Ave / I-105 EB Ramps	D	39.8	**E**	**58.7**
25	Wilmington Ave / East 120th St	C	21.1	C	21.5

Table 5-44: AM Peak Hour Study Intersection Performance—Alternative 2 (2027 & 2047) (continued)

Location #	Intersection Description	2027 Build (Alternative 2)		2047 Build (Alternative 2)	
		LOS	Delay (sec)	LOS	Delay (sec)
26	I-105 WB Ramps / Imperial Hwy	**F**	**175.4**	**F**	**176.7**
27	Mona Blvd / Imperial Hwy	**E**	**72.6**	**F**	**110.1**
28	Long Beach Blvd / Imperial Hwy	D	41.1	**E**	**61**
29	Long Beach Blvd / I-105 WB Off-Ramp	B	14.8	B	14.3
30	Long Beach Blvd / I-105 EB Off-Ramp	C	23.8	C	24.6
31	Garfield Ave / I-105 WB On-Ramp	C	22.1	C	23.8
32	Garfield Ave / I-105 EB Off-Ramp	C	33.9	C	32.1
33	Garfield Ave / Rosecrans Ave	D	53.4	D	53.4
34	Paramount Blvd / Imperial Hwy	C	29.4	C	30.7
35	Paramount Blvd / I-105 WB Off-Ramp	C	26.2	C	28.3
36	Paramount Blvd / I-105 EB On-Ramp	C	21.7	C	25.5
37	Paramount Blvd / Rosecrans Ave	D	52.8	D	54
38	Lakewood Blvd / Imperial Hwy	C	24.3	C	26.1
39	Lakewood Blvd / I-105 EB Off-Ramp &WB Ramps	**F**	**157.3**	**F**	**151.7**
40	Lakewood Blvd / Rosecrans Ave	C	27.4	C	28
41	Bellflower Blvd / Imperial Hwy	C	28.9	C	30.5
42	Bellflower Blvd / I-105 WB Ramps	C	29.5	C	29.4
43	Bellflower Blvd / I-105 EB Ramps	C	30.5	C	29
44	Bellflower Blvd / Rosecrans Ave	D	37.2	D	39.5
45	Woodruff Ave / Imperial Hwy	D	38.1	D	42.9
46	Hoxie Ave / Imperial Hwy	D	36.8	D	37.6
47	Studebaker Rd /Imperial Hwy	**E**	**69.0**	**E**	**67.8**
48	Studebaker Rd / I-105 WB On-Ramp & EB Off-Ramp	**F**	**91.3**	**F**	**90.5**
49	Studebaker Rd / Rosecrans Ave	D	42.3	D	48.3

Source: Traffic Study Report (provided under separate cover)
Notes: Ave = Avenue; Blvd = Boulevard; EB = Eastbound; Hwy = Highway; I- = Interstate; LOS = Level of Service; NB = Northbound; Rd = Road; sec = second; St = Street; WB = Westbound
Red and bold denotes LOS E or worse.

Table 5-45: PM Peak Hour Study Intersection Performance—Alternative 2 (2027 & 2047)

Location #	Intersection Description	2027 Build (Alternative 2)		2047 Build (Alternative 2)	
		LOS	Delay (sec)	LOS	Delay (sec)
1	I-105 WB Off-Ramp / NB Sepulveda Blvd	D	53.1	D	55
2	Sepulveda Blvd / Imperial Hwy	**F**	**95.0**	**F**	**101.3**
3	Aviation Blvd / Imperial Hwy	**E**	**65.0**	**F**	**98.7**
4	I-105 WB Off- & I-105 EB On-Ramp / Imperial Hwy	B	11.0	B	11.7
5	La Cienega Blvd / Imperial Hwy	D	43.9	D	45.5
6	Hawthorne Blvd / I-105 WB Off-Ramp	B	18.0	B	18.6
7	Hawthorne Blvd / Imperial Hwy	D	46.2	**E**	**60.1**
8	I-105 EB On-Ramp / Imperial Hwy (Freeman)	C	24.0	C	27.6
9	Prairie Ave / I-105 WB Off-Ramp	D	38.7	D	41.5
10	Prairie Ave / Imperial Hwy	**F**	**168.1**	**F**	**168.9**
11	I-105 EB Ramps / 120th St	C	30.6	C	32.1
12	Crenshaw Blvd / Imperial Hwy	D	46.7	D	47.5
13	Crenshaw Blvd / I-105 WB Off-Ramp	D	40.0	D	42.9
14	Crenshaw Blvd / 120th St	**E**	**55.8**	**E**	**60.4**
15	Vermont Ave / Imperial Hwy	D	47.0	**E**	**74.8**
16	Vermont Ave / I-105 WB Ramps	B	18.1	B	19.4
17	Vermont Ave / I-105 EB Off-Ramp	C	20.8	C	21.6
18	Vermont Ave / 120th St	C	24.5	C	28.1
19	Central Ave / Imperial Hwy	**E**	**59.0**	**E**	**62.3**
20	Central Ave / I-105 WB Ramps	C	22.0	C	23.4
21	Central Ave / I-105 EB Ramps	C	25.3	C	25
22	Central Ave / 120th St	D	41.1	D	47.2
23	Wilmington Ave / Imperial Hwy	C	24.2	C	24.9
24	Wilmington Ave / I-105 EB Ramps	C	27.7	C	28.4
25	Wilmington Ave / East 120th St	B	17.0	B	17.5
26	I-105 WB Ramps / Imperial Hwy	**F**	**84.2**	**F**	**94.2**
27	Mona Blvd / Imperial Hwy	**F**	**89.3**	**F**	**88.9**
28	Long Beach Blvd / Imperial Hwy	D	39.6	D	40.5
29	Long Beach Blvd / I-105 WB Off-Ramp	C	20.6	C	21.4
30	Long Beach Blvd / I-105 EB Off-Ramp	B	16.1	B	16
31	Garfield Ave / I-105 WB On-Ramp	C	20.6	C	22.7
32	Garfield Ave / I-105 EB Off-Ramp	D	35.3	D	35.7
33	Garfield Ave / Rosecrans Ave	D	47.6	D	49.1
34	Paramount Blvd / Imperial Hwy	D	37.1	D	37.9
35	Paramount Blvd / I-105 WB Off-Ramp	B	19.8	B	19.4

Table 5-45: PM Peak Hour Study Intersection Performance—Alternative 2 (2027 & 2047) (continued)

Location #	Intersection Description	2027 Build (Alternative 2)		2047 Build (Alternative 2)	
		LOS	Delay (sec)	LOS	Delay (sec)
36	Paramount Blvd / I-105 EB On-Ramp	C	23.4	C	23.5
37	Paramount Blvd / Rosecrans Ave	D	53.8	D	54.3
38	Lakewood Blvd / Imperial Hwy	C	32.7	C	34.7
39	Lakewood Blvd / I-105 EB Off-Ramp & WB Ramps	**E**	**55.5**	**E**	**61.8**
40	Lakewood Blvd / Rosecrans Ave	D	49.1	D	49.1
41	Bellflower Blvd / Imperial Hwy	C	27.2	C	27.4
42	Bellflower Blvd / I-105 WB Ramps	B	17.7	B	17.9
43	Bellflower Blvd / I-105 EB Ramps	C	20.3	C	20.4
44	Bellflower Blvd / Rosecrans Ave	C	30.8	C	30.8
45	Woodruff Ave / Imperial Hwy	D	54.9	D	54.4
46	Hoxie Ave / Imperial Hwy	**E**	**56.7**	D	53
47	Studebaker Rd / Imperial Hwy	**E**	**55.0**	**E**	**55.6**
48	Studebaker Rd / I-105 WB On-Ramp & EB Off-Ramp	**F**	**111.7**	**F**	**143.4**
49	Studebaker Rd / Rosecrans Ave	D	50.5	D	50.7

Source: Traffic Study Report (provided under separate cover)
Notes: Ave = Avenue; Blvd = Boulevard; EB = Eastbound; Hwy = Highway; I- = Interstate; LOS = Level of Service; NB = Northbound; Rd = Road; sec = second; St = Street; WB = Westbound
Red and bold denotes LOS E or worse.

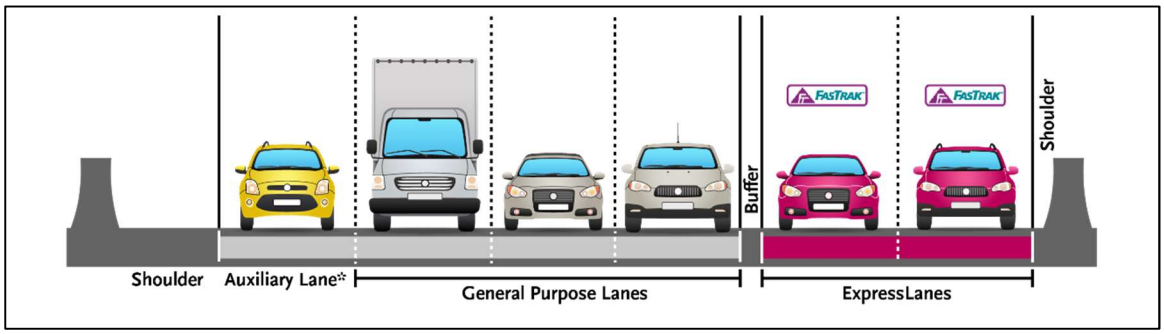
Cost Estimates

Estimated costs associated with this alternative include support cost, capital construction (roadway and structure) cost, and right-of-way cost, totaling $363 million ($474 million escalated); for a breakdown of costs, refer to Attachment D.

Alternative 3 – Build Alternative: Convert Existing HOV Lane to Two ExpressLanes (Non-standard Lane and Shoulder Widths)

Alternative 3 would convert the existing HOV lane to one ExpressLane and add a second ExpressLane in each direction (total of two Tolled ExpressLanes in each direction with discounts for HOV). Non-standard lane and shoulder widths (11-foot wide ExpressLanes, 11-foot wide general purpose lanes, 12-foot wide auxiliary lanes, 2 to 4-foot wide inside shoulder, 10-foot wide outside shoulder, and 2-foot buffer, respectively) would be provided to accommodate for the addition of the ExpressLane. One 12-foot general purpose lane will remain on the outside of the two 11-foot lanes to accommodate heavy truck traffic. Figure 5-3 illustrates a typical cross section for the proposed Alternative 3.

Figure 5-3: Cross Section for Alternative 3



Source: Metro, 2019
Note: *Auxiliary lane is only in certain location on I-105; see Attachment B for locations.

Alternative 3 would include the following additional improvements to the identified portion of the corridor:

Proposed Engineering Features

Mainline Improvements

- Restriping the freeway within the existing footprint to create two 11-foot wide ExpressLanes, with a 2-foot wide buffer separating the ExpressLane from the General Purpose Lane.
- Roadway Widening, up to 25-feet in some locations, to the outside to accommodate the duel ExpressLane configuration, an additional 12-foot weave lane at ingress/egress locations, and an additional 12-foot auxiliary lane at on-ramps and ExpressLanes Direct Connectors (where required); to avoid existing maintenance gate; and to improve or maintain stopping sight distances at curves.
- Non-standard 11-foot ExpressLanes, 11-foot general purpose lanes, 2 to 4-foot inside shoulders, 2-foot buffer, and standard 10-foot outside shoulders, would be implemented. Where necessary, outside shoulders would be removed to provide full structural sections to accommodate proposed travel lanes.
- New merge lanes, approximately 300-feet in length, at Eastbound I-105/Wilmington Avenue On-Ramp, Eastbound I-105/Bellflower Boulevard On-Ramp, Eastbound I-105/Paramount Boulevard On-Ramp, Westbound I-105/Lakewood Boulevard On-Ramp, and Westbound I-105/Wilmington Avenue On-Ramp, to meet Caltrans HDM standards (Figure 504.3A).
- New auxiliary lanes, approximately 1000-feet in length, at Westbound I-105/Northbound I-110 ExpressLanes Connector and Southbound I-110/Eastbound I-105 ExpressLanes Connector, to meet Caltrans HOV Guidelines and Caltrans HDM standards (Figure 504.3G), respectively.
- Extension of existing auxiliary lane from Northbound I-710/Westbound I-105 Connector, approximately 2,800-feet in length, to Westbound I-105/Long Beach Boulevard Off-Ramp, to meet Caltrans HDM standards.
- Extension of existing auxiliary lane from Long Beach Boulevard On-Ramp/Eastbound I-105, approximately 1,800-feet in length, to Eastbound I-105/Southbound I-710 Connector.

- New pavement would be a minimum of 6-feet in width and remaining exiting pavement would be a minimum of 6-feet in width to adjacent joints.

Local Improvements

- Central Avenue would be reprofiled \ to improve it to standard, to accommodate mainline roadway widening by 11-feet at Central Avenue.
- Approximately 2,200-feet of reconstruction would be required to Imperial Highway, between Mona Boulevard and Fernwood Avenue, to accommodate widening on the westbound side of the Alameda Street Viaduct and the subsequent construction of bents and footings to support the structure widening.
- Fir Street would be reprofiled to improve the Fir Street undercrossing existing minimum vertical clearance from 14-feet 9-inches to 15-feet 4-inches to accommodate mainline widening by 21-feet 6-inches at Fir Street.
- Bullis Road would be reprofiled to maintain the standard existing minimum vertical clearance of 15-feet, to accommodate mainline widening by 21-feet 6-inches at Bullis Road.
- Harris Avenue would be reprofiled to maintain the standard existing minimum vertical clearance of 15-feet, to accommodate mainline widening by 15-feet at Harris Avenue.

Bike, Pedestrian, and Sustainability Improvements

- Replace sidewalks, ADA ramps, and bikeway connections (as applicable), in accordance with local City or Caltrans standards (as applicable), to accommodate the reconstruction of Imperial Highway.
- Replace sidewalks, ADA ramps, and bikeway connections (as applicable), in accordance with local City or Caltrans standards (as applicable), to accommodate the reprofiling of local arterials (Dominguez Channel Walkway, Central Avenue, Fir Street, Bullis Road, and Harris Avenue) to satisfy minimum vertical clearance requirements.

Ramp/Interchange Improvements

Alternative 3 would impact some existing ramp and system interchanges. The affected ramps and interchanges and the proposed improvements are summarized in Table 5-46, Table 5-47 and Table 5-48. In general, some existing ramps will be shifted to accommodate outside widening by the Project. Within the Project limits, ramp metering is incorporated into the existing local interchange ramps, except at: Eastbound On-Ramp from Southbound Sepulveda Boulevard; Eastbound On-Ramp from Eastbound Imperial Highway; Eastbound On-Ramp from Southbound I-110; Eastbound On-Ramp from I-110; Eastbound On-Ramp from Hoxie Avenue; Westbound On-Ramp from Southbound Sepulveda Boulevard/Imperial Highway; Westbound On-Ramp from Southbound I-405; Westbound On-Ramp from Northbound I-405; Westbound I-105 HOV On-Ramp from Southbound I-110 HOV; Westbound On-Ramp from Northbound I-110; Westbound On-Ramp from I-605/Rosecrans; and Westbound On-Ramp from Southbound I-605; Westbound On-Ramp from Imperial; Westbound On-Ramp from Hoxie Avenue. Where ramp improvement requires relocation of the ramp limit line, ramp metering will be re-established. Existing ramp meters and equipment will be reused, where possible. Within

the Project limits, all interchange metered on-ramps between the I-405 and I-605 have an existing HOV bypass lane with no HOV ramp metering. Incorporation of HOV bypass lanes ramp metering will be added to all on-ramps not currently metered. In addition, where there is no ramp improvements and no existing ramp metering, new ramp meters are proposed between I-405 and I-605 as a part of the Project at: Eastbound On-Ramp from Eastbound Imperial Highway; Eastbound On-Ramp from Hoxie Avenue; Westbound On-Ramp from Imperial; Westbound On-Ramp from Hoxie Avenue.

Table 5-46: Existing On-Ramps within the Project Limits—Alternative 3

	Location	Post Mile (Approx.)	Ramp Improvements	Ramp Metering	
				Existing	Proposed*
1	Imperial Hwy EB On-Ramp (near California St)	R0.134			
2	Sepulveda Blvd WB On-Ramp	R0.295			
3	Sepulveda Blvd EB On-Ramp	R0.451			
4	Imperial Hwy EB On-Ramp (near Nash St.)	R0.889			X
5	Atwood Way EB On-Ramp	R1.164		X	
6	N&S405-W105 Connector	R1.695			
7	Imperial Hwy EB On-Ramp (Near La Cienega Blvd)	R1.909		X	
8	S405-E105 Connector	R2.531		X	
9	N405-E105 Connector	R2.291		X	
10	Hawthorne Blvd EB On-Ramp	R003.49		X	
11	Imperial Hwy EB On-Ramp (near Prairie Ave)	R003.49		X	
12	Imperial Hwy WB On-Ramp (near Prairie Ave)	R003.49		X	
13	W 120th St EB On-Ramp	R004.60		X	
14	Crenshaw Blvd WB On-Ramp	R004.57		X	
15	Crenshaw Blvd WB Loop On-Ramp	R004.75		X	
16	Crenshaw Blvd EB On-Ramp	R004.93		X	
17	Vermont Ave WB On-Ramp	R006.58		X	
18	S Hoover St EB On-Ramp	R007.13		X	
19	S110-W105 Connector	R007.40	X	X	X
20	S110-W105 Connector (HOV)	R007.23			
21	N110-W105 Connector	R007.43			
22	S110-E105 Connector (HOV)	R007.62			
23	N&S110-E105 Connector	R007.40	X	X**	X
24	Central Ave EB On-Ramp	R009.10	X	X	X

Table 5-46: Existing On-Ramps within the Project Limits—Alternative 3 (continued)

Location		Post Mile (Approx.)	Ramp Improvements	Ramp Metering	
				Existing	Proposed*
25	Central Ave WB On-Ramp	R008.75	X	X	X
26	Wilmington Ave EB On-Ramp	R009.79		X	
27	Imperial Hwy WB On-Ramp (near Wilmington Ave)	R010.03		X	
28	Long Beach Blvd EB Loop On-Ramp	R011.65	X	X	X
29	Long Beach Blvd EB On-Ramp	R011.65	X	X	X
30	Long Beach Blvd WB Loop On-Ramp	R011.52		X	
31	Long Beach Blvd WB On-Ramp	R011.37		X	
32	N710-W105 Connector	R013.02		X	
33	S710-W105 Connector	R013.25		X	
34	N710-E105 Connector	R013.85	X	X	X
35	S710-E105 Connector	R013.85	X	X	X
36	Paramount Blvd EB On-Ramp	R014.85	X	X	X
37	Garfield Ave WB On-Ramp	R014.03		X	
38	Lakewood Blvd WB On-Ramp	R015.55	X	X	X
39	Lakewood Blvd EB On-Ramp	R015.93		X	
40	Lakewood Blvd EB Loop On-Ramp	R015.71		X	
41	Bellflower Blvd EB On-Ramp	R016.85		X	
42	Bellflower Blvd WB On-Ramp	R016.40		X	
43	N&S605-W105 Connector	R017.42			
44	Imperial Hwy WB On-Ramp (near Hoxie Ave)	R017.72		X	X
45	Hoxie Ave EB On-Ramp	R017.95			X
46	Hoxie Ave WB On-Ramp	R017.88			X
Total Number of On-Ramp Improvements:			**10**		

Notes: * Existing ramp metering to be relocated and/or upgrade to latest equipment requirements.
**Ramps metered separately before joining.
Ave = Avenue; Blvd = Boulevard; E = East; EB = Eastbound; Hwy = Highway; N = North; S = South; W = West; WB = Westbound

Table 5-47: Existing Off-Ramps within the Project Limits—Alternative 3

	Location	Post Mile (Approx.)	Ramp Improvements
1	Imperial Hwy WB Off-Ramp (near California St)	R000.13	
2	Sepulveda Blvd WB Off-Ramp	R000.66	
3	Sepulveda Blvd WB Loop Off-Ramp	R000.48	
4	Sepulveda Blvd EB Off-Ramp	R000.37	
5	N Nash St WB Off-Ramp	R000.99	
6	E105-S405 Connector	R001.77	
7	Imperial Hwy WB Off-Ramp (near La Cienega)	R001.94	
8	W105-N&S405 Connector	R002.52	
9	Hawthorne Blvd WB Off-Ramp	R003.64	
10	S Prairie Ave EB Off-Ramp	R003.21	
11	S Prairie Ave WB Off-Ramp	R003.70	
12	W 120th St EB Off-Ramp	R004.35	X
13	Crenshaw Blvd WB Off-Ramp	R004.89	
14	Vermont Ave EB Off-Ramp	R006.60	X
15	Vermont Ave WB Off-Ramp	R006.90	
16	E105-N&S110 Connector	R007.40	X
17	W105-N110 Connector (HOV)	R007.97	
18	E105-N110 Connector (HOV)	R007.23	
19	W105-N&S110 Connector	R007.75	
20	Central Ave EB Off-Ramp	R008.75	X
21	Central Ave WB Off-Ramp	R009.10	X
22	Wilmington Ave EB Off-Ramp	R009.60	X
23	Imperial Hwy WB Off-Ramp (near Wilmington Ave)	R010.19	
24	Long Beach Blvd EB Off-Ramp	R011.45	X
25	Long Beach Blvd WB Off-Ramp	R011.65	X
26	E105-N&S710 Connector	R013.10	X
27	W105-N&S710 Connector	R014.10	X
28	Garfield Ave EB Off-Ramp	R013.76	
29	Paramount Blvd WB Off-Ramp	R014.85	X
30	Lakewood Blvd WB Off-Ramp	R015.93	
31	Lakewood Blvd EB Off-Ramp	R015.65	X
32	Bellflower Blvd EB Off-Ramp	R016.40	
33	Bellflower Blvd WB Off-Ramp	R016.85	
34	E105-N&S605 Connector	R017.44	
35	Norwalk Metro Station Off-Ramp	R017.67	
36	Hoxie Ave WB Off-Ramp	R017.95	
Total Number of Off-Ramp Improvements:			**12**

Notes: Ave = Avenue; Blvd = Boulevard; E = East; EB = Eastbound; Hwy = Highway; N = North; S = South; W = West; WB = Westbound

Table 5-48: Anticipated Interchange Impacts within the Project Limits—Alternative 3

Location	Post Mile (Approx.)	Interchange Improvements
I-110 / I-105 IC	R007.40	Convert HOV lane to 2 ExpressLanes
W105-N110 Connector	R007.40	Convert HOV Connector to ExpressLanes Connector
S110-E105 Connector	R007.40	Convert HOV Connector to ExpressLanes Connector
E105-N110 Connector	R007.40	Convert HOV Connector to ExpressLanes Connector
S110-W105 Connector	R007.40	Convert HOV Connector to ExpressLanes Connector
I-710 / I-105 IC	R013.45	Convert HOV lane to 2 ExpressLanes
I-605 / I-105 IC	R017.80	Convert HOV lane to 2 ExpressLanes

Notes: E = East; HOV = High Occupancy Vehicle; I- = Interstate; IC = Interchange; N = North; S = South; W = West

Where ramp improvement requires relocation of the ramp limit line, ramp metering will be re-established. Existing ramp meters and equipment will be reused, where possible. Within the Project limits, all interchange on-ramps between the I-405 and I-605 have an existing HOV bypass lane with no HOV ramp metering. Incorporation of HOV bypass lanes ramp metering will be added to all on-ramps not currently metered between I-405 and I-605 as part of the Project.

Physical modifications of the ramp geometry will not be required where the I-110/I-105 HOV Direct Connector is converted to an ExpressLanes Connector; however, replacement of signage and the addition of tolling equipment will be required accordingly.

Impact to Structures

Alternative 3 would impact existing structures and create new structures as part of the Project. The affected bridge structures and the proposed improvements are summarized in Table 5-49. Structure Impact Memorandums (Attachment K) have been prepared to accompany this Draft Project Report.

Alternative 3 would impact existing retaining walls and create new retaining walls. Retaining walls will be provided, where required, to minimize and avoid right-of-way acquisition. The affected retaining wall structures and the proposed improvements are summarized in Table 5-50: Anticipated Retaining Wall Impacts within the Project Limits—Alternative 3.

Table 5-49: Anticipated Bridge Structure Impacts within the Project Limits—Alternative 3

Post Mile	Bridge No.	Bridge Name	Westbound (Lt)			Eastbound(Rt)			Average Width of Widening (Feet)
			Rebuild (R)	Outside Widening	Median Widening	Rebuild (R)	Outside Widening	Median Widening	
R004.16	53 2518	Dominguez Channel		X			X		WB 13.7 / EB 7.3
R004.23	53 2598	Yukon Ave UC		X			X		WB 14.0 / EB 7.3
R007.05	53 2528	Hoover Street UC					X		EB 4.5
R007.79	53 2410R	Main St UC					X		EB 3.7
R008.04	53 2476	San Pedro St UC		X			X		WB 13.3 / EB 10.5
R008.29	53 2477	Avalon Blvd UC		X			X		WB 9.1 / EB 8.0
R008.46	53 2478	Stanford Ave UC		X			X		WB 16.3 / EB 12.0
R008.94	53 2480	Central Ave UC		X			X		WB 11.2 / EB 9.4
R008.98	53 2483	Compton Creek		X			X		WB 10.5 / EB 9.1
R009.21	53 2484	Success Ave UC		X			X		WB 10.8 / EB 8.5
R009.38	53 2485	Compton Ave UC		X			X		WB 4.5 / EB 6.5
R009.78	53 2487L	Willowbrook OH		X					WB 12.2
R010.25	53 2490	Alameda St Viaduct		X					WB 15.0
R011.10	53 2662	State St UC		X					WB 7.0
R011.56	53 2493	Long Beach Blvd UC					X		EB 11.3
R011.91	53 2494	Fir St UC		X			X		WB 21.0 / EB 11.5
R012.07	53 2495	Bullis Rd UC		X			X		WB 21.7 / EB 11.0
R012.30	53 2496	Gertrude Dr UC		X			X		WB 13.0 / EB 12.0
R012.58	53 2497	Harris Ave UC		X			X		WB 15.0 / EB 5.0
R012.88	53 2452	Atlantic Ave UC					X		EB 10.8

Notes: *Location requires a rebuild of a single OC; not a “left and right” structure.
Ave = Avenue; Blvd = Boulevard; Dr = Drive; OC = Overcrossing; OH = Overhead;
N/A = Not Applicable; Rd = Road; St = Street; UC = Undercrossing

Table 5-50: Anticipated Retaining Wall Impacts within the Project Limits—Alternative 3

Location	Post Mile	Retaining Wall Improvements		Maximum Length of Extension (Feet)
		Rebuild /New (N)	Type	
EB I-105 West of Inglewood Ave	R002.46	N	1	94
EB I-105 East of Inglewood Ave	R002.75	N	1	94
EB I-105 West of Hawthorne Blvd	R002.88	N	1	94
EB I-105 between Prairie Ave OC & Dominguez Channel	R003.87	R	1	184
WB I-105 between Prairie Ave OC & Dominguez Channel	R003.88	R	1	307
EB I-105 between Prairie Ave OC & Dominguez Channel	R004.04	N*	1	349
WB I-105 West of Dominguez Channel	R004.02	N*	1	544
WB I-105 between Dominguez Channel & Yukon Ave UC	R004.16	N*	1	332
WB I-105 East of Yukon Ave	R004.24	N*	1	844
EB I-105 West of Crenshaw Blvd	R004.58	N	1	94
EB I-105 West of Van Ness Ave	R005.20	N	1	94
WB I-105 West of Van Ness Ave	R005.14	N	1	491
WB I-105 at Van Ness Ave OC	R005.23	N	Tie-back	76
WB I-105 between Van Ness Ave OC & Wilton Place OC	R005.24	N	1	1,260
WB I-105 at Wilton Pl OC	R005.48	N	Tie-back	51
WB I-105 between Wilton Place OC & Western Ave OC	R005.49	N	1	1,253
WB I-105 at Western Ave OC	R005.73	N	Tie-back	99
WB I-105 between Western Ave OC & Normandie Ave OC	R005.75	N	1	2,652
WB I-105 at Normandie Ave OC	R006.27	N	Tie-back	77
WB I-105 between Normandie Ave OC & Budlong Ave OC	R006.27	N	1	1,246
WB I-105 East of Budlong Ave	R006.57	N	1	199
EB I-105 at Normandie Ave OC	R006.24	N	Tie-back	87
EB I-105 at Budlong Ave OC	R006.51	N	Tie-back	88
EB I-105 between Budlong Ave OC & Vermont Ave OC	R006.63	R	1	571
EB I-105 at Vermont Ave OC	R006.74	N	Tie-back	198
WB I-105 between Budlong Ave OC & Vermont Ave OC	R006.59	R	1	308
WB I-105 between Budlong Ave OC & Vermont Ave OC	R006.72	N	1	135
WB I-105 at Vermont Ave OC	R006.74	N	Tie-back	178
WB I-105 between Vermont Ave OC & Hoover St UC	R006.77	N	1	209
EB I-105 East of Hoover St UC	R007.10	N	1	94
WB I-105 East of Main St UC	R007.86	N	1	94
WB I-105 Central Ave WB On-Ramp	R008.78	N*	1	206

Table 5-50: Anticipated Retaining Wall Impacts within the Project Limits—Alternative 3 (continued)

Location	Post Mile	Retaining Wall Improvements		Maximum Length of Extension (Feet)
		Rebuild /New (N)	Type	
WB I-105 Central Ave WB On-Ramp	R008.87	N*	1	94
EB I-105 between Central Ave Off-Ramp & Central Ave UC	R008.78	N*	1	699
EB I-105 between Central Ave UC & Compton Creek	R008.94	N*	1	291
EB I-105 between Compton Creek & Central Ave On-Ramp	R009.01	N*	1	386
WB I-105 between Central Ave On-Ramp & Central Ave UC	R008.83	N	1	408
WB I-105 between Central Ave UC & Compton Creek	R008.94	N	1	144
WB I-105 between Compton Creek & Central Ave Off-Ramp	R009.00	N	1	52
WB I-105 between Compton Creek & Central Ave Off-Ramp	R009.01	N*	1	435
EB I-105 between Success Ave UC & Compton Ave UC	R009.31	N	1	328
EB I-105 between Willowbrook OH & Mona Blvd UC	R009.98	N	1	690
WB I-105 between Alameda St Viaduct & State St UC	R010.93	N	1	624
EB I-105 between State St UC & Long Beach Blvd UC	R011.16	R	1	308
EB I-105 between Harris Ave UC & Atlantic Ave UC	R012.73	R	1	308
WB I-105 between East of Wright Rd & West of I-710	R013.23	N	1	94
EB I-105 between Garfield Ave Off-Ramp & NB I-710/EB I-105 Connector	R013.66	N	5	825
EB I-105 at SB I-710/EB I-105 Connector adjacent to NB I-710 / EB I-105 connector	R013.81	N	5	392
EB I-105 at SB I-710 / EB I-105 Connector adjacent to EB I-105 Garfield Ave Off-Ramp	R013.89	N	5	608
EB I-105 between I-710 & Garfield Ave OC	R014.06	N	1	337
EB I-105 at Garfield Ave OC	R014.13	N	Tie-back	88
EB I-105 between Garfield Ave OC & Paramount Blvd OC	R014.14	R	1	2,618
EB I-105 at Paramount Blvd OC	R014.63	N	Tie-back	96
EB I-105 between Paramount Blvd OC & Merkel Ave OC	R014.66	N	1	955
WB I-105 between Garfield Ave OC & Paramount Blvd OC	R014.16	N	1	2,550
EB I-105 On-Ramp from Paramount Blvd	R014.78	R	5	739
EB I-105 On-Ramp from Paramount Blvd (at Merkel Ave OC)	R014.93	N	Tie-back	97
WB I-105 Off-Ramp to Paramount Blvd	R014.87	R	1	459
WB I-105 Off-Ramp to Paramount Blvd (at Merkel Ave OC)	R014.96	N	Tie-back	109
EB I-105 between Merkel Ave OC & Downey Ave OC	R015.04	N	1	228
EB I-105 at Downey Ave OC	R015.08	N	Tie-back	76
EB I-105 between Downey Ave OC & Laureldale Ave OC	R015.10	N	1	1,221

Table 5-50: Anticipated Retaining Wall Impacts within the Project Limits—Alternative 3 (continued)

Location	Post Mile	Retaining Wall Improvements		Maximum Length of Extension (Feet)
		Rebuild /New (N)	Type	
EB I-105 at Laureldale Ave OC	R015.33	N	Tie-back	57
EB I-105 between Laureldale Ave OC & Gardendale St OC	R015.34	N	1	220
EB I-105 at Gardendale St OC	R015.38	N	Tie-back	140
EB I-105 between Gardendale St OC & Barlin Ave OC	R015.41	N	1	567
EB I-105 at Barlin Ave OC	R015.52	N	Tie-back	83
WB I-105 between Merkel Ave OC & Downey Ave OC	R015.05	N	1	181
WB I-105 at Downey Ave OC	R015.08	N	Tie-back	75
WB I-105 between Downey Ave OC & Gardendale St OC	R015.10	R	1	690
WB I-105 at Gardendale St OC	R015.32	N	Tie-back	159
WB I-105 between Gardendale St OC & Lakewood Blvd On-Ramp	R015.35	N	1	657
WB I-105 On-Ramp from Lakewood Blvd	R015.56	R	1	165
EB I-105 Between Lakewood Blvd Off-Ramp & Lakewood Blvd On-Ramp	R015.60	N	1	176
EB I-105 between Dunrobin Ave OC & Woodruff Ave OC	R017.05	R	1	307
WB I-105 between Dunrobin Ave OC & Woodruff Ave OC	R017.05	R	1	348
WB I-105 between Woodruff Ave OC & San Gabriel River	R017.23	N	5	318
WB I-105 East of San Gabriel River	R017.60	N	1	94

Notes: *Retaining Wall/Sound Wall.
Ave = Avenue; Blvd = Boulevard; Dr = Drive; EB = Eastbound; I- = Interstate; OC = Overcrossing; NB = Northbound; SB = Southbound; St = Street; WB = Westbound; UC = Undercrossing

Noise Barriers

Alternative 3 would impact existing sound walls. The affected sound walls and the proposed improvements are summarized in Table 5-51: Anticipated Sound Wall Impacts within the Project Limits—Alternative 3.

Table 5-51: Anticipated Sound Wall Impacts within the Project Limits—Alternative 3

Location	Post Mile	Sound Wall Improvements			Maximum Length of Extension (Feet)
		Rebuild (R) /New (N)	Extension	Removal	
EB I-105 between W 118th St & Yukon Ave S	R003.91	R*			1,754
WB I-105 between Doty Ave & S Cherry Ave	R003.95	R*			2,310
EB I-105 between S Main St & S San Pedro St	R007.78	R			1,357
EB I-105 between West of S Avalon Blvd & Stanford Ave	R008.26	R			1,108
WB I-105 between S Main St & S Central Ave	R007.77	R			6,019
EB I-105 between S Central Ave Off & On Ramps	R008.77	R*			1,645
EB I-105 between S Central Ave On Ramp & S Wilmington Ave Off Ramp	R009.06	R			2,929
WB I-105 between S Central Ave & East of Compton Ave	R009.01	N*			2,519
WB I-105 Imperial Hwy On Ramp	R009.90	N			1,911
EB I-105 between Imperial Hwy On Ramp & Alameda St	R009.95	N			3,313
EB I-105 between Long Beach Blvd & Spruce St	R011.64	R			892
EB I-105 between Spruce St & Bullis Rd	R011.89	R			896
WB I-105 between Long Beach Blvd Off-Ramp & Fir St	R011.52	N			2,128
EB I-105 between Bullis Rd & Atlantic Ave	R012.06	N*			4,489
WB I-105 between Spruce St & Atlantic Ave	R011.91	R			4,830

Notes: *Retaining Wall/Sound Wall.
Ave = Avenue; Blvd = Boulevard; EB = Eastbound; Hwy = Highway; I- = Interstate; NB = Northbound; Rd = Road; SB = Southbound; St = Street; UC = Undercrossing; WB = Westbound

Non-standard Design Features (Design Standards Risk Assessment)

The engineering analysis performed during the PA&ED phase is preliminary and based on a low level of design detail and as such, the list of non-standard features is not comprehensive. As a result, many of the potential nonstandard design features have been identified using engineering judgment and past experiences on similar projects rather than detailed analysis. Likewise, the probability of design exception approval has been assessed using engineering judgment. The design coordinator and District 7 approval authority have been consulted early during the PA&ED phase to discuss potential design exceptions and reassess the probability of design exception approval.

A listing of major existing non-standard design features is included in Table 5-52. Detailed Existing Design Standards features are included in Attachment E.

Table 5-52: Existing Non-Standard Design Features—Alternative 3

No.	Design Standard from Highway Design Manual Tables 82.1A & 82.1B
1	201.1 (Horizontal Alignment), 203.1 (Stopping Sight Distance)
2	202.2(1) (Superelevation Rate)
3	302.1 (Shoulder Width)
4	309.1 (Horizontal Clearances (Clear Recovery Zone))
5	501.3 (Interchange Spacing)
6	504.2(2) Freeway Entrance
7	504.7 (Minimum Weaving Length)

At this preliminary stage, a design standards risk assessment for the anticipated proposed non-standard design features that do not meet Caltrans HDM standards are summarized in Table 5-53. Detailed Design Standards Risk Assessment and Justification for Probability Ratings for Alternative 3 is included in Attachment E.

Table 5-53: Design Standards Risk Assessment—Alternative 3

No.	Design Standard from Highway Design Manual Tables 82.1A & 82.1B	Probability of Nonstandard Design Feature Approval (None, Low, Medium, High,)
1	201.1 (Stopping Sight Distance Standards), 203.1 (Horizontal Alignment and Stopping Sight Distance)	Medium
2	202.2(1) (Superelevation Rate)	Medium
3	204.4 (Vertical Curves – 2 Percent and Greater)	Medium
4	301.1 (Lane Width)	Medium
5	302.1 (Shoulder Width)	Medium
6	304.1 (Side Slope Standards)	Medium
7	501.3 (Interchange Spacing)	Medium
8	504.2(2) (Freeway Entrance)	Medium
9	504.7 (Minimum Weaving Length)	Medium

Right-of-Way Data

Additional right-of-way would be required for the construction of the Build Alternatives. At this preliminary stage, the anticipated right-of-way impacts within the Project limits are summarized in Table 5-54.

Table 5-54: Anticipated Right-of-Way Impacts within the Study Area—Alternative 3

No.	Estimated Right-of-Way Impacts				APN	Fee Area (ft^2)	Location	Justification
	Full Acq.	Partial Acq.	TCE	AE				
1			X		4048-004-900		Dominguez Channel	Reprofiling of pedestrian walkways to satisfy minimum vertical clearance requirements.
2			X		4048-005-901			
3			X		6084-031-042		Central Ave	Reconstruction of Central Ave to satisfy minimum vertical clearance requirements.
4			X		6067-022-041		East 115th Place, north of Imperial Hwy	Proposed 11-foot widening of WB I-105 over Imperial Hwy to provide standard sight distance along inside shoulder. Associated improvements will require realigning Imperial Hwy and will impact properties between Imperial Hwy and East 115th Place.
5			X		6067-022-039			
6			X		6067-022-040			
7			X		6067-022-038			
8			X		6067-022-037			
9			X		6067-022-036			
10			X		6067-022-035			
11		X	X		6067-022-048	44		
12		X	X		6067-024-046	5,837		
				X	6169-032-917	1,553		
13		X	X		6169-001-900	1,242		
14		X	X		6169-002-005	3,899		

Notes: Acq. = Acquisition; AE = Aerial Easement; APN = Assessor's Parcel Number; Ave = Avenue; ft^2 = square feet; Hwy = Highway; I- = Interstate; St = Street; TCE = Temporary Construction Easement; WB = Westbound

Storm Water BMPs and existing utility conflicts shall be considered which may potentially require drainage easements, temporary construction easements and/or utility easements which will be confirmed for the "preferred" alternative.

Right-of-Way Data Sheets are included in Attachment G.

Utility and Other Owner Involvement

Both underground and above ground utility conflicts are anticipated within the Project area. Based on as-built plans obtained from Caltrans for portions of study area and available utility as-built plans provided by various utility owners and field visits for undeveloped portions of the study area, the anticipated utility impacts within the Project limits are summarized in Table 5-55 and detailed in Attachments F and G.

Table 5-55: Anticipated Impacts to Utilities within the Study Area—Alternative 3

No.	Location	Utility Owner and/or Contact Name	Wet (W) / Dry (D)	Utility Type(s)	Utility Conflict Description
1	Doty Ave	Pacific Bell	D	Telecom	Remained-in-Place; Pothole to confirm depth
2	Doty Ave	SCWC	W	Water	Remained-in-Place
3	Central Ave UC	Pacific Bell	D	Telecom	Remained-in-Place; Pothole to confirm depth
4	Central Ave UC	SCG	D	Gas	Remained-in-Place; Pothole to confirm depth
5	Central Ave UC	Shell	D	Gas	Remained-in-Place; Pothole to confirm depth
6	Central Ave UC	SCG	D	Gas	Remained-in-Place; Pothole to confirm depth
7	Central Ave UC	SCG	D	Gas	Remained-in-Place; Pothole to confirm depth; High Priority
8	Central Ave UC	LACSD	W	Sewer	Remained-in-Place
9	Central Ave UC	LACDWP	W	Water	Remained-in-Place
10	Bullis Rd UC	LACSD	W	Sewer	Remained-in-Place
11	Bullis Rd UC	SCE	D	Electrical	Remained-in-Place; Pothole to confirm depth
12	Bullis Rd UC	Standard Oil	W	Oil	Remained-in-Place; High Priority
13	Bullis Rd UC	City of Lynwood	W	Water	Remained-in-Place
14	Bullis Rd UC	PT&T	D	Telecom	Remained-in-Place; Pothole to confirm depth
15	Bullis Rd UC	SCG	D	Gas	Remained-in-Place; Pothole to confirm depth
16	Bullis Rd UC	Standard Oil	W	Oil	Remained-in-Place; High Priority
17	Bullis Rd UC	Standard Oil	W	Oil	Remained-in-Place; High Priority
18	Bullis Rd UC	Standard Oil	W	Oil	Remained-in-Place; High Priority
19	Bullis Rd UC	SCE	D	Electrical	Remained-in-Place; High Priority
20	Harris Ave UC	SCE	D	Electrical	Remained-in-Place; Pothole to confirm depth
21	Harris Ave UC	Rogers Cable	D	Telecom	Remained-in-Place; Pothole to confirm depth
22	Harris Ave UC	City of Lynwood	W	Water	Remained-in-Place

Table 5-55: Anticipated Impacts to Utilities within the Study Area—Alternative 3 (continued)

No.	Location	Utility Owner and/or Contact Name	Wet (W) / Dry (D)	Utility Type(s)	Utility Conflict Description
23	Harris Ave UC	City of Lynwood	W	Sewer	Remained-in-Place
24	Façade Ave	LACSD	W	Sewer	Remained-in-Place
25	Façade Ave	LACSD	W	Sewer	Remained-in-Place
26	Façade Ave	City of Paramount	W	Water	Remained-in-Place
27	Arthur Ave	LACSD	W	Sewer	Remained-in-Place
28	Paramount Blvd	Pacific Bell	D	Telecom	Remained-in-Place; Pothole to confirm depth
29	Paramount Blvd	SCG	D	Gas	Remained-in-Place; Pothole to confirm depth
30	Paramount Blvd	SCE	D	Electrical	Remained-in-Place; Pothole to confirm depth
31	Paramount Blvd	LACSD	W	Sewer	Remained-in-Place
32	Downey Ave OC	SCWC	W	Water	Remained-in-Place
33	Downey Ave OC	LACSD	W	Sewer	Remained-in-Place
34	Downey Ave OC	PT&T	D	Telecom	Remained-in-Place; Pothole to confirm depth
35	Downey Ave OC	LACSD	W	Sewer	Remained-in-Place
36	Downey Ave OC	PT&T	D	Telecom	Remained-in-Place; Pothole to confirm depth
37	Downey Ave OC	SCG	D	Gas	Remained-in-Place; Pothole to confirm depth
38	Downey Ave OC	PT&T	D	Telecom	Remained-in-Place; Pothole to confirm depth
39	Downey Ave OC	SCWC	W	Water	Remained-in-Place
40	Downey Ave OC	SCG	D	Gas	Remained-in-Place; Pothole to confirm depth

Notes: Ave = Avenue; Blvd = Boulevard; LACSD = Los Angeles County Sanitation District; LACDPW = Los Angeles County Department of Public Works; OC = Overcrossing; PT&T = Pacific Telephone and Telegraph; Rd = Road; SCE = Southern California Edison; SCG = Southern California Gas; SCWD = Southern California Water District; UC = Undercrossing

Positive location will be performed for underground utilities in the Project vicinity that may be in close proximity or conflict with proposed improvements as determined from as-built plans and utility company records.

Relocation or addition of towers are not anticipated for the existing overhead electrical lines.

Some existing utilities may also be affected, though no major relocations are expected. As-built plans were used to identify other existing utilities and major drainage culverts (diameter greater than 48 inches) and channels within the Project limits. Coordination with the identified utility companies shall be carried out during the PS&E and construction phases.

Design Year (2027 and 2047) Build Alternative (Alternative 3) Traffic Operations Analysis Summary

Analysis of the future Build Alternative 3 conditions on the I-105 freeway was conducted using the outputs from the travel demand model for Design Years 2027 and 2047.

Mainline

In 2027, with the additional capacity in the corridor under the Dual ExpressLanes Alternative 3, the total corridor travel demand is projected to increase by approximately 30 percent in the peak travel direction compared to the No-Build condition. Daily general purpose lanes are projected to carry slightly more daily traffic than the No-Build conditions, while the managed lanes carry nearly double daily traffic of the No-Build conditions. The corridor is forecast to carry 181,000 to 187,000 ADT in the general purpose lanes and 71,000 to 85,000 ADT in the ExpressLanes. Alternative 3 assumes maintaining the current HOV 2+ occupancy policy for toll free travel in the ExpressLanes. There is approximately 6-percent truck volume in the corridor.

The peak hour volumes and LOS for Alternatives 3 for freeway general purpose lane segments for both eastbound and westbound directions I-105 are summarized in Table 5-56 through Table 5-59. Alternative 3 is projected to have improved LOS performance compared to No Build Alternative 1 during the AM and PM peak hours with increased capacity in the managed lanes and potentially shifting single-occupancy vehicles from general purpose lanes to the managed lanes. In the westbound direction, Alternative 3 has similar LOS conditions to Alternative 2 during the AM peak hours, but better LOS conditions during the PM peak hour.

In 2047, under the Dual ExpressLanes Alternative 3, the total corridor travel demand is projected to increase by approximately 20 to 26 percent in the peak travel direction compared to the 2047 No Build condition. The corridor is forecast to carry 184,000 to 191,000 ADT in general purpose lanes and 66,000 to 79,000 ADT in the ExpressLanes. There is approximately 8-percent of truck volume in the corridor.

Table 5-56: I-105 Eastbound General Purpose Lanes Mainline Analysis—Alternative 3 (2027)

Location	Segment Type	2027 Build (Alternative 3)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between I-405 & Hawthorne Blvd / Prairie Ave Off-Ramp	Basic	4,398	21.8	C	4,974	-	**F***
Between Prairie Ave Off-Ramp & On-ramp	Basic	3,472	19.5	C	5,561	-	**F***
Between Prairie Ave & Crenshaw Blvd / 120th St	Basic	4,116	20.0	C	5,273	-	**F***
Between Crenshaw Blvd & Vermont Ave	Basic	5,367	23.6	C	7,598	29.8	D
Between Normandie OC & Vermont Off-Ramp	Basic	5,367	20.0	C	7,598	26.5	D
Between I-110 Off-Ramp & Hoover St On-Ramp	Basic	3,298	17.8	B	4,589	-	**F***
Between Central Ave Off-Ramp & On-Ramp	Basic	4,623	25.5	C	3,435	-	**F***
Between Wilmington Ave Off-Ramp & On-Ramp	Basic	4,405	25.6	C	4,753	-	**F***
Between Wilmington Ave & Long Beach Blvd	Basic	5,055	29.0	D	4,001	-	**F***
Between Long Beach Blvd Off-Ramp & On-Ramp	Basic	4,442	24.3	C	5,155	-	**F***
Between Long Beach Blvd & I-710	Basic	5,019	38.1	E	4,869	-	**F***
Between I-710 Off-Ramp & On-ramp	Basic	3,706	19.8	C	4,933	44.4	E
Between Garfield Ave & Grove St	Basic	3,653	23.5	C	3,624	-	**F***
Between Grove St OC & Paramount Blvd OC	Basic	5,189	-	**F***	5,933	-	**F***
Between Paramount Blvd & Lakewood Blvd	Basic	4,392	22.0	C	5,463	31.9	D
Between Lakewood Blvd & Bellflower Blvd	Basic	5,332	37.5	E	4,924	-	**F***

Source: Traffic Study Report (provided under separate cover)
Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds. Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; I- = Interstate; LOS = Level of Service; OC = Overcrossing; St = Street

Table 5-57: I-105 Eastbound General Purpose Lanes Merge/Diverge/Weave Analysis—Alternative 3 (2027)

Location	Segment Type	2027 Build (Alternative 3)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Imperial Hwy On-Ramp	Merge	1,860	20.5	C	5,006	-	**F***
I-405 NB On-Ramp	Merge	2,836	16.6	B	5,314	-	**F***
I-405 SB On-Ramp	Merge	4,398	19.0	C	4,974	-	**F***
Prairie Ave Off-Ramp	Diverge	4,052	23.5	C	5,464	-	**F***
Hawthorne Blvd / Imperial Hwy On-Ramp to Crenshaw Blvd / 120th St Off-Ramp	Weave	4,589	22.7	C	6,402	-	**F***
Crenshaw Blvd / 120th St On-Ramp	Merge	4,590	26.8	C	6,532	-	**F****
Crenshaw Blvd / 120th St On-Ramp (NB)	Merge	5,367	21.6	C	7,598	29.8	D
Vermont Ave Off-Ramp	Diverge	5,354	20.0	C	8,507	-	**F***
I-110 Off-Ramp	Diverge	4,855	17.0	B	8,452	-	**F***
Hoover St On-Ramp	Merge	3,939	23.8	C	3,640	-	**F***
I-110 On-Ramp to Central Ave Off-Ramp	Weave	5,750	24.1	C	4,429	-	**F***
Central Ave On-Ramp to Wilmington Ave Off-Ramp	Weave	5,392	31.1	D	4,845	-	**F***
Wilmington Ave On-Ramp	Merge	5,055	30.7	D	4,001	-	**F***
Long Beach Blvd Off-Ramp	Diverge	5,055	30.2	D	4,001	-	**F***
Southbound Long Beach Blvd On-Ramp	Merge	4,650	32.5	D	5,019	-	**F***
Northbound Long Beach Blvd On-Ramp	Merge	5,019	24.2	C	4,869	-	**F***
I-710 Off-Ramp	Diverge	5,091	-	**F****	4,857	-	**F****
Garfield Ave Off-Ramp	Diverge	3,706	22.2	C	4,933	39.6	E
I-710 NB On-Ramp	Merge	5,034	-	**F***	5,735	-	**F***
I-710 SB On-Ramp	Merge	5,189	-	**F***	5,933	-	**F***
Paramount Blvd On-Ramp	Merge	5,231	-	**F****	5,131	-	**F****
Lakewood Blvd Off-Ramp	Diverge	5,231	33.3	D	5,131	-	**F**
SB Lakewood Blvd On-Ramp	Merge	4,429	17.8	C	6,007	24.7	C
NB Lakewood Blvd On-Ramp	Weave	6,498	24.9	C	6,230	-	**F***
Bellflower Blvd On-Ramp	Merge	5,225	34.2	D	4,788	-	**F***
I-605 Off-Ramp	Diverge	5,225	34.2	D	4,788	-	**F****

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds. Red and bold denotes LOS E or worse.

Ave = Avenue; Blvd = Boulevard; Hwy = Highway; I- = Interstate; LOS = Level of Service; NB = Northbound; SB = Southbound; St = Street

Table 5-58: I-105 Westbound General Purpose Lanes Mainline Analysis—Alternatives 3 (2027)

Location	Segment Type	2027 Build (Alternative 3)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between Bellflower Blvd & Lakewood Blvd	Basic	4,961	-	**F***	6,399	-	**F***
Between Lakewood Blvd Off-Ramp & On-Ramp	Basic	4,803	-	**F***	4,776	28.9	D
Between Paramount Blvd Off-Ramp & On-Ramp	Basic	5,423	32.4	D	4,899	27.3	D
Between Paramount Blvd & I-710	Basic	5,468	26.0	D	4,953	20.1	C
Between I-710 Off-Ramp & Garfield Ave On-Ramp	Basic	4,543	-	**F***	3,462	19.5	C
Between -710 Off-Ramp & SB On-Ramp	Basic	5,683	-	**F***	3,855	23.7	C
Between I-710 NB On-Ramp & Gertrude Dr UC	Basic	5,763	-	**F***	5,751	-	**F***
Between Gertrude Dr UC & Long Beach Blvd	Basic	3,217	-	**F***	3,467	-	**F***
Between Long Beach Blvd Off-Ramp & On-Ramp	Basic	5,117	-	**F***	3,502	-	**F***
Between State St UC & Alameda St	Basic	3,919	-	**F***	4,472	-	**F****
Between Imperial Hwy Off-Ramp & On-Ramp	Basic	4,821	-	**F***	3,491	17.9	B
Between Imperial Hwy & Central Ave	Basic	3,704	-	**F***	4,243	25.1	C
Between Central Ave Off-Ramp & On-Ramp	Basic	4,809	-	**F***	3,273	19.1	C
Between Stanford Ave UC & Avalon Blvd UC	Basic	5,439	-	**F***	5,038	17.5	B
Between Avalon UC & San Pedro St UC	Basic	5,341	-	**F***	5,052	14.1	B
Between I-110 Off-Ramp & Hoover St	Basic	4,566	-	**F***	3,374	18.0	B
Between Vermont Ave Off-Ramp & On-Ramp	Basic	3,876	-	**F***	3,921	20.1	C
Between Vermont Ave & Crenshaw Blvd	Basic	4,231	-	**F***	5,457	22.0	C
Between Crenshaw Blvd Off-Ramp & On-Ramp	Basic	5,657	-	**F***	3,516	21.9	B
Between Prairie Ave / Hawthorne Blvd Off-Ramp & Imperial Hwy On-Ramp	Basic	5,279	31.0	D	3,274	22.5	C
Between Imperial Hwy & I-405	Basic	6,085	23.7	C	4,698	15.0	B
Between I-405 Off-Ramp & La Cienega Blvd	Basic	3,064	14.3	B	724	3.1	A

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds. Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; Dr = Drive; Hwy = Highway; I- = Interstate; LOS = Level of Service; NB = Northbound; SB = Southbound; St = Street; UC = Undercrossing

Table 5-59: I-105 Westbound General Purpose Lanes Merge/Diverge/Weave Analysis—Alternative 3 (2027)

Location	Segment Type	2027 Build (Alternative 3)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
I-605 On-Ramp	Merge	4,961	-	**F***	6,399	-	**F***
Bellflower Blvd Off-Ramp	Diverge	4,961	-	**F***	6,399	-	**F***
Bellflower Blvd On-Ramp to Lakewood Blvd Off-Ramp	Weave	6,103	-	**F***	6,608	-	**F****
Lakewood Blvd On-Ramp	Merge	5,606	-	**F****	5,257	27.7	C
Paramount Blvd Off-Ramp	Diverge	5,606	38.3	D	5,257	33.8	D
I-710 Off-Ramp	Diverge	5,468	20.0	C	4,953	15.8	B
Garfield Ave On-Ramp	Merge	5,683	-	**F***	3,855	18.9	B
I-710 SB On-Ramp	Merge	5,686	-	**F***	4,711	33.4	D
I-710 NB On-Ramp	Merge	5,763	-	**F***	5,751	-	**F***
Long Beach Blvd Off-Ramp	Diverge	3,217	-	**F***	3,467	-	**F****
NB Long Beach Blvd On-Ramp	Merge	6,444	-	**F***	3,965	-	**F***
SB Long Beach Blvd On-Ramp	Merge	3,919	-	**F***	4,472	-	**F***
Imperial Hwy Off-Ramp	Diverge	3,919	-	**F***	4,472	27.4	C
Imperial Hwy On-Ramp	Merge	3,704	-	**F***	4,243	27.5	D
Central Ave Off-Ramp	Diverge	3,704	-	**F***	4,243	27.6	C
Central Ave On-Ramp	Merge	5,439	-	**F***	5,038	17.5	B
I-110 Off-Ramp	Diverge	5,341	-	**F***	5,052	14.1	B
I-110 NB On-Ramp	Weave	4,426	-	**F***	4,651	24.2	C
I-110 SB On-Ramp	Merge	4,624	-	**F***	4,859	21.5	C
Vermont Ave On-Ramp	Merge	4,231	-	**F***	5,457	23.9	C
Crenshaw Blvd Off-Ramp	Diverge	4,397	-	**F***	5,151	23.2	C
NB Crenshaw Blvd On-Ramp	Merge	5,405	-	**F***	3,924	15.7	B
SB Crenshaw Blvd On-Ramp to Prairie Ave / Hawthorne Blvd Off-Ramp	Weave	6,169	-	**F***	4,174	19.1	B
Imperial Hwy On-Ramp	Merge	6,085	29.4	D	4,698	18.8	C
I-405 Off-Ramp	Diverge	6,085	**39.7**	**E**	4,698	**38.9**	**E**

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds. Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; Hwy = Highway; I- = Interstate; LOS = Level of Service; NB = Northbound; SB = Southbound

The peak hour volumes and LOS for Alternatives 3 for freeway general purpose lane segments are summarized in Table 5-60 through Table 5-63. From 2027 to 2047, the LOS conditions for Alternative 3 degrade primarily in the eastern portion of the corridor near the I-605 interchange. Alternative 3 in the eastbound direction is the only alternative that has some segments with LOS D or better during the PM peak hour. Overall, Alternative 3 has the best LOS of the three alternatives.

Table 5-60: I-105 Eastbound General Purpose Lanes Mainline Analysis—Alternative 3 (2047)

Location	Segment Type	2047 Build (Alternative 3)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between I-405 & Hawthorne Blvd / Prairie Ave Off-Ramp	Basic	4,683	23.3	C	3,765	-	**F***
Between Prairie Ave Off-Ramp & On-ramp	Basic	3,779	20.8	C	4,598	-	**F***
Between Prairie Ave & Crenshaw Blvd / 120th St	Basic	4,359	23.7	C	5,326	-	**F****
Between Crenshaw Blvd & Vermont Ave	Basic	5,611	24.5	C	6,865	29.8	D
Between Normandie OC & Vermont Off-Ramp	Basic	5,611	19.1	C	6,865	26.5	D
Between I-110 Off-Ramp & Hoover St On-Ramp	Basic	3,607	19.2	C	3,829	-	**F***
Between Central Ave Off-Ramp & On-Ramp	Basic	4,796	25.5	C	2,674	-	**F***
Between Wilmington Ave Off-Ramp & On-Ramp	Basic	4,513	24.8	C	3,938	-	**F***
Between Wilmington Ave & Long Beach Blvd	Basic	5,160	32.9	D	3,226	-	**F***
Between Long Beach Blvd Off-Ramp & On-Ramp	Basic	4,607	25.4	C	4,423	-	**F***
Between Long Beach Blvd & I-710	Basic	5,116	40.4	E	4,067	-	**F***
Between I-710 Off-Ramp & On-ramp	Basic	3,766	20.2	C	5,389	-	**F***
Between Garfield Ave & Grove St	Basic	3,713	39.4	E	3,962	-	**F***
Between Grove St OC & Paramount Blvd OC	Basic	5,249	-	**F***	6,266	-	**F***
Between Paramount Blvd & Lakewood Blvd	Basic	4,553	25.6	C	5,083	-	**F***
Between Lakewood Blvd & Bellflower Blvd	Basic	4,932	-	**F***	4,773	-	**F***

Source: Traffic Study Report (provided under separate cover)
Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds. Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; I- = Interstate; LOS = Level of Service; OC = Overcrossing; St = Street

Table 5-61: I-105 Eastbound General Purpose Lanes Merge/Diverge/Weave Analysis—Alternative 3 (2047)

Location	Segment Type	2047 Build (Alternative 3)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Imperial Hwy On-Ramp	Merge	1,976	20.5	C	4,599	-	**F***
I-405 NB On-Ramp	Merge	3,017	17.7	C	4,266	-	**F***
I-405 SB On-Ramp	Merge	4,683	19.8	C	3,765	-	**F***
Prairie Ave Off-Ramp	Diverge	4,297	24.9	C	4,545	-	**F***
Hawthorne Blvd / Imperial Hwy On-Ramp to Crenshaw Blvd / 120th St Off-Ramp	Weave	4,874	24.1	C	5,771	-	**F***
Crenshaw Blvd / 120th St On-Ramp	Merge	4,834	31.7	D	7,228	-	**F***
Crenshaw Blvd / 120th St On-Ramp (NB)	Merge	5,611	24.5	C	6,865	29.8	D
Vermont Ave Off-Ramp	Diverge	5,821	19.1	C	7,965	24.5	C
I-110 Off-Ramp	Diverge	5,319	16.3	B	8,176	22.2	C
Hoover St On-Ramp	Merge	4,247	25.4	C	2,903	-	**F***
I-110 On-Ramp to Central Ave Off-Ramp	Weave	6,037	25.7	C	3,510	-	**F***
Central Ave On-Ramp to Wilmington Ave Off-Ramp	Weave	5,521	30.3	D	4,068	-	**F***
Wilmington Ave On-Ramp	Merge	5,160	33.7	D	3,226	-	**F***
Long Beach Blvd Off-Ramp	Diverge	5,160	30.8	D	3,226	-	**F***
SB Long Beach Blvd On-Ramp	Merge	4,748	33.7	D	4,254	-	**F***
NB Long Beach Blvd On-Ramp	Merge	5,116	25.1	C	4,067	-	**F***
I-710 Off-Ramp	Diverge	5,190	-	**F****	4,057	-	**F***
Garfield Ave Off-Ramp	Diverge	3,766	22.6	C	5,389	-	**F***
I-710 NB On-Ramp	Merge	5,068	-	**F***	6,071	-	**F***
I-710 SB On-Ramp	Merge	5,249	-	**F***	6,266	-	**F***
Paramount Blvd On-Ramp	Merge	5,336	-	**F***	4,642	-	**F***
Lakewood Blvd Off-Ramp	Diverge	5,336	-	**F****	4,642	-	**F***
SB Lakewood Blvd On-Ramp	Merge	4,628	20.6	C	6,275	-	**F***
NB Lakewood Blvd On-Ramp	Weave	6,168	-	**F***	5,771	-	**F***
Bellflower Blvd On-Ramp	Merge	4,754	-	**F***	4,703	-	**F****
I-605 Off-Ramp	Diverge	4,754	-	**F****	4,703	-	**F***

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds. Red and bold denotes LOS E or worse.

Ave = Avenue; Blvd = Boulevard; Hwy = Highway; I- = Interstate; LOS = Level of Service; NB = Northbound; SB = Southbound; St = Street

Table 5-62: I-105 Westbound General Purpose Lanes Mainline Analysis—Alternative 3 (2047)

Location	Segment Type	2047 Build (Alternative 3)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between Bellflower Blvd & Lakewood Blvd	Basic	4,955	-	**F***	5,961	-	**F****
Between Lakewood Blvd Off-Ramp & On-Ramp	Basic	4,854	-	**F***	4,735	34.0	D
Between Paramount Blvd Off-Ramp & On-Ramp	Basic	5,553	31.7	D	4,871	26.9	D
Between Paramount Blvd & I-710	Basic	5,619	27.3	D	4,934	19.9	C
Between I-710 Off-Ramp & Garfield Ave On-Ramp	Basic	4,666	-	**F***	3,501	18.5	C
Between I-710 Off-Ramp & SB On-Ramp	Basic	5,801	-	**F***	3,953	22.6	C
Between I-710 NB On-Ramp & Gertrude Dr UC	Basic	5,595	-	**F***	5,303	-	**F***
Between Gertrude Dr UC & Long Beach Blvd	Basic	3,081	-	**F***	2,780	-	**F***
Between Long Beach Blvd Off-Ramp & On-Ramp	Basic	4,984	-	**F***	3,882	-	**F***
Between State St UC & Alameda St	Basic	3,713	-	**F***	4,853	-	**F****
Between Imperial Hwy Off-Ramp & On-Ramp	Basic	4,678	-	**F***	3,929	18.8	C
Between Imperial Hwy & Central Ave	Basic	3,594	-	**F***	4,684	26.4	D
Between Central Ave Off-Ramp & On-Ramp	Basic	4,662	-	**F***	3,659	20.0	C
Between Stanford Ave UC & Avalon Blvd UC	Basic	5,344	-	**F***	5,282	19.1	C
Between Avalon UC & San Pedro St UC	Basic	5,248	-	**F***	5,297	15.5	B
Between I-110 Off-Ramp & Hoover St	Basic	4,178	-	**F***	3,522	18.9	C
Between Vermont Ave Off-Ramp & On-Ramp	Basic	3,587	-	**F***	4,067	21.1	C
Between Vermont Ave & Crenshaw Blvd	Basic	3,840	-	**F***	5,561	22.5	C
Between Crenshaw Blvd Off-Ramp & On-Ramp	Basic	5,292	-	**F***	3,121	17.4	B
Between Prairie Ave / Hawthorne Blvd Off-Ramp & Imperial Hwy On-Ramp	Basic	5,092	-	**F****	2,885	22.4	C
Between Imperial Hwy & I-405	Basic	6,321	22.7	C	4,751	15.2	B
Between I-405 Off-Ramp & La Cienega Blvd	Basic	3,308	13.3	B	770	0.7	A

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds. Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; Dr = Drive; Hwy = Highway; I- = Interstate; LOS = Level of Service; NB = Northbound; SB = Southbound; St = Street; UC = Undercrossing

Table 5-63: I-105 Westbound General Purpose Lanes Merge/Diverge/Weave Analysis—Alternative 3 (2047)

Location	Segment Type	2047 Build (Alternative 3)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
I-605 On-Ramp	Merge	4,956	-	**F***	5,961	-	**F***
Bellflower Blvd Off-Ramp	Diverge	4,956	-	**F***	5,961	-	**F***
Bellflower Blvd On-Ramp to Lakewood Blvd Off-Ramp	Weave	6,024	-	**F***	6,507	35.3	E
Lakewood Blvd On-Ramp	Merge	5,658	-	**F****	5,217	33.4	D
Paramount Blvd Off-Ramp	Diverge	5,658	32.6	D	5,217	33.4	D
I-710 Off-Ramp	Diverge	5,619	20.8	C	4,934	15.7	B
Garfield Ave On-Ramp	Merge	5,801	-	**F***	3,953	18.1	B
I-710 SB On-Ramp	Merge	5,553	-	**F***	4,930	32.1	D
I-710 NB On-Ramp	Merge	5,595	-	**F***	5,303	-	**F***
Long Beach Blvd Off-Ramp	Diverge	3,081	-	**F***	2,780	-	**F***
NB Long Beach Blvd On-Ramp	Merge	6,510	-	**F***	4,278	-	**F***
SB Long Beach Blvd On-Ramp	Merge	3,713	-	**F***	4,853	-	**F***
Imperial Hwy Off-Ramp	Diverge	3,713	-	**F***	4,853	28.3	D
Imperial Hwy On-Ramp	Merge	3,594	-	**F***	4,684	29.0	D
Central Ave Off-Ramp	Diverge	3,594	-	**F***	4,684	28.4	D
Central Ave On-Ramp	Merge	5,344	-	**F***	5,282	19.1	C
I-110 Off-Ramp	Diverge	5,248	-	**F***	5,297	15.5	B
I-110 NB On-Ramp	Weave	4,073	-	**F***	4,825	25.1	C
I-110 SBOn-Ramp	Merge	4,296	-	**F***	4,964	22.3	C
Vermont Ave On-Ramp	Merge	3,840	-	**F***	5,561	24.4	C
Crenshaw Blvd Off-Ramp	Diverge	5,021	-	**F***	4,841	23.6	C
Northbound Crenshaw Blvd On-Ramp	Merge	5,624	-	**F***	3,530	15.4	B
Southbound Crenshaw Blvd On-Ramp to Prairie Ave/Hawthorne Blvd Off-Ramp	Weave	5,883	-	**F***	3,789	18.8	B
Imperial Hwy On-Ramp	Merge	6,321	28.2	D	4,751	19.0	C
I-405 Off-Ramp	Diverge	6,321	40.1	E	4,751	40.3	E

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds. Red and bold denotes LOS E or worse.

Ave = Avenue; Blvd = Boulevard; Hwy = Highway; I- = Interstate; LOS = Level of Service; NB = Northbound; SB = Southbound

The peak hour volumes and LOS for Alternatives 3 under 2027 conditions for freeway ExpressLanes are summarized in Table 5-64 and Table 5-65. Similar to Alternatives 2, Alternative 3 has overall better LOS on the managed lanes than the No Build Alternative 1. In the eastbound direction the managed lanes are LOS D or better from I-405 to Paramount Blvd where queuing from the I-605 interchange begins, whereas in the No Build Alternative 1 scenario the HOV lane is expected to be at LOS E or LOS F from I-405 to I-605. Similarly, in the westbound direction, the managed lanes are LOS D or better from Bellflower Blvd to I-405 during the AM and PM peak hours, whereas in the No Build Alternative 1 scenario the HOV lane is projected to be mostly degraded to LOS E or LOS F. In addition, volume in the managed lanes in Alternative 3 is more than double the volume in Alternative 1 for both 2027 and 2047

The peak hour volumes and LOS for Alternatives 3 under 2047 conditions for freeway ExpressLanes are summarized in Table 5-66 and Table 5-67. The LOS for Alternatives 3 remains approximately the same for the AM and PM peak hours in the eastbound direction in 2027.

Compared to Alternative 2, LOS in 2027 and 2047 in Alternative 3 is generally at LOS D while Alternative 2 generally performs at LOS C. However, Alternative 3 carries double the volume of Alternative 2. This is due partly to the additional capacity provided by the second ExpressLane and Alternative 3 maintaining the existing HOV 2+ occupancy policy for toll free travel, whereas Alternative 2 assumes an increase in occupancy policy to HOV 3+ for toll free travel.

Table 5-64: I-105 Eastbound ExpressLanes Peak Hour LOS—Alternative 3 (2027)

Location	Segment Type	2027 Build (Alternative 3)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between e/o Aviation Blvd & Inglewood Ave	Access	1,073	8.3	A	3,156	31.6	D
Between Inglewood Ave & Hawthorne Blvd Access	Basic	1,073	8.3	A	3,156	31.6	D
Between Hawthorne Blvd and Prairie Ave	Access	1,733	13.5	B	3,057	30.0	D
Between Prairie Ave Access & Crenshaw Blvd	Basic	1,733	13.5	B	3,057	30.0	D
Between Crenshaw Blvd & Crenshaw Blvd Access	Basic	1,688	13.2	B	3,067	30.1	D
Between Crenshaw Blvd & Western Ave	Access	1,688	13.2	B	3,067	30.1	D
Between Western Ave Access & Vermont Ave	Basic	1,688	13.2	B	3,067	30.1	D
Between Vermont Ave & NB I-110 Off-Ramp	Diverge	1,730	13.5	B	2,122	17.4	B
Between I-110 Off-Ramp & I-110 On-Ramp	Basic	1,607	12.6	B	1,787	14.2	B
Between I-110 On-Ramp & Central Ave Access	Merge	2,380	19.8	C	3,102	30.4	D
Between w/o & e/o Central Ave	Access	3,005	25.5	C	3,184	31.8	D
Between Central Ave Access & Wilmington Ave	Basic	3,004	25.5	C	3,200	32.0	D
Between Wilmington Ave & Alameda St	Basic	3,006	25.5	C	3,215	32.2	D
Between Alameda St & Long Beach Blvd Access	Basic	3,005	25.5	C	3,220	32.2	D
Between w/o & e/o Long Beach Blvd	Access	3,005	25.5	C	3,220	32.2	D
Between Long Beach Blvd Access & Gertrude Dr	Basic	2,868	25.2	C	3,230	33.0	D
Between Gertrude Dr & I-710	Basic	2,868	25.2	C	3,230	33.0	D
Between I-710 & Garfield Ave	Basic	2,868	25.2	C	3,230	33.0	D
Between Garfield Ave & I-710	Basic	2,868	25.2	C	3,230	33.0	D
Between I-710 & Grove St	Basic	2,868	25.2	C	3,230	33.0	D
Between Grove St & Paramount Blvd	Basic	2,868	-	**F***	3,230	-	**F***
Between Paramount Blvd & Downey Ave	Access	2,868	-	**F***	3,230	-	**F***
Between Downey Ave Access & Lakewood Blvd	Basic	3,079	-	**F***	3,243	-	**F***
Between Lakewood Blvd & Bellflower Blvd Access	Basic	3,079	-	**F***	3,243	-	**F***
Between w/o & e/o Bellflower Blvd	Access	3,321	-	**F****	3,255	-	**F****
Between Bellflower Blvd Access & I-605	Basic	3,321	30.2	D	3,255	31.9	D

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds. Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; Dr = Drive; I- = Interstate; LOS = Level of Service; NB = Northbound; St = Street

Table 5-65: I-105 Westbound ExpressLanes Peak Hour LOS—Alternative 3 (2027)

Location	Segment Type	2027 Build (Alternative 3)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between I-605 & Bellflower Blvd Access	Basic	1,861	14.8	B	1,750	13.9	B
Between e/o & w/o Bellflower Blvd	Access	1,861	14.8	B	1,737	13.8	B
Between Bellflower Blvd Access & Lakewood Blvd	Basic	3,230	32.3	D	2,782	24.8	C
Between Lakewood Blvd & Paramount Blvd	Basic	3,256	32.6	D	2,784	24.9	C
Between Paramount Blvd & e/o I-710	Basic	3,256	32.6	D	2,784	24.9	C
Between e/o & w/o I-710	Basic	3,298	33.0	D	2,815	25.1	C
Between w/o I-710 & Harris Ave Access	Basic	3,298	33.0	D	2,815	25.1	C
Between Harris Ave & Gertrude Dr	Access	3,317	33.2	D	2,974	27.5	D
Between Gertrude Dr Access & Long Beach Blvd	Basic	3,317	33.2	D	2,974	27.5	D
Between Long Beach Blvd & State St	Basic	3,247	32.5	D	2,937	27.2	D
Between State St UC & Imperial Hwy	Basic	3,247	32.5	D	2,937	27.2	D
Between Imperial Hwy & Central Ave Access	Basic	3,247	32.5	D	2,937	27.2	D
Between e/o & w/o Central Ave	Access	3,247	32.5	D	2,937	27.2	D
Between Central Ave Access and Avalon Blvd	Basic	3,084	29.7	D	1,947	15.7	B
Between Avalon Blvd & I-110 Off-Ramp (DAR)	Diverge	2,736	24.4	C	1,265	9.7	A
Between I-110 Off-Ramp (DAR) & I-110 On-Ramp (DAR)	Basic	2,696	24.1	C	1,270	9.8	A
Between I-110 On-Ramp (DAR) & Vermont Ave	Merge	2,670	23.8	C	1,251	9.6	A
Between Vermont Ave & Western Ave Access	Basic	2,670	23.8	C	1,251	9.6	A
Between e/o & w/o Western Ave	Access	2,670	23.8	C	1,251	9.6	A
Between Western Ave Access & Crenshaw Blvd	Basic	2,897	27.3	D	1,652	12.9	B
Between Crenshaw Blvd & Prairie Ave Access	Basic	2,897	27.3	D	1,673	13.1	B
Between Prairie Ave & Hawthorne Blvd	Access	2,897	27.3	D	1,673	13.1	B
Between Hawthorne Blvd Access & I-405	Basic	2,721	23.9	C	833	6.4	A
Between I-405 & Aviation Blvd	Basic	2,721	23.9	C	833	6.4	A

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds.

Ave = Avenue; Blvd = Boulevard; DAR = Direct Access Ramp; Dr = Drive; Hwy = Highway; I- = Interstate; LOS = Level of Service; St = Street

Table 5-66: I-105 Eastbound ExpressLanes Peak Hour LOS—Alternative 3 (2047)

Location	Segment Type	2047 Build (Alternative 3)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between e/o Aviation Blvd & Inglewood Ave	Access	923	7.1	A	2,691	26.9	D
Between Inglewood Ave & Hawthorne Blvd Access	Basic	923	7.1	A	2,691	26.9	D
Between Hawthorne Blvd & Prairie Ave	Access	1,473	11.5	B	2,768	27.1	D
Between Prairie Ave Access & Crenshaw Blvd	Basic	1,473	11.5	B	2,768	27.1	D
Between Crenshaw Blvd & Crenshaw Blvd Access	Basic	1,435	11.2	B	2,778	27.2	D
Between Crenshaw Blvd & Western Ave	Access	1,435	11.2	B	2,778	27.2	D
Between Western Ave Access & Vermont Ave	Basic	1,435	11.2	B	2,778	27.2	D
Between Vermont Ave & NB I-110 Off-Ramp	Diverge	1,318	10.3	A	2,065	17.2	B
Between I-110 Off-Ramp & I-110 On-Ramp	Basic	1,238	9.7	A	1,566	12.4	B
Between I-110 On-Ramp & Central Ave Access	Merge	2,011	16.8	B	2,775	27.2	D
Between w/o & e/o Central Ave	Access	2,530	21.4	C	2,849	28.5	D
Between Central Ave Access & Wilmington Ave	Basic	2,530	21.4	C	2,863	28.6	D
Between Wilmington Ave & Alameda St	Basic	2,530	21.4	C	2,877	28.8	D
Between Alameda St & Long Beach Blvd Access	Basic	2,530	21.4	C	2,881	28.8	D
Between w/o & e/o Long Beach Blvd	Access	2,530	21.4	C	2,881	28.8	D
Between Long Beach Blvd Access & Gertrude Dr	Basic	2,544	22.3	C	2,856	29.1	D
Between Gertrude Dr & I-710	Basic	2,544	22.3	C	2,856	29.1	D
Between I-710 & Garfield Ave	Basic	2,544	22.3	C	2,856	29.1	D
Between Garfield Ave & I-710	Basic	2,545	22.3	C	2,857	29.2	D
Between I-710 & Grove St	Basic	2,545	22.3	C	2,857	29.2	D
Between Grove St & Paramount Blvd	Basic	2,545	29.0	D	2,857	-	**F***
Between Paramount Blvd & Downey Ave	Access	2,545	-	**F***	2,857	-	**F***
Between Downey Ave Access & Lakewood Blvd	Basic	2,553	-	**F***	2,902	-	**F***
Between Lakewood Blvd & Bellflower Blvd Access	Basic	2,553	-	**F***	2,902	-	**F***
Between w/o & e/o Bellflower Blvd	Access	2,665	-	**F****	3,018	-	**F****
Between Bellflower Blvd Access & I-605	Basic	2,665	24.2	C	3,018	30.8	D

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 *Highway Capacity Manual* (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds. Red and bold denotes LOS E or worse.
Ave = Avenue; Blvd = Boulevard; Dr = Drive; I- = Interstate; LOS = Level of Service; NB = Northbound; St = Street

Table 5-67: I-105 Westbound ExpressLane Peak Hour LOS—Alternative 3 (2047)

Location	Segment Type	2047 Build (Alternative 3)					
		AM Peak Hour			PM Peak Hour		
		Volume	Density	LOS	Volume	Density	LOS
Between I-605 & Bellflower Blvd Access	Basic	1,665	13.2	B	1,598	12.7	B
Between e/o & w/o Bellflower Blvd	Access	1,665	13.2	B	1,585	12.6	B
Between Bellflower Blvd Access & Lakewood Blvd	Basic	2,822	28.2	D	2,801	26.9	D
Between Lakewood Blvd & Paramount Blvd	Basic	2,845	28.5	D	2,803	27.0	D
Between Paramount Blvd & e/o I-710	Basic	2,845	28.5	D	2,803	27.0	D
Between e/o & w/o I-710	Basic	2,878	28.8	D	2,833	27.2	D
Between w/o I-710 & Harris Ave Access	Basic	2,878	28.8	D	2,833	27.2	D
Between Harris Ave & Gertrude Dr	Access	2,933	29.3	D	2,799	27.4	D
Between Gertrude Dr Access & Long Beach Blvd	Basic	2,933	29.3	D	2,799	27.4	D
Between Long Beach Blvd & State St	Basic	2,871	28.7	D	2,765	27.1	D
Between State St UC & Imperial Hwy	Basic	2,871	28.7	D	2,765	27.1	D
Between Imperial Hwy & Central Ave Access	Basic	2,871	28.7	D	2,765	27.1	D
Between e/o & w/o Central Ave	Access	2,871	28.7	D	2,765	27.1	D
Between Central Ave Access & Avalon Blvd	Basic	2,794	27.4	D	2,083	17.4	B
Between Avalon Blvd & I-110 Off-Ramp (DAR)	Diverge	2,210	19.7	C	1,406	11.0	A
Between I-110 Off-Ramp (DAR) & I-110 On-Ramp (DAR)	Basic	2,177	19.4	C	1,412	11.0	B
Between I-110 On-Ramp (DAR) & Vermont Ave	Merge	2,157	19.3	C	1,391	10.9	A
Between Vermont Ave & Western Ave Access	Basic	2,157	19.3	C	1,391	10.9	A
Between e/o & w/o Western Ave	Access	2,157	19.3	C	1,391	10.9	A
Between Western Ave Access & Crenshaw Blvd	Basic	2,872	29.3	D	2,083	17.4	B
Between Crenshaw Blvd & Prairie Ave Access	Basic	2,873	29.3	D	2,109	17.6	B
Between Prairie Ave & Hawthorne Blvd	Access	2,873	29.3	D	2,109	17.6	B
Between Hawthorne Blvd Access & I-405	Basic	2,297	20.1	C	915	7.0	A
Between I-405 & Aviation Blvd	Basic	2,297	20.1	C	915	7.0	A

Source: Traffic Study Report (provided under separate cover)

Notes: LOS based on 2016 HCM (FREEVAL) where segments are not saturated. F* denotes saturated conditions where vehicles are in queue based on modeled segment speeds. F** denotes saturated conditions where demand exceeds or is at near capacity causing bottleneck to occur based on modeled speeds.
Ave = Avenue; Blvd = Boulevard; DAR = Direct Access Ramp; Dr = Drive; Hwy = Highway; I- = Interstate; LOS = Level of Service; St = Street

Ramps/Interchanges

The I-105 freeway on and off ramp conditions for Alternatives 3 for the future year 2027 are summarized in Table 5-68 and Table 5-69. Most of the ramp locations have forecasted volumes that are within the available capacities, with the exception the six ramps where demand exceeds the capacity of the ramp:

Table 5-68: I-105 Eastbound Freeway Ramp Conditions—Alternatives 3 (2027 & 2047)

Int. #	Location	Type	No. of Ramp Lanes	2027 Build (Alternative 3)				2047 Build (Alternative 3)			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Vol	V/C	Vol	V/C	Vol	V/C	Vol	V/C
-	Sepulveda Blvd/Imperial Hwy Off	Off-Ramp	2	465	0.16	486	0.16	465	0.16	486	0.16
-	Sepulveda Blvd On (SB)	On-Ramp	2	1,543	0.51	2,446	**0.82**	1,543	0.51	2,446	**0.82**
-	Imperial Hwy On (EB)	On-Ramp	1	581	0.39	1,174	**0.78**	581	0.39	1,174	**0.78**
-	Atwood Way/Douglas St On (SB)	On-Ramp	1	344	0.23	1,548	**1.03**	344	0.23	1,548	**1.03**
-	I-405 Fwy-Fwy Off (NB & SB)	Off-Ramp	2	1,274	0.35	2,991	**0.83**	1,274	0.35	2,991	**0.83**
4	Imperial Hwy On	On-Ramp	1	722	0.48	879	0.59	722	0.48	879	0.59
-	I-405 Fwy-Fwy On (NB)	On-Ramp	1	1,108	0.62	709	0.39	1,108	0.62	709	0.39
-	Fwy-Fwy On (SB)	On-Ramp	2	1,949	0.54	1,317	0.37	1,949	0.54	1,317	0.37
9	Prairie Ave Off	Off-Ramp	1	404	0.27	816	0.54	404	0.27	816	0.54
7	Hawthorne Blvd / Imperial Hwy On	On-Ramp	2	763	0.25	1,255	0.42	763	0.25	1,255	0.42
11	Crenshaw Blvd / 120th St Off	Off-Ramp	1	751	0.50	458	0.31	751	0.50	458	0.31
11	Crenshaw Blvd / 120th St On	On-Ramp	1	841	0.56	1,048	**0.70**	841	0.56	1,048	**0.70**
11	Crenshaw Blvd / 120th St On (NB)	On-Ramp	1	772	0.51	1,164	**0.78**	772	0.51	1,164	**0.78**
17	Vermont Ave Off	Off-Ramp	1	654	0.44	951	0.63	654	0.44	951	0.63
-	I-110 Fwy-Fwy Off (GP) (NB & SB)	Off-Ramp	2	1,801	0.50	3,914	**1.09**	1,801	0.50	3,914	**1.09**
-	I-110 Fwy-Fwy Off (ML) (NB)	Off-Ramp	1	1,458	**0.81**	1,338	0.74	1,458	**0.81**	1,338	**0.74**
-	Hoover St On	On-Ramp	1	672	0.45	326	0.22	672	0.45	326	0.22

Table 5-68: I-105 Eastbound Freeway Ramp Conditions—Alternatives 3 (2027 & 2047) (continued)

Int. #	Location	Type	No. of Ramp Lanes	2027 Build (Alternative 3)				2047 Build (Alternative 3)			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Vol	V/C	Vol	V/C	Vol	V/C	Vol	V/C
-	I-110 Fwy-Fwy On (ML) (NB)	On-Ramp	1	377	0.21	1,665	**0.92**	377	0.21	1,665	**0.92**
-	I-110 Fwy-Fwy On (NB & SB)	On-Ramp	2	2,260	0.63	1,922	0.53	2,260	0.63	1,922	0.53
21	Central Ave Off	Off-Ramp	1	1,664	**1.11**	1,346	**0.90**	1,664	**1.11**	1,346	**0.90**
21	Central Ave On	On-Ramp	1	1,020	0.68	1,578	**1.05**	1,020	0.68	1,578	**1.05**
24	Wilmington Ave Off	Off-Ramp	1	1,013	0.68	600	0.40	1,013	0.68	600	0.40
24	Wilmington Ave On	On-Ramp	1	959	0.64	1,291	**0.86**	959	0.64	1,291	**0.86**
30	Long Beach Blvd Off	Off-Ramp	1	1,193	**0.80**	640	0.43	1,193	**0.80**	640	0.43
-	Long Beach Blvd On (SB)	On-Ramp	1	869	0.58	902	0.60	869	0.58	902	0.60
-	Long Beach Blvd On (NB)	On-Ramp	1	608	0.41	648	0.43	608	0.41	648	0.43
-	I-710 Fwy-Fwy Off (NB & SB)	Off-Ramp	2	2,361	0.66	3,102	**0.86**	2,361	0.66	3,102	**0.86**
32	Garfield Ave Off	Off-Ramp	2	1,166	0.39	958	0.32	1,166	0.39	958	0.32
-	I-710 Fwy-Fwy On (NB)	On-Ramp	2	1,583	0.44	1,705	0.47	1,583	0.44	1,705	0.47
-	I-710 Fwy-Fwy On (SB)	On-Ramp	2	1,251	0.35	834	0.23	1,251	0.35	834	0.23
36	Paramount Blvd On	On-Ramp	1	863	0.58	605	0.40	863	0.58	605	0.40
39	Lakewood Blvd Off	Off-Ramp	1	1,358	**0.91**	1,011	0.67	1,358	**0.91**	1,011	0.67
-	Lakewood Blvd On (SB)	On-Ramp	1	280	0.19	216	0.14	280	0.19	216	0.14
-	Lakewood Blvd On (NB)	On-Ramp	1	282	0.19	182	0.12	282	0.19	182	0.12
43	Bellflower Blvd Off	Off-Ramp	1	1,186	**0.79**	1,101	**0.73**	1,186	**0.79**	1,101	**0.73**
43	Bellflower Blvd On	On-Ramp	2	730	0.24	1,159	0.39	730	0.24	1,159	0.39
-	I-605 Fwy-Fwy Off (NB & SB)	Off-Ramp	4	5,005	**0.70**	5,224	**0.73**	5,005	**0.70**	5,224	**0.73**
-	Park-and-Ride Lot Off	Off-Ramp	1	133	0.09	100	0.07	133	0.09	100	0.07
-	Hoxie Ave On	On-Ramp	2	126	0.08	240	0.16	126	0.08	240	0.16

Source: Traffic Study Report (provided under separate cover)
Notes: Ave = Avenue; Blvd = Boulevard; EB = Eastbound; Fwy = Freeway; GP = General Purpose; Hwy = Highway; I- = Interstate; ML = Managed Lanes; NB = Northbound; SB = Southbound; St = Street
Red and bold denotes LOS E or worse.

Table 5-69: I-105 Westbound Freeway Ramp Conditions—Alternatives 3 (2027 & 2047)

Int. #	Location	Type	No. of Ramp Lanes	2027 Build (Alternative 3)				2047 Build (Alternative 3)			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Vol	V/C	Vol	V/C	Vol	V/C	Vol	V/C
-	Sepulveda Blvd Off (SB)	Off-Ramp	1	583	0.39	551	0.37	583	0.39	551	0.37
1	Sepulveda Blvd Off (NB)	Off-Ramp	2	2,228	**0.74**	1,716	0.57	2228	**0.74**	1716	0.57
-	Nash St Off (SB)	Off-Ramp	1	1,328	**0.89**	559	0.37	1328	**0.89**	559	0.37
-	I-405 Fwy-Fwy On (NB & SB)	On-Ramp	2	2,123	0.59	1,650	0.46	2123	0.59	1650	0.46
4	Imperial Hwy Off	Off-Ramp	1	1,767	**1.18**	615	0.41	1767	**1.18**	615	0.41
-	I-405 Fwy-Fwy Off (NB & SB)	Off-Ramp	3	4,119	0.76	4,120	**0.76**	4119	**0.76**	4120	**0.76**
8	Imperial Hwy On	On-Ramp	1	1,530	**1.02**	532	0.35	1530	**1.02**	532	0.35
9	Prairie Ave/Hawthorne Blvd Off	Off-Ramp	2	242	0.08	482	0.16	242	0.08	482	0.16
-	Crenshaw Blvd On (SB)	On-Ramp	1	498	0.33	144	0.10	498	0.33	144	0.10
-	Crenshaw Blvd On (NB)	On-Ramp	1	1,358	**0.91**	595	0.40	1358	**0.91**	595	0.40
13	Crenshaw Blvd Off	Off-Ramp	2	826	0.28	1,384	0.46	826	0.28	1384	0.46
16	Vermont Ave On	On-Ramp	1	1,470	**0.98**	601	0.40	1470	**0.98**	601	0.40
-	I-110 Fwy-Fwy On (GP) (SB)	On-Ramp	1	1,029	0.57	1,148	0.64	1029	0.57	1148	0.64
16	Vermont Ave Off	Off-Ramp	1	939	0.63	733	0.49	939	0.63	733	0.49
-	I-110 Fwy-Fwy On (GP) (NB)	On-Ramp	1	1,421	**0.79**	1,124	0.62	1421	**0.79**	1124	0.62
-	I-110 Fwy-Fwy On (ML) (SB)	On-Ramp	1	1,378	**0.77**	1,222	0.68	1378	**0.77**	1457	**0.81**
-	I-110 Fwy-Fwy Off (ML) (SB)	Off-Ramp	1	774	0.43	360	0.20	774	0.43	360	0.20
-	I-110 Fwy-Fwy Off (GP) (NB & SB)	Off-Ramp	2	3,856	**1.07**	2,248	0.62	3856	**1.07**	2287	0.64
20	Central Ave On	On-Ramp	1	1,091	0.73	1,094	**0.73**	1091	**0.73**	1112	**0.74**
20	Central Ave Off	Off-Ramp	1	784	0.52	976	0.65	784	0.52	992	0.66
26	Imperial Hwy On	On-Ramp	1	1,535	**1.02**	1,195	**0.80**	1535	**1.02**	1215	**0.81**
2	Imperial Hwy Off	Off-Ramp	1	1,010	0.67	1,107	**0.74**	1010	0.67	1126	**0.75**
29	Long Beach Blvd On (SB)	On-Ramp	1	868	0.58	677	0.45	868	0.58	689	0.46
29	Long Beach Blvd On (NB)	On-Ramp	1	597	0.40	413	0.28	597	0.40	421	0.28
29	Long Beach Blvd Off	Off-Ramp	1	1,156	**0.77**	1,340	**0.89**	1156	**0.77**	1363	**0.91**
-	I-710 Fwy-Fwy On (NB)	On-Ramp	1	2,269	**1.26**	1,676	**0.93**	2269	**1.26**	1705	**0.95**

Table 5-69: I-105 Westbound Freeway Ramp Conditions—Alternatives 3 (2027 & 2047) (continued)

Int. #	Location	Type	No. of Ramp Lanes	2027 Build (Alternative 3)				2047 Build (Alternative 3)			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Vol	V/C	Vol	V/C	Vol	V/C	Vol	V/C
-	I-710 Fwy-Fwy On (SB)	On-Ramp	2	855	0.24	1,063	0.30	855	0.24	1081	0.30
31	Garfield Ave On	On-Ramp	2	932	0.31	665	0.22	932	0.31	665	0.22
-	I-710 Fwy-Fwy (NB & SB)	Off-Ramp	2	3,424	**0.95**	2,864	**0.80**	3424	**0.95**	2864	**0.80**
35	Paramount Blvd Off	Off-Ramp	1	592	0.39	671	0.45	592	0.39	671	0.45
39	Lakewood Blvd On	On-Ramp	1	703	0.47	1,111	0.74	703	0.47	1111	**0.74**
39	Lakewood Blvd Off	Off-Ramp	1	849	0.57	784	0.52	849	0.57	784	0.52
42	Bellflower Blvd On	On-Ramp	1	624	0.42	640	0.43	624	0.42	640	0.43
42	Bellflower Blvd Off	Off-Ramp	1	1,158	**0.77**	610	0.41	1158	**0.77**	610	0.41
-	I-605 Fwy-Fwy On (NB & SB)	On-Ramp	4	5,968	**0.83**	6,282	**0.87**	5968	**0.83**	6282	**0.87**
48	Imperial Hwy On	On-Ramp	1	625	0.42	411	0.27	625	0.42	411	0.27
-	Hoxie Ave On	On-Ramp	1	105	0.07	97	0.06	105	0.07	97	0.06
-	Hoxie Ave Off	Off-Ramp	1	69	0.05	52	0.03	69	0.05	52	0.03

Source: Traffic Study Report (provided under separate cover)
Notes: Ave = Avenue; Blvd = Boulevard; Fwy = Freeway; GP = General Purpose; Hwy = Highway; I- = Interstate; ML = Managed Lanes; NB = Northbound; SB = Southbound; St = Street
Red and bold denotes LOS E or worse.

The I-105 freeway on and off ramp conditions for Alternatives 3 for the future year 2047 are summarized in Table 5-70 and Table 5-71. Most of the ramp locations have forecasted volumes that are within the available capacities. In addition to the six ramps with demand exceeding capacity in the 2027 conditions, there is one additional ramp in the eastbound direction, and two additional ramps in the westbound direction that are forecast to have oversaturated condition in 2047.

Queuing analysis was performed at the off-ramp terminals using Synchro to determine the queues based on the intersection analysis. Table 5-70 and Table 5-71 include the approximate ramp length and the 95th percentile queue length as reported in the output files for the longest queue and the corresponding movement. As shown, Alternative 3 has seven off-ramps in the westbound direction exceeding turn bay storage capacity during the AM peak hour and eight off-ramps in the eastbound direction for the PM peak hour in 2027. However, this may only occur approximately 5 percent of the time as 95 percent of the time, lower volumes will allow the queue to dissipate. None of the locations has queuing extending the length of the ramp.

Table 5-70: I-105 Eastbound Freeway Off-Ramp Queueing—Alternatives 3 (2027 & 2047)

Int. #	Ramp Location	Ramp Length (ft)	2027 Build (Alternative 3)		2047 Build (Alternative 3)	
			95% Queue Length (ft) AM	95% Queue Length (ft) PM	95% Queue Length (ft) AM	95% Queue Length (ft) PM
9	Prairie Ave Off	2,589	176 (Left)	#593 (Thru)	#163 (Thru)	#575 (Thru)
11	Crenshaw Blvd / 120th St Off	1,827	#535 (Left)	#315 (Left)	#506 (Left)	#319 (Left)
17	Vermont Ave Off	1,149	#313 (Thru)	358 (Thru)	#369 (Thru)	#474 (Thru)
21	Central Ave Off	1,690	#569 (Left)	369 (Thru)	#560 (Left)	#596 (Thru)
24	Wilmington Ave Off	1,830	#457 (Left)	#401 (Left)	#407 (Left)	#413 (Left)
30	Long Beach Blvd Off	1,501	#308 (Thru)	#189 (Thru)	#330 (Thru)	#163 (Left)
32	Garfield Ave Off	3,061	#449 (Right)	#354 (Thru)	#469 (Right)	#365 (Thru)
39	Lakewood Blvd Off	1,682	#721 (Left)	#426 (Left)	#700 (Left)	#425 (Left)
43	Bellflower Blvd Off	1,878	443 (Thru)	#398 (Thru)	438 (Thru)	#406 (Thru)
48	Studebaker Rd Off	572	#285 (Left)	#556 (Right)	#315 (Right)	#617 (Right)

Source: Traffic Study Report (provided under separate cover)
Note: # 95th percentile volume exceeds capacity of the storage bay, which could potentially block other movements.
Ave = Avenue; Blvd = Boulevard; ft = feet; I- = Interstate; Rd = Road; St = Street

Table 5-71: I-105 Westbound Freeway Off-Ramp Queueing—Alternatives 3 (2027 & 2047)

Int. #	Ramp Location	Ramp Length (ft)	2027 Build (Alternative 3)		2047 Build (Alternative 3)	
			95% Queue Length (ft) AM	95% Queue Length (ft) PM	95% Queue Length (ft) AM	95% Queue Length (ft) PM
1	Sepulveda Blvd Off (NB)	1,740	#1389 (Thru)	#1001 (Thru)	#1378 (Thru)	#999 (Thru)
4	Imperial Hwy Off	1,576	509 (Left)	202 (Left)	474 (Left)	197 (Left)
6	Hawthorne Blvd Off	4,107	234 (Left)	282 (Left)	242 (Left)	273 (Left)
9	Prairie Ave Off	3,054	176 (Left)	#593 (Thru)	#163 (Thru)	#575 (Thru)
13	Crenshaw Blvd Off	1,802	416 (Thru)	#719 (Thru)	379 (Thru)	#695 (Thru)
16	Vermont Ave Off	1,266	#562 (Thru)	#347 (Thru)	#594 (Thru)	#340 (Thru)
20	Central Ave Off	1,058	#312 (Thru)	#328 (Thru)	#348 (Thru)	#307 (Thru)
26	Imperial Hwy Off	996	#515 (Left)	#468 (Thru)	#471 (Left)	#455 (Thru)
29	Long Beach Blvd Off	1,663	#289 (Thru)	#291 (Thru)	#282 (Thru)	#298 (Thru)
35	Paramount Blvd Off	1,182	#393 (Thru)	267 (Thru)	#370 (Thru)	246 (Thru)
39	Lakewood Blvd Off	1,688	#709 (Thru)	#484 (Thru)	#650 (Thru)	#443 (Thru)
42	Bellflower Blvd Off	1,270	315 (Left)	157 (Left)	293 (Left)	#163 (Left)

Source: Traffic Study Report (provided under separate cover)
Note: # 95th percentile volume exceeds capacity of the storage bay, which could potentially block other movements.
Ave = Avenue; Blvd = Boulevard; ft = feet; Hwy = Highway; NB = Northbound; Rd = Road; St = Street

Intersections

The peak hour performance results for the study area ramp termini and adjacent arterial intersections for 2027 and 2047 Build Alternatives 3 are summarized in Table 5-72 and Table 5-73. In 2027, Alternative 3 is expected to have 11 analyzed intersections at LOS E or worse in 2027, one (1) fewer than Alternative 1. During the PM peak hour, Alternative 3 is expected to have 12 analyzed intersections at LOS E or worse in 2027, three fewer than Alternative 1.

In 2047, half of the study intersections are forecasted to have LOS D or worse. Between 2027 and 2047, Alternative 3 is forecasted to decrease the number of intersections with LOS D or worse from 26 to 25 during the AM peak period and increased from 31 to 32 intersections during the PM peak period.

Table 5-72: AM Peak Hour Study Intersection Performance—Alternatives 3 (2027 & 2047)

Location #	Intersection Description	2027 Build (Alternative 3)		2047 Build (Alternative 3)	
		LOS	Delay (sec)	LOS	Delay (sec)
1	I-105 WB Off-Ramp / NB Sepulveda Blvd	**F**	**120.7**	**F**	**121.2**
2	Sepulveda Blvd / Imperial Hwy	D	49.4	D	46.4
3	Aviation Blvd / Imperial Hwy	**E**	**61.5**	**E**	**66.9**
4	I-105 WB Off- & I-105 EB On-Ramp / Imperial Hwy	C	28.2	C	27.5
5	La Cienega Blvd / Imperial Hwy	D	35.8	C	34.8
6	Hawthorne Blvd /I-105 WB Off-Ramp	B	16.8	B	17
7	Hawthorne Blvd /Imperial Hwy	C	28.6	C	29.1
8	I-105 EB On-Ramp / Imperial Hwy (Freeman)	C	27.2	C	26.7
9	Prairie Avenue / I-105 WB Off-Ramp	B	19.4	B	19.4
10	Prairie Ave / Imperial Hwy	**F**	**86.1**	**F**	**85.8**
11	I-105 EB Ramps / 120th St	**E**	**70.9**	D	53.4
12	Crenshaw Blvd / Imperial Hwy	D	38.8	D	42.1
13	Crenshaw Blvd / I-105 WB Off-Ramp	C	30.8	C	28.7
14	Crenshaw Blvd / 120th St	D	48.8	D	52.1
15	Vermont Ave / Imperial Hwy	**E**	**55.1**	**E**	**55.8**
16	Vermont Ave / I-105 WB Ramps	D	48.3	D	51.6
17	Vermont Ave / I-105 EB Off-Ramp	C	24.4	C	27.1
18	Vermont Ave / 120th St	C	24.0	C	25.2
19	Central Ave / Imperial Hwy	**E**	**63.0**	**E**	**58.7**
20	Central Ave / I-105 WB Ramps	C	27.1	C	29.3
21	Central Ave / I-105 EB Ramps	C	31.6	C	30.9
22	Central Ave / 120th St	D	36.4	D	37.7
23	Wilmington Ave / Imperial Hwy	B	17.6	B	17.7

Table 5-72: AM Peak Hour Study Intersection Performance—Alternatives 3 (2027 & 2047) (continued)

Location #	Intersection Description	2027 Build (Alternative 3)		2047 Build (Alternative 3)	
		LOS	Delay (sec)	LOS	Delay (sec)
24	Wilmington Ave / I-105 EB Ramps	D	45.1	**E**	**63**
25	Wilmington Ave / East 120th St	C	21.2	C	21.6
26	I-105 WB Ramps / Imperial Hwy	**F**	**368.3**	**F**	**307.5**
27	Mona Blvd / Imperial Hwy	**E**	**75.8**	**F**	**85.7**
28	Long Beach Blvd / Imperial Hwy	D	43.5	D	54.5
29	Long Beach Blvd / I-105 WB Off-Ramp	B	19.8	B	19.4
30	Long Beach Blvd / I-105 EB Off-Ramp	C	25.9	C	26.1
31	Garfield Ave / I-105 WB On-Ramp	C	24.5	C	25.7
32	Garfield Ave / I-105 EB Off-Ramp	D	40.0	D	41
33	Garfield Ave / Rosecrans Ave	D	53.4	D	53.4
34	Paramount Blvd / Imperial Hwy	C	29.4	C	30.7
35	Paramount Blvd / I-105 WB Off-Ramp	C	32.3	C	29.6
36	Paramount Blvd / I-105 EB On-Ramp	C	23.2	C	28.4
37	Paramount Blvd / Rosecrans Ave	D	52.8	D	54
38	Lakewood Blvd / Imperial Hwy	C	24.3	C	24
39	Lakewood Blvd / I-105 EB Off-Ramp & WB Ramps	**F**	**265.1**	**F**	**236.4**
40	Lakewood Blvd / Rosecrans Ave	C	27.4	C	27.7
41	Bellflower Blvd / Imperial Hwy	C	28.3	C	28.1
42	Bellflower Blvd / I-105 WB Ramps	C	33.5	C	33.8
43	Bellflower Blvd / I-105 EB Ramps	C	33.6	C	32.7
44	Bellflower Blvd / Rosecrans Ave	D	37.2	D	39.5
45	Woodruff Ave / Imperial Hwy	D	37.5	D	38.7
46	Hoxie Ave / Imperial Hwy	D	36.4	D	38.4
47	Studebaker Rd / Imperial Hwy	**E**	**77.1**	**E**	**79.2**
48	Studebaker Rd / I-105 WB On-Ramp & EB Off-Ramp	**F**	**98.6**	**F**	**235.3**
49	Studebaker Rd / Rosecrans Ave	D	42.3	D	48.3

Source: Traffic Study Report (provided under separate cover)
Notes: Ave = Avenue; Blvd = Boulevard; EB = Eastbound; Hwy = Highway; I- = Interstate; LOS = Level of Service; NB = Northbound; Rd = Road; sec = second; St = Street; WB = Westbound
Red and bold denotes LOS E or worse.

Table 5-73: PM Peak Hour Study Intersection Performance—Alternatives 3 (2027 & 2047)

Location #	Intersection Description	2027 Build (Alternative 3)		2047 Build (Alternative 3)	
		LOS	Delay (sec)	LOS	Delay (sec)
1	I-105 WB Off-Ramp / NB Sepulveda Blvd	D	53.6	D	52.3
2	Sepulveda Blvd / Imperial Hwy	**F**	**94.7**	**F**	**122**
3	Aviation Blvd / Imperial Hwy	**E**	**64.4**	**F**	**116.5**
4	I-105 WB Off- & I-105 EB On-Ramp / Imperial Hwy	B	11.5	B	10.2
5	La Cienega Blvd / Imperial Hwy	D	43.8	D	44.2
6	Hawthorne Blvd / I-105 WB Off-Ramp	B	18.1	B	17.7
7	Hawthorne Blvd / Imperial Hwy	D	46.1	**E**	**61.3**
8	I-105 EB On-Ramp / Imperial Hwy (Freeman)	**E**	**60.0**	**E**	**73.3**
9	Prairie Ave / I-105 WB Off-Ramp	D	38.0	D	38.2
10	Prairie Ave / Imperial Hwy	**F**	**168.2**	**F**	**168.9**
11	I-105 EB Ramps / 120th St	**E**	**56.9**	**E**	**61.3**
12	Crenshaw Blvd / Imperial Hwy	D	46.6	D	47.5
13	Crenshaw Blvd / I-105 WB Off-Ramp	D	40.1	D	38.5
14	Crenshaw Blvd / 120th St	**E**	**55.4**	**E**	**57.1**
15	Vermont Ave / Imperial Hwy	D	48.1	**E**	**75.7**
16	Vermont Ave / I-105 WB Ramps	B	18.3	B	17
17	Vermont Ave / I-105 EB Off-Ramp	C	24.7	C	26.2
18	Vermont Ave / 120th St	C	24.5	C	28.1
19	Central Ave / Imperial Hwy	D	49.4	**E**	**58.4**
20	Central Ave / I-105 WB Ramps	C	24.7	C	26
21	Central Ave / I-105 EB Ramps	C	22.8	D	49.7
22	Central Ave / 120th St	D	41.1	D	47.2
23	Wilmington Ave / Imperial Hwy	C	24.1	C	25.7
24	Wilmington Ave / I-105 EB Ramps	D	42.9	D	44.4
25	Wilmington Ave / East 120th St	B	17.2	B	17.9
26	I-105 WB Ramps / Imperial Hwy	**F**	**141.9**	**F**	**151.3**
27	Mona Blvd / Imperial Hwy	**F**	**88.6**	**F**	**107.5**
28	Long Beach Blvd / Imperial Hwy	D	39.3	D	44.4
29	Long Beach Blvd / I-105 WB Off-Ramp	C	23.1	C	23.6
30	Long Beach Blvd / I-105 EB Off-Ramp	B	19.0	B	18.9
31	Garfield Ave / I-105 WB On-Ramp	C	22.7	C	23.9
32	Garfield Ave / I-105 EB Off-Ramp	D	47.1	D	46.8
33	Garfield Ave / Rosecrans Ave	D	47.6	D	49.1

Table 5-73: PM Peak Hour Study Intersection Performance—Alternatives 3 (2027 & 2047) (continued)

Location #	Intersection Description	2027 Build (Alternative 3)		2047 Build (Alternative 3)	
		LOS	Delay (sec)	LOS	Delay (sec)
34	Paramount Blvd / Imperial Hwy	D	37.0	D	37.9
35	Paramount Blvd / I-105 WB Off-Ramp	C	20.9	C	20.2
36	Paramount Blvd / I-105 EB On-Ramp	C	24.0	C	24.1
37	Paramount Blvd / Rosecrans Ave	D	53.8	D	54.3
38	Lakewood Blvd / Imperial Hwy	C	32.5	C	35.5
39	Lakewood Blvd / I-105 EB Off-Ramp & WB Ramps	**F**	**97.2**	**F**	**96.7**
40	Lakewood Blvd / Rosecrans Ave	D	49.1	D	49.1
41	Bellflower Blvd / Imperial Hwy	C	27.4	C	27.8
42	Bellflower Blvd / I-105 WB Ramps	B	18.6	B	19
43	Bellflower Blvd / I-105 EB Ramps	D	37.6	D	38.4
44	Bellflower Blvd / Rosecrans Ave	C	30.8	C	30.8
45	Woodruff Ave / Imperial Hwy	D	53.6	D	54
46	Hoxie Ave / Imperial Hwy	**E**	**57.8**	**E**	**57.1**
47	Studebaker Rd / Imperial Hwy	**E**	**62.0**	D	54.7
48	Studebaker Rd / I-105 WB On-Ramp & EB Off-Ramp	**F**	**135.5**	**F**	**239.9**
49	Studebaker Rd / Rosecrans Ave	D	50.5	D	50.7

Source: Traffic Study Report (provided under separate cover)
Notes: Ave = Avenue; Blvd = Boulevard; EB = Eastbound; Hwy = Highway; I- = Interstate; LOS = Level of Service; NB = Northbound; Rd = Road; sec = second; St = Street; WB = Westbound
Red and bold denotes LOS E or worse.

In accordance with Caltrans Division of Traffic Operations Directive (13-02), a Step One Intersection Control Evaluation (ICE) was prepared. The purpose of the ICE is to assess intersections that are being geometrically impacted by the build scenario (Alternative 3) and ramps projected to operate at LOS D or worse in the 2047 No-Build Alternative 1 scenario. One intersection was identified as being geometrically impacted: the I-105 Eastbound at Central Avenue and six ramps are projected to operate at LOS D or worse in the 2047 No-Build Alternative 1 scenario: I-105 Eastbound On-Ramp/Imperial Highway; I-105 Eastbound On- and Off-Ramps/120th Street; I-105 Westbound On- and Off-Ramps/Imperial Highway, I-105 Eastbound On- and Off-Ramps/Wilmington Avenue; I-105 Eastbound and Westbound On- and Off-Ramps/Lakewood Boulevard; and the I-105 terminus at Studebaker Road. These may impact future operations, making conditions worse with implementation of the Build Alternative 3 scenario. Per the Caltrans ICE screening process, three intersection traffic control systems/strategies were evaluated: Yield (roundabouts), Stop (Minor Leg or Multi-Way), and Signalization. The ICE analysis determined that no intersection control strategies, other than signalized intersection, are viable except at the I-105 eastbound ramps/Wilmington Avenue and the I-105

terminus/Studebaker Road. At these two locations, a multilane (two-lane) roundabout could be operationally feasible. Therefore, additional analysis was conducted to determine the costs, benefits, and impacts of a roundabout. This analysis concluded that a roundabout would not be feasible at the I-105 eastbound ramps/Wilmington Avenue due to low cost benefit ratio and significant right of way impacts. At the coordination meeting with Caltrans, Metro, and City of Norwalk on December 23, 2019, City of Norwalk staff expressed their preference for the signal synchronization/lane reconfiguration improvement alternative at the I-105 terminus/Studebaker Road and not the roundabout improvement option primarily due to the significant right-of-way impact of the roundabout. As a result, the roundabout concept at I-105 Terminus/Studebaker Road was dropped from further consideration.

As a result, potential operational improvements at these eight locations focused on traffic signal improvements to mitigate adverse impacts (Table 7-1). The signal improvements at all eight locations will be implemented as part of the Project by Metro and Caltrans, in coordination with the respective local jurisdictions. In addition, it has been determined these signal improvements will not have any adverse impact to the adjacent arterial intersections within the study limits.

Cost Estimates

Estimated costs associated with this alternative include support cost, capital construction (roadway and structure) cost, and right-of-way cost, totaling $585 million ($764 million escalated); for a breakdown of costs, refer to Attachment D.

Common Proposed Engineering Features for All Build Alternatives

Tolled Components

The Project will require both tolling infrastructure and clearly defined business rules. The framework for these requirements is specified in the Draft ConOps plan and T&R Study, which are being prepared concurrently in support of the Project and are scheduled to be completed in mid-2020 (Draft). The following subsections provide a summary of toll concepts being developed. Business rules for the corridor have yet to be determined.

Toll Infrastructure

Ingress/Egress (Enter/Exit) access points are being considered at designated locations, as depicted on the Layouts in Attachment C and noted in Table 5-74.

At access points, a weaving lane between the No. 1 ExpressLane (Alternative 2) or the No. 2 ExpressLane (Alternative 3) and the No. 1 general purpose lanes is proposed at ingress/egress locations to provide a dedicated lane for speed adjustments between the high speed through traffic in the ExpressLanes and the slower speed of the general purpose lanes during heavily congested peak periods. In one location (along Eastbound I-105 near Western Avenue Overcrossing), a weave lane has been identified to not be feasible and a weave zone will be provided. A weave lane is not feasible in this location due to the need to widen the freeway to accommodate the weave lane and the impact of that widening to the rail crossing structure at Western Avenue. Additionally, in two locations (one at each end of the Project), weave lanes were identified as not necessary; these are locations where

the additional HOT lane is being introduced and the primary movement would be the ingress of vehicles into the ExpressLanes or the HOT lane is ending and the primary movement is egress. The ExpressLanes are anticipated to be buffer-separated from the general purpose lanes via double white striping. Channelizers will also be analyzed and considered for implementation throughout the corridor to prevent drivers from illegally weaving in and out of the lanes.

The Project would incorporate various toll infrastructure including toll gantries with transponder readers and high-speed digital cameras to verify transactions, read license plates, and automatically collect tolls from customers as part of an electronic toll collection (ETC) program; signage approaching ExpressLanes ingress/egress points including variable message signs indicating the current tolls; complete closed-circuit television coverage of the entire Express Facility to provide security and video surveillance for tolling equipment and to enable quick response to breakdowns and other incidents; power service; and fiber optics linking the electronic infrastructure to a centralized toll operations office. Toll gantries would be spaced within one-half mile of the ingress locations and are depicted on the Layouts in Attachment C.

Table 5-74: Ingress/Egress Locations within the Project Limits

	Location	Existing				Alternative 2				Alternative 3			
		Ingress	Egress	Post Mile	Length (feet)	Ingress	Egress	Post Mile	Length (feet)	Ingress	Egress	Post Mile	Length (feet)
Eastbound	Between Aviation Blvd & La Cienega Blvd	X		1.89	3,210	X		1.67	3,583	X		1.89	3,130
	Between Hawthorne Blvd OC & Imperial Hwy OC	X	X	3.16	1,590	X	X	2.93	2,000	X		3.16	2,000
	Between Vann Ness Ave OC & Western Ave OC	X	X	5.42	1,610	X	X	5.19	2,000	X*	X*	5.4	2,000
	E105-N110 HOV Connector Ramp		X	6.76	280		X	6.76	280		X	6.79	1,000
	S110-E105 HOV Connector Ramp	X		7.76	280	X		7.76	280	X		7.74	1,000
	Between Wadsworth Ave UC & Success Ave UC	X	X	8.84	1,300	X	X	8.56	2,000	X	X	8.67	2,000
	Long Beach Blvd	X	X	11.38	1,285	X	X	11.25	2,000	X	X	11.35	2,000
	Between Paramount Blvd OC & Downey Ave OC	X	X	14.71	1,600	X	X	14.56	2,000	X	X	14.71	2,000
	Between Bellflower Blvd & Dunrobin Ave	X		17.27	270	X	X	16.29	2,000		X	16.8	140
	Park-and-Ride Lot Off-Ramp		X	17.63	240		X	17.63	240		X	17.63	240
	Hoxie Ave On-Ramp	X		17.99	0	X		17.99	0	X		17.99	0
	End Freeway		X	18.1	0		X	18.1	0		X	18.1	0

Table 5-74: Ingress/Egress Locations within the Project Limits (continued)

	Location	Existing				Alternative 2				Alternative 3			
		Ingress	Egress	Post Mile	Length (feet)	Ingress	Egress	Post Mile	Length (feet)	Ingress	Egress	Post Mile	Length (feet)
Westbound	Begin Freeway	X		18.1	0	X		18.1	0	X		18.1	0
	Hoxie Ave Off-Ramp		X	18.02	160		X	18.02	160		X	18.02	160
	Between Hoxie On-Ramp & NB/SB I-605 On-Ramp	X	X	17.84	1,820	X	X	17.84	1,820	X		17.84	2,380
	Between Dunrobin Ave OC & Ardis Ave OC	X	X	16.77	1,560	X	X	16.74	2,000	X		16.89	2,000
	Between Harris Ave UC & Bullis Rd UC	X	X	12.5	1,690	X	X	12.65	2,000	X	X	12.55	2,000
	Between Success Ave UC & Stanford Ave UC	X	X	9.04	1,630	X	X	8.96	2,000	X	X	9.14	2,000
	S110-W105 HOV Connector Ramp	X		6.96	730	X		6.96	730	X		8.12	1,000
	W105-N110 HOV Connector Ramp		X	6.82	730		X	6.82	730		X	6.98	1,000
	Between S Normandie Ave OC & w/o Western Ave OC	X	X	6.02	1,550	X	X	5.96	2,000	X	X	6.4	2,000
	Between Prairie Ave Off-Ramp & Hawthorne Blvd OC	X	X	3.4	1,630	X*	X*	3.61	2,000		X		
	Between Imperial Hwy OC & Hawthorne Blvd OC		X	3.22	0		X	3.22	0		X	3.22	0
	Between La Cienega Blvd & Imperial Hwy UC		X	2.41	0		X	2.41	0			2.33	0

Notes: *No weave lane.
Ave = Avenue; Blvd = Boulevard; E = East; HOV = High Occupancy Vehicle; Hwy = Highway; I- = Interstate; N = North; NB = Northbound; Rd = Road; OC = Overcrossing; S = South; SB = Southbound; UC = Undercrossing

The placement of Maintenance Vehicle Pullouts (MVPs) are being considered at designated locations, as depicted on the Layouts in Attachment C and noted in Table 5-75, where there is available right-of-way. MVPs were provided where there is a need for access to Toll Gantry and Changeable Message Signs (CMS) features. Where available, California Highway Patrol (CHP) areas (Table 5-76: CHP Enforcement Areas/Observation Areas within the Project Limits) will be utilized as an MVP. The exact locations would be determined during final design but would be within the Project footprint analyzed in the environmental documents.

Chapter 2G of the California Manual on Uniform Traffic Control Devices (CAMUTCD) (2014 Edition) was as a basis for sign placement and sign type for the ExpressLanes facilities that will be created as part of the Project. Various tolling sign types include, but may not be limited to E8-2, E8-3, R3-48, R3-44, G86<CA>, and CMS. All sign types will be modified to better conform to FasTrak and other tolling sign design needs.

Impacted existing signs for the Project will primarily be existing carpool signage that will either need to be removed or modified under the Project's conversion of the HOV system to an ExpressLanes system. Additionally, existing signage related to the I-110 ExpressLanes connection will be modified or replaced to conform to CAMUTCD spacing and design guidelines.

Table 5-75: MVP Locations within the Project Limits

Post Mile	MVP Type	Westbound (Left)	Eastbound (Right)
R002.47	CMS		X
R002.72	Toll Gantries		X
R002.92	CMS		X
R004.01	Toll Gantries*		X
R004.60	CMS		X
R005.21	CMS		X
R005.38	Toll Gantries*	X	
R005.89	Toll Gantries		X
R006.07	Toll Gantries	X	
R006.27	CMS	X	
R006.79	CMS	X	X
R007.12	Toll Gantries		X
R007.65	Toll Gantries		X
R007.87	Toll Gantries	X	
R007.90	CMS*		X
R008.22	Toll Gantries*	X	
R008.51	CMS*		X
R009.33	CMS*	X	
R010.05	Toll Gantries		X
R011.18	CMS*		X

Table 5-75: MVP Locations within the Project Limits (continued)

Post Mile	MVP Type	Westbound (Left)	Eastbound (Right)
R012.61	Toll Gantries		X
R012.81	CMS*	X	
R013.29	CMS	X	
R014.06	CMS		X
R014.59	CMS		X
R015.20	Toll Gantries*		X
R017.09	CMS*	X	
R017.27	Toll Gantries	X	
R017.62	CMS	X	

Notes: * California Highway Patrol areas utilized as MVPs.
CMS = Changeable Message Sign; MVP = Maintenance Vehicle Pullouts

Toll Operations Policies

The ExpressLanes would require single occupant vehicles to pay a toll. The objective is to open the tolled ExpressLanes with some level of HOV occupancy free to encourage rideshine and transit usage. Operational adjustments to the tolled ExpressLanes may be implemented based on demand, rates of speed, traffic volumes, and to meet financial covenants, maintenance, and operational obligations. Potential operational adjustments include but are not limited to: adjusting to HOV3+ free with HOV2 discounted tolls; adjusting to HOV3+ free with HOV2s full tolls; adjusting to tolling HOV2s on individual tolling segments, such as direct connectors to or from other freeways; and periodic adjustments of tolling rates to maintain operations on individual tolling segments. This will be determined based on the T&R analysis, input from public, and Metro business rules. Caltrans has the authority to set the occupancy policy on the I-105 ExpressLanes. Adopted occupancy requirement decisions, will be included in the I-105 ConOps plan (Final).

Current key Metro business rules include: toll free travel for vehicles that meet minimum vehicle occupancy requirements, motorcycles, and buses; qualifying carpools would continue to be able to access the lanes without a charge; trucks, other than 2-axle light duty trucks, would not be allowed; a toll range of $0.35-$2.10 during peak periods as of January 2020; toll/transit credits available to frequent ExpressLanes transit riders; tolling will revert to HOV only use (i.e., no toll users will be permitted to enter the ExpressLanes) when travel speeds in the ExpressLanes fall below 45 miles per hour; emergency vehicles may use the ExpressLanes toll free when responding to incidents; qualifying Clean Air Vehicles would be given a 15-percent toll discount; and a Low Income Assistance Plan would be available to persons earning less than twice the Federal poverty level.

Toll Operations and Maintenance

At this time, a process is in place to develop a formal maintenance plan as part of the Caltrans and FHWA systems engineering process; initial assumptions are currently under

development as part of the I-105 ConOps plan. It is anticipated that Caltrans will maintain the physical infrastructure, such as pavement, striping, and median barriers, as well as perform general maintenance, such as trash and graffiti removal, paid for from toll revenues. It is anticipated that Metro will manage the tolling infrastructure[2], customer service centers, and other back-office support facilities.

Toll Revenue/Pricing Structure

Dynamic pricing is being analyzed for its application on the Project. Toll rates would be set in response to vehicle demand and would be adjusted as necessary to regulate volume in the ExpressLanes to maintain traffic flow at a predetermined LOS. Estimated toll rates and potential toll revenue will be reflected in the T&R Study.

The pricing structure and details will be evaluated further during final design. No tolling amount or pricing decisions have been made at this time.

Toll Collection

The I-105 Express Facility is expected to use an all-electronic toll collection system and would not accept cash or credit card payment on the facility. This would eliminate the need for customers to stop and pay tolls at traditional tollbooths. The electronic toll collection system would require customers to have pre-paid accounts with a tolling agency and mount a non-stop Automated Vehicle Identification transponder or toll tag on the windshield of a registered vehicle. Tolls would be collected electronically by reading the transponder at highway speeds.

In 2020, Metro began a pilot program to allow license plate based tolling known as "Pay as you Go". Under Pay as you Go, vehicles are allowed to use the ExpressLanes without a transponder. However, vehicles without a transponder will be charged a processing fee of $4 per trip in addition to the toll cost. Furthermore, vehicles without a transponder are ineligible for occupancy discounts (i.e. HOV2+ or HOV3+ free). To receive a discount for HOV status, vehicles must have a transponder equipped with a switch that motorists would utilize to declare their vehicle occupancy. Failure to use a transponder would also be a toll violation. Digital imagery of vehicles passing a toll gantry without a transponder would be collected. The digital images would be used to determine the license plate number of the vehicle without a transponder. Through coordination with license plate records of the Department of Motor Vehicles, toll violation notices would be mailed to vehicle owners to collect both the unpaid toll and a toll violation penalty ($4 per trip).

Toll Enforcement

Toll enforcement is an essential element of any successful ExpressLane system, ensuring that traffic laws are enforced, customers are charged the appropriate toll based on vehicle occupancy, and that toll evasion is minimized. Toll enforcement would be accomplished through CHP patrols, electronic systems, and facility design. The CHP is anticipated to be contracted to conduct routine and supplemental enforcement services on the I-105 Express Facility including toll infractions, HOV eligibility occupancy infractions, buffer crossing infractions, and speeding and other moving violations. Toll violations are currently

enforced through both visual observation by the CHP and the ETC system. The ETC system is intended to both identify vehicles that do not have a transponder as well as the declared transponder switch setting. The CHP currently provides enforcement on all of the toll roads in southern California under several different institutional arrangements.

California Highway Patrol Enforcement Areas/Observation Areas

Currently, there are existing CHP Enforcement Areas/Observation Areas along I-105 within the Project Limits. Existing and proposed CHP Enforcement Areas/Observation Areas are identified in Table 5-76: CHP Enforcement Areas/Observation Areas within the Project Limits, and shown on the Layouts (Attachment C).

CHP Observation Areas (typically 14-feet wide, 1000-feet long, preceded by a 115:1 taper, and followed by a 115:1 taper) have been incorporated into the Build Alternatives near the existing Metro Green Line LRT maintenance gates in efforts to minimize the need for additional mainline widening. Where the observation areas do not meet all of the typical dimensions due to limited space for widening, the minimum length provided will be 700-feet. The CHP Observation Areas are ideally located downstream of the access points to provide opportunities for CHP to observe the ExpressLanes operation, use, and potential violations.

CHP Enforcement Areas along the mainline are not proposed as part of the Project. .

Table 5-76: CHP Enforcement Areas/Observation Areas within the Project Limits

Existing / Proposed	CHP Zone Type	Post Mile (Approx.)	Westbound (Left)	Eastbound (Right)	Outside Shoulder	Inside Shoulder/ Median
Modified Existing	Observation	R002.94	X		X	
Proposed	Observation	R003.07	X			X
Modified Existing	Observation	R003.91	X		X	
Modified Existing	Enforcement/MVP	R004.01		X	X	
Existing	Observation/MVP	R005.38	X		X	
Existing	Observation	R005.41		X	X	
Existing	Observation	R005.84	X		X	
Proposed	Observation	R005.92		X		X
Modified Existing	Observation	R006.08	X		X	
Existing	Observation	R006.40		X	X	
Existing	Observation	R006.62	X	X	X	
Modified Existing	Observation	R006.66		X	X	
Existing	Enforcement/MVP	R007.15	X		X	
Modified Existing	Observation/MVP	R007.90		X	X	
Modified Existing	Observation	R008.00	X		X	
Modified Existing	Observation	R008.09		X	X	

Table 5-76: CHP Enforcement Areas/Observation Areas within the Project Limits (continued)

Existing / Proposed	CHP Zone Type	Post Mile (Approx.)	Westbound (Left)	Eastbound (Right)	Outside Shoulder	Inside Shoulder/ Median
Modified Existing	Observation/MVP	R008.22	X		X	
Modified Existing	Observation/MVP	R008.51		X	X	
Modified Existing	Observation	R009.32		X	X	
Modified Existing	Observation/MVP	R009.33	X		X	
Proposed	Observation	R010.03		X		X
Proposed	Observation	R010.05		X	X	
Proposed	Observation	R011.03	X			X
Modified Existing	Observation/MVP	R011.18		X	X	
Modified Existing	Observation	R011.70	X		X	
Modified Existing	Observation	R012.18		X	X	
Modified Existing	Observation	R012.36		X	X	
Proposed	Observation	R012.69		X		X
Modified Existing	Observation	R012.74		X	X	
Proposed	Observation	R014.08		X	X	
Modified Existing	Observation	R014.60		X	X	
Existing	Observation	R014.75	X		X	
Proposed	Observation	R015.16		X		X
Modified Existing	Observation/MVP	R015.20		X	X	
Modified Existing	Observation	R015.21	X		X	
Proposed	Observation	R015.28	X			X
Existing	Observation	R016.06		X	X	
Modified Existing	Observation	R016.23	X		X	
Modified Existing	Observation	R017.09		X	X	
Existing	Observation	R017.09	X		X	

Notes: CHP = California Highway Patrol; MVP = Maintenance Vehicle Pullouts

Coordination with the CHP is on-going. Enforcement Plans for the I-105 ExpressLanes operations will be developed jointly with Caltrans, Metro, and the CHP.

Clean Air Vehicle Strategies

Previously, all Clean Air Vehicles (CAVs) were toll-exempt on ExpressLanes. Under Section 21655.9, during periods of peak congestion, Metro can suspend the access privileges for vehicles issued distinctive decals, labels, or other identifiers pursuant to Section 5205.5, if a periodic review of lane performance discloses that the lane exceeds a LOS C and operation or projected operation of vehicles in a portion of the lane will significantly increase congestion. On April 26, 2018, the Metro Board of Directors approved a new policy which offers previously exempt CAVs that are Single Occupant

Vehicles a 15-percent toll discount, replacing the prior policy of free access. This policy took effect on March 1, 2019. CAVs with valid decals and meet the minimum HOV occupancy requirement may continue to use the ExpressLanes without paying a toll. The Project will be operated consistent to these provisions, until such a time that the CAV program expires, or additional action is taken by the Metro Board.

Active Traffic Management Strategies

Caltrans has also studied the implementation of Active Traffic Management strategies that seek to dynamically manage, and control traffic based on prevailing conditions on the I-105. These strategies would complement ExpressLanes operations and potentially include a coordinated ramp metering system, speed harmonization, queue warning, or dynamic re-routing. These strategies will ultimately improve mobility and enhance safety by using real-lime data, technology, and decision support structures for system operators to make informed, performance-driven decisions on how to manage traffic flow.

Transit Facilities

Local transit providers operating within the corridor include: Metro, Los Angeles World Airports (LAX FlyAway), Orange County Transportation Authority (OCTA), Torrance Transit, and Gardena Municipal Bus Lines.

The Metro, Los Angeles World Airports (LAX FlyAway), and OCTA express buses use various segments of I-105, including the existing HOV lanes; there are no stops on the freeway.

Metro, Gardena Municipal bus lines, and Torrance Transit operate local bus services on parallel streets within the corridor.

Metro Green Line LRT corridor in general, runs in the median of I-105 for the majority of the route. Impacts to the Metro Green Line Rail Transit corridor include addition of various tolling equipment to be placed on the existing median barrier. An updated Operations and Maintenance Agreement for the Metro Green Line Rail Transit corridor, previously executed August 12, 1995, will be required between Caltrans and Metro for various transit modifications of the Project (i.e., tolling equipment placed on median barrier).

Metro is currently evaluating the WSAB Transit Corridor Project, a new 19-mile LRT line that would connect downtown Los Angeles with southeast Los Angeles County, impacting I-105 and the surrounding areas. The WSAB Project is currently in the Environmental Impact Statement/Environmental Impact Report (EIR) process. As part of the WSAB Project, the current alignment proposes a new LRT connecting station on the Metro Green Line LRT. The new station would be located at the existing Century Boulevard Underpass Bridge (PM R014.38) and will require reconstruction of approximately 3,000-feet of the barrier separating the Metro Green Line LRT from I-105 traffic. Additionally, the WSAB Project will replace the Century Boulevard Underpass Bridge structure as a new LRT structure and reconstruct the freight structure directly adjacent to the Century Boulevard Underpass Bridge structure.

The WSAB Project will also reconstruct the Façade Avenue Overcrossing (PM R014.34) and Arthur Avenue Utility and Pedestrian Overcrossing (PM R014.43) structures to accommodate

the reconstruction of the median barrier required as part of the new Metro Green Line LRT/WSAB Project platform. An EIR/EIS is currently being prepared that will identify potential environmental impacts for the WSAB Project.

Railroad Facilities

The Union Pacific Railroad (UPRR) runs parallel to the Eastbound I-105, at approximately Post Mile 6.5, between Budlong Avenue and Vermont Avenue, and perpendicular to the I-105 as a railroad overhead, at approximately Post Mile 14.4. No impacts to UPRR facilities are anticipated as part of the Project.

The Alameda Corridor Transportation Authority (ACTA), as part of the Southern Pacific Transportation corridor (Alameda corridor), runs perpendicular to I-105 and Imperial Highway, at approximately Post Mile 10.6, adjacent to Alameda Street. Impacts to the ACTA corridor (Alameda corridor) include modification of existing aerial easement for reconstruction of Imperial Highway to accommodate widening on the westbound side of the Alameda Street Viaduct and the subsequent construction of bents and footings to support the structure widening. No impacts to ACTA facilities are anticipated as part of the Project for Build Alternative 3; facilities to Remain-In-Place. A Construct and Maintenance Agreement for the Alameda corridor will be required between Caltrans and ACTA for various modifications of the Project (e.g., aerial easement for reconstruction of Imperial Highway at Alameda Street).

As part of the WSAB Project, the Century Boulevard Underpass Bridge (PM R014.38) structure will be replaced as a new LRT structure, with the existing freight structure to be reconstructed as a new LRT structure and reconstruct the freight structure directly adjacent to the Century Boulevard Underpass Bridge structure.

Park-and-Ride Facilities

Existing Park-and-Ride facilities are identified in Table 5-77.

No improvements to the existing Park-and-Ride facilities are proposed as part of the Project.

No additional Park-and-Ride facilities are proposed as part of the Project.

The WSAB Project proposes a Park-and-Ride facility located north of I-105, with two parking lots at the corner of Century Boulevard and Industrial Avenue. In total this Park-and-Ride facility is expected to provide 353 parking spaces, including 7 ADA-compliant spaces.

Consultation with the District Park-and-Ride coordinator and Metro Parking Management will be initiated for the “preferred” alternative.

Table 5-77: Existing Park-and-Rides within Project Limits

Post Mile	Metro Green Line LRT Station	Location
1.54/1.66	Aviation/LAX Station	11500 Aviation Blvd Los Angeles, California 90045
2.98/3.04	Hawthorne/Lennox Station (West)	4443 West 111th St Lennox, California 90304
3.06/3.22	Hawthorne/Lennox Station (East)	11191 Larch Ave Lennox, California 90304
4.52/4.71	Crenshaw Station	11901 South Crenshaw Blvd Hawthorne, California 90303
6.67/6.74	Vermont/Athens Station	11603 South Vermont Ave Los Angeles, California 90048
7.28/7.34	Harbor Freeway Station	11500 South Figueroa St Los Angeles, California 90048
8.28/8.45	Avalon Station	11667 South Avalon Blvd Los Angeles, California 90067
9.74/9.83	Willowbrook – Rosa Parks Station*	11611 Willowbrook Ave Los Angeles, California 90059
11.43/11.62	Long Beach Blvd Station	11508 Long Beach Blvd Lynwood, California 90262
15.64/15.80	Lakewood Blvd Station	12801 Lakewood Blvd Downey, California 90242
17.72/17.94	Norwalk Station	12901 Hoxie Ave Norwalk, California 90650

Notes: *Willowbrook – Rosa Parks Station also serves the Metro Blue Line LRT corridor. Ave = Avenue; Blvd = Boulevard; LAX = Los Angeles International Airport; St = Street

Drainage and Water Quality

Receiving water bodies within the Project limits include the Compton Creek; Los Angeles River Reach 2; Los Angeles River Reach 1; Los Angeles River Estuary; Dominguez Channel (lined portion above Vermont Avenue); Dominguez Channel (unlined portion below Vermont Avenue); Los Angeles/Long Beach Inner Harbor; Los Angeles/Long Beach Outer Harbor; and San Pedro Bay Near/Off Shore Zones. Receiving waterbodies that are listed on the Final 2014/2016 Integrated Report Clean Water Act Section 303(d) List (State Water Resources Control Board, 2019) for water quality impairments with required Total Maximum Daily Loads are summarized in Table 5-78.

Table 5-78: Impaired Receiving Water Bodies within the Project Limits

Water Body	Impairment	TMDL Status	
		Being Addressed with USEPA, Approved TMDL	TMDL Required
Los Angeles River Reach 2 (Carson to Figueroa Street)	Trash	X	
	Ammonia	X	
	Nutrients (algae)	X	
	Copper	X	
	Lead	X	
	Indicator Bacteria	X	
	Oil		X
Los Angeles River Reach 1 (Estuary to Carson Street)	Zinc Dissolved	X	
	Cadmium	X	
	Cyanide		X
	pH	X	
	Ammonia	X	
	Nutrients (algae)	X	
	Indicator Bacteria	X	
	Trash	X	
	Lead	X	
	Cooper, Dissolved	X	
Compton Creek	pH	X	
	Lead	X	
	Trash	X	
	Copper	X	
	Indicator Bacteria		X
	Benthic Community Effects		X
	Zinc	X	

Table 5-78: Impaired Receiving Water Bodies within the Project Limits (continued)

Water Body	Impairment	TMDL Status	
		Being Addressed with USEPA, Approved TMDL	TMDL Required
Dominguez Channel Estuary (unlined portion below Vermont Avenue)	Benzo(a)pyrene (3,4-Benzopyrene -7-d)	X	
	PCBs (Polychlorinated biphenyls)	X	
	Pyrene	X	
	Phenanthrene	X	
	Copper	X	
	Chrysene (C1-C4)	X	
	Benzo(a)anthracene	X	
	DDT (tissue & sediment)	X	
	Lead	X	
	Dieldrin (tissue)	X	
	Chlordane (tissue)	X	
	Indicator Bacteria		X
	Benthic Community Effects	X	
	Toxicity	X	
Dominguez Channel (lined portion above Vermont Avenue)	Indicator Bacteria		X
	Zinc	X	
	Copper	X	
	Lead	X	
	Toxicity	X	
Los Angeles River Estuary	DDT (Dichlorodiphenyl-trichloroethane) (sediment)	X	
	Toxicity		X
	Chlordane	X	
	PCBs (Polychlorinated biphenyls) (sediment)		X
	Trash	X	
Los Angeles/Long Beach Inner Harbor	DDT (Dichlorodiphenyltrichloroethane)	X	
	Copper	X	
	Zinc	X	
	PCBs (Polychlorinated biphenyls)	X	
	Benthic Community Effects	X	
	Toxicity	X	
	Chrysene (C1-C4)	X	
	Benzo(a)pyrene (3,4-Benzopyrene -7-d)	X	

Table 5-78: Impaired Receiving Water Bodies within the Project Limits (continued)

Water Body	Impairment	TMDL Status	
		Being Addressed with USEPA, Approved TMDL	TMDL Required
Los Angeles/Long Beach Outer Harbor	PCBs (Polychlorinated biphenyls)	X	
	Toxicity	X	
	DDT (Dichlorodiphenyltrichloroethane)	X	
San Pedro Bay Near/Off Shore Zones	Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)	X	
	PCBs (Polychlorinated biphenyls)	X	
	Chlordane	X	
	PCBs (Polychlorinated biphenyls)	X	

Source: CWA Section 303(d) List of Water Quality Limited Segments, 2019

The *Caltrans' Corridor Stormwater Management Study for I-105 from SR-1 to I-605* (Caltrans, 2013) (provided under separate cover) and the SWDR, developed and completed for the Project as part of the PSR-PDS phase (Caltrans, 2015) (provided under separate cover; Signature Page included in Attachment I), and the *Water Quality Assessment Technical Memorandum,* developed and completed for the Project in conjunction with the Environmental Document (provided under separate cover), have been prepared to accompany this Draft Project Report.

The Project will result in an increase of more than one acre of new impervious surface, therefore, the Project will not meet exemption criteria identified in the *Caltrans Stormwater Quality Handbooks Project Planning and Design Guide* (Caltrans, 2017).

The amount of disturbed soils and post-construction treatment areas associated with the project improvements will be further evaluated for the "preferred" alternative, as identified as part of the SWDR requirements. Alternative 3 is anticipated having the largest footprint of all the alternatives, resulting in the greatest potential to create short-term impacts to water quality.

Drainage management measures would be included in the Project to address the impacts to drainage patterns associated with new construction. Proposed major drainage design features would include: maintaining existing drainage flow patterns and incorporate existing drainage systems to the maximum extent practical; providing drainage facilities that will accommodate future improvements; and providing drainage facilities to prevent and/or reduce substantial erosion or siltation on- or off-site. Some of the existing systems may be abandoned or removed to accommodate Project construction. All runoff from elevated structures would be collected and carried to the next treatment device or stabilized discharge location. In addition, the Project would include measures to address impacts to existing groundwater pumping and monitoring wells located within the Project limits between I-710 and I-605. Drainage improvements have been identified in the Preliminary

Drainage Report (provided under separate cover) prepared to accompany this Draft Project Report.

The Project will include BMPs to address storm water requirements and treatment of the added impervious area created by the Project. The considered BMPs described in this Draft Project Report build upon the BMPs presented in the *Caltrans' Corridor Stormwater Management Study for I-105 from SR-1 to I-605* (Caltrans, 2013) and the Draft SWDR developed and completed for the Project as part of the PSR-PDS phase (Caltrans, 2015). These considered BMPs include biofiltration swales/strips, detention devices, gross solids removal devices (GSRDs), and media filters. Existing GSRDs impacted by the Project would be analyzed and retrofitted to accommodate additional peak flows, where feasible. Storm water treatment will be further evaluated for the "preferred" alternative, including preparation of a Final SWDR and assessing additional hydromodification requirements.

Additionally, there are nine Pump Stations within the Project limits. Project improvements are anticipated to impact the Hawthorne, Garfield, Ardis, and Woodruff Pump Stations for Alternative 2, and Garfield and Downey Pump Stations for Alternative 3, requiring relocation of existing pump house stairs and/or existing access to the underground debris basin storage box structures. Pump Station improvements have been identified in the Preliminary Drainage Report (provided under separate cover) prepared to accompany this Draft Project Report.

Additionally, the existing 105 freeway was constructed with the use of a pavement structural section with permeable layer and edge drains to facilitate the drainage. For widened sections of the pavement under both build alternatives, the existing condition on the pavement structural section and drainage system will be evaluated for proper connections and extension of the edge drain system.

Highway Planting

Existing planting and irrigation systems removed during construction of the proposed improvements will be replaced, wherever space is available. Generally, existing vegetation in and around the interchange areas would be replanted; however, due to limited space between the freeway improvements and right-of-way, planting replacement will not always be possible along the mainline.

Existing planting, clear and grubbing, and existing impacted/protected trees for each Build Alternative are detailed in the *Draft Landscaping Impact Summary,* developed and completed for the Project in conjunction with the Environmental Document (provided under separate cover). Mature trees over 12 inches in diameter removed within Caltrans right of way will adhere to a replacement tree ratio of 1:1.

Planting design will be provided during the final project design and will consider safety, maintainability, and aesthetic compatibility with adjacent urban communities and will not deviate significantly from the existing planting theme.

The I-105 is a classified landscaped freeway, which is a section of freeway with ornamental vegetation planting that meets the criteria established by the California Code of

Regulations, Outdoor Advertising Regulations, Title 4, Division 6. This designation is used in the control and regulation of outdoor advertising displays.

Erosion Control

The amount of disturbed soils associated with the project improvements will be further evaluated for the "preferred" alternative, as identified as part of the Storm Water Data Report requirements. Alternative 3 is anticipated having the largest footprint of all the alternatives. The Draft SWDR developed and completed for the Project as part of the PSR-PDS phase (Caltrans, 2015) and the *Water Quality Assessment Technical Memorandum* has been prepared in conjunction with the Environmental Document (provided under separate cover) categorized the Project as Risk Level 2 based on the estimated amount of construction sediment yield and proximity to sensitive receiving waters identified at the time. Risk Level determination is based on the National Pollutant Discharge Elimination System (NPDES) Construction General Permit Requirements for identifying a project's sediment risk and receiving water body risk. As a risk level 2 project, the Project would be required to comply with the terms and conditions in accordance with Attachment D of the *NPDES Statewide Construction General Permit* (SWRCB, 2012) which includes a written site-specific Construction Site Monitoring Program (CSMP). The CSMP would include implementation of specific storm water effluent monitoring requirements to ensure that the implemented BMPs are effective in preventing discharges from exceeding any of the water quality standards.

Erosion control measures will be implemented during construction as well as after the project completion in accordance with the requirements of the Los Angeles Regional Water Quality Control Board and the current Statewide NPDES Construction General Permit. During construction, potential construction site BMPs, such as temporary fiber rolls, temporary mulch, drainage inlet protection, concrete washout facilities, street sweeping, and hydroseeding will be used to minimize erosion. All finished slopes will receive replacement planting or vegetative erosion control application.

The cost for erosion control and construction site BMPs have been included in the project cost estimates. Specific erosion control measures and construction site BMP design will be developed during the final project design. Preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP) will be required during construction.

Nonmotorized and Pedestrian Features

Nonmotorized and pedestrian features that are intended to preserve and enhance the opportunity for safe and convenient travel are discussed in the 'Bike, Pedestrian, and Sustainability Improvements' and 'Transit Facilities' subsections.

Impacts to existing pedestrian and bicycle facilities are anticipated during construction. Where feasible and necessary, detours will be provided. Anticipated impacts to pedestrian and bicycle facilities during construction are identified in the Transportation Management Plan (TMP) Data Sheet (Attachment J). The TMP will be developed for the "preferred" alternative to recommend specific methods of reducing construction and circulation impacts.

Needed Roadway Rehabilitation and Upgrading

The Preliminary Materials Report (provided under separate cover), developed and completed in support of the Project, categorized the existing I-105 mainlines and shoulders as Portland cement concrete pavement and the I-105 on- and off-ramps and Imperial Highway as asphalt concrete pavement (Diaz Yourman & Associates, 2019). The I-105 mainline and shoulder pavement is generally in fair to good conditions without any major pavement destresses.

A Life-Cycle Cost Analysis (LCCA) (provided under separate cover), was developed and completed in support of the Project. Since the mainline existing surface is concrete and not in need of reconstruction, the two pavement strategies compared for widening areas were Jointed Plain Concrete Pavement and Continuously Reinforced Concrete Pavement (CRCP). Preliminary results show a lower life cycle cost for CRCP. For the ramps that require reconstruction, a flexible pavement alternative was compared to a rigid alternative (JPCP). Each ramp showed a lower life cycle cost using JPCP. The recommended pavement structural sections were used when preparing the Project cost estimates (Attachment D).

An analysis of compatibility between existing structural section and proposed structural sections related to permeable base and sub surface drainage will be developed as part of the concept drainage report as part of the final project report once a preferred alternative is selected.

Flexible (i.e., Rubberized Hot Mix Asphalt—Gap Graded; Hot Mix Asphalt—Type A; Lean Concrete Base; Class 3 Aggregate Base) and Rigid (i.e., Jointed Plain Concrete Pavement; Geosynthetic Bond Breaker; Asphalt Treated Permeable Base; Lean Concrete Base; Class 3 Aggregate Base) pavement sections for the proposed improvements are recommended, as detailed in Figure 5 and Figure 6 of the Preliminary Materials Report (provided under separate cover), respectively, and shown on the Layouts and Typical Cross Sections (Attachment C).

The Project does not specifically include roadway rehabilitation and upgrading. However, due to the size and scope of the proposed improvements, some of the existing pavement may require reconstruction to accommodate Project facilities (i.e., existing shoulder to proposed traveled lane). The cost for potential pavement reconstruction has been included in the Project cost estimates (Attachment D).

There are no known Caltrans roadway rehabilitation projects currently planned within the Project limits.

Needed Structure Rehabilitation and Upgrading

Impacts to existing structures (bridges and retaining walls) are outlined in Table 5-22: Anticipated Bridge Structure Impacts within the Project Limits— Alternative 2, Table 5-23: Anticipated Retaining Wall Impacts within the Project Limits—Alternative 2, Table 5-49, and Table 5-50: Anticipated Retaining Wall Impacts within the Project Limits—Alternative 3.

There are no known Caltrans structure rehabilitation projects currently planned within the Project limits.

Compatibility with On-going and Future Improvements

Coordination for the Project construction phase will be conducted with all local jurisdictions within the project limits. Existing and future projects, as well as planning efforts, are outlined in Table 5-79.

Table 5-79: Existing and Future Projects within Project Limits

Project ID or Description	Timeline	Location / Post Mile	Lead / Partner Agencies	Project Description or Purpose
I-105 Corridor Sustainability Study	Summer 2017 – Winter 2019	I-105	SCAG / Caltrans, Metro	Planning study to assess the I-105 corridor and to employ innovative and sustainable multi-modal solutions, including: complete streets concepts, HOV lanes, ExpressLanes, & other advanced operational strategies.
Metro Green Line Extension Study	Fall 2016 – Not Identified	Metro Green Line	SCAG/ Metro, City of Norwalk, City of Santa Fe Springs	Planning study to identify and evaluate feasible alternatives for extending the Metro Green Line east from the Norwalk Station to connect to the Norwalk/Santa Fe Springs Metrolink Station.
Metro Crenshaw Line Extension	Under Construction, Completion in 2020	City of Los Angeles, City of Inglewood	Metro	Extension of the existing Metro Exposition Line at Crenshaw Blvd & Exposition Blvd, traveling 8.5 miles to the Metro Green Line.
LAWA Los Angeles International Automated People Mover	Under Construction, Completion in 2023	Los Angeles International Airport	LAWA	Providing an APM connecting multiple parts of the LAMP at Los Angeles International Airport.
Metro Green Line Extension to Torrance Project*	Alternatives Analysis, EIR/EIS in Spring 2019	City of Redondo Beach, City of Lawndale, City of Torrance	Metro	Continuation of the Metro Green Line from the Redondo Beach Station south to the Torrance Transit Center.
Metro Vermont Corridor Bus Rapid Transit Study*	Environmental Review, through 2023	City of Los Angeles, County of Los Angeles (I-105 PM R06.76)	Metro	Feasibility study of BRT options for the Vermont Corridor from Hollywood Blvd south to 120th St.
Metro WSAB Transit Corridor*	Environmental Review, Part of Twenty-Eight by '28 Initiative	Various Cities in Los Angeles County (I-105 PM R014.38)	Metro	LRT to connect Downtown Los Angeles, Vernon, Huntington Park, Bell, Cudahy, South Gate, Downey, Paramount, Bellflower, Cerritos, Artesia, and unincorporated areas of Los Angeles County.

Table 5-79: Existing and Future Projects within Project Limits (continued)

Project ID or Description	Timeline	Location / Post Mile	Lead / Partner Agencies	Project Description or Purpose
Metro I-605 Corridor Improvement Project*	EIR/EIS Review in Fall 2019, Expected to Conclude in Spring 2021	Various Cities in Los Angeles County (I-105 PM R017.83)	Caltrans, Metro	Improvements on I-605 between I-105 and I-10. Project is in the PA&ED phase.
Metro I-710 Corridor Project (07-249900)	Recirculated Draft EIR/ Supplemental Draft EIS in Summer of 2017, Expected to Conclude in Summer 2020	Various Cities in Los Angeles County (I-710 PM R4.9/24.9)	Caltrans, Metro	Improvements on I-710 between Ocean Blvd and SR-60. Project is in the PA&ED phase.

Notes: *Exact alignment to be determined.
APM = Automated People Mover; Ave = Avenue; Blvd = Boulevard; BRT = bus rapid transit; Caltrans = California Department of Transportation; EB = Eastbound; EIR =Environmental Impact Report; /EIS = Environmental Impact Statement; HOV = High Occupancy Vehicle; I- = Interstate; LA = Los Angeles; LAMP = Landside Access Modernization Program; LAWA = Los Angeles World Airports; LRT = light rail transit; OC = Overcrossing; PA&ED = Project Approval and Environmental Document; PM = post mile; PSR-PDS = Project Study Report-Project Development Support; SCAG = Southern California Association of Governments; St = Street; WB = Westbound; WSAB = West Santa Ana Branch

Effect of Projects-Funded-by-Others on State Highways

Any effects that the Project has on the State Highway System have been thoroughly coordinated with the appropriate agencies and stakeholders. Existing and forecasted traffic is discussed in Sections 4A, 4C, 5, and 6I, respectively. A traffic analysis has been developed and completed for the Project and is documented in the Traffic Study Report (provided under separate cover).

5B. Alternatives Considered but Rejected from Further Consideration Prior to PA&ED

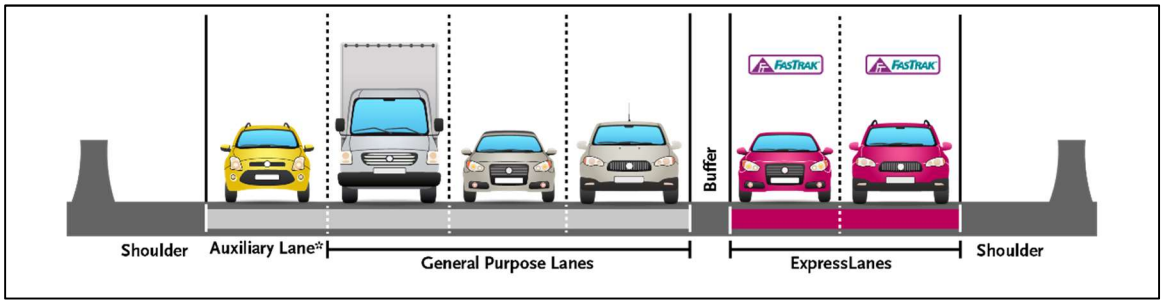
Alternatives were considered for further evaluation based on whether or not the alternative (1) failed to meet the most basic project objectives; (2) were infeasible, per CEQA Guidelines Section 1512.6(f)(1); or (3) were unable to avoid significant environmental impacts.

Alternatives considered during the project development process that were determined not to be studied further include the following:

Alternative 4 – Convert Existing HOV Lane to Two ExpressLanes (Standard Lane and Shoulder Widths)

Alternative 4 would convert existing HOV lane to two ExpressLanes in each direction with standard lane and shoulder widths (12-foot wide ExpressLane, 12-foot wide general purpose lanes12-foot wide auxiliary lanes, 10-foot wide inside and outside shoulders, and 4-foot buffer, respectively). Figure 5-4 illustrates a typical cross section for the proposed Alternative 4.

Figure 5-4: Cross Section for Rejected Alternative 4



Source: Metro, 2019
Note: *Auxiliary lane is only in certain location on I-105.

Associated freeway widening would require major relocation/reconstruction of retaining walls, drainage systems and dewatering and control wells, ramp and system interchanges, structure crossings, and sound walls; construction of new retaining walls, structure crossings, and sound walls; and modification/installation of overhead signage.

Additionally, installation of toll and communication infrastructure and new fiber optics and relevant equipment under proposed shoulders would be required.

Right-of-way acquisitions would be also required.

Screening Results

Alternative 4 was initially considered, however it was eliminated from further consideration, as it would have resulted in unavoidable, significant impacts, as described below.

Alternative 4 would impact approximately fifty-four existing on- and off-ramps and system interchanges. Additionally, Alternative 4 would impact approximately fifty-four existing structures (e.g., widened, modified) and create approximately thirty-six new structures (e.g., reconstructed).

Full parcel right-of-way acquisition of approximately thirty-two residential and two large commercial/industrial parcels would be required for the construction of the Alternative 4. At this preliminary stage, the anticipated right-of-way acquisition is estimated to be between $50 to $100 million. Alternative 4 results in the highest right-of-way impact, without obtaining the corresponding level of mobility benefits.

Alternative 4 would require an agreement with UPRR to relocate tracks between Budlong Avenue and Vermont Avenue. located within twenty-five feet of the centerline of the existing track.

Additionally, an agreement between Caltrans, the Water Replenishment District, and the State Water Resources Control Board (SWRCB) would be required for the relocation and maintenance of multiple dewatering, control, and observation wells impacted as part of Alternative 4 improvements. Costs associated with the relocation and maintenance is unknown but estimated to be extensive and not prudent.

Figure 5-5 and Figure 5-6 illustrate potential impacts for the considered Alternative 4.

Figure 5-5: Potential Impacts for Rejected Alternative 4 at I-105 and Long Beach On- and Off-Ramps

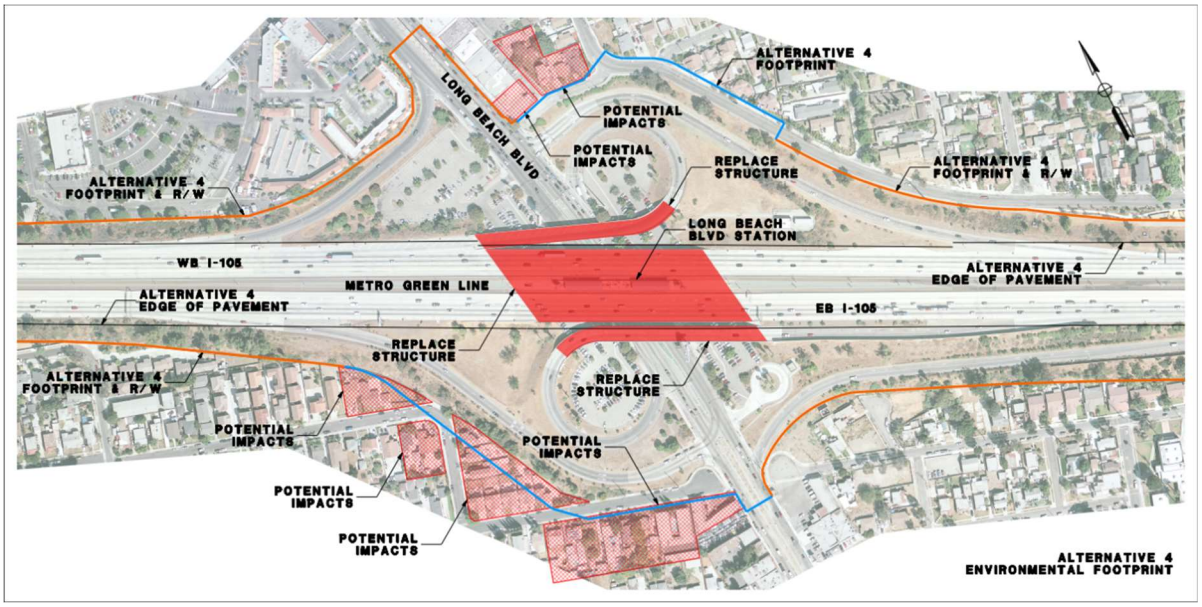
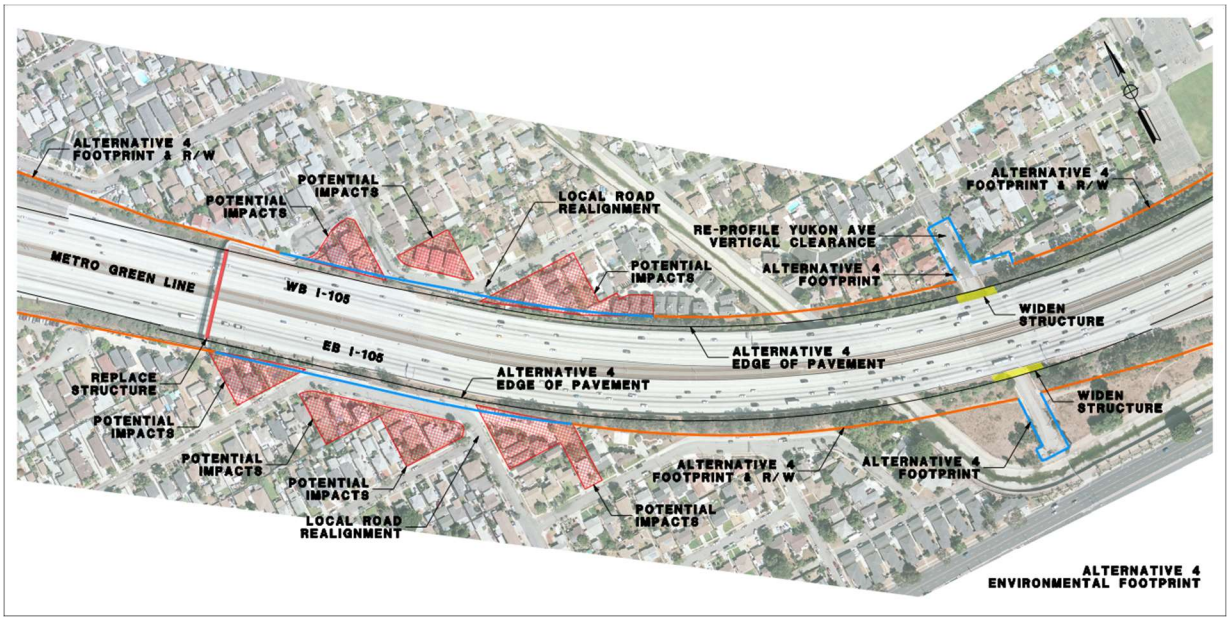


Figure 5-6: Potential Impacts for Rejected Alternative 4 in the City of Hawthorne



Hazardous materials are expected to be encountered with the construction of Alternative 4, based on preliminary online research (i.e., California Department of Resources Recycling and Recovery database; California Department of Toxic Substance Control ENVIROSTOR database; and the SWRCB GeoTracker database) along the I-105 corridor. Construction of Alternative 4 would be affected by recorded or visible hazardous waste problems within the project limits, including, but not limited to: aerially deposited lead, asbestos, lead-based paint, thermoplastic paint, and potentially contaminated soils and/or groundwater. Additional remediation and site assessment activities would be required for multiple parcels requiring partial and full acquisition. Alternative 4 would require substantial mitigation to lessen these environmental impacts.

An FHWA Community Impact Assessment Scoping Checklist has been prepared for Alternative 4. The Checklist shows Alternative 4 likely having significant impacts to the community and adversely affect minority or low-income communities due to relocation of housing and businesses, impacts to parks and recreational facilities, and potentially change tax bases.

Widening a freeway to the outside was determined to have more environmental effects (i.e., right-of-way, community impacts, and hazardous materials, etc.) than widening to the inside (i.e., reducing the width of the median).

Estimated construction costs associated with this alternative including right-of-way were estimated to be approximately $2 to $2.5 billion; for a breakdown of costs, refer to the Project's *Project Study Report-Project Development Support to Request Programming for Capital Support (PA&ED phase) in the 2016 STIP* (Caltrans, 2015).

Additionally, comments received during the scoping period from agencies, members of the public, elected officials, community groups, and other interested parties indicated support for dropping Alternative 4 from further evaluation. Written comments focused primarily on traffic/transportation, right-of-way, aesthetics, property acquisition, noise and community impacts. Spoken comments focused primarily on purpose and need, community impacts, and right-of-way acquisition. Furthermore, the City of South Gate discouraged right-of-way impacts with their City boundaries.

Reversible Lanes Alternative

The Project is required to demonstrate that reversible lanes were considered when submitting a capacity-increasing project or a major street or highway lane realignment project by Caltrans or a regional transportation planning agency to the CTC for approval, per Assembly Bill (AB) 2542, signed into law on September 23, 2016 and effective as of January 1, 2017 (Senate Rules Committee, Office of Senate Floor Analysis, Senate Floor Analysis AB 2542, 2016).

The purpose of AB 2542 is "to encourage the use of reversible lanes when they are the best option. Reversible lanes reduce congestion and prevent unnecessary road expansions. Road expansions can exacerbate our infrastructure backlog and have detrimental effects on the environment." As described by the California Senate Floor Analysis on AB 2542, "Reversible lanes add peak-direction capacity to a two-way road and decrease congestion by utilizing available lane capacity from the other (off-peak) direction. The lanes are particularly beneficial where the cost to increase capacity is especially expensive (e.g., bridges, dense urban areas)."

Reversible flow lanes are most appropriate on facilities that experience large directional traffic imbalances. Reversible facilities are best suited for long-distance trips with limited intermediate access needs along the affected route to minimize traffic disruptions (Freeway Management and Operations Handbook, FHWA, 2011). All freeway reversible lanes must be separated by "Jersey" barriers in a high-speed roadway setting. They are typically constructed in the median of freeway facilities and may be one, two, or more lanes wide.

Potential benefits of the reversible lanes include a reduction in capital cost of construction because reversible lanes would be implemented within the existing freeway median; and a reduction in environmental impacts because the idea would be mostly constructed within the existing freeway right-of-way.

Screening Results

The Metro Green Line LRT corridor runs in the median of nearly the entire length of the I-105 precluding reversible lanes. Caltrans existing data indicate that the directional split of the Managed Lanes is between 55 and 60 percent under both the AM and PM peak hour conditions at various locations along the I-105 freeway. Based on the 2047 design year future forecast, the build alternative directional split is between 50 and 59 percent under both the AM and PM peak hour conditions. FHWA's guidance to warrant reversible lanes is that peak-period traffic volumes should exhibit or be anticipated to exhibit significant direction imbalance (such as a 70/30 percent split). As the I-105

direction split is within a balanced range, it was determined that the reversible lane was not a viable option and removed from consideration.

Transportation System Management (TSM) and Transportation Demand Management (TDM) Alternative

A TSM/TDM Alternative was analyzed for the Project. The TSM/TDM Alternative aimed at improving traffic flow, promoting travel safety, and increasing transit usage and rideshare participation. The TSM/TDM Alternative would add transportation system and demand management techniques to existing features within the Project limits. Improvements that could have been incorporated as part of the alternative include: additional ramp metering; improved signal timing; increased transit service; improved signage; development of rideshare/carpool programs; and installation of intelligent transportation systems. TSM measures provide cost-effective improvements that increase transportation system performance within the major expense of capital expansion projects. These programs may include: minor geometric improvements; signal synchronization; motorist information; bus signal priority; and freeway ramp metering. TDM provides cost-effective improvements that seek to reduce system demand and thus increase system performance without implementing travel restrictions. TDM programs encompass rideshare programs and transfers between modes at key locations.

Screening Results

Based on preliminary analysis conducted for the TSM/TDM Alternative, TSM/TDM measures would decrease vehicle miles traveled and vehicle hours delay compared to the No-Build Alternative.

The TSM/TDM was initially considered, however it was eliminated from further consideration, as it does not fulfill the Project objectives, identified in Section 4, for the following reasons:

- TSM strategies to maximize efficiency of the existing facility by providing options to improve traffic flow (e.g., ridesharing, parking, and traffic-signal optimization) typically increase the number of vehicle trips a facility can carry without increasing the number of through lanes; therefore, the TSM/TDM Alternative would provide only minimal congestion reduction;
- The TSM/TDM Alternative would not maximize throughput because no additional through lanes would be provided;
- The TSM/TDM Alternative would provide minimal enhancement of operations and improvement to trip reliability; and
- The TSM/TDM Alternative would do little to increase mobility because it would have a limited effect on congestion.

As a result, the TSM/TDM Alternative was not carried forward as a stand-alone alternative. Although TSM measures alone could not satisfy the purpose and need of the Project, some TSM measures have been incorporated into the Build Alternatives accordingly.

5C. Locally Preferred Alternative

A “locally preferred alternative” (LPA) may be designated when the Project sponsor has determined, as in the present case, that one of the Project alternatives studied best satisfies the stated need and purpose for the Project. Designation of the LPA is noted and discussed in the Draft Environmental Document, but designation of the LPA does not constitute selection of a “preferred” alternative. The “preferred” alternative selection occurs after the Draft Environmental Document circulation, and after public and agency comments are received and considered. By designating an LPA, the Project sponsor makes public disclosure of their preference. This preference is thus made known to the general public as well as to other agencies that may have an interest in the overall Project. After comparing and weighing the benefits and impacts of all of the viable alternatives, the PDT has identified Alternative 3 as the LPA.

Alternative 3 is recommended as preferable to Alternative 2 because it will better satisfy the need and purpose of the Project. While both Build Alternatives achieve significant portions of the Project's stated purpose, Alternative 3 achieves better travel times, total throughput, and congestion reductions compared to Alternative 2. Alternative 3 has only marginal increased environmental impacts compared to Alternative 2 that can be mitigated

By designating Alternative 3 as the LPA prior to circulation of the Draft Environmental Document, the public is notified of the sponsor’s preference for the Project. The identification of an LPA is not a final decision, but it does indicate the sponsor’s preference. It also allows the sponsor to review this choice in its discussions with the public and other public agencies involved in the decision-making process. Selection of an LPA does not complete the approval process. The Draft Environmental Document will be released with approval of this Draft Project Report. This begins the opportunity for public comments and a full review of the Draft Environmental Document findings with the involved federal and state agencies. Once the Draft Environmental Document is updated to address comments received during the public hearing period, the sponsor will select a final “preferred” alternative, certify the EIR under CEQA, and approve the project. Once this is completed, agreement on the selected alternative is pursued with the agencies involved in the federal decision-making process. Following this action, the sponsor will request concurrence from Caltrans (as the NEPA delegated agency) on identification of the preferred alternative in the Final Draft Environmental Document.

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6. CONSIDERATIONS REQUIRING DISCUSSION

6A. Hazardous Waste

The *Preliminary Hazardous Waste Assessment Memorandum,* developed and completed for the Project in conjunction with the Environmental Document (provided under separate cover), has been prepared to accompany this Draft Project Report. The *Preliminary Hazardous Waste Assessment Memorandum* identifies apparent and potential sources of contamination within the Project area that may impact the proposed Project construction. The *Preliminary Hazardous Waste Assessment Memorandum* was performed for the general Project area within or immediately adjacent to the right-of-way including investigation of potential properties to be acquired under the proposed improvements. The *Preliminary Hazardous Waste Assessment Memorandum* primarily consisted of a regulatory record search regarding possible handling, spills, storage or production of hazardous materials and field reconnaissance of the Project site.

The *Preliminary Hazardous Waste Assessment Memorandum* identified the following potentially hazardous waste issues to exist within the project limits:

- One property, the City of Lynwood Redevelopment—Phase II Plaza Mexico Extension, located adjacent to the existing Caltrans right-of-way.
- Three properties subject to right-of-way acquisitions including: former Witco site (currently owned by Caltrans); Area 6 of City of Lynwood Master Redevelopment Project; and Industrial property at 2900 Fernwood Avenue.
- Aerially Deposited Lead (ADL) potentially existing in unpaved sections of the freeway roadbeds.
- Lead-Based Paint (LBP) potentially existing in freeway striping.
- Asbestos containing material and LBP potentially existing within the existing bridges proposed.
- Treated Wood Waste potentially existing in posts along metal beam guard railing and/or roadside signs.

The *Preliminary Hazardous Waste Assessment Memorandum* recommended the following actions to address the recognized areas of environmental concern and to perform baseline soil and groundwater sampling activities prior to parcel acquisitions:

- At the existing Caltrans right-of-way, located next to the City of Lynwood Redevelopment—Phase II Plaza Mexico Extension, conduct soil sampling during the PS&E phase to evaluate arsenic concentrations in soil due to the former presence of the Southern Pacific railroad tracks.
- At the portion of the former Witco Chemical Site planned for acquisition/temporary construction easement area, relocate (under supervision of Department of Toxic Substances Control) existing groundwater monitoring wells if the wells are to be present within the planned construction footprint.
- At the planned acquisition/temporary construction easement area within the Area 6 of the City of Lynwood Master Redevelopment Project site, conduct sampling activities during the PS&E phase to evaluate petroleum hydrocarbons and volatile

organic compounds (VOCs) in soil and groundwater. In addition, conduct soil sampling to evaluate petroleum hydrocarbons and arsenic concentrations in soil in the area of underground storage tanks formerly present within the planned acquisition/temporary construction easement area of this site.

- At the planned acquisition/temporary construction easement areas within the industrial property at 2900 Fernwood Avenue, conduct sampling activities during the PS&E phase to evaluate petroleum hydrocarbons and VOCs in soil and groundwater.
- Removal of existing Treated Wood Waste and yellow and non-yellow LBP traffic stripe and pavement markings.

The Aerially Deposited Lead testing, analysis, and reporting will be completed during the PS&E phase of the Project. Testing for lead-based paint and asbestos containing material surveys will be required.

As is the case for any project that proposes excavation, the potential exists for unknown hazardous contamination to be revealed during project construction (such as previously undetected petroleum hydrocarbon contamination from former underground storage tanks or potential explosive threat if a natural gas transmission pipeline is ruptured during construction). If known or previously unknown hazardous waste/material is encountered during construction, the procedures outlined in Section 7-107I of the *Caltrans Construction* Manual shall be followed.

6B. Value Analysis

A value analysis that identifies improvements or solves problems that improve value and reduce overall cost, is required for all National Highway System facilities costing $25 million or more. In cooperation with Caltrans District 7 and Metro, a value analysis study was conducted between the dates of May 6, 2019, and May 10, 2019, in Los Angeles, California, in support of the Project (provided under separate cover).

The objectives of the value analysis study were to: analyze the current project design, estimate, and schedule; provide possible cost and/or schedule saving recommendations; and provide performance improvement recommendations. As a result of these factors, the Value Analysis team developed one value analysis strategy for Alternative 2 and Alternative 3 that represents their opinion of the best combination of alternatives for the project to assist the decision makers in their evaluation of the Value Analysis alternatives. The value analysis strategies are based on factors that include improved performance, likelihood of implementation, least community impact, cost savings, or any combination of project's performance attributes. This information is a guide and is not intended to reject alternatives from project stakeholder consideration.

Table 6-1 provides a summary of the *Preliminary Value Analysis Study Report* (Value Management Strategies, Inc., May 2019) alternatives developed by the Value Analysis team for consideration by the Project Development Team (PDT) and a summary of the *Value Analysis Update Memorandum* (Value Management Strategies, Inc., September 2019) initial implementation decisions by the PDT.

Table 6-1: Value Analysis Strategies Recommended within the Project Limits

Value Analysis Alternative		Strategy Recommended for Consideration		Initial Implementation Decision	
No.	**Description**	**Alternative 2**	**Alternative 3**	**Alternative 2**	**Alternative 3**
1	Separate Project into EB and WB Segments to Deliver Half of Project Early	X	X	X	X
2	Add General Purpose Lane in Lieu of ExpressLane at EB I-710 to I-605	X	X		
3	Reduce Number of Ingress/Egress for ExpressLanes	X	X		
4	Use Slope Grading to Reduce Size or Eliminate Retaining Walls		X	X	X
5	Pursue Design Exception for Outside Shoulder Widening		X		
6	Use Double-Stripe and Rumble Strips in Lieu of Channelizers for Toll Lane Delineation	X	X	X	X

Source: *Preliminary Value Analysis Study Report* (Value Management Strategies, Inc., 2019)
Notes: EB = Eastbound; I- = Interstate; WB = Westbound

A structured review and evaluation for all of the concepts proposed as part of the value analysis will be conducted. During that time, the PDT will identify which Value Analysis alternatives are accepted, which are rejected and the rationale for rejection, and which Value Analysis alternatives are conditionally accepted with further study required, accordingly. Value Analysis alternatives that are accepted will be properly integrated into the project design for the "preferred" alternative, including preparation of a Final Value Analysis Study Report.

6C. Resource Conservation

The Project will reduce congestion and improve traffic flow, which will lead to a reduction in energy consumption. In addition, the potential for recycling existing asphalt concrete pavements will be investigated along with other potential ways to conserve resources.

6D. Right-of-Way Issues

Additional right-of-way would be required for the construction of the Build Alternatives as identified in Section 5A.

The Project is not in an area of high land values having potential for future airspace leases.

Right-of-Way Data Sheets are included in Attachment G.

6E. Environmental Compliance

The *Draft Environmental Impact Report (EIR) /Environmental Assessment* (EA) (provided under separate cover), has been prepared to accompany this Draft Project Report. The Draft

EIR/EA has been prepared in accordance with Caltrans' environmental procedures, as well as State and federal environmental regulations. The EIR/EA is the appropriate document for the Project. The signature page of the EIR/EA is attached to this document as Attachment L.

Caltrans would be the lead agency for required National Environmental Policy Act (NEPA) approval, as delegated by the Federal Highway Administration (FHWA), and the lead agency for required California Environmental Quality Act (CEQA) approval.

Project environmental studies began in January 2018 in support of the EIR/EA efforts, with the PA&ED phase scheduled to be completed by Summer 2020. These studies include:

- Air Quality Report
- Natural Environment Studies (Minimal Impacts)
- Historic Property Survey Report (Historical Resources Evaluation Report and Archaeological Survey Report)
- Community Impact Assessment
- Traffic Study Report
- Scenic Resource Evaluation and Visual Impact Assessment
- Geotechnical, Subsurface, and Seismic Study
- Water Quality Assessment Technical Memorandum
- Paleontological Impact Assessment
- Preliminary Hazardous Waste Assessment
- Traffic Noise Study Report
- Energy Study

The findings of these environmental studies are fully described in the Draft EIR/EA.

6F. Air Quality Conformity

The *Air Quality Report,* developed and completed for the Project in conjunction with the Environmental Document (provided under separate cover), has been prepared to accompany this Draft Project Report.

The Project will result in short-term degradation of air quality during construction by generating airborne dust from such activities as clearing, grading, hauling, demolition, or excavation for roadway improvements. Emissions from construction equipment powered by gasoline and diesel engines also are anticipated and would include criteria pollutants and Mobile Source Air Toxics from exhaust or road dust. Implementation of the measures described in the *Air Quality Report*, including compliance with Caltrans' Standard Specifications and South Coast Air Quality Management District rules and regulation, will ascertain that any temporary air quality impacts are minimized during construction.

The Project is located in the federal nonattainment area; and is subject to the requirements to demonstrate conformity. The Project is identified in the latest conforming SCAG 2016-2040 RTP/SCS and SCAG 2019 FTIP; and has satisfactorily demonstrated conformity at the regional level. A project-level hot-spot analysis was conducted

according to the U.S. EPA-approved CO Protocol and the latest Transportation Conformity Guidance for $PM_{2.5}$ and PM_{10}. The Project satisfies all criteria of the CO Protocol, and is therefore not anticipated to cause or worsen localized violations of new violations of the CO standards. The Project has undergone through a review by the IAC for its potential to cause concern for $PM_{2.5}$ and PM_{10}. At its June 2019 meeting, stakeholders at the Interagency Consultation concurred that the proposed project is not of air quality concern. As a result, the Project has satisfactorily demonstrated the project-level conformity requirements; and is not anticipated to worsen existing $PM_{2.5}$ and PM_{10} violations of delay timely attainment of the standards.

6G. Title VI Considerations

Title VI of the Civil Rights Act requires that no person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. Caltrans, Metro, and FHWA policies demonstrate commitment to this requirement. The Project would comply with the Title VI of the Civil Rights Act, and related statues, with provisions for low mobility and minority groups. Pedestrian facilities within the Project limits would conform with ADA and current local City or Caltrans standards (as applicable).

6H. Noise Abatement Decision Report

A Draft Noise Abatement Decision Report (NADR) is being prepared concurrently in support of the Project in conjunction with the *Traffic Noise Study Report* prepared and completed for Environmental Document (provided under separate cover), to determine the future traffic noise impacts, if any, of the proposed improvements on sensitive receptors and frequent human use areas within the Project corridor.

The noise abatement recommendations in the NADR:

- Is an evaluation of the reasonableness and feasibility of incorporating noise abatement measures into this project;
- Constitutes the preliminary decision on noise abatement measures to be incorporated into the Draft Environmental Document (DED) (if applicable); and
- Is required for Caltrans to meet the conditions of Title 23 Code of Federal Regulations, Part 772 in accordance with the Federal Highway Administration noise standards.

The NADR does not present the final decision regarding noise abatement; rather, it presents key information on abatement to be considered throughout the environmental review process, based on the best available information at the time the Project Draft Environmental Document is published. The NADR does not address noise barriers or other noise-reducing treatments required as mitigation for significant adverse environmental effects identified under CEQA.

Findings of the NADR (provided under separate cover) are summarized in Section 5 for both Alternative 2 (Table 5-24: Anticipated Sound Wall Impacts within the Project Limits—Alternative 2) and Alternative 3 (Table 5-51: Anticipated Sound Wall Impacts within the Project Limits—Alternative 3).

6I. Traffic Study Report

Existing and No-Build conditions and proposed traffic analyses are presented in the Traffic Study Report (provided under separate cover), prepared to accompany this Draft Project Report, and summarized in Sections 4 and 5, respectively. As part of the environmental clearance process, information in the Traffic Study Report was used to identify significant traffic impacts of the proposed project alternatives.

In summary, during Design Year 2027 and 2047 AM and PM peak hour conditions, Alternatives 2 and 3 have many fewer segments with LOS E or F than the No-Build Alternative. Alternative 3 is expected to perform the best with the fewest number of segments with LOS E or F. While the vehicle throughputs for the general purpose lanes are relatively the same among the three alternatives, Alternative 3 is anticipated to have a higher vehicle throughput for the managed lanes. By Design Year 2047, Alternative 3 is expected to have 1,350,000 vehicle-hours less delay (20-percent reduction) each year than the No-Build Alternative. Alternative 3 is also expected to have higher travel speeds and shorter travel times than the No-Build Alternative and Alternative 2.

6J. Concept of Operations

A ConOps plan that describes the design and operational characteristics of the managed lanes, enforcement, incident management, and agency and stakeholder coordination, is required for ExpressLane facilities. In cooperation with FHWA, SCAG, CHP, and other stakeholders, a ConOps plan is being prepared concurrently in support of the Project and is scheduled to be completed in mid-2020 (Draft).

For consistency, the Project is expected to have operational characteristics similar to the existing I-10/I-110 ExpressLanes. These include: 24/7 operation; dynamic pricing (tolls would vary based on congestion); a 15-percent discount for qualifying Clean Air Vehicles; transit corridor enhancement; Low Income Assistance Plan, Carpool Loyalty, and Transit Rewards program implementation; and dedicated CHP enforcement and Freeway Service Patrol (FSP) incident management.

6K. Traffic and Revenue Study

A Investment Grade T&R Study that considers congestion reduction, capacity enhancements, and time savings to estimate toll rates and potential toll revenue is being prepared concurrently in support of the Project and is scheduled to be completed in mid-2020 (Draft).

7. OTHER CONSIDERATIONS

7A. Public Hearing Process

It is recommended that a public hearing be scheduled presenting the developed viable alternatives identified in Section 5A for public comment.

7B. Route Matters

Freeway Agreements

A Freeway Agreement was executed on May 7, 1991 between Caltrans and the City of Norwalk on I-105 between the Downey City limit at the San Gabriel River and Studebaker Road (07-LA-105 R17.5/R18.2) and on I-605 between Alondra Boulevard and the Downey City limit at Cecilia Street (07-LA-605 R5.8/R8.9). This Freeway Agreement supersedes the said Freeway Agreement dated August 26, 1985.

An updated Freeway Agreement will be required between Caltrans and the City of Norwalk for various interchange access modifications, signage, allowance of ExpressLanes vehicles to use the Studebaker on and off ramps, and maintenance of the Project.

Tolling Agreements

A Joint Use Agreement No. 3783 S-1 was executed on March 23, 1988 between Caltrans and the Los Angeles CTC (now Los Angeles County Metropolitan Transportation Authority) including the I-105 freeway as a transitway (light rail system or busway/high occupancy vehicle facility).

A draft Application for Toll Facility was submitted to the CTC by Metro, in partnership with Caltrans District 7, in August 2019, for consideration by the CTC in accordance with AB 194 guidelines and requirements outlined in the California Streets and Highway Code Section 149.7. The CTC approved the I-105 Toll Facility application in October 2019.

A Toll Operating Agreement will be needed between Caltrans and Metro for ExpressLane construction and operations, liabilities and responsibilities of each party, and an outline of maintenance expectations for the Project. It is anticipated that the I-105 ExpressLanes Toll Operating Agreement would be modeled after the I-10 and I-110 ExpressLanes Toll Operating Agreements, currently in effect.

Transit Agreements

An Operations and Maintenance Agreement for the Metro Green Line was executed on August 12, 1995 between Caltrans and Metro. This Operations and Maintenance Agreement defines certain aspects of the operations and maintenance of the interactions between I-105 and the Metro Green Line. An amendment was executed on January 1, 2018 assigned and expanded the maintenance and operations responsibilities of the ten Park-and-Ride Lots to allow for charging of parking fees in said Park-and-Ride Lots.

An updated Operations and Maintenance Agreement for the Metro Green Line will be required between Caltrans and Metro for various transit modifications of the Project.

Railroad Agreements
A Construct and Maintenance Agreement for the Alameda corridor will be required between Caltrans and ACTA for various modifications of the Project (e.g., aerial easement for reconstruction of Imperial Highway at Alameda Street).

New Connections
No new public road connections are proposed as part of the Project.

Modified Accesses
For the majority of the ramps (e.g., on-ramps, off-ramps, connectors), where modifications are required as part of the Project, the convergence or divergence points of the ramp will remain in the same location.

As this Project is not modifying the existing interchange configuration and/or access within the Project limits, a draft *Modified Access Report Exception Request* was submitted to FHWA by Metro, in partnership with Caltrans District 7, in Fall 2019, in accordance with guidelines and requirements outlined in the *FHWA Interstate System Access Informational Guide* (FHWA, 2010).

Caltrans and FHWA concurred the Build Alternatives satisfy the criteria listed in the *FHWA Interstate System Access Informational Guide* (FHWA, 2010) as "determined that a MAR will not be required for this Project since there are no changes to access points" (November 22, 2019).

Intersection Control Evaluation
In general, local streets within the Project limits are anticipated to remain in the existing condition.

Preliminary evaluation of ramp-termini intersections within the Project limits identified ramp disruption at Central Avenue Intersection affecting the Westbound On- and Off-Ramps, per the Caltrans ICE screening process. The impacts to the Central Avenue Intersection are anticipated to be minimal.

Preliminary evaluation also identified the following ramps operating at LOS D or worse in the 2047 No-Build Alternative 1 scenario: I-105 Eastbound On-Ramp/Imperial Highway; I-105 Eastbound On- and Off-Ramps/120th Street; I-105 Westbound On- and Off-Ramps/Imperial Highway, I-105 Eastbound On- and Off-Ramps/Wilmington Avenue; I-105 Eastbound and Westbound On- and Off-Ramps/Lakewood Boulevard; and the I-105 terminus at Studebaker Road. These may impact future operations, making conditions worse with implementation of the Build Alternative 3 scenario. Per Caltrans ICE screening process, it is determined that no intersection control strategies, other than signalized intersection, are viable.

Potential operational improvements at these locations were investigated and analyzed for traffic signal improvements. At all eight locations, signal improvement operations were identified to address the adverse impacts (Table 7-1). The signal improvements at all eight locations will be implemented as part of the Project under Metro and Caltrans, in

coordination with the respective local jurisdictions. The analysis showed that these signal improvements will not have any adverse impact to the adjacent arterial intersections within the study limits. The Project is not required to provide additional lanes on local arterials at ramp intersections.

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Table 7-1: Potential Intersection Improvement Measures within Project Limits

Traffic Study Report Location #	Intersection	2047 Build Alternative 1 Summary				2047 Build Alternative 3 Summary				2047 Build Alternative 3 with Optimization				Potential Improvement Measure
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	
8	I-105 EB On-Ramp/ Imperial Hwy (Freeman) City of Hawthorne	C	27.9	C	29.6	C	26.7	E	73.3	C	29.4	D	38.1	Adjust cycle length from 100 to 110 seconds; adjust lane configuration for EB and WB approaches. EB change one thru lane to thru-left. WB change one thru lane to thru-right. Requires change to phasing.
11	I-105 EB Ramps/ 120th St City of Hawthorne	E	74.4	C	34.2	D	53.4	E	61.3	D	41.9	D	52.8	Adjust cycle length from 120 to 145 seconds; adjust lane configuration for SB approach. SB change to two left and one left-right. Add protected overlap to SB Left and WB Right movements.
20	I-105 WB Ramps/ Central Ave City of Los Angeles	C	22.6	C	22.1	C	29.3	C	26	C	29.3	C	26	None needed.
21	I-105 EB Ramps/ Central Ave City of Los Angeles	C	28.2	C	25.9	C	30.9	D	49.7	C	33	C	33.5	Optimize signal phasing splits (see Synchro phasing output for exact splits); adjust lane configuration for NB approach. NB change one thru lane to thru-right.

Table 7-1: Potential Intersection Improvement Measures within Project Limits (continued)

Traffic Study Report Location #	Intersection	2047 Build Alternative 1 Summary				2047 Build Alternative 3 Summary				2047 Build Alternative 3 with Optimization				Potential Improvement Measure
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	
24	I-105 EB Ramps/ Wilmington Ave County of Los Angeles	D	39.5	C	28.5	E	63	D	44.4	C	33.4	C	34	Adjust lane configuration for NB approach. NB change one thru lane to thru-left. Requires change to phasing.
26	I-105 WB Ramps/ Imperial Hwy County of Los Angeles	F	178.8	F	83.3	F	307.5	F	151.3	F	105.7	E	71.3	Adjust cycle length from 85 to 150 seconds.
39	I-105 Ramps/ Lakewood Blvd City of Downey	F	136.1	E	58.2	F	236.4	F	96.7	D	46.7	D	38.5	Restrict WB thru and add right-turn overlap (overlap SB thru and WB right, overlap EB left and SB right); adjust cycle length to 105 seconds.
48	I-105 Terminus/ Studebaker Rd City of Norwalk	F	87.7	F	108.1	F	235.3	F	239.9	C	27.8	C	34.1	Adjust cycle length from 90 to 100 seconds; adjust lane configuration for EB approach. EB change two lefts to single left and one left-right.

Source: Traffic Study Report (provided under separate cover)
Notes: Ave = Avenue; Blvd = Boulevard; EB = Eastbound; Hwy = Highway; I - = Interstate; NB = Northbound; Rd = Road; SB = Southbound; St = Street; WB = Westbound

The City of Norwalk expressed their preference for the signal synchronization/lane reconfiguration improvement alternative over the roundabout improvement option which has large right-of-way impacts (Caltrans, Metro, and City of Norwalk Coordination Meeting held December 23, 2019). As a result, the roundabout concept at I-105 Terminus/Studebaker Road was dropped from further consideration. In addition to the signal improvements identified in Table 7-1, the Project team has identified the following mitigation measures at this location to improve operation and safety:

- Adjust cycle length from 90 to 100 seconds and adjusting lane configuration for the I-105 eastbound approach from two lefts and one right to one left, one left-right, and one right at Studebaker Road;
- Additional safety signage one-half and one-quarter mile before the Studebaker Road intersection on the I-105 Eastbound ramp to warn drivers of the end of the freeway;
- CHP enforcement of illegal truck use of the off-ramp and pedestrian use of shoulder; and
- Signal synchronization between Imperial Highway and Foster Road on Studebaker Road at four intersections: Studebaker Road/Imperial Highway; Studebaker Road/Lyndora Street; Studebaker Road/Littchen Street; and Studebaker Road/Foster Road. This improvement will be led by City of Norwalk in coordination with Caltrans and Metro that will also synchronize the I-105/Studebaker Road signal controlled by Caltrans.

Traffic control strategy at each ramp intersection also is presented in the *I-105 PA&ED ICE Step I Memorandum*, prepared in conjunction with the Traffic Study Report (provided under separate cover), developed jointly with Caltrans, Metro, and FHWA, in accordance with Caltrans Traffic Operation Policy Directive 13-02, dated August 30, 2013, which requires the analysis of alternative traffic control strategies and treatments at state highway locations. The *I-105 PA&ED ICE Step I Memorandum* documents which different traffic control options were evaluated for each ramp intersection under Build Alternative 3. Recommended traffic control strategies, as a result of the evaluation, will be further studied for the "preferred" alternative.

An ICE Step II Memorandum is not required for the Project.

Relinquishments
No relinquishments are anticipated for the Project.

7C. Permits/Approvals

At this preliminary stage, the anticipated Permits and/or approvals required within the Project limits are summarized in Table 7-2.

Table 7-2: Permits/Approvals Anticipated within Project Limits

No.	Permits/Approvals	Agency	Status/ When Required
1	Clean Water Act Section 401 Water Quality Certification and Waste Discharge Requirements	RWQCB	Not Initiated / Application to be submitted after approval of ED/ROD and Prior to Construction
2	NPDES Statewide Storm Water Permit [Order No. 2012-0011-DWQ, NPDES No. CAS000003 (effective July 1, 2013), as amended by Order WQ No. 2014-0006-EXEC (effective January 17, 2014), Order No. 2014-0077-DWQ (effective July 1, 2014), Order No. 2015-0036-EXEC (effective April 17, 2015), and Order No. 2014-0026-EXEC (effective November 27, 2017)]	SWRCB	Not Initiated / Submitted Prior to Construction
3	NPDES Statewide Construction General Permit [Order No. 2009-0009-DWQ, NPDES No. CAS000002 (effective July 1, 2010), as amended by Order No. 2010-0014-DWQ (effective February 14, 2011) and Order No. 2012-0006-DWQ (effective July 17, 2012)]	SWRCB	Not Initiated / Submitted Prior to Construction
4	Clean Water Act Section 404 Nationwide Permit	USACE	Not Initiated / Application to be submitted after approval of ED/ROD
5	Clean Water Act Section 404 Letter of Permission within Special Area Management Plan area	USACE	Not Initiated / Application to be submitted after approval of ED/ROD
6	Clean Water Act Section 408 Permit for Filling or Dredging Waters of the U.S. (for Compton Creek)	USACE/ LACCD	Not Initiated / Application to be submitted after approval of ED/ROD
7	Section 1602 Lake or Streambed Alteration Agreement	CDFW	Not Initiated / Application to be submitted after approval of ED/ROD and Prior to Construction
8	Encroachment Permit	LACFCD	Not Initiated / Letter or Permit will be obtained during PS&E phase or construction within LACFCD property.
9	Freeway Agreement	Caltrans / City of Norwalk	Not Initiated / Agreements would be concluded with each of the cities in which Project construction will take place.
10	CTC Application for Toll Facility	CTC/ Metro	Initiated, Draft Application Submitted August 2019, approved by CTC in October 2019

Table 7-2: Permits/Approvals Anticipated within Project Limits (continued)

No.	Permits/Approvals	Agency	Status/ When Required
11	Toll Operating Agreement	Caltrans/ Metro	Not Initiated / Submitted Prior to Construction
12	Operations and Maintenance Agreement	Caltrans/ Metro	Not Initiated / Submitted Prior to Construction
13	Cooperative Agreements	Caltrans/ Metro	Not Initiated / Submitted Prior to PS&E, Construction, Operation, & Maintenance Phases
14	Enforcement Agreements	CHP/ Metro	Not Initiated / Submitted Prior to Construction
15	Approvals to relocate, protect-in-place, or remove utility facilities	Affected Utilities	Not Initiated / Prior to any construction within utility conflict areas.

Notes: Caltrans = California Department of Transportation;
CDFW = California Department of Fish and Wildlife; CHP = California Highway Patrol;
CTC = California Transportation Commission; ED = Environmental Document; LACFCD = Los Angeles County Flood Control District; NPDES = National Pollutant Discharge Elimination System; PS&E = Plans, Specifications, and Estimate; ROD = Record of Decision; RWQCB = Regional Water Quality Control Board; SWRCB = State Water Resources Control Board; USACE = U.S. Army Corps of Engineers; WQ = Water Quality

7D. Cooperative Agreements

A Cooperative Agreement No. 07-5081 was executed for this Project in October 2017 between Caltrans and Metro for State IQA, EDQC, and owner/operator approvals for preliminary engineering, environmental activities, and preliminary right-of-way activities for the Project (PA&ED Phase).

Additional Cooperative Agreements will be needed between Caltrans and Metro for future phases of the Project (PS&E, Construction, Operation, and Maintenance Phases).

7E. Other Agreements

CHP Agreements

Metro is also anticipated to establish contracts with CHP for enforcement and with FSP for dedicated incident response for the I-105 ExpressLanes.

An enforcement agreement will be needed between Metro and CHP for future phases of the Project (PS&E, Construction, Operation, and Maintenance Phases). This agreement is expected to use the existing agreement for enforcement of the I-10 and I-110 ExpressLanes as the basis for the Project.

7F. Involvement with a Navigable Waterway

There are no navigable waterways within the Project limits.

7G. Public Boat Ramps

There are no public boat ramps within the Project limits.

7H. Transportation Management Plan

Based on the initial examination of items related to the TMP Data Sheet (Attachment J), lane closures will be required, and lane requirement charts will be included in Caltrans Standard Special Provisions. It may be necessary to temporarily close on/off-ramps and connectors during the Project construction. Detour plans, staging plans, and traffic handling plans would be developed during the PS&E phase.

Supporting traffic counts for rerouting traffic during construction will be developed for the "preferred" alternative. A TMP will be developed during the subsequent phase for the "preferred" alternative to recommend specific methods of reducing construction and circulation impacts.

7I. Stage Construction

It is anticipated the Project will be designed and constructed as separate phases to facilitate Project delivery based on available funding. Each Project phase would include construction staging to minimize impacts to existing traffic. The same number of existing mainline lanes will be maintained open to traffic during construction whenever feasible.

Detailed stage construction and detour plans will be developed for the "preferred" alternative. Detailed stage construction plans and traffic handling plans will also be developed in PS&E.

7J. Accommodation of Oversize Loads

The I-105 freeway is a major east-west corridor designated as part of the National Highway Freight Network, and specifically designed to accommodate heavy truck traffic as part of the Federal Surface Transportation Assistance Act Route Network for oversized Trucks and the Subsystem of Highways for the Movement of Extralegal Permit Loads.

Improvements associated with this Project are not expected to affect the movement of oversized loads.

7K. Graffiti Control

The Project is located in the urban area of Los Angeles County, which is an identified graffiti-prone area in the Caltrans Project Development Procedures Manual, Appendix K. Graffiti deterrent technique would be used as part of the Project to limit accessibility to structures (e.g., bridges, retaining walls, sound walls, overhead signs). Graffiti resistant/deterrent paint and coating would be used where practical. Details of graffiti deterrent techniques will be provided during the final design.

7L. Storm Water Compliance

The *Caltrans' Corridor Stormwater Management Study for I-105 from SR-1 to I-605* (Caltrans, 2013) (provided under separate cover) and the Draft SWDR, developed and completed for the Project as part of the PSR-PDS phase (Caltrans, 2015) (provided under separate cover; Signature Page included in Attachment I), and the *Water Quality Assessment Technical Memorandum,* developed and completed for the Project in

conjunction with the Environmental Document (provided under separate cover), have been prepared to accompany this Draft Project Report. Storm water treatment will be further evaluated for the "preferred" alternative.

Receiving water bodies within the Project limits include the Compton Creek; Los Angeles River Reach 2; Los Angeles River Reach 1; Los Angeles River Estuary; Dominguez Channel (lined portion above Vermont Avenue); Dominguez Channel (unlined portion below Vermont Avenue); Los Angeles/Long Beach Inner Harbor; Los Angeles/Long Beach Outer Harbor; and San Pedro Bay Near/Off Shore Zones, as noted in Table 5-78. The anticipated storm water project risk level was determined in the Draft SWDR developed and completed for the Project as part of the PSR-PDS phase (Caltrans, 2015) as Risk Level 2. The Project is required to implement treatment BMPs to treat the Project targeted design constituents. It is anticipated that post-Project State right-of-way will provide adequate area for BMPs.

If it is determined that adequate post-Project State right-of-way is not available, then a cost estimate to obtain the required right-of-way, and any other pertinent site-specific treatment BMP feasibility information for selected BMPs, would be included for the "preferred" alternative and PS&E phase. The SWDR will be updated for the "preferred" alternative and the PS&E phase to confirm the risk level, disturbed soil area, change in amount of impervious area and specific BMPs to be implemented for design pollution prevention, treatment and construction. The contractor will prepare and implement a SWPPP to address construction site BMPs. For this phase, permanent BMPs have been evaluated from a corridor scoping level, in conjunction with the *Caltrans' Corridor Stormwater Management Study for I-105 from SR-1 to I-605* (Caltrans, 2013) and the Draft Storm Water Data Report (SWDR) developed and completed for the Project as part of the PSR-PDS phase (Caltrans, 2015). Applicable existing and future plans within the study area will be used as references to identify proposed BMP locations and types of treatment BMPs for the "preferred" alternative.

Specific erosion control measures and construction site BMP design will be developed during the final project design. Preparation and implementation of a SWPPP will be required during construction.

7M. Community Impacts and Emergency Services

The *Final Community Impact Assessment,* developed and completed for the Project in conjunction with the Environmental Document (provided under separate cover), has been prepared to accompany this Draft Project Report.

The Project is expected to overall improve traffic and circulation on I-105 in both the general purpose and ExpressLane facilities. Temporary traffic delays could occur during construction but would be minimized through implementation of the TMP.

The project does not affect any pedestrian and bicycle facilities.

Improved traffic and circulation may also improve traffic conditions on other freeways where queuing and build-up occurs. Developing an ExpressLane system for the Metro area will also improve congestion through Los Angeles County.

Emergency services may be affected during construction, but notification and alternate routes if necessary would be planned in the TMP.

7N. Complete Streets / Context Sensitive Solutions

Caltrans Deputy Directive 64-Revision (DD-64R) provides for the needs of travelers of all ages and abilities in all planning, programming, design, construction, operations, and maintenance activities on the State Highway System. Caltrans views all transportation improvements (new and retrofit) as opportunities to improve safety, access, and mobility for all travelers and recognizes bicycle, pedestrian, and transit modes as integral elements of the transportation system. It aims to provide safe mobility for all users, including motorists, bicyclists, pedestrian and transit riders.

Caltrans uses Context Sensitive Solutions as an approach to plan, design, construct, maintain, and operate its transportation system. These solutions use innovative and inclusive approaches that integrate and balance community, aesthetic, historic, and environmental values with transportation safety, maintenance, and performance goals.

The Project is consistent with these approaches by promoting multimodal transportation and coordinating its design with the urban boundary, rural character, and future development within and adjacent to the Project limits.

7O. Climate Change

Neither the U.S. EPA nor the Federal FHWA has issued explicit guidance or methods to conduct project-level greenhouse gas analysis. FHWA emphasizes concepts of resilience and sustainability in highway planning, project development, design, operations, and maintenance. Because there have been requirements set forth in California legislation and executive orders on climate change, the issue is addressed in the CEQA chapter of the Draft Environmental Document. The CEQA analysis may be used to inform the NEPA determination for the project.

7P. Wildlife Crossings

Caltrans has recently emphasized the consideration of incorporating wildlife crossings on all projects to facilitate migration of larger animals and reduce animal hits by vehicles. Consideration of this feature has been analyzed and found that there is no habitat of concern in the area.

8. FUNDING, PROGRAMMING, AND ESTIMATE

Funding

It has been determined that this project is eligible for Federal-aid funding.

Funding is expected to be provided through a combination of funds, not yet committed, but will likely include potential federal, state, and local funding sources.

Local funding for the Project would be through a combination of Measure M local sales tax funding and toll revenue-backed obligations issued by Metro. The Project will also seek funding from the state's Solutions for Congested Corridors program (SCCP) that was made available as part of Senate Bill 1 (SB 1). Metro has not yet selected its "preferred" Project financing approach with respect to these funding opportunities.

In addition, the Project may seek TIFIA funding to allow TIFIA loan proceeds to be used to pay a portion of the purchase price for the acquisition of the Project and defeat all of the outstanding bond indebtedness incurred in connection with the acquisition, design, construction and refinancing. TIFIA financing would use non-recourse toll bonds, secured by toll-revenue proceeds from the Project. Approval of TIFIA credit assistance will enhance the financial capacity to construct the future improvements.

It has been determined that this Project may be eligible for Congestion Mitigation and Air Quality Program funding.

Programming

The support cost ratio is 13.2%.

For the cost summary, see Attachment D.

Estimate

The estimates used for Table 8-1 and Table 8-2 are based on the largest Build Alternative footprint, which is Build Alternative 3.

Table 8-1: Estimate

Fund Source	Fiscal Year Estimate								
20.XX.075.600	**Prior**	**15/16**	**16/17**	**17/18**	**18/19**	**19/20**	**20/21**	**Future**	**Total**
Component	**In thousands of dollars ($1,000)**								
PA&ED Support									
PS&E Support* **							$4,000	$36,585	$40,585
Right-of-Way Support* **								$1,048	$1,048
Construction Support* **								$35,512	$35,512
Right-of-Way*								$1,577	$1,577
Construction*								$505,738	$505,738
Total							$4,000	$580,460	$584,460

Source: Metro, 2019

Notes: *Phase has not yet been programmed. ** Estimate Includes Caltrans IQA Reimbursements.
PA&ED = Project Approval and Environmental Document; PS&E = Plans, Specifications, and Estimate

Table 8-2: Sources and Uses of Project Funding

Funding Source	Project Development	Construction	Total
	In thousands of dollars ($1,000)		
Congestion Mitigation and Air Quality Improvement Program	$2,607	$0	$2,607
Metro Sales Tax Funds[1]	$74,538	$0	$74,538
Other Federal or State Funding[2]	$0	$125,000	$125,000
Toll Revenue-Backed Obligation	$0	$382,315	$382,315
Total Programmed	$77,145	$507,315	$584,460

Source: Metro, 2019

Notes: [1] Revenue from the Metro existing Sales Tax Measure M, as well as other discretionary funds from other Metro sales taxes (i.e., Proposition A, Proposition C, and Measure R), have been programmed for the Project.
[2] May include SB1 grants or other federal grants.

The Final Project Report will serve as the appropriate document from which the remaining support and capital components of the Project will be programmed.

9. DELIVERY SCHEDULE

The Project schedule includes several Project development milestones outlined in Table 9-1 below:

Table 9-1: Project Milestone Schedule

Project Milestones		Milestone Date Target (Month/Year)	Milestone Date Actual (Month/Day/Year)
Approved PID (Caltrans)	M010	June 2015	September 8, 2015
Program Project	M015	December 2017	December 4, 2017
Begin Environmental	M020	January 2018	January 3, 2018
Notice of Preparation (NOP)	M030	March 2018	March 7, 2018
Notice of Intent (NOI)	M035	March 2018	March 7, 2018
Circulate DPR & DED Externally	M120	May 2020	
PA&ED	M200	November 2020	
Begin Structure	M215	July 2021	
PS&E (95%)	M377	July 2022	
Draft Structures PS&E	M378	January 2022	
Project PS&E	M380	July 2023	
Right of Way Certification	M410	December 2023	
Ready to List	M460	March 2024	
Agency Advertise	M480	April 2024	
Award	M495	May 2024	
Approve Contract	M500	June 2024	
Contract Acceptance	M600	December 2028	
End Project	M800	March 2029	
Final Project Closeout	M900	June 2029	

Notes: Caltrans = California Department of Transportation; DED = Draft Environmental Document; DOE = Division of Equipment; DPR = Draft Project Report; PA&ED = Project Approval and Environmental Document; PID = Project Initiation Document; PS&E = Plans, Specifications and Estimates

The anticipated funding fiscal year for construction is 2024/2028.

Metro is the Project Sponsor, Funding and Lead Agency for the Project Development, Design and Construction Administration of this project. The estimated schedule is subject to change pending the amount of comments received after the circulation of the Draft Environmental Document; right-of-way acquisition, if required, for the "preferred" alternative; coordination with Metro rail operations; and installation and testing of toll equipment. The estimated schedule is based on one design/bid/build contract with full construction funding. Pending availability of Project construction funding, the Project may be implemented in phases and procured under one or more contracts, including the option of using design/build or contract authority. These phasing and delivery approaches would modify the overall Project schedule accordingly.

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10. RISKS

In accordance with Caltrans Deputy Directive (PD-09), project risk management (PRM) shall be applied throughout the various phases of the project. PRM is a process for planning for, identifying, analyzing, communicating, managing, and responding to project risks through all phases of project delivery. A risk register was prepared for the PSR-PDS phase and has been updated to accompany this Draft Project Report (Attachment H). The risk register includes a list of all identified risks, the risk owners, and an agreed upon risk response strategy. The successful delivery of a project can be increased by establishing and maintaining a risk register over the project lifecycle.

The primary source of payment for the I-105 ExpressLanes toll revenue bonds will be I-105 net toll revenues, not yet secured. The level of Project toll revenues collected at any time is dependent on the level of traffic on the I-105 ExpressLanes, which, is related to several factors, including those listed below:

Completion Risks

Any new project has construction risk. Unanticipated delays or cost overruns may limit the Metro's ability to collect toll revenues according to schedule and, in turn, the ability of the Metro to make debt service payments.

Construction delays and cost escalation for such projects may occur as a result of any number of causes, including, but not limited to, adverse weather conditions, unavailability of contractors, coordination among contractors, environmental concerns, labor disputes, engineering errors or unanticipated or increased costs of construction such as labor, equipment, and materials. In addition, construction delays and increased costs may also be caused by uncontrollable circumstances, force majeure events, unforeseen geotechnical conditions, or for other reasons. Although Metro has past experience with executing ExpressLanes, significant new construction projects always carry these inherent risks.

Collaboration with third-parties and community stakeholders are also key elements to successful project completion. Metro serves an increasingly large and diverse group of communities and stakeholders, and collaboration during the construction period is essential in minimizing negative stakeholder impacts that could adversely affect the effectiveness of the ExpressLanes.

Revenue Risks

The levels of traffic assumed and toll-revenue forecasts are based upon estimates and assumptions made by the traffic and revenue consultant. Based upon many estimates and assumptions, the traffic and revenue consultant has provided a reasonable revenue forecast which has been prepared in accordance with accepted practice consistent with Investment Grade T&R studies. However, such reports are not a guarantee of any future events or trends and the future demographic and economic developments cannot be predicted with certainty. Actual levels of traffic and toll revenues will differ, and may differ materially, from the levels projected.

A substantial deterioration in the level of economic activity could have an adverse impact on the level of toll revenues collected. Toll revenues may also decline due to traffic interruptions as a result of construction, greater carpooling or use of mass transit, increased costs of gasoline and of operating an automobile, more reliance on telecommuting in lieu of commuting to work, increase in alternative work schedules allowing for non-peak hour commutes, relocation of businesses to areas outside of the project corridor and similar activities. As a toll facility, traffic on the I-105 ExpressLanes is sensitive to vehicles using competing transportation routes or using general purpose lanes (which do not require the payment of a toll).

Toll revenue generation of the I-105 ExpressLanes is dependent on traffic volume/congestion, occupancy policy, and appropriate rate charges. While Metro has full authority to set appropriate rates and policies to satisfy debt obligations, risk of rate politicization or rate shock that may come from drastic rate changes could lead to unpredictable political or social risks to the ability to generate revenues.

Infrastructure Development Risks

The ability of Metro to pay debt service is to a great extent dependent on the successful management of the I-105 ExpressLanes and the ability to achieve revenues set forth in the traffic and revenue forecast. Successful operation of the I-105 ExpressLanes will require timely and complete maintenance. Metro budgets for maintenance based on its historical experience and internal projections. The actual costs of repairing and maintaining the I-105 ExpressLanes, however, may significantly exceed such projections. Any significant deterioration in the ExpressLanes may result in increased operating costs and reduced usage (or temporary lane closures) and may adversely affect the amount of net toll revenues available to pay debt service.

Force Majeure Risks

Operations of the I-105 ExpressLanes and the collection of tolls is at risk of earthquakes and other events of force majeure, such as damaging storms, winds and floods, fires and explosions, spills of hazardous substances, strikes and lockouts, sabotage, wars, blockades, riots, and acts of terrorism. Metro cannot predict the potential impact of such events on the financial condition of the Metro I-105 ExpressLanes and Metro's ability to pay the principal of and interest on Metro's I-105 ExpressLanes toll revenue backed obligations as well as when due.

Risk Mitigation

Metro anticipates using a design-build contract to construct the Project. The use of a design-build contract is expected to provide incentives to the selected construction contractor firm to provide the Project as indicated by the locally "preferred" Build Alternative chosen and within a date-certain schedule.

The preliminary Investment Grade traffic and revenue forecasts annual gross toll revenue. Metro has estimated Operations and Maintenance assumptions and demonstrate under all toll policies and Project Build Alternatives (i.e., Single Lane and Dual Lanes) that toll revenues are anticipated to cover the expected operations costs.

Metro anticipates providing conventional toll revenue obligation covenants including (i) pledge of toll revenues after operations and maintenance costs; (ii) debt service reserve account; (iii) operations and maintenance serve account; (iv) major maintenance reserve account; (v) rate covenant; and (vi) additional bonds test. The required reserves would be used in the event of a revenue shortfall during operations.

The Project will budget for reserves for operations and maintenance as well as major maintenance and is able to segregate funds into these reserves, which will serve to mitigate the risk that Metro would not operate and maintain the Project in a manner conducive to obtaining sufficient toll revenues.

Additionally, the rate covenant would indicate that Metro would set toll rates and a toll rate structure (i.e., toll policy) such that the Project would generate net toll revenues to achieve a debt service coverage ratio (typically higher than 1.25x). Adjusting the toll rates and structure could provide additional funds in the event of a shortfall. The traffic and revenue scenarios are provided in Section 2.4 of the Projects' CTC application and are based on a toll policy balanced between optimizing mobility and maximizing revenue. As shown in Section 2.5 of the Projects' CTC application, net toll revenue is estimated between $2.29 billion (Single Lane Aggressive) to $4.43 billion (Dual Lane Aggressive).

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11. EXTERNAL AGENCY COORDINATION

The Project is considered to be a High Profile Project which requires FHWA oversight, in accordance with the current FHWA and Caltrans Joint Stewardship and Oversight Agreement, due to its unique Toll Lane component and potential non-traditional revenue sources (Toll Revenue Bonds and potential TIFIA loan). A Value Engineering Analysis will also be required if federal-aid funding is secured. Design Standard Decision Documents proposed on the Interstate System are also required for FHWA approval.

FHWA staff has been apprised of the proposed Project and several meetings were held at Caltrans District 7 offices to review the proposed alternatives.

FHWA oversight of project development through the prescribed Systems Engineering Analysis process that is currently underway as part of the ConOps and T&R Study development, as well as the issuance of a clearance for construction at the conclusion of the design and environmental phases.

See the latest Stewardship and Oversight Agreement on Project Assumption and Program Oversight between the FHWA—California Division, and Caltrans for the Project actions assumed by Caltrans and the Project actions where FHWA has retained their authority as well as the detail associated with the various oversight responsibilities. Project actions are identified in the "Project Action Responsibility Matrix" within the stewardship agreement.

The Project has been identified by FHWA as a "Project of Division Interest."

The Project requires the following additional coordination:

US Army Corps of Engineers
Department of the Army Permit for:
Clean Water Act Section 404

General Permits (Regional Permit, Nationwide Permit or Programmatic Permit)
Standard Permits (Individual Permit or Letter of Permission)
Section 9 Permit

California Department of Fish and Wildlife
California Fish and Game Code Section1602
Lake or Streambed Alteration Agreement

Regional Water Quality Control Board
Clean Water Act Section 401
Water Quality Certification

California Highway Patrol
The CHP is included as an agency stakeholder for the PA&ED and ConOps development processes. Agreements, as identified in Section 7E, will be required to delineate responsibilities once a "preferred" alternative is selected.

Local Agency

Agreements (e.g., Freeway, Tolling, Cooperative, and Maintenance), as identified in Sections 7B, 7D, and 7E, will be required to delineate responsibilities once a "preferred" alternative is selected.

Transit

Agreements (e.g., Transit), as identified in Section 7B, will be required to delineate responsibilities once a "preferred" alternative is selected.

12. PROJECT REVIEWS

Scoping Team Field Review*_____Date _____

**Scoping Team Field Review attendance roster attached*.

District Program Advisor_____Date _____

Headquarters SHOPP Program Advisor_____Date _____

District Maintenance_____Date _____

Headquarters Project Delivery Coordinator_____Date _____

Project Manager_____Date _____

District Environmental Engineer_____Date _____

FHWA_____Date _____

District Safety Review_____Date _____

Constructability Review_____Date _____

Other_____Date _____

FHWA

FHWA staff have participated in PDT meetings through which FHWA staff has communicated the Project concept. The results of these reviews are included in the Agency's document control system which is accessible by the Project team.

Caltrans

Caltrans headquarters and District 7 staff have participated in PDT meetings through which Caltrans staff has communicated the Project concept. The results of these reviews are included in the Agency's document control system which is accessible by the Project team.

Local Agencies

Metro staff have participated in PDT meetings through which Metro staff has communicated the Project concept. The final design will also be reviewed by Metro as the Project advances.

The cities of El Segundo, Inglewood, Hawthorne, Los Angeles, Lynwood, South Gate, Paramount, Downey, Norwalk, and unincorporated areas of Los Angeles County have participated in community involvement meetings (Section 3B) through which City staff has communicated the Project concept. The final design will also be reviewed by the Cities as the Project advances.

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13. PROJECT PERSONNEL

Project personnel are outlined in Table 13-1, Table 13-2, and Table 13-3 below:

Table 13-1: Caltrans Project Personnel

Name	Title	Phone Number
Mohammed Chowdhury	Project Manager, Project Management	(213) 897-9516
Chao Wei	Senior Transportation Engineer, System Planning	(213) 897-1814
Dawn Helou	Senior Transportation Engineer, Managed Lanes Branch	(213) 894-6672
Le Chen	Associate Environmental Planner	(213) 897-4595
Lourdes Ortega	Senior Environmental Planner	(213) 897-9572
Richard Chiang	Senior Transportation Engineer, Design	(213) 897-3768
Sarah Horn	Senior Transportation Engineer, Corridor Manager (South) Area 3	(213) 897-5631
Kim Nguyen	Transportation Engineer, Assistant Corridor Manager (South) Area 3	(213)-897-5431

Table 13-2: FHWA Project Personnel

Name	Title	Phone Number
Omar Elkassed	FHWA, Program Coordinator, California Division	(213) 894-6718

Table 13-3: Metro Project Personnel

Name	Title	Phone Number
Philbert Wong	Senior Manager, Transportation Planning	(213) 418-3137
Shahrzad Amiri	Executive Officer, Congestion Reduction	(213) 922-3061
Alice Tolar	Manager, Transportation Planning	(213) 418-3334
Michael Maulano	Transportation Associate	(213) 922-5535
Daniel Tran	Manager, Transportation Planning	(213) 922-2313
Wilbur Babb	Manager, Community Relations	(213) 922-4955
Linh Trinh	Transportation Associate	(213) 922-5520

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14. ATTACHMENTS (NUMBER OF PAGES)

Attachment A: Project Map (1)
Attachment B: Lane Diagrams
- Attachment B-1: Alternative 1 – Lane Diagrams (4)
- Attachment B-2: Alternative 2 – Lane Diagrams (4)
- Attachment B-3 Alternative 3 – Lane Diagrams (4)

Attachment C: Layouts and Typical Cross Sections
- Attachment C-1.1: Alternative 1 – Typical Cross Sections (1)
- Attachment C-2.1: Alternative 2 – Typical Cross Sections (13)
- Attachment C-2.2: Alternative 2 – Layouts (69)
- Attachment C-3.1: Alternative 3 – Typical Cross Sections (10)
- Attachment C-3.2: Alternative 3 – Layouts (69)

Attachment D: Cost Estimates
- Attachment D-1: Alternative 2 – Cost Estimate (11)
- Attachment D-2: Alternative 3 – Cost Estimate (13)

Attachment E: Design Standards Risk Assessment
- Attachment E-1: Alternative 2 – Design Standards Risk Assessment (4)
- Attachment E-2: Alternative 3 – Design Standards Risk Assessment (4)

Attachment F: Utility Conflict Matrix
- Attachment F-1: Alternative 2 – Utility Conflict Matrix (12)
- Attachment F-2: Alternative 3 – Utility Conflict Matrix (12)

Attachment G: Right-of-Way Data Sheets and Exhibits
- Attachment G-1: Alternative 2 – Right-of-Way Data Sheets and Exhibits (13)

Attachment G-2: Alternative 3 – Right-of-Way Data Sheets and Exhibits (18)
Attachment H: Risk Register
- Attachment H-1: Alternative 2 – Risk Register (2)
- Attachment H-1: Alternative 3 – Risk Register (3)

Attachment I: Storm Water Data Sheet (Signature Page) (1)
Attachment J: TMP Data Sheet
- Attachment J-1: Alternative 2 – TMP Data Sheet (3)
- Attachment J-2: Alternative 3 – TMP Data Sheet (3)

Attachment K: Structure Impact Memorandums
- Attachment K-1: Alternative 2 – Structure Impact Memorandum (5)
- Attachment K-2: Alternative 3 – Structure Impact Memorandum (6)

Attachment L: Draft Environmental Document (Cover and Title Page) (1)