Westbound State Route 91 Improvement Project

CITIES OF CERRITOS AND ARTESIA, CALIFORNIA
DISTRICT 7 – LA – 91, (SR-91 PM 16.9–19.8, I-605 PM 5.0–5.8)
EA 29811/EFIS 0716000284

Initial Study with Proposed Negative Declaration/Environmental Assessment

Volume I

Prepared by the
State of California Department of Transportation

The environmental review, consultation, and any other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by Caltrans pursuant to 23 USC 327 and the Memorandum of Understanding dated December 23, 2016 and executed by FHWA and Caltrans.

Caltrans

July 2018

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District 07-LA-91-(SR-91 PM 16.9–19.8, I-605 PM 5.0–5.8)
EA: 29811/ EFIS: 0716000284

Widening of State Route 91 (SR-91) between approximately Shoemaker Avenue and the Interstate 605 (I-605) interchange (westbound SR-91 PM 16.9–19.8 and northbound I-605 PM 5.0–5.8) in the Cities of Cerritos and Artesia, California

INITIAL STUDY WITH PROPOSED NEGATIVE DECLARATION / ENVIRONMENTAL ASSESSMENT

Submitted Pursuant to: (State) Division 13, California Public Resources Code
(Federal) 42 USC 4332(2)(c)

THE STATE OF CALIFORNIA
Department of Transportation

July 11, 2018
Date of Approval

Ronald Kosinski

Ron Kosinski
Deputy District Director
California Department of Transportation
District 7
CEQA/NEPA Lead Agency

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7-LA-91-(SR-91 PM 16.9–19.8, I-605 PM 5.0–5.8)
29811

Proposed Negative Declaration

Pursuant to: Division 13, Public Resources Code

Project Description

The California Department of Transportation (Caltrans) District 7 and the Los Angeles County Metropolitan Transportation Authority (Metro), in collaboration with the Gateway Cities Council of Governments (GCCOG) and the Cities of Cerritos and Artesia, propose to widen and improve approximately 4 miles (mi) of freeway along westbound State Route 91 (SR-91) between approximately Shoemaker Avenue and the Interstate 605 (I-605) interchange. The study area includes westbound SR-91 (Post Miles [PM] 16.9–19.8) and northbound I-605 (PM 5.0–5.8) and traverses the cities of Cerritos and Artesia.

Determination

This proposed Negative Declaration (ND) is included to give notice to interested agencies and the public that it is Caltrans' intent to adopt an ND for this project. This does not mean that Caltrans' decision regarding the project is final. This ND is subject to change based on comments received by interested agencies and the public.

Caltrans has prepared an Initial Study for this project, and pending public review, expects to determine from this study that the proposed project would not have a significant effect on the environment for the following reasons:

The proposed project would have no effect on the following resources: Agriculture and Forest Resources, Mineral Resources, Biological Resources.

In addition, the proposed project would have less than significant effects to: Land Use and Planning, Utilities and Service Systems, Public Services, Visual/Aesthetics, Cultural Resources, Tribal Cultural Resources, Hydrology and Water Quality, Geology and Soils, Hazards and Hazardous Materials, Air Quality, Recreation, Noise, Population and Housing, Transportation/Traffic.

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Date of Approval

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Ron Kosinski, Deputy District Director
California Department of Transportation, District 7
CEQA/NEPA Lead Agency

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Chapter 1 Proposed Project

1.1 Introduction

The California Department of Transportation (Caltrans) District 7 and the Los Angeles County Metropolitan Transportation Authority (Metro), in collaboration with the Gateway Cities Council of Governments (GCCOG) and the Cities of Cerritos and Artesia, propose to widen and improve approximately 4 miles (mi) of freeway along westbound State Route 91 (SR-91) between approximately Shoemaker Avenue and the Interstate 605 (I-605) interchange, and at the I-605 northbound exit to Alondra Boulevard. The Study Area includes westbound SR-91 (Post Miles [PM] 16.9–19.8) and northbound I-605 (PM 5.0–5.8) and traverses the cities of Cerritos and Artesia. Caltrans, as assigned by the Federal Highway Administration (FHWA), is the Lead Agency for compliance under the National Environmental Policy Act (NEPA). Caltrans is the Lead Agency for compliance under the California Environmental Quality Act (CEQA). Figure 1-1 shows the project location and vicinity.

The Westbound SR-91 Improvement Project (project) is funded by County of Los Angeles Measure R sales tax funds, which are administered by Metro. California participated in the Surface Transportation Project Delivery Pilot Program (Pilot Program), pursuant to 23 United States Code (USC) 327, for more than 5 years, beginning July 1, 2007, and ending September 30, 2012. The Moving Ahead for Progress in the 21st Century Act (MAP-21 [P.L. 112-141]), signed by President Barack Obama on July 6, 2012, amended 23 USC 327 to establish a permanent Surface Transportation Project Delivery Program. As a result, Caltrans entered into a Memorandum of Understanding (MOU) pursuant to 23 USC 327 (NEPA Assignment MOU) with FHWA. The NEPA Assignment MOU became effective October 1, 2012, and was renewed on December 23, 2016, for a term of 5 years. In summary, Caltrans continues to assume FHWA responsibilities under NEPA and other federal environmental laws in the same manner as was assigned under the Pilot Program, with minor changes. With NEPA Assignment, FHWA assigned and Caltrans assumed all of the United States Department of Transportation (USDOT) Secretary’s responsibilities under NEPA. This assignment includes projects on the State Highway System and Local Assistance Projects off of the State Highway System within the State of California, except for certain categorical exclusions (CE) that FHWA assigned to Caltrans under the 23 USC 326 CE Assignment MOU, projects excluded by definition, and specific project exclusions.

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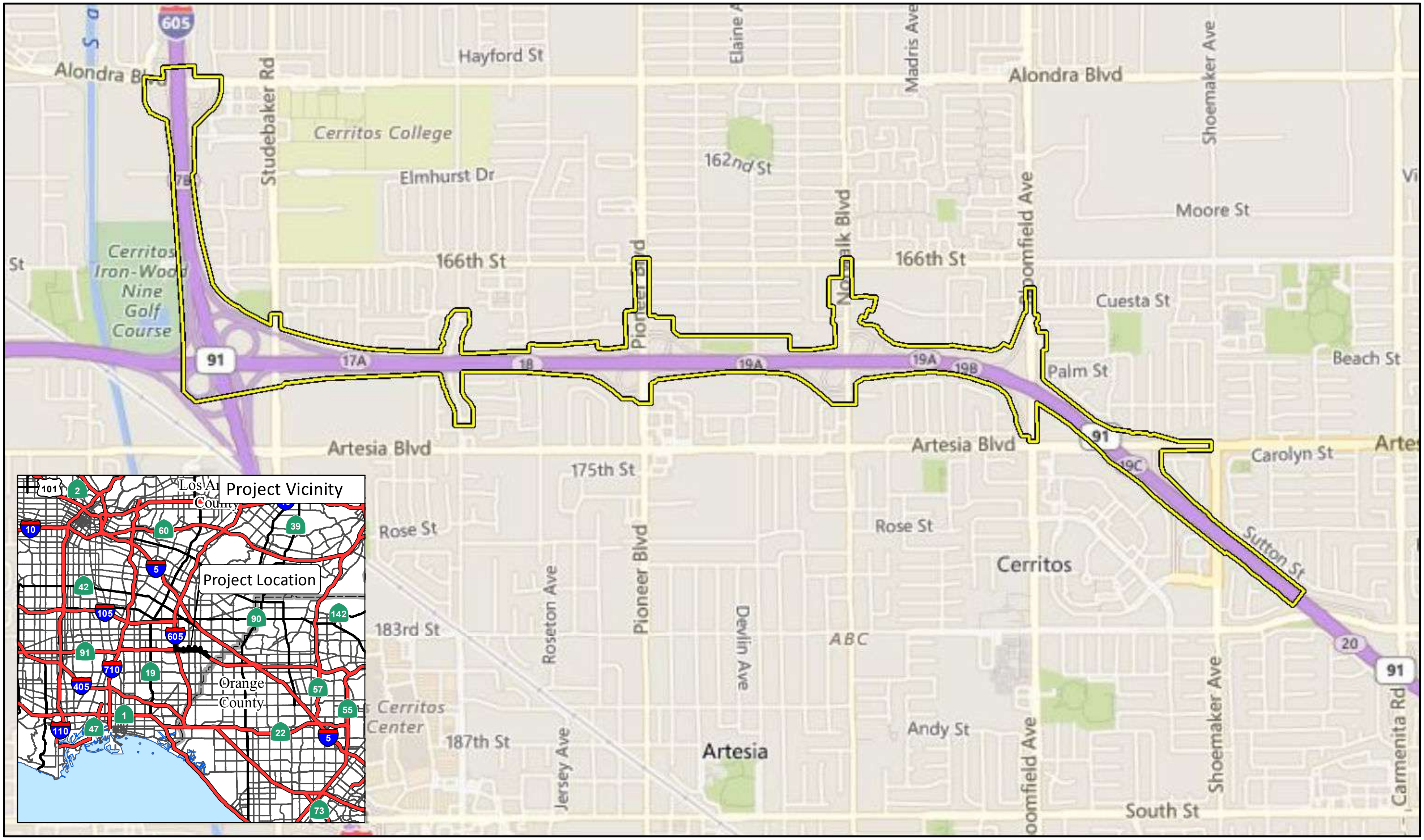

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Study Area Limits

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FIGURE 1-1

Westbound SR-91 Improvement Project

Project Location

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0716000284; EA-07-29811

SOURCE: Bing Maps (2014); Michael Baker (4/2017)

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The proposed project is listed in Amendment #3 to the 2016 Regional Transportation Plan (RTP)/Sustainable Communities Strategy (SCS) with Project ID 1163S012. The 2016 RTP was approved by the Regional Council of the Southern California Association of Governments (SCAG) on April 7, 2016, and Amendment #3 is scheduled to be adopted in December 2018. However, the proposed project is not currently programmed in the Federal Transportation Improvement Program (FTIP). The proposed project will be added to the FTIP prior to completion of the Project Approval and Environmental Documentation (PA&ED) phase.

1.2 Purpose and Need

1.2.1 Purpose

The purpose of the project is to reduce congestion and improve freeway operations (both mainline and ramps), improve safety, and improve local and system interchange operations.

1.2.2 Need

Westbound SR-91 approaching the connector ramp for both northbound and southbound I-605 currently experiences substantial congestion, which will continue in the future No Build condition. This congestion, as a result of inadequate capacity of the existing two-lane connector for westbound SR-91 to northbound and southbound I-605 as well as the closely spaced freeway entrance and exit ramps, contributes to a high concentration of accidents.

1.2.2.1 Capacity, Transportation Demand, and Safety

Existing Capacity and Levels of Service

Freeway traffic flow can be defined in terms of levels of service (LOS). There are six defined LOS for freeways: LOS A to LOS F. As shown on Figure 1-2, LOS A represents free traffic flow with low traffic volumes and high speeds, and LOS F represents traffic volumes that exceed the facility capacity and result in forced flow operations at low speeds.

The results of the Draft Traffic Analysis Report (which used the Highway Capacity Manual (HCM) method of analysis for determining LOS), provided in Table 1.1 and shown on Figure 1-3 (a.m. peak period) and Figure 1-4 (p.m. peak period), indicate that all existing freeway mainline segments are currently operating at LOS D or better during the peak hours. All freeway mainline segments would also operate at LOS D

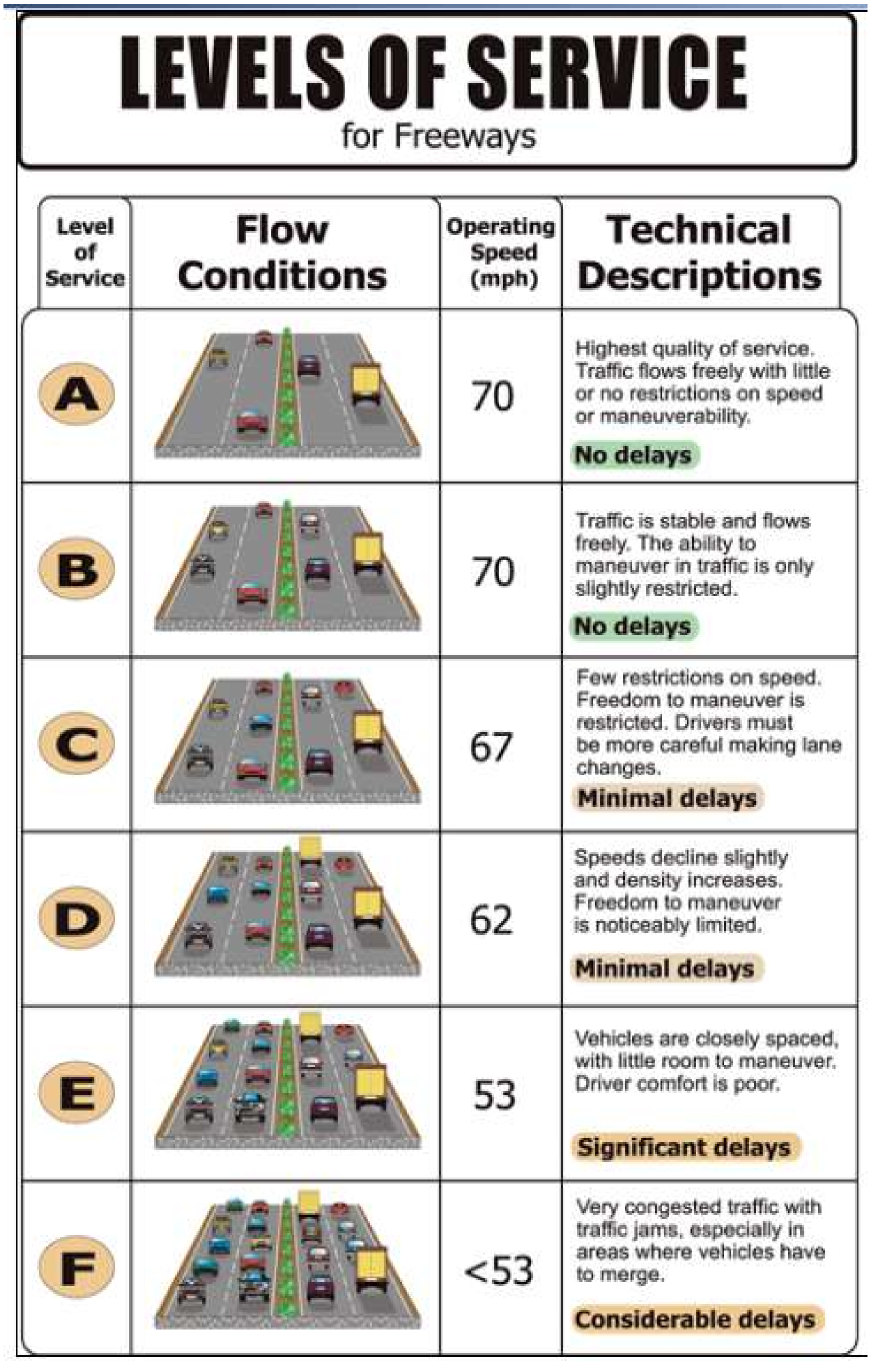

Figure 1-2 LOS Thresholds for a Basic Freeway Segment

FIGURE 1-3

Westbound SR-91 Improvement Project

Year 2016 Existing Conditions Level of Service Analysis
Based on HCM Method - AM Peak Period

07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

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SOURCE: Revised Draft Traffic Analysis Report, 2017

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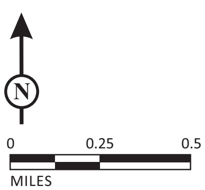
FIGURE 1-4



SOURCE: Revised Draft Traffic Analysis Report, 2017

Westbound SR-91 Improvement Project

Year 2016 Existing Conditions Level of Service Analysis
Based on HCM Method - PM Peak Period

07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

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Table 1.1 Year 2016 Existing Conditions Freeway Mainline Level of Service Analysis – Highway Capacity Manual Method

Segment Location	AM Peak Hour		PM Peak Hour	
	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
Westbound SR-91				
Carmenita Road Off-Ramp to 183rd Street On-Ramp	23.8	C	25.1	C
Artesia Boulevard Off-Ramp to Artesia Boulevard On-Ramp	22.9	C	24.4	C
Artesia Boulevard On-Ramp to Bloomfield Avenue On-Ramp	25.3	C	27.5	D
Norwalk Boulevard Off-Ramp to Norwalk Boulevard Loop On-Ramp	25.6	C	27.9	D
Norwalk Boulevard Loop On-Ramp to Norwalk Boulevard Direct On-Ramp	27.2	D	29.3	D
Pioneer Boulevard Off-Ramp to Pioneer Boulevard Loop On-Ramp	27.6	D	30.0	D
Pioneer Boulevard Loop On-Ramp to Pioneer Boulevard Direct On-Ramp	28.6	D	31.8	D
I-605 Off-Ramp (NB & SB) to Studebaker Road Off-Ramp	22.0	C	26.4	D
Studebaker Road Off-Ramp to I-605 NB/WB SR-91 Loop On-Ramp	19.6	C	25.0	C
I-605 NB/WB SR-91 Loop On-Ramp to I-605 SB/WB SR-91 On-Ramp	18.8	C	25.4	C

Source: Table 2-8, *Traffic Operations Analysis Report* (2018).
I-605 = Interstate 605
LOS = level of service
NB = northbound
pc/mi/ln = passenger car per mile per lane
SB = southbound
SR-91 = State Route 91
WB = westbound

or better during peak hours in the 2024 No Build scenario. Caltrans strives for freeway facilities to operate at either LOS C or D. Further details regarding existing and future traffic conditions are provided in Section 2.5, Traffic.

All existing freeway weaving segments operate at LOS D or better during the peak hours, except for the weaving segment from the Pioneer Boulevard on-ramp to the I-605 off-ramp for which the HCM results indicate LOS F, as shown in Table 1.2. All existing freeway merge and diverge segments operate at LOS D or better during peak hours, as shown in Table 1.3. All existing intersections in the Study Area operate at LOS D or better during peak hours, as shown in Table 1.4.

Table 1.2 Year 2016 Existing Conditions Freeway Weaving Analysis

Segment Location	AM Peak Hour		PM Peak Hour	
	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
Westbound SR-91				
183rd Street On-Ramp to Artesia Boulevard Off-Ramp	26.7	C	27.7	C
Bloomfield Avenue On-Ramp to Norwalk Boulevard Off-Ramp	27.7	C	30.1	D
Norwalk Boulevard Direct On-Ramp to Pioneer Boulevard Off-Ramp	28.8	D	32.0	D
Pioneer Boulevard Direct On-Ramp to I-605 Off-Ramp (NB & SB)	–	**F**	–	**F**
Northbound I-605				
SR-91 WB On-Ramp to Alondra Boulevard Off-Ramp	–	**F**	–	**F**

Source: Table 2-10, *Traffic Operations Analysis Report* (2018).
Note: Shaded cells indicate unsatisfactory LOS (i.e., LOS E or F).
I-605 = Interstate 605
LOS = level of service
NB = northbound
pc/mi/ln = passenger cars per mile per lane
SB = southbound
SR-91 = State Route 91
WB = westbound

Table 1.3 Year 2016 Existing Conditions Freeway Merge and Diverge Analysis

Junction	Merge/ Diverge	AM Peak Hour		PM Peak Hour	
		Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
Westbound SR-91					
Artesia Boulevard On-Ramp	Merge	21.8	C	24.4	C
Norwalk Boulevard Loop On-Ramp	Merge	22.1	C	23.2	C
Pioneer Boulevard Loop On-Ramp	Merge	22.3	C	24.7	C
Studebaker Road Off-Ramp	Diverge	25.6	C	29.0	D
I-605 NB On-Ramp	Merge	20.3	C	29.4	D

Source: Table 2-11, *Traffic Operations Analysis Report* (2018).
I-605 = Interstate 605
LOS = level of service
NB = northbound
pc/mi/ln = passenger cards per mile per lane
SR-91 = State Route 91

Table 1.4 Year 2016 Existing Conditions Intersection Level of Service Analysis

Intersection	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Westbound SR-91				
WB SR-91 Off-Ramp/Artesia Boulevard	22.5	C	19.0	B
Bloomfield Avenue/WB SR-91 On-Ramp	10.5	B	8.4	A
Norwalk Boulevard/WB SR-91 Off-Ramp	9.9	A	6.9	A
Pioneer Boulevard/WB SR-91 Off-Ramp	7.2	A	6.4	A
Studebaker Road/WB SR-91 Off-Ramp	16.5	B	8.3	A
Northbound I-605				
NB I-605 Off-Ramp/Alondra Boulevard	25.1	C	38.9	D

Source: Table 2-13, *Traffic Operations Analysis Report* (2018).
I-605 = Interstate 605
LOS = level of service
NB = northbound
sec/veh = seconds per vehicle
SR-91 = State Route 91
WB = westbound

In areas with long vehicle queues, slow speeds, and high levels of congestion, the HCM method of analysis can report LOS that is better than what drivers actually experience on the road. In order to report LOS that more closely reflects what drivers experience, the speed method of analysis for determining LOS was also employed. The speed method of analysis included observing existing speed profiles in the Study Area and comparing those speeds to likely LOS designations.

Based on the speed method of analysis, the existing freeway mainline segments mostly experience LOS E and LOS F during both peak periods, as shown in Table 1.5 and on Figure 1-5 (a.m. peak period) and Figure 1-6 (p.m. peak period). It should be noted that the segments analyzed using the speed method are different than the segments analyzed using the HCM method because the HCM segments are determined based on criteria used in the HCM manual that define analysis segments. However, for the speed method, the locations are entirely dependent on the locations of the Caltrans Performance Measurement System (PeMS) detector stations that provided the speed information.

Table 1.5 Year 2016 Existing Conditions Freeway Mainline Level of Service Analysis – Speed Method

Segment Location	AM Peak Hour		PM Peak Hour	
	Average Speed (mph)	LOS	Average Speed (mph)	LOS
Westbound SR-91				
Carmenita Road Off-Ramp to 183rd Street On-Ramp	40.0	D	30.0	**E**
183rd Street On-Ramp to Artesia Boulevard Off-Ramp	29.0	**F**	27.0	**F**
Artesia Boulevard Off-Ramp to Artesia Boulevard On-Ramp	25.0	**F**	22.0	**F**
Artesia Boulevard On-Ramp to Bloomfield Avenue On-Ramp	22.0	**F**	21.0	**F**
Bloomfield Avenue On-Ramp to Norwalk Boulevard Off-Ramp	20.0	**F**	22.0	**F**
Norwalk Boulevard Off-Ramp to Norwalk Boulevard Loop On-Ramp	28.0	**F**	32.0	**E**
Norwalk Boulevard Direct On-Ramp to Pioneer Boulevard Off-Ramp	39.0	D	41.0	D
Pioneer Boulevard Off-Ramp to Pioneer Boulevard Loop On-Ramp	33.0	**E**	37.0	D
Pioneer Boulevard Loop On-Ramp to Pioneer Boulevard Direct On-Ramp	37.0	D	46.0	C
Pioneer Boulevard Direct On-Ramp to I-605 Off-Ramp (NB and SB)	44.0	D	47.0	C
Northbound I-605				
SR-91 WB On-Ramp to Alondra Boulevard Off-Ramp	32.0	**E**	40.0	D

Source: Table 2-9, *Traffic Operations Analysis Report* (2018).
Note: Shaded cells indicate unsatisfactory LOS (i.e., LOS E or F).
I-605 = Interstate 605
LOS = level of service
mph = miles per hour
NB = northbound
SB = southbound
SR-91 = State Route 91
WB = westbound

The existing (2016) congestion during peak hours along westbound SR-91 is caused by the freeway geometric design along the Study Area and the high traffic demand. The two-lane westbound to northbound/southbound freeway-to-freeway connector ramp continues to worsen as the peak-hour flow of traffic creates vehicle queues. The vehicle queues cause slowing and congestion on westbound SR-91 leading up to the I-605 connector ramp. Demand is forecast to increase in the absence of physical and operational improvements.

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FIGURE 1-5

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SOURCE: Revised Draft Traffic Analysis Report, 2017

Westbound SR-91 Improvement Project

Year 2016 Existing Conditions Level of Service Analysis
Based on Speeds - AM Peak Period

07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

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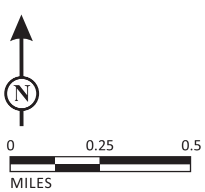
FIGURE 1-6



SOURCE: Revised Draft Traffic Analysis Report, 2017

Westbound SR-91 Improvement Project

Year 2016 Existing Conditions Level of Service Analysis

Based on Speeds - PM Peak Period

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0716000284; EA 29811

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The congestion caused by the ramp is then worsened by current geometric conditions, including the closely spaced arterial interchanges at Pioneer Boulevard, Norwalk Boulevard, and Bloomfield Avenue. These ramps are spaced much closer together than current freeway design standards allow, and this close spacing further contributes to congestion due to inadequate distances for vehicles to merge and weave to access the freeway on- and off-ramps. The interchange improvements would increase vehicular weaving and merging distances between interchanges.

Travel Times and Speeds

As shown in Table 1.5, traffic speeds are slowest at the eastern end of the Study Area and increase going to the west. This is a result of the fact that over 3,000 vehicles in the peak hour exit from westbound SR-91 to I-605, thereby reducing the traffic demand on the remaining lanes on westbound SR-91. Additionally, traffic speeds leading to the I-605 connector ramp and on the I-605 ramp are low. SR-91 is the closest east-west corridor to the two ports and provides direct access to many major warehouse clusters and distribution centers in the region.

Accidents and Safety

Accident data for the project limits are provided in Tables 1.6 and 1.7 for the 3-year period from January 1, 2012, through December 31, 2014. The accident data were obtained from Caltrans' Traffic Accident Surveillance and Analysis System (TASAS) database.

As shown in Tables 1.6 and 1.7, a total of 1,177 accidents occurred within the project limits, including the mainline segments, freeway-to-freeway direct connect ramps, and freeway-to-arterial ramps. The majority of the accidents (88 percent) occurred on the mainline segments, while the remainder (12 percent) occurred at the freeway-to-freeway direct connect ramps and freeway-to-arterial ramps. Approximately 82 percent of mainline accidents occurred on westbound SR-91. The accident rates at 12 locations were higher than the statewide averages for fatal plus injury accidents, while accident rates at 11 locations were higher than the statewide averages for total accidents. The locations where the actual accident rate is greater than the statewide average accident rate for similar facilities are highlighted on Figure 1-7.

Table 1.6 Westbound SR-91 Freeway, Summary of Existing (01/2012–12/2014) Accident Rates

Map No.[1]	Location	Actual Accident Rates[2,3]			Statewide Average Accident Rates[2]			Number of Accidents[2]			
		Fatal	Fatal + Injury	Total	Fatal	Fatal + Injury	Total	Fatal	Injury	PDO	Total
	Freeway Mainline Segments										
	Bellflower Boulevard to I-605 Freeway Interchange	0.000	0.180	0.500	0.003	0.280	0.960	0 (0%)	35 (36%)	61 (64%)	96
	I-605 Freeway Interchange to Studebaker Road	0.000	0.330	0.830	0.004	0.340	1.110	0 (0%)	8 (40%)	12 (60%)	20
1	Studebaker Road to Pioneer Boulevard	0.000	0.670	1.990	0.004	0.310	1.050	0 (0%)	100 (34%)	198 (66%)	298
2	Pioneer Boulevard to Norwalk Boulevard	0.012	0.690	2.550	0.004	0.320	1.050	1 (1%)	56 (26%)	153 (73%)	210
3	Norwalk Boulevard to Bloomfield Avenue	0.000	0.320	1.230	0.004	0.310	1.030	0 (0%)	25 (26%)	70 (74%)	95
4	Bloomfield Avenue to Artesia Avenue	0.000	0.370	1.270	0.004	0.310	1.020	0 (0%)	13 (29%)	32 (71%)	45
	Artesia Avenue to Shoemaker Avenue	0.000	0.290	0.810	0.004	0.300	1.000	0 (0%)	11 (35%)	20 (65%)	31
	Shoemaker Avenue to Carmenita Road	0.000	0.150	0.620	0.003	0.270	0.910	1 (2%)	14 (23%)	46 (75%)	61
	Freeway-to-Freeway Direct Connector Ramps										
5	WB SR-91 On-Ramp from SB I-605 Freeway	0.000	0.160	0.490	0.003	0.110	0.320	0 (0%)	5 (33%)	10 (67%)	15
6	WB SR-91 Loop On-Ramp from NB I-605 Freeway	0.000	0.200	0.980	0.004	0.210	0.720	0 (0%)	4 (20%)	16 (80%)	20
7	WB SR-91 Off-Ramp to I-605 Freeway (both NB and SB)	0.000	0.220	0.790	0.002	0.080	0.250	0 (0%)	13 (28%)	33 (72%)	46
	Freeway-to-Arterial Ramps										
8	WB SR-91 Off-Ramp to Studebaker Road	0.000	0.450	0.680	0.003	0.350	1.010	0 (0%)	2 (67%)	1 (33%)	3
	WB SR-91 On-Ramp from SB Pioneer Boulevard	0.000	0.000	0.170	0.003	0.180	0.570	0 (0%)	0 (0%)	1 (100%)	1
	WB SR-91 Loop On-Ramp from NB Pioneer Boulevard	0.000	0.160	0.470	0.002	0.210	0.730	0 (0%)	1 (33%)	2 (67%)	3
	WB SR-91 Off-Ramp to Pioneer Boulevard	0.000	0.150	0.880	0.003	0.350	1.010	0 (0%)	1 (17%)	5 (83%)	6
9	WB SR-91 On-Ramp from SB Norwalk Boulevard	0.000	0.520	1.040	0.003	0.180	0.570	0 (0%)	2 (50%)	2 (50%)	4
10	WB SR-91 Loop On-Ramp from NB Norwalk Boulevard	0.000	0.290	0.290	0.002	0.210	0.730	0 (0%)	1 (100%)	0 (0%)	1
11	WB SR-91 Off-Ramp to Norwalk Boulevard	0.000	1.290	1.550	0.003	0.350	1.010	0 (0%)	5 (83%)	1 (17%)	6
	WB SR-91 On-Ramp from Bloomfield Avenue	0.000	0.000	0.200	0.002	0.220	0.630	0 (0%)	0 (0%)	2 (100%)	2
12	WB SR-91 On-Ramp from WB Artesia Boulevard	0.000	1.050	1.390	0.003	0.180	0.570	0 (0%)	6 (75%)	2 (25%)	8
13	WB SR-91 Off-Ramp to Artesia Boulevard	0.000	1.120	1.600	0.003	0.350	1.010	0 (0%)	7 (70%)	3 (30%)	10

Source: Table B, Traffic Accident Surveillance and Analysis System–Transportation System Network (TASAS-TSN).

1 Map numbers correspond to numbers on Figure 1-7.

2 Accident rates are per million vehicle miles traveled for the mainline and per million vehicles for the connector and arterial ramps.

3 Shaded cells indicate accident rates that are higher than the statewide average.

Caltrans = California Department of Transportation
I-605 = Interstate 605
NB = northbound
PDO = property damage only
SB = southbound
SR-91 = State Route 91
WB = westbound

Table 1.7 Northbound I-605 Freeway, Summary of Existing (01/2012–12/2014) Accident Rates

Location	Actual Accident Rates[1]			Statewide Average Accident Rates[1]			Number of Accidents[1]			
	Fatal	Fatal + Injury	Total	Fatal	Fatal + Injury	Total	Fatal	Injury	PDO	Total
Freeway Mainline Segments										
South Street to SR-91 Freeway Interchange	0.006	0.170	0.658	0.004	0.280	0.920	1 (1%)	27 (25%)	82 (74%)	110
SR-91 Freeway Interchange to Alondra Boulevard	0.000	0.170	0.600	0.003	0.270	0.910	0 (0%)	21 (28%)	53 (72%)	74
Freeway-to-Freeway Direct Connector Ramps										
NB I-605 On-Ramp from WB SR-91 Freeway	0.000	0.050	0.150	0.003	0.110	0.320	0 (0%)	2 (33%)	4 (67%)	6
Freeway-to-Arterial Ramps										
NB I-605 Off-Ramp to Alondra Boulevard	0.000	0.080	0.470	0.003	0.350	1.010	0 (0%)	1 (17%)	5 (83%)	6

Source: Table B, Traffic Accident Surveillance and Analysis System–Transportation System Network (TASAS-TSN).
[1] Accident rates are per million vehicle miles traveled for the mainline and per million vehicles for the connector and arterial ramps.
Caltrans = California Department of Transportation
I-605 = Interstate 605
NB = northbound
PDO = property damage only
SR-91 = State Route 91
WB = westbound

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FIGURE 1-7

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SOURCE: Intueor Consulting, Inc., 2017

Westbound SR-91 Improvement Project

Accident Concentration Locations with Actual Accident Rates Greater than the Statewide Average

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0716000284; EA 29811

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Rear-end collisions were the most common accident type. Other key accident types included broadside and hit-objects. Rear-end collisions are typically related to traffic congestion in chokepoint areas and are associated with sudden attempts to stop when traffic volumes exceed the capacity of the road. The majority of broadside accidents can usually be attributed to merging/diverging vehicle movements.

1.2.2.2 Roadway Deficiencies

The traffic congestion, delays, and reduced travel speeds currently experienced in the Study Area are partly the result of the segment of westbound SR-91 approaching the connector ramp for both northbound and southbound I-605, which currently experiences substantial congestion and low peak-hour speeds and will continue to do so in the future No-Build condition. Closely spaced freeway entrance and exit ramps result in a high concentration of accidents.

1.2.2.3 Social Demands and Economic Development

From 2016 to 2044, the SCAG regional population[1] is forecast to grow by 18 percent, and the Study Area population is forecast to grow by 12 percent. During this same period, employment is anticipated to follow a different pattern, with regional employment forecast to grow by 23 percent and Study Area employment forecast to grow by 27 percent. The rate of population growth is projected to be lower in the Study Area than in the SCAG region because the Study Area is almost completely developed. New growth will be limited to smaller, infill-type developments. The rate of employment growth is projected to be higher in the Study Area than in the SCAG region because employment in the Study Area tends to be in industry sectors that are projected to experience substantial growth over the next several decades (education, health care, and professional services). For historical context, the regional population was approximately 8 million in 1960 (SCAG 2015). The 2016 regional population of nearly 19 million represents a 135 percent increase since 1960. The 2016 RTP growth forecast was the basis for the regional traffic modeling that was conducted for the project.

[1] The SCAG regional population includes Imperial County, Los Angeles County, Orange County, Riverside County, San Bernardino County, and Ventura County.

1.2.2.4 Legislation

Measure R Initiative

The proposed project is part of a larger program of transportation improvements included in Metro's Measure R[1]. Measure R, a 1/2-cent sales tax for Los Angeles County, is expected to provide $40 billion in local sales tax revenues over 30 years. Measure R, which took effect July 2009, provided funding for new transportation projects and programs and current projects already in development. These future and current projects include new rail and/or bus rapid transit projects, commuter rail improvements, Metro Rail system improvements, highway projects, improved countywide local bus operations, and local city-sponsored transportation improvements.

1.2.2.5 Modal Interrelationships and System Linkages

Bus service within the Study Area includes three Long Beach Transit (LBT) routes, two Cerritos on Wheels routes, two Norwalk Transit System (NTS) routes, one Orange County Transportation Authority (OCTA) route, and three Metro routes. The Study Area is also slated to receive rail service from the proposed Metro West Santa Ana Branch (WSAB) light rail line[2] in the coming years. As described in Section 1.3 below, the proposed project would provide improvements for pedestrians that would result in better first-mile/last-mile transit access.

1.2.2.6 Logical Termini and Independent Utility

Federal regulations (23 Code of Federal Regulations [CFR] 771.111(f)) require that "logical termini" and "independent utility" be established for a transportation improvement project evaluated under NEPA. The project limits were defined based on providing a logical and independent set of improvements. Logical termini are defined as rational end points for transportation improvement and analysis of the potential environmental impacts of a proposed project. A project is defined as having independent utility if it meets the project purpose in the absence of other improvements in the project limits.

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1 Los Angeles County Metropolitan Transportation Authority (Metro). Measure R. Website: https://www.metro.net/projects/measurer/ (accessed November 11, 2017).

2 Los Angeles County Metropolitan Transportation Authority (Metro). West Santa Ana Branch Transit Corridor. Website: https://www.metro.net/projects/west-santa-ana/ (accessed November 11, 2017).

Logical Termini

The focus of the proposed project is to reduce congestion and improve freeway operations. The environmental study limits extend from approximately Shoemaker Avenue to I-605 and north on I-605 to Alondra Boulevard, although actual improvements may not be included along this entire length. As shown in Table 1.5, Year 2016 Existing Conditions Freeway Mainline Level of Service Analysis, LOS E and LOS F conditions occur on westbound SR-91 during both the a.m. and p.m. peak hours within the study limits. Similarly, as shown in Table 1.6, Westbound SR-91 Freeway, Summary of Existing Accident Rates, accident rates are higher than the statewide average for the section of westbound SR-91 from Bloomfield Avenue to Studebaker Road within the study limits. The proposed geometric design features are expected to result in improved operating conditions throughout the length of the project, with reductions in vehicle delay and travel time. Safety would be improved as a result of increased weaving distances between interchanges. The proposed project provides logical termini because the western and eastern termini assure a sufficient length of alignment (approximately 4 mi) to integrate the proposed westbound SR-91 widening and Pioneer Boulevard and Norwalk Boulevard interchange improvements with existing facilities and avoid any abrupt transitions.

Independent Utility

The mixed-flow lane in the westbound direction for SR-91, the auxiliary lanes, and the interchange modifications included in the proposed project would provide benefits to the traveling public without requiring or being dependent on the provision of other improvements on SR-91 or other freeways or arterials. These improvements would benefit travelers as they enter/exit the freeway or travel in the general-purpose and high-occupancy vehicle (HOV) lanes. The proposed project represents a reasonable expenditure even if no additional transportation improvements are made in the corridor, it can be implemented in the absence of any other improvements, and it does not restrict consideration of alternatives for other reasonably foreseeable transportation improvements in the SR-91 corridor and areas adjacent to the project limits. The proposed project would have independent utility because it meets the project purpose in the absence of other improvements in the SR-91 corridor.

1.3 Project Description

This section describes the proposed action and the project alternative developed to meet the purpose and need of the project and to avoid or minimize environmental impacts. The alternatives are the Build Alternative and the No Build Alternative.

The project is located in southeast Los Angeles County on westbound SR-91 (PM 16.9–19.8) and I-605 (PM 5.0–5.8). The total length of the project is approximately 4 mi, with the majority of improvements along the westbound SR-91 three-mile segment.

1.3.1 Existing Freeway Mainline

Within the project limits, westbound SR-91 includes four mixed-flow lanes that are 11 feet (ft) wide, a 1.5 ft wide left median shoulder, a 12 ft wide HOV lane, and one 12 ft wide auxiliary lane between certain successive on- and off-ramps. Within the project limits, I-605 has four to five mixed-flow lanes and one HOV lane in each direction plus ramp merge and diverge lanes.

1.3.2 Existing Ramps and Interchanges (East to West and South to North)

The SR-91/Artesia Boulevard westbound off-ramp terminus is located at the eastern end of the Study Area. The exit ramp splits into one left-turn lane and one right-turn lane. The Artesia Boulevard westbound on-ramp currently is a direct ramp from Artesia Boulevard that merges onto SR-91 just east of the Bloomfield Avenue overpass.

The SR-91/Bloomfield Avenue westbound on-ramp is located northwest of the SR-91/Artesia Boulevard westbound off-ramp. The Bloomfield Avenue westbound on-ramp currently is a direct ramp from Bloomfield Avenue that merges onto SR-91 just west of Bloomfield Avenue.

SR-91 forms a partial cloverleaf interchange with Norwalk Boulevard. The westbound side consists of a two-lane off-ramp at Norwalk Boulevard, a one-lane on-ramp from southbound Norwalk Boulevard, and a one-lane loop on-ramp from northbound Norwalk Boulevard.

Similar to the SR-91/Norwalk Boulevard interchange, the SR-91/Pioneer Boulevard interchange is a partial cloverleaf. The westbound side of the interchange consists of a two-lane off-ramp at Pioneer Boulevard, a two-lane on-ramp from southbound Pioneer Boulevard (with one dedicated HOV lane), and a one-lane loop on-ramp from northbound Pioneer Boulevard.

The existing outside lane of the westbound SR-91 to the northbound I-605 two-lane connector ramp terminates as a trapped auxiliary lane for the northbound I-605 exit to Alondra Boulevard; the outside lane forces the driver to exit at Alondra Boulevard.

The SR-91/Studebaker Road westbound off-ramp splits into two lanes and is located immediately west of the SR-91/I-605 freeway-to-freeway connector.

The existing outside lane of the westbound SR-91 to the northbound I-605 two-lane connector ramp terminates as a trapped auxiliary lane for the northbound I-605 exit to Alondra Boulevard; the outside lane forces the driver to exit at Alondra Boulevard. The northbound I-605 Alondra Boulevard off-ramp splits into two lanes.

1.3.3 Alternatives

1.3.3.1 Build Alternative

The Build Alternative would add one new mixed-flow lane in the westbound direction on SR-91 from approximately Shoemaker Avenue to I-605, joining at the point where the westbound SR-91 to northbound I-605 connector ramp flares from one to two lanes. In addition, the new mixed-flow lane would create a three-lane exit movement on westbound SR-91 to both the northbound and southbound I-605 connector ramps where only a two-lane exit movement exists now.

The Build Alternative would keep the existing auxiliary lanes between Bloomfield Avenue and Norwalk Boulevard, Norwalk Boulevard and Pioneer Boulevard, and Pioneer Boulevard and westbound SR-91 to the northbound and southbound I-605 connector ramps.

Interchange modifications at Pioneer Boulevard and Norwalk Boulevard are also proposed under the Build Alternative. These modifications include reconstructing existing Type L-9 cloverleaf interchanges into Type L-7 cloverleaf interchanges. Typical Type L-7 and Type L-9 local street interchanges are shown on Figure 1-8.

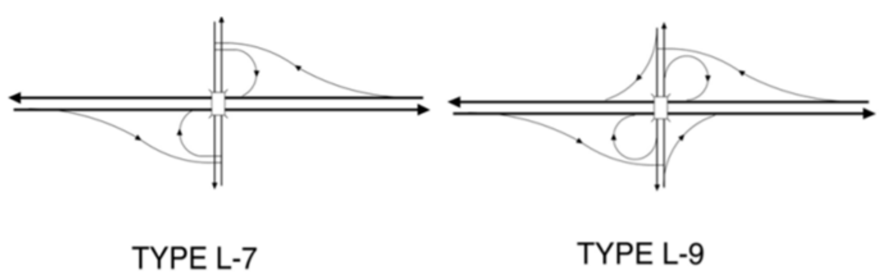
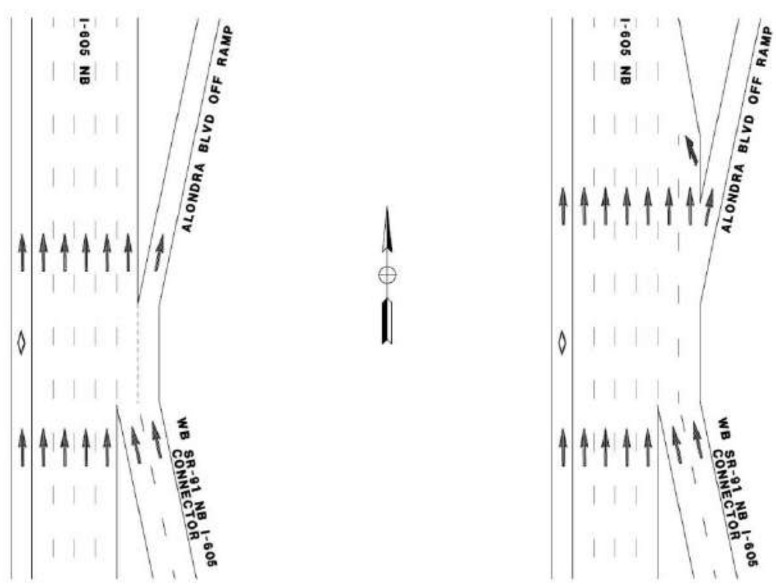


Figure 1-8 Typical Type L-7 and L-9 Local Street Interchanges

These new configurations will eliminate loop on-ramp free right-turn and direct on-ramp movements, and will increase the vehicular weaving and merging distances on the westbound SR-91 mainline between these two interchanges, as well as on the I-605 northbound/southbound connector ramp. These modifications will alter the arterial street operations as a result of the changed interchange access point for the arterial street to westbound SR-91.

The existing outside lane of westbound SR-91 to the northbound I-605 two-lane connector ramp terminates at Alondra Boulevard, forcing the driver in the outside lane to exit at Alondra Boulevard. Modifications are proposed at the Alondra Boulevard exit point to provide a single-lane exit movement and to carry the outside lane past the exit point and merge it with the northbound I-605 mainline prior to the Alondra Boulevard undercrossing. No Build and Build Alternatives for the I-605 northbound Alondra Boulevard off-ramp are shown on Figure 1-9.



No Build Alternative **Build Alternative**

Figure 1-9 Interstate 605 Northbound Alondra Boulevard Off-Ramp

The Build Alternative would include standardized features (such as Best Management Practices [BMPs] for water quality) that are generally applied to Caltrans' highway improvement projects. These standardized features avoid and minimize environmental impacts. More information on applicable project features can be found in the applicable environmental consequences sub-sections of Chapter 2.

Build Alternative Design Options

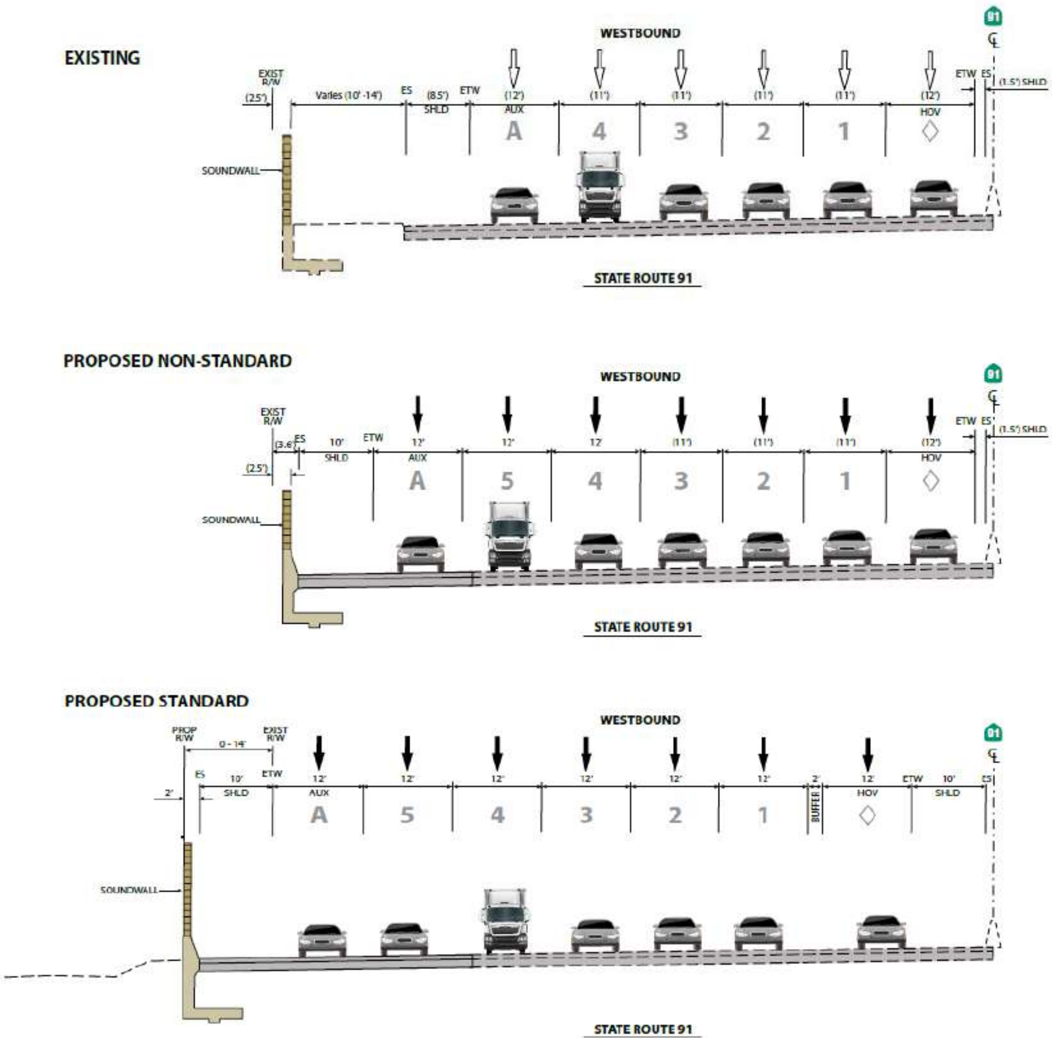
To compare overall freeway, ramp, and arterial street operations, the following design options for the Build Alternative were evaluated:

- **Design Option: Full Build.** Using standard (12 ft) lane and shoulder widths. This standard option would acquire 18 residences and one business on the north side of the freeway along 170th Street between the Norwalk Boulevard and Pioneer Boulevard interchanges in Artesia, as well as the Arco Gas Station on Pioneer Boulevard. A typical section of this design option is shown on the next page under the heading Typical Cross Sections as the Proposed Standard.

- **Design Option 1: Reduced Lane/Shoulder Width.** Using non-standard (narrower than standard) lane and shoulder widths. This non-standard option would eliminate the need for right-of-way acquisition (18 residences and one business) on the north side of the freeway along 170th Street between the Norwalk Boulevard and Pioneer Boulevard interchanges in Artesia. A typical section of this design option is shown under the heading Typical Cross Sections.
- **Design Option 2: Pioneer Boulevard L-9.** By keeping the Type L-9 interchange configuration at Pioneer Boulevard, both the loop and direct westbound on-ramps would remain. Both loop and direct westbound on-ramps would intersect Pioneer Boulevard at a 90-degree angle, which would slow vehicle speeds at the Pioneer Boulevard interchange and improve pedestrian and bicycle safety.
- **Design Option 3: Pioneer Boulevard Westbound Ramps/168th Alignment.** Aligning the SR-91 westbound ramps with 168th Street in Artesia at the Pioneer Boulevard interchange would create a four-legged intersection with Pioneer Boulevard as the north and south legs, the westbound ramps as the east leg, and 168th Street as the west leg. This option would require right-of-way acquisition of approximately eight parcels, which would include five residences, but would eliminate the need to acquire one gas station along Pioneer Boulevard.
- **Design Option 4: Diamond Ramps.** This design option utilizes diamond ramp configurations at Pioneer Boulevard and Norwalk Boulevard in lieu of the proposed Type L-7 cloverleaf interchange configurations. The diamond ramps were analyzed for comparison purposes to the partial cloverleaf ramp configuration options. The diamond ramps have a smaller footprint than the cloverleaf options but provide less weaving distance between successive on- and off-ramps, and therefore do not improve safety and traffic operations as much as the cloverleaf design options.
- **Design Option 5: Four-Lane Gridley Road Overcrossing.** The four-lane Gridley Road overcrossing structure is a design option that the City of Cerritos requested be studied. This would add approximately $4 million of construction cost, require no additional right-of-way acquisition, and is within the environmental footprint that is being studied with this project. However, since a four-lane Gridley Road overcrossing, when compared to the existing two-lane, is not required to fulfill the purpose and need of the project, the City of Cerritos

would need to find and obtain the additional funds necessary for the improvement.

Typical Cross Sections



Utilities

Table 1.8 provides a list of the 20 different utility owners and the type of facilities they operate within the Study Area.

The construction and operation of the Build Alternative will potentially require the utilities listed in Table 1.9 to be relocated. No oil utilities will need to be relocated.

Table 1.8 Utility Companies and Types of Facilities

Utility Company	Type
1. Central Basin Municipal Water District	Water
2. Chevron Pipe Line Company	Oil
3. City of Norwalk	Water, Sewer
4. Crown Castle	Telecom
5. Frontier Communications	Telecom
6. Kinder Morgan, Inc.	Oil
7. Los Angeles County Department of Public Works	Sewer
8. Shell Pipeline	Oil
9. Southern California Gas Company	Natural Gas
10. Wilshire Connection, LLC	Telecom
11. Charter Communications	Telecom
12. City of Cerritos	Water, Sewer
13. Crimson Pipeline	Oil
14. Defense Fuel Support Point	Oil
15. Golden State Water	Water
16. Liberty Utilities	Water
17. Los Angeles County Sanitation Districts	Sewer
18. Southern California Edison	Electric Power
19. Time Warner Cable	Telecom
20. XO Communications	Telecom

Source: *Utility Impacts and Relocation Report* (2018).

Table 1.9 Potentially Affected Utilities by Type

Location	Natural Gas	ElectricPower	Sewer	Telecom	Water	Total
Alondra Boulevard	—	—	—	—	—	—
166th Street	—	—	—	—	—	—
Studebaker Road	—	1	—	1	—	2
Gridley Road	—	—	—	—	—	—
Beach Street	—	—	—	—	—	—
169th Street	—	—	—	—	—	—
Pioneer Boulevard	—	1	—	3	—	4
170th Street	2	2	4	—	1	9
Norwalk Boulevard	—	1	—	2	—	3
Bloomfield Avenue	—	1	—	3	—	4
Artesia Boulevard	—	—	—	—	—	—
Subtotals	**2**	**6**	**4**	**9**	**1**	**22**

Source: *Utility Impacts and Relocation Report* (2018).

Staging Areas

Construction staging areas used by the contractor to store construction equipment will be limited to public right-of-way areas within the Study Area. Staging areas are anticipated to be within available space at interchange ramp areas.

Reversible Lanes

Reversible lanes are not a viable alternative for the proposed project since both directions of SR-91 have high traffic volumes in both the a.m. and p.m. peak periods.

Design Exceptions (Advisory and Mandatory)

The Build Alternative would require design exceptions. Design exceptions are necessary when the proposed design deviates from the standard design features presented in the Caltrans *Highway Design Manual* (2017). For example, the design standard for a freeway left-side shoulder is 10 ft; design exceptions would be requested for locations where the columns supporting overcrossing bridges encroach into the shoulder and narrow the shoulder to approximately 7 ft where it is beneath the bridge. The proposed Build Alternative would not be standard; therefore, mandatory and advisory design exceptions would be required for the Build Alternative. A standard alternative would not be cost effective, would require an extensive rebuild of the existing freeway, and would have extensive right-of-way impacts. There are 28 mandatory and 17 advisory design standards that would require design exceptions at one or more locations in the Study Area (see the Draft Project Report for a full list of design exceptions). Notably, Design Option 1 (Reduced Lane/Shoulder Width) includes reduced non-standard lane and shoulder widths.

Transportation Systems Management and Transportation Demand Management Alternatives

Transportation Systems Management (TSM) provides cost-effective improvements that increase transportation system performance without the major expense of capital expansion projects. These programs include minor geometric improvements, bicycle and pedestrian improvements, and other measures such as signal synchronization, motorist information, bus signal priority, and freeway ramp metering. Transportation Demand Management (TDM) provides cost-effective improvements that reduce system demand by eliminating trips or shifting trips out of the peak periods to other, less-congested time periods during the day, thus increasing transportation system performance without implementing travel restrictions. TDM programs include rideshare programs, employer flex-time, parking pricing, and intermodal improvements that support TDM programs and transfers between modes at key locations. TDM programs are devised to change the behavior of travelers. Some TDM approaches are voluntary, and they motivate participants with incentives. Other TDM approaches apply disincentives to drive single-occupancy vehicles, such as fees and constraints.

A TSM/TDM alternative is not considered a viable stand-alone option because it does not fulfill the project's purpose and need. A TSM/TDM alternative on its own would:

- Provide minimal congestion reduction,
- Provide minimal enhancement of operations and improvement in trip reliability,
- Not increase mobility significantly because it would have a limited effect on congestion, and
- Not maximize traffic throughput because no additional through lanes are provided.

TSM and TDM are similar in a number of ways, because they may:

- Lessen the number of trips,
- Lessen peak-hour travel,
- Conserve energy,
- Reduce emissions, and
- Provide more travel alternatives.

Although TSM and TDM measures alone do not satisfy the purpose and need of the project, the following TSM and TDM measures are beneficial and may be incorporated into the Build Alternative for the proposed project:

- Improved ramp-metering hardware and software and closed-circuit television systems for viewing ramps and nearby arterials
- Upgraded traffic signals that are interconnected and coordinated with adjacent signals and ramp meters at locations of interchange improvements
- Additional way-finding signs on freeways and arterials
- On- and off-ramps designed to limit impacts to non-motorized travel and preserve access to bike lanes and trails
- Intelligent Transportation Systems (ITS) elements, including fiber-optic and other communication systems for improved connectivity and remote management; changeable message signs; closed-circuit television coverage of the entire freeway mainline, ramps, and adjacent arterials; video detection systems; and vehicle detection systems for volume, speed, and vehicle classification
- Advanced traffic management system improvements to the hardware and software systems at the Caltrans District 7 Traffic Management Center
- Traveler information management system improvements to enhance dissemination of real-time information on roadway conditions

Bicycle and Pedestrian Facilities

New construction will be compliant with the Americans with Disabilities Act (ADA), per Caltrans standards. This includes curb ramps that will be replaced as part of the project. The Build Alternative will replace existing bicycle and pedestrian facilities and construct new bicycle and pedestrian facilities at the locations described below.

The following sidewalks are proposed where sidewalks do not currently exist:

- 1,293 ft along westbound Gridley Road between Aclare Street and Park Avenue
- 1,643 ft along westbound Bloomfield Avenue between the SR-91 eastbound off-ramp and 250 ft north of Lucas Street

The following bicycle facilities are proposed for future consideration within the project area where bicycle facilities do not currently exist:

- Bike lane in the northbound direction at the intersection of Pioneer Boulevard and the westbound SR-91 off-ramp
- Bike lane in the northbound direction at the intersection of Norwalk Boulevard and the westbound SR-91 off-ramp
- Bike lane in the southbound direction at the intersection of Bloomfield Avenue and the westbound SR-91 on-ramp/Lucas Street
- Bike lane in the northbound direction at the intersection of Bloomfield Avenue and the westbound SR-91 on-ramp/Lucas Street

1.3.3.2 No Build Alternative

The No Build Alternative does not include any planned improvements to the Study Area. Under this alternative, there would be no reconstruction or improvements to the Study Area. Within the project limits, westbound SR-91 would continue to have four mixed-flow lanes that are 11 ft wide, a 1.5 ft wide median shoulder, one 12 ft wide HOV lane, and one 12 ft wide auxiliary lane between certain successive on- and off-ramps.

1.3.3.3 Alternatives Considered but Eliminated from Further Discussion

A Value Analysis (VA) for this project was conducted July 31, 2017 to August 3, 2017. The VA included coordination with Caltrans, Metro, and consultants known as the VA Team. The following alternatives from the VA were considered, but eliminated from further discussion by the VA Team:

- **Close the Studebaker Road westbound off-ramp and eliminate the westbound SR 91/Studebaker Road Bridge widening.** This VA alternative was rejected because the City of Cerritos expressed their desire during the PSR Phase of the project for the Studebaker Road westbound off-ramp to remain open since it provides access to various facilities within the City. Furthermore, Caltrans' maintenance facility is located opposite the ramp terminus intersection. Closing the ramp would make access to the Caltrans maintenance facility more difficult. After reviewing the Caltrans TASAS accident data, there does not appear to be an accident concentration at the off-ramp. Ramp accident rates are below the statewide average.
- **Eliminate the preferential HOV lanes at the Bloomfield on-ramps and construct two-lane ramps.** This VA alternative was rejected because, while this alternative would save some cost, it is inconsistent with Caltrans ramp metering policy. HOV preferential lanes are included where there are no additional right-of-way impacts. However, a preferential HOV on-ramp lane at the Bloomfield Avenue westbound on-ramp is not included since it would result in additional right-of-way impacts.
- **Close the HOV lane during construction to facilitate the construction of bridge median columns.** This VA alternative was rejected because it was determined that Caltrans Office of Corridor Management South does not recommend the proposal because SR-91 is heavily congested at this section. Closing the HOV lane for 8–10 months would result in significant user delays on the mainline. Weekend, nighttime, and short-term closures may be allowed.
- **Keep existing 11-foot lanes at Norwalk Boulevard north of the ramps in lieu of the proposed 12-foot lanes.** In a meeting with Tracy High School/ABC School District, the School District did not oppose the right-of-way acquisition needed for the widening of Norwalk Boulevard, on the condition of reasonable compensation and parking lot reconfiguration. 11 ft lanes would still require right-of-way acquisition if any right shoulder is provided for bicycle use. Furthermore, curb-adjacent 11 ft wide lanes are extremely narrow next to the sidewalk and are not as safe for pedestrians using the sidewalk. Therefore, 12 ft lanes can be provided with the acquisition. For these reasons, this VA alternative was rejected.
- **Braid the Norwalk Boulevard on-ramp over the Pioneer Boulevard off-ramp.** This VA alternative was rejected because the construction cost would increase by $15 million and A.J. Padelford Park would be impacted. There would be additional noise impacts to the community because this VA alternative would require an elevated ramp.

1.4 Permits and Approvals Needed

The proposed project is anticipated to require the permits, licenses, agreements, and certifications (PLACs) listed in Table 1.10.

Table 1.10 Project Permits and Approvals

Agency	PLAC	Status
Federal Highway Administration (FHWA)	Air Quality Conformity Approval Letter	The Air Quality Conformity report will be submitted to the FHWA after receipt of public comments on the IS/EA. The FHWA will make a conformity determination prior to final approval of the IS/EA.
California Department of Fish and Wildlife (CDFW)	Fish and Game Code Section 1602 Streambed Alteration Agreement	This application will be submitted after Environmental Document approval. Caltrans will coordinate with the CDFW to obtain an agreement regarding riparian habitat impacts and mitigation.
United States Army Corps of Engineers (USACE)	Federal Clean Water Act (CWA) Section 404 Permit	After approval of the Final Environmental Document, Caltrans will submit the Jurisdictional Delineation to the USACE. Caltrans will obtain the Preliminary Jurisdictional Determination from USACE during the PS&E phase. In addition, prior to obtaining grading permits, Caltrans will submit a Pre-Construction Notification form to the USACE to obtain coverage under NWPs 14 and 33, pursuant to Section 404 of the Federal CWA.
Regional Water Quality Control Board (RWQCB)	CWA Section 401 Water Quality Certification or waiver	Caltrans will submit the application to the RWQCB after approval of the Final Environmental Document. Caltrans will coordinate with the RWQCB to obtain water quality certification during final design. The RWQCB will provide comments on the application. Meetings between Caltrans and the RWQCB will be held if necessary during final design. Caltrans will obtain the certification or waiver from the RWQCB during final design and will implement the requirements included in the certification or waiver.
State Water Resources Control Board (SWRCB)	*NPDES Construction General-Permit* Order No. 2009-0009-DWQ, (as amended by 2012-0006-DWQ)	The permits, including the NOI, will be submitted to the SWRCB prior to any project construction.
State Water Resources Control Board (SWRCB)	Caltrans NPDES Permit Order No. 2012-0011-DWQ, (as amended by Order WQ 2014-0006-EXEC, Order WQ 2014-0077-DWQ, and Order WQ 2015-0036-EXEC, NPDES No. CAS000003)	The Permit Registration Documents, including the NOI, will be submitted to the SWRCB prior to any project construction.
California Department of Transportation (Caltrans)	Construction Encroachment Permit	Application for a Caltrans construction encroachment permit will be submitted prior to construction, if a contractor is procured by Metro.
City of Cerritos	Construction Encroachment Permit	Application for a City of Cerritos construction encroachment permit for temporary access onto public rights-of-way will be submitted prior to construction.
City of Artesia	Construction Encroachment Permit	Application for a City of Artesia construction encroachment permit for temporary access onto public rights-of-way will be submitted prior to construction.

IS/EA = Initial Study/Environmental Assessment
Metro = Los Angeles County Metropolitan Transportation Authority
NOI = Notice of Intent
NPDES = National Pollutant Discharge Elimination System
NWP = Nationwide Permit
PLAC = permits, licenses, agreements, and certifications
PS&E = Plans, Specifications, and Estimates

Chapter 2 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

This chapter describes the current state of the resources in the study area and identifies the potential effects of implementing the proposed Westbound State Route 91 (SR-91) Improvement Project (project). Each subsection describes the present conditions, discusses the potential impacts of building the proposed project, and indicates what measures would be taken to avoid, minimize, or mitigate those impacts.

The environmental analysis contained within the following chapter considers the potential environmental consequences associated with implementation of the two proposed alternatives (the No Build Alternative and the Build Alternative).

The environmental impact analyses discuss potential impacts in three general categories: human environment, physical environment, and biological environment. As part of the scoping and environmental analysis carried out for the project, the following environmental issues were considered, but no adverse impacts were identified. As a result, there is no further discussion about these issues in this document:

- **Coastal Zone:** California's Coastal Zone generally extends 1,000 yards inland from the mean high tide line. The study area is located approximately 11 miles (mi) from the Pacific Ocean and is not located within the Coastal Zone.
- **Wild and Scenic Rivers:** According to the Bureau of Land Management (BLM), there are no Wild and Scenic Rivers located in the project area.[1]

[1] United States Department of the Interior, Bureau of Land Management (BLM). BLM California Wild and Scenic Rivers. Website: https://blm-prod.opengov.ibmcloud.com/programs/national-conservation-lands/wild-and-scenic-rivers/california (accessed November 28, 2017).

- **Farmland/Timberlands:** There will be no effect on farmland and timberlands resources because the project is not located within farmland and timberland.[1]
- **Hydrology and Floodplain:** There will be no effect on hydrology and floodplain because the project is not located within the 100-year base flood zone.
- **Natural Communities:** According to the *Natural Environment Study (Minimal Impacts)* (2017 and 2018 Errata), the Biological Study Area (BSA) does not contain any sensitive natural communities. The habitat types present in the BSA include flood control channels, transportation, ornamental landscaping, and disturbed or barren areas.
- **Threatened and Endangered Species:** According to the *Natural Environment Study (Minimal Impacts)* (2017 and 2018 Errata), the BSA does not contain suitable habitat for any threatened or endangered species.
    - The U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) have regulatory responsibility for the protection of special-status plant and animal species. Per the official species list received from the USFWS on March 19, 2018 (provided in Chapter 4), two plant species and five wildlife species that are federally and/or State-listed as endangered or threatened were identified as potentially occurring within the vicinity of the BSA. The plant species are Ventura marsh milk-vetch and the salt marsh bird's-beak. The animal species are western snowy plover, coastal California gnatcatcher, California least tern, least Bell’s vireo, and Pacific pocket mouse. None of these species were observed during field surveys and none are expected to occur within the BSA because there is no suitable habitat for these species in the BSA. No effect to USFWS listed species or critical habitat are anticipated.
    - The project is within National Oceanic and Atmospheric Administration’s National Marine Fisheries Service (NOAA Fisheries Service) jurisdiction. Per the NOAA Fisheries Service official species list received on March 19, 2018 (included in Chapter 4), one species, California steelhead trout, was reported to potentially have critical habitat occurring in the United States Geological Survey (USGS) *Los Alamitos, California* or *Whittier, California* 7.5-minute quadrangle areas; however, this habitat is not within or adjacent to the BSA. No effect to NOAA Fisheries Service listed species is anticipated.

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[1] California Department of Conservation. 2014. Farmland Mapping and Monitoring Program. San Bernardino Important Farmland. Website: https://maps.conservation.ca.gov/dlrp/ciff/ (accessed November 28, 2017).

The Build Alternative would include project features that are generally applied to California Department of Transportation (Caltrans) highway improvement projects. These standardized features avoid and minimize environmental impacts. The project features proposed as part of the project are provided in Table 2.0.1.

Table 2.0.1 Project Features Summary

Resource	Project Feature No.	Page No.	Title/Summary
Community Impacts	PF-REL-1	2.3-18	Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act) (Public Law 91-646, 84 Statutes 1894)
	PF-REL-2	2.3-18	TCE Restoration after Construction
	PF-EJ-1	2.3-35	Relocation Assistance Services
Utilities/Emergency Services	PF-UES-1	2.4-2	Utility Relocation Plans
	PF-UES-2	2.4-5	Roadway Closures and Detour Plans
Traffic and Transportation/ Pedestrian and Bicycle Facilities	PF-T-1	2.5-7	Transportation Management Plan
Visual	PF-VIS-1	2.6-30	Landscaping
	PF-VIS-2	2.6-30	Architectural Treatment and Review
	PF-VIS-3	2.6-31	Construction Lighting
Cultural Resources	PF-CR-1	2.7-7	Discovery of Cultural Materials
	PF-CR-2	2.7-8	Discovery of Human Remains
Water Quality and Storm Water Runoff	PF-WQ-1	2.8-11	Caltrans National Pollutant Discharge Elimination System (NPDES) Statewide Storm Water Permit and NPDES General Permit for Storm Water Discharges of Stormwater Runoff Associated with Construction Activities
	PF-WQ-2	2.8-11	Storm Water Pollution Prevention Plan
	PF-WQ-3	2.8-13	Treatment BMPs
Geology/Soils/Seismic/ Topography	PF-GEO-1	2.9-10	Geotechnical Investigation
	PF-GEO-2	2.9-11	Slope Protection
	PF-GEO-3	2.9-11	Soil Settlement and Liquefaction
Paleontology	PF-PAL-1	2.10-3	Paleontological Mitigation Plan
Hazardous Waste/Materials	PF-HAZ-1	2.11-4	Excess Aerially Deposited Lead (ADL) Contaminated Soils
	PF-HAZ-2	2.11-4	Testing for Lead
	PF-HAZ-3	2.11-5	Assessment for the Possible Presence of Asbestos-Containing Materials (ACMs) and Lead-Based Paint (LBP)
	PF-HAZ-4	2.11-5	Lead-Based Paint Survey
	PF-HAZ-5	2.11-5	Implement the Requirements in the Lead-Based Paint Survey Report
	PF-HAZ-6	2.11-9	Monitor Soil Excavation for Visible Soil Staining, Odor, and the Possible Presence of Unknown Hazardous Material Sources
	PF-HAZ-7	2.11-9	Soil Sampling for Pesticides on Any Former Agricultural Parcels
	PF-HAZ-8	2.11-10	Properly Dispose of All Soils Exceeding the Criteria for State or Federal Hazardous Waste
	PF-HAZ-9	2.11-10	Treated Wood Waste
	PF-HAZ-10	2.11-11	Polychlorinated Biphenyls
	PF-HAZ-11	2.11-10	Preliminary Site Investigation
Air Quality	PF-AQ-1	2.12-11	South Coast Air Quality Management District's (SCAQMD) Rule 403
	PF-AQ-2	2.12-12	Ozone (O_3) Precursor Emissions
	PF-AQ-3	2.12-12	Prevention of Excavated or Graded Material Spilling onto Public Streets and Roads
	PF-AQ-4	2.12-12	Standard Specifications for Construction (Sections 14-9.02 and 14-9.03)
	PF-AQ-5	2.12-12	Removal of Asbestos-Containing Materials (ACMs)
	PF-AQ-6	2.12-12	Prohibited from Idling in Excess of 5 Minutes
Noise	PF-N-1	2.13-21	Standard Specifications, Section 14-8.02, Noise Control
	PF-N-2	2.13-22	Construction Equipment Mufflers
	PF-N-3	2.13-22	Construction Staging Areas
	PF-N-4	2.13-22	Sensitive Receptors

Table 2.0.1 Project Features Summary

Resource	Project Feature No.	Page No.	Title/Summary
Wetlands and Other Waters	PF-WET-1	2.14-7	United States Army Corps of Engineers (USACE) Pursuant to Section 404 of the Clean Water Act
	PF-WET-2	2.14-8	Watershed Streambed Alteration Agreement (WSAA; in Combination with an LOP) or a Streambed Alternation Agreement (SAA; in Combination with an Individual Permit) with the California Department of Fish and Wildlife (CDFW)
	PF-WET-3	2.14-8	Section 401 Water Quality Certification (Certification) from the Los Angeles Regional Water Quality Control Board (RWQCB)
	PF-WET-4	2.14-8	Best Management Practices (BMPs) to Prevent Loose Soil or Pollutants Associated with the Project from Inadvertently Entering the Drainage Features
Animal Species	PF-BIO-1	2.16-32	Avoidance of Breeding Season
	PF-BIO-2	2.16-29	Nighttime Exit Counts and Acoustic Surveys
	PF-BIO-3	2.16-29	Avoidance of Bat Roosts
	PF-BIO-4	2.16-29	Avoidance of Maternity Colonies
	PF-BIO-5	2.16-29	Humane Bat Eviction
	PF-BIO-6	2.16-30	Installation of Alternate Roosting Habitat
	PF-BIO-7	2.16-30	Night Lighting During Construction
	PF-BIO-8	2.16-30	Avoidance of Foliage-Roosting Bats
	PF-BIO-9	2.16-30	Biological Monitoring by a Bat Specialist
	PF-BIO-10	2.16-31	Access to Bat-Roosting Habitat
	PF-BIO-11	2.16-31	Inspection of Swallow Nests
	PF-BIO-12	2.16-31	Best Management Practices During Construction
Invasive Species	PF-BIO-13	2.17-3	Plant Removal
	PF-BIO-14	2.17-3	Prevention of the Spread of Invasive Species

BMP = best management practice
LOP = Letter of Permission
TCE = temporary construction easement

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HUMAN ENVIRONMENT

2.1 Land Use

This section is based on a review of local planning documents and geographic information systems (GIS) land use data, the *Community Impact Assessment* (2018), as well as information from Section 2.3, Community Impacts, and Appendix A, Section 4(f) Analysis.

2.1.1 Existing and Future Land Uses

The study area for the land use analysis includes the project area (the physical area that would be directly affected by the proposed project) and the adjacent neighborhoods within the Cities of Artesia, Cerritos, and Norwalk (Census Tracts 5530.00, 5545.12, 5545.13, 5545.14, 5545.21, 5546.00, 5547.00, 5548.01, and 5548.02). The census tracts and block groups are depicted later on Figure 2.3-1 in Section 2.3, Community Impacts.

2.1.1.1 Existing Land Uses

The existing land uses in the study area are shown on Figure 2.1-1. North of State Route 91 (SR-91), existing land uses are a mix of single- and multi-family residential, commercial and services, industrial, education, and open space and recreation uses. South of SR-91, the primary existing land uses are similar. Existing land uses surrounding Interstate 605 (I-605) north of SR-91 include single-family residential, commercial, institutional, religious, medical, and park uses to the east and commercial, industrial, recreational (golf course), and utility facilities (Los Coyotes Water Reclamation Plant) to the west. The acreages and percentages of existing land uses in the study area are shown in Table 2.1.1.

As indicated in Table 2.1.1, approximately 18 acres (ac), or approximately 37 percent of the study area, consists of existing single-family residential uses. As shown on Figure 2.1-1, single-family residential uses are the predominant land use type within the study area, with the exception of the areas adjacent to the SR-91/I-605 interchange. Commercial and service uses and industrial uses are the second- and third-most common existing land uses, respectively, in the study area.

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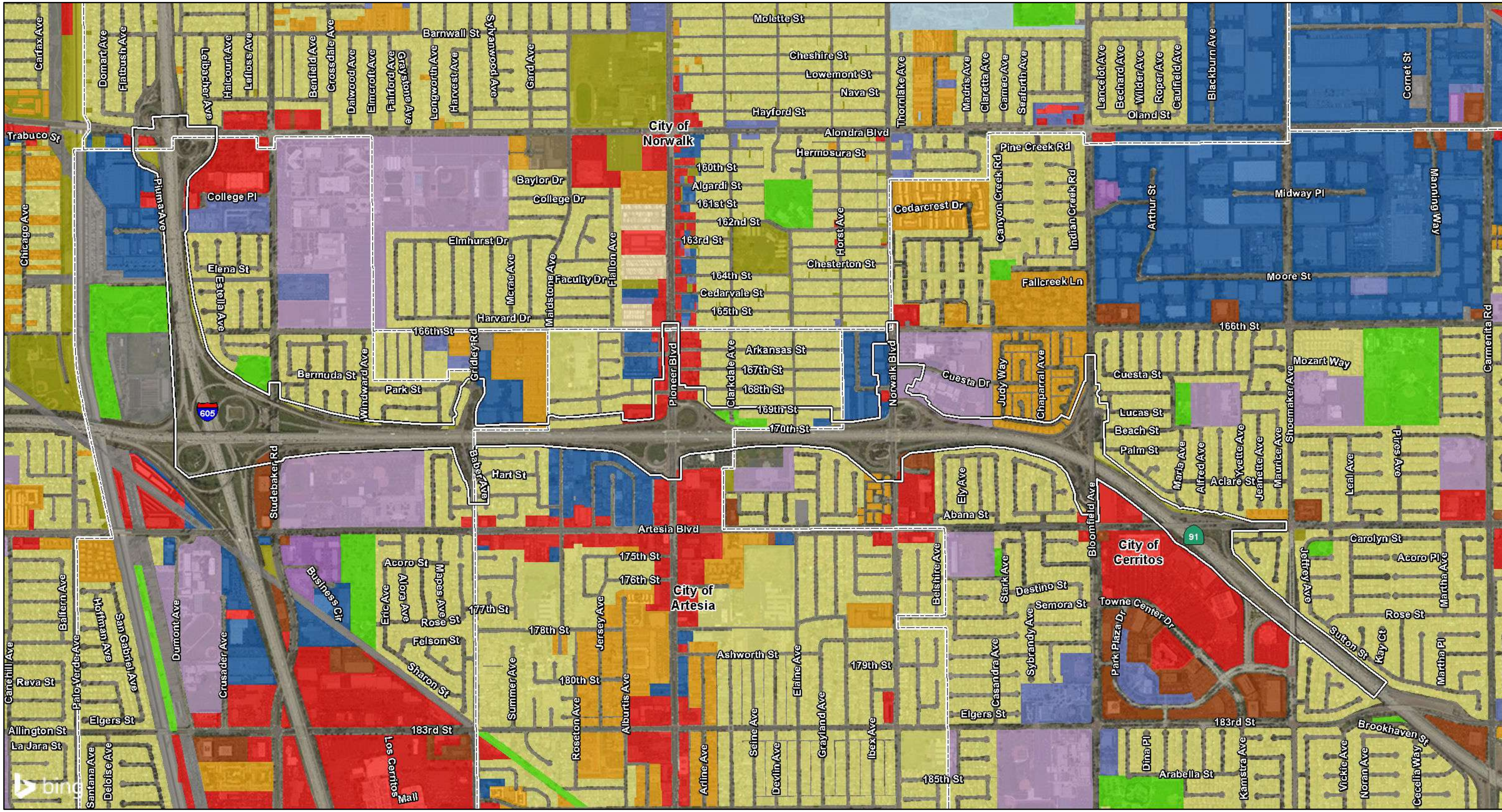

LEGEND

Study Area Limits

Existing Land Uses

- Single Family Residential
- Multi-Family Residential
- Mobile Homes and Trailer Parks
- General Office
- Commercial and Services
- Facilities
- Education
- Industrial
- Transportation, Communications, and Utilities
- Mixed Commercial and Industrial
- Mixed Residential and Commercial
- Open Space and Recreation
- Vacant
- Water

N

0 625 1250
FEET

SOURCE: Bing Maps (2015); Michael Baker (8/2017); SCAG (2012)

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FIGURE 2.1-1

Westbound SR-91 Improvement Project

Existing Land Uses

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

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Table 2.1.1 Existing Land Uses in the Land Use Analysis Study Area

Land Use	Acres				Percentage of Total Study Area
	Artesia	Cerritos	Norwalk	Study Area Total	
Commercial and Services	4.74	2.57	0.75	8.10	16.74%
Education	–	4.79	–	4.79	9.93%
Facilities	–	0.37	–	0.37	0.76%
General Office	–	0.94	–	0.94	1.96%
Industrial	1.09	4.10	0.02	5.21	10.80%
Multi-Family Residential	–	3.68	–	3.68	7.64%
Single-Family Residential	8.10	9.86	0.02	17.93	37.17%
Open Space and Recreation	1.77	0.83	–	2.60	5.40%
Transportation, Communications, and Utilities	–	1.34	–	1.34	2.78%
Vacant	–	3.06	0.24	3.29	6.83%
Total	**15.65**	**31.54**	**1.03**	**48.25**	**–**

Source: Southern California Association of Governments (SCAG). GIS Open Data Portal. Website: http://gisdata-scag.opendata.arcgis.com/ (accessed March 2018).
Note: Percentages are based on the total acreage within the study area (48.25 acres). The land use categories above do not capture local roadways, and the local rights-of-way are not included in the sum of the "Acres" columns. Therefore, percentages do not add up to 100.

2.1.1.2 General Plan Land Uses

General Plan land use designations, which guide future development in a jurisdiction, are depicted on Figure 2.1-2 for the study area and surrounding areas. In the study area north of SR-91, the General Plan land uses in the cities of Artesia, Cerritos, and Norwalk are predominantly single-family residential uses, followed by educational and facilities uses.

South of SR-91, the predominant General Plan land use in the cities of Artesia and Cerritos is also single-family residential, followed by commercial and services uses and educational uses. Next to the SR-91/I-605 interchange, the predominant uses include educational, industrial, and mixed commercial/industrial uses.

As shown in Table 2.1.2, single-family residential makes up the largest category of planned land uses within the study area (43.27 percent), followed by commercial and services uses and industrial uses (16.27 percent and 14.45 percent, respectively). The existing land uses in the study area are consistent with the land use designations in the General Plans of the Cities of Artesia, Cerritos, and Norwalk.

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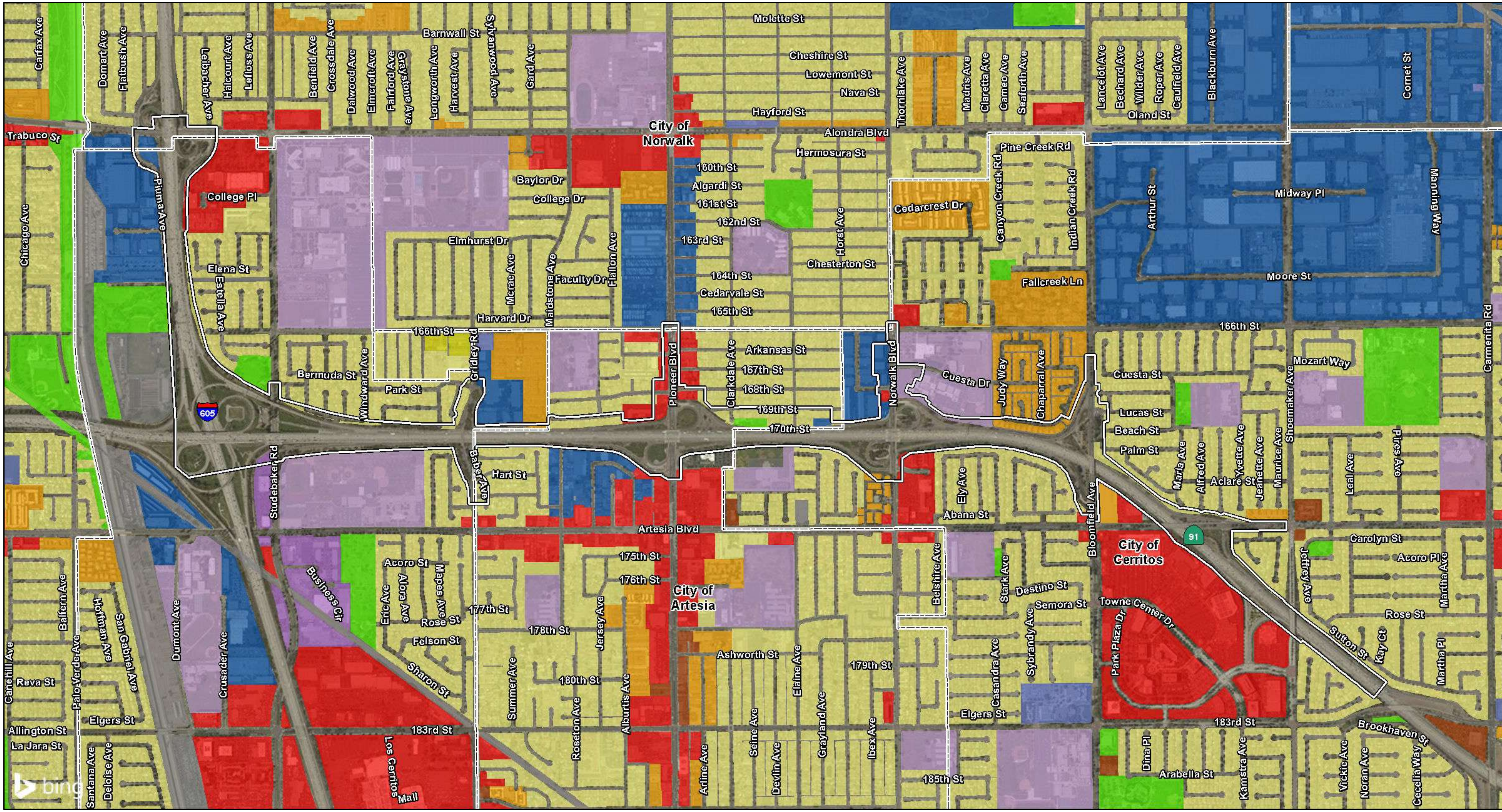

LEGEND

Study Area Limits

General Plan Land Use Designation

- Single Family Residential
- Multi-Family Residential
- Mixed Residential
- General Office
- Commercial and Services
- Facilities
- Education
- Industrial
- Transportation, Communications, and Utilities
- Mixed Commercial and Industrial
- Open Space and Recreation

N

0 625 1250

FEET

SOURCE: Bing Maps (2015); Michael Baker (8/2017); SCAG (2012)

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FIGURE 2.1-2

Westbound SR-91 Improvement Project

General Plan Land Use Designations

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

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Table 2.1.2 General Plan Land Uses in the Land Use Analysis Study Area

Land Use	Acres	Percentage
Commercial and Services	7.85	16.27%
Education	4.79	9.93%
Industrial	6.97	14.45%
Mixed Commercial and Industrial	0.55	1.14%
Multi-Family Residential	4.08	8.45%
Open Space and Recreation	1.92	3.98%
Single-Family Residential	20.87	43.27%
Transportation, Communications, and Utilities	1.21	2.50%
Total	**48.24**	**–**

Source: Southern California Association of Governments (SCAG). GIS Open Data Portal. Website: http://gisdata-scag.opendata.arcgis.com/ (accessed January 2018).

Note 1: Percentages are based on the total acreage within the study area, approximately 47.44 acres. The land use categories above do not capture local roadways, and the local rights-of-way are not included in the sum of the Acres column. Therefore, percentages do not add up to 100.

Note 2: The acreage of land identified in the study area for general plan land uses does not add up to the acreage of land identified in the study area for existing land uses, due to slight differences in SCAG existing land use and General Plan land use data.

2.1.1.3 Development Trends

The city of Artesia encompasses an area of 1.62 square miles (sq mi) and was incorporated in 1959 (City of Artesia 2017). The population of the city of Artesia in 2012 was 16,600, compared to 16,380 in 2000, according to the Southern California Association of Governments (SCAG) (2017). The city of Artesia has grown at a rate of 1.34 percent between 2000 and 2012 and has grown at a faster rate than the city of Cerritos during the same period. (SCAG 2017). The Artesia General Plan 2030 identifies the opportunity for infill and redevelopment projects, emphasizing a focus on new mixed-use development, diversifying housing types, and revitalizing existing commercial centers (City of Artesia, nd). Based on SCAG (2017) growth projections, employment in the city of Artesia is projected to increase by 6.13 percent from 2015 to 2040.

The city of Cerritos encompasses an area of 8.85 sq mi, and was incorporated in 1956 as the City of Dairy Valley, which reflected the agricultural focus of the community at the time (City of Cerritos 2016). The name change to Cerritos was made official on January 19, 1967. The population of the city of Cerritos in 2012 was 49,300, compared to 51,488 in 2000 (SCAG 2017). With a population growth rate of 1.85 percent expected between 2015 and 2040, the city of Cerritos is growing at a slower rate than the city of Artesia (SCAG 2017). The City of Cerritos General Plan recognized the city’s opportunity for infill and redevelopment projects. The General Plan outlines goals to develop two new parks and a mixed-use town center, along with various redevelopment projects. In addition, the City of Cerritos adopted the Los Cerritos and the Los Coyotes redevelopment plans with the intent to revitalize existing buildings and facilities to improve aesthetics and meet the changing needs of the community (City of Cerritos, 2004). According to SCAG (2017) growth projections, the city of Cerritos is projected to increase job growth by 10.8 percent from 2012 to 2040.

Approved and planned projects in the study area are described in Table 2.18.1 and shown on Figure 2.18-1 in Section 2.18, Cumulative Impacts.

2.1.1.4 Environmental Consequences

Temporary Impacts

Build Alternative (includes Design Options)

Construction of the Build Alternative would require temporary construction easements (TCEs) along the north side of SR-91 for certain areas of the project segment to allow access for the construction of best management practices (BMPs) for water quality, retaining walls, and roadway and/or interchange widening. TCEs are also required at the Alondra Boulevard/I-605 interchange northbound off-ramp. The affected parcels are identified in Table 2.3.9 and the locations of the parcels that would be affected by these TCEs are shown on Figure 2.3-3 in Section 2.3, Community Impacts. The largest TCEs occur between the Artesia Boulevard/SR-91 interchange and the Bloomfield Avenue/SR-91 interchange on the north and south sides of SR-91, as well as adjacent and east of Norwalk Boulevard north of the Norwalk Boulevard/SR-91 westbound exit ramp where it intersects with Norwalk Boulevard (at Tracy High School). Staging activities may result in temporary increases in dust and noise levels in the vicinity of these staging areas; however, such activities are not anticipated to interfere with existing uses on the parcels or result in land use conflicts with adjacent businesses and residences near SR-91 or I-605. These impacts would be temporary and would cease when the project construction is complete.

Open space and recreation uses make up the greatest share of existing land uses that would be impacted by TCEs. As shown in Table 2.1.3, the Build Alternative would result in the use of approximately 0.2 ac of existing commercial and services uses, approximately 0.03 ac of existing educational/institutional uses, approximately 0.5 ac of existing industrial uses, approximately 0.4 ac of existing residential uses, approximately 1.2 ac of existing open space and recreational uses, and approximately 0.03 ac of existing vacant land for TCEs.

Table 2.1.3 Existing Land Use Impacts

Permanent and Temporary Impacts	Build Alternative (acres)	Build Alternative with Design Option 1 (Reduced Lane/ Shoulder Width) (acres)	Build Alternative with Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment) (acres)	Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width) and Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment) (acres)
Permanent Impacts				
Commercial and Services	0.4	0.4	0.4	0.4
Education/Institutional	0.03	0.1	0.03	0.1
Industrial	0.5	0.0	0.5	0.0
Residential	1.4	1.2	2.1	1.9
Open Space and Recreation	0.03	0.3	0.03	0.3
Utility and Flood Control	0.0	0.0	0.0	0.0
Vacant	0.4	0.02	0.8	0.42
Permanent Impacts Total	**2.8**	**2.0**	**3.9**	**3.12**
TCEs				
Commercial and Services	0.2	0.2	0.2	0.2
Education/Institutional	0.03	0.1	0.03	0.1
Industrial	0.5	0.0	0.5	0.0
Residential	0.4	0.4	0.5	0.5
Open Space and Recreation	1.2	1.2	1.2	1.2
Utility and Flood Control	0.0	0.0	0.0	0.0
Vacant	0.03	0.0	0.03	0.0
TCE Total	**2.36**	**1.9**	**2.46**	**2.0**

Source: Southern California Association of Governments (SCAG). GIS Open Data Portal. Website: http://gisdata-scag.opendata.arcgis.com/ (accessed March 2018).
Note: Totals may not appear to sum correctly due to rounding.
GIS = geographic information system
TCEs = temporary construction easements

The Build Alternative would require TCEs on 30 parcels in the project area (refer to Table 2.3.9 in Section 2.3, Community Impacts).

Following completion of the project, areas that are temporarily disturbed by construction activities would be returned to their property owners in the same or better condition than prior to construction. As stated in Section 2.3.1.3 in PF-REL-2. owners of parcels where TCEs would be required would receive compensation for the temporary use of a portion of their property. Therefore, the temporary use of land during construction of the Build Alternative would have no substantial adverse effects.

Generally, any freeway lane or ramp closures would occur during off-peak and overnight hours, minimizing delays to the traveling public and local business operations. When full or partial closures of the freeway mainline are required, they would occur primarily at nighttime and on weekends to minimize delays to the traveling public. Access to all nearby businesses would be maintained during any freeway, ramp, and/or local street closures through the identification of detour routes on alternate freeway off-ramps and local streets. Although construction of the Build Alternative would not substantially interfere with any adjacent land uses, there would be inconveniences due to construction-related delays, temporary closures, and construction equipment operations. Full and partial closures will be coordinated with local jurisdictions as described in the Transportation Management Plan (Project Feature PF-T-1 in Section 2.5.3.2).

Construction of the Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width) would also require TCEs along the north side of SR-91 for certain areas of the project segment to allow access for the construction of BMPs for water quality, retaining walls, and roadway and/or interchange widening; however, due to the reduced lane and shoulder widths, the number of TCEs would be reduced from that needed for the Build Alternative. TCEs are also required at the Alondra Boulevard/ I-605 interchange northbound off-ramp. The affected parcels are identified in Table 2.3.10 and the locations of the parcels that would be affected by these TCEs are shown on Figure 2.3-4 in Section 2.3, Community Impacts. The largest TCEs occur between the Artesia Boulevard/SR-91 interchange and the Bloomfield Avenue/SR-91 interchange on the south side of SR-91, as well as adjacent and east of Norwalk Boulevard north of the Norwalk Boulevard/SR-91 westbound exit ramp where it intersects with Norwalk Boulevard (at Tracy High School). Staging activities may result in temporary increases in dust and noise levels in the vicinity of these staging areas; however, such activities are not anticipated to interfere with existing uses on the parcels or result in land use conflicts with adjacent businesses and residences near SR-91 or I-605. These impacts would be temporary and would cease when project construction is complete.

Open space and recreation uses make up the greatest share of existing land uses that would be impacted by TCEs. As shown in Table 2.1.3, the Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width) would result in the use of approximately 0.2 ac of existing commercial and services uses, approximately 0.1 ac of existing educational/institutional uses, approximately 0.4 ac of existing residential uses, and approximately 1.2 ac of existing open space and recreational uses for TCEs.

Construction of the Build Alternative with Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment) would require the same TCEs as the Build Alternative but would require additional TCEs due to the ramp configuration at Pioneer Boulevard/168th Street. The affected parcels are identified in Table 2.3.11 and the locations of the parcels that would be affected by these TCEs are shown on Figure 2.3-3 in Section 2.3, Community Impacts. Staging activities may result in temporary increases in dust and noise levels in the vicinity of these staging areas; however, such activities are not anticipated to interfere with existing uses on the parcels or result in land use conflicts with adjacent businesses and residences near SR-91 or I-605. These impacts would be temporary and would cease when project construction is complete.

Open space and recreation uses make up the greatest share of existing land uses that would be impacted by TCEs. As shown in Table 2.1.3, the Build Alternative with Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment) would result in the use of approximately 0.2 ac of existing commercial and services uses, approximately 0.03 ac of existing educational/institutional uses, approximately 0.5 ac of industrial existing uses, approximately 0.4 ac of existing residential uses, approximately 1.2 ac of existing open space and recreational uses, and approximately 0.03 ac of existing vacant land for TCEs.

Construction of the Build Alternative with Design Options 1 and 3 (Reduced Lane/Shoulder Width, and Pioneer Boulevard Westbound Ramps/168th Alignment, respectively) would require the same TCEs as the Build Alternative but also the TCEs identified under each respective design option. The affected parcels are identified in Table 2.3.12 and the locations of the parcels that would be affected by these TCEs are shown on Figure 2.3-4 in Section 2.3, Community Impacts. Staging activities may result in temporary increases in dust and noise levels in the vicinity of these staging areas; however, such activities are not anticipated to interfere with existing uses on the parcels or result in land use conflicts with adjacent businesses and residences near SR-91 or I-605. These impacts would be temporary and would cease when project construction is complete.

Open space and recreation uses make up the greatest share of existing land uses that would be impacted by TCEs. As shown in Table 2.1.3, the Build Alternative with Design Options 1 and 3 (Reduced Lane/Shoulder Width, and Pioneer Boulevard Westbound Ramps/168th Alignment, respectively) would result in the use of approximately 0.2 ac of existing commercial and services uses, approximately 0.1 ac of existing educational/institutional uses, approximately 0.5 ac of existing residential uses, and approximately 1.2 ac of existing open space and recreational uses for TCEs.

The Build Alternative including the diamond ramp configurations at Pioneer Boulevard and Norwalk Boulevard in lieu of the proposed Type L-7 cloverleaf interchange configurations (Design Option 4), four-lane Gridley Avenue overcrossing in lieu of the existing two-lane Gridley Avenue overcrossing (Design Option 5), and keeping the Type L-9 interchange configuration at Pioneer Boulevard (Design Option 2) would not result in any change in the number of required TCEs when compared to the Build Alternative.

No Build Alternative

The No Build Alternative would not result in the construction of any improvements to the project segment of SR-91 and the SR-91/I-605 interchange other than routine maintenance. As a result, the No Build Alternative would not result in temporary adverse effects related to existing and planned land uses.

Permanent Impacts

Build Alternative (includes Design Options)

The Build Alternative would require the permanent conversion from current and planned land uses to transportation uses to accommodate the proposed improvements. As shown in Table 2.1.3, the Build Alternative would result in the conversion of approximately 0.4 ac of existing commercial and services uses, approximately 0.03 ac of existing educational/institutional uses, approximately 0.5 ac of existing industrial uses, approximately 1.4 ac of existing residential uses, approximately 0.03 ac of open space and recreation uses, and approximately 0.4 ac of existing vacant land. As shown in Table 2.1.4, the Build Alternative would result in the conversion of approximately 0.07 ac of land planned for commercial and services uses, approximately 0.16 ac of planned educational/institutional uses, approximately 0.07 ac of planned single-family residential uses, approximately 0.01 ac of planned multifamily residential uses, and approximately 0.01 ac of planned open space and recreation uses, as identified in local General Plans.

The project would require 18 residential and 2 non-residential full acquisitions of right-of-way (ROW) under the Build Alternative. The full acquisitions would be required on land that is currently used for residential and commercial properties. The privately owned properties that would be fully acquired for the proposed project would be converted from their current and planned land uses to transportation land uses, and would no longer be available for future residential use. All of the proposed property acquisitions are situated adjacent to existing residential land uses but are contiguous. Although the project would result in a change in land use, there are plans to expand the A.J. Padelford Park and North Artesia Community Center parkland into the residential area that is being acquired. Project improvements would be compatible with the adjacent highway uses. In addition, the project would result in several benefits to the existing land uses, such as relieving congestion and improving freeway operations, including both the mainline and ramp connections.

Some of the partial acquisitions may result in the loss of landscaping or setbacks, or in noncompliance with other development standards on the remaining lot**.** As part of the acquisition process, coordination with the property owner and the local jurisdiction would be undertaken to address any variances needed resulting from noncompliance with development standards.

Design Option 1 (Reduced Lane/Shoulder Width) at 170th Street would reduce the amount of ROW required along westbound SR-91. This design option would eliminate the ROW impacts at 170th Street and would not require the acquisition of 18 homes and 1 business under the Build Alternative. As shown in Table 2.1.3, the total permanent impact area to existing land uses is 0.8 ac less than that of the Build Alternative.

Table 2.1.4 General Plan Land Use Impacts

Permanent Impacts	Build Alternative (acres)	Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width) (acres)	Build Alternative with Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Street Alignment) (acres)	Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width) and Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment) (acres)
Commercial and Services	0.07	0.07	0.80	0.76
Educational/Institutional	0.16	0.17	0.17	0.17
Industrial	0.0	0.0	0.0	0.0
Single-Family Residential	0.07	0.04	0.31	0.28
Multi-Family Residential	0.01	0.00	0.01	0.0
Open Space and Recreation	0.01	0.0	0.01	0.0
Permanent Impacts Total	**0.32**	**0.28**	**1.29**	**1.21**

Source: Southern California Association of Governments (SCAG). GIS Open Data Portal. Website: http://gisdata-scag.opendata.arcgis.com/ (accessed January 2018). Data compiled by LSA and Michael Baker International.

Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment) would require the acquisition of an additional eight properties, including five residential properties and three vacant lots, within Census Tract 5548.01. These eight properties are located along 168th Street in a cul-de-sac adjacent to the east side of Pioneer Boulevard in Artesia. As shown in Table 2.1.3, the total permanent impact area to existing land uses would be 1.1 ac greater when compared to just the Build Alternative.

The Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width) and Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment) would be a combination of the reduction and addition of acquisitions as described above and would result in a total permanent impact area of 3.12 ac to existing land uses.

Impacts to General Plan planned land uses show a similar trend with inclusion of the design options when compared to the Build Alternative as shown in Table 2.1.4.

No Build Alternative

The No Build Alternative would not result in any improvements on SR-91 and the SR-91/I-605 interchange within the study area. As a result, the No Build Alternative would not result in permanent impacts related to existing and planned land uses.

Avoidance, Minimization, and Mitigation Measures

The proposed project would not result in substantial permanent effects related to land use compatibility. No additional measures or mitigation are required.

2.1.2 Consistency with State, Regional, and Local Plans and Programs

This section discusses the project’s consistency with the SCAG 2016–2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), the SCAG 2017 Federal Transportation Improvement Program (FTIP), the SCAG 2004 Growth Vision Report, the SCAG 2008 Regional Comprehensive Plan (RCP), the Los Angeles County Metropolitan Transportation Authority’s (Metro) 2010 Congestion Management Program (CMP), and the General Plans of the Cities of Artesia and Cerritos.

2.1.2.1 Southern California Association of Governments Regional Transportation Plan/Sustainable Communities Strategy

SCAG is the Metropolitan Planning Organization (MPO) for six counties and 187 cities. SCAG prepares long-range planning documents guiding responses to regional challenges in the areas of transportation, air quality, housing, growth, hazardous waste, and water quality. Because these issues cross city and county boundaries, SCAG works with cities, counties, and public agencies in the six-county region (i.e., Los Angeles, Orange, Ventura, San Bernardino, Riverside, and Imperial Counties) to develop strategies to specifically address the growth and transportation issues facing Southern California.

The RTP is a long-range transportation plan that is developed and updated by SCAG every 4 years. The RTP provides a vision for transportation investments throughout the region. The proposed project is listed in Amendment #3 to the 2016 RTP/SCS with Project ID 1163S012. The 2016 RTP was approved by the Regional Council of SCAG on April 7, 2016, and Amendment #3 is scheduled to be adopted in December 2018.

2.1.2.2 Southern California Association of Governments Federal Transportation Improvement Program

The FTIP is a listing of all capital transportation projects proposed over a 6-year period for the SCAG region. The FTIP documents the funding programmed to implement the projects and programs listed in the RTP, and is developed in compliance with State and federal requirements. A new FTIP is prepared and approved every 2 years. These funded projects include highway improvements; transit, rail, and bus facilities; carpool lanes; signal synchronization; intersection improvements; freeway ramps; and other related improvements.

Federal law requires that all federally funded projects and regionally significant projects (regardless of funding) must be listed in an FTIP. The proposed project is not currently programmed in the FTIP. The proposed project will be added to the FTIP prior to completion of the Project Approval and Environmental Documentation (PA&ED) phase.

2.1.2.3 Los Angeles Metropolitan Transportation Authority’s 2010 Congestion Management Program

Metro’s 2010 CMP was developed to meet the requirements of Section 65089 of the California Government Code (Metro 2010). On October 28, 2010, the Metro Board adopted the 2010 CMP for Los Angeles County. The 2010 CMP summarizes the results of 18 years of CMP highway and transit monitoring and 15 years of monitoring local growth. CMP implementation guidelines for local jurisdictions are also contained in the 2010 CMP.

2.1.2.4 Local General Plans

General Plans contain policies that guide land use-related decisions within a city. General Plans address issues that directly and indirectly influence land uses (e.g., housing, noise, transportation, public services and facilities, and conservation and open space). Refer to Section 2.1.5 for an analysis of the consistency of the proposed project with the local planning document.

City of Artesia General Plan

Relevant circulation, recreation and resources, and land use-related policies in the City of Artesia General Plan are described below.

- **Land Use Element** (2016)
  - **Policy Action LU 1.3.1:** Enhance access, safety and the streetscape experience for pedestrians, bicyclists and transit riders; and focus improvements in areas with the highest need.
  - **Policy Action LU 2.1.1:** Maintain standards for circulation, noise, setbacks, buffer areas, landscaping and architecture to ensure compatibility between different uses.
- **Circulation Element** (2008)
  - **Policy Action CIR 1.1.3:** Identify necessary improvements associated with growth and land use change through the City's Capital Improvements Program.
  - **Policy Action CIR 2.1.4:** Work with Caltrans to ensure that sound walls along State facilities are landscaped and maintained with plant materials.
  - **Policy Action CIR 3.2.1:** Identify and implement necessary improvements associated with growth and land use change to maintain adequate capacity on major arterials.
  - **Policy Action CIR 6.1.1:** Work with Caltrans to review, monitor, and improve as necessary on-/off-ramps at the 91 freeway.
  - **Policy Action CIR 3.2.1:** Compliance with provisions of the Congestion Management Program (CMP).

City of Cerritos General Plan

Relevant circulation and land use-related policies in the City of Cerritos General Plan are described below.

- **Land Use Element** (2004)
  - **Policy LU-16.1:** Work with Caltrans to provide and maintain an attractive freeway environment in Cerritos, including access ramps and freeway interchanges.
- **Circulation Element** (2004)
  - **Policy CIR-1.6:** Where deemed necessary, upgrade major arterial facilities to accommodate regional traffic demand, improve access to and from freeway ramp facilities and to facilitate truck movements.
  - **Policy CIR-9.5:** Design and maintain landscaped parkways, decorative median islands and entrance planters at freeway on-ramps and off-ramps.
    - **Policy (a):** Align roadways in relationship to adjoining land uses to minimize noise and visual impacts.

2.1.2.5 Specific Plans

Some municipalities adopt specific plans to implement the policies established in the General Plan in a specific geographical area. The Cities of Artesia and Cerritos do not have specific plans within the study area.

2.1.2.6 Environmental Consequences

Temporary Impacts

Build Alternative (includes Design Options)

Consistency with State, regional, and local plans and programs is related to the consistency of permanent project changes with those plans. As a result, the construction of the Build Alternative would not result in any inconsistencies with State, regional, and local plans and policies.

No Build Alternative

Consistency with State, regional, and local plans and programs is related to the consistency of permanent changes with those plans. Therefore, there would be no temporary impacts under the No Build Alternative.

Permanent Impacts

Build Alternative (includes Design Options)

The local land use policies consistency analysis for the Build Alternative (including all the design options) is provided in Table 2.1.5. The Build Alternative would be generally consistent with the applicable policies and objectives contained in the General Plans of the Cities of Artesia and Cerritos. Specifically, the project is consistent with the policies and objectives to improve regional transportation facilities, maximize the efficiency of the circulation system, and improve access to city streets. In addition, implementation of the Build Alternative would not result in changes to existing land use patterns along SR-91 and I-605 because these freeways are existing transportation facilities located in a highly developed area, and the Build Alternative would result in a limited number of acquisitions. The Build Alternative would not require amendment of the affected Cities' General Plans.

No Build Alternative

The existing condition of SR-91 and the SR-91/I-605 interchange in the project area is generally not consistent with the regional mobility objectives of the City of Artesia and the City of Cerritos General Plan Circulation Elements. As shown in Table 2.1.5, the No Build Alternative would be generally inconsistent with the policies in these Cities' General Plans related to circulation and level of service (LOS) because the implementation of the No Build Alternative would not facilitate transportation improvements along SR-91.

Avoidance, Minimization, and Mitigation Measures

The proposed project would not result in substantial permanent effects related to plan consistency. No additional measures or mitigation are required.

2.1.3 Parks and Recreational Facilities

2.1.3.1 Regulatory Setting

This project will affect facilities that are protected by the Park Preservation Act (California Public Resources Code [PRC] Sections 5400-5409). The Park Preservation Act prohibits local and state agencies from acquiring any property which is in use as a public park at the time of acquisition unless the acquiring agency pays sufficient compensation or land, or both, to enable the operator of the park to replace the park land and any park facilities on that land.

Table 2.1.5 Consistency with Regional and Local Plans and Programs

Policy	No Build Alternative	Build Alternative
SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS FEDERAL TRANSPORTATION IMPROVEMENT PROGRAM		
Policy Guideline: Each project in the County TIP submitted to SCAG must be consistent with and reflect investment priorities established in the most recently adopted metropolitan transportation plan, in accordance with MAP-21. Each FTIP project must show consistency with the project's design concept, and timely implementation as reflected in the adopted RTP/SCS.	**Consistent.** The proposed project will be added to the FTIP prior to completion of the PA&ED phase. Therefore, the No Build Alternative would be inconsistent with this policy guideline.	**Consistent.** The 2016 RTP was approved by the Regional Council of SCAG on April 7, 2016. The proposed project is listed in Amendment #3 to the 2016 RTP/SCS with Project ID 1163S012. However, the proposed project is not currently programmed in the FTIP. The proposed project will be added to the FTIP prior to completion of the PA&ED phase. Therefore, the project is consistent with this policy guideline.
2004 Growth Vision Report		
Principle #1: Improve mobility for all residents. Encourage transit-oriented development. Promote a variety of travel choices	**Consistent.** The No Build Alternative would not result in any changes to existing conditions and would therefore not conflict with this principle. However, this alternative would not achieve the transportation improvements projected to result under the Build Alternative.	**Consistent.** By increasing operational efficiencies at SR-91, the Build Alternative would enhance transit and improve traffic conditions. Therefore, the project would be consistent with this principle.
2008 Regional Comprehensive Plan		
Transportation Goal: A more efficient transportation system that reduces and better manages vehicle activity.	**Consistent.** The No Build Alternative would not result in any changes to existing conditions and would therefore not conflict with this goal. However, this alternative would not achieve the transportation improvements projected to result under the Build Alternative.	**Consistent.** The Build Alternative would result in a more efficient transportation system by adding another lane on SR-91. Therefore, the project would be consistent with this goal.
Security and Emergency Preparedness Goal: Ensure transportation safety, security, and reliability for all people and goods in the region.	**Consistent.** The No Build Alternative would not result in any changes to existing conditions and would therefore not conflict with this goal. However, this alternative would not achieve the transportation improvements projected to result under the Build Alternative.	**Consistent.** The Build Alternative would help to ensure transportation safety, security, and reliability by adding another lane on SR-91. Therefore, the project would be consistent with this goal.
2016-2040 Regional Transportation Plan/Sustainable Communities Strategy		
Goal 2: Maximize mobility and accessibility for all people and goods in the region.	**Consistent.** The No Build Alternative would not result in any changes to existing conditions and would therefore not conflict with this goal. However, this alternative would not achieve the transportation improvements projected to result under the Build Alternative.	**Consistent.** The Build Alternative would maximize mobility and accessibility in the region by improving operational efficiency at SR-91. Therefore, the project would be consistent with this goal.
Goal 3: Ensure travel safety and reliability for all people and goods in the region.	**Consistent.** The No Build Alternative would not result in any changes to existing conditions and would therefore not conflict with this goal. However, this alternative would not achieve the transportation improvements projected to result under the Build Alternative.	**Consistent.** The Build Alternative would help to ensure transportation safety, security, and reliability by improving operational efficiency at SR-91. Therefore, the project would be consistent with this goal.

Table 2.1.5 Consistency with Regional and Local Plans and Programs

Policy	No Build Alternative	Build Alternative
LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY		
2010 Congestion Management Program		
Goals: To link local land use decisions with their impacts on regional transportation, and air quality; and to develop a partnership among transportation decision makers on devising appropriate transportation solutions that include all modes of travel.	**Consistent.** The No Build Alternative would not result in any changes to existing conditions and would therefore not conflict with these goals. However, this alternative would not achieve the transportation improvements projected to result under the Build Alternative.	**Consistent.** The Build Alternative would improve operational efficiencies at SR-91 and would therefore enhance transportation, resulting in improvements to regional transportation and air quality. Therefore, the project would be consistent with this goal.
CITY OF ARTESIA GENERAL PLAN		
Land Use Element (2016)		
Policy Action LU 1.3.1: Enhance access, safety and the streetscape experience for pedestrians, bicyclists and transit riders; and focus improvements in areas with the highest need.	**Inconsistent.** The No Build Alternative would not provide any enhancements related to access, safety, and the streetscape experience for pedestrians, bicyclists, and transit riders.	**Consistent.** The proposed project is an improvement to existing infrastructure. It would provide an opportunity for the incorporation of enhancements to access, safety, and the streetscape experience for pedestrians, bicyclists, and transit riders.
Policy Action LU 2.1.1: Maintain standards for circulation, noise, setbacks, buffer areas, landscaping and architecture to ensure compatibility between different uses.	**Consistent.** The No Build Alternative does not introduce a disruptive, non-conforming use to the surrounding land uses.	**Consistent.** The proposed project is an improvement to existing infrastructure. It is does not introduce a disruptive, non-conforming use to the surrounding land uses.
Circulation Element (revised 2008)		
Policy Action CIR 1.1.3: Identify necessary improvements associated with growth and land use change through the City's Capital Improvements Program.	**Inconsistent.** The No Build Alternative would not improve conditions on SR-91 or local roadways and would not implement necessary improvements to accommodate growth and land use change.	**Consistent.** The proposed project would improve conditions on SR-91 and local roadways, and would implement necessary improvements to accommodate growth and land use change.
Policy Action CIR 2.1.4: Work with Caltrans to ensure that sound walls along State facilities are landscaped and maintained with plant materials.	**Inconsistent.** The No Build Alternative would not result in the construction of sound walls with landscaped plant materials.	**Consistent.** Where feasible and practical, the proposed project would incorporate landscaped plant materials on new or reconstructed sound walls.
Policy Action CIR 3.2.1: Identify and implement necessary improvements associated with growth and land use change to maintain adequate capacity on major arterials.	**Inconsistent.** The No Build Alternative would not improve conditions on SR-91 or local roadways and would not implement necessary improvements to accommodate growth and land use change to maintain adequate capacity on major arterials.	**Consistent**. Where feasible and practical, the proposed project would implement necessary improvements to maintain adequate capacity on major arterials.
Policy Action CIR 6.1.1: Work with Caltrans to review, monitor, and improve as necessary on-/off-ramps at the 91 freeway.	**Inconsistent.** The No Build Alternative would not improve conditions on SR-91 and would not implement necessary improvements to accommodate growth and land use change to maintain adequate capacity on SR-91 on-/off-ramps..	**Consistent.** The proposed project would improve conditions on SR-91, and would implement necessary improvements to accommodate growth and land use change to maintain adequate capacity on SR-91 on-/off-ramps.
Policy Action CIR 3.2.1: Compliance with provisions of the Congestion Management Program (CMP).	**Consistent.** While no changes would occur under the No Build Alternative, it would not be inconsistent with the provision of the CMP.	**Consistent.** The improvements associated with the proposed project would be consistent with the provisions of the CMP.

Table 2.1.5 Consistency with Regional and Local Plans and Programs

Policy	No Build Alternative	Build Alternative
CITY OF CERRITOS GENERAL PLAN		
Land Use Element (2004)		
Policy LU-16.1: Work with Caltrans to provide and maintain an attractive freeway environment in Cerritos, including access ramps and freeway interchanges.	**Inconsistent.** The No Build Alternative would not improve conditions on SR-91 or at ramps and interchanges, and would not implement improvements to maintain an attractive freeway environment.	**Consistent.** The proposed project would improve conditions on SR-91 and at ramps and interchanges, and would implement improvements to maintain an attractive freeway environment where feasible and practical.
Circulation Element (2004)		
Policy CIR-1.6: Where deemed necessary, upgrade major arterial facilities to accommodate regional traffic demand, improve access to and from freeway ramp facilities and to facilitate truck movements.	**Inconsistent.** The No Build Alternative would not improve conditions on SR-91 or major arterials, and would not implement necessary improvements to accommodate regional traffic demand and would not improve access.	**Consistent.** The proposed project would improve conditions on SR-91 and along major arterials, and would implement necessary improvements to accommodate regional traffic demand and improve access.
Policy CIR-9.5: Design and maintain landscaped parkways, decorative median islands and entrance planters at freeway on-ramps and off-ramps. **Policy (a):** Align roadways in relationship to adjoining land uses to minimize noise and visual impacts.	**Inconsistent.** The No Build Alternative would not improve conditions on SR-91 or at ramps and interchanges, and would not implement improvements to maintain an attractive freeway environment. No features would be constructed to minimize noise and visual impacts.	**Consistent.** The proposed project would improve conditions on SR-91 and at ramps and interchanges, and would implement improvements to maintain an attractive freeway environment where feasible and practical. Project elements would be incorporated to minimize noise and visual impacts.

Source: *Community Impact Assessment* (2018).
Caltrans = California Department of Transportation
FTIP = Federal Transportation Improvement Program
PA&ED = Project Approval/Environmental Documentation
RTP/SCS = Regional Transportation Program/Sustainable Communities Strategy
SR-91 = State Route 91
TIP = Transportation Improvement Program

2.1.3.2 City of Artesia

The City of Artesia operates and maintains a total of three city parks: Artesia Park, A.J. Padelford Park, and Baber Park (City of Artesia 2017). The following parks and recreational facilities in the city of Artesia are within 0.5 mile (mi) of the project area:

- **A.J. Padelford Park, 16912 Clarkdale Avenue, Artesia (Map ID No. P-6):** This neighborhood park features one full basketball court, two playgrounds, a Teen Center, and one multi-purpose room. This park is 1.56 ac and is located partially within the study area of the proposed project.
- **Baber Park, 17101 Baber Avenue, Artesia (Map ID No. P-5):** This park is a passive open space area. This park is 0.9 ac and is located partially within the study area of the proposed project.

- **North Artesia Community Center, 11870 169th Street, Artesia (Map ID No. P-6):** This community center is located within A.J. Padelford Park and provides a location for City of Artesia-sponsored educational and recreational opportunities.

2.1.3.3 Affected Environment

City of Cerritos

The City of Cerritos operates and maintains a total of 20 community parks and 6 recreational facilities, including community gyms at three high schools, the Cerritos Olympic Swim and Fitness Center, the Iron-Wood Nine Golf Course, and the Cerritos Regional Park, Sports Complex and Skate Park (City of Cerritos 2017). The following parks and recreational facilities in the city of Cerritos are within 0.5 mi of the project area:

- **Satellite Park, 12410 Ash Creek Road (Map ID No. P-8):** This park features ball courts and fields, picnic shelters, and play areas. This park is approximately 1.9 ac and is located approximately 570 feet (ft) from the project area.
- **Reservoir Hill Park, 16733 Studebaker Road (Map ID No. P-3):** This park features play areas. This park is 4.6 ac and is located partially within the project area.
- **Cerritos Park East, 13234 East 166th Street (Map ID No. P-13):** This park features ball courts and fields, a meeting room, picnic shelters, restrooms, play areas, a spray pool, and on-site staff. This park is approximately 29.9 ac and is located approximately 1,640 ft from the project area.
- **Frontier Park, 16910 Maria Avenue (Map ID No. P-10):** This park features ball courts, fields, a meeting room, picnic shelters, a restroom, play areas, and on-site staff. This park is approximately 2.6 ac and is located approximately 890 ft from the project area.
- **Ecology Park, 17133 Gridley Road (Map ID No. P-4):** This park features ball courts and play areas. This park is approximately 1.5 ac and is located partially within the project area.
- **Saddleback Park, 13037 Acoro Street (Map ID No. P-12):** This park features ball courts and play areas. This park is 1.5 ac and is located approximately 360 ft from the project area.
- **Loma Park, 17503 Stark Avenue (Map ID No. P-9):** This park features picnic shelters and play areas. This park is approximately 0.8 ac and is located approximately 1,155 ft from the project area.

- **Rosewood Park, 17715 Eric Avenue (Map ID No. 16):** This park features ball courts and fields, picnic shelters, and play areas. This park is approximately 8 ac and is located approximately 1,940 ft from the project area.
- **Cerritos Sculpture Garden, 183rd Street (Map ID No. 17):** This garden features interior and exterior spaces showcasing art and nature. This garden is approximately 0.02 sq mi and is located approximately 2,160 ft from the project area.
- **Brookhaven Park, 13167 Brookhaven Street (Map ID No. P-14):** This park features ball courts and play areas. This park is approximately 0.7 ac and is located approximately 275 ft from the project area.
- **Heritage Park, 18600 Bloomfield Avenue (Map ID No. P-11):** This park features ball courts and fields, an island playground, a meeting room, picnic shelters, restrooms, play areas, and on-site staff. This park is approximately 15.3 ac and is located approximately 2,380 ft from the project area.
- **Cerritos Park East Community Center, 13234 East 166th Street (Map ID No. P-13):** This community center is located within Cerritos Park East and provides a location for City-sponsored educational and recreational opportunities.
- **Cerritos Olympic Swim and Fitness Center, 13150 East 166th Street (Map ID No. RF-2):** This facility is an enclosed 50-meter (m) pool with dressing rooms, a press box area, and seating capacity for 1,200 spectators. Swimming classes for children and adults are offered here. This facility is located approximately 1,640 ft from the project area.
- **Community Gymnasium at Whitney High School, 16800 Shoemaker Avenue (Map ID No. S-13):** This community gymnasium is a shared facility that hosts organized youth and adult sports classes. This community gymnasium is located approximately 1,265 ft from the project area.
- **Cerritos Center for the Performing Arts, 12700 Center Court Drive (Map ID No. 23):** This facility functions as a performing arts and conference facility, offering performances in music, dance, and theater, as well as a facility for meetings, banquets, and special events. This facility is located approximately 1,000 ft from the project area.
- **Heritage Park Community Center, 18600 Bloomfield Avenue (Map ID No. P-11):** This community center is located within Heritage Park and provides a location for City-sponsored educational and recreational opportunities.
- **Tracy High School, 12222 Cuesta Drive (Map ID No. S-10):** This high school campus encompasses 14.57 ac, is a public continuation high school that serves as an alternative education program, and primarily serves students in grades 10

through 12. The facility contains several amenities, including outdoor basketball courts, blacktop tennis courts, and a multipurpose grass area that primarily serves as a baseball field.

City of Norwalk

The City of Norwalk operates and maintains a total of 12 parks as well as a cultural arts center, a gymnasium, the Hargitt House Museum, the Sproul Museum, the Sproul Reception Center, a teen center, an aquatic pavilion, a golf center, and a senior center (City of Norwalk 2017). The following parks and community centers in the city of Norwalk are within 0.5 mi of the project area:

- **Glazier Park, 10810 Excelsior Drive (Map ID No. P-1):** This park features ball courts, picnic shelters, play areas, restrooms, and passive recreation areas. This park is located approximately 2,430 ft from the project area.
- **Hermosillo Park, 11959 162nd Street (Map ID No. P-7):** This park features ball courts and fields, play areas, and passive recreation areas. This park is located approximately 1,600 ft from the project area.

City of Bellflower

The City of Bellflower operates and maintains a total of four city parks as well as a civic auditorium (City of Bellflower 2017). The following parks and community facilities in the city of Bellflower are within 0.5 mi of the project area:

- **Ruth B. Caruthers Park, 10500 Flora Vista Street (Map ID No. P-2):** This park features ball courts and fields, picnic shelters, a skate park, game room, a wading pool, fitness center, equestrian path, bike trail, and play areas. This park is approximately 20 ac and is located approximately 1,340 ft from the project area.
- **Flora Vista Dog Park, 9203 Flora Vista Street (Map ID No. P-2):** This dog park is part of the larger Ruth B. Caruthers Park.
- **Bellflower Bike Trail (Map ID No. B-1):** A 2.7 mi asphalt bike trail that runs along the former ROW of the Pacific Electric rail system. The trail begins at Ruth B. Caruthers Park and heads northwest to its terminus at Somerset Boulevard.

Parks and recreation resources within 0.5 mi of the project area identified by Map ID are shown on Figure A-1 in Appendix A, Resources Evaluated Relative to the Requirements of Section 4(f).

Bicycle Facilities

On-road bicycle facilities within the project area include:[1]

- A Class III[2] bikeway extends in both directions on 195th Street from the San Gabriel River Trail to Bloomfield Avenue. These bikeways then transition to a Class II bikeway before joining the Coyote Creek Bicycle Path.
- A Class II bikeway extends on Pioneer Boulevard from South Street before turning eastward onto Del Amo Boulevard.
- A Class II bikeway extends on Bloomfield Avenue starting at 183rd Street and ends at South Street before continuing east on South Street to Carmelita Avenue, where another bikeway extends southward on Shoemaker Avenue.

The project area is located between the following two major bike trails in the region owned and operated by the Los Angeles County Department of Public Works Road Maintenance Division:

- The San Gabriel River Bicycle Trail runs 30.2 mi along the San Gabriel River, from San Gabriel Canyon Road in Azusa to an access into El Dorado Park in Long Beach. There are numerous access points along the path. Within the study area, the Trail crosses under SR-91 just west of I-605, which it parallels for much of its length.
- The Coyote Creek Bicycle Trail is a 9.5 mi Class I bike path adjacent to the Coyote Creek flood control channel, extending from Santa Fe Springs to Long Beach, where it joins the San Gabriel River Bicycle Path. It crosses under SR-91 about 1 mi east of the study area, at Carmenita Road.

Park Preservation Act

The project will affect four park facilities that are protected by the Park Preservation Act (California Public Resources Code [PRC] Sections 5400–5409). These park facilities are Reservoir Hill Park, Ecology Park, Baber Park, and A. J. Padelford Park (each described above). The Park Preservation Act prohibits local and State agencies from acquiring any property that is in use as a public park at the time of acquisition

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1 County of Los Angeles. 2012. *Bicycle Master Plan.* Website: https://dpw.lacounty.gov/pdd/bike/docs/bmp/BMP%20CHP%203.pdf (accessed December 12, 2017).

2 Class I (separate bike path), Class II (bike lane), and Class III (signed as bike route, no striping).

unless the acquiring agency pays sufficient compensation or land, or both, to enable the operator of the park to replace the park land and any park facilities on that land.

2.1.3.4 Environmental Consequences

Temporary Impacts

Build Alternative (includes Design Options)

Construction of the Build Alternative would result in temporary effects at 3 of the 30 parks and recreational resources within the project area as discussed below.

- **Ecology Park:** The project would not require temporary impacts to Ecology Park for construction activities; however, there would be temporary impacts to approximately 0.045 ac of parkland in the northern portion of this resource. This temporary impact area is located beyond the noise barrier that separates the park from SR-91, and it is not accessible from Ecology Park. Therefore, the temporary impact area would not adversely affect users of Ecology Park nor would it adversely affect the facilities, function or activities at the park.
- **A.J. Padelford Park and North Artesia Community Center (A.J. Padelford Park Facility):** The project would require a TCE on approximately 0.13 ac of land along the south side of the property boundary to remove and reconstruct the existing noise barrier that separates westbound SR-91 from the A.J. Padelford Park Facility. The TCE is located to the south of the community center building and recreational resources where there is currently an existing noise barrier. Once the residential and non-residential properties along 170th Street have been acquired, access to the A.J. Padelford Park Facility from 170th Street would be restricted. However, access from the main entrance along 169th Street would remain.

  Construction activities would include the use of vehicles, equipment, or construction staging that would create short-term dust, noise, and visual impacts on the resource from the use of construction equipment, ground disturbance, and other construction activities. However, these impacts would be intermittent and temporary, and use of the playground, handball court, basketball court, and multipurpose field would not be adversely affected. Following construction, the TCE area would be revegetated and improved. Temporary impacts would not interrupt access to the A.J. Padelford Park Facility, and the park and community center would remain open for public use during construction and operation of the project. While temporary impacts to the park facilities would be required, the temporary impacts area would not adversely affect users of the A.J. Padelford Park Facility.

- **Tracy High School:** The project would require TCEs on approximately 0.84 ac of land at Tracy High School. A TCE on 0.816 ac of land would be required on the parking lot adjacent to Norwalk Boulevard in the western end of the school's boundary for the proposed interchange and intersection improvements at Norwalk Boulevard. A second TCE would be required on 0.023 ac of land along the school's southeastern parking lot for a construction staging area for the reconstruction of the noise barrier along the alleyway adjacent to the school's boundary to accommodate new Caltrans ROW.

  Before construction activities begin, the western parking lot would be reconfigured and restriped; therefore, the project would not limit the number of spaces in the western parking lot.

  During project construction, an existing sewer manhole at the southeast corner of the property would need to be relocated. Several parking stalls would be temporarily unavailable during the manhole and sewer relocation. There could also be short-term dust, noise, and visual impacts on the resource from the use of construction equipment, ground disturbance, and other construction activities. However, these impacts would be intermittent and temporary, and the basketball courts, tennis courts, and multipurpose field would not be adversely affected. Following construction, the TCE area in the southeastern parking lot would be returned to its intended use.

  Temporary impacts would not interrupt access to the recreational resources at this property, and would remain open for public use during construction and operation of the project.

No Build Alternative

The No Build Alternative would not result in the construction of any improvements to the project segment of SR-91 and the SR-91/I-605 interchange other than routine maintenance. As a result, the No Build Alternative would not result in temporary adverse effects related to parks and recreation facilities, or Section 4(f) resources.

Permanent Impacts

Build Alternative (includes Design Options)

The following park and recreation facilities would be impacted with the implementation of the Build Alternative. These park and recreational facilities qualify for protection under Section 4(f) of the Department of Transportation Act of 1966 and are discussed in more detail in Appendix A, Section 4(f) Analysis.

- **Reservoir Hill Park:** Construction of the Build Alternative would result in a small acquisition (less than 10 square feet [sf]) on the southern property boundary of Reservoir Hill Park to accommodate interchange improvements along the portion of westbound SR-91 that leads to northbound I-605 and would include the expansion of the connector ramp from one lane to two in what is considered a gore point. The permanent incorporation would occur in an area away from the recreational resource and would not interrupt access to the park. The park would remain open for public use during construction and operation of the project.

- **Ecology Park:** The project would result in the permanent incorporation of 0.63 ac of vegetated slope from Ecology Park into the transportation facility. Permanent impacts would not interrupt access to the park, and the park would remain open for public use during construction and operation of the project.

  Construction of the Build Alternative with Design Option 5 (Four-Lane Gridley Road Overcrossing) would include the demolition and reconstruction of the existing Gridley Road overcrossing. While the overcrossing would be removed and replaced, permanent access to an overcrossing connecting to/from Ecology Park would be maintained, and there would be no permanent loss of access to this resource.

- **Baber Park:** The project would result in the permanent incorporation of 0.023 ac of vegetated slope from Baber Park into the transportation facility. Permanent impacts would not interrupt access to the park, and the park would remain open for public use during construction and operation of the project. Construction of the Build Alternative with Design Option 5 (Four-Lane Gridley Road Overcrossing) would include the demolition and reconstruction of the existing Gridley Road overcrossing. While the overcrossing would be removed and replaced, permanent access to/from Baber Park (via Baber Avenue to the east of the park) would be maintained, and there would be no permanent loss of access to this resource.

- **A.J. Padelford Park and North Artesia Community Center (A.J. Padelford Park Facility):** The project would result in the permanent incorporation of 0.0064 ac of parkland from the A.J. Padelford Park Facility into the transportation facility. This would occur in the southeastern portion of the park boundary to accommodate new Caltrans ROW for the widening of westbound SR-91 and the reconstruction of the noise barrier along 170th Street. Project improvements at this location would include the freeway widening of westbound SR-91 and the demolition and reconstruction of the noise barrier that currently serves as the southern boundary of the A.J. Padelford Park Facility.. Permanent impacts would not interrupt access to the A.J. Padelford Park Facility, and the park and community center would remain open for public use during construction and operation of the Build Alternative.

Under Design Option 1 (Reduced Lane/Shoulder Width), the project would not result in the permanent incorporation of this resource into the transportation facility. Acquisition of park land would not be required, and a new ROW would not be necessary.

- **Tracy High School:** The project would result in the permanent incorporation of 0.32 ac of parking lot from Tracy High School at the western portion of the school boundary to accommodate the interchange reconfiguration and intersection improvements at Norwalk Boulevard. Additional improvements would include the reconfiguration of lanes along Norwalk Boulevard and the reconstruction of the existing Type L-9 cloverleaf interchange into a Type L-7 cloverleaf interchange configuration. The interchange modification would also alter the arterial street operations as a result of the changed interchange access point for the arterial street to westbound SR-91.

  Permanent impacts would not interrupt access to the resource, and would not affect the activities, features, or attributes of this resource. The resource would remain open for public use during construction and operation of the project. The project would result in a portion of the property being permanently incorporated into a transportation facility. To minimize the impact on this resource, the parking lot would be reconfigured and restriped prior to construction so that the number of parking stalls would remain the same despite the permanent impacts.

No Build Alternative

The No Build Alternative would not result in any improvements on SR-91 and the SR-91/I-605 interchange within the study area. As a result, the No Build Alternative would not result in permanent impacts related to parks and recreation facilities, or Section 4(f) resources.

Avoidance, Minimization, and/or Mitigation Measures

The proposed project would not result in substantial permanent effects related to parks and recreation facilities. No additional measures or mitigation are required.

2.2 Growth

2.2.1 Regulatory Setting

The Council on Environmental Quality (CEQ) regulations, which established the steps necessary to comply with the National Environmental Policy Act (NEPA) of 1969, require evaluation of the potential environmental effects of all proposed federal activities and programs. This provision includes a requirement to examine indirect effects, which may occur in areas beyond the immediate influence of a proposed action and at some time in the future. The CEQ regulations (40 Code of Federal Regulations [CFR] 1508.8) refer to these consequences as indirect impacts. Indirect impacts may include changes in land use, economic vitality, and population density, which are all elements of growth.

The California Environmental Quality Act (CEQA) also requires the analysis of a project's potential to induce growth. The CEQA guidelines (Section 15126.2[d]) require that environmental documents "…discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment…"

2.2.2 Affected Environment

Existing and General Plan land uses in Cerritos and Artesia along the project segment of State Route 91 (SR-91) and Interstate 605 (I-605) and the projected growth rates for the various jurisdictions are discussed in Section 2.1, Land Use, and in Chapter 1, Section 1.2.2.3, Social Demands and Economic Development.

This analysis of potential growth impacts follows the first-cut screening guidelines provided in the California Department of Transportation's (Caltrans) *Guidance for Preparers of Growth-related, Indirect Impact Analysis* (2006). The first-cut screening approach identifies the need for and the extent of growth-related impact analysis based on the responses to various questions related to a project's change in accessibility, its potential to influence growth, and the potential for project-related growth to impact resources of concern.

2.2.3 Environmental Consequences

2.2.3.1 Temporary Impacts

Build Alternative (includes Design Options)

Any potential growth-related impacts of the Build Alternative would be a result of the operation of the Build Alternative and would be permanent. Therefore, the Build

Alternative and its design options would not result in any temporary growth-related impacts.

No Build Alternative

Under the No Build Alternative, none of the proposed improvements to SR-91 and I-605 would be constructed. The No Build Alternative would maintain the existing conditions; therefore, the No Build Alternative would not result in temporary growth-inducing impacts.

2.2.3.2 Permanent Impacts

Build Alternative (includes Design Options)

The assessment of the potential growth-related impacts of the Build Alternative was conducted using the first-cut screening analysis approach, including assessment of whether further analysis would be necessary based on consideration of the following four questions.

1. **How, if at all, does the proposed project potentially change accessibility?**

   The Build Alternative proposes improvements to an existing freeway facility and does not increase the number of access points to or from the facility. The proposed project is located in a highly urbanized area, and the proposed improvements do not provide a new transportation facility or new access to previously inaccessible areas. The Build Alternative would help alleviate existing and forecasted traffic congestion in the study area, resulting in improved operations on the SR-91, the I-605, and on nearby arterials. Additionally, the Build Alternative would help accommodate projected future (2044) traffic volumes in the study area consistent with adopted local land use and transportation plans (as discussed in Section 2.1, Land Use, and in Chapter 1, Section 1.2.2.3, Social Demands and Economic Development). Therefore, the proposed project does not have the potential to change accessibility.

2. **How, if at all, do the project type, project location, and growth pressure potentially influence growth?**

   Growth in Cerritos and Artesia is expected to occur with or without the Build Alternative because growth has continued in the study area even without improvements to SR-91. The Build Alternative would accommodate approved and planned growth in the study area (see Table 2.18.1 for a list of reasonably foreseeable land use and infrastructure projects within the study area) because the proposed project would add capacity to a heavily traveled segment of SR-91 and I-605 and thereby help alleviate existing and forecasted congestion in the study area. Pressure for growth is a result of a combination of factors, including economic, market, and land use demands and conditions. The study area cities are projected to experience population growth rates ranging from 3 percent (for Cerritos) to 8 percent (for Artesia) between 2012 and 2040 as projected by the Southern California Association of Governments' (SCAG) 2016–2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) Final Growth Forecasts.[1]

If traffic congestion was a constraint on growth, the improvements to alleviate congestion and expand the capacity of the existing SR-91 and I-605 facilities could make growth in the study area more attractive. However, as shown in Table 2.18.1, a substantial number of development projects were proposed and approved prior to the initiation of the planning studies for the proposed project, which indicates that development in the study area cities is not dependent on the completion of this freeway improvement project. Additionally, the SR-91 and I-605 corridor runs through a heavily urbanized and built-out area, wherein there is not a substantial amount of land available for new development. The project is in conformance with the growth-related objectives and policies of the General Plans of the Cities of Cerritos and Artesia. The overarching goals identified in these General Plans call for the provision of adequate transportation facilities, a reduction in traffic congestion, and interagency coordination to achieve a reduction in regional traffic congestion. The Build Alternative does not propose improvements that are inconsistent with these goals or other related policies. Moreover, the fact that the project is called for in the RTP/SCS, for which each local jurisdiction provides input, suggests that growth policies would effectively manage any growth created by the Build Alternative. Table 2.18.1 provides the status of land use developments within the study area. These developments will be developed with or without the proposed project.

Because it is located within an existing urbanized area, the Build Alternative is unlikely to alter the historic and projected growth patterns within either the

[1] Southern California Association of Governments (SCAG). 2016–2040 RTP/SCS Final Growth Forecast by Jurisdiction. Website: https://www.scag.ca.gov/Documents/2016_2040RTPSCS_FinalGrowthForecastbyJurisdiction.pdf (accessed November 10, 2017).

affected jurisdictions or Los Angeles County and does not encourage growth on undeveloped and unplanned land. Therefore, the Build Alternative would accommodate existing and planned growth, but not influence growth beyond what is currently planned.

3. Is project-related growth reasonably foreseeable as defined in NEPA?

Under NEPA, indirect impacts need only be evaluated if they are reasonably foreseeable, rather than remote and speculative. As discussed above, the Build Alternative would not influence growth beyond those projects currently planned for the area (Table 2.18.1) and would not influence the rate, type, or amount of growth that would otherwise occur. Therefore, no reasonably foreseeable project-related growth would occur under the Build Alternative.

4. If there is project-related growth, how, if at all, will that impact resources of concern?

As indicated above, because the Build Alternative would not influence the rate, type, or amount of growth that would otherwise occur, the reasonably foreseeable growth anticipated to occur in the study area is not project-related.

Because the Build Alternative would not result in growth-inducing impacts, no analysis of those potential impacts beyond what is contained above in the first-cut screening analysis is necessary.

No Build Alternative

Under the No Build Alternative, none of the proposed improvements to SR-91 and I-605 would be constructed. The No Build Alternative would maintain the existing conditions; therefore, the No Build Alternative would not result in growth-related impacts.

2.2.4 Avoidance, Minimization, and/or Mitigation Measures

As the Build Alternative would not result in any temporary or permanent growth-related impacts, no avoidance, minimization, or mitigation measures are required.

2.3 Community Impacts

2.3.1 Community Character and Cohesion

2.3.1.1 Regulatory Setting

The National Environmental Policy Act (NEPA) of 1969, as amended, established that the federal government use all practicable means to ensure that all Americans have safe, healthful, productive, and aesthetically and culturally pleasing surroundings (42 United States Code [USC] 4331[b][2]). The Federal Highway Administration (FHWA) in its implementation of NEPA (23 USC 109(h)) directs that final decisions on projects are to be made in the best overall public interest. This requires taking into account adverse environmental impacts, such as destruction or disruption of human-made resources, community cohesion, and the availability of public facilities and services.

Under the California Environmental Quality Act (CEQA), an economic or social change by itself is not to be considered a significant effect on the environment. However, if a social or economic change is related to a physical change, then social or economic change may be considered in determining whether the physical change is significant. Since this project would result in physical change to the environment, it is appropriate to consider changes to community character and cohesion in assessing the significance of the project's effects.

2.3.1.2 Affected Environment

The study area for community character and cohesion includes portions of the cities of Artesia, Cerritos, and Norwalk, specifically the 9 census tracts and 20 applicable block groups adjacent to the project area (Census Tracts 5530.00 [Block Groups 3 and 4], 5545.12 [Block Groups 1 and 2], 5545.13 [Block Group 1], 5545.14 [Block Groups 1. 2, and 3], 5545.21 [Block Groups 1 and 3], 5546.00 [Block Groups 1 and 2], 5547.00 [Block Groups 1, 2, and 3], 5548.01 [Block Groups 1 and 2], and 5548.02 [Block Groups 1, 2, and 3], which are shown on Figure 2.3-1). (Please note that the figures for this section have been placed at the end of the text to enhance the section's readability.) Data presented in this section are based on census tract information available from the United States (U.S.) Census Bureau, the 2010 Census, and the

2011–2015 American Community Survey (ACS)[1] 5-Year Estimates. The ACS is a mandatory, ongoing statistical survey that samples a small percentage of the population every year to provide estimates on various community characterisitcs. The 5-Year Estimates include data collected over a 5-year period to provide the most reliable estimates for a community.

Community character consists of all the attributes, including social and economic characteristics, and assets that make a community unique and establish a sense of place for its residents. The southern portion of the study area along State Route 91 (SR-91) consists of a mix of education, industrial, commercial/service, and single-family residential uses, with a smaller number of multi-family residential uses. By contrast, the northern portion of the study area along SR-91 is characterized by more single- and multi-family residences, but also includes areas of commercial, industrial, and educational uses. Land uses surrounding Interstate 605 (I-605) in the study area consist of a mix of transportation, communication, utility, recreation, and industrial uses and a small pocket of commercial uses to the west and a mix of commercial, industrial, single-family residential, and recreational uses to the east.

Community cohesion is the degree to which residents have a sense of belonging to their neighborhoods, a level of commitment to the community, or a strong attachment to neighbors, groups, and institutions, usually as a result of continued association over time. Demographic data compiled by the U.S. Census Bureau, including the 2010 Census and the 2011–2015 ACS, may be used to measure a community's level of cohesion. The following demographic indicators tend to correlate with a higher degree of community cohesion and are used to determine the degree of community cohesion in the study area cities and census tracts:

- **Ethnicity:** In general, homogeneity of the population contributes to higher levels of community cohesion. Communities that are ethnically homogeneous often speak the same language, hold similar beliefs, and share a common culture and, therefore, are more likely to engage in social interaction on a routine basis. The U.S. Census Bureau compiles limited data regarding ethnicity. While the U.S.

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[1] The ACS is an ongoing survey conducted by the U.S. Census Bureau that provides data every year, supplying communities with current information they need to plan investments and services. ACS data are estimates derived from a sampling of the population, rather than population totals collected for the Decennial Census.

Census Bureau provides data regarding Hispanic/Latino origin, the language spoken at home, and ancestry, it does not provide data regarding religion. Table B03002 of the 2011–2015 ACS provides data regarding the population by ethnicity and race used to identify ethnically homogeneous communities within the study area.

- **Housing Occupancy:** Communities with a high percentage of owner-occupied residences are typically more cohesive because their population tends to be less transient. Because they have a financial stake in their community, homeowners often take a greater interest in what is happening in their community than renters do. This means they often have a stronger sense of belonging to their community. Table B25008 of the 2011–2015 ACS provides data regarding the percentage of housing units in Los Angeles County as well as in each study area city and census tract that is owner-occupied.
- **Housing Tenure:** Communities with a high percentage of long-term residents are typically more cohesive because a greater proportion of the population has had time to establish social networks and develop an identity with the community. Table B25026 of the 2011–2015 ACS provides data regarding the year that each householder in Los Angeles County and the study area cities and census tracts moved into his or her current housing unit. For purposes of this analysis, those households that moved into their current residence in 2001 or earlier are considered long-term residents since they have lived in their current residence for more than 15 years.
- **Household Size:** In general, communities with a high percentage of families with children are more cohesive than communities made up of largely single people. This appears to be because children tend to establish friendships with other children in their community. The social networks of children often lead to the establishment of friendships and affiliations among parents in the community. Table B11016 of the 2011–2015 ACS provides data on household type by household size used to identify family households within the study area.
- **Elderly Residents:** In general, communities with a high percentage of elderly residents (65 years or older) tend to demonstrate a greater social commitment to their community. This is because the elderly population, which includes retirees, often tends to be more active in the community due to its members having more time available to volunteer and participate in social organizations. Table B01001 of the 2011–2015 ACS provides data regarding the age of the population of Los Angeles County and each study area city and census tract.

- **Transit-Dependent Population:** Communities with a high percentage of residents who are dependent on public transportation typically tend to be more cohesive than communities that are dependent on automobiles for transportation. This is because residents who tend to walk or use public transportation for travel tend to engage in social interactions with each other more frequently than residents who travel by automobile. The transit-dependent population was identified from the U.S. Census Bureau (2015) and data reported in Table S0801 of the 2012–2016 ACS.

These indicators of community character and cohesion in the study area and the applicable local jurisdictions are described in greater detail below.

Ethnicity

Table 2.3.1 provides data regarding ethnicity and race in Los Angeles County, the study area cities of Artesia and Cerritos, and the nine census tracts and associated block groups in the study area, as reported in the 2011–2015 ACS for 2015. The *Community Impact Assessment* (CIA) (2018) prepared for this project also included data from 2013 regarding ethnicity and race for Los Angeles County, the study area cities, and the study area census tract block groups. Table 2.3.1 also identifies whether ethnically homogeneous communities are likely to exist in the study area cities and census tract block groups. Ethnically homogeneous communities are identified in the study area cities and census tract block groups when both of the following criteria are met: (1) a particular ethnic group makes up 30 percent or more of the population within that city or census tract block group; and (2) that particular ethnic group population makes up a higher percentage of the community than it does of Los Angeles County as a whole. These criteria were developed based on a reasonable estimate of the minimum number of residents required before ethnic places of worship, cultural institutions, and/or business districts were established in the community.

As identified in Table 2.3.1, Los Angeles County is predominantly Hispanic or Latino, followed by White and Asian. The composition of the cities of Artesia and Cerritos is predominantly Asian (40 and 60 percent, respectively). In the city of Artesia, the second-largest ethnic population is Hispanic or Latino (37 percent), followed by White (20 percent). In the city of Cerritos, the second-largest ethnic population is White (16 percent), followed by Hispanic or Latino (13 percent). When compared to these two cities and Los Angeles County, Census Tract 5545.14 Block Group 3 has the highest percentage of American Indian and Alaska Native persons

Table 2.3.1 2015 Population by Ethnicity and Race

Area		White Alone	Black or African American Alone	American Indian and Alaska Native Alone	Asian Alone	Native Hawaiian and Other Pacific Islander Alone	Some Other Race Alone	Two or More Races	Hispanic or Latino	Ethnically Homogeneous Communities[1]
County										
Los Angeles County		27%	8%	0.2%	14%	0.2%	0.3%	2%	48%	N/A
Study Area Cities										
City of Artesia		20%	2%	0%	***40%***	0%	0.06%	2%	37%	Yes
City of Cerritos		16%	7%	0.03%	***60%***	0.2%	***0.4%***	2%	13%	Yes
Study Area Census Tracts and Block Groups										
Census Tract 5530.00	Block Group 3 (City of Norwalk)	22%	5%	0%	9%	0%	0%	1%	***62%***	Yes
	Block Group 4 (City of Norwalk)	23%	***10%***	0%	***17%***	0%	***1%***	1%	48%	No
Census Tract 5545.12	Block Group 1 (City of Cerritos)	18%	3%	0%	***73%***	0%	***3%***	1%	3%	Yes
	Block Group 2 (City of Cerritos)	13%	***10%***	***1%***	***64%***	0%	0%	1%	11%	Yes
Census Tract 5545.13	Block Group 1 (City of Cerritos)	7%	8%	***1%***	***72%***	0%	0%	***5%***	7%	Yes
Census Tract 5545.14	Block Group 1 (City of Cerritos)	12%	6%	0%	***30%***	0%	0%	1%	***50%***	Yes
	Block Group 2 (City of Cerritos)	14%	***26%***	0%	***55%***	0%	0%	***3%***	1%	Yes
	Block Group 3 (City of Cerritos)	14%	2%	***2%***	***68%***	0%	0%	2%	12%	Yes
Census Tract 5545.21	Block Group 1 (City of Cerritos)	25%	***10%***	0%	***42%***	0%	0%	***4%***	19%	Yes
	Block Group 3 (City of Cerritos)	22%	***10%***	0%	***47%***	0%	0%	0%	21%	Yes
Census Tract 5546.00	Block Group 1 (City of Norwalk)	12%	3%	***1%***	***33%***	0%	0%	1%	***50%***	Yes
	Block Group 2 (City of Norwalk)	18%	***11%***	0%	***26%***	0%	0%	2%	44%	No
Census Tract 5547.00	Block Group 1 (City of Norwalk)	7%	6%	0%	8%	0%	0%	0%	***79%***	Yes
	Block Group 2 (City of Norwalk)	5%	1%	0%	***17%***	0%	***4%***	0%	***73%***	Yes
	Block Group 3 (City of Norwalk)	4%	3%	0%	6%	0%	0%	0%	***86%***	Yes
Census Tract 5548.01	Block Group 1 (City of Artesia)	1%	0%	0%	3%	0%	0%	0%	***96%***	Yes
	Block Group 2 (City of Artesia)	23%	8%	0%	***39%***	0%	0%	***5%***	26%	Yes
Census Tract 5548.02	Block Group 1 (City of Artesia)	23%	1%	0%	***32%***	0%	0%	***4%***	39%	Yes
	Block Group 2 (City of Artesia)	13%	3%	0%	***58%***	0%	0%	1%	25%	Yes
	Block Group 3 (City of Artesia)	***37%***	8%	0%	***35%***	0%	0%	5%	14%	Yes

Source: United States Census Bureau, 2011–2015 ACS 5-Year Estimates; Table B03002.

Note: ***Bold italicized numbers*** indicate the values are higher than in Los Angeles County as a whole. Shaded numbers indicate the likely presence of an ethnically homogeneous community. Ethnically homogeneous communities were identified in the study area cities and census tract block groups when both of the following criteria are met: (1) a particular ethnic group is 30 percent or more of the population within that city or census tract block group; and (2) that particular ethnic group population makes up a higher percentage of the community than it does of Los Angeles County as a whole.

[1] An ethnically homogeneous community is a geographic area with a high population concentration of a particular ethnic group. Ethnically homogeneous communities often possess a strong cultural identity and typically include a concentration of businesses that cater to the local ethnic group by providing familiar goods and services.

ACS = American Community Survey

N/A = not applicable

(2 percent). Census Tract 5545.12 Block Group 2, Census Tract 5545.13 Block Group 1, and Census Tract 5546.00 Block Group 1 also have higher percentages of American Indian and Alaska Native persons, with each at 1 percent. Census Tract 5547.00 Block Group 2 and Census Tract 5545.12 Block Group 1 have the highest percentage of persons who identify as Other (4 percent and 3 percent, respectively). Census Tract 5548.02 Block Group 3 and Census Tract 5545.21 Block Group 1 have the highest percentages of White persons at 37 percent and 25 percent, respectively. The White populations make up a higher share of the population within these block groups than in the cities of Artesia and Cerritos, but lower than in Los Angeles County.

Between 2013 and 2015, the city of Artesia's population was 36.5 percent Hispanic or Latino on average, while the city of Cerritos's population was 12.5 percent Hispanic or Latino on average in the same time frame. In both cities, Non-Hispanic Asian residents were identified as having the largest ethnic population, making up an average of 38.5 percent of the total population in the city of Artesia and 60.5 percent of the total population in the city of Cerritos.

In half of the studied census tract block groups that surround the project area, the Hispanic or Latino population made up over one-third of the entire area's population in 2015, with 7 of the 10 block groups residing in the city of Norwalk, 2 in the city of Artesia, and 1 in the city of Cerritos.

The highest Non-Hispanic or Latino race identified in 17 of the 20 block groups was Asian, making up an average of 39.5 percent of the population across all 17 block groups; located in the city of Cerritos, Census Tract 5545.12 Block Group 1 had the highest percentage, with 73 percent of residents identifying as Asian.

As shown in Table 2.3.1, both study area cities have one ethnically homogeneous community (Asian alone). A majority of the census tract block groups also have at least one ethnically homogeneous community (either Asian alone, Hispanic or Latino, or White alone). Of the 20 census tract block groups, 2 in the study area do not include at least one ethnically homogeneous community (Census Tract 5530.00 Block Group 4 and Census Tract 5546.00 Block Group 2).

In summary, most of the study area demonstrates strong ethnic homogeneity in a portion of the population.

Housing Occupancy

Table 2.3.2 provides a summary of the percentage of owner-occupied residences for Los Angeles County, the study area cities, and the census tracts based on the 2011–2015 ACS data. As shown in Table 2.3.2, the percentages of owner-occupied residences in both study area cities and all of the census tracts are higher than in Los Angeles County overall (48.6 percent).

Table 2.3.2 Percentage of Owner-Occupied Residences

Area	Owner-Occupied Residences	Long-Term Residents (Moved in 1999 or Earlier)[1]
County		
Los Angeles County	48.6%	48.7%
Study Area Cities		
City of Artesia	***53.7%***	***52.4%***
City of Cerritos	***77.7%***	***58.7%***
Study Area Census Tracts		
Census Tract 5530.00 (City of Norwalk)	***90.6%***	48.3%
Census Tract 5545.12 (City of Cerritos)	***83.8%***	***55.3%***
Census Tract 5545.13 (City of Cerritos)	***70.8%***	***50.3%***
Census Tract 5545.14 (City of Cerritos)	***62.5%***	***57.0%***
Census Tract 5545.21 (City of Cerritos)	***73.5%***	***54.5%***
Census Tract 5546.00 (Cities of Norwalk and Artesia)	***53.6%***	46.8%
Census Tract 5547.00 (City of Artesia)	***61.9%***	***61.7%***
Census Tract 5548.01 (City of Artesia)	***64.1%***	47.9%
Census Tract 5548.02 (City of Artesia)	***49.1%***	***53.8%***

Source: United States Census Bureau, 2011–2015 ACS 5-Year Estimates; Tables B25008 and B25026.
Note: ***Bold italicized numbers*** indicate the values are higher than in Los Angeles County as a whole.
[1] Includes those residents who moved into their current residences in 1999 or earlier, as reported in Table B25026 of the 2011–2015 ACS.
ACS = American Community Survey

Housing Tenure

Data on housing tenure, or how long residents have lived at their current residences, is also shown in Table 2.3.2. In Los Angeles County, 48.7 percent of residents have lived in their current residences for more than 15 years and, therefore, can be considered long-term residents. Table 2.3.2 also shows that each of the study area cities has a larger percentage of long-term residents than Los Angeles County.

A majority of the study area census tracts have a larger percentage of long-term residents when compared to Los Angeles County, consistent with the data shown for the study area cities. The census tract with the highest percentage of long-term residents is Census Tract 5547.00 in the city of Artesia at 61.7 percent. As shown in Table 2.3.2, only three of the nine study area census tracts have a lower percentage of long-term residents than Los Angeles County overall.

Elderly Residents

Table 2.3.3 shows the percentage of the population that is elderly (65 years old or older) in Los Angeles County, the study area cities, and the census tract block groups. As shown in Table 2.3.3, elderly residents make up a larger share of the population in each of the study area cities than in Los Angeles County overall. Table 2.3.3 shows that elderly residents' shares of the population range from approximately 5.2 percent to 34.9 percent in the study area census tract block groups, and that 12 of the 20 study area census tract block groups have a higher percentage of elderly residents than Los Angeles County overall.

Household Size

Table 2.3.3 provides the number of family and non-family households in Los Angeles County and the study area cities and census tract block groups. As shown in Table 2.3.3, the number of family households in both the cities of Artesia and Cerritos (3,747 and 12,784 households, respectively) is significantly higher than the number of non-family households. This trend is also evident within the study area census tract block groups. The largest type of household in both cities is two-person households.

Transit Dependency

Table 2.3.3 shows the percentage of the population that is transit-dependent in Los Angeles County, the study area cities, and the census tract block groups. As shown in Table 2.3.3, the percentage of transit-dependent populations within the cities of Artesia and Cerritos (0.8 percent and 1.1 percent, respectively) are lower than in Los Angeles County overall (2.8 percent). Table 2.3.3 also shows that the transit-dependent population in the study area census tract block groups varies, ranging from approximately 0.0 percent to 3.1 percent of the population, and that only 1 of the 20 study area census tract block groups has a higher percentage of transit-dependent residents than Los Angeles County overall.

Community Cohesion Summary

As described above, both of the study area cities exhibit one or more community cohesion indicators. The city of Cerritos has a higher percentage of owner-occupied residences than the city of Artesia and Los Angeles County overall. Both cities each have a larger percentage of family households than non-family households when compared to Los Angeles County overall. In addition, both of the study area cities have at least one ethnically homogeneous population. All 20 of the census tract block groups in the community impacts study area exhibit one or more community cohesion

Table 2.3.3 Community Cohesion Indicators

Area		Ethnically Homogeneous Communities[1]	Elderly Residents (>64 Years Old)	Households (Family/Non-Family)	Transit-Dependent Population
County					
Los Angeles County		N/A	11.9%	2,186,485 / 1,076,584	2.8%
Study Area Cities					
City of Artesia		Yes	***13.2%***	***3,747 / 811***	0.8%
City of Cerritos		Yes	***20.2%***	***12,784 / 2,254***	1.1%
Study Area Census Tract Block Groups					
Census Tract 5530.00	Block Group 3 (City of Norwalk)	Yes	9.1%	***517 / 13***	1.1%
	Block Group 4 (City of Norwalk)	No	11.4%	***221 / 69***	1.6%
Census Tract 5545.12	Block Group 1 (City of Cerritos)	Yes	***19.8%***	***1,011 / 97***	2.3%
	Block Group 2 (City of Cerritos)	Yes	***26.6%***	***563 / 160***	***3.1%***
Census Tract 5545.13	Block Group 1 (City of Cerritos)	Yes	***19.6%***	***634 / 172***	0.6%
Census Tract 5545.14	Block Group 1 (City of Cerritos)	Yes	10.5%	***327 / 128***	0.0%
	Block Group 2 (City of Cerritos)	Yes	***18.3%***	***379 / 46***	0.0%
	Block Group 3 (City of Cerritos)	Yes	***22.3%***	***434 / 72***	2.1%
Census Tract 5545.21	Block Group 1 (City of Cerritos)	Yes	***16.7%***	***642 / 76***	1.5%
	Block Group 3 (City of Cerritos)	Yes	***34.9%***	***423 / 193***	0.6%
Census Tract 5546.00	Block Group 1 (City of Norwalk)	Yes	***13.7%***	***687 / 211***	0.0%
	Block Group 2 (City of Norwalk)	No	9.2%	***423 / 31***	0.9%
Census Tract 5547.00	Block Group 1 (City of Norwalk)	Yes	10.9%	***314 / 35***	0.3%
	Block Group 2 (City of Norwalk)	Yes	***12.3%***	***414 / 42***	0.1%
	Block Group 3 (City of Norwalk)	Yes	9.5%	***226 / 12***	2.8%
Census Tract 5548.01	Block Group 1 (City of Artesia)	Yes	5.2%	***443 / 74***	0.6%
	Block Group 2 (City of Artesia)	Yes	***18.3%***	***168 / 63***	1.6%
Census Tract 5548.02	Block Group 1 (City of Artesia)	Yes	10.8%	***613 / 128***	0.6%
	Block Group 2 (City of Artesia)	Yes	***16.2%***	***411 / 124***	0.8%
	Block Group 3 (City of Artesia)	Yes	***23.5%***	***364 / 89***	1.8%

Source: United States Census Bureau, 2011–2015 ACS 5-Year Estimates; Tables B01001, B25026, B26001, B25046.

Note: ***Bold italicized numbers*** indicate the values are higher than in the Los Angeles County as a whole. For Households data, a higher value above Los Angeles County as a whole is defined as a case where the number of family households exceed the number of non-family household by more than double.

[1] An ethnically homogeneous community is a geographic area with a high population concentration of a particular ethnic group. Ethnically homogeneous communities often possess a strong cultural identity and typically include a concentration of businesses that cater to the local ethnic group by providing familiar goods and services.

ACS = American Community Survey

N/A = not applicable

indicators, and 11 of the study area census tract block groups (Census Tract 5545.12, Block Groups 1 and 2; Census Tract 5545.13, Block Group 1; Census Tract 5545.14, Block Groups 2 and 3; Census Tract 5545.21, Block Groups 1 and 3; Census Tract 5547.00, Block Group 2; Census Tract 5548.01, Block Group 2; and Census Tract 5548.02 Block Groups 2 and 3) demonstrate three or more community cohesion indicators. Based on these data, the study area census tract block groups with one community cohesion indicator appear to exhibit a moderate degree of community cohesion. Census Tract 5545.12, Block Groups 1 and 2; Census Tract 5545.13, Block Group 1; Census Tract 5545.14, Block Groups 2 and 3; Census Tract 5545.21, Block Groups 1 and 3; Census Tract 5547.00, Block Group 2; Census Tract 5548.01, Block Group 2; and Census Tract 5548.02 Block Groups 2 and 3, which each have three or more community cohesion indicators, appear to exhibit a high degree of community cohesion.

Other Demographics

Employment

Table 2.3.4 provides information regarding the civilian labor force in the study area cities, including the number of employed and unemployed persons and the unemployment rate, with comparisons to Los Angeles County and State employment statistics. Table 2.3.4 also provides the number of primary jobs in the cities, neighborhoods, and communities in the community impacts study area. Unlike the civilian labor force data, which is based on an area’s resident labor force, primary jobs relate to the number of jobs physically located in an area. The U.S. Census Bureau’s Longitudinal Employer-Household Dynamics (LEHD) Program defines a primary job as the job that earned an individual the most money.

As shown in Table 2.3.4, both of the study area cities had a lower unemployment rate (2.6 percent in the city of Artesia and 3.2 percent in the city of Cerritos) than Los Angeles County (4.4 percent) in November 2017.

Table 2.3.4 also shows that, as of 2015, the latest available data, the city of Artesia had approximately 4,472 primary jobs and the city of Cerritos had approximately 34,906 primary jobs. While the city of Cerritos functions as a regional employment center, the city of Artesia has a lower jobs-to-housing ratio.

Table 2.3.4 Study Area Employment

Area	Employment Status				
	Civilian Labor Force	Employed	Unemployed	Unemployment Rate	Primary Jobs[1]
State and County					
California	19,353,400	18,516,000	837,400	4.3%	14,568,990
Los Angeles County	5,164,000	4,939,000	225,000	4.4%	3,928,040
Study Area Cities					
City of Artesia	9,000	8,800	200	2.2%	4,472
City of Cerritos	25,200	24,400	800	3.2%	34,906

Source 1: Employment Development Department, Labor Market Information Division. 2017. Monthly Labor Force Data for Counties, November 2017 – Preliminary. Website: http://www.labormarketinfo.edd.ca.gov/file/lfmonth/1711pcou.pdf (accessed December 16, 2017).

Source 2: Employment Development Department, Labor Market Information Division. 2017. Monthly Labor Force Data for Cities and Census-Designated Places, November 2017 – Preliminary. Website: http://www.labormarketinfo.edd.ca.gov/file/lfmonth/allsubs.xls (accessed December 16, 2017).

Source 3: United States Census Bureau. 2015. OnTheMap Application. Longitudinal-Employer Household Dynamics Program. Website: http://onthemap.ces.census.gov/ (accessed December 16, 2017).

Note: Civilian labor force, employed labor force, unemployed labor force, and unemployment rate (not seasonally adjusted) in August 2017, as reported by the California Employment Development Department. Primary jobs in 2015, as reported by the United States Census. The California Employment Development Department does not compile labor force data at the census tract level.

[1] The United States Census Bureau's Longitudinal Employer-Household Dynamics (LEHD) Program defines a primary job as the job that earned an individual the most money.

Income and Poverty Status

Table 2.3.5 provides the median household income for Los Angeles County, the study area cities, and the census tract block groups. As shown in Table 2.3.5, the median household income in Los Angeles County is $56,196. The median household incomes in the cities of Artesia and Cerritos ($60,749 and $90,321, respectively) are higher than in Los Angeles County. Table 2.3.5 also shows that the median household incomes in the 20 study area census tract block groups ranges from approximately $44,756 in Census Tract 5546.00 Block Group 1 in the city of Artesia to $115,089 in Census Tract 5545.14 Block Group 2 in the city of Cerritos, and that 15 of the 20 study area census tract block groups each has a higher median household income than in Los Angeles County.

The U.S. Department of Health and Human Services (HHS) 2017 Poverty Guidelines lists the median household income for a household of four as $24,600 (HHS 2017). As shown in Table 2.3.5, there are no block groups in the cities of Artesia, Cerritos, or Norwalk with a median income below the HHS threshold. All households in these areas have a median income that ranges from $44,756 to $113,750.

Table 2.3.5 Household Income

Area		Median Household Income[1]	
County			
Los Angeles County		$56,196	
Study Area Cities			
City of Artesia		***$60,749***	
City of Cerritos		***$90,321***	
Study Area Census Tract Block Groups			
Census Tract 5530.00	Block Group 3 (City of Norwalk)	***$82,250***	
	Block Group 4 (City of Norwalk)	***$79,792***	
Census Tract 5545.12	Block Group 1 (City of Cerritos)	***$113,750***	
	Block Group 2 (City of Cerritos)	***$97,574***	
Census Tract 5545.13	Block Group 1 (City of Cerritos)	***$95,294***	
Census Tract 5545.14	Block Group 1 (City of Cerritos)	$50,701	
	Block Group 2 (City of Cerritos)	***$115,089***	
	Block Group 3 (City of Cerritos)	***$88,056***	
Census Tract 5545.21	Block Group 1 (City of Cerritos)	***$84,412***	
	Block Group 3 (City of Cerritos)	***$66,357***	
Census Tract 5546.00	Block Group 1 (Cities of Norwalk and Artesia)	$44,756	
	Block Group 2 (Cities of Norwalk and Artesia)	***$70,476***	
Census Tract 5547.00	Block Group 1 (City of Artesia)	$53,798	
	Block Group 2 (City of Artesia)	***$71,167***	
	Block Group 3 (City of Artesia)	$53,929	
Census Tract 5548.01	Block Group 1 (City of Artesia)	$54,632	
	Block Group 2 (City of Artesia)	***$90,592***	
Census Tract 5548.02	Block Group 1 (City of Artesia)	***$66,719***	
	Block Group 2 (City of Artesia)	***$60,905***	
	Block Group 3 (City of Artesia)	***$62,951***	

Source: United States Census Bureau, 2011–2015 ACS 5-Year Estimates; Table B19103.
[1] ***Bold italicized numbers*** indicate the values are higher than Los Angeles County as a whole.
ACS = American Community Survey

Community Facilities

Table 2.3.6 lists the community facilities (i.e., libraries, hospitals, public and private schools, and privately operated community centers and recreation facilities) within 0.5 mile (mi) of the Build Alternative that were considered in the evaluation of potential effects to community facilities. These facilities are shown on Figure 2.3-2. Refer to Section 2.1, Land Use, for a list of public parks and recreational resources within 0.5 mi of the Build Alternative, and to Section 2.4, Utilities/Emergency Services, for a list of police and fire facilities within 0.5 mi of the Build Alternative.

Property Tax Base

Property taxes are levied on the assessed value of privately owned property. Property taxes generated in the community impacts study area are collected by the County of Los Angeles (County) and apportioned to the applicable jurisdiction and other taxing agencies in which the property is located. The base property tax rate in the State of

Table 2.3.6 Community Facilities

Community ID No.	Community Facility	Address	Owner/Operator
1	Helen Wittmann Elementary School	16801 Yvette Avenue, Cerritos, CA 90703	ABC Unified School District
2	Benito Juarez Academy of Engineering and Technology	11939 Aclare Street, Cerritos, CA 90703	ABC Unified School District
3	Cecil B. Stowers Elementary School	13350 Beach Street, Cerritos, C 90703	ABC Unified School District
4	John F. Kennedy Elementary School	17500 Belshire Avenue, Artesia, CA 90701	ABC Unified School District
5	Luther Burbank Elementary School	17711 Roseton Avenue, Artesia, CA 90701	ABC Unified School District
6	Frank C. Leal Elementary School	12920 Droxford Street, Cerritos, CA 90703	ABC Unified School District
7	Faye Ross Middle School Academy of Creative and Media Arts	17707 Elaine Avenue, Artesia, CA 90701	ABC Unified School District
8	Tracy High School	12222 Cuesta Drive, Cerritos, CA 90703	ABC Unified School District
9	Gahr High School	11111 Artesia Boulevard, Cerritos, CA 90703	ABC Unified School District
10	Gretchen Whitney High School	16800 Shoemaker Avenue, Cerritos, CA 90703	ABC Unified School District
11	ABC Adult School	12254 Cuesta Drive, Cerritos, CA 90703	ABC Unified School District
12	Bellflower High School	15301 McNab Avenue, Bellflower, CA 90706	Bellflower Unified School District
12	Anna M. Glazier Elementary School	10932 East Excelsior Drive, Norwalk, CA 90650	Norwalk-La Mirada Unified School District
12	Arturo Sanchez Elementary School	11960 162nd Street, Norwalk, CA 90650	Norwalk-La Mirada Unified School District
13	Norwalk-La Mirada Adult School	15711 Pioneer Boulevard, Norwalk, CA 90650	Norwalk-La Mirada Unified School District
14	Cerritos Community College	11110 Alondra Boulevard, Norwalk, CA 90650	Cerritos Community College
15	Northwood University at Cerritos College	11111 New Falcon Way, Cerritos, CA 90703	Northwood University
16	PCI College	17215 Studebaker Road, Cerritos, CA 90703	PCI College
17	Fremont College	18000 Studebaker Road, Suite 900A, Cerritos, CA 90703	Fremont College
18	Kings Kids Preschool	18424 Bloomfield Avenue, Cerritos, CA 90703	Private
19	Nazarene Christian School	15014 Studebaker Road, Norwalk, CA 90650	Private
20	Field of Dreams Learning	15014 Studebaker Road, Norwalk, CA 90650	Private
21	Cerritos Institute of Religion	16025 Studebaker Road, Cerritos, CA 90703	Private
22	Valley Christian Elementary	17408 Grand Avenue, Bellflower, CA 90706	Private
23	Valley Christian High School	10818 Artesia Boulevard, Cerritos, CA 90703	Private
24	Twigs to Trees Child Development Center	15108 Studebaker Road, Norwalk, CA 90650	Private
25	Wonderland Preschool	10440 Artesia Boulevard, Bellflower, CA 90706	Private
26	CPC Preschool	11840 178th Street, Artesia, CA 90701	Private
27	Cerritos KinderCare	18727 Carmenita Road, Cerritos, CA 90703	Private

Compiled in 2017.

California is 1 percent of the assessed property's value, while the total property tax rate, which includes additional debt service, varies by jurisdiction. The amount of property tax revenue allocated to each local jurisdiction also varies. According to the County Auditor-Controller's Office, approximately 9.37 percent of each property tax dollar in Los Angeles County was allocated to cities in Fiscal Year (FY) 2016–2017. Table 2.3.7 provides a summary of the property tax revenue collected in the city of Cerritos in FY 2015–2016 and the city of Artesia in FY 2014–2015.

Table 2.3.7 Property and Sales Tax Revenues

Jurisdiction	Property Tax Revenue	Sales Tax Revenue	Average Sales Tax Revenue Per Business
City of Artesia	$1,698,157	$3,096,626	$5,035
City of Cerritos	$11,278,384	$32,846,913	$18,932

Source 1: California State Board of Equalization. Taxable Sales in California Cities, by Type of Business, 2015. June 13, 2017. Website: http://www.boe.ca.gov/news/2015/t4_2015.pdf (accessed December 16, 2017).
Source 2: California State Board of Equalization. Taxable Sales in California Cities, by Type of Business, Third Quarter 2016. Website: http://www.boe.ca.gov/news/2016/t4_3Q16.pdf (accessed December 16, 2017).
Source 3: City of Artesia. 2016. Comprehensive Annual Financial Report Fiscal Year Ended June 30, 2015. Website: http://www.cityofartesia.us/DocumentCenter/View/1556 (accessed December 16, 2017).
Source 4: City of Cerritos. 2016. Comprehensive Annual Financial Report for the Fiscal Year Ended June 30, 2016. Website: http://www.cerritos.us/GOVERNMENT/_pdfs/CAFR_2016.pdf (accessed December 16, 2017).
Note: Property and sales tax revenue for the City of Artesia is for Fiscal Year 2014–2015. Property and sales tax revenue for the City of Cerritos is for Fiscal Year 2015–2016. Average sales tax revenue per business is calculated by dividing the total sales tax revenue by the number of business outlets in the city as reported by the California State Board of Equalization in the same fiscal year.

Sales Tax Base

Sales taxes are levied on taxable sales generated in each jurisdiction. Effective October 1, 2017, the sales tax rate in Los Angeles County and in each study area city is 9.5 percent,[1] of which 0.25 percentage point is allocated to County transportation funds and 1 percentage point is allocated to city or County operations.[2] Table 2.3.7 provides the sales tax revenue collected in each study area city in FY 2015–2016.

The California State Board of Equalization tabulates taxable sales transactions for each city and county in California and reports them on a quarterly and yearly basis.

1 California Department of Tax and Fee Administration. 2017. California Sales and Use Tax Rates by County and City, Operative October 1, 2017. Website: http://www.cdtfa.ca.gov/formspubs/cdtfa95.pdf (accessed December 26, 2017).

2 California Department of Tax and Fee Administration, Detailed Description of the Sales & Use Tax Rate. Website: https://www.cdtfa.ca.gov/taxes-and-fees/sut-rates-description.htm (accessed December 26, 2017).

Table 2.3.7 reports the average sales tax revenue per business in each of the study area cities according to their latest published annual reports (2016).

2.3.1.3 Environmental Consequences

Temporary Impacts

Build Alternative (includes Design Options)

Impacts to community cohesion generally depend on whether a project is likely to create a barrier within or disrupt the connectivity of a community. Either of these can result from disruptions to access or residential and/or business acquisitions. Temporary impacts to community character and cohesion can occur from the temporary use of privately owned properties as temporary construction easements (TCEs), short-term air quality and noise effects, and temporary road and ramp closures/detours along and in the immediate vicinity of SR-91 and I-605 within the project limits.

The Build Alternative would require TCEs along the north side of SR-91 for certain areas of the project segment to allow for the construction of best management practices (BMPs) for water quality, retaining walls, and roadway and/or interchange widening adjacent to institutional and residential areas. Additionally, TCEs are required at the Alondra Boulevard/I-605 interchange northbound off-ramp. The locations of the parcels that would be affected by these TCEs are shown on Figure 2.3-3. There is a potential for the temporary use of such land to divide or create barriers between existing communities; however, in several instances, SR-91 and I-605 already bisect existing communities and would not likely result in adverse effects on community cohesion.

Construction activities would result in temporary impacts associated with construction equipment noise and air emissions at residences and businesses adjacent to SR-91 and I-605. These impacts would be temporary and would cease when the project construction is complete.

A Transportation Management Plan (TMP) is included as a project feature (i.e., PF-T-1) and is described in Section 2.5, Traffic and Transportation/Pedestrian and Bicycle Facilities. The TMP will be prepared in coordination with the affected cities and access to all businesses would be maintained during construction of the Build Alternative. The TMP will also address traffic delays; maintain traffic flow in the project area; manage detours and temporary road, lane, and ramp closures; provide ongoing information to the public regarding construction activities, closures, and detours; and maintain a safe environment for construction workers and travelers.

Access to all nearby businesses would be maintained during any temporary mainline, ramp, and arterial closures. All businesses would be accessible from alternate freeway off-ramps and by using local streets. Based on the availability of a well-developed arterial roadway network in the vicinity of the potential closures to accommodate detoured traffic, the increased travel times and distances would be limited and would result in minimal disruption to neighborhoods and businesses adjacent to the project area and would not divide the study area cities or neighborhoods in those cities. Nevertheless, construction-related closures could impede movement within the study area cities. Although community members would still be able to use community services and facilities during the construction period, there would be some degree of inconvenience due to construction-related delays, temporary closures, and construction equipment operation.

Temporary public parking impacts would occur during construction at several locations within the project limits, including:

- 14 parking stalls at the LA Fitness property located along the I-605 northbound Alondra Boulevard off-ramp;
- Approximately 560 feet (ft) of curbside parking along the south side of Beach Street (this impact would not occur under Design Option 1, Reduced Lane/Shoulder Width);
- 6 parking stalls at the Artesia Inn and Suites property located north of SR-91 at the northbound Pioneer Boulevard off-ramp;
- Approximately 630 ft of curbside parking along both sides of 170th Street;
- Approximately 380 ft of curbside parking along both sides of Norwalk Boulevard north of SR-91;
- 76 parking stalls at the Tracy High School property located north of SR-91 at the northbound Norwalk Boulevard off-ramp; and
- 12 parking stalls at the ABC Adult School parking lot near the Cerritos Villas Condominiums.

The availability of parking at the above locations would be restored upon completion of construction.

Construction employment has two components: direct and indirect. The direct effect is the number of construction jobs created to complete the project. The indirect effect is the additional employment and business activity that would be generated in the regional economy by the initial construction expenditure.

Table 2.3.8 shows that construction of the Build Alternative is estimated to generate a total of 1,456 jobs. Design Option 1 (Reduced Lane/Shoulder Width) of the Build Alternative is estimated to generate a slightly lower number of jobs (1,364) when compared to the Build Alternative. In both cases, approximately half of the jobs would be direct jobs, while the other half would be indirect employment. These construction jobs would generate temporary employment and revenues for both local and regional economies.

Table 2.3.8 Estimated Construction Employment Under the Build Alternative

Estimated Project Costs[1]		Estimated Employment Generated		
		Direct Jobs[2]	Indirect Jobs[2]	Total Jobs
Build Alternative	$112,000,000	728	728	1,456
Design Option 1 (Reduced Lane/Shoulder Width)	$105,000,000	682	682	1,364

Source 1: *Draft Project Report* (2018).
Source 2: Federal Highway Administration. 2018. Employment Impacts of Highway Infrastructure Investment. Website: https://www.fhwa.dot.gov/policy/otps/pubs/impacts/ (accessed January 2018).
[1] Escalated capital construction costs without right-of-way acquisition costs.
[2] Employment impacts vary over time. Based on the latest data provided by the Federal Highway Administration (2018), $1 billion in investments supports approximately 13,000 construction jobs, with approximately 50 percent each for direct and indirect jobs.

No Build Alternative

The proposed improvements would not be constructed under the No Build Alternative. Therefore, no temporary impacts related to community character and cohesion would occur.

Permanent Impacts

Build Alternative (includes Design Options)

The Build Alternative would result in beneficial effects related to community character and cohesion in terms of improved access and connectivity, improved safety, and decreased travel times. In addition, emergency services in the study area cities (fire and police protection, for example) would be more readily available with the construction of the Build Alternative because mobility in the study area would improve over existing conditions. The Build Alternative would provide improvements to a segment of SR-91 and the SR-91/I-605 interchange where traffic operations are currently deficient. Therefore, the Build Alternative would not create any new or exacerbate any existing physical divisions in the study area or in the cities in the study area.

The widening of the existing Gridley Road overcrossing within the project limits, which is proposed as Design Option 5, would create visual changes for SR-91 drivers and the adjacent communities but would not create a barrier within or disrupt the connectivity of a community.

Permanent public parking impacts would occur at two locations within the project limits, including:

- Approximately 255 ft of curbside parking along both sides of Pioneer Boulevard (only with Design Option 1, Reduced Lane/Shoulder Width); and
- Approximately 630 ft of curbside parking along both sides of Norwalk Boulevard north of SR-91.

After approximately 255 ft of curbside parking is removed along both sides of Pioneer Boulevard, parking would remain available farther north along both sides of Pioneer Boulevard. After approximately 630 ft of curbside parking is removed along both sides of Norwalk Boulevard, parking would remain available farther north along both sides of Norwalk Boulevard.

As described in detail later in Section 2.3.2, Relocations and Real Property Acquisition, the Build Alternative would result in some property acquisition in the project area. The Build Alternative would result in the displacement of 20 total units within the city of Artesia, including 18 residential units, with approximately 80 residential occupants, and 2 non-residential units, which include two commercial businesses. The Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width) would result in the displacement of one non-residential unit. The Build Alternative with Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment) would result in the displacement of 25 total units within Artesia, including 23 residential units, with approximately 102 residential occupants, and 2 non-residential units, which include two commercial businesses. The following Project Feature PF-REL-1 would minimize permanent impacts related to relocations and displacements under the Build Alternative and design options:

PF-REL-1 Property acquisition will be conducted in compliance with the requirements of the Uniform Relocation Assistance and Real Property

Acquisition Policies Act of 1970 (Uniform Act) (Public Law 91-646, 84 Statutes 1894). The Uniform Act mandates that certain relocation services and payments be made available to eligible residents, businesses, and nonprofit organizations displaced by federal or federally assisted projects. The Uniform Act provides for uniform and equitable treatment by federal or federally assisted programs of persons displaced from their homes, businesses, or farms and establishes uniform and equitable land acquisition policies.

PF-REL-2 After construction, all temporary construction easements (TCEs) would be restored to their original pre-project or better conditions.

Residential Displacements

As described in the CIA (2018), the communities within the replacement areas (the cities of Artesia, Hawaiian Gardens, Norwalk, and Lakewood) are located within 3 mi of the displacement area; therefore, the commute distance to jobs and schools would be reasonable and would not result in substantial hardships for the displacees. In addition, residential displacees would have access to schools within the same school district (i.e., the ABC Unified School District). From preliminary market research, it can be concluded that there are enough residential replacement properties, and it is expected that a similar number and type of properties would be available within the displacement area at the time of property acquisitions.

Replacement neighborhoods are generally homogeneous to those in the displacement area. The housing stock in the replacement areas' census tract block groups includes a total of 5,616 single-family residences, with a total of 148 vacant single-family homes, which translates to a 2.6 percent vacancy rate.

Median home values in the replacement areas range from $262,100 to $533,300, and current rental prices generally range from $2,195 to $2,800 per month for comparable rental homes in the replacement areas. The average ages of the residences within the replacement areas are 50 to 60 years, and the housing conditions range from average to good. All of the residences considered for potential replacement homes are single-family residences, similar to those in the displacement area.

Design Option 1 (Reduced Lane/Shoulder Width), described in Chapter 1, would not result in residential displacements and therefore would have no effect on community character or cohesion.

Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment) would require the acquisition of five residential properties within Census Tract 5548.01. These five properties are located along 168th Street in a cul-de-sac adjacent to the east side of Pioneer Boulevard in Artesia.

Non-Residential Displacements

The non-residential displaced properties in the project area include a race car parts dealer, which currently resides in a light industrial zoning area, and a gas station/auto service station. Based on preliminary research documented in the CIA, there are three potential properties with the same zoning and square footage to accommodate the displaced race car parts dealer. A review of available replacement properties for the gas station/auto service station did not result in the identification of a suitable site within the study area for the assessment of project effects related to property acquisition and relocation.

All of the displacees, with the exception of the gas station/auto service station, are anticipated to remain in the project area, which would minimize potential adverse effects to community character and cohesion. Due to the high likelihood of the availability of identical services provided by the gas station/auto service station by other existing gas stations/auto service stations throughout the project area, its relocation to a new area would not disrupt the social fabric of the surrounding communities in the project area.

Overall, it is unlikely that community character and cohesion would be permanently impacted by the project in any of the study area cities. It is also important to note that SR-91 has been a prominent transportation corridor in the area since 1968, and most of the communities in the study area have been established adjacent to the existing right-of-way (ROW). None of the relocations required under the Build Alternative would impact the cohesion of any of the communities in which it is located. Changes associated with the proposed project would result in minimal alterations to community character and cohesion, and no substantial adverse effects to communities would occur.

No Build Alternative

No improvements to SR-91 or the SR-91/I-605 interchange are proposed under the No Build Alternative. Therefore, no permanent impacts to community character and cohesion would occur.

2.3.1.4 Avoidance, Minimization, and/or Mitigation Measures

Because the project will incorporate the project features as described above in Section 2.3.1.3, no substantial adverse impacts to community character and cohesion would occur. Therefore, no avoidance, minimization, and/or mitigation measures are required.

2.3.2 Relocations and Real Property Acquisition

2.3.2.1 Regulatory Setting

The Caltrans Relocation Assistance Program (RAP) is based on the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (Uniform Act), and Title 49 Code of Federal Regulations (CFR) Part 24. The purpose of the RAP is to ensure that persons displaced as a result of a transportation project are treated fairly, consistently, and equitably so that such persons will not suffer disproportionate injuries as a result of projects designed for the benefit of the public as a whole. Please see Appendix C for a summary of the RAP.

All relocation services and benefits are administered without regard to race, color, national origin, persons with disabilities, religion, age, or sex. Please see Appendix B for a copy of Caltrans Title VI Policy Statement.

2.3.2.2 Affected Environment

The information in this section is summarized from the CIA (2018) and *Relocation Impact Report* (RIR) (2018). As shown on Figure 2.3-1, the study area for the assessment of project effects related to property acquisition and relocation was defined as 20 census tract block groups (Census Tracts 5530.00 [Block Groups 3 and 4], 5545.12 [Block Groups 1 and 2], 5545.13 [Block Group 1], 5545.14 [Block Groups 1. 2, and 3], 5545.21 [Block Groups 1 and 3], 5546.00 [Block Groups 1 and 2], 5547.00 [Block Groups 1, 2, and 3], 5548.01 [Block Groups 1 and 2], and 5548.02 [Block Groups 1, 2, and 3]) in the cities of Artesia, Cerritos, and Norwalk and a 20 mi radius of these census tract block groups. This study area was selected because it covers the entire project area and includes areas in the vicinity of the project area that are likely to be considered for the relocation of businesses or residences displaced by the Build Alternative. As described earlier in Section 2.1, Land Use, the existing land uses in the study area include primarily residential uses (both single-family and multi-family), with some commercial/service, industrial, and open space/recreational uses along SR-91 and single-family residential, commercial, institutional, religious, medical, and park uses along I-605, north of SR-91 in the project area.

2.3.2.3 Environmental Consequences

Temporary Impacts

Build Alternative (includes Design Options)

The Build Alternative would require TCEs along the north side of SR-91 for certain areas of the project segment to allow for the construction of BMPs for water quality, retaining walls, and roadway and/or interchange widening adjacent to institutional and residential areas. Additionally, TCEs are also required at the Alondra Boulevard/I-605 interchange northbound off-ramp. The locations of the parcels that would be affected by these TCEs for the Build Alternative are shown on Figure 2.3-3. Tables 2.3.9, 2.3.10, and 2.3.11 provide detailed information regarding the TCEs required under the Build Alternative, the Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width), and the Build Alternative with Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment), respectively, including the parcel numbers and street addresses of those parcels where TCEs would be required. The locations of the parcels that would be affected by these TCEs for the Build Alternative, the Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width), and the Build Alternative with Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment) are shown on Figure 2.3-4. Tables 2.3.9, 2.3.10, and 2.3.11 also provide the existing land uses on such parcels.

As shown in Tables 2.3.9, 2.3.10, and 2.3.11, the proposed project would require TCEs of 30 (Build Alternative), 21 (Build Alternative with Design Option 1, Reduced Lane/Shoulder Width), and 30 (Design Option 3, Pioneer Boulevard Westbound Ramps/168th Alignment) parcels, respectively, in the project area. While most of these TCEs would consist of small slivers of land that are currently being used for landscaping or parking lots, or land that is currently vacant, larger TCEs would be required for construction staging areas under the proposed project.

After construction, the TCEs used for the Build Alternative and design options would be restored to their original pre-project conditions. None of the TCEs would require businesses, employees, or residents to relocate. Owners of the parcels affected by TCEs would be compensated for temporary use of their property during construction. For these reasons, the temporary use of land during construction of the Build Alternative and design options would not result in substantial adverse effects.

Table 2.3.9 Build Alternative Proposed Right-of-Way Acquisition and Easements

APN	Address	Existing Land Use	Acquisitions (Partial or Full) and Easements Type	Relocation
7011-004-076	11820 168th Street, Artesia	Residential	TCE	No
7011-004-901	No Address, Artesia	Open Space	TCE	No
7011-004-902	11814 168th Street, Artesia	Vacant	TCE	No
7011-004-903	Pioneer Boulevard Artesia	Vacant	TCE	No
7011-020-038	11947 170th Street, Artesia	Residential	Full	Yes
7011-020-040	11951 170th Street, Artesia	Residential	Full	Yes
7011-020-041	11955 170th Street, Artesia	Residential	Full	Yes
7011-020-044	11961 170th Street, Artesia	Residential	Full	Yes
7011-020-045	11965 170th Street, Artesia	Residential	Full	Yes
7011-020-049	11973 170th Street, Artesia	Residential	Full	Yes
7011-020-050	11977 170th Street, Artesia	Residential	Full	Yes
7011-020-057	11967 170th Street, Artesia	Residential	Full	Yes
7011-020-061	11957 170th Street, Artesia	Residential	Full	Yes
7011-020-062	11959 170th Street, Artesia	Residential	Full	Yes
7011-020-063	11971 170th Street, Artesia	Residential	Full	Yes
7011-020-064	11949 170th Street, Artesia	Residential	Full	Yes
7011-020-905	16912 Clarkdale Avenue, Artesia	Open Space	Partial/TCE	No
7011-021-030	12017 170th Street, Artesia	Residential	Full	Yes
7011-021-031	12021 170th Street, Artesia	Residential	Full	Yes
7011-021-032	12021 170th Street, Artesia	Residential	Full	Yes
7011-021-059	12001 170th Street, Artesia	Residential	Full	Yes
7011-021-066	12027 170th Street, Artesia	Industrial	Full	No
7011-021-067	12009 170th Street, Artesia	Residential	Full	Yes
7011-021-068	12011 170th Street, Artesia	Residential	Full	Yes
7011-021-069	12015 170th Street, Artesia	Residential	Full	Yes
7012-001-901	12222 Cuesta Drive, Cerritos	Institutional	Partial/TCE	No
7012-003-009	16923 Judy Way	Residential	Access Impact	No
7012-003-010	16921 Judy Way	Residential	Access Impact	No
7012-003-011	16925 Judy Way	Residential	Access Impact	No
7012-003-012	16927 Judy Way	Residential	Access Impact	No
7012-003-013	12412 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-014	12410 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-015	12414 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-016	12408 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-017	12418 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-018	12416 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-019	12420 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-020	12422 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-021	12428 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-022	12426 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-023	12430 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-024	12424 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-025	12434 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-026	12432 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-027	12436 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-028	12438 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-029	12444 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-030	12442 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-031	12446 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-032	12440 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-033	12450 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-034	12448 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-035	12452 Rancho Vista Drive, Cerritos	Residential	Access Impact	No

Table 2.3.9 Build Alternative Proposed Right-of-Way Acquisition and Easements

APN	Address	Existing Land Use	Acquisitions (Partial or Full) and Easements Type	Relocation
7012-003-036	12454 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-037	12460 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-038	12458 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-039	12462 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-040	12456 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-020-026	12642 Palm Street, Cerritos	Residential	Partial/TCE	No
7012-020-900	No Address, Cerritos	Open Space	TCE	No
7012-027-901	No Address, Cerritos	Open Space	TCE	No
7014-004-005	16809 Pioneer Boulevard, Artesia	Commercial	Full	Yes
7014-004-032	16905 Pioneer Boulevard, Artesia	Commercial	TCE	No
7014-006-005	11616 169th Street, Artesia	Residential	TCE	No
7014-006-006	11612 169th Street, Artesia	Residential	TCE	No
7014-006-007	11606 169th Street, Artesia	Residential	TCE	No
7014-006-008	11602 169th Street, Artesia	Residential	TCE	No
7014-006-009	11564 169th Street, Artesia	Residential	TCE	No
7014-006-010	11558 169th Street, Artesia	Residential	Partial/PE/TCE	No
7014-006-011	11554 169th Street, Artesia	Residential	Partial/PE/TCE	No
7014-006-012	11548 169th Street, Artesia	Residential	Partial/PE/TCE	No
7014-006-013	11542 169th Street, Artesia	Residential	Partial/PE/TCE	No
7014-006-014	11536 169th Street, Artesia	Residential	Partial/PE/TCE	No
7014-022-197	No Address, Cerritos	Residential	Partial	No
7016-002-044	10802 Alondra Boulevard, Cerritos	Commercial	TCE	No
7016-002-048	10802 College Place, Cerritos	Commercial	TCE	Yes
7016-002-050	10930 Alondra Boulevard, Cerritos	Commercial	TCE	No
7016-018-065	16923 Eric Avenue, Cerritos	Residential	TCE	No
7016-020-046	16920 Harvest Avenue, Cerritos	Residential	TCE	No
7016-020-900	No Address, Cerritos	Open Space	TCE	No
7016-023-041	16811 Westwinds Circle, Cerritos	Residential	TCE	No
7016-023-045	16825 Leeward Avenue, Cerritos	Residential	TCE	No
7016-023-901	No Address, Cerritos	Open Space	TCE	No
7030-001-048	12611 Artesia Boulevard, Cerritos	Residential	Partial/TCE	No

Source: *Westbound SR-91 Improvement Project Estimate Abstract* (2017).
Access Impact = No garage access; replacement parking is available on site
APN = Assessor's Parcel Number
Full = Full acquisition
Partial = Partial Acquisition
PE = Permanent Easement
TCE = Temporary Construction Easement

Table 2.3.10 Build Alternative With Design Option 1 (Reduced Lane/ Shoulder Width) Proposed Right-of-Way Acquisition and Easements

APN	Address	Existing Land Use	Acquisitions (Partial or Full) and Easements Type	Relocation
7011-004-076	11820 168th Street, Artesia	Residential	TCE	No
7011-004-901	No Address, Artesia	Open Space	TCE	No
7011-004-902	11814 168th Street, Artesia	Vacant	TCE	No
7011-004-903	Pioneer Boulevard, Artesia	Vacant	TCE	No
7011-020-905	16912 Clarkdale Avenue, Artesia	Open Space	Partial/TCE	No
7012-001-901	12222 Cuesta Drive, Cerritos	Institutional	Partial/TCE	No
7012-020-026	12642 Palm Street, Cerritos	Residential	Partial/TCE	No
7012-020-900	No Address, Cerritos	Open Space	TCE	No
7012-027-901	No Address, Cerritos	Open Space	TCE	No
7014-004-005	16809 Pioneer Boulevard, Artesia	Commercial	Full	Yes
7014-004-032	16905 Pioneer Boulevard, Artesia	Commercial	TCE	No
7014-022-197	No Address	Residential	Partial/TCE	No
7016-002-044	10802 Alondra Boulevard	Commercial	TCE	No
7016-002-048	10802 College Place	Commercial	TCE	No
7016-002-050	10930 Alondra Boulevard	Commercial	TCE	No
7016-018-065	16923 Eric Avenue	Residential	TCE	No
7016-020-046	16920 Harvest Avenue	Residential	TCE	No
7016-020-900	No Address	Open Space	TCE	No
7016-023-041	16811 Westwinds Circle	Residential	TCE	No
7016-023-045	16825 Leeward Avenue	Residential	TCE	No
7016-023-901	No Address	Open Space	TCE	No
7030-001-048	12611 Artesia Boulevard	Residential	Partial/TCE	No

Source: *Westbound SR-91 Improvement Project Estimate Abstract* (2017).
APN = Assessor's Parcel Number
Partial = Partial Acquisition
TCE = Temporary Construction Easement

Table 2.3.11 Build Alternative With Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment) Proposed Right-of-Way Acquisition and Easements

APN	Address	Existing Land Use	Acquisitions (Partial or Full) and Easements Type	Relocation
7011-004-076	11820 168th Street, Artesia	Residential	TCE	No
7011-004-901	No Address, Artesia	Open Space	TCE	No
7011-004-902	11814 168th Street, Artesia	Vacant	TCE	No
7011-004-903	Pioneer Boulevard Artesia	Vacant	TCE	No
7011-020-038	11947 170th Street, Artesia	Residential	Full	Yes
7011-020-040	11951 170th Street, Artesia	Residential	Full	Yes
7011-020-041	11955 170th Street, Artesia	Residential	Full	Yes
7011-020-044	11961 170th Street, Artesia	Residential	Full	Yes
7011-020-045	11965 170th Street, Artesia	Residential	Full	Yes
7011-020-049	11973 170th Street, Artesia	Residential	Full	Yes
7011-020-050	11977 170th Street, Artesia	Residential	Full	Yes
7011-020-057	11967 170th Street, Artesia	Residential	Full	Yes
7011-020-061	11957 170th Street, Artesia	Residential	Full	Yes
7011-020-062	11959 170th Street, Artesia	Residential	Full	Yes
7011-020-063	11971 170th Street, Artesia	Residential	Full	Yes
7011-020-064	11949 170th Street, Artesia	Residential	Full	Yes
7011-020-905	16912 Clarkdale Avenue, Artesia	Open Space	Partial/TCE	No
7011-021-030	12017 170th Street, Artesia	Residential	Full	Yes
7011-021-031	12021 170th Street, Artesia	Residential	Full	Yes
7011-021-032	12021 170th Street, Artesia	Residential	Full	Yes
7011-021-059	12001 170th Street, Artesia	Residential	Full	Yes
7011-021-066	12027 170th Street, Artesia	Industrial	Full	No
7011-021-067	12009 170th Street, Artesia	Residential	Full	Yes
7011-021-068	12011 170th Street, Artesia	Residential	Full	Yes
7011-021-069	12015 170th Street, Artesia	Residential	Full	Yes
7012-001-901	12222 Cuesta Drive, Cerritos	Institutional	Partial/TCE	No
7012-003-009	16923 Judy Way	Residential	Access Impact	No
7012-003-010	16921 Judy Way	Residential	Access Impact	No
7012-003-011	16925 Judy Way	Residential	Access Impact	No
7012-003-012	16927 Judy Way	Residential	Access Impact	No
7012-003-013	12412 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-014	12410 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-015	12414 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-016	12408 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-017	12418 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-018	12416 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-019	12420 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-020	12422 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-021	12428 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-022	12426 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-023	12430 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-024	12424 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-025	12434 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-026	12432 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-027	12436 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-028	12438 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-029	12444 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-030	12442 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-031	12446 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-032	12440 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-033	12450 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-034	12448 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-035	12452 Rancho Vista Drive, Cerritos	Residential	Access Impact	No

Table 2.3.11 Build Alternative With Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment) Proposed Right-of-Way Acquisition and Easements

APN	Address	Existing Land Use	Acquisitions (Partial or Full) and Easements Type	Relocation
7012-003-036	12454 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-037	12460 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-038	12458 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-039	12462 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-003-040	12456 Rancho Vista Drive, Cerritos	Residential	Access Impact	No
7012-020-026	12642 Palm Street, Cerritos	Residential	Partial/TCE	No
7012-020-900	No Address, Cerritos	Open Space	TCE	No
7012-027-901	No Address, Cerritos	Open Space	TCE	No
7014-004-005	16809 Pioneer Boulevard, Artesia	Commercial	Full	Yes
7014-004-032	16905 Pioneer Boulevard, Artesia	Commercial	TCE	No
7014-006-005	11616 169th Street, Artesia	Residential	TCE	No
7014-006-006	11612 169th Street, Artesia	Residential	TCE	No
7014-006-007	11606 169th Street, Artesia	Residential	TCE	No
7014-006-008	11602 169th Street, Artesia	Residential	TCE	No
7014-006-009	11564 169th Street, Artesia	Residential	TCE	No
7014-006-010	11558 169th Street, Artesia	Residential	Partial/PE/TCE	No
7014-006-011	11554 169th Street, Artesia	Residential	Partial/PE/TCE	No
7014-006-012	11548 169th Street, Artesia	Residential	Partial/PE/TCE	No
7014-006-013	11542 169th Street, Artesia	Residential	Partial/PE/TCE	No
7014-006-014	11536 169th Street, Artesia	Residential	Partial/PE/TCE	No
7014-022-197	No Address, Cerritos	Residential	Partial	No
7016-002-044	10802 Alondra Boulevard, Cerritos	Commercial	TCE	No
7016-002-048	10802 College Place, Cerritos	Commercial	TCE	Yes
7016-002-050	10930 Alondra Boulevard, Cerritos	Commercial	TCE	No
7016-018-065	16923 Eric Avenue, Cerritos	Residential	TCE	No
7016-020-046	16920 Harvest Avenue, Cerritos	Residential	TCE	No
7016-020-900	No Address, Cerritos	Open Space	TCE	No
7016-023-041	16811 Westwinds Circle, Cerritos	Residential	TCE	No
7016-023-045	16825 Leeward Avenue, Cerritos	Residential	TCE	No
7016-023-901	No Address, Cerritos	Open Space	TCE	No
7030-001-048	12611 Artesia Boulevard, Cerritos	Residential	Partial/TCE	No
7011-004-008	168th Street, Artesia	Residential	Full	Yes
7011-004-051	168th Street, Artesia	Residential	Full	Yes
7011-004-055	11826 168th Street, Artesia	Residential	Full	Yes
7011-004-069	11832 168th Street, Artesia	Residential	Full	Yes
7011-004-076	11820 168th Street, Artesia	Residential	Full	Yes
7011-004-070	No Address	Vacant	Full	No
7011-004-902	No Address	Vacant	Full	No
7011-004-903	No Address	Vacant	Full	No

Source: *Westbound SR-91 Improvement Project Estimate Abstract* (2017).
Access Impact = No garage access; replacement parking is available on site
APN = Assessor's Parcel Number
Full = Full acquisition
Partial = Partial Acquisition
PE = Permanent Easement
TCE = Temporary Construction Easement

No Build Alternative

The No Build Alternative would not construct any improvements to SR-91 and the SR-91/I-605 interchange and, therefore, would not require the temporary use of any privately owned land for TCEs or staging areas.

Permanent Impacts

Build Alternative (includes Design Options)

As shown in Table 2.3.9, the Build Alternative would require the partial acquisition of 10 parcels and the full acquisition of 21 parcels resulting in the relocation of two non-residential properties.

As shown in Table 2.3.10, the Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width) would require the partial acquisition of five parcels and the full acquisition of one parcel, resulting in the relocation of one non-residential property.

As shown in Table 2.3.11, the Build Alternative with Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment) would require the partial acquisition of 10 parcels and the full acquisition of 26 parcels, resulting in the relocation of two non-residential properties.

Table 2.3.12 provides a list of the permanent relocations required under the Build Alternative. Table 2.3.13 provides a list of the permanent relocations required under the Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width). Table 2.3.14 provides the list of the permanent relocations required under the Build Alternative with Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment).

As shown in Tables 2.3.12, 2.3.13, and 2.3.14, these relocations would occur in Artesia. No relocations would occur in the city of Cerritos. The Build Alternative and the Build Alternative with Design Option 3 (Pioneer Boulevard Westbound Ramps/ 168th Alignment) would result in the relocation of two businesses: a race car parts dealer and a gas station/auto service station. These non-residential displacements could affect up to 40 employees. The Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width) would result in the relocation of one business: the gas station/auto service station.

Table 2.3.12 Build Alternative Displacements

APN	Address	Business Name(s)	Businesses Displaced	Employees Displaced	Residents Displaced
7011-021-066	Race car parts dealer	Elite Offroad Performance	1	20	N/A
7014-004-005	Gas station/auto service station	Arco	1	20	N/A
7011-020-038	11947 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-020-064	11949 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-020-040	11951 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-020-041	11955 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-020-061	11957 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-020-062	11959 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-020-044	11961 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-020-045	11956 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-020-057	11967 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-020-063	11971 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-020-049	11973 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-020-050	11977 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-021-059	12001 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-021-067	12009 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-021-068	12011 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-021-069	12015 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-021-030	12017 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-021-031, 7011-021-032	12021 170th Street, Artesia	N/A	N/A	N/A	4.42
		Total	**2**	**40**	**80**

Source: *Relocation Impact Report* (2018).
APN = Assessor's Parcel Number
N/A = not applicable

Table 2.3.13 Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width) Displacements

APN	Address	Business Name(s)	Businesses Displaced	Employees Displaced	Residents Displaced
7014-004-005	Gas station/auto service station	Arco	1	20	N/A
		Total	**1**	**20**	**N/A**

Source: *Relocation Impact Report* (2018).
APN = Assessor's Parcel Number
N/A = not applicable

Table 2.3.14 Build Alternative with Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment) Displacements

APN	Address	Business Name(s)	Businesses Displaced	Employees Displaced	Residents Displaced
7011-021-066	Race car parts dealer	Elite Offroad Performance	1	20	N/A
7014-004-005	Gas station/auto service station	Arco	1	20	N/A
7011-020-038	11947 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-020-064	11949 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-020-040	11951 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-020-041	11955 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-020-061	11957 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-020-062	11959 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-020-044	11961 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-020-045	11956 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-020-057	11967 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-020-063	11971 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-020-049	11973 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-020-050	11977 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-021-059	12001 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-021-067	12009 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-021-068	12011 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-021-069	12015 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-021-030	12017 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-021-031, 7011-021-032	12021 170th Street, Artesia	N/A	N/A	N/A	4.42
7011-004-008	11834 168th Street, Artesia	N/A	N/A	N/A	4.42
7011-004-051	11836 168th Street, Artesia	N/A	N/A	N/A	4.42
7011-004-055	11826 168th Street, Artesia	N/A	N/A	N/A	4.42
7011-004-069	11832 168th Street, Artesia	N/A	N/A	N/A	4.42
7011-004-076	11820 168th Street, Artesia	N/A	N/A	N/A	4.42
7011-004-070	Vacant, No Address	N/A	N/A	N/A	N/A
7011-004-902	11814 168th Street, Artesia	N/A	N/A	N/A	NA
7011-004-903	Vacant, No Address	N/A	N/A	N/A	N/A
		Total	**2**	**40**	**102**

Source: *Relocation Impact Report* (2018).
APN = Assessor's Parcel Number
N/A = not applicable

These non-residential relocations in the city of Artesia would displace approximately 40 employees under the Build Alternative, which represents approximately 0.04 percent of the total number of primary jobs in the city of Artesia. Because non-residential relocations under the design options would result in the same or less non-residential relocations than that of the Build Alternative, impacts under the design options would be no greater in magnitude when compared to the Build Alternative. Based on the RIR (2018), there are three locations available for sale and three locations available for lease within 20 mi of the study area to which the displaced race car parts dealer could relocate. As of November 2017, there were three properties with a light industrial/manufacturing or an industrial/warehouse zoning designation for sale in the cities of Downey, Vernon, and South El Monte that could serve as replacement properties for the displaced race car parts dealer. Additionally there were three properties with an industrial/warehousing zoning designation for lease in the cities of Downey and Cerritos that could serve as replacement properties for the displaced race car parts dealer. Due to the specialty nature of the gas station and the fact that it is a franchise and not corporately owned, there are limited suitable replacement sites within a reasonable distance from the displacement property. Research shows there are currently no comparable properties for lease or sale within 20 mi of the displacement property. Additional relocation sites could be sought farther from the displacement site, or the business owner may consider purchasing a vacant property and constructing a new facility.

Project Feature PF-REL-1, provided earlier in Section 2.3.1.3, would minimize the permanent impacts related to relocations and displacements under the Build Alternative, including design options, by conducting property acquisitions and providing relocation assistance in compliance with the Uniform Act.

Property Tax

The acquisition of privately owned properties along the alignment would result in property tax revenue losses for local taxing agencies because these parcels would be removed from the property tax assessment roll. The parcel acquisitions under the Build Alternative would result in the loss of an estimated $399.99 in annual property tax revenue to the City of Artesia, which is approximately 0.024 percent of the City of Artesia’s total annual property tax revenue. The County, ABC Unified School Districts, and other local taxing agencies that receive a share of property taxes from these parcels would also be affected.

Sales Tax

The partial acquisitions associated with the Build Alternative would result in the displacement of two sales tax-generating businesses (a race car parts dealer and a gas station/auto service station) within the city of Artesia. As discussed above, these businesses may need to be relocated outside the city of Artesia due to its specialty nature and lack of comparable properties within the city limits. In the event that the displaced businesses would be relocated within the city of Artesia, there would be no net loss of sales tax revenue to the City of Artesia. However, relocation to a different city would result in a net loss of sales tax revenue to the City of Artesia. Due to privacy laws, the California State Board of Equalization does not disclose sales tax revenues generated by individual businesses; therefore, the potential loss in sales tax revenue was estimated based upon the average sales tax per business in the city of Artesia. If the businesses were to relocate outside of the city of Artesia, the potential annual sales tax revenue loss would be approximately $10,070 for the City of Artesia. This represents approximately 0.16 percent of the City of Artesia's total annual sales tax revenue.

No Build Alternative

No improvements to SR-91 or the SR-91/I-605 interchange are proposed under the No Build Alternative. Therefore, no displacements or property acquisitions would be necessary, and the No Build Alternative would also not result in property or sales tax revenue losses.

2.3.2.4 Avoidance, Minimization, and/or Mitigation Measures

After construction, all TCEs would be restored to their original pre-project or better conditions per Project Feature PF-REL-2. Because the project will incorporate Project Feature PF-REL-1 as described above in Section 2.3.1.3, no substantial adverse impacts related to relocations would occur. Therefore, no avoidance, minimization, and/or mitigation measures are required.

2.3.3 Environmental Justice

2.3.3.1 Regulatory Setting

All projects involving a federal action (funding, permit, or land) must comply with Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* signed by President William J. Clinton on February 11, 1994. This EO directs federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. Low income is defined based on the Department of Health and Human Services poverty guidelines. For 2017, this was $24,600 for a family of four.

All considerations under Title VI of the Civil Rights Act of 1964, and related statutes, have also been included in this project. Caltrans' commitment to upholding the mandates of Title VI is demonstrated by its Title VI Policy Statement, signed by the Director, which can be found in Appendix B of this document.

2.3.3.2 Affected Environment

The environmental justice study area includes portions of the cities of Artesia, Cerritos, and Norwalk including the 20 census tract block groups shown previously on Figure 2.3-1 (Census Tracts 5530.00 [Block Groups 3 and 4], 5545.12 [Block Groups 1 and 2], 5545.13 [Block Group 1], 5545.14 [Block Groups 1. 2, and 3], 5545.21 [Block Groups 1 and 3], 5546.00 [Block Groups 1 and 2], 5547.00 [Block Groups 1, 2, and 3], 5548.01 [Block Groups 1 and 2], and 5548.02 [Block Groups 1, 2, and 3]).

The Council on Environmental Quality (CEQ), an advisory body that has oversight of the federal government's compliance with EO 12898 and NEPA, has developed guidance for implementing environmental justice under NEPA.[1] The CEQ guidance recommends identifying minority populations where either (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. The CEQ guidance also recommends identifying low-income populations in an affected area by applying the annual statistical poverty thresholds from the U.S. Census Bureau Current Population Reports, Series P-60, Consumer Income and Poverty.

In January 2003, Caltrans published the *Desk Guide Environmental Justice in Transportation Planning and Investments* (Desk Guide), which provides information and examples of ways to promote environmental justice to those involved in making decisions about California's transportation system.[2] The Desk Guide notes that transportation agencies, particularly those in a state as diverse as California, may need to adapt the regulatory definitions of low-income and minority populations to conduct a meaningful analysis. In regions with high minority and low-income populations, for instance, use of the standard definitions to define such populations could result in the selection of most of the region. Because the study area cities contain substantial minority populations, a different standard is required to identify those census tract block groups in the study area where minority populations are present in meaningfully greater percentages than in the general population of Los Angeles County. For the analysis of the proposed project, the term "meaningfully greater" is

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1 Council on Environmental Quality. 1997. *Environmental Justice Under the National Environmental Policy Act*. December 10, 1997. Website: https://ceq.doe.gov/docs/ceq-regulations-and-guidance/regs/ej/justice.pdf (accessed December 16, 2017).

2 California Department of Transportation (Caltrans). 2003. *Desk Guide, Environmental Justice in Transportation Planning and Investments*. January 2003. Website: http://www.dot.ca .gov/hq/LocalPrograms/saferoutes/ EnvironmentalJusticeDeskGuideJan2003.pdf (accessed December 16, 2017).

used when the percentage of an environmental justice population or group in the project area is 5 percentage points greater than its share of the city's or Los Angeles County's population. The largest minority population in both the cities of Artesia and Cerritos is the Non-Hispanic Asian American population, which makes up 40 percent of the population in the city of Artesia and 60 percent of the population in the city of Cerritos. In the city of Norwalk, Hispanic or Latino residents make up approximately 70 percent of the total population.

As noted previously in Table 2.3.5, there are no low-income households in the study area; therefore, the discussion of environmental justice focuses only on minority populations.

This environmental justice analysis applies the following methodology to identify minority populations:

- Census tract block groups are considered to have substantial minority populations if their percentage of minority residents is more than 10 percentage points higher than Los Angeles County as a whole (i.e., 83 percent or higher).

The environmental justice analysis was conducted using demographic information from the 2011–2015 ACS. The following populations were considered in assessing whether the Build Alternative would result in disproportionate impacts to environmental justice populations and whether that alternative would result in benefits for those populations:

- **Minority Population:** Defined as individuals who identify themselves as Black/African-American, Asian, Native Hawaiian/Pacific Islander, Native American/Native Alaskan, Some Other Race, two or more races, or of Hispanic/Latino origin (a descriptor of ethnic origin that may be applied to any race). As described in the methodology set forth above, study area census tract block groups are considered to have substantial minority populations if their aggregated percentage of minority residents is 83 percent or higher.

The percentages of the population in Los Angeles County, the study area cities, and the census tract block groups that consist of minorities are summarized in Table 2.3.15. The ***bold italicized*** percentages in Table 2.3.15 represent those study area cities and census tract block groups that contain substantial minority populations, as defined above, in comparison to Los Angeles County overall.

Table 2.3.15 Minority Populations

Area		Minorities[1]
County		
Los Angeles County		73%
Study Area Cities		
City of Artesia		80%
City of Cerritos		***84%***
Study Area Census Tracts		
Census Tract 5530.00	Block Group 3 (City of Norwalk)	78%
	Block Group 4 (City of Norwalk)	77%
Census Tract 5545.12	Block Group 1 (City of Cerritos)	82%
	Block Group 2 (City of Cerritos)	***87%***
Census Tract 5545.13	Block Group 1 (City of Cerritos)	***93%***
Census Tract 5545.14	Block Group 1 (City of Cerritos)	***88%***
	Block Group 2 (City of Cerritos)	***86%***
	Block Group 3 (City of Cerritos)	***86%***
Census Tract 5545.21	Block Group 1 (City of Cerritos)	75%
	Block Group 3 (City of Cerritos)	78%
Census Tract 5546.00	Block Group 1 (Cities of Norwalk and Artesia)	82%
	Block Group 2 (Cities of Norwalk and Artesia)	***93%***
Census Tract 5547.00	Block Group 1 (City of Artesia)	***95%***
	Block Group 2 (City of Artesia)	***96%***
	Block Group 3 (City of Artesia)	***95%***
Census Tract 5548.01	Block Group 1 (City of Artesia)	***99%***
	Block Group 2 (City of Artesia)	77%
Census Tract 5548.02	Block Group 1 (City of Artesia)	77%
	Block Group 2 (City of Artesia)	***87%***
	Block Group 3 (City of Artesia)	63%

Source: United States Census Bureau, 2011–2015 ACS. Tables B03002 and B17001.
Note: ***Bold italicized numbers*** indicate the values that are substantially higher than the percentage for Los Angeles County as a whole. For minority populations, “substantially greater” means 10 percentage points higher than the percentage for Los Angeles County (i.e., 83%). For low-income populations, “substantially greater” means 5 percentage points higher than the percentage for Los Angeles County (i.e., 17.8%).
[1] Includes all individuals who identify themselves as Black/African-American, Asian, Native Hawaiian/Pacific Islander, Native American/Native Alaskan, Some Other Race, two or more races, or of Hispanic/Latino origin (persons of Hispanic/Latino origin may be of any race).
ACS = American Community Survey

As shown in Table 2.3.15, minorities make up 73 percent of the population in Los Angeles County. Minorities are a higher percentage of the population in the city of Artesia (80 percent) and an even higher percentage of the population in the city of Cerritos (84 percent) than in Los Angeles County as a whole. Overall, substantial minority populations exist in 11 of the 20 study area census tract block groups. Census Tracts 5545.12 Block Group 2 (87 percent), 5545.13 Block Group 1 (93 percent), 5545.14 Block Group 1 (88 percent), 5545.14 Block Group 2 (86 percent), and 5545.14 Block Group 3 (86 percent) in the city of Cerritos have substantial minority populations. Census Tracts 5546.00 Block Group 2 (93 percent), 5547.00 Block Group 1 (95 percent), 5547.00 Block Group 2 (96 percent), 5547.00 Block Group 3 (95 percent), 5548.01 Block Group 1 (99 percent), and 5548.02 Block Group 2 (87 percent) in the city of Artesia also have substantial minority populations.

2.3.3.3 Environmental Consequences

Temporary Impacts

Build Alternative (includes Design Options)

Construction of the Build Alternative could have short-term effects on access and circulation, due to road closures; aesthetics, due to construction staging areas and equipment; and noise and exposure to hazardous materials, due to construction activities. As discussed in Section 2.3.1, Community Character and Cohesion, construction activities (including TCEs along the north side of SR-91 for certain areas of the project segment and at the Alondra Boulevard/I-605 interchange northbound off-ramp) associated with the Build Alternative would temporarily affect residents and businesses throughout the entire project area and would not be solely limited to minority populations in the area. The locations of the parcels that would be affected by these TCEs are shown on Figure 2.3-3.Those impacts would include temporary disruptions of local traffic patterns and access to residences and businesses during overnight mainline, ramp, and local arterial closures as well as increased traffic congestion, noise levels, and dust. Existing access to adjacent residences and businesses would resume following construction.

During construction, short-term degradation of air quality may occur due to the release of particulate emissions generated by excavation, grading, hauling, and other activities related to construction. Project Features PF-AQ-1 through PF-AQ-6, which are detailed in Section 2.12, Air Quality, would minimize the project’s temporary air quality impacts. Implementation of Project Feature PF-T-1, described in Section 2.5, Traffic and Transportation/Pedestrian and Bicycle Facilities, would minimize the project’s temporary impacts related to access disruptions. Short-term construction activities during the project would result in temporary noise from construction equipment and vehicles. However, the project would be required to comply with Caltrans Standard Specifications, Section 14-8.02, Noise Control, to minimize construction noise impacts on sensitive land uses adjacent to the project site. Implementation of Project Feature N-1, which is detailed in Section 2.13, Noise, would minimize the project’s construction noise impacts. With implementation of these project features and minimization measure, low-income and minority populations would not be disproportionately impacted.

As described in Section 2.3.1, Community Character and Cohesion, the project construction activities would provide direct and indirect jobs that would benefit local economies, including low-income and minority populations.

As described in further detail in Section 2.11, Hazardous Waste/Materials, five properties that are located in the vicinity of the Build Alternative were identified as having hazardous waste concerns. Due to the nature of the businesses and the proximity of these properties to the maximum disturbance limits for the Build Alternative, there is potential that contaminated groundwater originating at those parcels could be encountered during project construction. One property of hazardous concern is located within or adjacent to Census Tracts 5545.14 Block Group 1, which has a substantial minority population. The remaining properties of hazardous concern are not located within census tract block groups that have substantial minority populations.

No Build Alternative

Under the No Build Alternative, the temporary construction-related adverse effects on all populations, including low-income and minority populations, during construction of the Build Alternative would not occur. However, the low-income and minority populations also would not gain any economic benefit from the construction of the Build Alternative.

Permanent Impacts

Build Alternative

Potential long-term noise impacts associated with project operations are solely from traffic noise. Various receptor locations are adjacent to SR-91, and would be affected by the traffic noise from the project. These receptor locations would include areas that contain a meaningfully greater percentage of minority populations, including Census Tracts 5545.12 Block Group 2; 5545.14 Block Group 2; 5545.21 Block Groups 1 and 3; and 5548.01 Block Groups 1 and 2. The receptor locations would be or would continue to be exposed to noise levels that approach or exceed the Noise Abatement Criteria (NAC) under the Build Alternative and all design options. Impacts from traffic noise would affect all residents and businesses adjacent to westbound SR-91 and would not be solely limited to minority populations in the area. Therefore, the Build Alternative would not have disproportionately high and adverse noise impacts on minority populations in the project area.

The purpose of the project is to reduce congestion and improve freeway operations, improve safety, and improve local and system interchange operations. Potential traffic impacts associated with project operations would affect all residents and businesses adjacent to westbound SR-91 and would not be solely limited to minority populations in the area. Therefore, the Build Alternative would not have disproportionately high and adverse traffic impacts on minority populations in the project area.

Under the Build Alternative, the project would require full acquisition of 18 residential properties and 1 non-residential property along 170th Street in Census Tract 5548.01 Block Group 1, in the city of Artesia. These acquisitions would be required in order to expand the existing non-standard lane widths, currently in operation along westbound SR-91, to Caltrans' standard lane widths. The census tract block group where these properties are located contains a population that is 96 percent Hispanic or Latino, which is substantially higher than the city of Artesia's and Los Angeles County's percentages of 37 percent and 48 percent, respectively. Therefore, the Hispanic or Latino population in the census tract block group is meaningfully greater than that of the city of Artesia and Los Angeles County. In addition, the project would also require the acquisition of one non-residential business in Census Tract 5548.01 Block Group 2. This area contains a substantially higher percentage of African-American residents, at 8 percent, when compared to the city of Artesia's 2 percent overall African-American population. Therefore, the African-American population in the census tract block group is meaningfully greater than those in the city of Artesia and Los Angeles County.

The permanent acquisition of the 18 residential and 2 non-residential properties would accommodate the expansion of the westbound lanes on SR-91 to develop standard lane widths in areas that currently have non-standard lane widths. Without the property acquisitions, the expansion of westbound SR-91 would require the relocation and reconstruction of the existing noise barrier along 170th Street, and the width of 170th Street would be inadequate for emergency vehicle access and unsafe for residents. Permanent acquisitions as a result of the project would be required in census tract block groups where the environmental justice population is meaningfully greater than its population in the city and Los Angeles County. According to the RIR, there are sufficient replacement properties within the cities of Artesia, Hawaiian Gardens, Norwalk, and Lakewood, and it is anticipated that a similar number and type of properties would be available within the displacement area within the time of the acquisitions. Despite the availability of replacement properties, relocations may have physical, financial, and psychological effects on displaced residents. Physical effects may include finding and moving into suitable replacement housing, as well as an increase in commute and transportation to work. Possible financial impacts could include moving expenses, increased living expenses, increased commute to work, or increased property taxes. In addition, relocation may also be difficult due to overcrowded residences and high rents/mortgages compared to the incomes of the displacees. The median existing home value in the city of Artesia is $422,500, and the median existing home values in the census tract block groups associated with the displacement area range from $262,100 to $380,600. As discussed above in Section 2.3.1.3, Project Feature PF-REL-1 would minimize permanent impacts related to relocations and displacements under the Build Alternative for all affected populations. Therefore, the Build Alternative would not have disproportionately high and adverse relocation impacts on minority populations in the project area.

Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width)

Potential permanent impacts described above for the Build Alternative would be similar for the Build Alternative with Design Option 1 (Reduced Lane/Shoulder Widths) and would not be solely limited to minority populations in the area. However, this Design Option would eliminate the relocation impacts at 170th Street and would not require the acquisition of 18 homes and one business in Block Group 1, Census Tract 5548.01, in the City of Artesia. Therefore, this Design Option would not have disproportionately high and adverse impacts on minority populations in the project area.

Build Alternative with Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment)

Potential permanent impacts described above for the Build Alternative would be similar under the Build Alternative with Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment) and would not be solely limited to minority populations in the area. However, this design option would require the acquisition of an additional eight properties along 168th Street, including five single-family residential units and three vacant lots within Census Tract 5584.01, Block Group 1, in the city of Artesia. As discussed above in Section 2.3.1.3, Project Feature PF-REL-1 would minimize permanent impacts related to relocations and displacements under the Build Alternative for all affected populations. Therefore, the Build Alternative would not have disproportionately high and adverse relocation impacts on minority populations in the project area.

In addition, various receptor locations adjacent to SR-91 would be affected by the traffic noise from the project, including Census Tract 5548.01, Block Group 1, which is affected by Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment). The receptor locations would be or would continue to be exposed to noise levels that approach or exceed the NAC under Design Option 3 (Pioneer

Boulevard Westbound Ramps/168th Alignment). Impacts from traffic noise would affect all residents and businesses adjacent to westbound SR-91 and would not be solely limited to minority populations in the area. Therefore, the Build Alternative would not have disproportionately high and adverse noise impacts on minority populations in the project area under Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment).

As described in Project Feature PF-EJ-1 below, relocation assistance services would be available for all affected individuals and businesses in accordance with the Caltrans RAP.

PF-EJ-1 To minimize potential impacts on environmental justice populations, the California Department of Transportation (Caltrans) Relocation Assistance Program (RAP) includes advisory services to assist individuals and businesses being displaced by a public project. Relocation assistance services would be provided to all displaced residents and would include provisions for identifying current real estate listings, payment programs for moving expenses (e.g., packing and unpacking, temporary storage, transportation, and moving insurance), purchase supplements, rental assistance, and down payments.

The Caltrans RAP includes advisory services to assist individuals and businesses being displaced by a public project. Relocation assistance services would be provided to all displaced residents and would include provisions for identifying current real estate listings, payment programs for moving expenses (e.g., packing and unpacking, temporary storage, transportation, and moving insurance), purchase supplements, rental assistance, and down payments. These services would be available to all members of the population, and environmental justice populations would not be denied benefits or receive fewer benefits than the general population. Therefore, relocation impacts on environmental justice populations would not be disproportionately high and adverse.

No Build Alternative

No improvements to SR-91 and the SR-91/I-605 interchange other than routine maintenance are proposed under the No Build Alternative. Therefore, the No Build Alternative would not result in property acquisition or permanent increases in noise levels that would impact populations in the area, including low-income and minority populations. However, the No Build Alternative would also not provide transportation benefits to populations in the area, including to low-income and minority populations, which would occur under the Build Alternative.

2.3.3.4 Avoidance, Minimization, and/or Mitigation Measures

Project features included in the Build Alternative would reduce temporary construction traffic, noise, and air quality impacts on all populations in the study area, including low-income and minority populations.

Temporary construction impacts on minority and low-income populations would be minimized by implementation of Project Feature PF-T-1, which is provided in Section 2.5, Traffic and Transportation/Pedestrian and Bicycle Facilities.

Temporary air quality effects would be minimized by Project Features PF-AQ-1 through PF-AQ-6, which are detailed in Section 2.12, Air Quality. These project features and measures require the control of dust and equipment emissions during construction of the Build Alternative. These features and measures would benefit all persons in the project area, including low-income and minority populations.

Temporary noise effects would be minimized by Project Feature N-1, which is detailed in Section 2.13, Noise. Project Feature PF-N-1 includes compliance with Caltrans Standard Specifications, Section 14-8.02, Noise Control, during construction of the Build Alternative. This project feature would benefit all persons in the project area, including low-income and minority populations.

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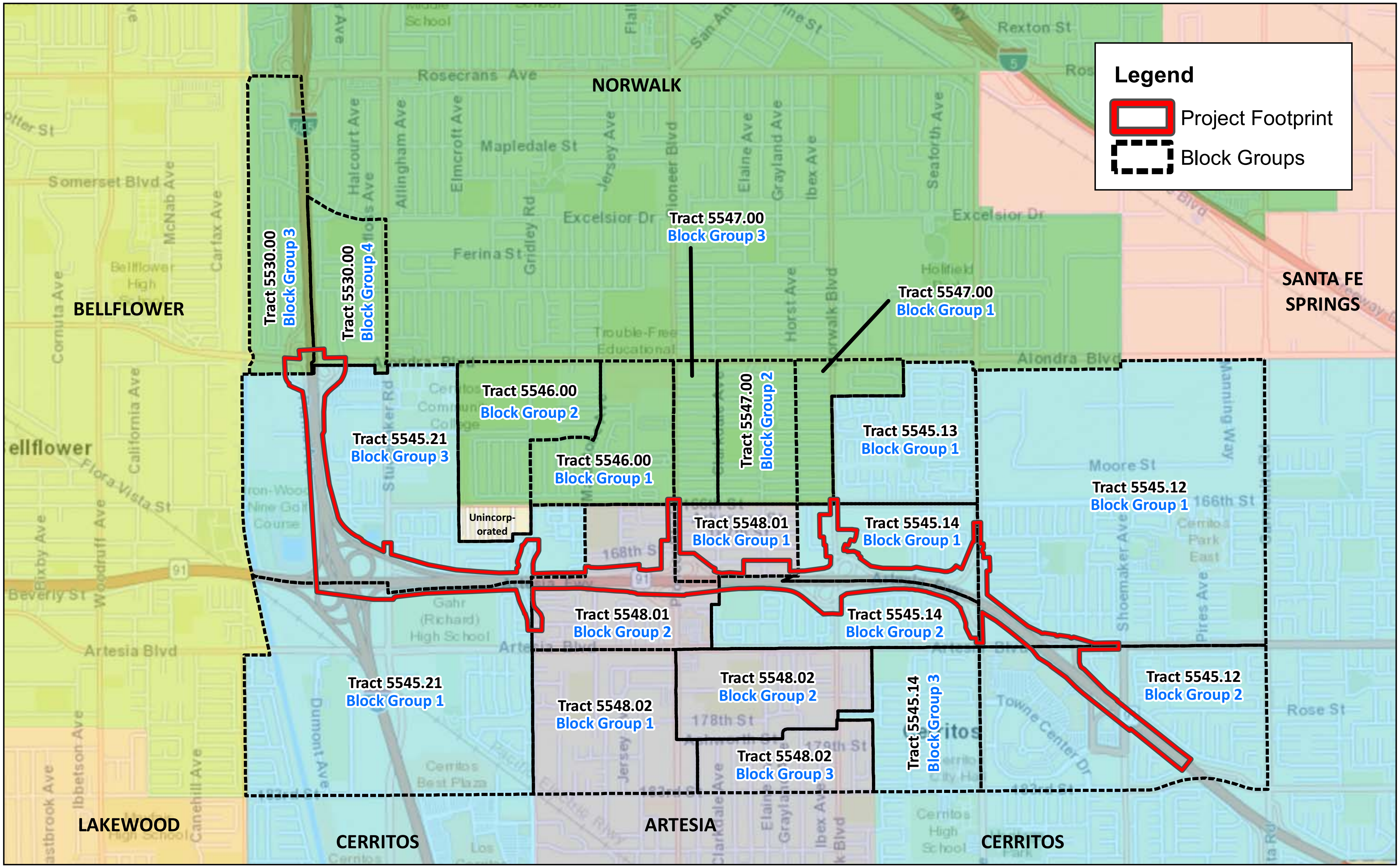

FIGURE 2.3-1

0 0.25 0.5
MILES

SOURCE: US Census Bureau 2010; LA County 2017; ESRI 2017.

Westbound SR-91 Improvement Project

Study Area

R-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

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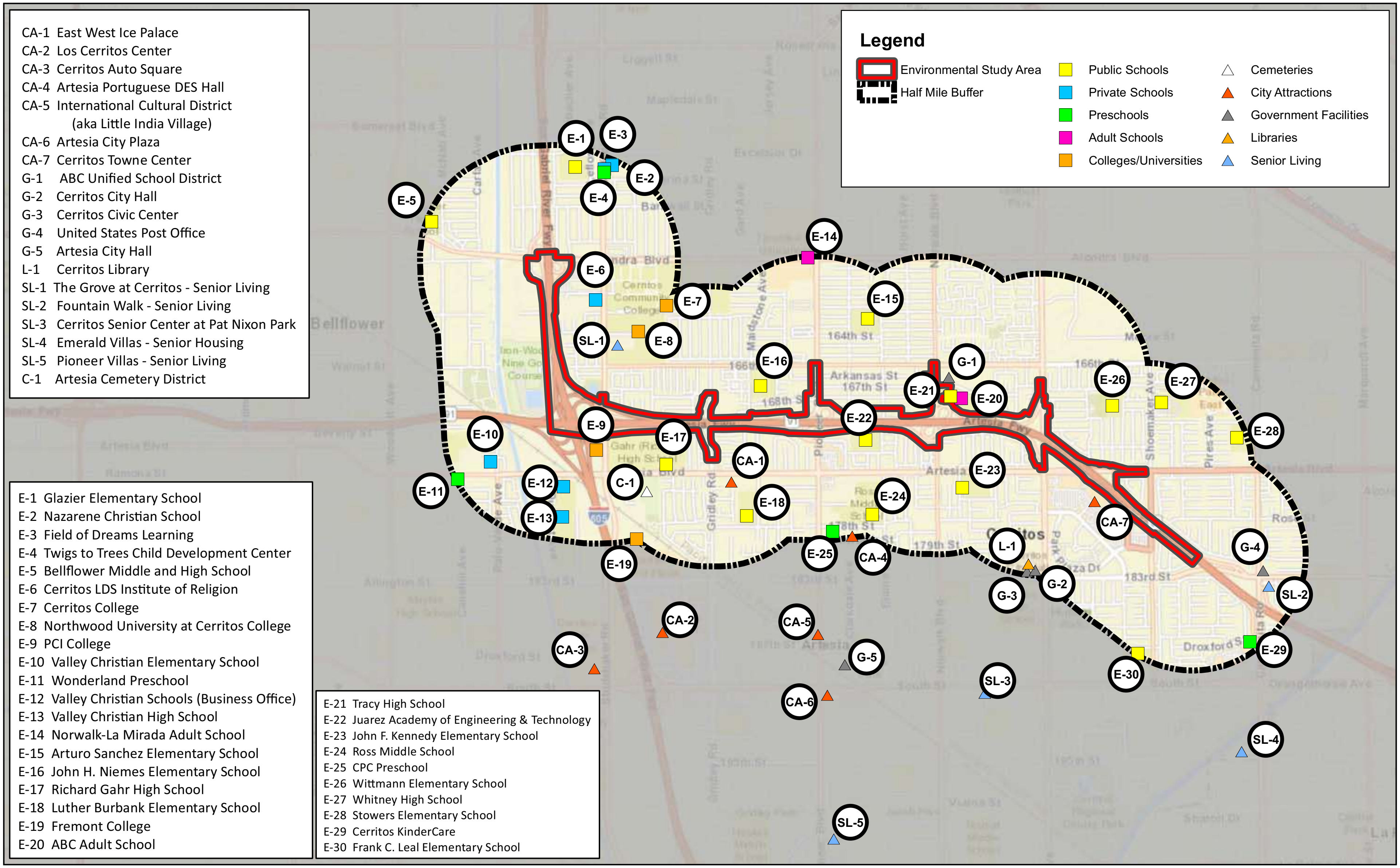

FIGURE 2.3-2

0 .5 1
MILES

SOURCE: SCAG 2012; ESRI 2017.

Westbound SR-91 Improvement Project

Community Facilities

R-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

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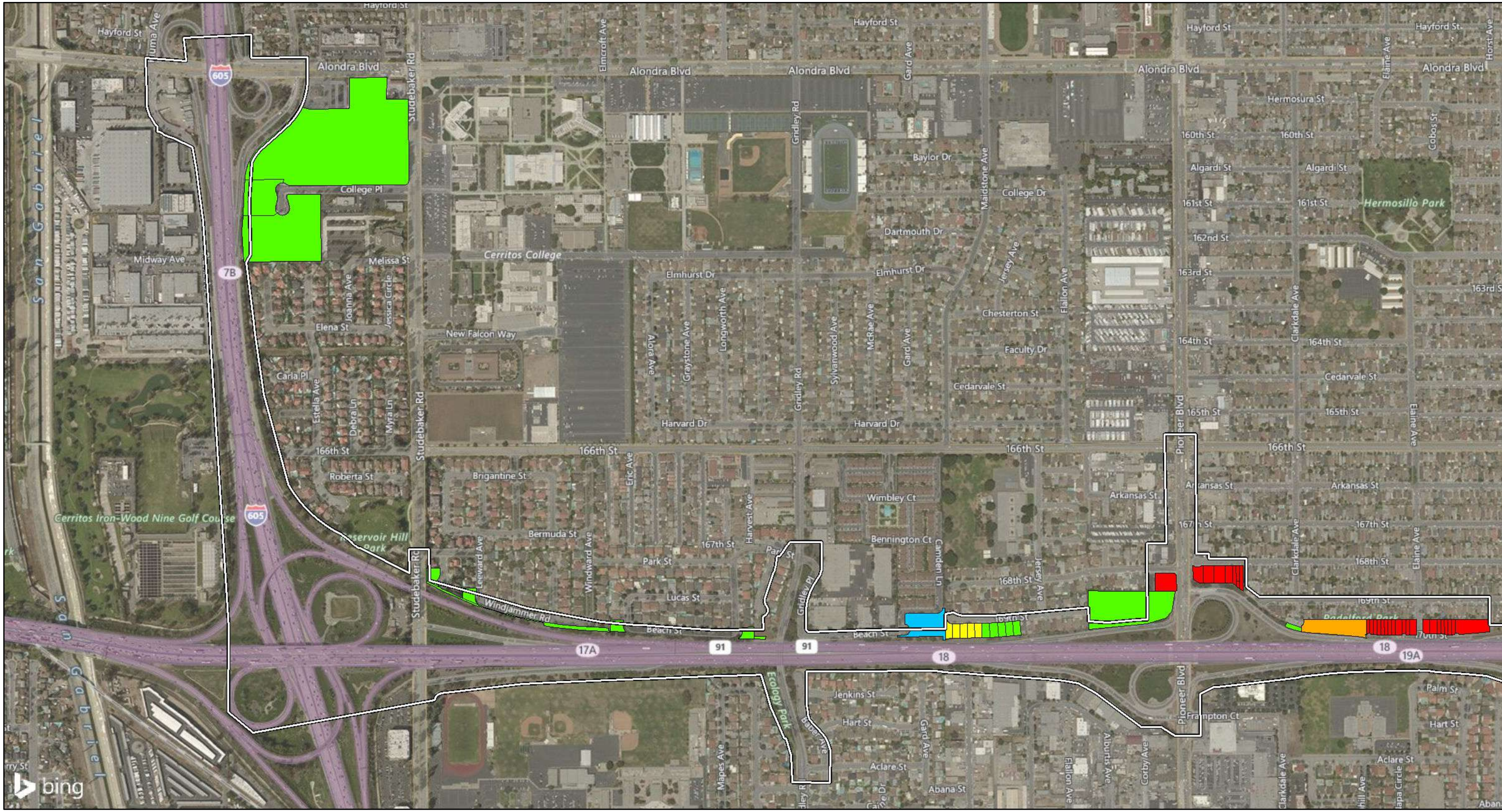

LEGEND

Study Area Limits

Build Alternative w/Design Option 3 (Pioneer Blvd WB Ramps/168th Alignment)

- Full Acquisition
- Partial Acquisition
- Partial Acquisition/Permanent Easement (PE)/Temporary Construction Easement (TCE)
- Partial Acquisition/Temporary Construction Easement (TCE)
- Temporary Construction Easement (TCE)
- Access Impact

N

0 325 650
FEET

SOURCE: Bing Maps (7/2014); Michael Baker (9/2017)

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FIGURE 2.3-3
Sheet 1 of 2

Westbound SR-91 Improvement Project

Property Acquisitions and Temporary Construction Easements for the Build Alternative and the Build Alternative with Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment)

07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

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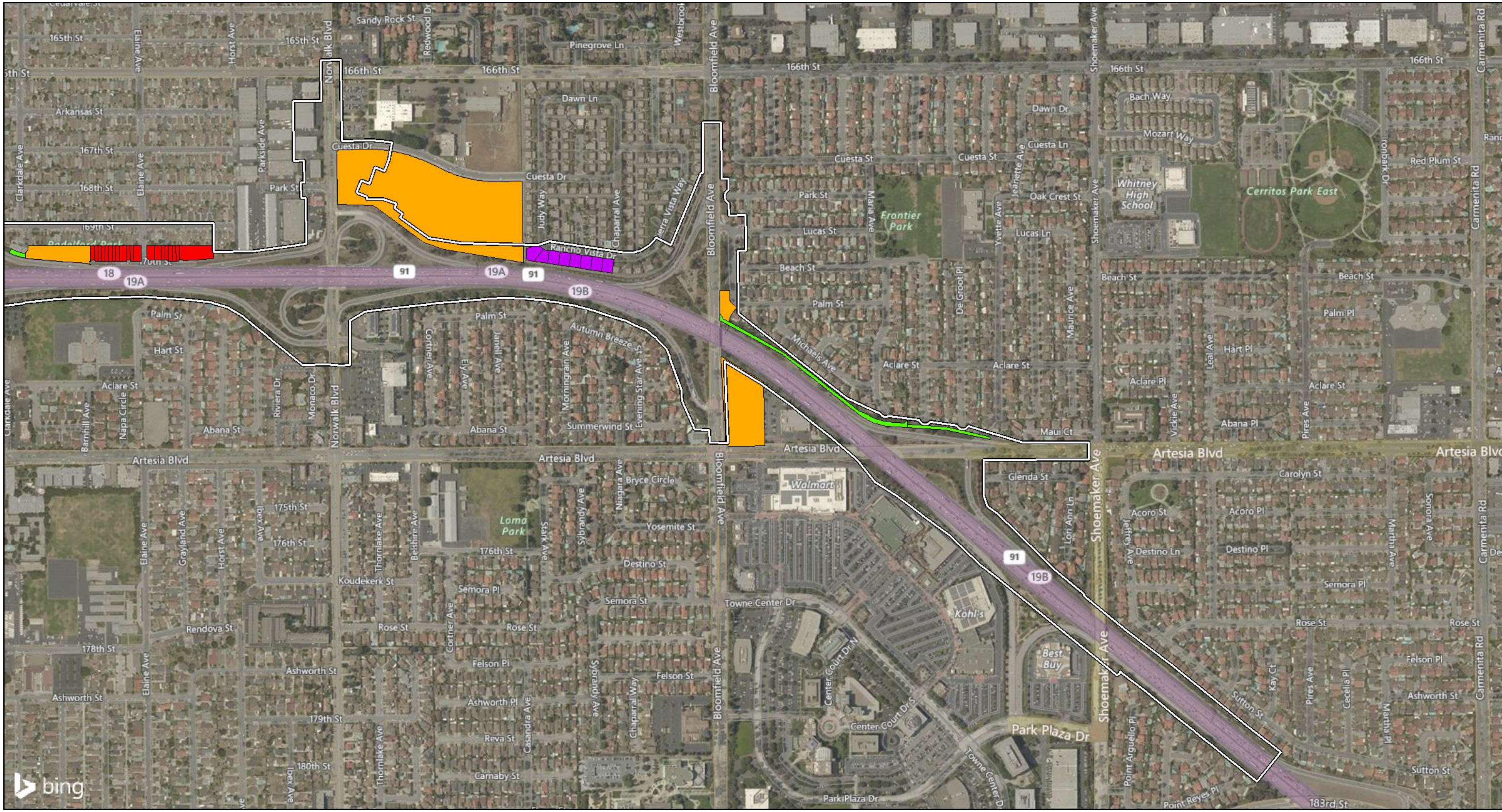

LEGEND

Study Area Limits

Build Alternative w/Design Option 3 (Pioneer Blvd WB Ramps/168th Alignment)

- Full Acquisition
- Partial Acquisition
- Partial Acquisition/Permanent Easement (PE)/Temporary Construction Easement (TCE)
- Partial Acquisition/Temporary Construction Easement (TCE)
- Temporary Construction Easement (TCE)
- Access Impact

N

0 325 650
FEET

SOURCE: Bing Maps (7/2014); Michael Baker (9/2017)

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FIGURE 2.3-3

Sheet 2 of 2

Westbound SR-91 Improvement Project

Property Acquisitions and Temporary Construction Easements for the Build Alternative and the Build Alternative with Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment)

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0716000284; EA 29811

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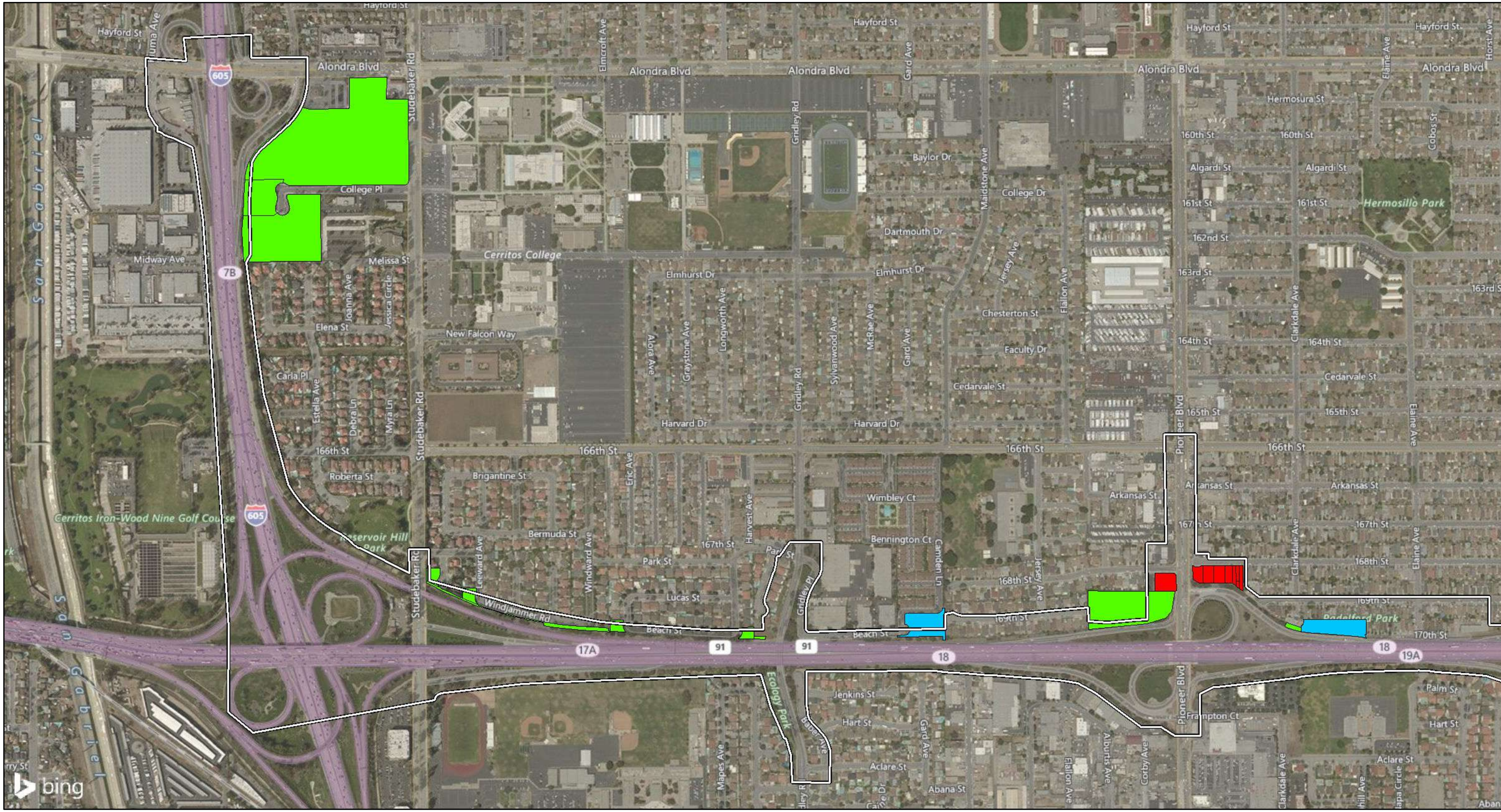

LEGEND

Study Area Limits

Design Option 1 (Reduced Lane/Shoulder Width) with Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment)

- Full Acquisition
- Partial Acquisition/Temporary Construction Easement (TCE)
- Temporary Construction Easement (TCE)

N

0 325 650
FEET

FIGURE 2.3-4
Sheet 1 of 2

Westbound SR-91 Improvement Project

Property Acquisitions and Temporary Construction Easements for the Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width) and Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment)

07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

SOURCE: Bing Maps (7/2014); Michael Baker (9/2017)

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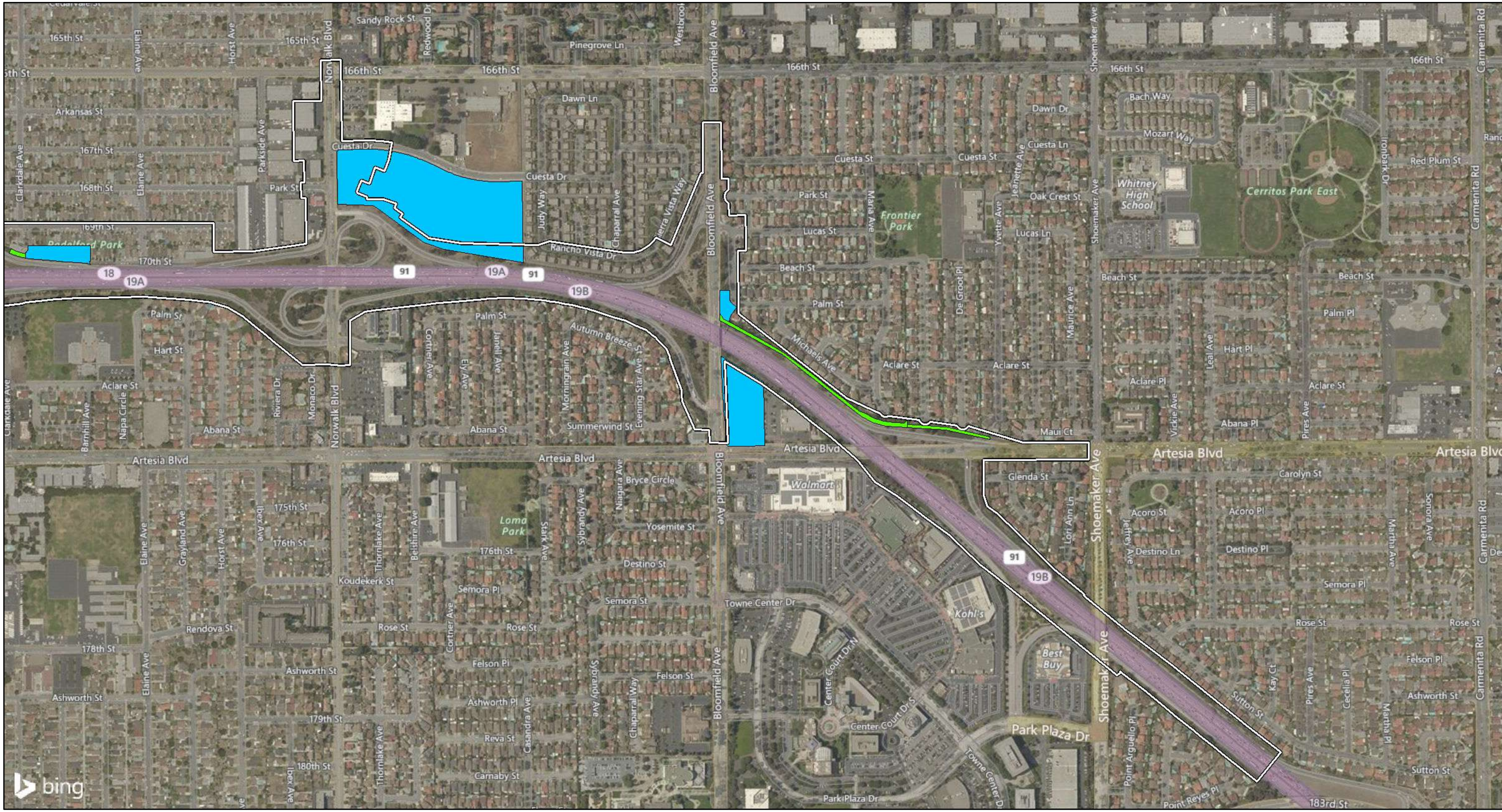

LEGEND

Study Area Limits

Design Option 1 (Reduced Lane/Shoulder Width) with Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment)

- Full Acquisition
- Partial Acquisition/Temporary Construction Easement (TCE)
- Temporary Construction Easement (TCE)

0 325 650
FEET

SOURCE: Bing Maps (7/2014); Michael Baker (9/2017)

I:\RBF1601\GIS\MXD\ISEA\PropertyAcquisitionsAndTCE_NonStandardLane.mxd (6/11/2018)

FIGURE 2.3-4
Sheet 2 of 2

Westbound SR-91 Improvement Project

Property Acquisitions and Temporary Construction Easements
for the Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width)
and Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment)

07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

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2.4 Utilities/Emergency Services

2.4.1 Affected Environment

This section is based on information from the *Utility Impacts and Relocation Report* (2018) prepared for the proposed Westbound State Route 91 (SR-91) Improvement Project (project). This section describes the existing utilities and emergency services facilities and providers in the project footprint (the maximum disturbance limits for the Build Alternative) and study area. The study area extends 0.5 mile (mi) from the limits of the project footprint.

2.4.1.1 Utilities

Existing utilities are located adjacent to and within the study area. The locations of utilities have been identified from as-built drawings and field reviews. Utility owners with facilities known to exist within the study area include the following:

- Central Basin Municipal Water District
- Chevron Pipe Line Company
- City of Norwalk
- Crown Castle
- Frontier Communications
- Kinder Morgan, Inc.
- County of Los Angeles Department of Public Works
- Shell Oil Pipeline Company
- Southern California Gas Company
- Wilshire Connection, LLC
- Charter Communications
- City of Cerritos
- City of Artesia
- City of Santa Fe Springs
- Crimson Pipeline
- Defense Fuel Support Point
- Golden State Water Company
- Liberty Utilities
- Los Angeles County Sanitation Districts
- Southern California Edison
- Time Warner Cable
- XO Communications

2.4.1.2 Fire Protection and Emergency Services

Fire protection and emergency medical/paramedic services in the study area cities (Cerritos and Artesia) are provided by the Los Angeles County Fire Department. There are no fire stations or hospitals located within 0.5 mi of the proposed project. The nearest Los Angeles County Fire Department fire stations are located 0.58 mi east of the study area in Norwalk, 0.78 mi south of the study area in Cerritos, and 1.19 mi south of the study area in Cerritos. The nearest hospital that provides 24-hour emergency services is the La Palma Intercommunity Hospital at 7901 Walker Street in La Palma; the hospital is approximately 1.53 mi southeast of the proposed project.

2.4.1.3 Police Protection

Police protection services in the study area are provided by the police departments in the study area cities of Cerritos and Artesia, as well as the Los Angeles County Sheriff's Department. There is one police station located within 0.5 mi of the proposed project: the Cerritos Sheriff's Station/ Community Safety Center at 18135 Bloomfield Avenue in Cerritos. The other nearest police stations are located 1.5 mi southeast of the proposed project in La Palma and 2.32 mi north of the proposed project in Norwalk.

2.4.2 Environmental Consequences

2.4.2.1 Temporary Impacts

Build Alternative

Utilities (e.g., water lines, sewer laterals, electrical connections/lines/poles, natural gas service lines, street lights, fire hydrants, and cable television lines and utility boxes) in the project right-of-way (ROW) could be abandoned, removed, relocated or replaced due to the construction of the Build Alternative.

The utility facilities that could potentially be affected during construction of the Build Alternative are listed in Table 2.4.1. An updated utility search would be conducted during final design to determine all utilities that would require protection in place, removal or relocation. Completion of the utility work required for the affected utilities listed in Table 2.4.1 may result in temporary service disruptions to some utility users in the vicinity of the study area.

The following project feature has been incorporated into the Build Alternative to minimize the potential temporary adverse effects of the project construction on utilities.

PF-UES-1 During final design, utility relocation plans will be prepared in consultation with the affected utility providers/owners for those utilities that will need to be relocated, removed, or protected in place. If relocation is necessary, the final design will focus on relocating utilities within existing public rights-of-way (ROWs) and/or easements. If relocation outside of existing ROWs or additional public ROWs and/or easements required for the proposed project are necessary, the final design will focus on relocating those facilities

Table 2.4.1 Utilities Potentially Affected During Construction of the Build Alternative

Utility Providers Within Project Limits	Facility Impacted by Proposed Project
Central Basin Municipal Water District	No impacted facilities
Charter Communications	No impacted facilities
Chevron Pipe Line Company	No impacted facilities
City of Artesia	2-inch underground water
City of Cerritos	33-inch underground sewer, fire hydrant
City of Norwalk	No impacted facilities
City of Santa Fe Springs	16-inch underground sewer
County of Los Angeles Department of Public Works	Four 8-inch underground sewers
Crimson Pipeline	No impacted facilities
Crown Castle	No impacted facilities
Defense Fuel Support Point	No impacted facilities
Frontier Communications	Two telephone call boxes, underground telecom
Golden State Water Company	No impacted facilities
Kinder Morgan, Inc.	No impacted facilities
Liberty Utilities	No impacted facilities
Los Angeles County Sanitation Districts	No impacted facilities
Shell Oil Pipeline Company	No impacted facilities
Southern California Edison	Four electric power poles, two 12 kilovolt (kV) overhead electrical lines, two 12 kV underground electrical lines, overhead electrical for street lighting, underground electrical for street lighting
Southern California Gas Company	Two 2-inch underground gas, 3-inch underground gas
Time Warner Cable	Two overhead telecom, two underground telecom
Wilshire Connection, LLC	Two underground telecom
XO Communications	No impacted facilities

Source: *Utility Impacts and Relocation Report* (2018).

to minimize environmental impacts as a result of project construction and ongoing maintenance and repair activities. Utility relocations are anticipated to be completed by the various utility owners prior to or during construction.

Prior to utility relocation activities, the Construction Contractor will coordinate with affected utility providers regarding potential utility relocations and inform affected utility users in advance about the date and timing of potential service disruptions.

During construction of the Build Alternative, some impairment to the delivery of emergency services, including fire and police response times, may occur due to limited lane closures on the mainline, ramps and arterials. Detour routes would be provided to direct traffic around any mainline or ramp closures using the local arterial street network. Emergency-services providers (including the local fire and police departments and the California Highway Patrol [CHP]) could experience these travel delays when traveling to/from emergency scenes during these mainline freeway closures.

Closures would include the partial or complete closure of local streets and ramps during night time and off-peak hours during critical construction phases. During partial local street closures, the Construction Contractor would post signs to notify the public 5 working days prior to the closure. For complete local street or ramp closures, the Construction Contractor would coordinate and obtain prior authorization from Caltrans and notify the public of the full closure 5 working days prior to the closure. The Construction Contractor would implement traffic controls per approved traffic control plans. Emergency services providers, including the local fire and police departments and the CHP, could experience travel delays when traveling to/from emergency scenes during bridge closures. During construction of the Build Alternative, some impairment to the delivery of emergency services, including fire and response times, may occur due to limited lane closures on the mainline, ramps, and arterials. Detour routes would be provided to direct traffic around any mainline or ramp closures using the local arterial street network. Emergency service providers (including the local fire and police departments and CHP) could experience these travel delays when traveling to/from emergency scenes during the mainline freeway closures.

The Construction Contractor would coordinate and obtain prior authorization from Caltrans for any lane closures on the freeway mainline, and will notify local police, fire and emergency responders regarding the planned closures. The public will also be notified of any closures through public information outreach. In addition, construction alerts would be issued to local transit operators, local radio and cable television companies, emergency services (fire and police), schools, local major employers, and traffic navigation systems groups. Detour plans would be developed during final design to finalize detour routes. Currently, it is expected that detoured traffic would use major arterials in the vicinity of the proposed project, Interstate 605 (I-605), and SR-91. Emergency services providers, including the local fire and police departments and the CHP, could experience travel delays when traveling to/from emergency scenes during freeway closures.

The following project feature has been incorporated into the Build Alternative to minimize the potential temporary adverse effects of the project construction on emergency services:

PF-UES-2 Prior to and during construction, the Construction Contractor will coordinate all temporary mainline, ramp, and arterial roadway closures and detour plans with law enforcement, fire protection, and emergency medical service providers to minimize temporary delays in emergency response times, including the identification of alternative routes for emergency vehicles and routes across the construction areas that are developed in coordination with the affected agencies.

In addition, temporary construction impacts to emergency services would be minimized by implementation of Project Feature PF-T-1 in Section 2.5, Traffic and Transportation/Pedestrian and Bicycle Facilities. Project Feature PF-T-1 requires development and implementation of a Transportation Management Plan (TMP) during construction of the Build Alternative to address traffic delays; maintain traffic flow in the SR-91 corridor; manage detours and temporary road, lane, and ramp closures; provide ongoing information to the public regarding construction activities, closures, and detours; and maintain a safe environment for construction workers and travelers.

No Build Alternative

No improvements to SR-91 and I-605 other than routine maintenance are proposed under the No Build Alternative, and the freeway would remain as it exists today. Therefore, the No Build Alternative would not result in temporary adverse effects on utilities and emergency services.

2.4.2.2 Permanent Impacts

Build Alternative

Any relocation or other effects to utility facilities (provided in Table 1.9, Potentially Affected Utilities by Type) under the Build Alternative would occur during the construction phase. All existing utility facilities would be anticipated to be perpetuated under the Build Alternative. The Build Alternative would not result in increased demand for domestic water services, wastewater facilities, or solid waste disposal. Therefore, the Build Alternative would not result in permanent adverse effects on utility providers or their facilities.

As required by Caltrans and the respective standards of the affected cities, emergency access would be maintained or provided as part of the final design of the Build Alternative. The improvements to the SR-91 mainline, I-605 connector ramps, and SR-91 arterials would reduce traffic congestion and result in decreased travel times on SR-91 compared to the No Build Alternative. These improvements in traffic flow are likely to improve emergency response times within the study area. Therefore, the Build Alternative would not result in adverse effects to emergency services and providers.

No Build Alternative

No improvements to SR-91 are proposed under the No Build Alternative other than routine maintenance. The freeway would remain as it exists today, with the exception of other proposed projects that are under development or currently under construction. The No Build Alternative would have no immediate impacts to emergency services. As LOS on SR-91 deteriorates in the future, response times of emergency response vehicles could increase. However, the No Build Alternative would not result in permanent direct adverse effects related to emergency services, utility services, and their facilities.

2.4.3 Avoidance, Minimization, and/or Mitigation Measures

Because the project will incorporate project features as outlined above in Section 2.4.2.1, no substantial adverse impacts to utilities and emergency services would occur. Therefore, no avoidance, minimization, and/or mitigation measures are required.

2.5 Traffic and Transportation/Pedestrian and Bicycle Facilities

2.5.1 Regulatory Setting

The California Department of Transportation (Caltrans), as assigned by the Federal Highway Administration (FHWA), directs that full consideration should be given to the safe accommodation of pedestrians and bicyclists during the development of Federal-aid highway projects (see 23 Code of Federal Regulations [CFR] 652). It further directs that the special needs of the elderly and the disabled must be considered in all Federal-aid projects that include pedestrian facilities. When current or anticipated pedestrian and/or bicycle traffic presents a potential conflict with motor vehicle traffic, every effort must be made to minimize the detrimental effects on all highway users who share the facility.

In July 1999, the U.S. Department of Transportation (USDOT) issued an Accessibility Policy Statement pledging a fully accessible multimodal transportation system. Accessibility in federally assisted programs is governed by the USDOT regulations (49 CFR Part 27) implementing Section 504 of the Rehabilitation Act (29 United States Code [USC] 794). The FHWA has enacted regulations for the implementation of the 1990 Americans with Disabilities Act (ADA), including a commitment to build transportation facilities that provide equal access for all persons. These regulations require application of the ADA requirements to federal-aid projects, including Transportation Enhancement Activities.

2.5.2 Affected Environment

This section is based on the *Traffic Operations Analysis Report* (2018) prepared for the project. The study area extends from the Shoemaker Avenue westbound on-ramp to Interstate 605 (I-605) and north on I-605 to Alondra Boulevard, although actual improvements may not be included along this entire length. The study area includes the ramp terminus intersections at key ramp locations in addition to the freeway mainline, arterial system connector ramps, and the westbound system connector ramp from State Route 91 (SR-91) to I-605. The traffic impact analysis in the *Traffic Operations Analysis Report* (2018) considered the following scenarios:

- Existing Baseline Conditions (2016)
- No Build Alternative – Opening Year (2024) and Horizon Year (2044)

- Build Alternative – Opening Year (2024) and Horizon Year (2044)
- Build Alternative with Design Options – Opening Year (2024) and Horizon Year (2044)

2.5.2.1 Existing Facility

As previously stated in Chapter 1, Proposed Project, the project limits include westbound SR-91 (Post Mile [PM] 16.9–19.8) and northbound I-605 (PM 5.0–5.8) and traverse Cerritos and Artesia. The total length of the project is approximately 4 miles (mi), with the majority of the improvements along the westbound SR-91 3 mi segment. Within the project limits, westbound SR-91 has four mixed-flow lanes that are 11 feet (ft) wide, a 1.5 ft wide left median shoulder, one 12 ft wide high occupancy vehicle (HOV) lane, and one 12 ft wide auxiliary lane between certain successive on- and off-ramps. Within the project limits, I-605 has four to five mixed-flow lanes and one HOV lane in each direction plus ramp merge and diverge lanes.

2.5.2.2 Existing Traffic Operations

Existing Levels of Service

Freeway traffic flow can be defined in terms of levels of service (LOS). For freeways, there are six defined LOS, ranging from LOS A to LOS F (based on the *Highway Capacity Manual* [HCM] methodology). LOS A represents free traffic flow with low traffic volumes and high speeds, and LOS F represents traffic volumes that exceed the facility capacity and result in forced flow operations at low speeds, as shown on Figure 1-2 in Chapter 1. As shown on Figure 1-2 in Chapter 1, traffic volumes on facilities such as SR-91 and I-605 substantially affect travel speeds and times.

Mainline and Ramps

As discussed in Section 1.2.2.1, Capacity, Transportation Demand, and Safety, and also shown in Tables 2.5.1, 2.5.2, and 2.5.3 (all tables are provided at the end of this section), the results of the HCM analysis indicate that all but two existing freeway mainline, weaving, and merge/diverge segments are currently operating at LOS D or better during the peak hours. The exceptions are the weaving segment from the Pioneer Boulevard on-ramp to the I-605 off-ramp and the weaving segment from the SR-91 westbound on-ramp to the Alondra Boulevard off-ramp, for which the HCM results indicate LOS F. However, in areas with long vehicle queues, slow speeds, and higher levels of congestion, the HCM method of analysis can report LOS that is better than what drivers actually experience on the road. This is because the downstream traffic congestion and bottlenecks reduce the vehicle throughput in the study area and the volumes are constrained by the adjacent congested portions of the freeway. In order to report LOS that more closely reflects what drivers experience, the speed method of analysis for determining LOS was also employed for current conditions along with a microsimulation model for future No Build and Build conditions. The speed method of analysis included observing existing speed profiles in the study area and comparing those speeds to likely LOS designations. Based on the speed method, the LOS for the existing mainline segments are mostly LOS E and F during both peak periods, as shown in Table 2.5.4. Note that the speed-based method is only used for existing conditions when actual speeds can be measured. The future analysis relies on HCM as well as the microsimulation model results.

Intersections

A total of six study area intersections were evaluated and the LOS calculated using HCM 2010 methodology. As shown in Table 2.5.5, all westbound SR-91 and northbound I-605 study intersections perform at LOS C or better during the a.m. and p.m. peak hours, with the exception of the northbound I-605 off-ramp to Alondra Boulevard, which operates at LOS D during the p.m. peak hour.

2.5.2.3 Pedestrian and Bicycle Facilities

Pedestrian travel across the project limits where arterial streets cross I-605 is provided via sidewalks at the following location:

- Alondra Boulevard

Pedestrian travel across the project limits where arterial streets cross SR-91 is provided via sidewalks at the following locations:

- Studebaker Road
- Gridley Road
- Pioneer Boulevard
- Norwalk Boulevard
- Bloomfield Avenue
- Artesia Boulevard
- Shoemaker Avenue

These arterials generally include sidewalks on at least one side, and usually both sides, of the road as they cross I-605 or SR-91.

On-road bikeways within the project limits include:[1]

- A Class III[2] bikeway extends in both directions on 195th Street from the San Gabriel River Trail to Bloomfield Avenue. These bikeways then transition to a Class II bikeway before joining the Coyote Creek Bicycle Path.
- A Class II bikeway extends on Pioneer Boulevard from South Street before turning eastward onto Del Amo Boulevard.
- A Class II bikeway extends on Bloomfield Avenue starting at 183rd Street and ends at South Street before continuing east on South Street to Carmelita Avenue, where another bikeway extends southward on Shoemaker Avenue.

The study area is located between the following two major bike trails in the region:

- The San Gabriel River Bicycle Trail runs 30.2 mi along the San Gabriel River, from San Gabriel Canyon Road in Azusa to an access into El Dorado Park in Long Beach. There are numerous access points along the path. Within the study area, the Trail crosses under SR-91 just west of I-605, which it parallels for much of its length.
- The Coyote Creek Bicycle Trail is a 9.5 mi Class I bike path adjacent to the Coyote Creek flood control channel, extending from Santa Fe Springs to Long Beach, where it joins the San Gabriel River Bicycle Path. It crosses under SR-91 about 1 mi east of the study area, at Carmenita Road.

2.5.3 Environmental Consequences

The methodologies for forecasting and assessing future year with and without project traffic effects are described in detail in Chapters 3 and 4 of the *Traffic Operations Analysis Report* (2018). The methodologies of those analyses are summarized below.

Methodology

The analysis evaluation criteria used to determine acceptable traffic operation conditions are based on the LOS policies identified by Caltrans. Caltrans strives for freeway facilities to operate at either LOS C or D. Freeway LOS was shown on

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1 County of Los Angeles. 2012. *Bicycle Master Plan.* Website: https://dpw.lacounty.gov/pdd/bike/docs/bmp/BMP%20CHP%203.pdf (accessed December 12, 2017).

2 Class I (separate bike path), Class II (bike lane), and Class III (signed as bike route, no striping).

Figure 1-2 in Chapter 1. Based on Caltrans policy, LOS D was used as the threshold for the freeway facilities analysis. Any future freeway facilities projected to operate at an unacceptable LOS (i.e., LOS E or F) need to be mitigated. Per Caltrans, an impact to freeway facilities would occur if the project would:

- Degrade the LOS on the freeway facility from LOS D to LOS E or F, or
- Impact (worsen) a facility that is already operating at an unacceptable LOS (i.e., LOS E or F).

The six study area intersections noted previously were taken into account in the traffic impact analysis as they may be potentially impacted due to the proposed improvements to SR-91 and I-605. Intersections would be considered impacted if they are projected to operate at an unacceptable LOS (i.e., LOS E or F) under the Build Alternative and are not projected to operate at unsatisfactory LOS under the No Build Alternative scenario.

The 2024 No Build Alternative consists of projects included in the Southern California Association of Governments (SCAG) 2016 Regional Transportation Plan (RTP); however, projects anticipated to be open to traffic after 2024 were removed from the 2024 roadway network for the traffic analysis.

The improvements included in the Build Alternative are described in more detail in Chapter 1, Proposed Project, in this environmental document. In addition to the Build Alternative, the proposed diamond ramp configurations (Diamond Ramps Design Option) at Pioneer Boulevard and Norwalk Boulevard in lieu of the proposed Type L-7 cloverleaf interchange configuration, the proposed Type L-9 westbound ramp configuration (Pioneer Boulevard L-9 Design Option), as well as the proposed alignment of SR-91 westbound ramps with 168th Street (Pioneer Westbound Ramps/168th Alignment Design Option) were analyzed.

2.5.3.2 Temporary Impacts

Build Alternative (includes Design Options)

During construction, the proposed project would result in temporary impacts to traffic circulation due to traffic diversions resulting from temporary closures to local roadways, sidewalks, bikeways, and freeway lanes. As described in the following project feature (PF-T-1), a Transportation Management Plan (TMP) will be implemented to address changes in traffic flows and pedestrian and bicycle circulation and to provide measures to minimize the adverse effects of construction activities on traffic flows and pedestrian and bicycle travel within the study area.

PF-T-1 **Transportation Management Plan.** A Final Transportation Management Plan (TMP) will be developed in detail during final design, which would be implemented by the Resident Engineer during project construction to address short-term traffic circulation and access effects during project construction. Specifically, when the TMP is prepared during final design, a Qualified Traffic Engineer will prepare the TMP, which will include, but not be limited to, the elements described below to reduce traveler delays and enhance traveler safety during project construction. The TMP would be approved by the Los Angeles County Metropolitan Transportation Authority (Metro) and the California Department of Transportation (Caltrans) District 7 during final design and would be incorporated into the plans, specifications, and estimates for implementation by the Resident Engineer.

The purpose of the TMP is to address the short-term traffic and transportation impacts during construction of the project. The objectives of the TMP are to:

- Maintain traffic safety during construction,
- Effectively maintain an acceptable level of traffic flow throughout the transportation system during construction,
- Minimize traffic delays and facilitate reduction of the overall duration of construction activities,
- Minimize detours and impacts to pedestrians and bicyclists,
- Foster public awareness of the project and related transportation and traffic impacts, and
- Achieve public acceptance of construction of the project and the TMP measures.

The TMP will contain, but not be limited to, the following elements, which are intended to reduce traveler delay and enhance traveler safety. These elements will be refined during final design and incorporated in the TMP for implementation during project construction.

- **Public Information/Public Awareness Campaign:** The primary goal of the Public Awareness Campaign (PAC) is to educate motorists, business owners and operators, residents, elected officials, and government agencies about project construction activities and associated transportation impacts. The PAC is an important tool for reaching target audiences with important construction project information and is anticipated to include but not be limited to the following:

- Rideshare information
- Brochures and mailers
- Media releases
- Paid advertising, including radio, print, and social media
- Public meetings
- Broadcast fax and email services
- A telephone hotline
- Notification to targeted groups
- Commercial traffic reporters/feeds
- A project website
- Visual information
- Local cable television and news
- Internet postings
- Digital signage to inform commuters about closures
- Print banners and signs
- Business mitigation strategies
- Social and digital media alerts
- Parking mitigation strategies

- **Traveler Information Strategies:** The effective implementation of a traveler information system during construction is crucial for enabling motorists to make informed decisions about their travel plans and options with real-time traffic information. That real-time traffic information will include information on mainline, ramp, lane, and arterial closures and detours; travel delays; access to adjacent land uses; “businesses are open” signs; and other signs and information to assist travelers in navigating through, around, and in construction areas. Key components of the traveler information system are anticipated to include but not be limited to the following:

  - Fixed and portable changeable message signs
  - Ground-mounted signs
  - Automated work zone information systems
  - Highway advisory radio
  - A lane-closure website
  - The Caltrans highway information network
  - Bicycle and pedestrian information
  - A Commute Smart website

- **Incident Management:** Effective incident management will ensure that incidents in and near construction areas are cleared quickly and do not result in substantial delays for the traveling public in the vicinity of work zones. Incident management includes but is not limited to the following:

  - A Caltrans Construction Zone Enhanced Enforcement Program (COZEEP)
  - A Freeway Service Patrol
  - Traffic surveillance stations
  - A Caltrans Transportation Management Center
  - A traffic management team
  - Towing services

- **Construction Strategies:** The TMP will include procedures to lessen the transportation effects of project-related construction activities and will include but not be limited to consideration of the following:

  - Conflicts with other projects and special events
  - Construction staging alternatives
  - Mainline lane closures
  - Local road closures
  - Ramp and connector closures (no two consecutive on- or off-ramps in the same direction would be closed at the same time)
  - Pedestrian and bicycle detours and facility closures
  - Traffic control improvements
  - Coordination with other projects and local municipalities

- Project phasing
- Traffic screens
- Truck traffic restrictions

- **Demand Management:** Temporarily reducing the overall traffic volumes on the project segment of SR-91 and I-605 could reduce the short-term adverse effects of construction on traffic operations. The TMP will include but not be limited to the following strategies that could reduce vehicular demand in the study area during project construction:

  - Rideshare incentives
  - Transit services
  - Shuttle services
  - Variable work hours and telecommuting
  - Park-and-ride lots

- **Alternate Route Strategies:** The TMP will provide strategies for notifying motorists, pedestrians, and bicyclists of planned construction activities. This notification will allow travelers to make informed decisions about their travel plans, including the consideration of possible alternate routes. The TMP will finalize the detour and alternate routes for motorists, specifically addressing the following:

  - Mainline lane closures
  - Ramp/connector closures
  - Local road closures
  - Temporary highway or shoulder use
  - Local street improvements
  - Temporary detours and closures of bicycle and pedestrian facilities
  - Traffic signal coordination

The Construction Contractor will implement the measures in the TMP during construction.

The TMP, a standard measure implemented on all Caltrans construction projects, is designed to minimize construction-activity-related motorist delays, queuing, and accidents by the effective application of traditional traffic-handling practices and innovative approaches. The purpose of the TMP is to relieve congestion and maintain traffic flow throughout the alternative routing and surrounding area within the study area. The TMP will be finalized during final design but not until funding and final staging/phasing is determined at a later date. The TMP includes traffic mitigation strategies for the duration of construction, addresses lane closure requirements, and seeks to inform the public and motorists regarding the construction schedule, potential detours, and anticipated traffic delays during construction.

No Build Alternative

None of the improvements proposed under the Build Alternative would be constructed under the No Build Alternative. As a result, the No Build Alternative would not result in temporary impacts related to traffic and circulation or to pedestrian and bicycle facilities.

2.5.3.3 Permanent Impacts

The following tables provide detailed information on the traffic operations under the Existing (2016) conditions, 2024 Build Alternative, 2024 No Build Alternative, 2024 Diamond Ramps Design Option, 2024 Pioneer Boulevard L-9 Design Option, and 2024 Pioneer Boulevard Westbound Ramps/168th Alignment Design Option:

- Table 2.5.6 summarizes the westbound SR-91 mainline LOS (using HCM methodology) during the a.m. and p.m. peak periods under the Existing (2016) conditions, 2024 Build Alternative, 2024 No Build Alternative, 2024 Diamond Ramps Design Option, 2024 Pioneer Boulevard L-9 Design Option, and 2024 Pioneer Boulevard Westbound Ramps/168th Alignment Design Option.
- Table 2.5.7 summarizes the westbound SR-91 and northbound I-605 weaving LOS (using HCM methodology) during the a.m. and p.m. peak periods under the Existing (2016) conditions, 2024 Build Alternative, 2024 No Build Alternative, 2024 Diamond Ramps Design Option, 2024 Pioneer Boulevard L-9 Design Option, and 2024 Pioneer Boulevard Westbound Ramps/168th Alignment Design Option.
- Table 2.5.8 summarizes the westbound SR-91 merge and diverge LOS (using HCM methodology) during the a.m. and p.m. peak periods under the Existing (2016) conditions, 2024 Build Alternative, 2024 No Build Alternative, 2024

Diamond Ramps Design Option, 2024 Pioneer Boulevard L-9 Design Option, and 2024 Pioneer Boulevard Westbound Ramps/168th Alignment Design Option.

- Table 2.5.9 summarizes the westbound SR-91 and northbound I-605 intersection LOS (using HCM methodology) during the a.m. and p.m. peak periods under the Existing (2016) conditions, 2024 Build Alternative, 2024 No Build Alternative, 2024 Diamond Ramps Design Option, 2024 Pioneer Boulevard L-9 Design Option, and 2024 Pioneer Boulevard Westbound Ramps/168th Alignment Design Option.

The following tables provide detailed information on the traffic operations under the Existing (2016) conditions, 2044 Build Alternative, 2044 No Build Alternative, 2044 Diamond Ramps Design Option, 2044 Pioneer Boulevard L-9 Design Option, and 2044 Pioneer Boulevard Westbound Ramps/168th Alignment Design Option:

- Table 2.5.10 summarizes the westbound SR-91 mainline LOS (using HCM methodology) during the a.m. and p.m. peak periods under the Existing (2016) conditions, 2044 Build Alternative, 2044 No Build Alternative, 2044 Diamond Ramps Design Option, 2044 Pioneer Boulevard L-9 Design Option, and 2044 Pioneer Boulevard Westbound Ramps/168th Alignment Design Option.
- Table 2.5.11 summarizes the westbound SR-91 and northbound I-605 weaving LOS (using HCM methodology) during the a.m. and p.m. peak periods under the Existing (2016) conditions, 2044 Build Alternative, 2044 No Build Alternative, 2044 Diamond Ramps Design Option, 2044 Pioneer Boulevard L-9 Design Option, and 2044 Pioneer Boulevard Westbound Ramps/168th Alignment Design Option.
- Table 2.5.12 summarizes the westbound SR-91 merge and diverge LOS (using HCM methodology) during the a.m. and p.m. peak periods under the Existing (2016) conditions, 2044 Build Alternative, 2044 No Build Alternative, 2044 Diamond Ramps Design Option, 2044 Pioneer Boulevard L-9 Design Option, and 2044 Pioneer Boulevard Westbound Ramps/168th Alignment Design Option.
- Table 2.5.13 summarizes the westbound SR-91 and northbound I-605 intersection LOS (using HCM methodology) during the a.m. and p.m. peak periods under the Existing (2016) conditions, 2044 Build Alternative, 2044 No Build Alternative, 2044 Diamond Ramps Design Option, 2044 Pioneer Boulevard L-9 Design Option, and 2044 Pioneer Boulevard Westbound Ramps/168th Alignment Design Option.

As indicated previously, 2024 has been identified as the opening year for the project, and 2044 has been identified as the design year. The traffic impacts and operations under the Build Alternative and No Build Alternative in 2024 and 2044 are discussed below. There are a few freeway mainline locations where the LOS based on the HCM results is forecast to worsen with the Build Alternative compared to the No Build Alternative. This is partly due to the fact that the projected future traffic volumes are higher under the Build Alternative due to the added capacity and improved operating conditions, which can cause traffic to shift from other routes. As previously mentioned, this is also partly due to the fact that in areas with long vehicle queues, slow speeds, and higher levels of congestion, the HCM method of analysis can report LOS that is better than what drivers actually experience on the road. Because the HCM methodology can be limited in its ability to assess corridors with significant congestion, such as westbound SR-91, the traffic microsimulation model was also used as a tool for assessing the corridor under future No Build and future Build conditions.

As demonstrated by the results of the microsimulation analysis, which is provided in Appendix C of the *Traffic Operations Analysis Report* (2018), the proposed Build Alternative and design options would reduce congestion and improve local and system freeway operations. The improvements are expected to result in substantially improved operating conditions throughout the study corridor, including substantial reductions in vehicle delay, reductions in travel time, and increased operating speeds on all westbound SR-91 segments. Safety and high accident locations would also be improved via the reduction in congestion and the operational improvements in traffic flow and improvements to the geometric design features in the corridor.

The purpose of the project is to reduce congestion and improve freeway operations (both mainline and ramps), improve safety, and improve local and system interchange operations, which would occur based on the results of the microsimulation model analysis. The need for the project is due to the existing congestion on westbound SR-91 approaching the connector ramp for both northbound and southbound I-605 as a result of inadequate capacity of the existing two-lane connector for westbound SR-91 to northbound and southbound I-605 as well as the closely spaced freeway entrance and exit ramps, contributing to a high concentration of accidents. The Build Alternative would meet the purpose and need of the project because the proposed geometric design features are expected to result in improved operating conditions throughout the length of the project, with reductions in vehicle delay and travel time.

Safety would be improved as a result of increased weaving distances between interchanges as well as the improved operations.

Build Alternative

Mainline and Ramps

Opening Year 2024

As identified in Table 2.5.6, all 14 of the westbound SR-91 mainline segments are projected to operate at LOS C or better during a.m. peak periods under the 2024 Build Alternative. All of the westbound SR-91 mainline segments are projected to operate at LOS D or better during p.m. peak periods under the 2024 Build Alternative. With the additional freeway mainline capacity proposed under the 2024 Build Alternative, traffic operations within the study area are proposed to improve at four freeway segments over the 2024 No Build Alternative.

As identified in Table 2.5.7, of the five existing ramps, three ramps under the 2024 Build Alternative during the a.m. and p.m. peak periods are projected to operate at the same LOS as compared to the 2024 No Build Alternative. Of the five existing ramps, two ramps under the 2024 Build Alternative during the a.m. and p.m. peak periods are projected to remain operating at LOS F. One ramp under the 2024 Build Alternative during the a.m. and p.m. peak periods is projected to operate at LOS D, as compared to LOS C under the 2024 No Build Alternative. One ramp under the 2024 Build Alternative during the a.m. peak period is projected to operate at LOS C as compared to LOS D under the 2024 No Build Alternative. As identified in Table 2.5.8, the generally consistent LOS on the existing ramps result in weaving segments and merge/diverge segments under the 2024 Build Alternative operating at similar LOS as under the 2024 No Build Alternative.

Design Year 2044

As identified in Table 2.5.10, all 14 of the westbound SR-91 freeway mainline segments are projected to operate at LOS D or better during the a.m. and p.m. peak periods under the 2044 Build Alternative. With the additional freeway mainline capacity proposed under the 2044 Build Alternative, traffic operations within the study area are proposed to improve at four freeway segments under the 2044 No Build Alternative.

As identified in Table 2.5.11, of the five existing ramps, three ramps under the 2044 Build Alternative during the a.m. and p.m. peak periods are projected to operate at the same LOS as compared to the 2044 No Build Alternative. Of the five existing ramps, two ramps under the 2044 Build Alternative during the a.m. and p.m. peak periods are projected to remain operating at LOS F. One ramp under the 2044 Build Alternative during the a.m. and p.m. peak periods is projected to operate at LOS D, as compared to LOS C under the 2044 No Build Alternative. One ramp under the 2044 Build Alternative during the a.m. and p.m. peak periods is projected to operate at LOS C, as compared to LOS D under the 2044 No Build Alternative. As identified in Table 2.5.12, the generally consistent LOS on the existing ramps results in weaving segments and merge/diverge segments under the 2044 Build Alternative condition operating at similar LOS as under the 2044 No Build Alternative.

Intersections

Opening Year 2024

As shown in Table 2.5.9, under the 2024 Build Alternative, zero study area intersections are projected to operate at LOS E or F in the a.m. or p.m. peak period. Compared to the 2024 No Build Alternative, none of the intersections would experience an improvement in LOS in one or both peak periods under the 2024 Build Alternative; however, one intersection was identified where a minor degradation in LOS would be experienced. At the intersection of the Studebaker Road/westbound SR-91 off-ramp, the LOS in the a.m. peak period would degrade to LOS C from LOS B, and in the p.m. peak period would degrade to LOS B from LOS A under the 2024 Build Alternative condition. However, this intersection would not reach LOS E or F and, therefore, would not be considered impacted.

Design Year 2044

As shown in Table 2.5.13, under the 2044 Build Alternative, a total of two study area intersections are projected to operate at LOS E or F in one peak period. Compared to the 2044 No Build Alternative, none of the intersections would experience an improvement in LOS in one or both peak periods under the 2044 Build Alternative; however, one intersection was identified where a minor degradation in LOS would be experienced. At the intersection of the Studebaker Road/westbound SR-91 off-ramp, the LOS in the a.m. peak period would degrade to LOS C from LOS B and in the p.m. peak period would degrade to LOS B from LOS A under the 2024 Build Alternative. However, this intersection would not reach LOS E or F and therefore would not be considered impacted.

Bicycle and Pedestrian Facilities

New construction will be ADA compliant, per Caltrans standards. This includes curb ramps that will be replaced as part of the project. The Build Alternative will replace existing bicycle and pedestrian facilities and construct new bicycle and pedestrian facilities at the locations described below.

The following sidewalks are proposed where sidewalks do not currently exist:

- 1,293 ft along westbound Gridley Road between Aclare Street and Park Avenue
- 1,643 ft along westbound Bloomfield Avenue between the SR-91 eastbound off-ramp and 250 ft north of Lucas Street

The following bicycle facilities are proposed where bicycle facilities do not currently exist:

- 210 ft long bike lane in the northbound direction at the intersection of Pioneer Boulevard and the westbound SR-91 off-ramp
- 128 ft long bike lane in the northbound direction at the intersection of Norwalk Boulevard and the westbound SR-91 off-ramp
- 110 ft long bike lane in the southbound direction at the intersection of Bloomfield Avenue and the westbound SR-91 on-ramp/Lucas Street
- 100 ft long bike lane in the northbound direction at the intersection of Bloomfield Avenue and the westbound SR-91 on-ramp/Lucas Street

No Build Alternative

Mainline and Ramps

The freeway mainline segments are projected to operate at LOS D or better under the 2024 No Build Alternative based on the HCM results. Specific data for the 2024 No Build Alternative are provided in Table 2.5.6. Of the five weaving segments analyzed, two segments in the a.m. and p.m. peak periods are projected to operate at LOS F, as shown in Table 2.5.7. All five merge/diverge areas in the a.m. and p.m. peak periods would operate at LOS D or better under the 2024 No Build Alternative, as shown in Table 2.5.8.

The freeway mainline segments are projected to operate at LOS D or better under the 2044 No Build Alternative. Specific data for the 2044 No Build Alternative are provided in Table 2.5.10. Of the five weaving segments analyzed, two segments in the a.m. and p.m. peak periods are projected to operate at LOS F, as shown in Table

2.5.11. All five merge/diverge areas in the a.m. and p.m. peak periods would operate at LOS D or better under the 2024 No Build Alternative, as shown in Table 2.5.12.

Intersections

As shown in Table 2.5.9, under the 2024 No Build Alternative, zero study area intersections are projected to operate at LOS F.

As shown in Table 2.5.13, under the 2044 No Build Alternative, zero study area intersections are projected to operate at LOS F.

Bicycle and Pedestrian Facilities

None of the improvements proposed under the Build Alternative would be constructed under the No Build Alternative; therefore, no permanent impacts related to pedestrian or bicycle facilities would occur.

2.5.4 Avoidance, Minimization, and/or Mitigation Measures

Because the project will incorporate the project features outlined above in Section 2.5.3, no adverse impacts to transportation would occur. Therefore, no avoidance, minimization, and/or mitigation measures are required.

Table 2.5.1 Year 2016 Existing Conditions Freeway Mainline Level of Service Analysis – HCM Method

Segment Location	AM Peak Hour		PM Peak Hour	
	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
Westbound SR-91				
Carmenita Road Off-Ramp to 183rd Street On-Ramp	23.8	C	25.1	C
Artesia Boulevard Off-Ramp to Artesia Boulevard On-Ramp	22.9	C	24.4	C
Artesia Boulevard On-Ramp to Bloomfield Avenue On-Ramp	25.3	C	27.5	D
Norwalk Boulevard Off-Ramp to Norwalk Boulevard Loop On-Ramp	25.6	C	27.9	D
Norwalk Boulevard Loop On-Ramp to Norwalk Boulevard Direct On-Ramp	27.2	D	29.3	D
Pioneer Boulevard Off-Ramp to Pioneer Boulevard Loop On-Ramp	27.6	D	30.0	D
Pioneer Boulevard Loop On-Ramp to Pioneer Boulevard Direct On-Ramp	28.6	D	31.8	D
I-605 Off-Ramp (NB & SB) to Studebaker Road Off-Ramp	22.0	C	26.4	D
Studebaker Road Off-Ramp to I-605 NB/WB SR-91 Loop On-Ramp	19.6	C	25.0	C
I-605 NB/WB SR-91 Loop On-Ramp to I-605 SB/WB SR-91 On-Ramp	18.8	C	25.4	C

Source: Intueor Consulting, Inc. (2017).
I-605 = Interstate 605
HCM = Highway Capacity Manual
LOS = level of service
NB = northbound
pc/mi/ln = passengers car per mile per lane
SB = southbound
SR-91 = State Route 91
WB = westbound

Table 2.5.2 Year 2016 Existing Conditions Freeway Weaving Analysis

Segment Location	AM Peak Hour		PM Peak Hour	
	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
Westbound SR-91				
183rd Street On-Ramp to Artesia Boulevard Off-Ramp	26.7	C	27.7	C
Bloomfield Avenue On-Ramp to Norwalk Boulevard Off-Ramp	27.7	C	30.1	D
Norwalk Boulevard Direct On-Ramp to Pioneer Boulevard Off-Ramp	28.8	D	32.0	D
Pioneer Boulevard Direct On-Ramp to I-605 Off-Ramp (NB & SB)	–	**F**	–	**F**
Northbound I-605				
SR-91 WB On-Ramp to Alondra Boulevard Off-Ramp	–	**F**	–	**F**

Source: Intueor Consulting, Inc. (2017).
Note: Shaded cells indicate unsatisfactory LOS levels (i.e., LOS E or F).
I-605 = Interstate 605
LOS = level of service
NB = northbound
pc/mi/ln = passenger cars per mile per lane
SB = southbound
SR-91 = State Route 91
WB = westbound

Table 2.5.3 Year 2016 Existing Conditions Freeway Merge and Diverge Analysis

Junction	Merge/ Diverge	AM Peak Hour		PM Peak Hour	
		Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
Westbound SR-91					
Artesia Boulevard On-Ramp	Merge	21.8	C	24.4	C
Norwalk Boulevard Loop On-Ramp	Merge	22.1	C	23.2	C
Pioneer Boulevard Loop On-Ramp	Merge	22.3	C	24.7	C
Studebaker Road Off-Ramp	Diverge	25.6	C	29.0	D
I-605 NB On-Ramp	Merge	20.3	C	29.4	D

Source: Intueor Consulting, Inc. (2017).
I-605 = Interstate 605
LOS = level of service
NB = northbound
pc/mi/ln = passenger cars per mile per lane
SR-91 = State Route 91

Table 2.5.4 Year 2016 Existing Conditions Freeway Mainline Level of Service Analysis – Speed Method

Segment Location	AM Peak Hour		PM Peak Hour	
	Average Speed (mph)	LOS	Average Speed (mph)	LOS
Westbound SR-91				
Carmenita Road Off-Ramp to 183rd Street On-Ramp	40.0	D	30.0	**E**
183rd Street On-Ramp to Artesia Boulevard Off-Ramp	29.0	**F**	27.0	**F**
Artesia Boulevard Off-Ramp to Artesia Boulevard On-Ramp	25.0	**F**	22.0	**F**
Artesia Boulevard On-Ramp to Bloomfield Avenue On-Ramp	22.0	**F**	21.0	**F**
Bloomfield Avenue On-Ramp to Norwalk Boulevard Off-Ramp	20.0	**F**	22.0	**F**
Norwalk Boulevard Off-Ramp to Norwalk Boulevard Loop On-Ramp	28.0	**F**	32.0	**E**
Norwalk Boulevard Direct On-Ramp to Pioneer Boulevard Off-Ramp	39.0	D	41.0	D
Pioneer Boulevard Off-Ramp to Pioneer Boulevard Loop On-Ramp	33.0	**E**	37.0	D
Pioneer Boulevard Loop On-Ramp to Pioneer Boulevard Direct On-Ramp	37.0	D	46.0	C
Pioneer Boulevard Direct On-Ramp to I-605 Off-Ramp (NB & SB)	44.0	D	47.0	C
Northbound I-605				
SR-91 WB On-Ramp to Alondra Boulevard Off-Ramp	32.0	**E**	40.0	D

Source: Cambridge Systematics, Inc. (2017).
Note: Shaded cells indicate unsatisfactory LOS levels (i.e., LOS E or F).
I-605 = Interstate 605
LOS = level of service
mph = miles per hour
NB = northbound
SB = southbound
SR-91 = State Route 91
WB = westbound

Table 2.5.5 Year 2016 Existing Conditions Intersection Level of Service Analysis

Intersection	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Westbound SR-91				
WB SR-91 Off-Ramp/Artesia Boulevard	22.5	C	19.0	B
Bloomfield Avenue/WB SR-91 On-Ramp	10.5	B	8.4	A
Norwalk Boulevard/WB SR-91 Off-Ramp	9.9	A	6.9	A
Pioneer Boulevard/WB SR-91 Off-Ramp	7.2	A	6.4	A
Studebaker Road/WB SR-91 Off-Ramp	16.5	B	8.3	A
Northbound I-605				
NB I-605 Off-Ramp/Alondra Boulevard	25.1	C	38.9	D

Source: Intueor Consulting, Inc. (2017).
I-605 = Interstate 605
LOS = level of service
NB = northbound
sec/veh = seconds per vehicle
SR-91 = State Route 91
WB = westbound

Table 2.5.6 Freeway Mainline Level of Service Analysis – Year 2016 Existing Conditions vs. Year 2024 Opening Year

Segment Location	AM Peak-Hour LOS						PM Peak-Hour LOS					
	2016 Existing Conditions	2024 No Build	2024 Build	2024 Diamond Ramps Design Option	2024 Pioneer Blvd L-9 Design Option	2024 Pioneer Blvd WB Ramps/ 168th Alignment Design Option	2016 Existing Conditions	2024 No Build	2024 Build	2024 Diamond Ramps Design Option	2024 Pioneer Blvd L-9 Design Option	2024 Pioneer Blvd WB Ramps/ 168th Alignment Design Option
Westbound SR-91												
Carmenita Road Off-Ramp to 183rd Street On-Ramp	C	C	C	C	C	C	C	C	D	D	D	D
Artesia Boulevard Off-Ramp to Artesia Boulevard On-Ramp	C	C	C	C	C	C	C	C	D	D	D	D
Artesia Boulevard On-Ramp to Bloomfield Avenue On-Ramp	C	C	C	C	C	C	D	D	C	C	C	C
Norwalk Boulevard Off-Ramp to Norwalk Boulevard Loop On-Ramp	C	C	C	C	C	C	D	D	C	–	C	C
Norwalk Boulevard Loop On-Ramp to Norwalk Boulevard Direct On-Ramp	D	D	–	–	–	–	D	D	–	–	–	–
Norwalk Boulevard Off-Ramp to Norwalk Boulevard Direct On-Ramp	–	–	–	-	–	–	–	–	–	C	–	–
Pioneer Boulevard Off-Ramp to Pioneer Boulevard Loop On-Ramp	D	D	C	C	C	C	D	D	D	–	D	D
Pioneer Boulevard Loop On-Ramp to Pioneer Boulevard Direct On-Ramp	D	D	–	–	C	–	D	D	–	–	D	–
Pioneer Boulevard Off-Ramp to Pioneer Boulevard Direct On-Ramp	–	–	–	-	–	–	–	–	–	D	–	–
I-605 Off-Ramp (NB & SB) to Studebaker Road Off-Ramp	C	C	C	C	C	C	D	D	C	C	C	C
Studebaker Road Off-Ramp to Lane Drop	–	–	B	B	B	B	–	–	C	C	C	C
Studebaker Road Off-Ramp to I-605 NB/WB SR-91 Loop On-Ramp	C	C	–	–	–	–	C	C	–	–	–	–
Lane Drop to I-605 NB On-Ramp	–	–	C	C	C	C	–	–	D	D	D	D
I-605 NB/WB SR-91 Loop On-Ramp to I-605 SB/WB SR-91 On-Ramp	C	C	C	C	C	C	C	C	D	D	D	D

Source: Intueor Consulting, Inc. (2017).
I-605 = Interstate 605 LOS = level of service NB = northbound SB = southbound SR-91 = State Route 91 WB = westbound

Table 2.5.7 Freeway Weaving Analysis – Year 2016 Existing Conditions vs. Year 2024 Opening Year

Segment Location	AM Peak-Hour LOS						PM Peak-Hour LOS					
	2016 Existing Conditions	2024 No Build	2024 Build	2024 Diamond Ramps Design Option	2024 Pioneer Blvd L-9 Design Option	2024 Pioneer Blvd WB Ramps/ 168th Alignment Design Option	2016 Existing Conditions	2024 No Build	2024 Build	2024 Diamond Ramps Design Option	2024 Pioneer Blvd L-9 Design Option	2024 Pioneer Blvd WB Ramps/ 168th Alignment Design Option
Westbound SR-91												
183rd Street On-Ramp to Artesia Boulevard Off-Ramp	C	C	D	D	D	D	C	C	D	D	D	D
Bloomfield Avenue On-Ramp to Norwalk Boulevard Off-Ramp	D	D	C	C	C	C	D	D	D	D	D	D
Norwalk Boulevard Direct On-Ramp to Pioneer Boulevard Off-Ramp	D	D	D	D	D	D	D	D	D	D	D	D
Pioneer Boulevard Direct On-Ramp to I-605 Off-Ramp (NB & SB)	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**
Northbound I-605												
SR-91 WB On-Ramp to Alondra Boulevard Off-Ramp	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**

Source: Intueor Consulting, Inc. (2017).
Note: Shaded cells indicate unsatisfactory LOS levels (i.e., LOS E or F).
I-605 = Interstate 605 LOS = level of service NB = northbound SB = southbound SR-91 = State Route 91 WB = westbound

Table 2.5.8 Freeway Merge and Diverge Analysis – Year 2016 Existing Conditions vs. Year 2024 Opening Year

Junction	Merge/Diverge	AM Peak-Hour LOS						PM Peak-Hour LOS					
		2016 Existing Conditions	2024 No Build	2024 Build	2024 Diamond Ramps Design Option	2024 Pioneer Blvd L-9 Design Option	2024 Pioneer Blvd WB Ramps/ 168th Alignment Design Option	2016 Existing Conditions	2024 No Build	2024 Build	2024 Diamond Ramps Design Option	2024 Pioneer Blvd L-9 Design Option	2024 Pioneer Blvd WB Ramps/ 168th Alignment Design Option
Westbound SR-91													
Artesia Boulevard On-Ramp	Merge	C	C	C	C	C	C	C	C	D	D	D	D
Norwalk Boulevard Loop On-Ramp	Merge	C	C	–	–	–	–	C	C	–	–	–	–
Pioneer Boulevard Loop On-Ramp	Merge	C	C	–	–	C	–	C	C	–	–	C	–
Studebaker Road Off-Ramp	Diverge	C	C	C	C	C	C	D	D	C	C	C	C
I-605 NB On-Ramp	Merge	C	C	C	C	C	C	D	D	D	D	D	D

Source: Intueor Consulting, Inc. (2017).
I-605 = Interstate 605 LOS = level of service NB = northbound SR-91 = State Route 91

Table 2.5.9 Intersection Level of Service Analysis – Year 2016 Existing Conditions vs. Year 2024 Opening Year

Junction	AM Peak-Hour LOS						PM Peak-Hour LOS					
	2016 Existing Conditions	2024 No Build	2024 Build	2024 Diamond Ramps Design Option	2024 Pioneer Blvd L-9 Design Option	2024 Pioneer Blvd WB Ramps/ 168th Alignment Design Option	2016 Existing Conditions	2024 No Build	2024 Build	2024 Diamond Ramps Design Option	2024 Pioneer Blvd L-9 Design Option	2024 Pioneer Blvd WB Ramps/ 168th Alignment Design Option
Westbound SR-91												
WB SR-91 Off-Ramp/Artesia Boulevard	C	B	B	B	B	B	B	B	B	B	B	B
Bloomfield Avenue/WB SR-91 On-Ramp	B	B	B	B	B	B	B	B	B	B	B	B
Norwalk Boulevard/WB SR-91 Off-Ramp	A	A	–	–	–	–	A	A	–	–	–	–
Norwalk Boulevard/WB SR-91 On-Off Ramp	–	–	C	A	C	C	–	–	B	A	B	B
Pioneer Boulevard/WB SR-91 Off-Ramp	A	A	–	–	–	–	A	A	–	–	–	–
Pioneer Boulevard/WB SR-91 On-Off Ramp	–	–	C	B	B	C	–	–	C	A	B	C
Studebaker Road/WB SR-91 Off-Ramp	B	B	C	C	C	C	A	A	B	B	B	B
Northbound I-605												
NB I-605 Off-Ramp/Alondra Boulevard	C	C	C	C	C	C	D	C	C	C	C	C

Source: Intueor Consulting, Inc. (2017).
I-605 = Interstate 605
LOS = level of service
NB = northbound
SR-91 = State Route 91
WB = westbound

Table 2.5.10 Freeway Mainline Level of Service Analysis – Year 2016 Existing Conditions vs. Year 2044 Horizon Year

Segment Location	AM Peak-Hour LOS						PM Peak-Hour LOS					
	2016 Existing Conditions	2044 No Build	2044 Build	2044 Diamond Ramps Design Option	2024 Pioneer Blvd L-9 Design Option	2024 Pioneer Blvd WB Ramps/ 168th Alignment Design Option	2016 Existing Conditions	2044 No-Build	2044 Build	2044 Diamond Ramps Design Option	2024 Pioneer Blvd L-9 Design Option	2024 Pioneer Blvd WB Ramps/ 168th Alignment Design Option
Westbound SR-91												
Carmenita Road Off-Ramp to 183rd Street On-Ramp	C	C	C	C	C	C	C	C	D	D	D	D
Artesia Boulevard Off-Ramp to Artesia Boulevard On-Ramp	C	C	C	C	C	C	C	C	D	D	D	D
Artesia Boulevard On-Ramp to Bloomfield Avenue On-Ramp	C	C	C	C	C	C	D	D	C	C	C	C
Norwalk Boulevard Off-Ramp to Norwalk Boulevard Loop On-Ramp	C	D	C	–	C	C	D	D	D	–	D	D
Norwalk Boulevard Loop On-Ramp to Norwalk Boulevard Direct On-Ramp	D	D	–	–	–	–	D	D	–	–	–	–
Norwalk Boulevard Off-Ramp to Norwalk Boulevard Direct On-Ramp	–	–	–	C	–	–	–	–	–	D	–	–
Pioneer Boulevard Off-Ramp to Pioneer Boulevard Loop On-Ramp	D	D	C	–	C	C	D	D		–	D	D
Pioneer Boulevard Loop On-Ramp to Pioneer Boulevard Direct On-Ramp	D	D	–	–	D	–	D	D	–	–	D	–
Pioneer Boulevard Off-Ramp to Pioneer Boulevard Direct On-Ramp	–	–	–	C	–	–	–	–	–	D	–	–
I-605 Off-Ramp (NB & SB) to Studebaker Road Off-Ramp	C	C	C	C	C	C	D	D	C	C	C	C
Studebaker Road Off-Ramp to Lane Drop	–	–	C	C	C	C	–	–	C	C	C	C
Studebaker Road Off-Ramp to I-605 NB/WB SR-91 Loop On-Ramp	C	C	–	–	–	–	C	C	–	–	–	–
Lane Drop to I-605 NB On-Ramp	–	–	C	C	C	C	–	–	D	D	D	D
I-605 NB/WB SR-91 Loop On-Ramp to I-605 SB/WB SR-91 On-Ramp	C	C	C	C	C	C	C	C	D	D	D	D

Source: Intueor Consulting, Inc. (2017).
I-605 = Interstate 605
LOS = level of service
NB = northbound
SB = southbound
SR-91 = State Route 91
WB = westbound

Table 2.5.11 Freeway Weaving Analysis – Year 2016 Existing Conditions vs. Year 2044 Horizon Year

Segment Location	AM Peak-Hour LOS						PM Peak-Hour LOS					
	2016 Existing Conditions	2044 No Build	2044 Build	2044 Diamond Ramps Design Option	2024 Pioneer Blvd L-9 Design Option	2024 Pioneer Blvd WB Ramps/ 168th Alignment Design Option	2016 Existing Conditions	2044 No Build	2044 Build	2044 Diamond Ramps Design Option	2024 Pioneer Blvd L-9 Design Option	2024 Pioneer Blvd WB Ramps/ 168th Alignment Design Option
Westbound SR-91												
183rd Street On-Ramp to Artesia Boulevard Off-Ramp	C	C	D	D	D	D	C	D	D	D	D	D
Bloomfield Avenue On-Ramp to Norwalk Boulevard Off-Ramp	C	D	C	C	C	C	D	D	D	D	D	D
Norwalk Boulevard Direct On-Ramp to Pioneer Boulevard Off-Ramp	D	D	D	D	D	D	D	D	D	D	D	D
Pioneer Boulevard Direct On-Ramp to I-605 Off-Ramp (NB & SB)	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**
Northbound I-605												
SR-91 WB On-Ramp to Alondra Boulevard Off-Ramp	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**

Source: Intueor Consulting, Inc. (2017).
Note: Shaded cells indicate unsatisfactory LOS levels (i.e., LOS E or F).
I-605 = Interstate 605 SB = southbound
LOS = level of service SR-91 = State Route 91
NB = northbound WB = westbound

Table 2.5.12 Freeway Merge and Diverge Analysis – Year 2016 Existing Conditions vs. Year 2044 Horizon Year

Junction	Merge/Diverge	AM Peak-Hour LOS						PM Peak-Hour LOS					
		2016 Existing Conditions	2044 No Build	2044 Build	2044 Diamond Ramps Design Option	2024 Pioneer Blvd L-9 Design Option	2024 Pioneer Blvd WB Ramps/ 168th Alignment Design Option	2016 Existing Conditions	2044 No Build	2044 Build	2044 Diamond Ramps Design Option	2024 Pioneer Blvd L-9 Design Option	2024 Pioneer Blvd WB Ramps/ 168th Alignment Design Option
Westbound SR-91													
Artesia Boulevard On-Ramp	Merge	C	C	C	C	C	C	C	C	D	D	D	D
Norwalk Boulevard Loop On-Ramp	Merge	C	C	–	–	–	–	C	C	–	–	–	–
Pioneer Boulevard Loop On-Ramp	Merge	C	C	–	–	C	–	C	C	–	–	C	–
Studebaker Road Off-Ramp	Diverge	C	C	C	C	C	C	D	D	C	C	C	C
I-605 NB On-Ramp	Merge	C	C	C	C	C	C	D	D	D	D	D	D

Source: Intueor Consulting, Inc. (2017).
I-605 = Interstate 605 NB = northbound
LOS = level of service SR-91 = State Route 91

Table 2.5.13 Intersection Level of Service Analysis – Year 2016 Existing Conditions vs. Year 2044 Horizon Year

Junction	AM Peak-Hour LOS						PM Peak-Hour LOS					
	2016 Existing Conditions	2044 No Build	2044 Build	2044 Diamond Ramps Design Option	2024 Pioneer Blvd L-9 Design Option	2024 Pioneer Blvd WB Ramps/ 168th Alignment Design Option	2016 Existing Conditions	2044 No Build	2044 Build	2044 Diamond Ramps Design Option	2024 Pioneer Blvd L-9 Design Option	2024 Pioneer Blvd WB Ramps/ 168th Alignment Design Option
Westbound SR-91												
WB SR-91 Off-Ramp/Artesia Boulevard	C	B	B	B	B	B	B	B	B	B	B	B
Bloomfield Avenue/WB SR-91 On-Ramp	B	B	B	B	B	B	B	B	B	B	B	B
Norwalk Boulevard/WB SR-91 Off-Ramp	A	A	–	–	–	–	A	A	–	–	–	–
Norwalk Boulevard/WB SR-91 On-Off Ramp	–	–	C	B	C	C	–	–	B	A	B	B
Pioneer Boulevard/WB SR-91 Off-Ramp	A	A	–	–	–	–	A	A	–	–	–	–
Pioneer Boulevard/WB SR-91 On-Off Ramp	–	–	C	B	B	C	–	–	C	B	B	C
Studebaker Road/WB SR-91 Off-Ramp	B	B	C	C	C	C	A	A	B	B	B	B
Northbound I-605												
NB I-605 Off-Ramp/Alondra Boulevard	C	C	C	C	C	C	D	C	C	C	C	C

Source: Intueor Consulting, Inc. (2017).
I-605 = Interstate 605 SR-91 = State Route 91
LOS = level of service WB = westbound
NB = northbound

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2.6 Visual/Aesthetics

2.6.1 Regulatory Setting

The National Environmental Policy Act (NEPA) of 1969, as amended, establishes that the federal government use all practicable means to ensure all Americans safe, healthful, productive, and *aesthetically* (emphasis added) and culturally pleasing surroundings (42 United States Code [USC] 4331[b][2]). To further emphasize this point, the Federal Highway Administration (FHWA), in its implementation of NEPA (23 USC 109[h]), directs that final decisions on projects are to be made in the best overall public interest taking into account adverse environmental impacts, including among others, the destruction or disruption of aesthetic values.

The California Environmental Quality Act (CEQA) establishes that it is the policy of the state to take all action necessary to provide the people of the state "with … enjoyment of *aesthetic*, natural, scenic and historic environmental qualities" (CA Public Resources Code [PRC] Section 21001[b]).

2.6.2 Affected Environment

The information in this section is based on the *Visual Impact Assessment* (VIA) (2018) and the General Plans of the Cities of Artesia and Cerritos. The VIA follows the recommended methodology in the publication *Visual Impact Assessment for Highway Projects* (FHWA 2015).

2.6.2.1 Visual Setting

The proposed project is located on State Route 91 (SR-91) between Shoemaker Avenue and the Interstate 605 (I-605) interchange, and on northbound I-605 at the Alondra Boulevard off-ramp in the cities of Artesia and Cerritos, Los Angeles County, California. The project is located in the central portion of the Los Angeles Basin in Southern California, approximately 8.5 miles (mi) north of the Pacific Ocean. The landscape is characterized by developed land and an extensive transportation network. The land uses within the corridor are primarily urban residential and transportation uses, but also include areas of commercial and recreational uses.

The study area is on a lowland coastal plain which slopes gradually southward and westward toward the Pacific Ocean. It is a relatively flat alluvial plain with ground surface elevations along the corridor ranging from approximately 52 feet (ft) above mean sea level (amsl) near Shoemaker Avenue to approximately 70 ft amsl at the

SR-91 and I-605 interchange. The study area is urban in character. There are no distinct natural open spaces or natural features commonly found in designated scenic highways, such as undulating landforms or immediate open views of lakes, mountains, or preserved vegetation. As a result, existing views within and surrounding the study area are limited.

No scenic resources have been identified for this project, and no scenic corridors or designated scenic highways (specifically, SR-91) are located within the study area.

The City of Artesia General Plan (as amended in 2008) Circulation Element includes the following policies to enhance aesthetics and imagery of the city of Artesia's circulation network that are relevant to the proposed project:

Community Policy CIR 2.1: Provide landscaped medians and greenbelts along major arterials, highways, and freeways where economically feasible.

Policy Action CIR 2.1.4: Work with Caltrans to ensure that sound walls along State facilities are landscaped and maintained with plant materials.

Policy Action CIR 2.1.5: Maintain and replace street trees as needed to achieve their aesthetic purpose and avoid damage to streets and sidewalks.

The City of Cerritos General Plan's (2004) Land Use Element, Community Design Element, and Conservation Element include the following policies to protect visual resources that are relevant to the proposed project:

Policy LU-16.1: Work with Caltrans to provide and maintain an attractive freeway environment in Cerritos, including access ramps and freeway interchanges.

Policy CD-1.1: Develop a comprehensive gateway improvement program to select significant gateways along major arterials for improvements including monument-type "City of Cerritos" identification signs, special enhanced landscaping and paving, public art and unique private development standards.

Policy CD-1.2: Cooperate with Caltrans to improve freeway landscaping, especially at the on- and off-ramps and at the I-605/SR-91 interchange.

Policy CON-6.1: Enforce the City's Tree Preservation Ordinance in order to preserve the City's existing urban forest.

In addition to the policies listed above, the City of Cerritos has a tree protection ordinance as part of its municipal code. Sections 9.75.190 (City Tree Removal) and 9.75.200 (Protection of City Trees) of the Cerritos Municipal Code require all tree removal and tree protection activities to be conducted in compliance with City of Cerritos standards. Cerritos Municipal Code Sections 9.75.190 and 9.75.200 respectively prohibit the removal of City trees unless authorized by the City of Cerritos and require City tree removal activity to be conducted by City of Cerritos personnel. In addition, Cerritos Municipal Code Section 9.75.200 requires all City trees, shrubs, or plants in the construction vicinity to be properly handled and supported to prevent injury to the tree.

2.6.2.2 Visual Assessment Unit

The project corridor can be treated as a single landscape unit due to the lack of off-site views (variation in land form and land cover) and homogenous nature character of the project area at the SR-91/I-605 interchange and as SR-91 traverses through the landscape. Although there are multiple land uses within the Visual Assessment Unit (VAU), all are within similar proximity to the project limits and have similar views to the project site. Figure 2.6-1 depicts the project limits of the Build Alternative and the associated key views used to assess potential visual impacts as a result of project implementation. The characteristics of the landscape unit identified are consistent throughout the project limits, comprised primarily of a built environment, such as commercial, industrial, residential, parks, and highway components. Though the built environment is complemented with other features, such as landscaping, to soften the appearance of structures, reduce scale, and provide needed visual diversity to all general viewer groups, there are no outstanding off-site features closely oriented to the project limits of the Build Alternative. The following single VAU has been identified.

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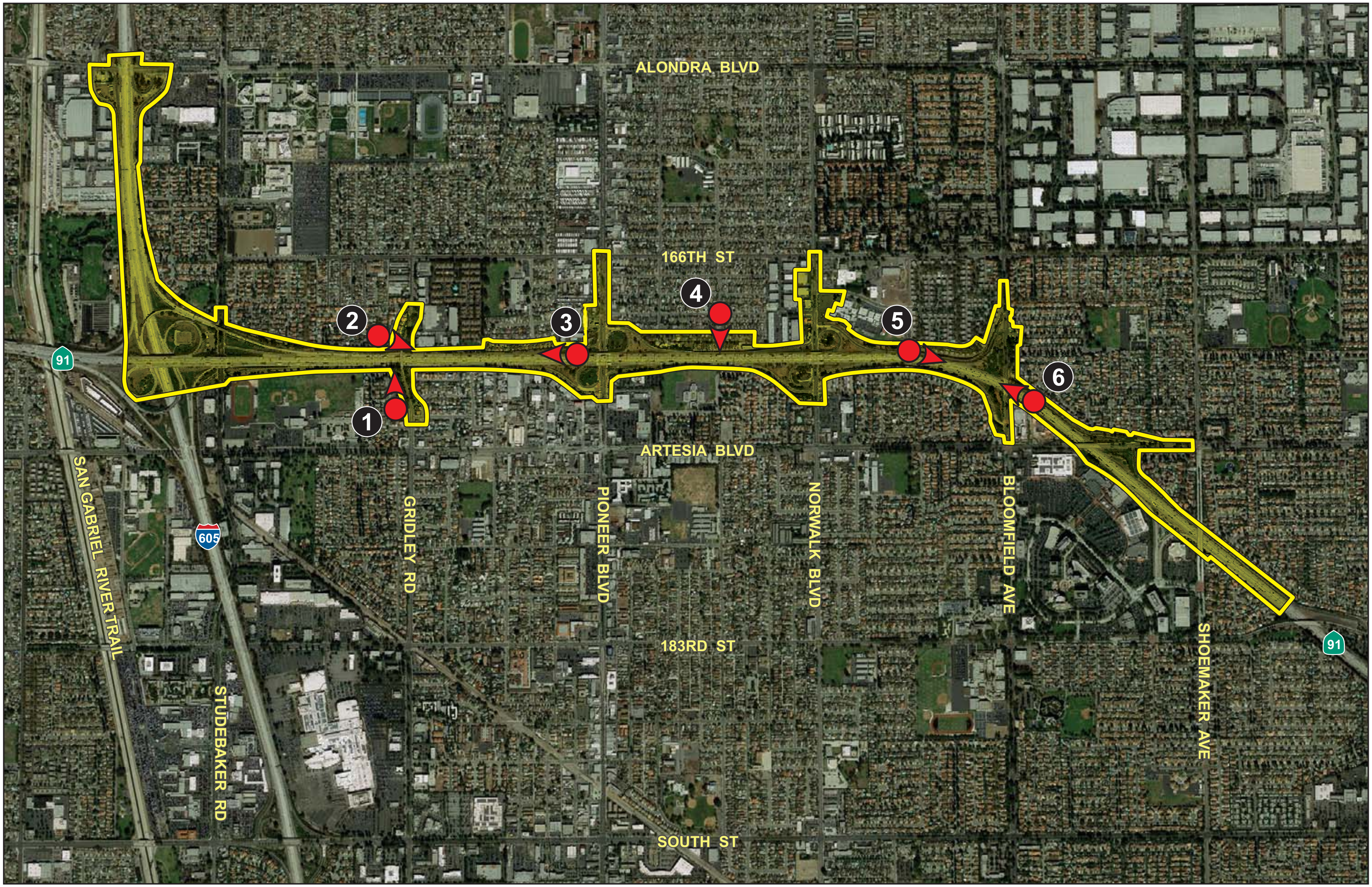

FIGURE 2.6-1

N

Project Site
Direction of Photo
Key View Location
1 Key View Number

SOURCE: Google Earth

Westbound SR-91 Improvement Project

Project Limits and Key View Locations

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Visual Assessment Unit 1

Visual Assessment Unit 1 (VAU1) is located in the northern portion of the city of Artesia and in the eastern and western portions of the city of Cerritos. VAU1 is located within a highly developed area and is surrounded by residential, commercial, recreational, and institutional uses to the north; residential uses to the east; residential, commercial, institutional, light industrial, and transportation (I-605) uses to the south; and residential, commercial, recreational, and light industrial uses to the west of VAU1. The landscape in VAU1 is generally characterized by surrounding urban development, transportation uses, and other man-made features. Background views of the Angeles National Forest hillsides and ridgelines to the north are afforded throughout VAU1. The relatively flat topography of VAU1 provides for visually uniform views for viewers within the study area. Vegetation within VAU1 generally consists of ornamental landscaping, consisting primarily of hottentot-fig (*Carpobrotus edulis*), as well as mature pine (*Pinus* sp.) and eucalyptus (*Eucalyptus* sp.) trees.

2.6.2.3 Key Views

Because it is not feasible to analyze all the views in which the Build Alternative would be seen, it is necessary to select a number of key views associated with VAU1 that would most clearly demonstrate the change in the project’s visual resources. Key views also represent the viewer groups that have the highest potential to be affected by the Build Alternative, considering visual exposure and visual sensitivity.

The location and direction of each key view is shown on Figure 2.6-1. Descriptions of the existing key views with further details are provided below and on Figures 2.6-2 through 2.6-7.

Key View 1

Key View 1 is located in the western portion of VAU1 on the south side of SR-91 at Ecology Park in the city of Cerritos. Key View 1 represents a typical northern view as viewed by Ecology Park visitors. Key View 1 provides a view of the Gridley Road/SR-91 overcrossing structure.

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Direction of Photo
Key View Location
1 Key View Number

FIGURE 2.6-2

Westbound SR-91 Improvement Project
Key View 1 - Existing Condition

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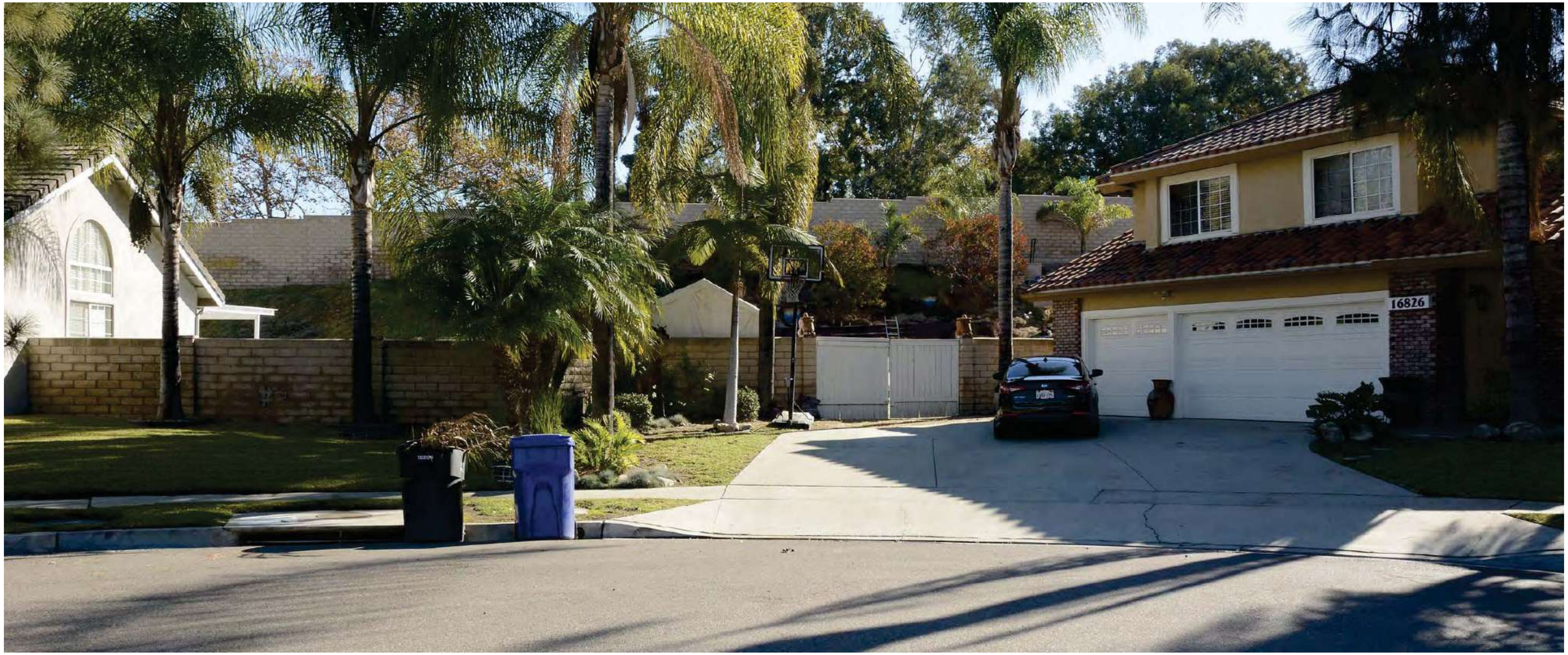

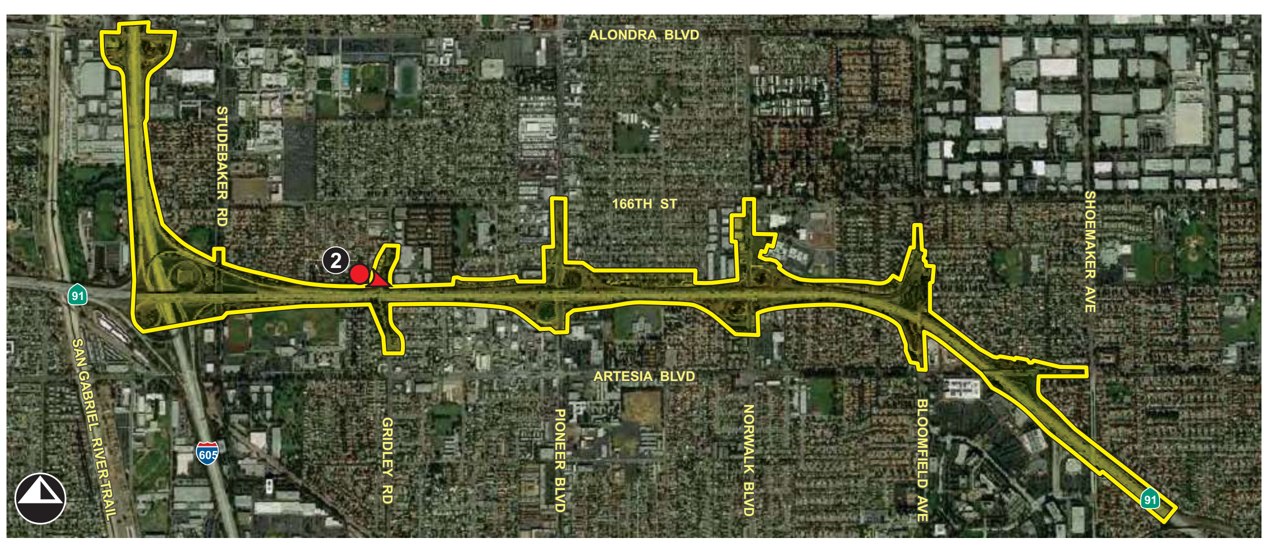

Direction of Photo
Key View Location
1 Key View Number

FIGURE 2.6-3

Westbound SR-91 Improvement Project
Key View 2 - Existing Condition

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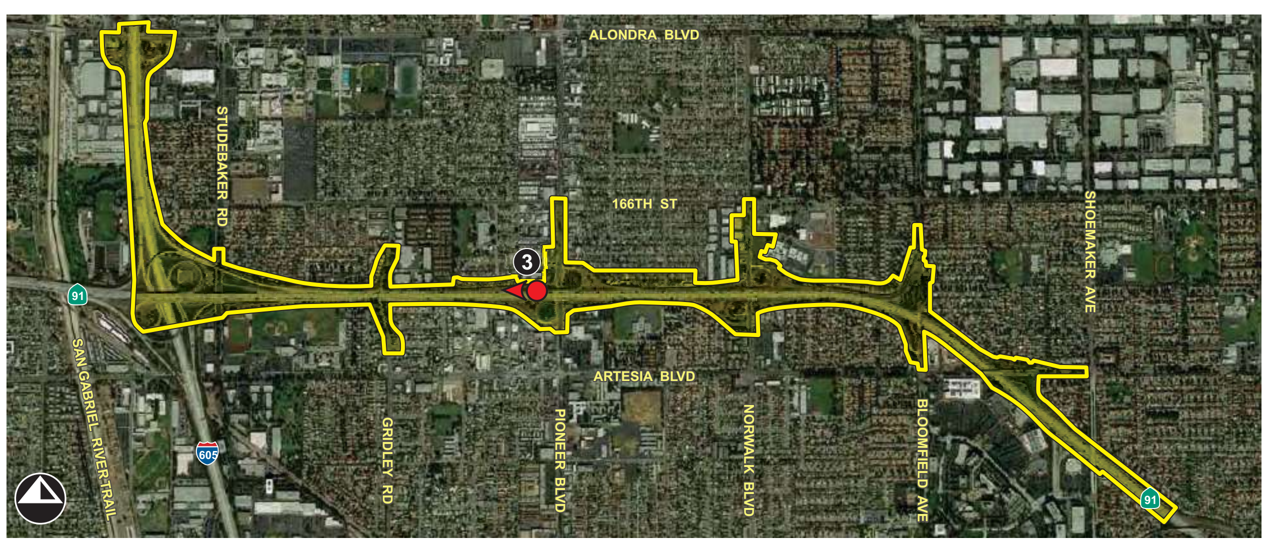

Direction of Photo
Key View Location
1 Key View Number

FIGURE 2.6-4

Westbound SR-91 Improvement Project

Key View 3 - Existing Condition

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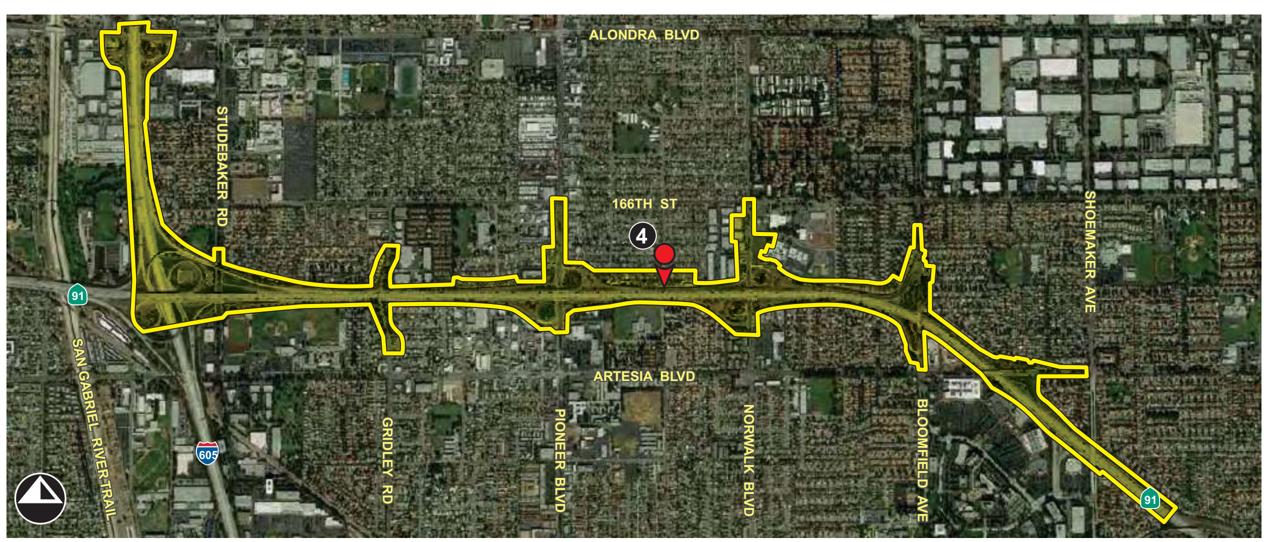

Direction of Photo
Key View Location
1 Key View Number

FIGURE 2.6-5

Westbound SR-91 Improvement Project
Key View 4 - Existing Condition

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Direction of Photo
Key View Location
1 Key View Number

FIGURE 2.6-6

Westbound SR-91 Improvement Project
Key View 5 - Existing Condition

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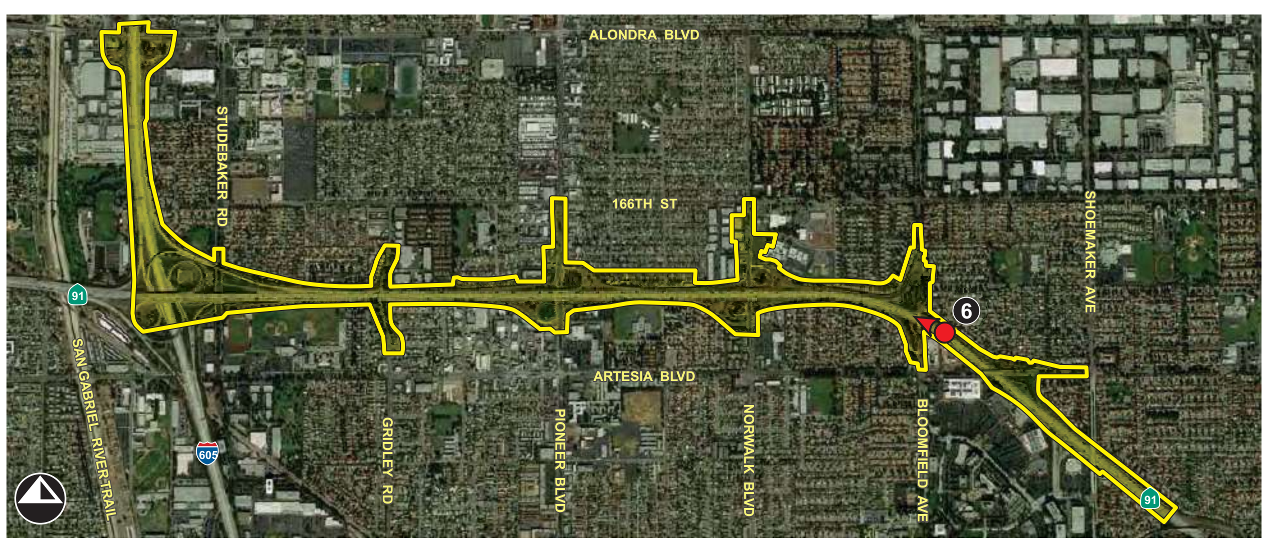

Direction of Photo
Key View Location
Key View Number

FIGURE 2.6-7

Westbound SR-91 Improvement Project
Key View 6 - Existing Condition

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Key View 2

Key View 2 is located in the western portion of VAU1 on the north side of SR-91 along Sunny Ridge Court in the city of Cerritos. Key View 2 represents a typical eastern view from residential uses along Sunny Ridge Court. Key View 2 provides a view of the Gridley Road/SR-91 overcrossing structure as seen from residential uses along Sunny Ridge Court.

Key View 3

Key View 3 is located in the central portion of VAU1 along the westbound lanes of SR-91 in the city of Artesia. Key View 3 represents a typical view from westbound SR-91 motorists.

Key View 4

Key View 4 is located in the central portion of VAU1 on the north side of SR-91 along Elaine Avenue in the city of Artesia. Key View 4 represents a typical southern view from residential uses, motorists, bicyclists, and pedestrians along Elaine Avenue.

Key View 5

Key View 5 is located in the eastern portion of VAU1 near the southern boundary of the Cerritos Villas residential community in the city of Cerritos. Key View 5 represents an eastern view from residential uses bordering SR-91 at the Cerritos Villas residential community.

Key View 6

Key View 6 is located in the eastern portion of VAU1 along the westbound lanes of SR-91 in the city of Cerritos, just east of the Bloomfield Avenue/SR-91 overcrossing structure. Key View 6 represents a typical view from westbound SR-91 motorists. Key View 6 provides a view of the Bloomfield Avenue/SR-91 overcrossing structure.

2.6.2.4 Visual Character

Visual character includes attributes such as form, line, color, texture, and is used to describe, not evaluate a key view; that is, these attributes are considered neither positive nor negative. However, a change in visual character can be evaluated in the context of the viewer response to that change. Changes in visual character can be identified by how visually compatible a proposed project would be with the existing condition by using visual character attributes as indicators. For this project, the following attributes were considered:

- **Form:** Visual mass or shape
- **Line:** Edges or linear definition
- **Color:** Reflective brightness (light, dark) and hue (red, green)
- **Texture:** Surface coarseness
- **Dominance:** Position, size, or contrast
- **Scale:** Apparent size as it relates to the surroundings
- **Diversity:** A variety of visual patterns
- **Continuity:** Uninterrupted flow of form, line, color, or textural pattern

The surrounding uses include residential, commercial, recreational, institutional, and light industrial. On-site uses consist of freeway (SR-91 and I-605), local roadway crossings (Gridley Road, Pioneer Boulevard, Norwalk Boulevard, and Bloomfield Avenue), and residential and commercial areas. Existing visual resources visible within the project viewshed include the hillsides and ridgelines of the Angeles National Forest to the north of the study area. Overall, the distant views toward these hills and ridgelines provide some visual diversity in form, line, and color compared to the flat topography within VAU1. Vegetation within the area generally consists of ornamental landscaping, consisting primarily of hottentot-fig (*Carpobrotus edulis*), mature pine (*Pinus* sp.), and eucalyptus (*Eucalyptus* sp.) trees. These various vegetation types generally vary in color (brown, green, and pink) and height (from grasses/shrubs to tall standing trees).

Visual mass is dominated by buildings, bridges, walls, other freeway components, and landscaping, which all contribute to the uniformity of VAU1’s visual character. The existing alignment of SR-91 is very linear from a bird’s eye view and the same is true from a motorist’s perspective. The only occurrence in which SR-91 may slightly deviate from this linearity is at the ramps and connectors. The walls, buildings, and other freeway components that protrude perpendicularly from the ground are also linear and angular and bound the edges of the freeway.

Since VAU1 is situated in an urbanized environment, viewer groups are exposed to artificial light at night. During the day, motorists are exposed to glare from reflective surfaces, such as windows and metallic details on cars travelling on the roadway.

The existing textural pattern of VAU1 has typical characteristics of an urban environment. Concrete and vegetation are the primary visual surface treatments used throughout VAU1.

2.6.2.5 Visual Quality

Visual quality is evaluated by identifying the vividness, intactness, and unity present within VAU1. Public attitudes validate the assessed level of quality and predict how changes within VAU1 can affect these attitudes. This process helps identify specific methods for addressing each visual impact that may occur as a result of the Build Alternative. The three criteria for evaluating visual quality are defined below:

- Vividness is the extent to which the landscape is memorable and is associated with distinctive, contrasting, and diverse visual elements.
- Intactness is the integrity of visual features in the landscape and the extent to which the existing landscape is free from non-typical visual intrusions.
- Unity is the extent to which all visual elements combine to form a coherent, harmonious visual pattern.

Due to the developed nature and relatively flat topography of VAU1, the vividness in VAU1 is low. The only visual resource within VAU1 is the Angeles National Forest, approximately 25 mi to the north. However, due to the developed nature of the study area and visual obstructions (noise barriers, freeway signage, power lines, etc.), the intactness of northerly views to the Angeles National Forest is low. VAU1 is fairly unified, as a combination of low-lying development (one to two stories in height) and the horizontal alignment of the freeway creates a sense of linear form. The existing visual quality of VAU1 can be considered as low.

2.6.2.6 Viewer Groups

The population affected by the Build Alternative is composed of viewers. Viewers are people whose views of the landscape may be altered by the Build Alternative—either because the landscape itself has changed or their perception of the landscape has changed.

There are two major types of viewer groups for highway projects: highway neighbors (views to the project area) and highway users (views from the project area). Highway neighbors are people who have daily or routine views of the road. For this project, the following highway neighbors were considered:

- Residential neighbors
- Commercial and light industrial neighbors
- Recreational neighbors
- Institutional neighbors

Highway users are people who have daily or routine views from the road. For this project, the following highway users were considered:

- Freeway motorist users
- Local roadway users

2.6.2.7 Viewer Response

Viewer response is a measure or prediction of the viewer's reaction to changes in the visual environment. Each viewer group has its own particular level of viewer exposure and viewer sensitivity, resulting in distinct and predictable visual concerns for each group, which, in turn, help to predict the group's responses to visual changes.

Viewer Exposure

Viewer exposure is a measure of the viewer's ability to see a particular object. Viewer exposure has three attributes: location, quantity, and duration. Location relates to the position of the viewer in relationship to the object being viewed. The nearer viewers are to the object, the greater the exposure. Quantity refers to how many people see the object. The more people who can see an object or the greater frequency at which an object is seen, the greater its exposure to viewers. Duration refers to how long a viewer is able to keep an object in view. The longer an object can be kept in view, the greater the exposure. High viewer exposure helps predict viewers that could have a response to a visual change.

- **Residential Viewers:** Several residential uses to the north and south of SR-91 in the study area have direct views of the project limits. These residents would have direct, long-duration views to project changes and would likely have a high concern for the Build Alternative and its effect on views from their homes and neighborhood.
- **Commercial and Light Industrial Viewers:** Views of the project limits are afforded from light industrial uses located to the northeast of the Gridley Road overcrossing structure of SR-91 and northwest of the SR-91/Norwalk Boulevard interchange; commercial uses are positioned to the northwest of the SR-91/Pioneer Boulevard interchange, northwest of the SR-91/Norwalk Boulevard interchange, and at the intersection of Bloomfield Avenue and Artesia Boulevard. These uses attract hundreds of visitors daily. Viewers include employees and customers walking to and from the parking lot to the commercial and light industrial buildings. These users would have direct views of the project limits. However, the duration of views from these users are considered to be short, as

commercial and light industrial patrons are not typically visually engaged in their surroundings. These users are usually more focused on getting to and from their destination.

- **Recreational Viewers:** Ecology Park, Reservoir Hill Park, and A.J. Padelford Park adjoin SR-91 to the south, north, and north, respectively. These parks serve the local communities (the cities of Cerritos and Artesia), and contain areas for barbecuing, picnic tables, children's playgrounds, basketball courts, and bathrooms. Visitors at these recreational park facilities would have direct views of the project limits. The duration of views from recreational park visitors would be short to moderate.
- **Institutional Viewers:** Gahr High School is located to the south of SR-91 (between Studebaker Road and Gridley Road), and Tracy High School is located to the northeast of the SR-91/Norwalk Boulevard interchange. Employees and students at Gahr High School and Tracy High School would have recurrent views of the project limits, as these viewers visit their respective schools on a daily basis (typically Monday through Friday). Although most of their time is spent inside, employees and students at Gahr High School and Tracy High School have recurring, long-duration views of the project limits.
- **Freeway Motorist Viewers:** As noted above, SR-91 provides commuters, haulers, and local residents several connections to the Greater Los Angeles metropolitan area. This viewer group is composed of a large quantity of viewers, as existing average daily traffic (ADT) volumes along SR-91 in the study area range between approximately 255,000 and 288,000 vehicles.[1] Daily commuters may have an increased awareness of views from the road due to the amount of time spent on the freeway (near the project area) each day. Drivers traveling in congested traffic conditions would likely perceive detailed views of the project elements for longer durations of time. Drivers traveling at normal freeway speeds usually focus attention on long-range non-peripheral views and would have short durations of views to project elements.
- **Local Roadway Viewers:** Local roadways in the study area with views of the project limits include Studebaker Road, Gridley Road, Pioneer Boulevard, Elaine Avenue, Norwalk Boulevard, Bloomfield Avenue, and Artesia Boulevard. These roadways provide direct views of the project limits from motorists, bicyclists, and pedestrians. This viewer group is composed of a low-to-medium quantity of

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[1] California Department of Transportation (Caltrans). Traffic Counts. Website: http://traffic-counts.dot.ca.gov/ (accessed January 4, 2018).

viewers, as ADT volumes range from a low of 7,900 along Gridley Road to 53,000 along Bloomfield Avenue (in the study area).[1,2] Drivers traveling along these roadways would likely have detailed views of the project elements for short durations of time. As such, local roadway travelers would have an increased awareness of views to the project changes.

Viewer Sensitivity

Viewer sensitivity is a measure of the viewer's recognition of a particular object. It has three attributes: activity, awareness, and local values. Activity relates to the preoccupation of viewers—whether they are preoccupied, thinking of something else, or truly engaged in observing their surroundings. The more viewers actually observe their surroundings, the more sensitivity they will have for changes to those visual resources. Awareness relates to the focus of the view—whether the focus is wide and the view general or whether the focus is narrow and the view specific. The more specific the awareness, the more sensitive a viewer is to change. Local values and attitudes can also affect viewer sensitivity. If the viewer group values aesthetics in general or if a specific visual resource has been protected by a local, State, or national designation, it is likely that viewers will be more sensitive to visible changes to that resource. High viewer sensitivity helps predict viewers that could have a high concern for any visual change.

- **Residential Viewers:** Residential viewers are usually attentive of their surrounding visual environment. Residential viewers along Baber Avenue, Sunny Ridge Court, Elaine Avenue, 169th Street, Palm Street, Sierra Vista Way, as well as those to the southeast of the SR-91/Bloomfield Avenue interchange and to the north and south of Artesia Boulevard, are considered to be highly aware of change due to their awareness and local values. In general, the awareness of residential viewers in the study area is characterized by a narrow focus of their immediate surroundings in the project area. However, more wide-ranging views with a broad focus of the surrounding area are afforded at the upper levels of the residential uses located to the southeast of the SR-91/Bloomfield Avenue interchange. Based on the City of Artesia General Plan and City of Cerritos General Plan, community residents are concerned with the visual character and quality of their

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1 City of Cerritos. 2004. *City of Cerritos General Plan.* Adopted January 2004.

2 City of Artesia. 2010. City of Artesia General Plan 2030 Environmental Impact Report. July.

neighborhoods and surroundings. Viewer sensitivity for residential viewers is considered high.

- **Commercial and Light Industrial Viewers:** Employees and customers at commercial and light industrial uses are typically preoccupied (e.g., at work, in the store, etc.), and are not engaged in the surrounding outdoor visual environment. These viewers naturally have a narrow focus and a specific viewshed. As such, commercial and light industrial viewers in the study area are considered to have a generally low concern for visual change and viewer sensitivity for commercial and light industrial users is considered low.
- **Recreational Viewers:** Park visitors at Ecology Park, Reservoir Hill Park, and A.J. Padelford Park are expected to be engaged in active (playing sports, etc.) or passive (picnicking, barbecuing, etc.) recreational activities. As such, the focus and viewshed of these viewers are considered to be narrow or wide-ranging depending on the activity. Therefore, visitors at recreational uses in the study area would be cognizant of visual changes associated with the Build Alternative. Viewer sensitivity for recreational viewers is considered moderate.
- **Institutional Viewers:** Employees and students at Gahr High School and Tracy High School spend most of their time inside of school buildings and are preoccupied with their schoolwork. However, students and teachers also engage in physical education and sports activities at their respective school sites. As such, the focus and viewshed of these viewers can be narrow or wide-ranging depending on the activity. Viewers at these institutional uses would be aware of the visual changes from the Build Alternative. Viewer sensitivity for institutional viewers is considered moderate.
- **Freeway Motorist Viewers:** Freeway motorists are generally considered to be engaged in their surrounding visual environment, depending on speed of travel and traffic conditions. The awareness of SR-91 motorists in the study area includes a narrow focus and broad view of the surroundings. SR-91 is not designated as a State Scenic Highway by the California Department of Transportation (Caltrans) and/or in the local General Plans (i.e., of the Cities of Artesia or Cerritos). In addition, there are no designated scenic vistas or other resources located in the cities of Artesia or Cerritos. However, the Cities of Artesia and Cerritos value motorists’ views along freeway corridors in the project corridor, as outlined in the City of Artesia General Plan (Community Goal CIR 2 and Policy Action 2.1.4) and the City of Cerritos General Plan (Goal LU-16, Policy LU-16.1, and Policy CD-1.2). Therefore, SR-91 motorists’ views are somewhat sensitive and viewer sensitivity is considered moderate.

- **Local Roadway Viewers:** Motorists along the local roadways in the study area (i.e., Studebaker Road, Gridley Road, Pioneer Boulevard, Elaine Avenue, Norwalk Boulevard, Bloomfield Avenue, and Artesia Boulevard) are usually engaged in their visual surroundings due to a slower speed of travel (25 to 40 miles per hour [mph]). In general, the focus of views along these roadways is wide and consists of a variety of objects and elements. Although there are no City-designated scenic or visual resources in the project area, the Cities of Artesia and Cerritos value local motorists', bicyclists', and pedestrians' views within the circulation network, as outlined in the City of Artesia General Plan (Community Planning Principle CIR 2, Community Goal CIR 2, Community Policy CIR 2.1, and Policy Action 2.1.5) and the City of Cerritos General Plan (Goal LU-11, Goal LU-13, Policy CD-1.1, Goal CD-2, Goal CON-6, and Policy CON-6.1). As such, local roadway travelers are expected to be aware of visual changes from the Build Alternative and viewer sensitivity is considered moderate.

Overall Viewer Response

The narrative descriptions of viewer exposure and viewer sensitivity for each viewer group were merged to establish the overall viewer response of each group.

- **Residential Viewers:** As previously noted, residential uses have long-term, direct views of the project limits, and would likely have a high concern for visual changes from the Build Alternative. In general, these viewers are engaged in their visual environment, and have narrow to wide-ranging views of the project limits and surroundings. As such, the overall viewer response for this viewer group is high.
- **Commercial and Light Industrial Viewers:** Employees and customers at the commercial and light industrial uses in the study area would have direct views of the project limits, but are typically preoccupied and not engaged in their surrounding visual environment. These viewers have a narrow focus and specific viewshed. Therefore, the overall viewer response for this viewer group is moderate-low.
- **Recreational Viewers:** Visitors at Ecology Park, Reservoir Hill Park, and A.J. Padelford Park would have direct views of the project limits. These viewers can be visually engaged in their surrounding environment during passive recreational activities, but can also have a narrow focus and viewshed during active recreational activities. Therefore, the overall viewer response for this viewer group is moderate.

- **Institutional Viewers:** Employees and students at Gahr High School and Tracy High School would have direct views of the project limits. Although these viewers spend most of their time inside and have a narrow focus (in their classes, school work, etc.), some spend time outdoors for physical activities (physical education, sports, etc.) and are exposed to the surrounding outdoor visual environment. In addition, these viewers have generally long-term views of the project limits due to their trip frequency (to and from their schools, typically Monday through Friday), and long duration of stay (several hours daily) at the schools. As such, the overall viewer response for this viewer group is moderate.
- **Freeway Motorist Viewers:** Highway motorists would have direct and frequent views of the project limits. The viewer duration for motorists is ultimately dependent on the density of traffic (especially during peak travel periods); therefore, motorists' views can range from short to long depending on traffic conditions. As noted above, there are no designated scenic or visual resources in the study area. However, freeway motorists compose a large viewing group (approximately 255,000 to 288,000 ADT), and the General Plans for the Cities of Artesia and Cerritos contain goals and policies to enhance motorists' views from SR-91. Therefore, the overall viewer response for this viewer group is moderate.
- **Local Roadway Viewers:** Motorists, bicyclists, and pedestrians traveling along Studebaker Road, Gridley Road, Pioneer Boulevard, Elaine Avenue, Norwalk Boulevard, Bloomfield Avenue, and Artesia Boulevard are generally engaged in their visual surroundings. These viewers would have would have short, direct, and rather frequent views of the project limits. As noted above, there are no designated scenic vistas or visual resources in the project area. However, local motorists, bicyclists, and pedestrians that travel these roadways frequently would be aware of visual changes from the project. Therefore, the overall viewer response for this viewer group is moderate.

2.6.3 Environmental Consequences

2.6.3.1 Temporary Impacts

Build Alternative (including Design Options)

Construction of the Build Alternative, including design options, would result in temporary visual impacts as a result of construction activities, including removing vegetation, grading, the use of night lighting, dust control, temporary structures, hauling equipment, construction staging or laydown yards, and signs indicating traffic detours. Even though the visual impacts from construction activities may be unavoidable to some extent to highway users and highway neighbors, avoidance and minimization would not be necessary during the construction period due to the temporary nature of these impacts. Once construction is complete, permanent highway planting and replacement planting measures would be implemented to reduce the impacts of construction. Additionally, the project would be required to comply with the Caltrans Standard Specifications for Construction, which would minimize visual impacts through the use of opaque temporary construction fencing that would be situated around construction staging areas. The Build Alternative would implement the Project Features PF-VIS-1 and PF-VIS-2 to ensure all landscaping plans and architectural treatments would be designed by the Caltrans District Landscape Architect in cooperation with the Cities of Artesia and Cerritos and that all tree removal activities and roadway improvements would be conducted in compliance with the applicable City codes and policies. The Build Alternative would implement Project Feature PF-VIS-3 to ensure that construction lighting types, plans, and placement are reviewed by the Caltrans District Landscape Architect to minimize potential impacts from light and glare.

PF-VIS-1 **Landscaping.** Freeway landscape palettes and concept plans shall be implemented during the Plans, Specifications, and Estimates (PS&E) phase in consultation with the City of Cerritos and/or City of Artesia and the California Department of Transportation (Caltrans) District Landscape Architect. The freeway landscape palettes and concept plans shall be designed in correspondence with the goals, policies, and actions of the City of Artesia General Plan (Community Goal CIR 2, Community Policy CIR 2.1, Policy Action 2.1.4, and Policy Action 2.1.5), City of Cerritos General Plan (Goal LU-13, Goal LU-16, Goal CD-2, Goal CON-6, Policy LU-16.1, Policy CD-1.2, and Policy Con-6.1), and Cerritos Municipal Code (Sections 9.75.190 [City Tree Removal] and 9.75.200 [Preservation of City Trees]).

PF-VIS-2 **Architectural Treatments and Review.** All proposed Architectural Treatments proposed shall be developed during the PS&E phase in consultation with the City of Cerritos and/or City of Artesia and the Caltrans District Landscape Architect. All proposed architectural treatments shall be reviewed and approved by Caltrans prior to final design and implementation.

PF-VIS-3 **Construction Lighting.** Construction lighting types, plans, and placement shall be reviewed at the discretion of the Caltrans District Landscape Architect in order to minimize light and glare impacts on surrounding sensitive uses.

No Build Alternative

The No Build Alternative would not include the construction of any of the project improvements on SR-91, I-605, or local roadways; therefore, the visual character and quality within VAU1 will remain similar to the existing condition. The No Build Alternative would not result in temporary visual impacts within the study area.

2.6.3.2 Permanent Impacts

Build Alternative

Visual impacts associated with a project are determined by a measurement of the resource change and viewer response. The following analysis describes and illustrates visual impacts of the Build Alternative by key view, compares existing conditions to the proposed Build Alternative design options (Build Alternative, Non-Standard Lane and Shoulder Widths Design Option, and Pioneer Boulevard Type L-9 Interchange Configuration Design Option) and includes the predicted viewer responses.

Visual elements of the Build Alternative would include a new mixed-flow lane on westbound SR-91, two new overcrossing structures (replacing the existing structures along Gridley Road and Bloomfield Avenue), reconfigured interchanges (at Pioneer Boulevard and Norwalk Boulevard), full right-of-way (ROW) acquisition of 18 residences and a business along 170th Street, partial acquisition of an ARCO Gas Station, upgraded traffic signals, the construction of several noise barriers (up to 16 ft in height) and a combination noise barrier/retaining wall, and some vegetation removal. The project would result in an increase in hardscape within VAU1 that would be visible to local residents, local roadway travelers (roadway motorists, bicyclists and pedestrians), freeway motorists, recreational uses, institutional (school) uses, and commercial and light industrial uses. Permanent visual impacts under the Build Alternative are discussed below for each key view.

Key View 1

Existing views at Key View 1 mainly consist of Ecology Park, the graded slope of the Gridley Road overcrossing structure, and mature vegetation. The visual form in Key View 1 is dominated by the graded slope for the Gridley Road overcrossing structure and mature vegetation that surrounds Ecology Park. Uniform colors are visible throughout Key View 1, including green colors associated with grass, mature trees, and the graded slope of Gridley Road; brown colors of tree trunks and branches, picnic tables, and dirt; tan colors of the sandbox; and blue colors associated with the children's swing set. Textures throughout Key View 1 consist of the granular grass and tree foliage and coarse sandbox area of the park. A mixture of mature trees, various textures, dominance of the Gridley Road overcrossing structure, and variety of colors provide some diversity in Key View 1. The unity is decreased from the visible vertical elements (i.e., mature trees, pedestrian lighting, and children's swing set), although the mature trees and vegetation increase the intactness in Key View 1. The vividness of Key View 1 is characterized by the contrasting mix of abundant mature trees and dominance of the Gridley Road overcrossing structure.

Viewer Response

Key View 1 represents a typical view from Ecology Park visitors to the southwest of the new Gridley Road overcrossing structure. Ecology Park visitors in Key View 1 would be directly exposed to the changes along Gridley Road in VAU1. Frequent visitors to Ecology Park would have long-term views of the visual changes associated with the Build Alternative. As such, overall viewer response in Key View 1 would be moderate.

Resource Change

Under the Build Alternative, the visible form of Key View 1 would be altered due to the new Gridley Road overcrossing structure. Refer to Figure 2.6-8. The proposed condition would appear similar to the existing condition with respect to colors and textures, although an increase in hardscape from the Gridley Road overcrossing retaining wall could occur. The diversity in Key View 1 would be slightly degraded, as several trees on the graded slope of the Gridley Road overcrossing structure would be removed. In addition, the scale and dominance of the Gridley Road overcrossing structure would increase in Key View 1, as the new Gridley Road overcrossing retaining wall would result in increased hardscape and additional vertical elements.

The intactness would be decreased in Key View 1 as a result of the new Gridley Road overcrossing retaining wall structure. The vividness and unity in Key View 1 would be slightly decreased, as the new Gridley Road overcrossing structure would reduce the amount of natural vegetation and green colors in the area and increase the hardscape. No visual resources or scenic views would be obstructed from implementation of the Build Alternative in Key View 1, and

FIGURE 2.6-8

Direction of Photo
Key View Location
Key View Number

Westbound SR-91 Improvement Project
Key View 1 - Proposed Condition

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tree removal activities would be required to comply with Sections 9.75.190 (City Tree Removal) and 9.75.200 (Protection of City Trees) of the Cerritos Municipal Code. The resource change in Key View 1 as a result of the Build Alternative is considered to be moderate due to a slight decrease in diversity and intactness from Ecology Park viewers. As such, the overall visual impact at Key View 1 would be moderate. With implementation of Project Features PF-VIS-1 and PF-VIS-2, the permanent visual impacts of the Build Alternative at Key View 1 would not be adverse.

Key View 2

Existing views at Key View 2 mainly consist of single-family residences on Sunny Ridge Court, mature trees/vegetation, the graded slope area of the Gridley Road overcrossing structure, and an existing combined noise barrier/retaining wall abutting the west side of Gridley Road. The visual form in Key View 2 is dominated by the single-family residence and graded slope and noise barrier/retaining wall for the Gridley Road overcrossing structure. The linear continuity in Key View 2 is characterized by horizontal fence lines and rooflines in the foreground and middle ground views, and horizontal lines created by the Gridley Road overcrossing noise barrier/retaining wall. Vertical elements such as mature palm trees are shown in Key View 2 and slightly decrease the intactness of this view. A variety of colors are visible throughout Key View 2, including green colors associated with grass and mature trees/vegetation; brown colors of palm tree stems and the graded slope of the Gridley Road overcrossing; tan colors of the Gridley Road overcrossing noise barrier/retaining wall, single-family residential structure, and perimeter wall; and white/light-gray colors associated with the residential garage door, backyard fence, and driveway area. Textures throughout Key View 2 consist of the granular grass and tree foliage; rough noise barrier/retaining wall, and residential perimeter wall and roof; coarse Gridley Road graded slope dirt area and palm trees; and smooth pavement areas. The diversity and vividness of Key View 2 is characterized by a mixture of mature trees, various textures, a variety of colors, and the scale and dominance of the Gridley Road overcrossing and single-family residence. The unity in Key View 2 is slight, as the variety of vertical elements, contrasting linear form, and scale and dominance of the Gridley Road overcrossing structure detract from the unity of the visual pattern in Key View 2.

Viewer Response

Key View 2 represents a typical view from residential uses along Sunny Ridge Court toward the new Gridley Road overcrossing structure. Residential viewers in

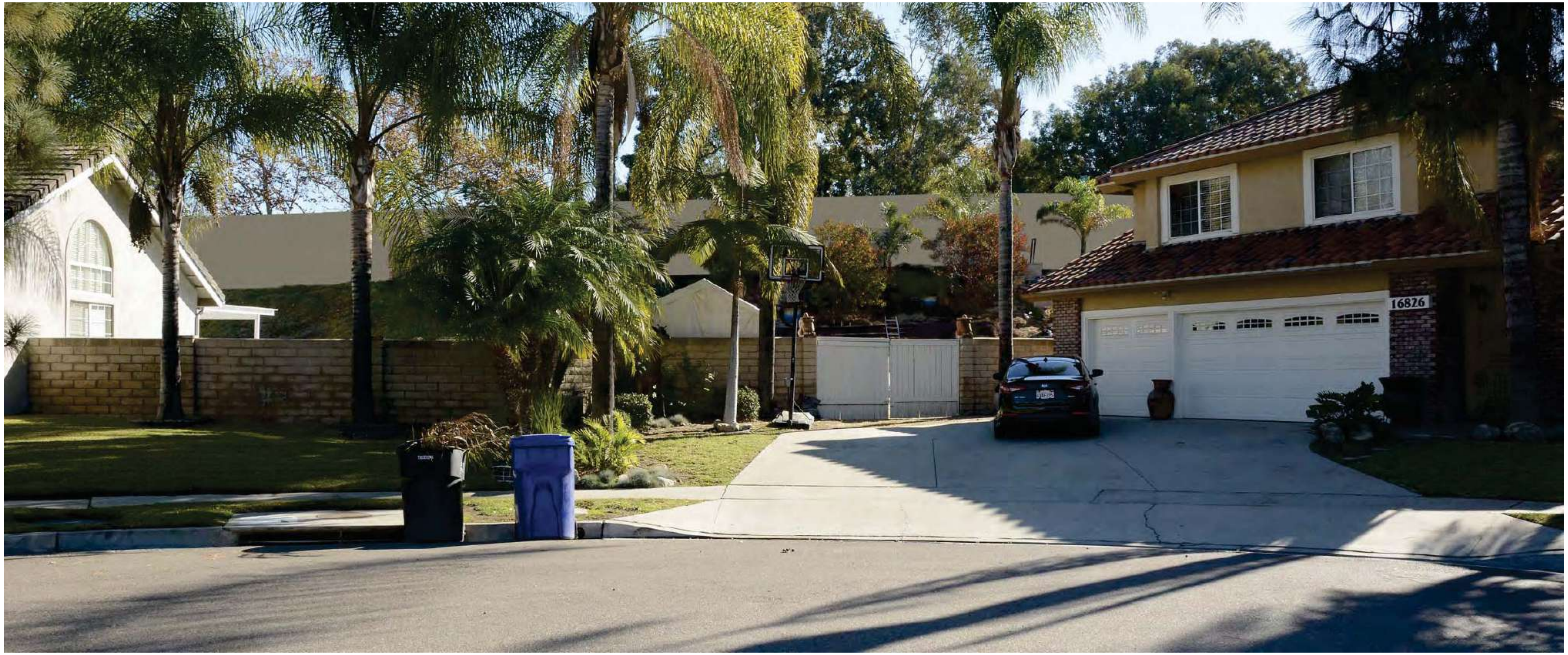
Key View 2 would be directly exposed to the changes along Gridley Road in VAU1, which include the replaced retaining wall/noise barrier. Residential uses along Sunny Ridge Court would have long-term views of the visual changes associated with the Build Alternative. As such, overall viewer response in Key View 2 would be high.

Resource Change

Under the Build Alternative, the visible form of Key View 2 would not be altered due to the new Gridley Road overcrossing structure. Refer to Figure 2.6-9. The proposed condition would appear similar to the existing condition with respect to colors and texture, although a slight increase in tan colors from the Gridley Road overcrossing retaining wall would occur. The diversity, intactness, vividness, and unity in Key View 2 would remain similar to existing conditions, as the new Gridley Road overcrossing structure would not have physical structures or impeding features that would increase the dominance or scale of Gridley Road. The resource change in Key View 2 as a result of the Build Alternative is considered to be low, as the new Gridley Road overcrossing structure would appear similar to existing conditions from Key View 2. As such, the overall visual impact at Key View 2 would be moderate. With implementation of Project Features PF-VIS-1 and PF-VIS-2, the permanent visual impacts of the Build Alternative at Key View 2 would not be adverse.

Key View 3

Existing views at Key View 3 predominantly consist of the westbound SR-91 travel lanes and ROW, roadside vegetation, freeway signage, a noise barrier, and mature trees in background views. The linear continuity in Key View 3 appears to be consistent throughout the view. The SR-91 freeway, shoulder areas, and roadside vegetation create a linear focus along westbound SR-91. Edges are defined by transitional texture and color schemes along the paved area of SR-91, roadside vegetation areas, and noise barrier along westbound SR-91. The color scheme throughout Key View 3 is dominated by light gray, brown, green, and tan colors associated with the paved SR-91 travel lanes, disturbed roadside vegetation, mature vegetation, and noise barrier located along westbound SR-91. Textures in Key View 3 are dominated by the smooth surfaces along SR-91 and the adjoining noise barrier and the granular foliage of roadside vegetation (mature and disturbed) along the SR-91 shoulders. Due to a lack of various visual patterns (other than linear patterns) in Key View 3, there is a lack of diversity. However, linear elements such as the SR-91 travel lanes, mature roadside vegetation, and adjoining noise barrier create



Direction of Photo
Key View Location
Key View Number

FIGURE 2.6-9

Westbound SR-91 Improvement Project
Key View 2 - Proposed Condition

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some visual unity in Key View 3. Vertical elements such as roadway signage, power poles, and mature trees are visible, and nominally decrease the intactness in Key View 3. Due to a lack of prominent visual features and the flat topography in Key View 3, the visual landscape is not very vivid.

Viewer Response

Key View 3 represents a typical view from westbound SR-91 motorists to the west of Pioneer Boulevard. Westbound SR-91 motorists in Key View 3 would be directly exposed to the changes along westbound SR-91, including the construction of a new travel lane and potential noise barrier up to 16 ft in height along the westbound SR-91 shoulder. As noted above, approximately 255,000 to 288,000 vehicles travel this portion of SR-91 each day. The viewer quantity is high and the duration of views from SR-91 commuters and other motorists is ultimately dependent on the density of traffic, especially during peak travel periods. Although westbound SR-91 motorists may or may not be highly aware in Key View 3 depending on the speed of travel, the viewshed of SR-91 motorists does not include any designated visual resources, and SR-91 is not designated as a State or local scenic highway. However, the City of Artesia values motorists' views along freeway corridors in the project corridor, as outlined in the City of Artesia General Plan (Community Goal CIR 2 and Policy Action 2.1.4). As such, overall viewer response in Key View 3 would be moderate.

Resource Change

Under the Build Alternative, the visible form, diversity, texture, color, and linear continuity would be altered in Key View 3. The visible form has changed due to the scale and dominance of the new noise barrier along westbound SR-91, and the blockage of mature roadside trees has decreased the diversity in Key View 3. Refer to Figure 2.6-10. An increase in smooth texture and a decrease in middle-ground granular foliage have occurred due to the new westbound SR-91 noise barrier. In addition, a decrease in green colors and an increase in tan colors has occurred as a result of the new noise barrier. The linear continuity in this key view remains, although the new noise barrier dominates the visual pattern along westbound SR-91. The vividness and intactness has decreased in Key View 3 as a result of the new westbound SR-91 noise barrier. The noise barrier dominates this view, and has decreased middle-ground and background views of mature tree vegetation. The visual unity remains similar to existing conditions, as the linear form of the new noise barrier creates a visual pattern for westbound SR-91

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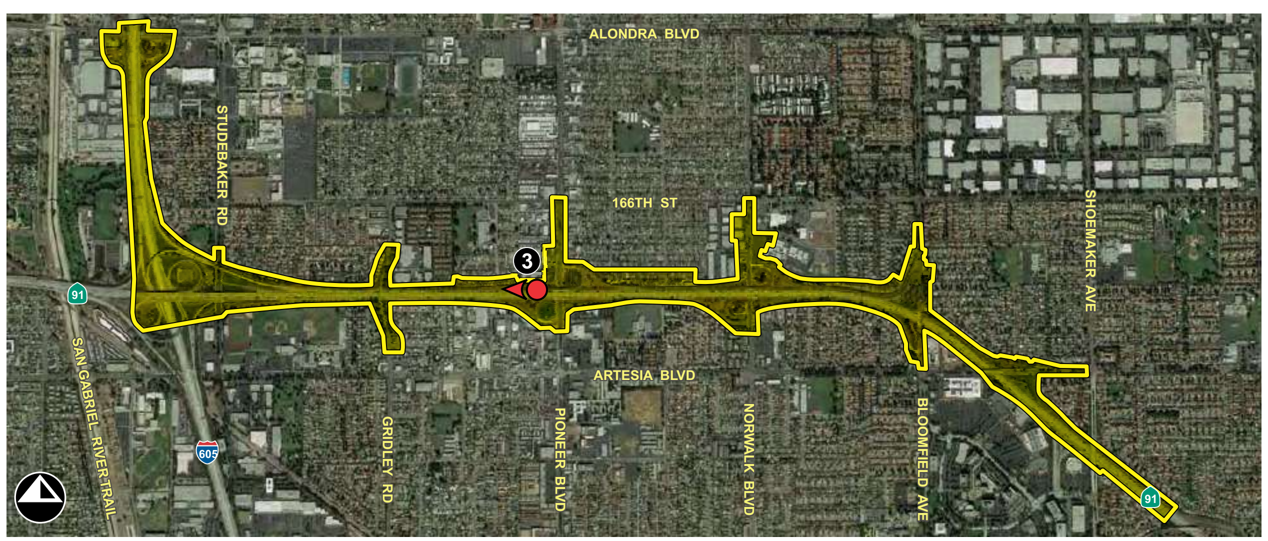

Direction of Photo
Key View Location
1 Key View Number

FIGURE 2.6-10

Westbound SR-91 Improvement Project
Key View 3 - Proposed Condition

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motorists. No visual resources or scenic views are obstructed from the Build Alternative in Key View 3. Therefore, the resource change in Key View 3 for the project is considered to be moderate due to an increase in hardscape features (i.e., the new noise barrier and westbound SR-91 lane addition) in the area. The overall visual impact in Key View 3 would be moderate. With implementation of Project Features PF-VIS-1 and PF-VIS-2, the permanent visual impacts of the Build Alternative at Key View 3 would not be adverse.

Key View 4

Existing views at Key View 4 mainly consist of Elaine Avenue, residential uses to the east and west of Elaine Avenue, and some mature vegetation. Background views of the existing westbound SR-91 noise barrier are also provided at Key View 4. The visual form in Key View 4 appears to be relatively consistent throughout this view. The Elaine Avenue ROW and sidewalks appear to be linear and continuous toward SR-91 and the westbound SR-91 noise barrier. The uniform size and height of the single-family residences create a pedestrian-friendly scale in Key View 4. The visual corridor is defined by the residences to the east and west of Elaine Avenue, and the westbound SR-91 noise barrier in background views. The color scheme throughout Key View 4 is dominated by light gray, tan/light brown, and green colors associated with the paved roadway, single-family residences and sidewalks, and mature vegetation, respectively. Textures in Key View 4 mostly consist of the smooth surfaces of roadway pavement and painted areas of exterior residences along Elaine Avenue and the granular foliage of surrounding vegetation. The vividness and intactness in Key View 4 are minute, as the visual elements (street ROW, residences, and some vegetation) fail to create a diverse viewshed.

Viewer Response

Key View 4 represents a typical view from residential uses along Elaine Avenue and southbound Elaine Avenue motorists, bicyclists, pedestrians. The southbound Elaine Avenue traveler and residential viewers in Key View 4 would be directly exposed to the changes along Elaine Avenue and 170th Street as a result of the Build Alternative, which include the acquisition and demolition of 18 residences and a business along 170th Street to accommodate standard lane and shoulder widths along westbound SR-91, a new noise barrier up to 16 ft high abutting residences along 169th Street, and relocation of the existing westbound SR-91 noise barrier to the north. Elaine Avenue is a local residential street and experiences a low amount of daily traffic (less than 5,000 ADT),[1] but residents along Elaine Avenue, 168th Street, 169th Street, and 170th Street would have long-term (permanent) views of the Build Alternative. As such, overall viewer response in Key View 4 would be moderate.

Resource Change

Under the Build Alternative, the visible form of Key View 4 would be altered due to the demolition of 18 residences and a business along 170th Street, the construction of a new noise barrier up to 16 ft in height abutting the residences on 169th Street, and the relocation of the existing westbound SR-91 noise barrier to the north. As shown on Figure 2.6-11, the new noise barrier associated with the Build Alternative would result in an increase in hardscape features, and a slight decrease in mature vegetation. The visual form in Key View 4 would be altered, as the scale and dominance of the new noise barrier would encroach onto the residences positioned along 169th Street. This would also result in a decrease in diversity, vibrant (green) colors, and textural variety, as the new noise barrier and relocated westbound SR-91 noise barrier would remove and obstruct views of mature trees, increase the amount of light brown/tan colors, and decrease the background, granular foliage of trees in Key View 4. The linear continuity in Key View 4 remains, although the new noise barrier and residential ROW acquisition decreases the depth of views in Key View 4. The vividness and intactness has decreased in Key View 4 as a result of the new westbound SR-91 noise barrier and relocated westbound SR-91 noise barrier. The visual unity remains similar to existing conditions in Key View 4, and no visual resources or scenic views are obstructed from the Build Alternative in Key View 4. The overall visual character in Key View 4 would be similar to existing conditions. The resource change in Key View 4 for the Build Alternative is considered to be moderate, as the project would increase the hardscape features (i.e., the new noise barrier) in the area, but the overall visual character would be similar to existing conditions. Therefore, the overall visual impact in Key View 4 would be moderate. With implementation of Project Features PF-VIS-1 and PF-VIS-2, the permanent visual impacts of the Build Alternative at Key View 4 would not be adverse.

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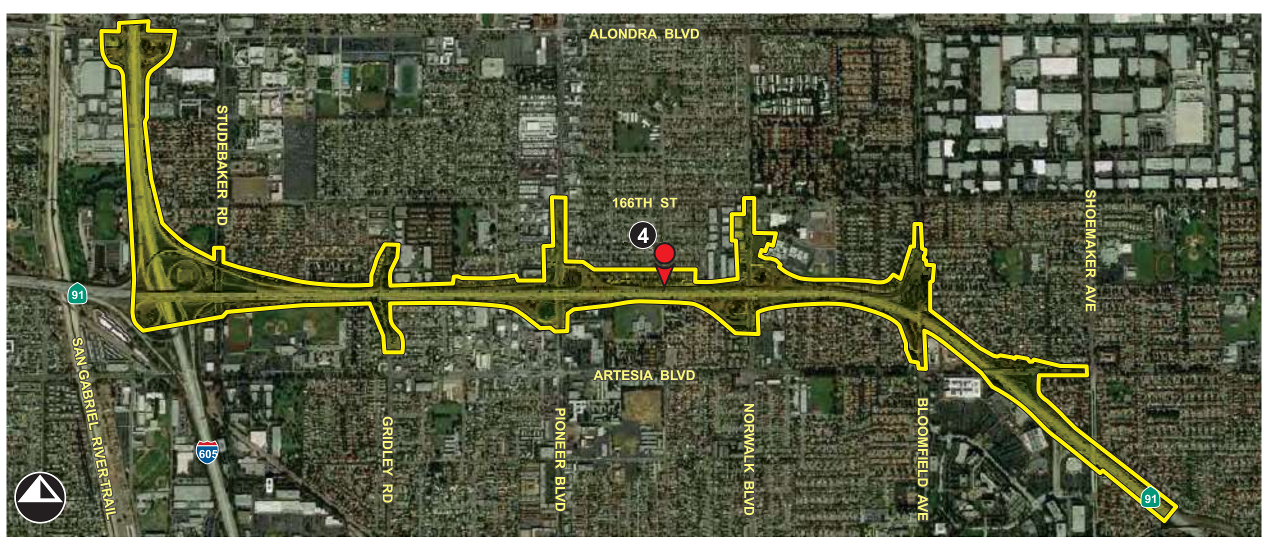
1 City of Artesia. 2010. City of Artesia General Plan 2030 Environmental Impact Report. July.



Direction of Photo
Key View Location
1 Key View Number

FIGURE 2.6-11

Westbound SR-91 Improvement Project
Key View 4 - Proposed Condition

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Key View 5

Existing views from Key View 5 mainly consist of the existing westbound SR-91 noise barrier and retaining wall positioned in the foreground and middle-ground views. The back alley/driveway area and garage areas of the Cerritos Villas residential community are also shown in Key View 5. The visual form in Key View 5 is dominated by the height, scale, and hardscape of the existing westbound SR-91 noise barrier and retaining wall. The horizontal alignment and straight edges of the westbound SR-91 noise barrier provide linear continuity in Key View 5 looking east. The colors visible in Key View 5 are fairly uniform, as the westbound SR-91 noise barrier, Cerritos Villas residences, and back alley/driveway consist of tan and light gray colors. Landscaping between the westbound SR-91 noise barrier and retaining wall provides some green colors and softens the appearance of hardscape in Key View 5. Textures throughout Key View 5 consist of the rough and bumpy masonry on the westbound SR-91 noise barrier and retaining wall, granular foliage of landscaping, and coarse surface of the Cerritos Villas back alley/driveway. Vividness is lacking in Key View 5 due to absent diverse visual elements, natural features (landscaping, mature vegetation, etc.), and the encroachment of hardscape features (noise barrier and retaining wall). Easterly views from Key View 5 are fairly unified and intact due to the uninterrupted linear flow of the westbound SR-91 noise barrier and retaining wall, and visual obstructions are absent.

Viewer Response

Key View 5 represents a typical view from residential uses in the Cerritos Villas residential community to the north of SR-91. Residential uses in Key View 5 would be directly exposed to the changes along westbound SR-91 in VAU1 which include a new combination noise barrier/retaining wall (i.e., merging the westbound SR-91 noise barrier and retaining wall) along westbound SR-91 up to approximately 20 to 22 ft in height. Although the residences along the southern boundary of the Cerritos Villas residential community do not have backyard areas or balconies with views of the project limits, these residential viewers access the back alley/driveway area of Cerritos Villas residential community on a daily basis, and would have long-term views of the visual changes associated with the Build Alternative. As such, overall viewer response in Key View 5 would be moderate-high.

Resource Change

Under the Build Alternative, the visible form of Key View 5 would be changed due to the construction of a new combination noise barrier/retaining wall. Due to the widening and added westbound SR-91 travel lane, the westbound SR-91 noise barrier would be relocated and combined with the existing retaining wall along the southern boundary of the Cerritos Villas property. The existing landscaping between the westbound SR-91 noise barrier and retaining wall would also be removed for construction of the new noise barrier/retaining wall. As shown on Figure 2.6-12, construction of the new noise barrier/retaining wall would decrease the color diversity and textural variety in Key View 5. Specifically, a decrease in green colors and granular foliage and an increase in tan colors and rough texture would occur. The height, scale, mass, and added hardscape of the new combination noise barrier/retaining wall portrays visual dominance over its surroundings and dominates the view, as the new wall would be approximately 20 to 22 ft in height. Encroachment of this new combination noise barrier/retaining wall would be increased. Overall, construction of the new combination noise barrier/retaining wall would reduce the visual diversity, intactness, unity, and vividness in Key View 5. The resource change in Key View 5 as a result of the Build Alternative is considered to be moderate-high, as the new noise barrier/retaining wall would increase the hardscape from Key View 5 and visually encroach onto the viewers at the Cerritos Villas. As such, the overall visual impact at Key View 5 would be moderate-high. To minimize visual impacts from the new noise barrier/retaining wall at Key View 5, the new combination noise barrier/retaining wall should be architecturally treated to lessen the increased hardscape appearance at the adjoining residential viewers to the north. With implementation of Project Features PF-VIS-1 and PF-VIS-2, the permanent visual impacts of the Build Alternative at Key View 5 would not be adverse.

Key View 6

Existing views from Key View 6 mostly consist of the westbound SR-91 travel lanes, mature roadside vegetation, freeway signage, and the Bloomfield Avenue overcrossing structure. The visual form in Key View 6 is defined by a linear focus from the SR-91 freeway and roadside vegetation toward Bloomfield Avenue. The Bloomfield Avenue overcrossing structure provides the viewer a sense of depth, although it decreases the intactness of Key View 6. The color scheme throughout Key View 6 is dominated by grey, brown, and green colors associated with the paved SR-91 travel lanes, disturbed roadside vegetation, and mature vegetation areas along SR-91. Textures in Key View 6 are dominated by the smooth pavement along SR-91 and the Bloomfield Avenue overcrossing structure and granular foliage of roadside vegetation (mature and disturbed) along the SR-91 shoulders. Due to a lack of various visual patterns (other than linear patterns), there is a lack of diversity in Key View 6.

Direction of Photo
Key View Location
1 Key View Number

FIGURE 2.6-12

Westbound SR-91 Improvement Project
Key View 5 - Proposed Condition

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However, linear elements such as the SR-91 travel lanes and mature roadside vegetation create some visual unity in Key View 6. The views along SR-91 are fairly intact in Key View 6, although the Bloomfield Avenue overcrossing structure somewhat impedes more profound background views. Due to a lack of distinct visual features in Key View 6, westbound SR-91 motorists' views are not vivid.

Viewer Response

Key View 6 represents a typical view from westbound SR-91 motorists. The westbound SR-91 traveler would be directly exposed to the new Bloomfield Avenue overcrossing structure in VAU1. As noted above, approximately 255,000 to 288,000 vehicles travel this portion of SR-91 each day. The viewer duration is ultimately dependent on the density of traffic, especially during peak travel periods. Although westbound SR-91 motorists may or may not be highly aware in Key View 6 depending on the speed of travel, the viewshed of SR-91 motorists does not include any designated visual resources, and SR-91 is not designated as a State or local scenic highway. However, the City of Cerritos values motorists' views along freeway corridors in the project corridor, as outlined in the City of Cerritos General Plan (Goal LU-16, Policy LU-16.1, and Policy CD-1.2). As such, it is anticipated that SR-91 freeway motorists would be aware of the visual changes associated with the Build Alternative. Overall viewer response in Key View 6 would be moderate.

Resource Change

The new Bloomfield Avenue overcrossing structure would be similar to the existing overcrossing structure, although the structure would appear to be slightly larger in terms of mass, scale, and height; refer to Figure 2.6-13. The visible form remains largely intact compared to existing conditions. However, some vegetation/tree removal would occur on the westbound SR-91 shoulder, and background views of the new westbound SR-91 noise barrier/retaining wall near the Cerritos Villas residential community would be afforded. Only a slight change in color would occur, as some brown/green colors associated with roadside vegetation would be removed, the new westbound SR-91 noise barrier/retaining wall in background views would add tan colors, and the new overcrossing structure would increase the amount of gray color in the view. The existing textures would remain relatively unchanged, although an increase in the smooth pavement of SR-91 and the larger Bloomfield Avenue overcrossing structure would occur. The linear focus of views along westbound SR-91 would not be altered in Key View 6. The visual unity would remain similar to existing

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Direction of Photo
Key View Location
1 Key View Number

FIGURE 2.6-13

Westbound SR-91 Improvement Project

Key View 6 - Proposed Condition

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conditions, as the new Bloomfield Avenue overcrossing would not dominate westerly views from westbound SR-91 motorists. The intactness of views would remain fair, and the vividness of Key View 6 would increase as a result of the mass, height, and scale of the new Bloomfield Avenue overcrossing structure.

No visual resources or scenic views would be obstructed from the Build Alternative in Key View 6. Therefore, the resource change in Key View 6 for the Build Alternative would be low. The overall visual impact in Key View 6 would be moderate-low. With implementation of Project Features PF-VIS-1 and PF-VIS-2, the permanent visual impacts of the Build Alternative at Key View 6 would not be adverse.

Although visual impacts associated with the alteration to scale and increased pavement would remain, the project features would allow the Build Alternative to integrate well with the existing landscape and ensure visual compatibility with the surrounding environment. Even with the Build Alternative in place, the alignment and topography of the SR-91 freeway mainline would remain consistent with the existing condition and VAU1's existing urbanized setting would remain relatively unchanged. As a result, the Build Alternative would not drastically alter the existing visual character and visual quality of the project corridor, resulting in a moderate overall visual impact.

Non-Standard Lane and Shoulder Widths Design Option

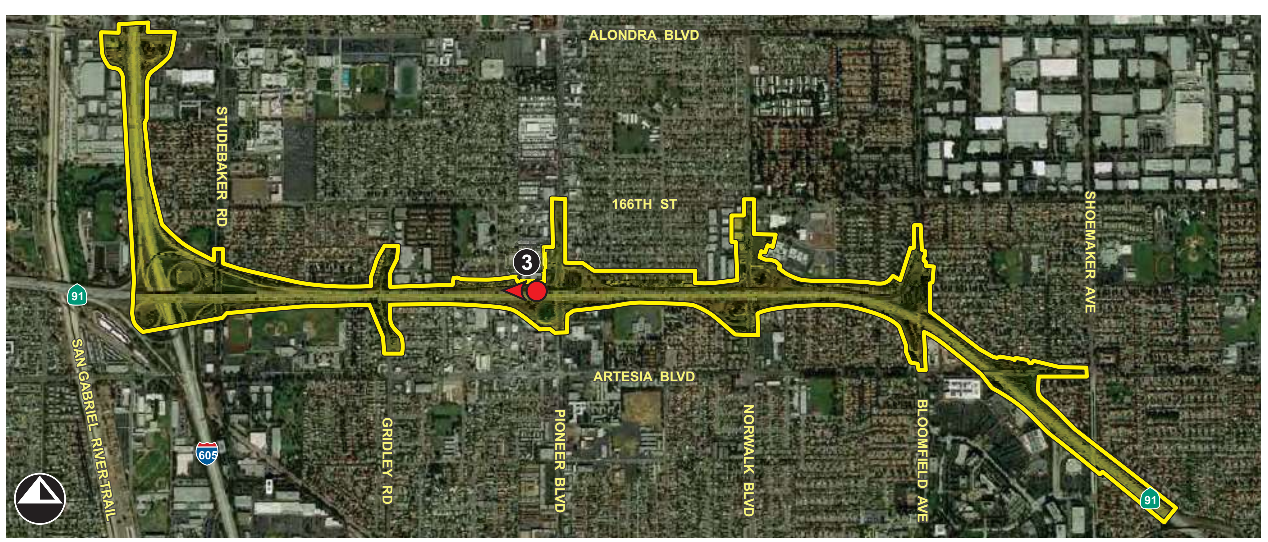
Similar to the Build Alternative, the Non-Standard Lane and Shoulder Widths Design Option would result in the construction of a new mixed-flow lane on westbound SR-91, two new overcrossing structures (replacing the existing structures along Gridley Road and Bloomfield Avenue), reconfigured interchanges (at Pioneer Boulevard and Norwalk Boulevard), partial acquisition of an ARCO Gas Station, upgraded traffic signals, the construction of several noise barriers (up to 16 ft in height) and a combination noise barrier/retaining wall, and some vegetation removal. The Non-Standard Lane and Shoulder Widths Design Option varies from the Build Alternative in that the new westbound SR-91 travel lane would be constructed using non-standard lane widths. Using non-standard lane widths on westbound SR-91 would eliminate any ROW impacts on 170th Street, and the 18 residences and a business on this roadway would remain intact. There is no visible difference between the Non-Standard Lane and Shoulder Widths Design Option and the Standard Lane Widths Design Option from the vantage point in Key View 4.

The use of non-standard lane widths would result in minimal visual impacts to the residences along 169th and 170th Street, and the existing visual environment in this area would be preserved. As such, the visual character and quality of the project corridor from Key View 4 would remain similar to existing conditions (refer to Figure 2.6-5). As such, the resource change with implementation of the Non-Standard Lane and Shoulder Widths Design Option would be low, and the overall visual impact would be moderate-low. With implementation of Project Features PF-VIS-1 and PF-VIS-2, the permanent visual impacts of the Build Alternative with the Non-Standard Lane and Shoulder Widths Design Option at Key View 4 would not be adverse.

Pioneer Boulevard L-9 Design Option

Similar to the Build Alternative, the Pioneer Boulevard L-9 Design Option would result in the construction of a new mixed-flow lane on westbound SR-91, two new overcrossing structures (replacing the existing structures along Gridley Road and Bloomfield Avenue), reconfigured interchanges (at Pioneer Boulevard and Norwalk Boulevard), full ROW acquisition of 18 residences and a business along 170th Street, partial acquisition of an ARCO Gas Station, upgraded traffic signals, construction of several noise barriers (up to 16 ft in height) and a combination noise barrier/retaining wall, and some vegetation removal. The Pioneer Boulevard L-9 Design Option varies from the Build Alternative in that the westbound SR-91 direct on-ramp from Pioneer Boulevard would remain intact, and a new noise barrier along the westbound SR-91 shoulder would not be constructed. The visible difference between the Pioneer Boulevard L-9 Design Option and the Standard Lane Widths Design Option would be seen from Key View 3.

Under the Pioneer Boulevard L-9 Design Option, the visual character and quality would remain similar to existing conditions at Key View 3 (refer to Figure 2.6-14). Under this design option, the existing direct westbound SR-91 on-ramp from Pioneer Boulevard would remain, and a new noise barrier would not be constructed along the westbound SR-91 shoulder. An increase in hardscape and some textural change would occur, as some roadside vegetation would be removed to construct the new westbound SR-91 travel lane. However, this change would not alter the visual form, linear continuity, diversity, or scale, and the vividness, intactness, and unity would not be degraded. No visual resources or scenic views are obstructed from the Pioneer Boulevard L-9 Design Option in Key View 3. Therefore, the resource change in Key View 3 for the Pioneer Boulevard L-9 Design Option is considered to be low, as a nominal increase in hardscape features (i.e., the new westbound SR-91 lane addition)



Direction of Photo
Key View Location
Key View Number

FIGURE 2.6-14

Westbound SR-91 Improvement Project
Key View 3 - Proposed Condition
Pioneer Boulevard Type L-9 Interchange Configuration Design Option

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would occur. The overall visual impact in this key view would be moderate-low. With implementation of Project Features PF-VIS-1 and PF-VIS-2, the permanent visual impacts of the Build Alternative Pioneer Boulevard L-9 Design Option at Key View 3 would not be adverse.

No Build Alternative

The No Build Alternative would not include the construction of any of the project improvements on SR-91, I-605, or local roadways; therefore, the visual character and quality of VAU1 will remain similar to the existing condition. The No Build Alternative would not result in permanent visual impacts within the study area.

2.6.4 Avoidance, Minimization, and/or Mitigation Measures

Because the project will incorporate the project features outlined above in Section 2.6.3.1, no substantial adverse impacts related to visual quality would occur. Therefore, no avoidance, minimization, and/or mitigation measures are required.

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2.7 Cultural Resources

This section is based on the *Historic Property Survey Report* (HPSR) (2018).

2.7.1 Regulatory Setting

The term "cultural resources," as used in this document, refers to the "built environment" (e.g., structures, bridges, railroads, water conveyance systems, etc.), places of traditional or cultural importance, and archaeological sites (both prehistoric and historic), regardless of significance. Under federal and state laws, cultural resources that meet certain criteria of significance are referred to by various terms including "historic properties," "historic sites," "historical resources," and "tribal cultural resources." Laws and regulations dealing with cultural resources include:

- The National Historic Preservation Act (NHPA) of 1966, as amended, sets forth national policy and procedures for historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for listing in the National Register of Historic Places (NRHP). Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties and to allow the Advisory Council on Historic Preservation (ACHP) the opportunity to comment on those undertakings, following regulations issued by the ACHP (36 Code of Federal Regulations [CFR] 800). On January 1, 2014, the First Amended Section 106 Programmatic Agreement (PA) among the Federal Highway Administration (FHWA), the ACHP, the California State Historic Preservation Officer (SHPO), and Caltrans went into effect for Caltrans projects, both state and local, with FHWA involvement. The PA implements the ACHP's regulations, 36 CFR 800, streamlining the Section 106 process and delegating certain responsibilities to Caltrans. The FHWA's responsibilities under the PA have been assigned to Caltrans as part of the Surface Transportation Project Delivery Program (23 United States Code [USC] 327).
- Historic properties may also be covered under Section 4(f) of the U.S. Department of Transportation Act, which regulates the "use" of land from historic properties (in Section 4(f) terminology—historic sites). See Appendix A for specific information about Section 4(f).
- The California Environmental Quality Act (CEQA) requires the consideration of cultural resources that are historical resources and tribal cultural resources, as well as "unique" archaeological resources. California Public Resources Code (PRC) Section 5024.1 established the California Register of Historical Resources

(CRHR) and outlined the necessary criteria for a cultural resource to be considered eligible for listing in the CRHR and, therefore, a historical resource. Historical resources are defined in PRC Section 5020.1(j). In 2014, Assembly Bill 52 (AB 52) added the term "tribal cultural resources" to CEQA, and AB 52 is commonly referenced instead of CEQA when discussing the process to identify tribal cultural resources (as well as identifying measures to avoid, preserve, or mitigate effects to them). Defined in PRC Section 21074(a), a tribal cultural resource is a CRHR or local register eligible site, feature, place, cultural landscape, or object which has a cultural value to a California Native American tribe. Tribal cultural resources must also meet the definition of a historical resource. Unique archaeological resources are referenced in PRC Section 21083.2.

- PRC Section 5024 requires state agencies to identify and protect state-owned historical resources that meet the NRHP listing criteria. It further requires Caltrans to inventory state-owned structures in its rights-of-way.

2.7.2 Affected Environment

2.7.2.1 Methods

Area of Potential Effects

The Area of Potential Effects (APE) for cultural resources was established to identify the geographic area within which the proposed project may directly or indirectly cause alterations in the character or use of cultural resources. The APE for the proposed project totals 190.23 acres (ac), of which the Direct APE[1] comprises 74.84 ac. Specifically, the horizontal APE[2] includes: segments of northbound Interstate 605 (I-605), westbound State Route 91 (SR-91), Pioneer Boulevard, Park Street, Norwalk Boulevard, Artesia Boulevard, Studebaker Road, Gridley Road, Gridley Place, Beach Street, Bloomfield Avenue, Alondra Boulevard, Westwinds Circle, 170th Street, and adjacent parcels where right-of-way (ROW) acquisition, construction staging, or temporary construction easements would occur. The adjacent parcels in the horizontal APE are located along Hyde Park Court, 169th Street, Cuesta Drive, Palm Street, Leeward Avenue, Eric Avenue, Harvest Avenue, College Place, and Clarkdale Avenue. In total, there are 85 private parcels within the horizontal APE. Buildings in the horizontal APE consist largely of single-family residences, but

[1] The Direct APE is the area that potentially would be directly and physically impacted by the proposed project.

[2] The horizontal APE refers to the depth of ground disturbance.

also include low-rise commercial buildings and institutional facilities. The horizontal APE also includes the Gridley Road overcrossing, Bloomfield Avenue overcrossing, Studebaker Road overcrossing, SR-91/I-605 connector, Pioneer Boulevard overcrossing, Norwalk Boulevard overcrossing, Artesia Boulevard overcrossing, and Alondra Boulevard overcrossing. The vertical APE will extend to a maximum depth of 20 feet (ft) for retaining wall and sound wall piles and 30 ft for piles for the Gridley Road overcrossing and Bloomfield Avenue overcrossing piers.

Record Search

On May 12, 2017, a record search was conducted at the South Central Coastal Information Center (SCCIC) of the California Historical Resources Information System (CHRIS) located at California State University, Fullerton. The record search included a review of all recorded prehistoric and historic cultural resources within a 0.5-mile (mi) radius of the project APE, as well as a review of known cultural resource survey and excavation reports. Additionally, the following inventories were examined during the SCCIC record search:

- National Register of Historic Places (National Register)
- California Register of Historical Resources (California Register)
- California Historical Landmarks (CHL)
- California Points of Historical Interest (SPHI)
- California Historic Resources Inventory (HRI)

In addition to the research conducted at the SCCIC, further background research was conducted using published literature on local and regional history, online resources regarding the history and development of the study area, and historic aerial photographs and historic maps of the project vicinity. On the basis of this research, a historic context was developed in which cultural resources could be evaluated for significance. This context was used during the analysis of historic archaeological resources and the historic built environment. The general history of the study area is followed by the contexts identified as relevant to the evaluated properties: Postwar Commercial and Industrial Development in Artesia and Cerritos, School Development in Artesia and Cerritos, Hospital Development in Artesia and Cerritos, and Mid-Century Modern Architecture. For further details of the historic context of the project APE, refer to the *Historical Resources Evaluation Report* (HRER) (2018). The following repositories and resources were contacted and utilized to access historical information pertinent to the parcels within the project APE and the project vicinity:

- Cerritos Public Library
- City of Artesia Department of Building and Safety
- City of Cerritos Department of Building and Safety
- ABC Unified School District
- Los Angeles Public Library
- Historic Aerials (https://historicaerials.com)

Field Surveys

On May 31, 2017, a Qualified Archaeologist completed a pedestrian survey of portions of the Direct APE, which is described in the *Archaeological Survey Report* (ASR) (2018). Because much of the APE is within active freeway and street ROWs, access was not safely available in all areas. Areas of exposed ground that could be accessed safely, even if vegetated, were surveyed by walking linear transects separated by 22.5–33 ft over larger areas and by more intensive and narrower transects over smaller areas. Inaccessible areas were visually inspected from a distance. Special attention was given to areas that exhibited exposed sediment, cut slopes, or rodent burrow back-dirt. Areas within the Direct APE that were not surveyed include existing freeways, paved roads and sidewalks, concrete-lined drainage channels, buildings, and structures.

On July 6 and 21, 2017, a pedestrian field survey of the buildings, structures, and other architectural features located within the APE was completed by a Qualified Architectural Historian and is described in the HRER (2018). During the survey, built environment resources within the APE that appeared to be 45 years of age or older were inspected and photographed, and their locational information noted on APE maps. For detailed notations of their structural and architectural characteristics and current conditions, as well as their settings and associated features, please refer to the HRER (2018).

Native American Consultation

In conjunction with the project, consultation was conducted with the Native American Heritage Commission (NAHC) and with a number of Native American Tribes (groups and individuals) to comply with Section 106 of the NHPA and Assembly Bill (AB) 52. The NAHC was contacted on May 18, 2017, to conduct a Sacred Lands File (SLF) search of the APE. On May 22, 2017, the NAHC responded by stating that the SLF review identified no Native American cultural resources within the project APE. The NAHC also recommended that seven Native American individuals representing the Gabrielino and Juaneño groups be contacted for information regarding cultural resources that could be affected by the project.

Chapter 4, Comments and Coordination, provides detailed information regarding Native American consultation, which is summarized below. The following Native American Tribes, groups, and individuals were contacted via letter sent by certified mail on May 24, 2017, and again by two rounds of follow-up emails or telephone calls on June 12 and 19, 2017, depending on whether the previous contact was successful:

- Gabrieleno Band of Mission Indians – Kizh Nation, Andrew Salas, Chairperson
- Gabrieleno/Tongva San Gabriel Band of Mission Indians, Anthony Morales, Chairperson
- Gabrielino/Tongva Nation, Sandonne Goad, Chairperson
- Gabrielino Tongva Indians of California Tribal Council, Robert Dorame, Chairperson
- Gabrielino-Tongva Tribe, Linda Candelaria, Co-Chairperson
- Juaneño Band of Mission Indians Acjachemen Nation – Belardes, Joyce Perry, Tribal Manager
- Juaneño Band of Mission Indians Acjachemen Nation – Belardes, Matias Belardes, Chairperson

2.7.2.2 Results

Archaeological Results

No archaeological resources were identified within the APE through archival research, Native American Consultation, or field survey. The majority of the Direct APE is within California Department of Transportation (Caltrans) ROW along the north side of westbound SR-91 from a point just east of I-605 to Artesia Boulevard, the transition from westbound SR-91 to northbound I-605, and along the east side of northbound I-605 south of Alondra Boulevard.

Pedestrian surveys for archaeological resources showed that all surveyable areas in the Direct APE exhibited high levels of disturbance from the freeway, adjacent drainages, and nearby road construction. The disturbance included bulldozed local sediment mixed with gravel, asphalt, concrete, and other debris, as well as Artificial Fill and recent trash. The entire Direct APE has been substantially altered due to previous construction activities.

Built Environment Results

Archival research and field surveys resulted in the identification of a number of built environment resources within the project APE. The entire project APE was researched and surveyed for historic-period (45 years of age or older) built environment resources. Based on a review of the Caltrans Historic Highway Bridge Inventory (2016), all bridges within the APE for this project have been previously determined ineligible for National Register listing (designated as Category 5). Further, field surveys identified six historic-period built environment resources within the APE that required evaluation under the Section 106 PA. The rest of the built environment resources in the APE were exempt from evaluation pursuant to Attachment 4 of the Section 106 PA. Pursuant to the Section 106 PA, none of the built environment resources evaluated during studies associated with the proposed project is eligible for listing in the National Register or the California Register. Under Section 106 PA Stipulation VIII.C.6, Caltrans requests the SHPO's concurrence in these eligibility determinations. Table 2.7.1 summarizes these built environment resources and eligibility determinations.

Table 2.7.1 Built Resources Within the Project APE

Name	Address/Location	National Register/California Register Eligibility[1]
College Hospital	10802 College Place APN: 7016-022-048	Determined ineligible as a historic property under Section 106 PA
N/A	16706 Pioneer Boulevard APN: 7011-005-044	Determined ineligible as a historic property under Section 106 PA
N/A	16712 Pioneer Boulevard APN: 7011-005-902	Determined ineligible as a historic property under Section 106 PA
N/A	12111 Park Street APN: 7011-001-005	Determined ineligible as a historic property under Section 106 PA
N/A	12120 Park Street APN: 7011-001-017	Determined ineligible as a historic property under Section 106 PA
Tracy High School	12222 Cuesta Drive APN: 7012-001-901	Determined ineligible as a historic property under Section 106 PA

Source 1: *Historical Resources Evaluation Report* (2018)
Source 2: *Historic Property Survey Report* (2018).
[1] These determinations are a result of studies conducted for the Westbound SR-91 Improvement Project.
APE = Area of Potential Effects
APN = Assessor's Parcel Number
California Register = California Register of Historical Resources
N/A = not applicable
National Register = National Register of Historic Places
PA = Programmatic Agreement
Section 106 = Section 106 of the National Historic Preservation Act of 1966
SR-91 = State Route 91

2.7.3 Environmental Consequences

2.7.3.1 Temporary Impacts

Build Alternative (includes Design Options)

The Build Alternative would require ground disturbance and modification to existing freeway structures. There are no historic properties within the project APE that are eligible for inclusion in the National Register; therefore, the construction of the Build Alternative would not affect historic properties.

No Build Alternative

Under the No Build Alternative, none of the proposed improvements would be constructed. The No Build Alternative would maintain the existing conditions; therefore, the No Build Alternative would not result in temporary impacts related to historic properties as a result of construction activities.

2.7.3.2 Permanent Impacts

Build Alternative (includes Design Options)

There are no historic properties within the project APE that are eligible for inclusion in the National Register. Therefore, the operation of the Build Alternative would not affect historic properties. Based on the findings of the HPSR (2018) and pursuant to the Section 106 PA, the Build Alternative would not affect historic properties per 36 CFR 800.4. Therefore, Caltrans has made a finding of No Historic Properties Affected for the project.

Previously Undocumented Cultural Materials

There is always a potential for previously undocumented cultural materials or human remains to be unearthed during site preparation, grading, or excavation for the Build Alternative. Those potential effects would be avoided or minimized through the following project features:

PF-CR-1 **Discovery of Cultural Materials.** If cultural materials are discovered during site preparation, grading, or excavation, the construction contractor will divert all earthmoving activity within and around the immediate discovery area until a qualified archaeologist can assess the nature and significance of the find. The California Department of Transportation (Caltrans) District 7 Environmental Branch Chief or the District 7 Native American Coordinator will then determine an appropriate course of action. If the discovery of cultural materials occurs outside the Caltrans right-of-way, then coordination with the appropriate local agency will be conducted.

PF-CR-2 **Discovery of Human Remains.** If human remains are discovered during site preparation, grading, or excavation, State Health and Safety Code (H&SC) Section 7050.5 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and the Los Angeles County Coroner shall be contacted. If the remains are thought to be Native American, the Coroner will notify the Native American Heritage Commission (NAHC), who pursuant to California Public Resources Code (PRC) Section 5097.98, will then notify the Most Likely Descendant (MLD). At that time, the persons who discovered the remains will contact the Caltrans District 7 Environmental Branch Chief or the District 7 Native American Coordinator so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of California PRC 5097.98 are to be followed as applicable.

Section 4(f) Resources

No National Register-listed and eligible resources were identified within the APE (HPSR 2018). Therefore, there are no cultural resources present within the APE that would trigger the requirements for protection under Section 4(f), and no further discussion of those types of resources is provided relative to the requirements of Section 4(f).

No Build Alternative

Under the No Build Alternative, none of the proposed improvements would be constructed. The No Build Alternative would maintain the existing conditions; therefore, the No Build Alternative would not result in permanent impacts related to cultural resources as a result of construction activities.

2.7.4 Avoidance, Minimization, and/or Mitigation Measures

As the Build Alternative would not result in any temporary or permanent cultural resource related impacts, no avoidance, minimization, or mitigation measures are required.

PHYSICAL ENVIRONMENT

2.8 Water Quality and Storm Water Runoff

2.8.1 Regulatory Setting

2.8.1.1 Federal Requirements: Clean Water Act

In 1972, Congress amended the Federal Water Pollution Control Act, making the addition of pollutants to the waters of the United States (U.S.) from any point source[1] unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. This act and its amendments are known today as the Clean Water Act (CWA). Congress has amended the act several times. In the 1987 amendments, Congress directed dischargers of storm water from municipal and industrial/construction point sources to comply with the NPDES permit scheme. The following are important CWA sections:

- Sections 303 and 304 require states to issue water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for a federal license or permit to conduct any activity that may result in a discharge to waters of the U.S. to obtain certification from the state that the discharge will comply with other provisions of the act. This is most frequently required in tandem with a Section 404 permit request (see below).
- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) of any pollutant into waters of the U.S. Regional Water Quality Control Boards (RWQCBs) administer this permitting program in California. Section 402(p) requires permits for discharges of storm water from industrial/construction and municipal separate storm sewer systems (MS4s).
- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the U.S. This permit program is administered by the U.S. Army Corps of Engineers (USACE).

The goal of the CWA is “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.”

The USACE issues two types of 404 permits: General and Individual. There are two types of General permits: Regional and Nationwide. Regional permits are issued for a

[1] A point source is any discrete conveyance such as a pipe or a man-made ditch.

general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Regional or Nationwide Permit may be permitted under one of the USACE's Individual permits. There are two types of Individual permits: Standard permits and Letters of Permission. For Individual permits, the USACE decision to approve is based on compliance with U.S. Environmental Protection Agency's (U.S. EPA) Section 404 (b)(1) Guidelines (40 Code of Federal Regulations [CFR] Part 230), and whether the permit approval is in the public interest. The Section 404(b)(1) Guidelines (Guidelines) were developed by the U.S. EPA in conjunction with the USACE, and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that the USACE may not issue a permit if there is a least environmentally damaging practicable alternative (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S. and not have any other significant adverse environmental consequences. According to the Guidelines, documentation is needed that a sequence of avoidance, minimization, and compensation measures has been followed, in that order. The Guidelines also restrict permitting activities that violate water quality or toxic effluent[1] standards, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause "significant degradation" to waters of the U.S. In addition, every permit from the USACE, even if not subject to the Section 404(b)(1) Guidelines, must meet general requirements. See 33 CFR 320.4. A discussion of the LEDPA determination, if any, for the document is included in the Wetlands and Other Waters section.

2.8.1.2 State Requirements

Porter-Cologne Water Quality Control Act

California's Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within California. This act requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or gaseous) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the state. It predates the CWA and regulates discharges to waters of the state. Waters of the state include more than just waters of the U.S., like groundwater and surface waters not considered

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[1] The U.S. EPA defines "effluent" as "wastewater, treated or untreated, that flows out of a treatment plant, sewer, or industrial outfall."

waters of the U.S. Additionally, it prohibits discharges of "waste" as defined, and this definition is broader than the CWA definition of "pollutant." Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDRs) and may be required even when the discharge is already permitted or exempt under the CWA.

The State Water Resources Control Board (SWRCB) and RWQCBs are responsible for establishing the water quality standards (objectives and beneficial uses) required by the CWA and regulating discharges to ensure compliance with the water quality standards. Details about water quality standards in a project area are included in the applicable RWQCB Basin Plan. In California, RWQCBs designate beneficial uses for all water body segments in their jurisdictions and then set criteria necessary to protect those uses. As a result, the water quality standards developed for particular water segments are based on the designated use and vary depending on that use. In addition, the SWRCB identifies waters failing to meet standards for specific pollutants. These waters are then state-listed in accordance with CWA Section 303(d). If a state determines that waters are impaired for one or more constituents and the standards cannot be met through point source or non-point source controls (NPDES permits or WDRs), the CWA requires the establishment of Total Maximum Daily Loads (TMDLs). TMDLs specify allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

State Water Resources Control Board and Regional Water Quality Control Boards

The SWRCB administers water rights, sets water pollution control policy, and issues water board orders on matters of statewide application, and oversees water quality functions throughout the state by approving Basin Plans, TMDLs, and NPDES permits. RWQCBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

National Pollutant Discharge Elimination System (NPDES) Program

Municipal Separate Storm Sewer Systems (MS4)

Section 402(p) of the CWA requires the issuance of NPDES permits for five categories of storm water discharges, including Municipal Separate Storm Sewer Systems (MS4s). An MS4 is defined as "any conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town, county, or other public body having jurisdiction over storm water, that is designed or used for collecting or conveying storm water." The SWRCB has identified Caltrans as an owner/operator of an MS4 under federal regulations. Caltrans' MS4 permit covers all Caltrans rights-of-way, properties, facilities, and activities in the state. The SWRCB or the RWQCB issues NPDES permits for five years, and permit requirements remain active until a new permit has been adopted.

Caltrans' MS4 Permit, Order No. 2012-0011-DWQ as amended by Order WQ 2014-0006-EXEC, Order WQ 2014-0077-DWQ, and Order WQ 2015-0036-EXEC, NPDES No. CAS000003, effective April 7, 2015, has three basic requirements:

1. Caltrans must comply with the requirements of the Construction General Permit (see below);
2. Caltrans must implement a year-round program in all parts of the State to effectively control storm water and non-storm water discharges; and
3. Caltrans storm water discharges must meet water quality standards through implementation of permanent and temporary (construction) Best Management Practices (BMPs), to the maximum extent practicable, and other measures as the SWRCB determines to be necessary to meet the water quality standards.

To comply with the permit, Caltrans developed the Statewide Storm Water Management Plan (SWMP) to address storm water pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The SWMP assigns responsibilities within Caltrans for implementing storm water management procedures and practices as well as training, public education and participation, monitoring and research, program evaluation, and reporting activities. The SWMP describes the minimum procedures and practices Caltrans uses to reduce pollutants in storm water and non-storm water discharges. It outlines procedures and responsibilities for protecting water quality, including the selection and implementation of BMPs. The proposed project will be programmed to follow the guidelines and procedures outlined in the latest SWMP to address storm water runoff.

Construction General Permit

Construction General Permit, Order No. 2009-0009-DWQ (adopted on September 2, 2009 and effective on July 1, 2010), as amended by Order No. 2010-0014-DWQ (effective February 14, 2011) and Order No. 2012-0006-DWQ (effective on July 17, 2012). The permit regulates storm water discharges from construction sites that result in a Disturbed Soil Area (DSA) of one acre or greater, and/or are smaller sites that are part of a larger common plan of development. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation result in soil disturbance of at least one acre must comply with the provisions of the General Construction Permit. Construction activity that results in soil disturbances of less than one acre is subject to this Construction General Permit if there is potential for significant water quality impairment resulting from the activity as determined by the RWQCB. Operators of regulated construction sites are required to develop Storm Water Pollution Prevention Plans (SWPPPs); to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the Construction General Permit.

The Construction General Permit separates projects into Risk Levels 1, 2, or 3. Risk levels are determined during the planning and design phases, and are based on potential erosion and transport to receiving waters. Requirements apply according to the Risk Level determined. For example, a Risk Level 3 (highest risk) project would require compulsory storm water runoff pH and turbidity monitoring, and before construction and after construction aquatic biological assessments during specified seasonal windows. For all projects subject to the permit, applicants are required to develop and implement an effective SWPPP. In accordance with the Caltrans SWMP and Standard Specifications, a Water Pollution Control Program (WPCP) is necessary for projects with DSA less than one acre.

Section 401 Permitting

Under Section 401 of the CWA, any project requiring a federal license or permit that may result in a discharge to a water of the U.S. must obtain a 401 Certification, which certifies that the project will be in compliance with state water quality standards. The most common federal permits triggering 401 Certification are CWA Section 404 permits issued by the USACE. The 401 permit certifications are obtained from the appropriate RWQCB, dependent on the project location, and are required before the USACE issues a 404 permit.

In some cases, the RWQCB may have specific concerns with discharges associated with a project. As a result, the RWQCB may issue a set of requirements known as WDRs under the State Water Code (Porter-Cologne Act) that define activities, such as the inclusion of specific features, effluent limitations, monitoring, and plan submittals that are to be implemented for protecting or benefiting water quality. WDRs can be issued to address both permanent and temporary discharges of a project.

2.8.2 Affected Environment

The information in this section is from the Water Quality Assessment Report prepared for the project (November 2017).

The proposed project is located in the San Gabriel River watershed, which is bound by the Santa Ana River watershed to the east and the Los Angeles River watershed to the west. Land uses within the watershed are diverse and range from open space near the San Gabriel River headwaters in the San Gabriel Mountains, and become more dense and urbanized in the south, wherein impaired water quality can be seen due to pollutants from dense areas of residential and commercial activities. The watershed is covered under two municipal storm water NPDES permits.[1] The project is also within the Lower San Gabriel Hydrologic Area (CalWater watershed hydrologic sub-area 405.15). When storm water falls on the existing State Highway system within the study area, it sheet flows where it is captured by Caltrans drains, culverts, curbs, and/or gutters. Underground pipes direct this flow directly to the local city and/or county flood control drainage network. Storm water that falls onto the study area will ultimately be discharged into Artesia-Norwalk Drain, Coyote Creek, and San Gabriel River Reach 1. From those drainage facilities, eventually the flow path leads to the Pacific Ocean. Within the study area for the proposed Westbound State Route 91 (SR-91) Improvement Project (project), runoff from SR-91 is not discharged directly or indirectly to an Area of Biological Significance.

Existing beneficial uses apply to the water bodies to which the proposed project discharges. Beneficial uses are defined in the Los Angeles RWQCB's Basin Plan as those necessary for the survival or well-being of humans, plants, and wildlife. Examples of beneficial uses include the following:

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[1] State Water Resources Control Board (SWRCB). San Gabriel River Watershed. Website: https://www.waterboards.ca.gov/rwqcb4/water_issues/programs/regional_program/Water_Quality_and_Watersheds/san_gabriel_river_watershed/summary.shtml (accessed November 13, 2017).

- **Municipal and Domestic Supply:** Municipal and domestic supply waters are used for community, military, municipal, or individual water supply systems. These uses may include, but are not limited to, drinking water supply.
- **Industrial Service Supply:** Industrial service supply waters are used for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well re-pressurization.
- **Industrial Process Supply:** Industrial process supply waters are used for industrial activities that depend primarily on water quality.
- **Navigation:** Navigation waters are used for shipping, travel, or other transportation by private, military, or commercial vessels.
- **Commercial and Sport Fishing:** Commercial and sport fishing waters are used for commercial or recreational collection of fish, shellfish, or other organisms including, but not limited to, uses involving organisms intended for human consumption or bait purposes.
- **Warm Freshwater Habitat:** Warm freshwater habitat waters support warm-water ecosystems including, but not limited to, preservation and enhancement of aquatic habitats, vegetation, fish, and wildlife, including invertebrates.
- **Estuarine Habitat:** Estuarine habitat waters support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, and shorebirds).
- **Marine Habitat:** Marine habitat waters support marine ecosystems including, but not limited to, preservation or enhancement of marine habitats, vegetation such as kelp, fish, shellfish, or wildlife (e.g., marine mammals and shorebirds).
- **Wildlife Habitat:** Wildlife habitat waters support wildlife habitats that may include, but are not limited to, the preservation and enhancement of vegetation and prey species used by waterfowl and other wildlife.
- **Rare, Threatened, or Endangered Species:** Rare, threatened, or endangered species waters include the uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under State or federal laws as rare, threatened, or endangered.
- **Migration of Aquatic Organisms:** Migration of aquatic organisms waters support habitats necessary for migration, acclimatization between fresh and salt water, or other temporary activities by aquatic organisms (e.g., anadromous fish).

- **Spawning, Reproduction, and/or Early Development:** Spawning, reproduction, and/or early development waters support high-quality aquatic habitats suitable for the reproduction and early development of fish.
- **Shellfish Harvesting:** Shellfish harvesting waters support habitats suitable for the collection of filter-feeding shellfish (e.g., clams, oysters, and mussels) for human consumption or commercial or sports purposes.
- **Water Contact Recreation:** Water contact recreation waters are used for recreational activities involving body contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, whitewater activities, fishing, and using natural hot springs.
- **Non-Contact Water Recreation:** Non-contact water recreation waters are used for recreational activities involving proximity to water, but not normally involving body contact with water where ingestion of water would be reasonably possible. These uses may include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tide pool and marine life study, hunting, sightseeing, and aesthetic enjoyment in conjunction with the above activities.

For Coyote Creek, beneficial uses identified include municipal and domestic supply; industrial service supply; industrial process supply; warm freshwater habitat; wildlife habitat; rare, threatened, or endangered species; water contact recreation; and non-contact water recreation. For the San Gabriel River Reach 1, beneficial uses include municipal and domestic supply, warm freshwater habitat, wildlife habitat, water contact recreation, and non-contact water recreation. For the San Gabriel River estuary, existing beneficial uses include industrial service supply; navigation; commercial and sport fishing; estuarine habitat; marine habitat; wildlife habitat; rare, threatened, or endangered species; migration of aquatic organisms; spawning, reproduction, and/or early development; shellfish harvesting; water contact recreation; and non-contact water recreation. No existing beneficial uses were identified for the Artesia-Norwalk Drain.

Some segments of the San Gabriel River and its tributaries within the watershed exceed water quality objectives for various pollutants and have been identified as impaired under Section 303(d) of the CWA. To address these impairments, TMDLs have been established for some pollutants. The Artesia-Norwalk Drain is a Section 303(d) list constituent and TMDL constituent for both indicator bacteria and selenium. Coyote Creek is a Section 303(d) list constituent for ammonia, dissolved copper, diazinon, indicator bacteria, lead, pH, and toxicity, and is a TMDL constituent for lead, copper, and zinc. The San Gabriel River Reach 1 is a Section 303(d) list constituent for coliform bacteria and pH, and a TMDL constituent for copper. The San Gabriel River Estuary is a Section 303(d) list constituent for copper, dioxin, nickel, and dissolved oxygen, and is similarly a TMDL constituent for copper.

Previous corridor storm water management studies have estimated the depth to historically high groundwater in the vicinity of the study area to range from 8 feet (ft) below ground surface (bgs) to 35 ft bgs at various site locations where infiltration basins were the selected Treatment BMPs. Per the California Department of Water Resources (DWR) Water Data Library, the nearest groundwater wells with current groundwater level and quality data are located approximately 1.8 miles (mi) south of the southern boundary of the study area, adjacent to the Cerritos Regional County Park. In June 2017, depth to groundwater at various stations at the wells ranged from 24.55 ft bgs to 90.88 ft bgs. The Basin Plan also identifies beneficial uses for groundwater where the project is located, as follows:

- **Municipal and Domestic Supply:** Municipal and domestic supply waters are used for community, military, municipal, or individual water supply systems. These uses may include, but are not limited to, drinking water supply.
- **Agricultural Supply:** Agricultural supply waters are used for farming, horticulture, or ranching. These uses may include, but are not limited to, irrigation, stock watering, and support of vegetation for range grazing.
- **Industrial Service Supply:** Industrial service supply waters are used for industrial activities that do not depend primarily on water quality. These uses may include, but are not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, and oil well re-pressurization.
- **Industrial Process Supply:** Industrial process supply waters are used for industrial activities that depend primarily on water quality. These uses may include, but are not limited to, all uses of water related to product manufacture or food preparation.

Groundwater in the Coastal Plain of Los Angeles Groundwater Basin, Central Sub-Basin, in which the project is located, is characterized by the DWR as having Total Dissolved Solids (TDS) content in the sub-basin that range from 200 to 2,500 milligrams per liter (mg/l), according to data from 293 public supply wells. The average of these wells is 453 mg/l. The water quality impairments include inorganic compounds, radiological constituents, nitrates, volatile organic compounds (VOCs), and semi-volatile organic compounds (SVOCs).

There are no drinking water reservoirs and recharge facilities that exist within the study area; however, several flood-control reservoirs are located within the upper part of the watershed.

2.8.3 Environmental Consequences

2.8.3.1 Temporary Impacts

Build Alternative (includes Design Options)

During construction of the Build Alternative, the proposed project's total DSA is estimated to be 29.25 ac. Work in this area will include the construction of mixed flow and auxiliary lanes, reconstruction of ramps and interchange improvements, widening of overhead bridge structures, construction of drainage structures, and creation of permanent water quality Treatment BMPs. Existing drainage facilities will be protected in place where possible and extended to the widening limits. During construction, sediment and sediment exposure are likely to occur while roadways are demolished and new structures are built. Other pollutants likely to occur during construction include metals, trash, petroleum products, wet and dry concrete waste, sanitary waste, and chemicals (e.g., gasoline, oils, grease, solvents, lubricants, and soap). Each of these pollutants on its own or in combination with others can have a detrimental effect on water quality.

Based on currently available information, the proposed project is classified as a Risk Level 1 project, which is considered low risk due to the project's location in an area with moderately erosive soils, but no sediment impairments. Under the Construction General Permit (CGP), the proposed project is required to prepare a SWPPP and implement erosion and sediment control BMPs during construction. When properly designed, implemented, and maintained, these BMPs serve as a project feature and avoid or minimize any temporary impacts to water quality. In addition, implementation of non-storm-water management and material management BMPs during construction would minimize the amount of chemical pollutants, such as concrete waste, and prevent them from entering surface waters. Non-storm-water management BMPs are source-control BMPs that prevent pollution by limiting or reducing potential pollutants at their source or eliminating off-site discharges, and also include procedures and practices designed to minimize or eliminate the discharge of pollutants from vehicle and equipment cleaning, fueling, and maintenance operations to storm water drainage systems or watercourses. Furthermore, waste management BMPs consist of implementing procedural and structural BMPs for handling, storage, and disposal of waste generated by a construction project to prevent the release of waste materials and pollutants during storm water and non-storm-water discharges.

As described in the following project features (PF-WQ-1 and PF-WQ-2), construction activities would comply with the CGP and implementation of the SWPPP, Erosion Control Plan, the BMPs described above, and performance standards from Caltrans and the County of Los Angeles storm water ordinances would avoid and minimize the potential for temporary construction-related surface water pollution and ensure that water quality in the receiving water bodies would not be adversely impacted by erosion, sedimentation, or chemical pollutants during construction.

PF-WQ-1 Prior to commencement of construction activities, the proposed project shall comply with the provisions of the California Department of Transportation (Caltrans) National Pollutant Discharge Elimination System (NPDES) Statewide Storm Water Permit (Order No. 2012-0011-DWQ, as amended by Order WQ 2014-0006-EXEC, Order WQ 2014- 0077-DWQ, and Order WQ 2015-0036-EXEC, NPDES No. CAS000003) and the NPDES General Permit for Storm Water Discharges of Storm Water Runoff Associated with Construction Activities (Order No. 2009-0009-DWQ, as amended by 2012-0006-DWQ), and any subsequent permits in effect at the time of construction.

PF- WQ-2 Prior to commencement of construction activities, a Storm Water Pollution Prevention Plan (SWPPP) shall be prepared and implemented to address all construction-related activities, equipment, and materials that have the potential to impact water quality. It shall be prepared per the requirements stated in the NPDES General Permit for Storm Water Discharges of Storm Water Runoff Associated with Construction Activities and any subsequent permit in effect at the time of construction. The SWPPP shall identify the sources of pollutants that may affect the quality of storm water and include the construction site Best Management Practices (BMPs) to control pollutants such as sediment control, catch basin inlet protection, construction materials management and non-storm-water BMPs. All construction site BMPs shall follow the latest edition of the *Caltrans Project Planning and*

Design Guide (PPDG) (2017) and Caltrans *Construction Manual* (2017). These include but are not limited to temporary sediment control, temporary soil stabilization, scheduling, waste management, materials handling, and other non-storm water BMPs.

Dewatering is not anticipated during construction. In the event that groundwater and any other non-storm-water dewatering activities become necessary, these activities would be subject to the requirements and permitting authority of the RWQCB.

Drainage features within the study area all have low aquatic values, primarily due to their concrete linings and lack of habitat. One drainage feature is earthen-bottomed with very little vegetation and almost no structural complexity, indicating a low aquatic habitat value. Therefore, no short-term impacts to the biological aquatic environment would occur. The BMPs outlined above identified as part of the SWPPP would avoid any impacts to aquatic species that may be present in existing downstream suitable habitat, if any.

No Build Alternative

Construction-related activities would not occur under the No Build Alternative; therefore, there would be no temporary impact to water quality or storm water runoff.

2.8.3.2 Permanent Impacts

Build Alternative (includes Design Options)

The Build Alternative represents a 5.83 ac increase in impervious surface over existing conditions due to new roadway area, interchanges, and bridges, as well as an alteration of drainage patterns on roadways. This permanent increase in impervious surface area will result in a permanent increase in runoff and pollutant loading by increasing peak loads and runoff volumes, in turn increasing the potential for erosion and sedimentation in surface waters. Contaminants in the runoff from the widened roadway could include sediments, oils, grease, and metals, similar to existing contaminants within the study area. Targeted Design Constituents are defined in the Caltrans NPDES Permit as pollutants that are expected to be generated by the proposed project and may “cause a condition of pollution or nuisance due to the discharge of excessive amounts, proximity to receiving waters,” or their properties, or may cause the impairment of Section 303(d) listed receiving waters. Targeted Design Constituents anticipated to be generated by the proposed project include copper, lead, pesticides, and nutrients. As required by the Caltrans NPDES Permit, the proposed project is required to prepare a Storm Water Data Report (SWDR) and evaluate the project for the feasibility of Treatment BMPs that will be implemented during construction to the maximum extent practicable.

As described in the following project feature (PF-WQ-3), the SWDR will document the Caltrans-approved Treatment BMPs that will treat the Targeted Design Constituents listed above. Also included as a project element is the incorporation of Design Pollution BMPs that include the preservation of existing vegetation and slope and surface protection systems (e.g., permanent soil stabilization), as well as the use of 4:1 or flatter slopes. A new substantial source of pollutants would not be introduced, as the project is proposed to accommodate existing uses. Turbidity in downstream water bodies may increase due to the increase in impervious surface area. Overall, once Treatment and Design Pollution BMPs are properly designed, implemented, and maintained, no permanent adverse water quality impacts would occur.

PF-WQ-3 Caltrans *Project Planning and Design Guide* (2017) Approved Treatment BMPs shall be implemented to the Maximum Extent Practicable (MEP) and documented in the Storm Water Data Report (SWDR), meeting requirements in the Caltrans NPDES Permit and any subsequent permits.

No Build Alternative

The No Build Alternative would not result in changes to existing drainage systems or an increase in impervious surface areas; therefore, no substantial adverse water quality-related impacts would occur.

2.8.4 Avoidance, Minimization, and/or Mitigation Measures

Because potential temporary and permanent adverse impacts to water quality would be addressed by construction and permanent BMPs included as project features, no avoidance, minimization, and/or mitigation measures are necessary.

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2.9 Geology/Soils/Seismic/Topography

2.9.1 Regulatory Setting

For geologic and topographic features, the key federal law is the Historic Sites Act of 1935, which establishes a national registry of natural landmarks and protects "outstanding examples of major geological features." Topographic and geologic features are also protected under the California Environmental Quality Act (CEQA).

This section also discusses geology, soils, and seismic concerns as they relate to public safety and project design. Earthquakes are prime considerations in the design and retrofit of structures. Structures are designed using Caltrans' Seismic Design Criteria (SDC). The SDC provides the minimum seismic requirements for highway bridges designed in California. A bridge's category and classification will determine its seismic performance level and which methods are used for estimating the seismic demands and structural capabilities. For more information, please see Caltrans' Division of Engineering Services, Office of Earthquake Engineering, Seismic Design Criteria.

The City of Cerritos General Plan (January 2004) and City of Artesia General Plan (September 2010) both require new structures and alterations to existing structures to comply with the Los Angeles County Building Code and California Building Code in order to minimize seismic hazards.

2.9.2 Affected Environment

This section summarizes information provided in the *Preliminary Geotechnical Report* (2018) and *Preliminary Geotechnical Materials Report* (2017). This section discusses the existing geologic and soils conditions within the study area.

2.9.2.1 Regional Geology, Topography, and Soils

The study area is located within the Peninsular Ranges Geomorphic Province of California, which stretches from the Los Angeles Basin to the tip of Baja California. This province is characterized as a series of northwest-trending mountain ranges separated by subparallel fault zones and a coastal plain of subdued landforms. The mountain ranges are underlain primarily by Mesozoic metamorphic rocks that were intruded by plutonic rocks of the Southern California batholith, while the coastal plain is underlain by subsequently deposited marine and non-marine sedimentary formations.

The Los Angeles Basin is a large, relatively flat, low-lying coastal plain surrounded by mountains on the north, east, and southeast. The western margin of the Los Angeles Basin is bordered by the Pacific Ocean and the Palos Verdes Hills. The floor of the Los Angeles Basin slopes gradually southwesterly from approximately 300 to 600 feet (ft) in elevation along the margins of the surrounding hills to sea level along the coastline.

Based on regional geological maps, geologic materials within the vicinity of the study area consist of predominantly sands, silts and some clay associated with the thick alluvial fan, alluvial basin, and alluvial outwash deposits derived from the San Gabriel River. These deposits consist of moderately dense to dense, porous to very porous, massive to crudely layered, slightly silty, coarse to fine sand and gravels. Old and Very Old Alluvial Fan Deposits consist of moderately to well consolidated gravel and cobble deposits within a dirty sand matrix. These materials are over 3,000 ft thick and are underlain by Tertiary-age marine formations of the San Pedro, Fernando, and Puente Formations to depths on the order of 11,000 ft, which in turn are underlain by early Tertiary formations. Mesozoic-age crystalline basement rocks are at depths of about 15,000 ft.

2.9.2.2 Local Geology, Topography, and Soils

The study area is within an embayment on the central part of the Los Angeles Basin. Holocene to Late Pleistocene Young Alluvial Fan Deposits underlie the study area. The alluvial deposits are unconsolidated to slightly consolidated and are generally associated with the San Gabriel River. The State Route 91 (SR-91) elevations within the study area range from approximately 60–95 ft above mean sea level (amsl). According to the Log of Test Borings (LOTBs) for the study area, the upper 60 ft of the underlying soils generally consist of fine- to medium-grained, loose to medium dense, silty and clayey sand, sandy silt, poorly graded sand, and clayey silt. Interbeds of soft silt and clay and occasionally organic materials were also observed. Below 60 ft, the soils become generally fine to coarse, dense silty sand with varying amount of gravel.

2.9.2.3 Geologic Hazards

Geologic hazards relevant to the proposed project include seismic ground shaking, localized soil liquefaction, and seismic settlement. The following geologic hazards were reviewed and determined not to be relevant to the proposed project; therefore, they are not discussed later in 2.9.3, Environmental Consequences:

- **Tsunami and Seiches:** Seiches are large waves generated in enclosed bodies of waters, such as lakes, in response to ground shaking. Tsunamis are waves generated in large bodies of water as a result of fault displacement or major ground movement. There are no enclosed bodies of water near the study area and the Pacific Ocean is approximately 17.25 miles (mi) west of the study area. As a result, the existing potential risks related to tsunamis and seiches are considered negligible.
- **Seismically-induced Landslides:** The study area is not located within an earthquake-induced landslide zone (California Geological Survey 1999). Evidence of landslides was not observed during the site investigation and the study area topography is relatively flat. Additionally, according to the City of Cerritos General Plan Safety Element (January 2004), Cerritos does not have the potential for landslides. The City of Artesia General Plan Geology and Soils Element (September 2010) states that Artesia is not located within a mapped Earthquake-Induced Landslide Zone of Required Investigation and earthquake-induced landsliding is not anticipated to occur.
- **Rock Falls:** The City of Cerritos General Plan (January 2004) and the City of Artesia General Plan (September 2010) do not document rock fall areas. As discussed above, the study area consists of relatively flat topography, and geologic hazards (e.g., landslide areas as a result of steep slopes) have not been mapped in the project area. Therefore, rock fall hazards are unlikely to occur in the project area.
- **Slope Instability:** The existing embankment slopes along the proposed project alignment are generally inclined 1.5:1 (horizontal:vertical) or flatter and are generally vegetated. No sign of slope instability was observed during site investigation. No hazardous geologic structure exists near the surface that may cause instability of the existing embankments.
- **Scour:** Scour is not anticipated because no drainage channels or creeks cross the study area.
- **Soil Corrosion:** According to the *Preliminary Geotechnical Materials Report* (2017), due to a predominance of granular soils throughout the study area, the soils are not expected to be corrosive.
- **Volcanic Hazards:** There are no active, potentially active, or inactive volcanoes in Los Angeles County. Therefore, volcanic hazards would not affect the study area.

- **Economical Resources/Mineral Hazards:** The City of Cerritos and City of Artesia General Plans as well as the map of Aggregate Sustainability in California[1] do not identify economical resources/mineral resources in the study area.

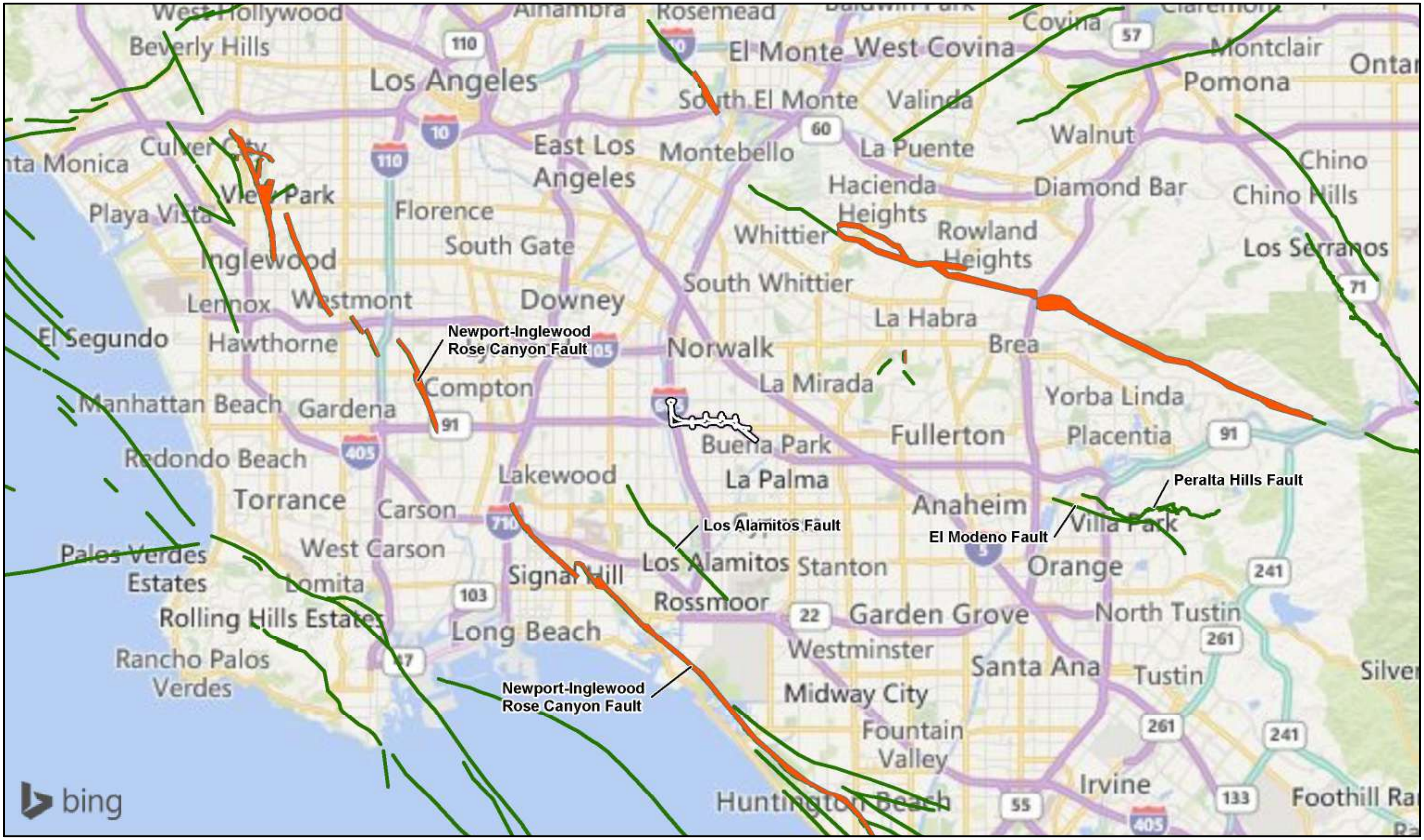
Faulting and Seismicity

The study area is located in a seismically active region of Southern California. Historical epicenter maps show widespread seismicity throughout the Los Angeles Basin. Although historical earthquakes occur in proximity to known faults, they are difficult to directly associate with mapped faults. Part of this difficulty is due to the fact that the Los Angeles Basin is underlain by several subsurface thrust faults (blind faults). Earthquakes in the region occur primarily as loose clusters along the Newport-Inglewood Structural Zone (NISZ), along the southern margin of the Santa Monica Mountains, the southern margin of the Santa Susana and San Gabriel Mountains, and in the Coyote Hills-Puente Hills area.

The study area is not located within an Alquist-Priolo Fault Zone. The closest significant active fault with Holocene surface rupture is the Newport-Inglewood-Rose Canyon Fault, crossing approximately 6.3 mi southwest of the Interstate 605 (I-605)/ SR-91 interchange. This fault zone is believed to be capable of producing a 7.2 magnitude earthquake. The closest mapped active fault with surface rupture is the late Quaternary Los Alamitos Fault, located approximately 3 mi southwest of the I-605/SR-91 interchange. In addition, the Anaheim Fault crosses SR-91 at the on-ramp of Bloomfield Avenue; however, the top of the rupture plane of this Holocene-age fault is approximately 2.4 mi below ground surface. The locations of these faults are shown on Figure 2.9-1.

The nearest substantial local sources of earthquakes and estimated peak ground acceleration (PGA) are summarized in Table 2.9.1.

[1] California Geological Survey. Aggregate Sustainability in California. 2012. Website: http://www.conservation.ca.gov/cgs/information/publications/ms/Documents/MS_52_2012.pdf (accessed December 18, 2017).



LEGEND

Project Location

Alquist-Priolo Earthquake Fault Zones

Quaternary Faults (>6 Magnitude in Last 1.6 Million Years)

0 2.5 5

MILES

SOURCE: Bing Maps (2015); Michael Baker (11/2017)

FIGURE 2.9-1

Westbound SR-91 Improvement Project

Active Fault Map

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0716000284; EA 29811

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Table 2.9.1 Closest Active Faults Information

Controlling Deterministic Faults	Fault ID	Fault Type	Dip	Mmax	RRUP (km)	Factors Used	Basin Effect		PGA (g)		
							$Z_{1.0}$ (m)	$Z_{2.5}$ (m)	D	P	C
Puente Hills (Santa Fe Springs)	359	Rev	29°V	6.6	4.863	Basin, Near Fault	800	5.43	0.54	0.61	0.61
Puente Hills (Coyote Hills)	361	Rev	26°V	6.8	6.115	Basin Near Fault			0.51		
Compton	367	Rev	20°V	6.9	10.548	Basin Near Fault			0.55		

Source: *Preliminary Geotechnical Report* (2018).
°V = degrees vertical
C = Controlling
D = Deterministic
g = value of acceleration equal to 32 feet/second^2
km = kilometers
m = meters
Mmax = maximum magnitude
P = Probabilistic
PGA = peak ground acceleration
Rev = Reverse
RRUP = closest distance to a fault rupture plane
$Z_{1.0}$ = depth to a shear-wave velocity of 1.0 kilometer/second
$Z_{2.5}$ = depth to a shear-wave velocity of 2.5 kilometers/second

PGA is a measurement of maximum ground acceleration in a particular area and is an important factor for structural engineering against earthquake damage for things such as roads, bridges, and buildings. It can be described as how hard the ground may shake in a given geographic area based on several factors (e.g., the distance from an active fault, the maximum expected earthquake from that fault, and the underlying geologic units). The study area is likely to experience strong ground motion with an approximate PGA of 0.61 g.[1]

Groundwater

Neither SR-91 nor I-605 cross over a drainage channel or creek within the study area. Coyote Creek is located approximately 1.35 mi east of the SR-91/Shoemaker Avenue interchange, and the San Gabriel River is located approximately 1,500 ft west of the I-605/SR-91 interchange. Excavations and cut slopes from the proposed project are not anticipated to encounter seepage from these concrete-lined channels. Based on 1960s LOTBs, the groundwater elevation along SR-91 ranged from 38 ft amsl at the I-605 interchange to 53 ft amsl at Bloomfield Avenue. The groundwater elevation at I-605/Alondra Avenue was approximately 46 ft amsl. Per the GeoTracker database (2017), groundwater elevations are generally in the range of 49–53 ft amsl within the study area, or approximately 7 to 12 ft below the existing ground surface in the vicinity of SR-91 and approximately 20 ft below the existing ground surface at I-605/Alondra Boulevard. Based on available data, the historical high groundwater elevation appears to be higher than today.

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1 “g” is a common value of acceleration equal to 32 feet/second^2.

According to the California Water Science Center (2017), the study area is located within the Los Angeles/Santa Ana basin, which is known to be subject to subsidence due to groundwater pumping. Therefore, there is a potential for subsidence within the study area.

Liquefaction Potential and Seismic Settlement

Liquefaction occurs when loose, saturated, generally fine sands and silts are subjected to strong ground shaking. The soils lose shear strength and become liquid, potentially resulting in large total and differential ground surface settlements as well as possible lateral spreading during an earthquake. Based on the California Geological Survey (CGS) Seismic Hazard Maps, the study area is located within a liquefaction study zone. Underlying soils within the study area are expected to consist of fine- to medium-grained, loose to medium dense sand. The groundwater table is relatively shallow, and the site is subject to strong ground motion. Therefore, liquefaction potential is high. The preliminary estimate for free-field liquefaction settlement ranges between 4 and 8 inches at different locations of the study area.

According to the City of Cerritos General Plan Safety Element (January 2004), the entire city of Cerritos is located within a Liquefaction Hazard Zone. According to the City of Artesia General Plan (September 2010), Artesia is located within a mapped Liquefaction Zone of Required Investigation.

2.9.3 Environmental Consequences

2.9.3.1 Temporary Impacts

Build Alternative (includes Design Options)

Soil Erosion

Construction of the Build Alternative would result in a total disturbed soil area (DSA) of approximately 29.25 acres (ac). Excavated soil in the construction areas would be exposed and, as a result, there would be an increased potential for soil erosion during construction compared to existing conditions. During a storm event, soil erosion could occur at an accelerated rate. Temporary cut slopes would follow the guidelines of the California Department of Transportation’s (Caltrans) *Trenching and Shoring Manual* (Caltrans 2011), and the Occupational Safety and Hazard Administration (OSHA) 29 Code of Federal Regulations (CFR) 1926 Subpart P would be followed for temporary excavations.

During all construction activities for the Build Alternative, the construction contractor will be required to adhere to the requirements of the General Construction Permit and to implement erosion and sediment control best management practices (BMPs) specifically identified in the project Storm Water Pollution Prevention Plan (SWPPP) to keep sediment from moving off site into receiving waters and impacting water quality. Refer to Section 2.8, Water Quality and Storm Water Runoff, for additional discussion regarding construction-related water quality issues and mitigation, including BMPs.

Worker safety hazards resulting from erosion during construction of the Build Alternative would be minimized based on implementation of the requirements in the General Construction Permit and erosion and sediment control BMPs in the SWPPP.

Ground Motion

Construction activities could be affected by ground motion from seismic activities. Possible ground rupture, liquefaction, and consolidation settlement could occur in the study area if an earthquake were to occur during construction. Implementation of safe construction practices and compliance with Caltrans and the California Division of Occupational Safety and Health Administration (Cal/OSHA) safety requirements would minimize the impacts to worker safety during construction activities.

No Build Alternative

Under the No Build Alternative, the temporary construction-related impacts discussed above for the Build Alternative would not occur because there would be no construction of the proposed project improvements under this alternative.

2.9.3.2 Permanent Impacts

Build Alternative (includes Design Options)

Local Geology, Topography, and Soils

The Build Alternative would not result in permanent substantive changes to the topography in the study area because the improvements would generally be constructed at or close to the same grade as the existing SR-91 and I-605.

The proposed grading is not anticipated to increase the potential for erosion within the study area because the proposed slopes would be flatter than the existing slopes. In addition, no excessive erosion was observed for the existing slopes. Caltrans requirements for erosion protection such as control of irrigation and surface runoff, surface soil compaction, and slope planting/paving would be followed. These measures would be sufficient to reduce erosion potential effectively.

As discussed in Section 2.9.2, soils within the study area are predominantly silty and clayey sand, sandy silt, poorly graded sand, and clayey silt. The sandy soils are primarily silty sand, which are not considered to be expansive. The clayey soils consist of sandy and clayey silt and silty clay; the corresponding expansion potential is considered to be moderate to high. Design and construction of the proposed improvements would comply with the Caltrans *Highway Design Manual* (HDM) (December 2016) and other required standards, and recommendations from the *Preliminary Geotechnical Report* (2018), as included in Project Feature PF-GEO-1.

PF-GEO-1 **Geotechnical Investigation.** During the Plans, Specifications, and Estimates (PS&E) phase, a detailed geotechnical investigation will be conducted by qualified geotechnical personnel to further assess the geotechnical conditions at the project area. The geotechnical investigation will include exploratory borings and cone penetration test soundings to investigate site-specific soils and conditions and to collect samples of subsurface soils for laboratory testing. Those soil samples will be tested to evaluate moisture content and dry density, grain-size distribution, percent passing No. 200 sieve, Atterberg limits, expansion index, corrosivity, consolidation, and direct shear. The project-specific findings and recommendations of the geotechnical investigation will be summarized in a structure foundation report and a geotechnical design report to be submitted to the California Department of Transportation (Caltrans) for review and approval. Those findings and recommendations will be incorporated in the final design of the selected Build Alternative.

Adherence to recommendations within these reports would substantially reduce substantial adverse effects from geologic hazards. In addition, surficial soils that are sandy can be susceptible to soil erosion produced by running water. The clayey surficial soils are expected to expand when wet and to crack upon drying. Cracking allows infiltration of water from storms and irrigation, ultimately causing loosening of the surficial soils. This results in an increase of soil erodibility. Proposed fill slopes are generally 4:1 (horizontal:vertical), which satisfies the Caltrans HDM requirements for side slopes. Other proposed grading requires 1.5:1 (horizontal:vertical) or flatter cut slopes. The revegetation and engineering of graded slopes specified in Project Feature PF-GEO-2 will be performed prior to construction to minimize the soil erodibility and slope stability.

PF-GEO-2 **Slope Protection.** Prior to construction, revegetation of graded slopes should be performed to minimize erosion. In addition, slopes along the northbound extent of the Pioneer Boulevard and Norwalk Boulevard undercrossings are recommended to either have slopes of at least 2:1 (horizontal:vertical) or the slopes should be benched or paved to have an adequate factor of safety. Alternatively, a slope stability analysis would be performed per the specifications listed in the Preliminary Geotechnical Report. An engineering geologist would observe all cut slopes during grading to ensure no unforeseen adverse conditions occur.

Additionally, Section 2.8, Water Quality and Storm Water Runoff, contains additional project features related to soil erosion, including BMPs; and Section 2.11, Hazardous Waste/Materials, contains additional project features related to hazardous wastes and materials.

Faulting and Seismicity, Settlement, Groundwater, and Liquefaction

The main geotechnical considerations for the study area are the presence of potentially compressible (shallow and deep) and liquefiable soils. Settlement is anticipated at the SR-91 crossing street on-/off-ramps where approach fills are required. Preliminary liquefaction settlement estimates indicate settlements between 4 inches and 8 inches could occur within the study area. As mentioned above, future subsidence of the site should also be expected. Recommendations to reduce the compressibility of soils and potential for liquefaction would be followed, as included in Project Feature PF-GEO-3.

PF-GEO-3 **Soil Settlement and Liquefaction.** Surcharge loading in combination with wick drains should be utilized in areas with compressible soils to reduce settlement potential. Embankment areas could also be over-excavated and backfilled with lightweight materials. Remedial grading beneath the walls foundation will be required if shallow foundations are considered. In addition, deep foundations may be recommended depending on the results of the site-specific geotechnical investigation (see project feature PF-GEO-1 above). The top 5 feet of existing soil will need to be excavated in areas that will receive embankment fill and retaining walls, and be recompacted to 95 percent relative compaction. All recommendations listed in the *Preliminary Geotechnical Report* (2018) and site-specific geotechnical investigation related to remedial grading, foundations, and earth pressures would be implemented as included in the project specifications.

Although subsidence and liquefaction can be expected within the study area due to the presence of groundwater, no adverse effects to groundwater are expected to occur. This is because groundwater is expected to be at least 7 ft below the ground surface in the study area. Because the anticipated earthwork is minimal and mostly consists of fill placement rather than deep excavations, installation of dewatering systems and adverse effects to groundwater are not anticipated.

No Build Alternative

Under the No Build Alternative, the permanent impacts discussed above for the Build Alternative would not occur because none of the proposed permanent improvements provided in the Build Alternative would be implemented and operated under this alternative.

2.9.4 Avoidance, Minimization, and/or Mitigation Measures

Because the project will incorporate the project features described in Section 2.9.3.2, no substantial adverse impacts related to geology, soils, and seismicity would occur. Therefore, no avoidance, minimization, and/or mitigation measures are required.

2.10 Paleontology

This section is based on the *Paleontological Identification Report and Paleontological Evaluation Report* (PIR/PER) (2017 and 2018 Errata).

2.10.1 Regulatory Setting

Paleontology is a natural science focused on the study of ancient animal and plant life as it is preserved in the geologic record as fossils.

A number of federal statutes specifically address paleontological resources, their treatment, and funding for mitigation as a part of federally authorized project.

- 23 United States Code (USC) 1.9(a) requires that the use of Federal-aid funds must be in conformity with all federal and state laws.
- 23 United States Code (USC) 305 authorizes the appropriation and use of federal highway funds for paleontological salvage as necessary by the highway department of any state, in compliance with 16 USC 431-433 above and state law.

Under California law, paleontological resources are protected by the California Environmental Quality Act (CEQA).

2.10.2 Affected Environment

A paleontological resource locality search for any known localities within and surrounding the study area was completed through the Natural History Museum of Los Angeles County (LACM) in May 2017. Relevant geologic maps and geological and paleontological literature were reviewed. A pedestrian survey of the study area was conducted on May 31, 2017.

The study area is within the northern Peninsular Ranges Geomorphic Province, a large structural block that extends from the Transverse Ranges in the north to the tip of Baja California. Within this larger region, the study area is located in the Los Angeles Basin, which is a broad alluvial plain bounded by mountains to the north and east and the Pacific Ocean to the west and south.

Geologic mapping indicates the entire study area is underlain by Holocene to late Pleistocene (less than 126,000 years ago) Alluvial Fan and Valley Deposits, Undivided. Although not mapped, Artificial Fill is likely present from the surface to varying depths throughout much of the study area where it was placed during construction of the existing freeways, streets, overcrossings, and undercrossings.

Because of its disturbed context, Artificial Fill does not have the potential to contain scientifically important paleontological resources. The upper 10 feet (ft) of the Young Alluvial Fan and Valley Deposits, Undivided are unlikely to contain scientifically important paleontological resources because of their young age (likely less than 4,200 years). However, the sediments of the Young Alluvial Fan and Valley Deposits, Undivided below a depth of 10 ft may be old enough to contain scientifically important paleontological resources.

The results of the locality search through the LACM indicated that the study area contains Younger Quaternary Alluvium overlain by Older Quaternary Alluvium (i.e., Young Alluvial Fan and Valley Deposits, Undivided). According to the locality search conducted by the LACM, there are no vertebrate fossil localities within the study area. However, LACM has records of several fossil localities near the project site from deposits similar to those found in the study area. The museum notes that these deposits are not usually paleontologically sensitive in the uppermost layers, but that scientifically important fossils may be encountered in the older deposits found at varying depths. The closest vertebrate fossil locality recorded by the LACM in these older deposits is located southwest of the study area on the northwest side of the Long Beach Airport, along Cover Street between Pixie Avenue and Paramount Boulevard. This locality, LACM 3660, produced a specimen of fossil mammoth (*Mammuthus*) at a depth of 19 ft below the surface. Farther southwest of the study area, near Bixby Road between Atlantic Avenue and Orange Avenue, locality LACM 6802 produced fossil specimens of undetermined vertebrates at a depth of 16 ft below the surface. South-southwest of the study area, near the intersection of Spring Street and Cherry Avenue south of the San Diego Freeway (Interstate 405 [I-405]), locality LACM 1021 produced fossil specimens of bird (Aves) and mammoth (*Mammuthus*) at an unknown depth. LACM 3347 is located where Older Quaternary deposits are mapped at the surface to the northeast of the project area, north of Leffingwell Road east of La Mirada Boulevard. This locality produced a fossil specimen of horse (*Equus*) at a depth of only 2 ft below the surface.

The pedestrian survey indicated that most of the study area is underlain by Artificial Fill. Other sediments observed are consistent with the Young Alluvial Fan and Valley Deposits, Undivided mapped in the study area.

2.10.3 Environmental Consequences

2.10.3.1 Temporary Impacts

Build Alternative (includes Design Options)

The construction of the Build Alternative would not result in temporary impacts to paleontological resources because the impacts to those types of resources during construction would be considered permanent as described in Section 2.10.3.2.

No Build Alternative

Under the No Build Alternative, none of the proposed improvements to State Route 91 (SR-91) and Interstate 605 (I-605) would be constructed. The No Build Alternative would maintain the existing conditions; therefore, the No Build Alternative would not result in temporary impacts related to paleontological resources as a result of construction activities.

2.10.3.2 Permanent Impacts

Build Alternative (includes Design Options)

Excavation that extends more than 10 ft below the original ground surface could result in impacts to paleontological resources. Construction of the Build Alternative requires a maximum depth of 20 ft for retaining wall and sound wall piles and 30 ft for piles for the Gridley Road overcrossing and Bloomfield Avenue overcrossing piers. As such, excavation for these construction activities may have the potential to impact paleontological resources. The potential impacts would be avoided or minimized through the following project feature:

PF-PAL-1 **Paleontological Mitigation Plan.** A Qualified Paleontologist shall prepare a Paleontological Mitigation Plan (PMP) following the guidelines in the California Department of Transportation (Caltrans) Standard Environmental Reference (SER), Environmental Handbook, Volume 1, Chapter 8 – Paleontology (June 2016 or more current) and guidelines developed by the Society of Vertebrate Paleontology (SVP 2010). The PMP shall be prepared concurrently with final design plans during the Plans, Specifications, and Estimates (PS&E) phase.

No Build Alternative

Under the No Build Alternative, none of the proposed improvements to SR-91 and I-605 would be constructed. The No Build Alternative would maintain the existing conditions; therefore, the No Build Alternative would not result in permanent adverse impacts related to paleontological resources as a result of construction activities.

2.10.4 Avoidance, Minimization, and/or Mitigation Measures

As the Build Alternative would not result in any temporary or permanent paleontological resources related impacts, no avoidance, minimization, or mitigation measures are required.

2.11 Hazardous Waste/Materials

2.11.1 Regulatory Setting

Hazardous materials, including hazardous substances and wastes are regulated by many state and federal laws. Statutes govern the generation, treatment, storage and disposal of hazardous materials, substances, and waste, and also the investigation and mitigation of waste releases, air and water quality, human health, and land use.

The primary federal laws regulating hazardous wastes/materials are the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980 as amended, and the Resource Conservation and Recovery Act (RCRA) of 1976. The purpose of CERCLA, often referred to as "Superfund," is to identify and clean up abandoned contaminated sites so that public health and welfare are not compromised. The RCRA provides for "cradle to grave" regulation of hazardous waste generated by operating entities. Other federal laws include:

- Clean Water Act
- Clean Air Act
- Safe Drinking Water Act
- Occupational Safety and Health Act (OSHA)
- Toxic Substances Control Act (TSCA)
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

In addition to the acts listed above, Executive Order (EO) 12088, *Federal Compliance with Pollution Control Standards*, mandates that necessary actions be taken to prevent and control environmental pollution when federal activities or federal facilities are involved.

California regulates hazardous materials, waste, and substances under the authority of the CA Health and Safety Code and is also authorized by the federal government to implement RCRA in the state. California law also addresses specific handling, storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning of hazardous waste. The Porter-Cologne Water Quality Control Act also restricts disposal of wastes and requires cleanup of wastes that are below hazardous waste concentrations but could impact ground and surface water quality. California regulations that address waste management and prevention and cleanup of contamination include Title 22 Division 4.5 Environmental Health Standards for the

Management of Hazardous Waste, Title 23 Waters, and Title 27 Environmental Protection.

Worker and public health and safety are key issues when addressing hazardous materials that may affect human health and the environment. Proper management and disposal of hazardous material is vital if it is found, disturbed, or generated during project construction.

2.11.2 Affected Environment

The information presented in this section is based on the *Phase I Initial Site Assessment* (ISA) (2018) prepared for the project.

2.11.2.1 Field Survey and Record Search Methodology

The following were conducted as part of the ISA:

- **Reconnaissance-Level Visit:** On July 14, 2017, October 12, 2017, January 12, 2018, and January 18, 2018, a site reconnaissance visit consisting of both the visual observation and photographic documentation of existing conditions and the nature of the development within the study area was conducted. The visit included observations of specific properties for evidence of release(s) and assessment of the potential for on-site releases of hazardous materials and petroleum products.
- **Environmental Database Review:** A regulatory database search of known potential hazardous materials on site, including federal and State environmental databases for the study area, was conducted on June 23, 2017 and October 10, 2017.
- **Agency Records Review:** The California Department of Toxic Substances Control (DTSC) Hazardous Materials Division and the Los Angeles Regional Water Quality Control Board (RWQCB) were contacted to obtain documentation for properties within and adjacent to the existing and proposed right-of-way (ROW) for the Build Alternative.
- **Historical Research:** Aerial photographs, Sanborn Fire Insurance Maps, and historical topographic maps of the study area were reviewed.
- **Aerially Deposited Lead Site Investigation Report Review:** Soil sampling results from an aerially deposited lead (ADL) site investigation within the study area were reviewed.
- **Interview:** Interviews were conducted with key site personnel, as available, regarding current and previous uses of the study area, particularly activities involving hazardous substances and petroleum products.

Based upon records searches and field surveys, issues include the potential occurrence of ADL, yellow traffic striping, asbestos-containing materials (ACM), lead based paint (LBP), pesticides, treated wood waste (TWW), and polychlorinated biphenyls (PCBs) as presented in Table 2.11.1.

Table 2.11.1 Hazardous Waste/Materials of Concern

Hazardous Waste/Materials of Concern	Occurrence
Aerially Deposited Lead (ADL)	ADL contamination is generally found in unpaved soil due to historical use of lead-containing fuel.
Yellow Traffic Striping	Yellow traffic stripes that need to be removed may contain lead and chromium at concentrations that are considered hazardous.
Asbestos Containing Material (ACM)	ACMs were used in construction until the late 1970s.
Lead Based Paint (LBP)	Building materials used prior to 1978 may contain LBP.
Pesticides	The potential exists for persistent pesticides to be present in soil as a result of using pesticides for weed control. It is recommended that the soil be sampled and analyzed for organochlorine pesticides (OCPs).
Treated Wood Waste (TWW)	TWW comes from old wood that has been treated with chemical preservatives.
Polychlorinated Biphenyls (PCBs)	PCBs were used in the past as insulating oils in electrical transformers, fluorescent light ballasts, and/or as hydraulic oils in elevator equipment prior to the 1980s.

Source: *Phase I Initial Site Assessment* (2018).

2.11.3 Environmental Consequences

2.11.3.1 Temporary Impacts

Build Alternative (includes Design Options)

Temporary impacts related to hazardous waste/materials during project construction could occur within the maximum disturbance limits for the Build Alternative and design options on individual properties identified for full acquisition, as described in the following sections. No hazardous waste/materials concerns were observed or reported within parcels proposed for temporary construction easements (TCEs) and/or partial acquisitions under the Build Alternative and design options. The temporary impacts discussed below apply to the Build Alternative and all design options.

Aerially Deposited Lead

The *ADL Site Investigation Report* (2014) indicated that soil samples with concentrations of lead that exceed regulatory limits were taken at a majority of the on- and off-ramp locations along State Route 91 (SR-91) between Interstate 605 (I-605) and Shoemaker Road. Project Feature PF-HAZ-1 would minimize this effect.

Aerially deposited lead (ADL) from the historical use of leaded gasoline exists along roadways throughout California. There is the likely presence of soils with elevated concentrations of lead as a result of ADL on the state highway system right of way within the limits of the Build Alternative. Soil determined to contain lead concentrations exceeding stipulated thresholds must be managed in a manner to determine whether such soils may be safely reused within the project limits.

PF-HAZ-1 During construction, excess aerially deposited lead (ADL) contaminated soils require special handling and waste management, especially when disturbed during earthmoving activities. California Department of Transportation (Caltrans) Office of Environmental Engineering will initiate a project-specific ADL site investigation to evaluate whether the excess ADL-contaminated soils generated can be reused within the project limits. If the excess ADL soils cannot be reused within the project limits, the site investigation will also determine whether they are classified as federal or State hazardous waste that requires off-site disposal at a permitted Class I California hazardous waste disposal facility or can be relinquished to the contractor with or without restrictions on use.

Pavement Marking Materials

Yellow traffic striping and pavement-marking materials (e.g., paint, thermoplastic, permanent tape, and temporary tape) that would be removed during construction of the Build Alternative may contain elevated concentrations of metals such as lead. Removal of these materials during construction could affect construction workers and the surrounding environment. Project Feature PF-HAZ-2 would minimize this effect.

PF-HAZ-2 During the design phase, yellow traffic striping and pavement marking materials will be tested for lead and lead chromate. If hazardous materials are discovered, the project specifications will direct the Construction Contractor to remove and properly dispose of any materials in accordance with the Caltrans *Construction Manual* (July 2017), Chapter 7, Section 7-107, Hazardous Waste and Contamination.

Asbestos-Containing Materials and Lead-Based Paint Related to Structures

The Build Alternative will require the relocation of 18 single-family residences and two commercial parcels located within the northern portion of Artesia, north of the project segment of SR-91. The Non-Standard Lane and Shoulder Widths Design Option that includes narrower than standard lane and shoulders would result in one non-residential displacement, and the Pioneer Boulevard Westbound Ramps/168th

Alignment Design Option would result in an additional five residential displacements. Based on the construction dates of these structures, ACMs and LBP may be present in these structures. ACMs and LBP represent a concern during demolition of these structures. The acquired parcels are shown in Figure 2.11-1. Project Features PF-HAZ-3, PF-HAZ-4, PF-HAZ-5, and PF-HAZ-6 specifically require proper testing, monitoring, removal, and disposal of ACMs and LBP.

PF-HAZ-3 After property acquisition and prior to demolition, structures that are proposed to be demolished and/or modified within State Route 91 (SR-91) right-of-way (ROW) will be assessed for the possible presence of asbestos-containing materials (ACMs) and lead-based paint (LBP). These studies will be conducted by trained and/or licensed professionals and will comply with the United States Environmental Protection Agency (EPA), the National Emission Standards for Hazardous Air Pollutants (NESHAPs), Title 40 of the Code of Federal Regulations (CFR), the Southern California Air Quality Management District (SCAQMD) Rule 1403, and guidelines from the Department of Housing and Urban Development (HUD) and California Department of Public Health (CDPH). The results of these studies will provide a description of the locations of the ACMs and LBP; their estimated quantities; and recommendations for their removal, containment, and off-site transportation and disposal.

PF-HAZ-4 Qualified Professionals will complete a LBP survey on the structures that were constructed before 1979 during the Plans, Specifications, and Estimates (PS&E) phase. The LBP study will be conducted by trained and/or licensed professionals and will comply with the EPA, HUD, and CDPH guidelines. The LBP study report will provide a description of the LBP locations; the estimated quantities of LBP; and specific requirements for the removal, containment, and off-site transport and disposal of materials containing LBP from the acquired properties. The requirements from that study will be included in the project specifications for implementation during project construction.

PF-HAZ-5 The Construction Contractor will implement the requirements in the LBP survey report as included in the project specifications.

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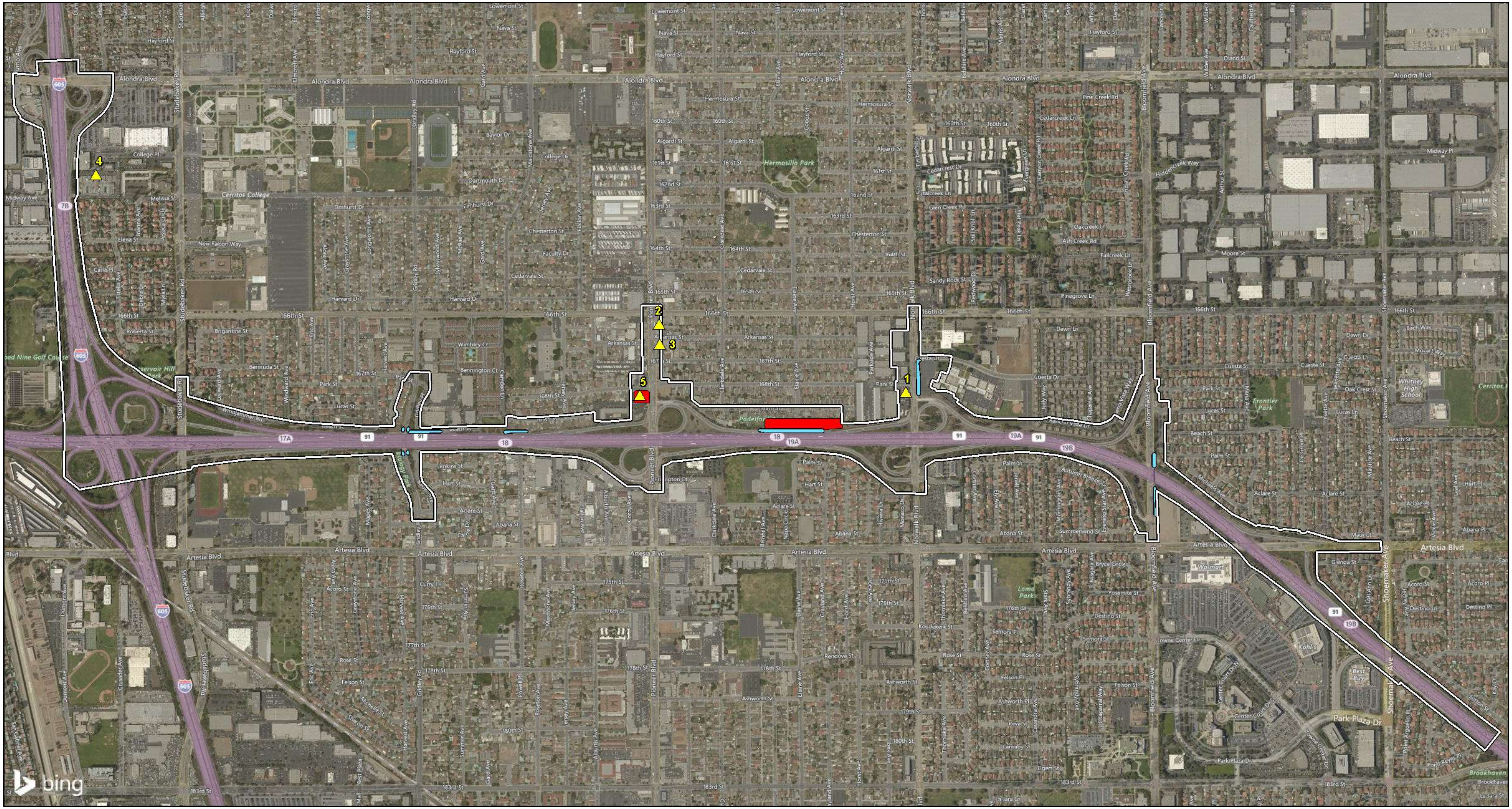

LEGEND

Study Area Limits

Full Acquisition

Partial Acquisition

Potential Hazardous Materials Sites

N

0 525 1050
FEET

SOURCE: Bing Maps (2015); Michael Baker (11/2017)

I:\RBF1601\GIS\MXD\ISEA\HazSites.mxd (3/26/2018)

FIGURE 2.11-1

Westbound SR-91 Improvement Project

Potential Hazardous Materials Sites

07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

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PF-HAZ-6 During construction, the Construction Contractor will monitor soil excavation for visible soil staining, odor, and the possible presence of unknown hazardous material sources. If hazardous material contamination or sources are suspected or identified during project construction activities, the Construction Contractor will be required to cease work in the area and to have a Qualified Professional evaluate the soils and materials to determine the appropriate course of action required, consistent with the Unknown Hazards Procedures in Chapter 7 of the Caltrans *Construction Manual* (July 2017). Adequate protection for construction workers will be provided with the implementation of a Health and Safety Plan and Soil Management Plan.

Pesticide Use

Due to the historical use of many areas within or in the vicinity of the study area as agricultural land, soils within the study area may contain residue pesticide. However, it is likely that the previous construction of SR-91 and I-605 will have reduced the potential for pesticide contamination within the project limits. Project Features PF-HAZ-7 and PF-HAZ-8 require a site investigation be performed for any undeveloped areas that might contain elevated contaminations of pesticide to identify whether any residual contamination from the past agricultural uses is still present, and to determine if any potential hazards may occur during construction activities associated with residual contamination. As a result, the Build Alternative would not result in adverse impacts related to residual contamination from the past agricultural uses within the study area.

PF-HAZ-7 Soil sampling for pesticides on any former agricultural parcels will be completed during the PS&E phase. Samples will be collected and analyzed to evaluate the presence or absence of residual organochlorine pesticides and arsenical herbicides. The soil sampling will be conducted in general accordance with DTSC Interim Guidance for Sampling Agricultural Fields for School Sites (August 26, 2002). The performance standard of soil sampling for this measure complies with applicable federal, State, and local regulations regarding the removal, handling, transport, and disposal of soils contaminated with pesticides. The analytical results of the soil sampling will determine the appropriate handling and disposal of the soil.

PF-HAZ-8 During construction, the construction contractor will properly dispose of all soils exceeding the criteria for State or federal hazardous waste at an appropriate State-certified landfill facility.

Treated Wood Waste

Removal of sign posts and/or guard rails located along the SR-91 and I-605 ROW as well as at on/off ramps during construction of the Build Alternative would generate TWW. Removal of these materials during construction could affect construction workers and the surrounding environment. Project Feature PF-HAZ-9 would minimize this effect.

PF-HAZ-9 Caltrans follows regulations adopted by the California Department of Toxic Substances Control (DTSC) when managing treated wood waste (TWW) to prevent releases of hazardous chemical preservatives, scavenging, and harmful exposure to people, aquatic life and animals. During construction, TWW may be handled as a regulated solid waste. TWW may be disposed in a State Water Resources Control Board certified solid waste landfill, rather than a hazardous waste landfill.

PCBs

Polychlorinated biphenyls (PCBs) were used in the past as insulating oils in electrical transformers, fluorescent light ballast, and/or as hydraulic oils in elevator equipment prior to the 1980s. There are 21 electrical distribution transformers (both ground-mounted and utility pole-mounted) present within the project area along the north side of SR-91 and east side of I-605. Of these 21, 8 are located over bare soil and 1 is located partially over bare soil. Soil disturbance during construction activities may affect construction workers and the surrounding environment. Project Feature PF-HAZ-10 would minimize this effect.

PF-HAZ-10 Prior to site disturbance activities, the soil beneath transformers that are located over bare soils shall be sampled for polychlorinated biphenyls (PCBs). Soil samples shall be collected using either hand auger or direct-push methodology. The samples will be collected from the upper 6 inches, followed by a 1-foot depth, and then 1-foot intervals thereafter to a total depth not to exceed 4 feet below surface grade (bsg). The soil samples will be analyzed for PCBs using United States Environmental Protection Agency (USEPA) Method 8082.

Potentially Contaminated Soil and/or Groundwater

Five properties that have contributed to known groundwater impacts are located in the vicinity of the maximum disturbance limits of the Build Alternative. These five properties are located at 16821 Norwalk Boulevard, 16604/16620 Pioneer Boulevard, 16632 Pioneer Boulevard, 10802 College Place, and 16809 Pioneer Boulevard. Due to the nature of the businesses and the proximity of these properties to the maximum disturbance limits for the Build Alternative, there is potential that contaminated groundwater originating at those parcels could be encountered during construction of the project. Project Feature PF-HAZ-11 specifically requires that a site investigation be performed on these parcels to identify potential hazards that may occur during project construction associated with contaminated soil and groundwater.

PF-HAZ-11 A preliminary site investigation will be initiated during Project Approval and Environmental Documentation (PA&ED) and completed during PS&E on the five properties that will not be fully or partially acquired or used during construction but are adjacent to the maximum disturbance limits. The preliminary site investigation will assess the presence or absence of impacts associated with the hazardous waste concerns.

The site investigation will provide the appropriate avoidance, minimization, or mitigation for those hazards. As a result, the Build Alternative would not result in adverse impacts related to contaminated soil and/or groundwater at these parcels.

Hazardous materials present in the study area or in the project vicinity based on the database search, historical records review, reconnaissance-level visit, and interviews are listed in Table 2.11.2 and shown on Figure 2.11-1.

No Build Alternative

The No Build Alternative would not result in the disturbance or removal of any soils, groundwater, or structures and therefore would not result in temporary impacts related to hazardous waste/materials.

2.11.3.2 Permanent Impacts

Build Alternative (includes Design Options)

Routine maintenance activities during operation of the Build Alternative would be required to follow applicable regulations with respect to the use, storage, handling,

Table 2.11.2 Hazardous Materials in the Study Area

Figure 2.11-1 ID	Property Name and Address	Description
1	Shell Gas Station 16821 Norwalk Boulevard	The property is listed as a previous leaking underground storage tank (LUST); the current status of the case is open with eligibility for closure. An enclosure is present with a National Fire Protection Association (NFPA) placard identifying a flammable hazardous material. The property appeared well-maintained and clean, with no obvious spills or leaks. The LUST site is considered a potential Recognized Environmental Condition (REC) and would be dependent on issuing of site closure by the regulatory agency.
2	Diamond Tire Center/Dae Lim Auto Repair 16604/16620 Pioneer Boulevard	The property is listed as an open LUST case. According to GeoTracker, the location has been under investigation for 28 years. Reconnaissance of the location revealed two monitoring wells and one grated drain location. Some type of runoff suggestive of motor oil was observed leaking around and onto a monitoring well box in the parking lot area, and staining from previous leaking was also observed; therefore, this property is considered a REC.
3	Artesia Building Materials 16632 Pioneer Boulevard	Site reconnaissance indicated the property was clean and well maintained with no obvious spills or leaks. However, this property is listed as a LUST case and is considered open and has been under site assessment as of 2012. The case cannot be closed until a secondary source of contamination has been removed; therefore, this property is considered a REC.
4	College Hospital 10802 College Place	Hazardous material and unmarked waste were observed during the site visit. No additional information was available. Based on the available information, this is considered a potential REC.
5	Arco Gas Station 16809 Pioneer Boulevard	According to the *Environmental Data Resources Corridor Report* (i.e., Appendix B of the *Phase I Initial Site Assessment*) this property was previously listed as a LUST site in 2002 and the case closed in 2012. According to GeoTracker, the property was previously listed as a LUST site with soil and groundwater fuel hydrocarbon contamination. Although the site has received LUST site closure, residual impact may remain in the soil and groundwater beneath the site. This property is considered a Historical Recognized Environmental Condition (HREC).

Source: *Phase I Initial Site Assessment* (2018).

transport, and disposal of potentially hazardous materials. Therefore, the operation of the Build Alternative would not result in adverse impacts related to hazardous waste/materials.

No Build Alternative

The No Build Alternative would not change the existing physical environment, and therefore there would be no permanent impacts related to hazardous waste/materials under this alternative. Similar to the Build Alternatives, routine maintenance activities would continue under the No Build Alternative, including compliance with applicable regulations regarding the handling and disposal of potentially hazardous materials.

2.11.4 Avoidance, Minimization, and/or Mitigation Measures

Because the Build Alternative would not result in any temporary or permanent impacts related to hazardous materials, no avoidance, minimization, or mitigation measures are required.

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2.12 Air Quality

2.12.1 Regulatory Setting

The Federal Clean Air Act (FCAA) of 1970 (42 United States Code [USC] 7401 et seq.), as amended, is the primary Federal law that governs air quality while the California Clean Air Act (CCAA) is its companion State law. These laws, and related regulations by the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB), set standards for the concentration of pollutants in the air. At the Federal level, these standards are called National Ambient Air Quality Standards (NAAQS). NAAQS and State ambient air quality standards have been established for six transportation-related criteria pollutants that have been linked to potential health concerns: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM) which is broken down for regulatory purposes into particles of 10 micrometers or smaller (PM_{10}) and particles of 2.5 micrometers and smaller ($PM_{2.5}$), and sulfur dioxide (SO_2). In addition, national and State standards exist for lead (Pb), and State standards exist for visibility-reducing particles, sulfates, hydrogen sulfide (H_2S), and vinyl chloride. The NAAQS and State standards are set at levels that protect public health with a margin of safety, and are subject to periodic review and revision. Both State and Federal regulatory schemes also cover toxic air contaminants (air toxics); some criteria pollutants are also air toxics or may include certain air toxics in their general definition.

Federal air quality standards and regulations provide the basic scheme for project-level air quality analysis under the National Environmental Policy Act (NEPA). In addition to this environmental analysis, a parallel “Conformity” requirement under the FCAA also applies.

2.12.1.1 Conformity

The conformity requirement is based on FCAA Section 176(c), which prohibits the U.S. Department of Transportation (USDOT) and other Federal agencies from funding, authorizing, or approving plans, programs, or projects that do not conform to the State Implementation Plan (SIP) for attaining the NAAQS. “Transportation Conformity” applies to highway and transit projects and takes place on two levels: the regional (or planning and programming) level and the project level. The proposed project must conform at both levels to be approved.

Conformity requirements apply only in nonattainment and “maintenance” (former nonattainment) areas for the NAAQS, and only for the specific NAAQS that are or were violated. EPA regulations at 40 Code of Federal Regulations (CFR) 93 govern the conformity process. Conformity requirements do not apply in unclassifiable/ attainment areas for NAAQS and do not apply at all for State standards regardless of the status of the area.

Regional conformity is concerned with how well the regional transportation system supports plans for attaining the NAAQS for CO, NO_2, O_3, particulate matter (PM_{10} and $PM_{2.5}$), and in some areas (although not in California), SO_2. California has nonattainment or maintenance areas for all of these transportation-related “criteria pollutants” except SO_2, and also has a nonattainment area for Pb; however, Pb is not currently required by the FCAA to be covered in transportation conformity analysis. Regional conformity is based on emission analysis of Regional Transportation Plans (RTPs) and Federal Transportation Improvement Programs (FTIPs) that include all transportation projects planned for a region over a period of at least 20 years (for the RTP), and four years (for the FTIP). RTP and FTIP conformity uses travel demand and emission models to determine whether or not the implementation of those projects would conform to emission budgets or other tests at various analysis years showing that requirements of the FCAA and the SIP are met. If the conformity analysis is successful, the Metropolitan Planning Organization (MPO), the Federal Highway Administration (FHWA), and the Federal Transit Administration (FTA), make the determinations that the RTP and FTIP are in conformity with the SIP for achieving the goals of the Clean Air Act. Otherwise, the projects in the RTP and/or FTIP must be modified until conformity is attained. If the design concept and scope and the “open-to-traffic” schedule of a proposed transportation project are the same as described in the RTP and FTIP, then the proposed project meets regional conformity requirements for purposes of project-level analysis.

Project-level conformity is achieved by demonstrating that the project comes from a conforming RTP and Transportation Improvement Program (TIP); the project has a design concept and scope[1] that has not changed significantly from those in the RTP and TIP; project analyses have used the latest planning assumptions and EPA-approved emissions models; and in PM areas, the project complies with any control measures in the SIP. Furthermore, additional analyses (known as hot-spot analyses)

[1] “Design concept” refers to the type of facility that is proposed, such as a freeway or arterial highway. “Design scope” refers to those aspects of the project that would clearly affect capacity and thus any regional emissions analysis, such as the number of lanes and the length of the project.

may be required for projects located in CO and PM nonattainment or maintenance areas to examine localized air quality impacts.

2.12.2 Affected Environment

This section is based on the *Air Quality Analysis* (2018) prepared for the project.

2.12.2.1 Climate

The project site is located within the South Coast Air Basin, which includes Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. Air quality regulation in the Basin is administered by the South Coast Air Quality Management District (SCAQMD), a regional agency created for the Basin.

The South Coast Air Basin climate is determined by its terrain and geographical location. The Basin is a coastal plain with connecting broad valleys and low hills. The Pacific Ocean forms the southwestern boundary, and high mountains surround the rest of the Basin. The region lies in the semipermanent high pressure zone of the eastern Pacific. The resulting climate is mild and tempered by cool ocean breezes. This climatological pattern is rarely interrupted. However, periods of extremely hot weather, winter storms, and Santa Ana wind conditions do occur in the Basin.

The annual average temperature varies little throughout the South Coast Air Basin, ranging from the low to middle 60s, measured in degrees Fahrenheit (°F). With a more pronounced oceanic influence, coastal areas show less variability in annual minimum and maximum temperatures than inland areas. The climatological station closest to the site-monitoring temperature is the Anaheim Station.[1] The annual average maximum temperature recorded at this station is 77.4°F, and the annual average minimum is 55.4°F. January is typically the coldest month in this area of the Basin.

The majority of annual rainfall in the South Coast Air Basin occurs between November and April. Summer rainfall is minimal and is generally limited to scattered thundershowers in coastal regions and slightly heavier showers in the eastern portion of the Basin along the coastal side of the mountains. The climatological station closest to the site that monitors precipitation is the Anaheim Station. Average rainfall measured at this station varied from 3.47 inches in February to 0.72 inch or less

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1 Western Regional Climatic Center. Website: http://www.wrcc.dri.edu (accessed March 2018).

between May and October, with an average annual total of 14.09 inches. Patterns in monthly and yearly rainfall totals are unpredictable due to fluctuations in the weather.

The South Coast Air Basin experiences a persistent temperature inversion (increasing temperature with increasing altitude) as a result of the Pacific high. This inversion limits the vertical dispersion of air contaminants, holding them relatively near the ground. As the sun warms the ground and the lower air layer, the temperature of the lower air layer approaches the temperature of the base of the inversion (upper) layer until the inversion layer finally breaks, allowing vertical mixing with the lower layer. This phenomenon is observed from midafternoon to late afternoon on hot summer days, when the smog appears to clear up suddenly. Winter inversions frequently break by midmorning.

Inversion layers are important in determining O_3 formation. O_3 and its precursors will mix and react to produce higher concentrations under an inversion. The inversion will also simultaneously trap and hold directly emitted pollutants (e.g., CO). PM_{10} is both directly emitted and indirectly created in the atmosphere as a result of chemical reactions. Concentration levels of these pollutants are directly related to inversion layers due to the limitation of mixing space.

Surface or radiation inversions are formed when the ground surface becomes cooler than the air above it during the night. The ground goes through a radiative process on clear nights, when heat energy is transferred from the ground to a cooler night sky. As the ground cools during the evening hours, the air directly above it also cools, while air higher up remains relatively warm. The inversion is destroyed when heat from the sun warms the ground, which in turn heats the lower layers of air; this heating stimulates the ground level air to float up through the inversion layer.

The combination of stagnant wind conditions and low inversions produces the greatest concentration of pollutants. On days of no inversion or high wind speeds, ambient air pollutant concentrations are the lowest. During periods of low inversions and low wind speeds, air pollutants generated in urbanized areas in Los Angeles and Orange Counties are transported predominantly onshore into Riverside and San Bernardino Counties. In the winter, the greatest pollution problems are CO and oxides of nitrogen (NO_X) because of extremely low inversions and air stagnation during the night and early morning hours. In the summer, the longer daylight hours and the brighter sunshine combine to cause a reaction between hydrocarbons and NO_X to form photochemical smog.

2.12.2.2 Monitored Air Quality

The SCAQMD operates several air quality monitoring stations in the project area. The Compton Air Quality Monitoring Station at 700 North Bullis Road monitors four of the five criteria pollutants (CO, O_3, NO_2, and $PM_{2.5}$). The closest monitoring station with PM_{10} data is the Anaheim-Pampas Lane Station. Figure 2.12-1 shows the locations of the air quality monitoring stations near the project. Air quality trends identified from data collected at both the Compton and Anaheim-Pampas Lane air quality monitoring stations between 2011 and 2016 are listed in Table 2.12.1.

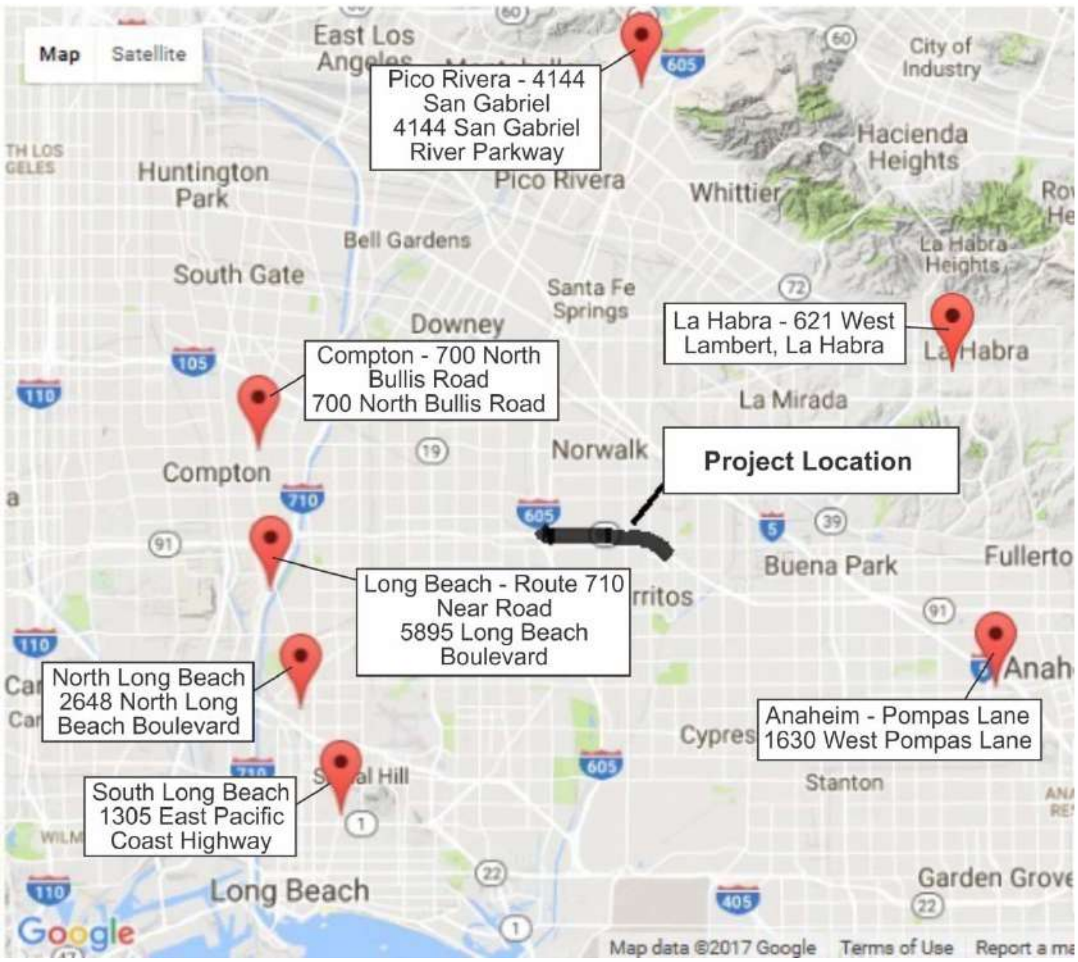


Figure 2.12-1 Air Quality Monitoring Stations in the Project Vicinity

Table 2.12.1 Ambient Air Quality Levels In Project Vicinity

Pollutant	Standard	2011	2012	2013	2014	2015	2016
Carbon Monoxide							
Max 1-hr concentration (ppm)		5.8	5.2	5.8	5.8	4.4	4.4
No. days exceeded: State Federal	> 20 ppm/1-hr > 35 ppm/1-hr	0 0	0 0	0 0	0 0	0 0	0 0
Max 8-hr concentration (ppm)		4.7	4.0	3.5	3.8	3.3	3.9
No. days exceeded: State Federal	>9.1 ppm/8-hr >9.5 ppm/8-hr	0 0	0 0	0 0	0 0	0 0	0 0
Ozone							
Max 1-hr concentration (ppm)		0.082	0.086	0.090	0.087	0.087	0.079
No. days exceeded: State	> 0.09 ppm/1-hr	0	0	0	0	0	0
Ozone							
Max 8-hr concentration (ppm)		0.065	0.070	0.069	0.063	0.066	0.059
No. days exceeded: State Federal	> 0.07 ppm/8-hr > 0.075 ppm/8-hr	0 0	0 0	0 0	0 0	0 0	0 0
Particulate matter less than 10 microns in size (PM_{10})							
Max 24-hr concentration ($\mu g/m^3$)		53.0	48.0	77.0	85.0	59.0	74.0
No. days exceeded: State Federal	> 50 $\mu g/m^3$ > 150 $\mu g/m^3$	2 0	0 0	1 0	2 0	2 0	N/A 0
Annual avg. concentration ($\mu g/m^3$)		24.7	22.3	25.2	26.7	25.3	N/A
Exceeds Standard? State	> 20 $\mu g/m^3$	Yes	Yes	Yes	Yes	Yes	N/A
Particulate matter less than 2.5 microns in size ($PM_{2.5}$)							
Max 24-hr concentration ($\mu g/m^3$)		35.3	51.2	52.1	35.8	41.3	36.3
No. days exceeded: Federal	> 35 $\mu g/m^3$	2	1	1	1	3	1
Annual avg. concentration ($\mu g/m^3$)		13.0	11.7	N/A	N/A	N/A	N/A
Exceeds Standard? State Federal	> 12 $\mu g/m^3$ > 15 $\mu g/m^3$	Yes No	No No	N/A N/A	N/A N/A	N/A N/A	N/A N/A
Nitrogen Dioxide							
Max 1-hr concentration: State	> 180 ppb	75.4	79.3	69.8	68.2	73.6	63.7
No. days exceeded		0	0	0	0	0	0
Annual avg. concentration: Federal	> 53 ppb	18	17	17	N/A	16	15
No. days exceeded		0	0	0	N/A	0	0

Source 1: United States Environmental Protection Agency. Air Quality Data. Website: https://www.epa.gov/outdoor-air-quality-data (accessed March 2018).
Source 2: California Air Resources Board, iADAM: Air Quality Data Statistics. Website: www.arb.ca.gov/adam/index.html (accessed March 2018).

$\mu g/m^3$ = micrograms per cubic meter
avg. = average
hr = hour
max = maximum
N/A = not available
PM_{10} = particulate matter less than 10 microns in size
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
ppb = parts per billion
ppm = parts per million

2.12.2.3 Sensitive Receptors

Sensitive populations are more susceptible to the effects of air pollution than the general population. Sensitive populations (sensitive receptors) that are in proximity to localized sources of toxics and CO are of particular concern. Land uses considered to be sensitive receptors include residences, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. Land uses in the project area include residential, schools (i.e., John H. Niemes Elementary School, Tracy High School, Richard Gahr High School, Juarez Academy of Engineering & Technology), parks and community centers, agriculture, office, utility, and vacant land. The majority of the sensitive receptors in or adjacent to the project area are residential uses and schools.

2.12.2.4 Criteria Pollutant Attainment/Nonattainment Status

As noted earlier, the six criteria pollutants are O_3, CO, PM (including both $PM_{2.5}$ and PM_{10}), NO_2, SO_2, and lead. The primary standards for these criteria pollutants are shown in Table 2.12.2 along with a brief description of the health effects associated with exposures to these pollutants and the typical sources of these pollutants. The NAAQS are two-tiered: primary, to protect public health, and secondary, to prevent degradation to the environment (e.g., impairment of visibility and damage to vegetation and property).

Air quality monitoring stations are located throughout the nation and maintained by the local air districts and State air quality regulating agencies. Data collected at permanent monitoring stations are used by the EPA to identify regions as "attainment," "nonattainment," or "maintenance," depending on whether the regions meet the requirements stated in the primary NAAQS. Nonattainment areas are imposed with additional restrictions as required by the EPA. In addition, different classifications of nonattainment (e.g., marginal, moderate, serious, severe, and extreme) are used to classify each air basin in the State on a pollutant-by-pollutant basis. The classifications are used as a foundation to create air quality management strategies to improve air quality and comply with the NAAQS. The South Coast Air Basin's attainment status for each of the criteria pollutants is listed in Table 2.12.2.

2.12.3 Environmental Consequences

2.12.3.1 Short-Term Impacts

Build Alternatives (includes Design Options)

Construction Air Quality Conformity

Under the transportation conformity regulations (40 CFR 93.123(c)(5)), construction-related activities that cause temporary increases in emissions are not required in a hot-spot analysis. These temporary increases in emissions are those that occur only during the construction phase and last five years or less at any individual site. They typically fall into two main categories:

- **Fugitive Dust:** A major emission from construction due to ground disturbance. All air districts and the California Health and Safety Code (Sections 41700-41701) prohibit "visible emissions" exceeding three minutes in one hour – this applies not only to dust but also to engine exhaust. In general, this is interpreted as visible emissions crossing the right-of-way line.

Table 2.12.2 State and Federal Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Period	California Standard[1]	Federal Standard[2]	Basin Attainment Status[3]		Principal Health and Atmospheric Effects	Typical Sources
				California Standard	Federal Standard		
Ozone (O_3)	1-hour	0.09 ppm (180 µg/m^3)	Revoked	Non-Attainment	Non-Attainment (Extreme)	High concentrations irritate lungs. Long-term exposure may cause lung tissue damage and cancer. Long-term exposure damages plant materials and reduces crop productivity. Precursor organic compounds include many known toxic air contaminants. Biogenic VOC may also contribute.	Low-altitude ozone is almost entirely formed from ROG or VOC and NO_X in the presence of sunlight and heat. Major sources include motor vehicles and other mobile sources, solvent evaporation, and industrial and other combustion processes.
	8-hour	0.070 ppm (137 µg/m^3)	0.070 ppm (137 µg/m^3)	Non-Attainment	Non-Attainment (Extreme)		
Respirable Particulate Matter (PM_{10})	24-hour	50 µg/m^3	150 µg/m^3	Non-Attainment	Attainment / Maintenance	Irritates eyes and respiratory tract. Decreases lung capacity. Associated with increased cancer and mortality. Contributes to haze and reduced visibility. Includes some toxic air contaminants. Many aerosol and solid compounds are part of PM_{10}.	Dust- and fume-producing industrial and agricultural operations; combustion smoke; atmospheric chemical reactions; construction and other dust-producing activities; unpaved road dust and re-entrained paved road dust; natural sources (wind-blown dust, ocean spray).
	Annual	20 µg/m^3	---	Non-Attainment	---		
Fine Particulate Matter ($PM_{2.5}$)	24-hour	---	35 µg/m^3	---	Non-Attainment (Serious)	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and produces surface soiling. Most diesel exhaust particulate matter – a toxic air contaminant – is in the $PM_{2.5}$ size range. Many aerosol and solid compounds are part of $PM_{2.5}$.	Combustion including motor vehicles, other mobile sources, and industrial activities; residential and agricultural burning; also formed through atmospheric chemical (including photochemical) reactions involving other pollutants including NO_X, SO_X, ammonia, and ROG.
	Annual	12 µg/m^3	12.0 µg/m^3	Non-Attainment	Non-Attainment (Serious)		
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	Attainment	Attainment / Maintenance	CO interferes with the transfer of oxygen to the blood and deprives sensitive tissues of oxygen. CO also is a minor precursor for photochemical O_3.	Combustion sources, especially gasoline-powered engines and motor vehicles. CO is the traditional signature pollutant for on-road mobile sources at the local and neighborhood scale.
	8-hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	Attainment	Attainment / Maintenance		

Table 2.12.2 State and Federal Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Period	California Standard[1]	Federal Standard[2]	Basin Attainment Status[3]		Principal Health and Atmospheric Effects	Typical Sources
				California Standard	Federal Standard		
Nitrogen Dioxide (NO_2)	1-hour	0.18 ppm (339 μg/m^3)	0.10 ppm (188 μg/m^3)	Attainment	Unclassifiable / Attainment	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown. Contributes to acid rain. Part of the "NO_X" group of O_3 precursors.	Motor vehicles and other mobile sources; refineries; industrial operations.
	Annual	0.030 ppm (57 μg/m^3)	0.053 ppm (100 μg/m^3)	Attainment	Attainment / Maintenance		
Lead (Pb)	30-day average	1.5 μg/m^3	---	Nonattainment (Los Angeles County only)	---	Disturbs gastrointestinal system. Causes anemia, kidney disease, and neuromuscular and neurological dysfunction. Also a toxic air contaminant and water pollutant.	Lead-based industrial processes like battery production and smelters. Lead paint, leaded gasoline. Aerially deposited lead from gasoline may exist in soils along major roads.
	Rolling 3-month average[6]	---	0.15 μg/m^3	---	Non-Attainment (Los Angeles County only)		
Sulfur Dioxide (SO_2)	1-hour	0.25 ppm (655 μg/m^3)	0.075 ppm (196 μg/m^3)	Attainment[5]	Attainment	Irritates respiratory tract; injures lung tissue. Can yellow plant leaves. Destructive to marble, iron, steel. Contributes to acid rain. Limits visibility.	Fuel combustion (especially coal and high-sulfur oil), chemical plants, sulfur recovery plants, metal processing; some natural sources like active volcanoes. Limited contribution possible from heavy-duty diesel vehicles if ultra-low sulfur fuel not used.
	3-hour[9]	---	0.5 ppm (1,300 μg/m^3)	---	Attainment		
	24-hour	0.04 ppm (105 μg/m^3)	0.14 ppm	Attainment[5]	Attainment		
Hydrogen Sulfide (H_2S)	1-hour	0.03 ppm (42 μg/m^3)	---	Attainment	---	Colorless, flammable, poisonous. Respiratory irritant. Neurological damage and premature death. Headache, nausea.	Industrial processes such as: refineries and oil fields, asphalt plants, livestock operations, sewage treatment plants, and mines. Some natural sources like volcanic areas and hot springs.
Vinyl Chloride	24-hour	0.01 ppm (26 μg/m^3)	---	Attainment	---	Neurological effects, liver damage, cancer. Also considered a toxic air contaminant.	Industrial processes
Sulfates	24-hour	25 μg/m^3	---	Attainment	---	Premature mortality and respiratory effects. Contributes to acid rain. Some toxic air contaminants attach to sulfate aerosol particles.	Industrial processes, refineries and oil fields, mines, natural sources like volcanic areas, salt-covered dry lakes, and large sulfide rock areas.

Table 2.12.2 State and Federal Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Period	California Standard[1]	Federal Standard[2]	Basin Attainment Status[3]		Principal Health and Atmospheric Effects	Typical Sources
				California Standard	Federal Standard		
Visibility-Reducing Particles	---	Extinction coefficient of 0.23 per kilometer (visibility of 10 miles or more due to particles when relative humidity is less than 70%)	---	Attainment	---	Reduces visibility. Produces haze. Note: not related to the Regional Haze program under the Federal Clean Air Act, which is oriented primarily toward visibility issues in National Parks and other "Class I" areas.	See particulate matter above.

Source: *Air Quality Analysis* (2018).

[1] California standard levels obtained from CARB CAAQS webpage. Website: http://www.arb.ca.gov/research/aaqs/caaqs/caaqs.htm (accessed March 2018).

[2] Federal standard levels obtained from the EPA NAAQS table. Note that some Federal standards include a level (such as the concentrations shown in the table) and a form (often a statistical form or based on excluding a certain number of exceedances of the standard level over a given number of years). Exceedances of the standard level are not necessarily violations or exceedances of the standard. Website: https://www.epa.gov/criteria-air-pollutants/naaqs- table (accessed March 2018).

[3] Attainment status obtained from SCAQMD NAAQS and CAAQS Attainment Status for the South Coast Air Basin. Website: http://www.aqmd.gov/docs/default- source/clean-air-plans/air-quality-management-plans/naaqs-caaqs-feb2016.pdf (accessed March 2018).

[4] Designation is pending; Non-Attainment (Extreme) classification is expected.

[5] Attainment status obtained from CARB Area Designation Maps. Website: http://www.arb.ca.gov/desig/adm/adm.htm (accessed March 2018).

[6] Final rule signed October 15, 2008. The 1978 lead standard (1.5 $\mu g/m^3$ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

[7] According to the CARB website, the Los Angeles County portion of the South Coast Air Basin is designated "Nonattainment" only for near-source monitors. Expect to remain in attainment based on current monitoring data.

[8] Designation is pending; Unclassifiable/Attainment classification is expected.

[9] This is a secondary standard. Not to be exceeded more than once per year.

$\mu g/m^3$ = micrograms per cubic meter
CARB = California Air Resources Board
Basin = South Coast Air Basin
CAAQS = California ambient air quality standards
EPA = United States Environmental Protection Agency
mg/m^3 = milligrams per cubic meter
NAAQS = national ambient air quality standards
NO_X = oxides of nitrogen
ppm = parts per million
ROG = reactive organic gases
SCAQMD = South Coast Air Quality Management District
SO_X = oxides of sulfur
VOC = volatile organic compounds

Sources of fugitive dust include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site may deposit mud on local streets, which could be an additional source of airborne dust after it dries. PM_{10} emissions may vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} emissions depend on soil moisture, silt content of soil, wind speed, and the amount of equipment operating. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

- **Construction Equipment Emissions:** Diesel exhaust particulate matter is a California-identified toxic air contaminant, and localized issues may exist if diesel-powered construction equipment is operated near sensitive receptors.

Construction activities will not last for more than 5 years at one general location, so construction-related emissions do not need to be included in regional and project-level conformity analysis.

Construction Emissions

During construction, short-term degradation of air quality may occur due to the release of particulate emissions generated by excavation, grading, hauling, and other activities related to construction. Emissions from construction equipment also are anticipated and would include CO, NO_X, volatile organic compounds (VOCs), directly emitted PM ($PM_{2.5}$ and PM_{10}), and toxic air contaminants (TACs) (e.g., diesel exhaust PM).

Site preparation and roadway construction would involve clearing, cut-and-fill activities, grading, and paving roadway surfaces. Construction-related effects on air quality from most roadway projects would be greatest during the site preparation phase because most engine emissions are associated with the excavation, handling, and transport of soils to and from the site. If not properly controlled, these activities would temporarily generate $PM_{2.5}$, PM_{10}, CO, SO_2, NO_X, and VOCs. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could become an additional source of airborne dust after drying. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} emissions would depend on soil moisture, the silt content of soil, wind speed, and the amount of equipment operating at the time. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

Construction activities for large development projects are estimated by the EPA to add 1.2 tons of fugitive dust per acre of soil disturbed per month of activity. If water or other soil stabilizers are used to control dust, the emissions can be reduced by up to 50 percent. SCAQMD Rule 403 regarding fugitive dust minimization requirements would reduce potential dust emissions during construction. The following project features will be implemented during construction activities.

PF-AQ-1 During clearing, grading, earthmoving, or excavation operations, excessive fugitive dust emissions will be controlled by regular watering or other dust-preventive measures using the following procedures, as specified in the South Coast Air Quality Management District's (SCAQMD) Rule 403. All material excavated or graded will be sufficiently watered to prevent excessive amounts of dust. Watering will occur at least twice daily with complete coverage, preferably in the late morning and after work is done for the day. All material transported on site or off site will be either sufficiently watered or securely covered to prevent excessive amounts of dust. The area disturbed by clearing, grading, earthmoving, or excavation operations will be minimized so as to prevent excessive amounts of dust. These control techniques will be indicated in project specifications. Visible dust beyond the property line emanating from the project will be prevented to the maximum extent feasible.

PF-AQ-2 Project grading plans will show the duration of construction. Ozone (O_3) precursor emissions from construction equipment vehicles will be controlled by maintaining equipment engines in good condition and in proper tune per manufacturers' specifications.

PF-AQ-3 All trucks that are to haul excavated or graded material on site will comply with State Vehicle Code Section 23114, with special attention to Sections 23114(b)(F), (e)(2), and (e)(4), as amended, regarding the prevention of such material spilling onto public streets and roads.

PF-AQ-4 The Construction Contractor will adhere to the California Department of Transportation (Caltrans) Standard Specifications for construction (Sections 14-9.02 and 14-9.03).

PF-AQ-5 Should the project geologist determine that asbestos-containing materials (ACMs) are present at the project study area during final inspection prior to construction, the appropriate methods will be implemented to remove ACMs.

PF-AQ-6 All construction vehicles both on- and off-site shall be prohibited from idling in excess of 5 minutes.

If construction activities were to increase traffic congestion in the study area, CO and other emissions from traffic would increase slightly while those vehicles are delayed. However, based on the amount of daily work trips required for project construction (between 26 and 56 daily trips, depending on the activities), construction worker trips are not anticipated to increase traffic congestion in the study area.

SO_2 is generated by oxidation during combustion of the organic sulfur compounds contained in diesel fuel. Under California law and CARB regulations, off-road diesel fuel used in California must meet the same sulfur and additional standards as on-road diesel fuel (not more than 15 parts per million [ppm] sulfur), and as such, SO_2-related issues due to diesel exhaust would be minimal.

The construction emissions were estimated for the project using the Sacramento Metropolitan Air Quality Management District's (AQMD) Road Construction Emissions Model, Version 8.1.0, which is consistent with the guidance provided by SCAQMD for evaluating construction impacts from roadway projects. The maximum amount of construction-related emissions during a peak construction day is presented in Table 2.12.3 (model data are provided in Appendix D of the *Air Quality Analysis* [2018]). The $PM_{2.5}$ and PM_{10} emissions assume a 50 percent control of fugitive dust as a result of watering and associated dust-control measures. The emissions presented below are based on the best information available at the time of calculations and specify that the schedule for the Build Alternative is anticipated to take approximately 37 months, beginning in May 2021 and ending in June 2024. California Department of Transportation (Caltrans) Standard Specifications for construction (Section 14-9.02 [Air Pollution Control] and Section 14-9.03 [Dust Control]) will be adhered to in order to reduce emissions generated by construction equipment. Additionally, SCAQMD has established rules for reducing fugitive dust emissions. With the implementation of standard construction measures (providing 50 percent effectiveness) such as frequent watering (e.g., a minimum of twice per day) as well as Project Features PF-AQ-1 through PF-AQ-6, fugitive dust and exhaust emissions

Table 2.12.3 Estimated Daily Construction Emissions

Construction Phase	Pollutant[1] (lbs/day)				
	ROG	CO	NO_X	PM_{10}[2,3]	$PM_{2.5}$[2,3]
Grubbing/Land Clearing	1.50	12.55	14.05	50.63	10.96
Grading/Excavation	6.29	54.41	63.60	53.05	13.15
Drainage/Utilities/Sub-Grade	3.50	33.94	31.46	51.58	11.84
Paving	1.69	19.59	14.82	0.81	0.71
Maximum	*6.29*	*54.41*	*63.60*	*53.05*	*13.15*
Total (Tons/Construction Project)	**1.18**	**10.69**	**11.46**	**12.25**	**2.93**

Source: *Air Quality Analysis* (2018).

1 Emissions were calculated using the Roadway Construction Emissions Model (RCEM) (Version 8.1.0) developed by the Sacramento Metropolitan Air Quality Management District.

2 PM_{10} and $PM_{2.5}$ estimates assume control of fugitive dust from watering and associated dust control measures.

3 Emissions include the sum of exhaust and fugitive dust.

CO = carbon monoxide
lbs/day = pounds per day
NO_X = oxides of nitrogen
PM_{10} = particulate matter less than 10 microns in size
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
ROG = reactive organic gases

from construction activities would not result in any adverse air quality impacts. Some phases of construction, particularly asphalt paving, would result in short-term odors in the immediate area of each paving site(s). Such odors would quickly disperse to below detectable thresholds as distance from the site(s) increases.

The estimated peak-day construction emissions for the Build Alternative are summarized in Table 2.12.3.

Naturally Occurring Asbestos

The project is in Los Angeles County, which is among the counties listed as containing serpentine and ultramafic rock. However, the portion of Los Angeles County in which the project lies is not known to contain serpentine or ultramafic rock, according to the California Department of Conservation, Division of Mines and Geology (2000). Therefore, the impact from naturally occurring asbestos during project construction would be minimal to none. In the unlikely event that naturally occurring asbestos, serpentine, or ultramafic rock is discovered, SCAQMD will be notified per Section 93105, Title 17 of the California Code of Regulations (CCR).

No Build Alternative

The No Build Alternative would not result in construction related to the project and, therefore, would not result in temporary impacts to air quality.

2.12.3.2 Permanent Impacts

Build Alternatives (includes Design Options)

Regional Air Quality Conformity

The project is listed in Amendment #3 to the 2016 RTP/Sustainable Communities Strategy (SCS) with Project ID1163S012. Its description is as follows: "Improvements to the I-605/SR-91 interchange consist of adding an additional general purpose lane, adding auxiliary lanes, and on/ off ramp improvements. PM SR-91 16.9/19.8; I-605 PM 5.0/5.8" (Southern California Association of Governments 2016a). The 2016 RTP was approved by the Regional Council of the Southern California Association of Governments (SCAG) on April 7, 2016, and Amendment #3 is scheduled to be adopted in December 2018. However, the proposed project is not currently programmed in the Federal Transportation Improvement Program (FTIP). The proposed project will be added to the FTIP prior to completion of the Project Approval/Environmental Documentation (PA/ED) phase. The RTP/SCS listing is included in Appendix B of the *Air Quality Analysis*.

Project-Level Conformity

Because the project limits are within an attainment/maintenance area for CO and PM_{10} and a nonattainment area for $PM_{2.5}$ federal standards, local hot-spot analyses for CO, $PM_{2.5}$, and PM_{10} are required for conformity purposes. The results of these hot-spot analyses are provided below. The FHWA Air Quality Conformity Determination will be needed before Caltrans can issue a Finding of No Significant Impact (FONSI).

Carbon Monoxide

The methodology required for a CO local analysis is summarized in the Caltrans Transportation Project-Level Carbon Monoxide Protocol (Protocol), Section 3 (Determination of Project Requirements) and Section 4 (Local Analysis). In Section 3, the Protocol provides two conformity requirement decision flowcharts designed to assist project sponsors in evaluating the requirements that apply to specific projects. The flowchart on Figure 1 (Appendix A of the *Air Quality Analysis*) of the Protocol applies to new projects and was used in this analysis. Below is a step-by-step explanation of the flowchart. Each level cited is followed by a response, which in turn determines the next applicable level of the flowchart for the project (Caltrans 1998).

The flowchart begins with Section 3.1.1.

- **3.1.1. Is this project exempt from all emissions analyses?**
  NO.

  Table 1 of the Protocol is Table 2 of 40 CFR, Section 93.126. Section 3.1.1 is inquiring if the project is exempt. Such projects appear in Table 1 of the Protocol. The Build Alternative widens an existing highway, which is not one of the exempt projects listed in Table 1. Therefore, the project is not exempt from all emissions analyses.

- **3.1.2. Is the project exempt from regional emissions analyses?**
  NO.

  Table 2 of the Protocol is Table 3 of 40 CFR, Section 93.127. The question is attempting to determine whether the project is listed in Table 2. Projects that are included in Table 2 of the Protocol are exempt from regional conformity. Because the project would widen an existing highway, it is not exempt from regional emissions analysis.

- **3.1.3. Is the project locally defined as regionally significant?**
  YES.

  As mentioned above, the proposed project would widen an existing highway. Therefore, the project is potentially significant.

- **3.1.4. Is the project in a federal attainment area?**
  NO.

  The project is in an attainment/maintenance area for the federal CO standard; therefore, the project is subject to a regional conformity determination.

- **3.1.5. Is there a currently conforming RTP and TIP?**
  YES.

- **3.1.6. Is the project included in the regional emissions analysis supporting the currently conforming RTP and TIP?**
  YES.

The project is listed in Amendment #3 to the 2016 RTP/SCS with Project ID 1163S012. Its description is listed as: "Improvements to the I-605/SR-91 interchange consist of adding an additional general purpose lane, adding auxiliary lanes, and on/off ramp improvements. PM SR-91 16.9/19.8; I-605 PM 5.0/5.8". The proposed project will be added to the Federal Transportation Improvement Program (FTIP) prior to completion of the Project Approval/Environmental Documentation (PA/ED) phase. The RTP/SCS listing is included in Appendix B.

- **3.1.7. Has the project design concept and/or scope changed significantly from that in the regional analysis?**
  NO.

  As discussed in 3.1.6, regional conformity for the proposed project will be demonstrated once the RTP and the FTIP have been approved by the FHWA and the Federal Transit Administration (FTA).

- **3.1.9. Examine local impacts.**
  Section 3.1.9 of the flowchart directs the project evaluation to Section 4 (Local Analysis) of the Protocol. This concludes Figure 1.

  Section 4 contains Figure 3 (Local CO Analysis [Appendix A]). This flowchart is used to determine the type of CO analysis required for the Build Alternative. Below is a step-by-step explanation of the flowchart. Each level cited is followed by a response, which in turn determines the next applicable level of the flowchart for the Build Alternative. The flowchart begins at Level 1.

- **Level 1. Is the project in a CO non-attainment area?**
  NO.

  The project site is in an area that has demonstrated attainment with the federal CO standards.

- **Level 1 (cont.). Was the area redesignated as "attainment" after the 1990 Clean Air Act?**
  YES.

  The project is located in the South Coast Air Basin, under the jurisdiction of the SCAQMD, and was classified nonattainment after the 1990 CAA. The Basin was granted federal redesignation to attainment/maintenance on June 11, 2007.

- **Level 1 (cont.). Has "continued attainment" been verified with the local Air District, if appropriate?**
  YES.

  The South Coast Air Basin was designated as attainment/maintenance by the EPA on June 11, 2007. (Proceed to Level 7).

- **Level 7. Does the project worsen air quality?**
  YES.

  Because the proposed project would increase traffic volumes on the freeway by 5 percent or more, as well as on the local intersections, the project would potentially worsen air quality.

  a. *The project significantly increases the percentage of vehicles operating in cold start mode. Increasing the number of vehicles operating in cold start mode by as little as 2% should be considered potentially significant.*

     All vehicles on the freeway and in the intersections are assumed to be in a fully warmed-up mode. Therefore, this criterion is not met.

  b. *The project significantly increases traffic volumes. Increases in traffic volumes in excess of 5% should be considered potentially significant. Increasing the traffic volume by less than 5% may still be potentially significant if there is also a reduction in average speeds.*

     The proposed project would improve State Route 91 (SR-91) by changing the existing highway. As shown in Tables 2.12.4 and 2.12.5, traffic volumes along SR-91 would exceed 125,000 average daily traffic (ADT). As shown, all roadway segments would have a 5 percent or lower total ADT increase, except for the two shaded roadway segments in each table. These segments are between two existing on-ramps. The Build Alternative would combine the southbound on-ramp with the northbound on-ramp, thus putting the combined traffic volumes onto these segments. This traffic volume combination would have a lesser effect on the corresponding roadway segments east of the intersections. As shown in Tables 2.12.6 and 2.12.7, the intersections affected by the project would not change substantially with the Build Alternative compared to the No Build Alternative.

Table 2.12.4 Opening Year (2024) Traffic Volumes

Roadway Segment	No Build (2024)			Build (2024) Both Without and With Diamond Ramps Design Option			Project Increase (Percent)	
	Total ADT	Truck ADT	Truck %	Total ADT	Truck ADT	Truck %	Total ADT	Truck ADT
Westbound SR-91								
East of Studebaker Road	106,700	11,240	10.5	109,700	11,590	10.6	2.8	3.1
West of Pioneer Boulevard	136,400	13,570	9.9	149,000	13,590	9.1	9.2	0.1
East of Pioneer Boulevard	132,400	13,120	9.9	139,300	13,880	10.0	5.2	5.8
West of Norwalk Boulevard	131,100	12,980	9.9	144,400	13,120	9.1	10	1.1
East of Norwalk Boulevard	128,500	12,820	10.0	135,200	12,340	9.1	5.2	-3.7
West of Bloomfield Avenue	124,800	12,410	9.9	130,200	13,020	10.0	4.3	4.9
East of Artesia Boulevard	116,800	11,530	9.9	119,500	11,840	9.9	2.3	2.7
West of 183rd Street	126,400	12,580	10.0	128,400	12,830	10.0	1.6	2.0
Northbound I-605								
North of Westbound SR-91 On-Ramp	153,900	11,790	7.7	155,200	11,880	7.7	0.8	0.8

Source: *Air Quality Analysis* (2018).
Note: = Roadway segments that are between two existing on-ramps.
ADT = average daily trips I-605 = Interstate 605 SR-91 = State Route 91

Table 2.12.5 Future Year (2044) Traffic Volumes

Roadway Segment	No Build (2044)			Build (2044) Both Without and With Diamond Ramps Design Option			Project Increase (Percent)	
	Total ADT	Truck ADT	Truck %	Total ADT	Truck ADT	Truck %	Total ADT	Truck ADT
Westbound SR-91								
East of Studebaker Road	108,500	14,960	13.8	111,200	15,250	13.7	2.5	1.9
West of Pioneer Boulevard	137,700	17,320	12.6	150,600	17,960	11.9	9.4	3.7
East of Pioneer Boulevard	133,600	17,140	12.8	140,300	17,570	12.5	5.0	2.5
West of Norwalk Boulevard	132,100	16,950	12.8	145,300	17,780	12.2	10.0	4.9
East of Norwalk Boulevard	129,400	17,390	13.4	135,900	18,390	13.5	5.0	5.8
West of Bloomfield Avenue	125,200	15,990	12.8	130,400	16,330	12.5	4.2	2.1
East of Artesia Boulevard	116,400	15,580	13.4	119,000	15,840	13.3	2.2	1.7
West of 183rd Street	126,700	16,040	12.7	128,800	16,310	12.7	1.7	1.7
Northbound I-605								
North of Westbound SR-91 On-Ramp	155,700	14,800	9.5	157,200	16,450	10.5	1.0	11

Source: *Air Quality Analysis* (2018).
Note: = Roadway segments that are between two existing on-ramps.
ADT = average daily trips I-605 = Interstate 605 SR-91 = State Route 91

Table 2.12.6 Existing (2016) and 2024 Intersection Turn Volumes

Intersections and Time of Day		Vehicles Per Hour											
		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Existing (2016)													
Existing (2016) Scenario													
WB SR-91 Off-Ramp & Artesia Boulevard	AM	0	863	0	0	544	0	572	0	188	0	0	0
Norwalk Boulevard & WB SR-91 Off-Ramp	AM	0	0	0	99	0	232	0	1206	0	0	1098	0
Pioneer Boulevard & WB SR-91 Off-Ramp	AM	0	0	0	102	0	130	16	873	0	0	1034	8
Studebaker Road & WB SR-91 Off-Ramp	AM	1	0	0	367	0	98	0	892	0	0	1012	1
NB I-605 Off-Ramp & Alondra Boulevard	AM	38	1331	0	0	1510	8	302	48	284	1	0	115
WB SR-91 Off-Ramp & Artesia Boulevard	PM	0	875	0	0	697	0	485	0	79	0	0	0
Norwalk Boulevard & WB SR-91 Off-Ramp	PM	0	0	0	69	0	152	0	919	0	0	1152	0
Pioneer Boulevard & WB SR-91 Off-Ramp	PM	0	0	0	96	0	113	12	979	0	0	1069	4
Studebaker Road & WB SR-91 Off-Ramp	PM	0	0	0	165	0	60	0	1123	0	0	1097	0
NB I-605 Off-Ramp & Alondra Boulevard	PM	79	1338	0	0	1645	10	414	153	391	3	0	92
2024													
No Build Scenario													
WB SR-91 Off-Ramp & Artesia Boulevard	AM	0	778	0	0	507	0	410	0	134	0	0	0
Norwalk Boulevard & WB SR-91 Off-Ramp	AM	0	0	0	88	0	204	0	973	0	0	1075	0
Pioneer Boulevard & WB SR-91 Off-Ramp	AM	0	0	0	103	0	112	30	812	0	0	885	9
Studebaker Road & WB SR-91 Off-Ramp	AM	3	0	2	299	0	101	0	845	0	0	946	1
NB I-605 Off-Ramp & Alondra Boulevard	AM	32	1292	0	0	1535	9	278	44	259	2	0	120
WB SR-91 Off-Ramp & Artesia Boulevard	PM	0	733	0	0	780	0	422	0	70	0	0	0
Norwalk Boulevard & WB SR-91 Off-Ramp	PM	0	0	0	71	0	189	0	743	0	0	998	0
Pioneer Boulevard & WB SR-91 Off-Ramp	PM	0	0	0	91	0	151	8	890	0	0	1019	4
Studebaker Road & WB SR-91 Off-Ramp	PM	0	0	0	173	0	57	0	969	0	0	949	0
NB I-605 Off-Ramp & Alondra Boulevard	PM	72	1167	0	0	1571	14	325	92	345	4	0	70
Build Scenario													
WB SR-91 Off-Ramp & Artesia Boulevard	AM	0	778	0	0	507	0	410	0	134	0	0	0
Norwalk Boulevard & WB SR-91 Off-Ramp	AM	0	0	0	88	0	204	0	973	0	0	1075	0
Pioneer Boulevard & WB SR-91 Off-Ramp	AM	0	0	0	103	0	112	30	812	0	0	885	9
Studebaker Road & WB SR-91 Off-Ramp	AM	3	0	2	299	0	101	0	845	0	0	946	1
NB I-605 Off-Ramp & Alondra Boulevard	AM	32	1292	0	0	1535	9	278	44	259	2	0	120
WB SR-91 Off-Ramp & Artesia Boulevard	PM	0	733	0	0	780	0	422	0	70	0	0	0
Norwalk Boulevard & WB SR-91 Off-Ramp	PM	0	0	0	71	0	189	0	743	0	0	998	0
Pioneer Boulevard & WB SR-91 Off-Ramp	PM	0	0	0	91	0	151	8	890	0	0	1019	4
Studebaker Road & WB SR-91 Off-Ramp	PM	0	0	0	173	0	57	0	969	0	0	949	0
NB I-605 Off-Ramp & Alondra Boulevard	PM	72	1167	0	0	1571	14	325	92	345	4	0	70
Diamond Ramps													
WB SR-91 Off-Ramp & Artesia Boulevard	AM	0	786	0	0	431	0	360	0	128	0	0	0
Norwalk Boulevard & WB SR-91 Off-Ramp	AM	0	0	0	88	0	188	192	974	0	0	1075	665
Pioneer Boulevard & WB SR-91 Off-Ramp	AM	0	0	0	135	0	109	250	833	0	0	763	619
Studebaker Road & WB SR-91 Off-Ramp	AM	3	0	2	438	0	111	0	837	0	0	901	1

Table 2.12.6 Existing (2016) and 2024 Intersection Turn Volumes

Intersections and Time of Day		Vehicles Per Hour											
		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
NB I-605 Off-Ramp & Alondra Boulevard	AM	32	1294	0	0	1490	9	293	44	260	2	0	120
WB SR-91 Off-Ramp & Artesia Boulevard	PM	0	757	0	0	703	0	342	0	39	0	0	0
Norwalk Boulevard & WB SR-91 Off-Ramp	PM	0	0	0	71	0	150	97	784	0	0	936	486
Pioneer Boulevard & WB SR-91 Off-Ramp	PM	0	0	0	95	0	144	204	890	0	0	1050	447
Studebaker Road & WB SR-91 Off-Ramp	PM	0	0	0	273	0	103	0	951	0	0	910	0
NB I-605 Off-Ramp & Alondra Boulevard	PM	72	1179	0	0	1459	14	343	92	355	4	0	70

Source: *Air Quality Analysis* (2018).
EBL = eastbound left
EBR = eastbound right
EBT = eastbound through
I-605 = Interstate 605
NB = northbound
NBL =northbound left
NBR =northbound right
NBT =northbound through
SBL = southbound left
SBR = southbound right
SBT = southbound through
SR-91 = State Route 91
WB = westbound
WBL = westbound left
WBR = westbound right
WBT = westbound through

Table 2.12.7 2044 Intersection Turn Volumes

Intersections and Time of Day		Vehicles per hour											
		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2044													
No Build Scenario													
WB SR-91 Off-Ramp & Artesia Boulevard	AM	0	794	0	0	517	0	418	0	136	0	0	0
Norwalk Boulevard & WB SR-91 Off-Ramp	AM	0	0	0	90	0	208	0	992	0	0	1097	0
Pioneer Boulevard & WB SR-91 Off-Ramp	AM	0	0	0	105	0	115	31	828	0	0	903	9
Studebaker Road & WB SR-91 Off-Ramp	AM	3	0	2	305	0	103	0	862	0	0	965	1
NB I-605 Off-Ramp & Alondra Boulevard	AM	33	1318	0	0	1566	9	283	45	264	2	0	122
WB SR-91 Off-Ramp & Artesia Boulevard	PM	0	748	0	0	796	0	431	0	72	0	0	0
Norwalk Boulevard & WB SR-91 Off-Ramp	PM	0	0	0	73	0	193	0	758	0	0	1018	0
Pioneer Boulevard & WB SR-91 Off-Ramp	PM	0	0	0	92	0	154	8	908	0	0	1039	4
Studebaker Road & WB SR-91 Off-Ramp	PM	0	0	0	176	0	58	0	988	0	0	968	0
NB I-605 Off-Ramp & Alondra Boulevard	PM	76	1190	0	0	1602	14	332	93	352	4	0	71
Build Scenario													
WB SR-91 Off-Ramp & Artesia Boulevard	AM	0	797	0	0	481	0		0	132	0	0	0
Norwalk Boulevard & WB SR-91 Off-Ramp	AM	0	0	0	90	0	192	0	993	209	655	1106	0
Pioneer Boulevard & WB SR-91 Off-Ramp	AM	26	0	130	117	0	108	146	848	251	641	793	93
Studebaker Road & WB SR-91 Off-Ramp	AM	3	0	2	450	0	113	0	863	0	0	915	1
NB I-605 Off-Ramp & Alondra Boulevard	AM	33	1314	0	0	1530	9	307	45	264	2	0	122
WB SR-91 Off-Ramp & Artesia Boulevard	PM	0	750	0	0	727	0	345	0	70	0	0	0
Norwalk Boulevard & WB SR-91 Off-Ramp	PM	0	0	0	73	0	141	0	797	104	488	952	0
Pioneer Boulevard & WB SR-91 Off-Ramp	PM	12	0	55	83	0	214	90	872	213	466	1073	50
Studebaker Road & WB SR-91 Off-Ramp	PM	0	0	0	279	0	83	0	984	0	0	919	0
NB I-605 Off-Ramp & Alondra Boulevard	PM	73	1206	0	0	1487	14	350	93	356	4	0	71
Diamond Scenario													
WB SR-91 Off-Ramp & Artesia Boulevard	AM	0	797	0	0	481	0	399	0	132	0	0	0
Norwalk Boulevard & WB SR-91 Off-Ramp	AM	0	0	0	90	0	192	209	993	0	0	1106	655
Pioneer Boulevard & WB SR-91 Off-Ramp	AM	0	0	0	117	0	108	251	848	0	0	793	641
Studebaker Road & WB SR-91 Off-Ramp	AM	3	0	2	450	0	113	0	863	0	0	915	1
NB I-605 Off-Ramp & Alondra Boulevard	AM	33	1314	0	0	1530	9	307	45	264	2	0	122
WB SR-91 Off-Ramp & Artesia Boulevard	PM	0	750	0	0	727	0	345	0	70	0	0	0
Norwalk Boulevard & WB SR-91 Off-Ramp	PM	0	0	0	73	0	141	104	797	0	0	952	488
Pioneer Boulevard & WB SR-91 Off-Ramp	PM	0	0	0	83	0	214	213	872	0	0	1073	466
Studebaker Road & WB SR-91 Off-Ramp	PM	0	0	0	279	0	83	0	984	0	0	919	0
NB I-605 Off-Ramp & Alondra Boulevard	PM	73	1206	0	0	1487	14	350	93	356	4	0	71

Source: *Air Quality Analysis* (2018).

EBL = eastbound left
EBR = eastbound right
EBT = eastbound through
I-605 = Interstate 605
NB = northbound
NBL =northbound left
NBR =northbound right
NBT =northbound through
SBL = southbound left
SBR = southbound right
SBT = southbound through
SR-91 = State Route 91
WB = westbound
WBL = westbound left
WBR = westbound right
WBT = westbound through

As shown in Table 2.12.8 and 2.12.9, the same ramp changes affect the change to the LOS of the freeway ramps and nearby arterials. However, for the unaffected ramps and nearby arterials, the LOS is unchanged with the Build Alternative compared to the No Build Alternative.

c. The project worsens traffic flow. For uninterrupted roadway segments, a reduction in average speeds (within a range of 3 to 50 mph) should be regarded as worsening traffic flow. For intersection segments, a reduction in average speed or an increase in average delay should be considered as worsening traffic flow.

As Tables 2.12.8 and 2.12.9 show, the proposed project would increase delay and LOS for some of the affected intersections. Therefore, this criterion is not met.

- **Level 7 (cont.): Is the project suspected of resulting in higher CO concentrations than those existing within the region at the time of attainment demonstration?** NO.

  The following four intersections in the same region as the project location were evaluated in the 1997 CO Attainment Demonstration: Wilshire Boulevard at Veteran Avenue, Sunset Boulevard at Highland Avenue, La Cienega Boulevard at Century Boulevard, and Long Beach Boulevard at Imperial Highway. CO concentrations at the intersections under study would be lower than those reported for the maximum of the intersections analyzed in the CO attainment plan because all of the following conditions, listed in Section 4.7.2 of the Protocol, are satisfied:

  - The receptor locations at the intersections under study are at the same distance or farther from the traveled roadway than the receptor locations used in the intersections in the attainment plan. The attainment plan evaluates the CO concentrations at a distance of 10 feet (ft) from the edge of the roadways. The Protocol does not permit the modeling of receptor locations closer than this distance.
  - The project intersection traffic volumes and geometries are not substantially different from those included in the attainment plan. Also, the intersections under study have less total traffic and the same number of lanes or fewer than the intersections in the attainment plan.

Table 2.12.8 Intersection Level of Service (LOS) Analysis – AM Period

Intersection	Existing (2016)		2024 No Build		2024 Build		2024 Diamond Ramps		2044 No Build		2044 Build		2044 Diamond Ramps	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
WB SR-91 Off-Ramp & Artesia Boulevard	22.5	C	15.7	B	14.9	B	14.9	B	15.9	B	15.5	B	15.5	B
Norwalk Boulevard & WB SR-91 Off-Ramp	9.9	A	7.2	A	24.3	C	9.8	A	7.3	A	24.6	C	10.3	B
Pioneer Boulevard & WB SR-91 Off-Ramp	7.2	A	6.7	A	71.4	E	14.0	B	6.7	A	65.8	E	13.5	B
Studebaker Road & WB SR-91 Off-Ramp	16.5	B	15.2	B	20.5	C	20.5	C	15.8	B	21.2	C	21.2	C
NB I-605 Off-Ramp & Alondra Boulevard	25.1	C	22.9	C	24.5	C	24.5	C	23.6	C	26.2	C	26.2	C

Source: *Traffic Operations Analysis Report* (2018).
I-605 = Interstate 605 NB = northbound SR-91 = State Route 91
LOS = level of service sec/veh = seconds/vehicle WB = westbound

Table 2.12.9 Intersection Level of Service (LOS) Analysis – PM Period

Intersection	Existing (2016)		2024 No Build		2024 Build		2024 Diamond Ramps		2044 No Build		2044 Build		2044 Diamond Ramps	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
WB SR-91 Off-Ramp & Artesia Boulevard	19.0	B	15.2	B	13.0	B	13.0	B	15.6	B	13.2	B	13.2	B
Norwalk Boulevard & WB SR-91 Off-Ramp	6.9	A	6.9	A	16.4	B	6.9	A	6.9	A	16.0	B	6.8	A
Pioneer Boulevard & WB SR-91 Off-Ramp	6.4	A	6.5	A	34.3	C	9.7	A	6.4	A	34.8	C	10.5	B
Studebaker Road & WB SR-91 Off-Ramp	8.3	A	8.7	A	12.6	B	12.6	B	8.8	A	12.7	B	12.7	B
NB I-605 Off-Ramp & Alondra Boulevard	38.9	D	25.9	C	26.3	C	26.3	C	26.8	C	27.0	C	27.0	C

Source: *Traffic Operations Analysis Report* (2018).
I-605 = Interstate 605 NB = northbound SR-91 = State Route 91
LOS = level of service sec/veh = seconds/vehicle WB = westbound

- The assumed meteorology for the intersections under study is the same as the assumed meteorology for the intersections in the attainment plan. Both use the worst-case scenario meteorology settings in the California Line Source Dispersion Model, Version 4 (CALINE4) and/or the EPA's CO hot-spot analysis model (a combination of the California Line Source Dispersion Model, Version 3 [CALINE3] dispersion modeling and the queueing algorithms from the *Highway Capacity Manual* [HCM]) (CAL3QHC).
- As shown in Table 2.12.10, the intersection traffic lane volumes are similar to or lower for the intersections under study than those assumed for the Wilshire Boulevard/Veteran Avenue intersection (the intersection with the highest traffic volumes) in the attainment plan.
- The percentages of vehicles operating in cold-start mode are the same or lower for the intersections under study compared to those used for the intersections in the attainment plan. All vehicles in the intersection are assumed to be in a fully warmed-up mode.
- The percentage of heavy duty gas trucks in the intersections under study is the same or lower than the percentages used for the intersections in the attainment plan analysis. It is assumed that the traffic distribution at the intersections under study do not vary from the California Emission Factor Model (EMFAC) standards.
- The average delay and queue length for each approach are the same or less for the intersections under study compared to those found in the intersections in the attainment plan. The predicted LOS for the intersections under study range from A to F. The LOS for the intersections in the attainment plan are not listed; however, the traffic counts and intersection geometries correspond to LOS F for three out of four intersections in the attainment plan.
- The background CO concentrations in the vicinity of the project were 4.4 ppm for 1 hour and 3.9 ppm for 8 hours in 2016, which is lower than the background concentrations for the intersections in the attainment plan, which varied from 5.3 ppm to 13.2 ppm for 1 hour and 3.7 ppm to 9.9 ppm for 8 hours.

The project is not expected to result in any concentrations exceeding the 1-hour or 8-hour CO standards. Therefore, a detailed CALINE4 CO hot-spot analysis is not required.

Table 2.12.10 Comparison of Peak-Hour Intersection Departure Traffic Volumes

Intersection	Scenario Year	Average Peak-Hour Lane Volume (AM/PM)				Total Departure Intersection Volume and Percent Change[1]			
		Northbound	Southbound	Eastbound	Westbound	AM Peak-Hour		PM Peak-Hour	
						Volume	% Change	Volume	% Change
2003 AQMP									
Wilshire Blvd & Veteran Ave	N/A	362/507	178/328	1,188/477	559/1,035	2,285	N/A	2,347	N/A
EXISTING									
WB SR-91 Off-Ramp & Artesia Blvd	N/A	380/282	0/0	432/438	272/349	1,084	(-53%)	1,068	(-54%)
Norwalk Blvd & WB SR-91 Off-Ramp	N/A	603/460	549/576	0/0	166/111	1,318	(-42%)	1,146	(-51%)
Pioneer Blvd & WB SR-91 Off-Ramp	N/A	445/496	521/537	0/0	116/115	1,082	(-53%)	1,137	(-52%)
Studebaker Rd & WB SR-91 Off-Ramp	N/A	446/562	507/549	1/0	233/113	1,186	(-48%)	1,223	(-48%)
NB I-605 Off-Ramp & Alondra Blvd	N/A	317/479	58/48	456/472	506/552	1,337	(-41%)	1,551	(-34%)
PROPOSED PROJECT									
No Build Alternative									
WB SR-91 Off-Ramp & Artesia Blvd	2024	272/246	0/0	389/367	254/390	915	(-60%)	1,003	(-57%)
	2044	277/252	0/0	397/374	259/398	933	(-59%)	1,024	(-56%)
Norwalk Blvd & WB SR-91 Off-Ramp	2024	487/372	538/499	0/0	146/130	1170	(-49%)	1,001	(-57%)
	2044	496/379	549/509	0/0	149/133	1194	(-48%)	1,021	(-56%)
Pioneer Blvd & WB SR-91 Off-Ramp	2024	421/449	447/512	0/0	108/121	976	(-57%)	1,082	(-54%)
	2044	623/588	764/795	78/34	113/149	1,577	(-31%)	1,564	(-33%)
Studebaker Rd & WB SR-91 Off-Ramp	2024	423/485	474/475	3/0	200/115	1,099	(-52%)	1,074	(-54%)
	2044	431/494	483/484	3/0	52/29	968	(-58%)	1,007	(-57%)
NB I-605 Off-Ramp & Alondra Blvd	2024	291/381	61/37	441/413	515/528	1,308	(-43%)	1,359	(-42%)
	2044	296/389	61/38	450/422	525/539	1,332	(-42%)	1,387	(-41%)
Build Alternative									
WB SR-91 Off-Ramp & Artesia Blvd	2024	272/246	0/0	389/367	254/390	915	(-60%)	1,003	(-57%)
	2044	226/208	0/0	399/375	241/364	845	(-63%)	946	(-60%)
Norwalk Blvd & WB SR-91 Off-Ramp	2024	487/372	538/499	0/0	146/130	1,170	(-49%)	1,001	(-57%)
	2044	601/208	881/720	0/0	141/107	1,623	(-29%)	1,035	(-56%)
Pioneer Blvd & WB SR-91 Off-Ramp	2024	421/449	447/512	0/0	108/121	976	(-57%)	1,082	(-54%)
	2044	623/588	764/795	78/34	113/149	1,577	(-31%)	1,564	(-33%)
Studebaker Rd & WB SR-91 Off-Ramp	2024	423/485	474/475	3/0	200/115	1,099	(-52%)	1,074	(-54%)
	2044	432/492	458/460	3/0	282/181	1,174	(-49%)	1,133	(-52%)
NB I-605 Off-Ramp & Alondra Blvd	2024	291/381	61/37	441/413	515/528	1,308	(-43%)	1,359	(-42%)
	2044	308/400	62/38	449/426	513/500	1,332	(-42%)	1,364	(-42%)

Table 2.12.10 Comparison of Peak-Hour Intersection Departure Traffic Volumes

Intersection	Scenario Year	Average Peak-Hour Lane Volume (AM/PM)				Total Departure Intersection Volume and Percent Change[1]			
		Northbound	Southbound	Eastbound	Westbound	AM Peak-Hour		PM Peak-Hour	
Diamond Ramps Design Option									
WB SR-91 Off-Ramp & Artesia Blvd	2024	272/246	0/0	389/367	254/390	915	(-60%)	1,003	(-57%)
	2044	277/252	0/0	397/374	259/398	933	(-59%)	1,024	(-56%)
Norwalk Blvd & WB SR-91 Off-Ramp	2024	583/441	870/711	0/0	138/111	1,591	(-30%)	1,262	(-46%)
	2044	601/451	881/720	0/0	141/107	1,623	(-29%)	1,278	(-46%)
Pioneer Blvd & WB SR-91 Off-Ramp	2024	542/547	691/749	0/0	122/120	1,355	(-41%)	1,415	(-40%)
	2044	550/543	717/770	0/0	113/149	1,379	(-40%)	1,461	(-38%)
Studebaker Rd & WB SR-91 Off-Ramp	2024	419/476	451/455	3/0	275/188	1,147	(-50%)	1,119	(-52%)
	2044	432/492	458/460	3/0	282/181	1,174	(-49%)	1,133	(-52%)
NB I-605 Off-Ramp & Alondra Blvd	2024	299/395	61/37	442/417	500/491	1,301	(-43%)	1,340	(-43%)
	2044	308/400	62/38	449/426	513/500	1,332	(-42%)	1,364	(-42%)

Source 1: *Transportation Project-Level Carbon Monoxide Protocol User Workbook* (U.C. Davis, 1998)
Source 2: *Traffic Operations Analysis Report* (2018).
[1] Percent reduction is in comparison to the Wilshire Boulevard/Veteran Avenue intersection contained in the 2003 AQMP.
AQMP = Air Quality Management Plan
Ave = Avenue
Blvd = Boulevard
I-605 = Interstate 605
N/A = not applicable
NB = northbound
Rd = road
SR-91 = State Route 91
WB = westbound

Particulate Matter ($PM_{2.5}$ and PM_{10})

The proposed project is in a nonattainment area for federal $PM_{2.5}$ and is in an attainment/maintenance area for federal PM_{10} standards (South Coast Air Basin portion only). Therefore, per 40 CFR Part 93, analyses are required for conformity purposes. However, the EPA does not require hot-spot analyses (either qualitative or quantitative) for those that are not listed in Section 93.123(b)(1) as a project of air quality concern (POAQC). The EPA defines POAQCs as the following:

(i) New or expanded highway projects that have a significant number of or significant increase in diesel vehicles;

(ii) Projects affecting intersections that are LOS D, E, or F with a significant number of diesel vehicles, or those that will change to LOS D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;

(iii) New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location;

(iv) Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location; or

(v) Projects in or affecting locations, areas, or categories of sites that are identified in the $PM_{2.5}$ and PM_{10} applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

The project does not qualify as a POAQC for the following reasons:

- The proposed project would improve SR-91 by changing the existing highway. As Tables 2.12.4 and 2.12.5 show, while traffic volumes along SR-91 would exceed the 125,000 ADT criteria for a POAQC and the truck percentage exceeds 8 percent, the truck traffic volumes and percentages would not change substantially with the project. The two shaded roadway segments in each table are between two existing on-ramps. The Build Alternative would combine the southbound on-ramp with the northbound on-ramp, thus putting the combined traffic volumes onto these segments. Thus, while the project would result in shifting some traffic (both truck and auto) from other routes to westbound SR-91 as a result of the increased capacity of the roadway and enhanced operating conditions, the project would not result in a higher proportion of trucks overall. While some segments could experience a very small increase in truck percentage (0.1 percent), other segments would experience a decrease in truck percentage due to a proportionally larger increase in shifted auto volumes as compared to truck volumes. Finally, the trucks that would operate on the improved corridor under the Build Alternative would experience much less congestion, higher speeds, less delay, and lower travel times in the corridor.

- The proposed project does not affect intersections that are at LOS D, E, or F that have a significant number of diesel vehicles. Based on the *Traffic Operations Analysis Report* (2018), the proposed project would reduce delay and improve the LOS at intersections in the project vicinity. Tables 2.12.8 and 2.12.9 show the LOS conditions in the project vicinity with and without the proposed project. While some of the road segments show a worsening of LOS, all of the segments where the LOS worsens are outside the area where the project results in physical changes (improvements) to the roadway network. These locations are either to the east or west of the area of improvement. The improvements themselves, by adding capacity (due to the new freeway lane and other measures which improve operating conditions), attract traffic to the westbound corridor. The attraction of trips extends beyond the limits of the physical improvements themselves because these improvements alleviate a major bottleneck in the corridor. Each of the segments that show a degradation in LOS are forecast to experience an increase in travel demand of approximately 5 percent to 7.5 percent. In these segments, without a physical or operational improvement to go along with the increase in traffic flow, the HCM analysis will result in a degraded LOS (higher traffic flow, but the same capacity). However, the HCM does not account for upstream or downstream improvements that would occur as a result of the project. The traffic microsimulation model that was developed to assess the project area showed improvements in traffic flow, increased speeds, and decreased delay in the study area and outside the study area, which is not captured by the HCM results. Thus, while the HCM shows a slight worsening of LOS for these segments, the microsimulation model demonstrates that they will likely improve in operation conditions in the future.
- The proposed project does not include the construction of a new bus or rail terminal.
- The proposed project does not expand an existing bus or rail terminal.

- The proposed project is not in or affecting locations, areas, or categories of sites that are identified in the $PM_{2.5}$ and PM_{10} applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

On July 25, 2017, the Transportation Conformity Working Group (TCWG) determined that the project is not a POAQC. Per the transportation conformity rules and regulations, all nonexempt projects must go through review by the TCWG. This project was approved and concurred upon by interagency consultation at the TCWG meeting as a project not having adverse impacts on air quality, and this project meets the requirements of the federal Clean Air Act (CAA) and 40 CFR, Section 93.116. A copy of the TCWG finding is included in Appendix C of the *Air Quality Analysis* (2018).

Therefore, the proposed Build Alternative meets the CAA requirements and 40 CFR, Section 93.116, without any explicit hot-spot analysis. As shown in Table 2.12.11, the $PM_{2.5}$ and PM_{10} exhaust emissions would be lower under the Build and No Build Alternatives than they are in the Existing (2016) condition. Exhaust emissions are the same under the Build and No Build Alternatives. Thus, the proposed Build Alternative would not create a new violation of the federal standards for $PM_{2.5}$ or PM_{10}.

The South Coast Air Basin region is in nonattainment for the State $PM_{2.5}$ and PM_{10} air quality standards. As Table 2.12.1 shows, the background PM_{10} concentrations currently exceed the State 24-hour and annual standards. Therefore, the increased emissions listed in Table 2.12.11 would likely contribute to violations of the State PM_{10} ambient air quality standards (CAAQS) in the Basin region. Similarly, the increase in $PM_{2.5}$ emissions from the project as listed in Table 2.12.11 would likely worsen the existing violation of the $PM_{2.5}$ CAAQS in the Basin region. However, as listed in Table 2.12.11 for both $PM_{2.5}$ and PM_{10} the future emissions would be less than the existing condition.

Mobile-Source Air Toxics

In addition to the criteria air pollutants for which there are NAAQS, the EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories and refineries).

Table 2.12.11 2024 Opening Year and 2044 Horizon Year Regional Vehicle Emissions

Alternative	2024 Opening Year (lbs/day)							2044 Horizon Year (lbs/day)						
	CO	ROG	NO_X	PM_{10}		$PM_{2.5}$		CO	ROG	NO_X	PM_{10}		$PM_{2.5}$	
				Exhaust	Tire Wear & Brake Dust	Exhaust	Tire Wear & Brake Dust				Exhaust	Tire Wear & Brake Dust	Exhaust	Tire Wear & Brake Dust
Existing (2016)	1,018	36	384	5.0	41.7	4.7	16.6	1,018	36	384	5.0	41.7	4.7	16.6
No Build Alternative	441	16	101	1.4	34.4	1.3	13.6	242	11	46	0.6	34.2	0.6	13.5
Change from Existing (2016)	*-577*	*-20*	*-283*	*-3.6*	*-7.4*	*-3.5*	*-3.0*	*-776*	*-25*	*-339*	*-4.4*	*-7.6*	*-4.2*	*-3.1*
Build Alternatives (Both Without and With Diamond Ramps Design Option)	435	16	99	1.4	36.1	1.3	14.3	238	11	41	0.6	35.9	0.6	14.2
Change from Existing (2016)	*-583*	*-21*	*-285*	*-3.6*	*-5.6*	*-3.5*	*-2.3*	*-780*	*-26*	*-343*	*-4.4*	*-5.9*	*-4.2*	*-2.4*
Change from No Build Alternative	*-6*	*0.3*	*-2.2*	*0.0*	*1.7*	*0.0*	*0.7*	*-3.9*	*-0.4*	*-4.7*	*0.0*	*1.7*	*0.0*	*0.7*

Source: Compiled using CT-EMFAC Version 6 (2017).
Note: Totals may not appear to sum correctly due to rounding.
Caltrans = California Department of Transportation
CO = carbon monoxide
CT-EMFAC = Caltrans Emission Factors Model
lbs/day = pounds per day
NO_X = oxides of nitrogen
PM_{10} = particulate matter less than 10 microns in size
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
ROG = reactive organic gases

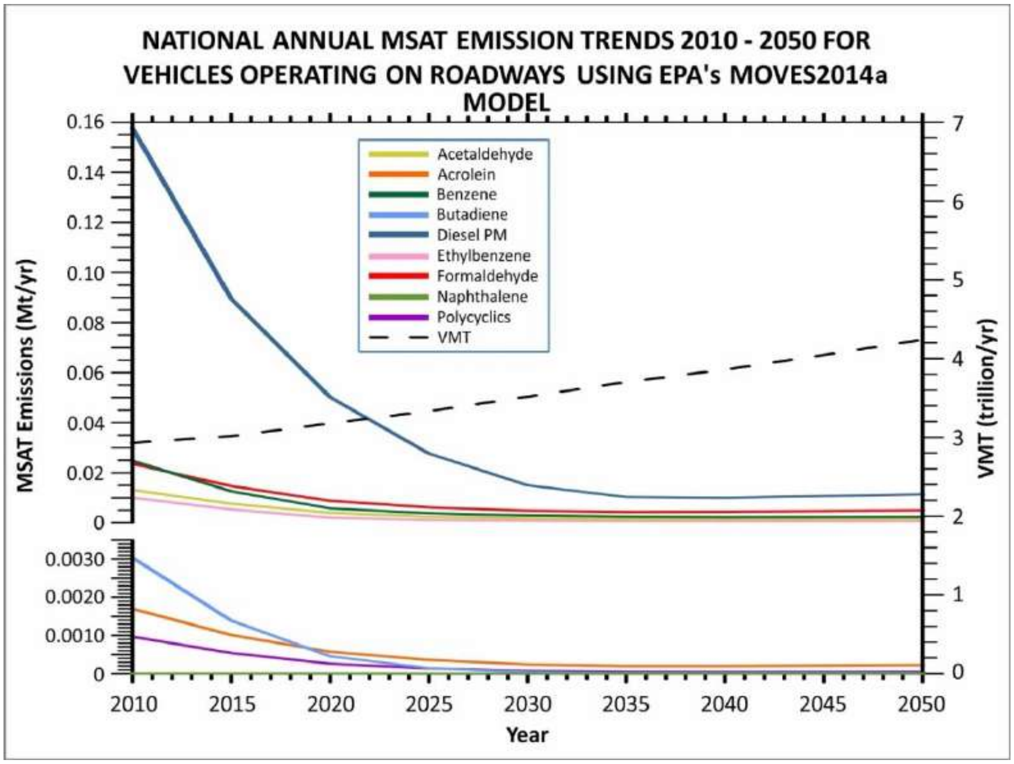
Controlling air toxic emissions became a national priority with the passage of the CAA Amendments of 1990, whereby Congress mandated the EPA regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in its latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (*Federal Register*, Volume 73, No. 201, page 61,358; October 16, 2008) and identified a group of 93 compounds emitted from mobile sources that are listed in its Integrated Risk Information System (IRIS). In addition, the EPA identified nine compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from its 2011 National Air Toxics Assessment. These are acrolein, benzene, 1,3-butadiene, acetaldehyde, diesel PM, ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter. While the FHWA considers these the priority Mobile Source Air Toxics (MSAT), the list is subject to change and may be adjusted in consideration of future EPA rules.

The 2008 EPA rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines.

Based on an FHWA analysis using the EPA's Motor Vehicle Emission Simulator, Version 2014a (MOVES2014a) (Figure 2.12-2), even if vehicle miles traveled (VMT) increases by 45 percent as forecast, a combined reduction of 91 percent in the total annual emissions for the priority MSAT is projected for the same time period. The projected reduction in MSAT emissions would be slightly different in California due to the use of the EMFAC in place of the MOVES model.

Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how the potential health risks posed by MSAT exposure should be factored into project-level decision-making in the context of NEPA.

Nonetheless, air toxics concerns continue to be raised regarding highway projects during the NEPA process. Even as the science emerges, transportation agencies are duly expected by the public and other agencies to address MSAT impacts in environmental documents. The FHWA, the EPA, the Health Effects Institute (HEI), and others have funded and conducted research studies in order to more clearly define potential risks from MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this field.



Source: Federal Highway Administration (2016).

Diesel PM = diesel particulate matter
EPA = United States Environmental Protection Agency
MOVES2014a = Motor Vehicle Emission Simulator, version 2014a
MSAT = Mobile Source Air Toxics
Mt/yr = million tons per year
NEPA = National Environmental Policy Act
trillion/yr = trillion per year
VMT = vehicle miles traveled

Figure 2.12-2 National Mobile Source Air Toxics Emission Trends

NEPA requires, to the fullest extent possible, that the policies, regulations, and laws of the federal government be interpreted and administered in accordance with its environmental protection goals. NEPA also requires federal agencies to use an interdisciplinary approach in planning and decision-making for any action that adversely impacts the environment. NEPA requires, and the FHWA is committed to, the examination and avoidance of potential impacts to the natural and human environment when considering approval of proposed transportation projects. In addition to evaluating the potential environmental effects, Caltrans must also take into account the need for safe and efficient transportation in reaching a decision that is in the best overall public interest. The FHWA policies and procedures for implementing NEPA are contained in regulations in 23 CFR, Part 771.

On October 18, 2016, the FHWA issued guidance to advise FHWA division offices as to when and how to analyze MSAT in the NEPA process for highways. That document is an update to the guidance released in February 2006, September 2009, and December 2012. The guidance is described as interim because MSAT science is still evolving. As the science progresses, FHWA will update the guidance. This analysis follows the FHWA guidance.

Information that is Incomplete or Unavailable

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. The EPA is the lead authority for administering the CAA and its amendments and has specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. The agency maintains the IRIS, which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects."[1] Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the HEI. Two HEI studies are summarized in Appendix D of the FHWA *Updated Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents* (2016). Among the adverse health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious are the adverse human health effects of MSAT compounds at current environmental concentrations or in the future as vehicle emissions substantially decrease.

[1] United States Environmental Protection Agency (EPA). Volatile Organic Compounds' Impact on Indoor Air Quality. Website: https://www.epa.gov/indoor-air-quality-iaq/volatile-organic-compounds-impact-indoor-air-quality (accessed March 2018).

The methodologies for forecasting health impacts include emissions modeling, dispersion modeling, exposure modeling, and then final determination of health impacts; each step in the process builds on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70-year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, because such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways, to determine the portion of time that people are actually exposed at a specific location, and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT because of factors including low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by the HEI. As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA and the HEI have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also a lack of national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the CAA to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards (e.g., benzene emissions from refineries). The decision framework is a two-step process. The first step requires the EPA to determine a “safe” or “acceptable” level of risk due to emissions from a source, which is generally no greater than approximately 100 in 1 million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in 1 million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in 1 million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in 1 million. In a June 2008 decision, the United States Court of Appeals for the District of Columbia Circuit upheld the EPA’s approach to addressing risk in its two-step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than safe or acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision-makers, who would need to weigh this information against project benefits such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, which are better suited for quantitative analysis.

Quantitative Project-Level MSAT Analysis

Emissions factors for each of the MSAT were obtained for the project area using emission rates generated by the Caltrans Emission Factors Model (CT-EMFAC), Version 6, and the VMT associated with each of the project alternatives. Results of the analyses are tabulated in Table 2.12.12 for the Existing (2016), 2024, and 2044 conditions.

The analysis indicates that a substantial decrease in MSAT emissions can be expected between the Existing (2016) and future (2024 and 2044) No Build Alternative conditions. This decrease is prevalent throughout the highest priority MSAT and the analyzed alternatives. This decrease is also consistent with the aforementioned EPA study that projects a substantial reduction in on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde between 2000 and 2050. Based on the analysis for this project, between the Existing (2016) and No Build Alternative (2044) conditions, the expected reductions in MSAT are 92 percent of diesel PM, 65 percent of benzene, 65 percent of 1,3 butadiene, 63 percent of naphthalene, 74 percent of polycyclic organic matter, 65 percent of acrolein, and 66 percent of formaldehyde. These projected reductions are achieved while the total VMT in the project area increases by 17 percent.

Table 2.12.12 Existing (2016), 2024 Opening Year, and 2044 Horizon Year Mobile Source Air Toxics Emissions (lbs/day)

Scenario	Diesel PM	Benzene	1,3-Butadiene	Naphthalene	POM	Acrolein	Formaldehyde	Ethyl benzene	Acetaldehyde
Existing (2016)	3.96	1.20	0.24	0.03	0.06	0.05	2.30	10.8	0.97
2024 Opening Year									
No Build Alternative	0.46	0.53	0.11	0.02	0.02	0.02	1.04	0.05	0.44
Change from Existing (2016)	*-3.51*	*-0.66*	*-0.14*	*-0.02*	*-0.03*	*-0.03*	*-1.26*	*-10.75*	*-0.53*
Build Alternative	0.46	0.53	0.11	0.02	0.02	0.02	0.95	0.04	0.39
Change from Existing (2016)	*-3.50*	*-0.67*	*-0.14*	*-0.02*	*-0.03*	*-0.03*	*-1.34*	*-10.76*	*-0.58*
Change from No Build	*0.00*	*-0.01*	*0.00*	*0.00*	*-0.001*	*0.00*	*-0.08*	*-0.01*	*-0.04*
2044 Horizon Year									
No Build Alternative	0.25	0.37	0.07	0.01	0.01	0.02	0.78	0.04	0.34
Change from Existing (2016)	*-3.72*	*-0.83*	*-0.17*	*-0.02*	*-0.04*	*-0.04*	*-1.51*	*-10.76*	*-0.63*
Build Alternative	0.25	0.36	0.07	0.01	0.01	0.02	0.69	0.03	0.29
Change from Existing (2016)	*-3.72*	*-0.84*	*-0.17*	*-0.02*	*-0.04*	*-0.04*	*-1.61*	*-10.77*	*-0.68*
Change from No Build	*0.00*	*-0.01*	*-0.001*	*-0.001*	*-0.001*	*0.00*	*-0.09*	*-0.01*	*-0.05*

Source: Compiled using CT-EMFAC Version 6 (2017).
Note: Totals may not appear to sum correctly due to rounding.
Caltrans = California Department of Transportation
CT-EMFAC = Caltrans Emission Factors Model
Diesel PM = diesel particulate matter
lbs/day = pounds per day
POM = polycyclic organic matter

As Table 2.12.12 shows, the Build Alternative (2024 and 2044) conditions MSAT emissions are lower than the Existing (2016) condition emissions. All of the Build Alternative (2024 and 2044) conditions MSAT emissions are equal to or less than the corresponding No Build Alternative conditions emissions. In addition to the Build Alternative resulting in a decrease in localized MSAT emissions, the EPA's vehicle and fuel regulations, coupled with fleet turnover, would cause substantial reductions over time that would cause region-wide MSAT levels to be substantially lower than under the Existing (2016) conditions.

Long-Term Regional Vehicle Emissions Impacts

The potential impact of the proposed project on regional vehicle emissions was calculated using traffic data for the project region and emission rates from the CT-EMFAC, Version 6, which uses emission factors developed by the CARB in its Emission Factor Model, Version 2014 (EMFAC2014).

The regional VMTs for Existing (2016), the No Build Alternative, and the Build Alternative were estimated using the daily traffic volumes included in the *Traffic Operations Analysis Report* (2018). The VMT calculations include SR-91 westbound traffic between Carmenita Road on the east and I-605 on the west. These roadway segments represent areas where the traffic volumes would be affected by the proposed project. The VMT data, along with the CT-EMFAC (based on EMFAC2014) emission rates, were used to calculate the CO, reactive organic gases (ROGs), NO_X, $PM_{2.5}$, and PM_{10} emissions for the Existing (2016), 2024, and 2044 conditions. The modeling results are summarized in Table 2.12.11.

As Table 2.12.11 shows, both the No Build and Build Alternative criteria pollutant emissions are all lower than the Existing (2016) condition emissions. With the exception of $PM_{2.5}$ and PM_{10}, the Build Alternative criteria pollutant emissions are all less than the No Build Alternative emissions. The increased $PM_{2.5}$ and PM_{10} emissions are due to the increase in re-entrained dust emissions (modeled as tire wear and brake dust) associated with the increased regional VMT.

No Build Alternative

The No Build Alternative does not include any planned improvements to the westbound SR-91 corridor. Under the No Build Alternative, there would be no reconstruction or improvements to the SR-91 corridor. As shown in Table 2.12.11, with the exception of $PM_{2.5}$ and PM_{10}, the Build Alternative criteria pollutant emissions are all less than the No Build Alternative emissions.

2.12.4 Avoidance, Minimization, and/or Mitigation Measures

Because the project will incorporate the project features as outlined above in Section 2.12.3, no substantial adverse impacts to air quality would occur. Therefore, no avoidance, minimization, and/or mitigation measures are required.

2.12.5 Climate Change

Neither the EPA nor the FHWA has issued explicit guidance or methods to conduct project-level greenhouse gas analysis. The 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 California Environmental Quality Act (CEQA) chapter of this document. The CEQA analysis may be used to inform the NEPA determination for the project.

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2.13 Noise

2.13.1 Regulatory Setting

The National Environmental Policy Act (NEPA) of 1969 and the California Environmental Quality Act (CEQA) provide the broad basis for analyzing and abating highway traffic noise effects. The intent of these laws is to promote the general welfare and to foster a healthy environment. The requirements for noise analysis and consideration of noise abatement and/or mitigation, however, differ between NEPA and CEQA.

2.13.1.1 California Environmental Quality Act

CEQA requires a strictly baseline versus build analysis to assess whether a proposed project will have a noise impact. If a proposed project is determined to have a significant noise impact under CEQA, then CEQA dictates that mitigation measures must be incorporated into the project unless such measures are not feasible. The rest of this section will focus on the NEPA/23 Code of Federal Regulations Part 772 (23 CFR 772) noise analysis; please see Chapter 3 of this document for further information on noise analysis under CEQA.

2.13.1.2 National Environmental Policy Act and 23 CFR 772

For highway transportation projects with the Federal Highway Administration (FHWA) involvement (and Caltrans, as assigned), the Federal-Aid Highway Act of 1970 and its implementing regulations (23 CFR 772) govern the analysis and abatement of traffic noise impacts. The regulations require that potential noise impacts in areas of frequent human use be identified during the planning and design of a highway project. The regulations include noise abatement criteria (NAC) that are used to determine when a noise impact would occur. The NAC differ depending on the type of land use under analysis. For example, the NAC for residences (67 dBA) is lower than the NAC for commercial areas (72 dBA). Table 2.13.1 lists the noise abatement criteria for use in the NEPA/23 CFR 772 analysis.

Figure 2.13-1 lists the noise levels of common activities to enable readers to compare the actual and predicted highway noise levels discussed in this section with common activities.

Table 2.13.1 Noise Abatement Criteria

Activity Category	NAC, Hourly A-Weighted Noise Level, dBA $L_{eq}(h)$	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B1	67 (Exterior)	Residential.
C1	67 (Exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, daycare centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (Interior)	Auditoriums, daycare centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A–D or F.
F	No NAC—reporting only	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical, etc.), and warehousing.
G	No NAC—reporting only	Undeveloped lands that are not permitted.

[1] Includes undeveloped lands permitted for this activity category.
dBA = A-weighted decibels
$L_{eq}(h)$ = one-hour A-weighted equivalent continuous sound level
NAC = Noise Abatement Criteria

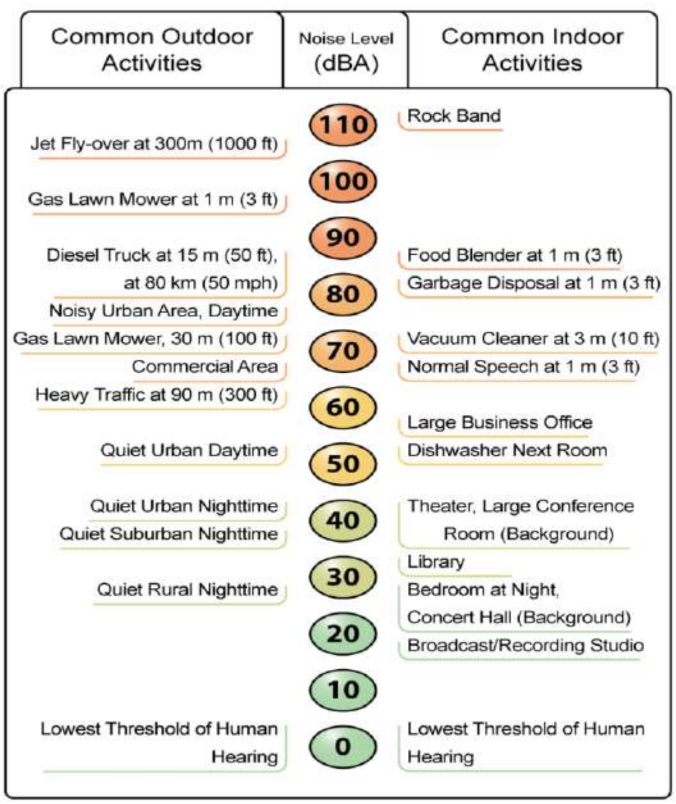


Figure 2.13-1 Noise Levels of Common Activities

According to the Caltrans *Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects*, *May 2011*, a noise impact occurs when the predicted future noise level with the project substantially exceeds the existing noise level (defined as a 12 dBA or more increase) or when the future noise level with the project approaches or exceeds the NAC. Approaching the NAC is defined as coming within 1 dBA of the NAC.

If it is determined that the project will have noise impacts, potential abatement measures must be considered. Noise abatement measures that are determined to be reasonable and feasible at the time of final design are incorporated into the project plans and specifications. This document discusses noise abatement measures that would likely be incorporated into the project.

Caltrans *Traffic Noise Analysis Protocol* sets forth the criteria for determining when an abatement measure is reasonable and feasible. Feasibility of noise abatement is basically an engineering concern. A minimum 5 dBA reduction for all impacted receptors in the future noise levels must be achieved for an abatement to be considered feasible. Other considerations include topography, access requirements, other noise sources, and safety considerations. Additionally, a noise reduction of at least 7 dBA must be achieved at one or more benefited receptors for an abatement measure to be considered reasonable. The reasonableness determination is basically a cost-benefit analysis. Factors used in determining whether a proposed noise abatement measure is reasonable include: residents' acceptance and the cost per benefited residence.

2.13.2 Affected Environment

This section is based on the May 2018 *Noise Study Report* (NSR) and the June 2018 *Noise Abatement Decision Report* (NADR) prepared for the proposed project. The NSR followed Caltrans 2011 *Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects* (Noise Protocol) and the 2013 Caltrans *Technical Noise Supplement*.

2.13.2.1 Surrounding Land Use and Receptors

Developed and undeveloped land uses in the project vicinity were identified through land use maps, aerial photography, and site inspection. Receptors were identified within each land use category. Existing land uses in the study area include single- and multifamily residences, schools, a hospital, a day-care facility, a community center, parks, sports areas, a golf course, recreational areas, a hotel, restaurants, vacant land, retail, office, utility, commercial, and light industrial uses. Existing land uses in the study area are described below in further detail.

- **Northbound Side of Interstate 605 (I-605) Between Alondra Boulevard and State Route 91 (SR-91):** Land uses in this area include single-family residences, a park, a hospital, a restaurant, and retail. Land uses in this area are from 14 feet (ft) lower to 22 ft higher in elevation than I-605. Currently, existing 5.6 to 8.3 ft high walls shield the single-family residences and park from traffic noise generated by I-605 and SR-91. Single-family residences were evaluated under Activity Category B, which has an exterior NAC of 67 dBA L_{eq} (equivalent continuous sound level measured in A-weighted decibels). Areas of frequent human use in the park were evaluated under Activity Category C, which has an exterior NAC of 67 dBA L_{eq}. Other areas of the park, which have no frequent human use areas, were classified under Activity Category C for reporting purposes. The interior area of the hospital was evaluated under Activity Category D, which has an interior NAC of 52 dBA L_{eq}. The restaurants with outdoor seating were evaluated under Activity Category E, which has an exterior NAC of 72 dBA L_{eq}. Retail uses were classified under Activity Category F for reporting purposes.
- **Southbound Side of I-605 Between Alondra Boulevard and SR-91:** Land uses in this area include a golf course, a sanitation facility, a gas station, retail, and light industry. Land uses in this area are from 19 ft lower to 4 ft higher in elevation than I-605. Currently, no existing walls shield these uses from traffic noise. The golf course was classified as Activity Category C for reporting purposes. The sanitation facility, the gas station, retail, and light industrial uses were classified as Activity Category F for reporting purposes.
- **Westbound Side of SR-91 Between I-605 and Gridley Road:** Land uses in this area include single-family residences. Land uses in this area are from 1 to 17 ft lower in elevation than SR-91. Currently, a 3 to 11 ft high existing wall shields these residences from traffic noise. The single-family residences were evaluated under Activity Category B, which has an exterior NAC of 67 dBA L_{eq}.
- **Eastbound Side of SR-91 Between I-605 and Gridley Road:** Land uses in this area include single-family residences, a school and associated active sports areas, and a park. Land uses in this area are 3 to 19 ft lower in elevation than SR-91. Currently, a combination of a 16.8 ft high existing wall at the edge of the shoulder, a 13.5 ft high existing wall at the property line, and a 6.2 to 6.9 ft high wall at the property line shields the school and associated outdoor sports areas

from traffic noise. An existing 8.9 to 12.7 ft high wall shields the residences and the park. Single-family residences were evaluated under Activity Category B, which has an exterior NAC of 67 dBA L_{eq}. The active sports areas associated with the school and the outdoor frequent human use areas associated with the park were evaluated under Activity Category C, which has an exterior NAC of 67 dBA L_{eq}. The classrooms were evaluated under Activity Category D, which has an interior NAC of 52 dBA L_{eq}.

- **Westbound Side of SR-91 Between Gridley Road and Pioneer Boulevard:** Land uses in this area include single- and multifamily residences, a park, a hotel, restaurants, gas stations, and light industry. Land uses in this area are 3 to 21 ft lower in elevation than SR-91. Currently, an existing 8.8 to 15.7 ft high wall and an existing 5 to 6.1 ft high wall located along the State right-of-way (ROW), the edge of the shoulder, and the private property line shield some of these uses from traffic noise. The single- and multifamily residences were evaluated under Activity Category B, which has an exterior NAC of 67 dBA L_{eq}. The park was evaluated under Activity Category C, which has an exterior NAC of 67 dBA L_{eq}. The hotel swimming pool was evaluated under Activity Category E, which has an exterior NAC of 72 dBA L_{eq}. Restaurants that have no outdoor eating areas and retail uses were classified under Activity Category E for reporting purposes. Light industrial uses were classified under Activity Category F for reporting purposes.
- **Eastbound Side of SR-91 Between Gridley Road and Pioneer Boulevard:** Land uses in this area include single-family residences, a park, and light industry. Land uses in this area are 1 to 20 ft lower in elevation than SR-91. Currently, an existing 5.6 to 18.1 ft high wall shields the park and single-family residences from traffic noise. The single-family residences were evaluated under Activity Category B, which has an exterior NAC of 67 dBA L_{eq}. The park was evaluated under Activity Category C, which has an exterior NAC of 67 dBA L_{eq}. Light industrial uses were classified under Activity Category F for reporting purposes.
- **Westbound Side of SR-91 Between Pioneer Boulevard and Norwalk Boulevard:** Land uses in this area include single-family residences, a day-care center, a park, a community center, a gas station, vacant land, and light industrial uses. Land uses in this area are 4 to 24 ft lower in elevation than SR-91. Currently, an existing 15.8 to 16.2 ft high wall along the State ROW and an 11.3 to 13.4 ft high wall along the edge of the shoulder shield the residences, park, community center, day-care center, and some of the light industrial uses. The single-family residences were evaluated under Activity Category B, which has an exterior NAC of 67 dBA L_{eq}. The park was evaluated under Activity Category C,

which has an exterior NAC of 67 dBA L_{eq}. The community center and day-care center were evaluated under Activity Category D, which has an interior NAC of 52 dBA L_{eq}. The gas station and light industrial uses were classified under Activity Category F for reporting purposes. Vacant uses were classified under Activity Category G for reporting purposes.

- **Eastbound Side of SR-91 Between Pioneer Boulevard and Norwalk Boulevard:** Land uses in this area include single- and multifamily residences, a school, a restaurant, and an office building that includes a school. Land uses in this area are 3 to 22 ft lower in elevation than SR-91. Currently, an existing 15 ft high wall along the edge of the shoulder shields the offices and schools from traffic noise. Existing 5.9 to 10 ft high walls along the edge of the shoulder and the private property line shield the residences. The single- and multifamily residences were evaluated under Activity Category B, which has an exterior NAC of 67 dBA L_{eq}. The school playground was evaluated under Activity Category C, which has an exterior NAC of 67 dBA L_{eq}. The classrooms were evaluated under Activity Category D, which has an interior NAC of 52 dBA L_{eq}. The restaurant, with an outdoor eating area, was evaluated under Activity Category E, which has an exterior NAC of 72 dBA L_{eq}. The office has no outdoor active use areas and was evaluated under Activity Category E for reporting purposes.
- **Westbound Side of SR-91 Between Norwalk Boulevard and Bloomfield Avenue:** Land uses in this area include multifamily residences, schools, a school playground, and an active sports area associated with a school. Land uses in this area are 5 to 20 ft lower in elevation than SR-91. Currently, an existing 10.8 to 14.7 ft high wall along the State ROW shields the school from traffic noise, and existing 6.9 to 13.5 ft high walls along the edge of the shoulder shield the residences. The multifamily residences were evaluated under Activity Category B, which has an exterior NAC of 67 dBA L_{eq}. The active sports areas associated with the schools were evaluated under Activity Category C, which has an exterior NAC of 67 dBA L_{eq}. The classrooms were evaluated under Activity Category D, which has an interior NAC of 52 dBA L_{eq}.
- **Eastbound Side of SR-91 Between Norwalk Boulevard and Bloomfield Avenue:** Land uses in this area include single-family residences and an office building that includes a school. Land uses in this area are 3 to 18 ft lower in elevation than SR-91. Currently, an existing 5.4 to 7.3 ft high wall along the edge of the shoulder and the private property line shields the residences from traffic noise. An existing 6 ft high wall along the State ROW and the private property line shields the office building and the school from traffic noise. The single-

family residences were evaluated under Activity Category B, which has an exterior NAC of 67 dBA L_{eq}. The classrooms were evaluated under Activity Category D, which has an interior NAC of 52 dBA L_{eq}. Offices that have no outdoor frequent human use areas were classified under Activity Category E for reporting purposes.

- **Westbound Side of SR-91 Between Bloomfield Avenue and South of Artesia Boulevard:** Land uses in this area include single-family residences. Land uses in this area are from 4 ft lower in elevation than SR-91 to 4 ft higher in elevation than SR-91. Currently, an existing 8.3 to 8.7 ft high wall along the private property line shields some of the residences from traffic noise. An existing 7 to 8.5 ft high wall along the State ROW shields some of the residences from traffic noise. The single-family residences were evaluated under Activity Category B, which has an exterior NAC of 67 dBA L_{eq}.
- **Eastbound Side of SR-91 Between Bloomfield Avenue and South of Artesia Boulevard:** Land uses in this area include multifamily residences and retail. Land uses in this area are from 5 ft lower in elevation than SR-91 to elevations similar to SR-91. Currently, no existing walls shield these uses from traffic noise. A field inspection was conducted for the multifamily residential complex representing the Aria and Sage Apartments on June 25, 2017. Tables and chairs were observed and documented on the ground floor patios and upper floor balconies for the two apartment complexes and were determined to be outdoor frequent human use areas. The multifamily residences were evaluated under Activity Category B, which has an exterior NAC of 67 dBA L_{eq}. Outdoor frequent human use areas associated with retail uses were evaluated under Activity Category E, which has an exterior NAC of 72 dBA L_{eq}. Retail uses that have no outdoor frequent human use areas were classified under Activity Category F for reporting purposes.

2.13.2.2 Existing Noise Level Measurements

The existing noise environment in the study area is described below based on short- and long-term noise monitoring that was conducted at representative receptor locations.

Short-Term Monitoring

The primary source of noise in the study area is the traffic on SR-91, I-605, Alondra Boulevard, Studebaker Road, Pioneer Boulevard, Norwalk Boulevard, Bloomfield Avenue, and Artesia Boulevard. Short-term (10-minute) noise measurements were conducted to document existing noise levels at 61 representative receptor locations in the study area. Short-term noise level measurements were conducted using Larson

Davis Models 831, 824, 820 Type 1 sound level meters and a Larson Davis Model 720 Type 2 sound level meter. Table 2.13.2 contains the results of the short-term noise level measurements and a description of the noise-monitoring locations. These short-term (ST) noise measurements were used to calibrate the noise model and to predict the noise levels at all 362 modeled receptors in the study area. The short-term monitoring locations are shown on Figure 2.13-2.

Long-Term Monitoring

Long-term (LT) traffic noise level measurements were conducted to document the peak traffic noise hour. Long-term ambient noise monitoring was conducted using two dosimeters at six representative locations in the study area. The following is a summary of those measurements:

- The long-term noise level measurement at LT-1 was performed at 16311 Monica Circle from 9:00 a.m. on Tuesday, June 27, 2017 to 9:00 a.m. on Wednesday, June 28, 2017. Traffic noise peaks at 66 dBA L_{eq} during the 5:00 a.m., 6:00 a.m., 7:00 a.m., 8:00 a.m., 6:00 p.m., 7:00 p.m., and 8:00 p.m. hours at LT-1.
- The long-term noise level measurement at LT-2 was performed at 16923 Eric Avenue from 10:00 a.m. on Tuesday, June 27, 2017 to 10:00 a.m. on Wednesday, June 28, 2017. Traffic noise peaks at 66 dBA L_{eq} during the 6:00 a.m. and 7:00 a.m. hours at LT-2.
- The long-term noise level measurement at LT-3 was performed at 11622 169th Street from 9:00 a.m. on Wednesday, June 28, 2017 to 9:00 a.m. on Thursday, June 29, 2017. Traffic noise peaks at 68 dBA L_{eq} during the 5:00 a.m. hour at LT-3.
- The long-term noise level measurement at LT-4 was performed at 12023 Palm Street from 9:00 a.m. on Wednesday, June 28, 2017 to 9:00 a.m. on Thursday, June 29, 2017. Traffic noise peaks at 64 dBA L_{eq} during the 5:00 a.m. and 6:00 a.m. hours at LT-4.
- The long-term noise level measurement at LT-5 was performed at 12331 Palm Street from 9:00 a.m. on Thursday, June 29, 2017 to 9:00 a.m. on Friday, June 30, 2017. Traffic noise peaks at 63 dBA L_{eq} during the 5:00 a.m., 6:00 a.m., and 7:00 a.m. hours at LT-5.
- The long-term noise level measurement at LT-6 was performed at 17201 Michaels Avenue from 10:00 a.m. on Thursday, June 29, 2017 to 10:00 a.m. on Friday, June 30, 2017. Traffic noise peaks at 62 dBA L_{eq} during the 5:00 a.m., 6:00 a.m., and 7:00 p.m. hours at LT-6.

Table 2.13.2 Short-Term Ambient Noise Monitoring Results

Monitor No.	Date	Start Time	Duration	dBA L_{eq}	Location Description	Land Use	Noise Sources
ST-1	6/27/2017	9:28 AM	10 minutes	64.7	10808 Alondra Boulevard. In front of the Frantone's Pizza, near an outdoor patio area.	Restaurant/Retail	Traffic on I-605, off- and on-ramps, and parking lot
ST-2	6/27/2017	9:28 AM	10 minutes	74.6	10802 College Place. West side of the hospital, northeast of dumpster.	Hospital	Traffic on I-605
ST-3	6/27/2017	10:30 AM	10 minutes	64.1	16311 Monica Circle. In the backyard.	Residential	Traffic on I-605
ST-4	6/27/2017	10:30 AM	10 minutes	59.8	10814 Petula Place. In the backyard.	Residential	Traffic on I-605
ST-5	6/27/2017	11:07 AM	10 minutes	56.4	Directly next to 16643 Estella Avenue, in line with the backyard.	Residential	Traffic on I-605
ST-6	6/27/2017	11:07 AM	10 minutes	63.4	16733 Studebaker Road. In Reservoir Hill Park, at the top of the hill.	Park	Traffic on I-605 and SR-91
ST-7	6/27/2017	9:28 AM	10 minutes	71.4	10710 Alondra Boulevard. Northwest corner of the Shell gas station.	Gas Station	Traffic on Piuma Avenue, Alondra Boulevard, and I-605
ST-8	6/27/2017	9:28 AM	10 minutes	73.3	16121 Piuma Avenue. In the parking lot.	Park	Traffic on I-605 and Piuma Avenue
ST-9	6/27/2017	10:30 AM	10 minutes	76.1	16449 Piuma Avenue. Northeast corner of The City of Cerritos Iron-Wood Nine Golf Course.	Golf Course	Traffic on I-605 and occasional traffic on Piuma Avenue
ST-10	6/27/2017	10:30 AM	10 minutes	71.7	16599 Piuma Avenue. In the parking lot. Receptor placed equidistant between the facility and I-605.	Golf Course	Traffic on I-605
ST-11	6/27/2017	12:53 PM	10 minutes	61.5	16825 Leeward Avenue. Next to the backyard.	Residential	Traffic on SR-91 and SR-91/ I-605 connector
ST-12	6/27/2017	12:53 PM	10 minutes	63.8	16835 Outrigger Circle. In the front yard.	Residential	Traffic on SR-91 and SR-91/ I-605 connector and occasional traffic on Windjammer Road and Outrigger Circle
ST-13	6/27/2017	1:44 PM	10 minutes	64.4	16923 Eric Avenue. In the backyard.	Residential	Traffic on SR-91
ST-14	6/27/2017	1:44 PM	10 minutes	59.9	11238 Lucas Street. In the backyard.	Residential	Traffic on SR-91
ST-15	6/27/2017	1:44 PM	10 minutes	65.1	11221 Beach Street. On the driveway.	Residential	Traffic on SR-91
ST-16	6/27/2017	2:35 PM	10 minutes	60.1	16826 Sunny Ridge Court. In the backyard.	Residential	Traffic on SR-91
ST-17	8/3/2017	9:46 AM	10 minutes	68.3	11111 Artesia Boulevard. Adjacent to the football field of Gahr High School.	Playground	Traffic on SR-91, I-605 and Studebaker Road

Table 2.13.2 Short-Term Ambient Noise Monitoring Results

Monitor No.	Date	Start Time	Duration	dBA L_{eq}	Location Description	Land Use	Noise Sources
ST-18	6/27/2017	1:44 PM	10 minutes	55.9	11111 Artesia Boulevard. In the second baseball field from the west at Gahr High School.	Playground	Traffic on SR-91
ST-19	6/27/2017	2:35 PM	10 minutes	55.5	11111 Artesia Boulevard. Northeast corner of Gahr High School.	School	Traffic on SR-91
ST-20	6/27/2017	2:35 PM	10 minutes	61.4	11307 Palm Street. In the backyard.	Residential	Traffic on SR-91
ST-21	6/28/2017	9:16 AM	10 minutes	74.2	11441 Beach Street. In front of the building.	Retail	Traffic on SR-91
ST-22	6/28/2017	9:16 AM	10 minutes	64.6	Next to the Hyde Park Court park.	Park	Traffic on SR-91
ST-23	6/28/2017	9:54 AM	10 minutes	61.5	11523 Hyde Park Court. In front of the residence.	Residential	Traffic on SR-91
ST-24	6/28/2017	9:54 AM	10 minutes	54.4	Walkway between 11510 and 11508 Belvedere Court. At south side of the two residences.	Residential	Traffic on SR-91
ST-25	8/3/2017	9:46 AM	10 minutes	65.3	11554 169th Street. In the backyard.	Residential	Traffic on SR-91
ST-26	6/28/2017	10:27 AM	10 minutes	63.3	11644 169th Street. In the backyard.	Residential	Traffic on SR-91
ST-27	6/28/2017	10:27 AM	10 minutes	67.0	16905 Pioneer Boulevard. Artesia Inn and Suites. Southeast of the pool.	Hotel	Traffic on SR-91
ST-28	6/28/2017	11:04 AM	10 minutes	59.1	16707 Pioneer Boulevard. In the parking lot of El Pollo Loco.	Restaurant	Traffic on Pioneer Boulevard and parking lot
ST-29	6/28/2017	9:16 AM	10 minutes	65.5	11431 Jenkins Street. In the backyard.	Residential	Traffic on SR-91
ST-30	6/28/2017	9:16 AM	10 minutes	58.8	Between 17102 and 17106 Gard Avenue. Outside of backyard gate of 17102 Gard Avenue.	Residential	Traffic on SR-91
ST-31	8/3/2017	9:47 AM	10 minutes	71.0	17027 Roseton Avenue. In front of the building, in the cul-de-sac of Roseton Avenue.	Offices	Traffic on SR-91
ST-32	6/28/2017	10:27 AM	10 minutes	69.2	Between 17004 and 17105 Alburtis Avenue. Outside of the property gate of 17105 Alburtis Avenue.	Light Industrial	Traffic on SR-91
ST-33	6/28/2017	11:05 AM	10 minutes	53.4	16646 Pioneer Boulevard. In the backyard.	Residential	Traffic on Pioneer Boulevard and SR-91
ST-34	8/3/2017	10:49 AM	10 minutes	62.9	11814 168th Street. In the vacant land, in line with residential backyards.	Vacant Land	Traffic on SR-91 and Pioneer Boulevard
ST-35	6/28/2017	11:05 AM	10 minutes	54.7	11832 168th Street. In the backyard.	Residential	Traffic on SR-91
ST-36	6/28/2017	9:54 AM	10 minutes	60.3	11864 169th street. In the backyard.	Residential	Traffic on SR-91

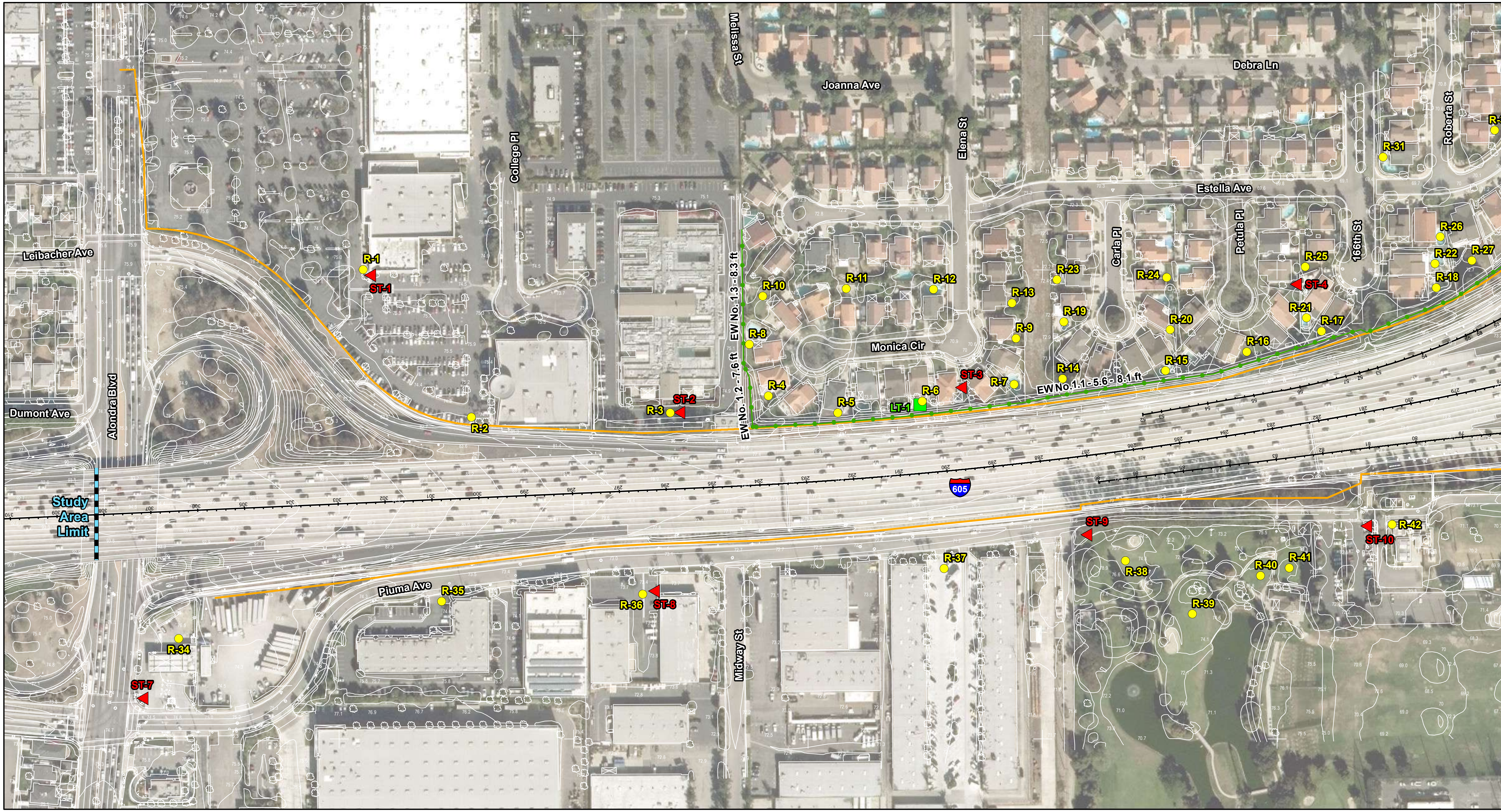
Table 2.13.2 Short-Term Ambient Noise Monitoring Results

Monitor No.	Date	Start Time	Duration	dBA L_{eq}	Location Description	Land Use	Noise Sources
ST-37	6/28/2017	1:45 PM	10 minutes	63.5	In the park. Directly south of the backyard of 11936 169th Street.	Park	Traffic on SR-91
ST-38	6/28/2017	1:45 PM	10 minutes	58.4	11951 170th Street. In the backyard.	Residential	Traffic on SR-91
ST-39	6/28/2017	1:45 PM	10 minutes	59.6	Directly south of the backyard of 12021 170th Street. In the parking lot.	Residential	Traffic on SR-91
ST-40	6/28/2017	2:26 PM	10 minutes	61.8	In the parking lot of 16741 Parkside Avenue. Next to the backyard of 12058 169th Street.	Residential	Traffic on SR-91
ST-41	6/29/2017	9:15 AM	10 minutes	70.6	16821 Norwalk Boulevard. Southeast corner of the Shell gas station.	Gas Station	Traffic on Norwalk Avenue, SR-91, and the westbound SR-91 off-ramp
ST-42	8/3/2017	10:50 AM	10 minutes	67.7	17100 Pioneer Boulevard. Next to the Angeles Institute building.	School	Traffic on SR-91 and the eastbound SR-91 on-ramp from Pioneer Boulevard
ST-43	6/28/2017	12:49 PM	10 minutes	62.3	11939 Aclare Street. Juarez Academy of Engineering and Technology. At the northwest corner of the building.	School	Traffic on SR-91
ST-44	8/3/2017	10:49 AM	10 minutes	66.3	12029 Palm Street. In the backyard.	Residential	Traffic on SR-91
ST-45	6/28/2017	2:26 PM	10 minutes	57.5	17203 Ibex Avenue. On the driveway.	Residential	Traffic on SR-91
ST-46	6/29/2017	9:15 AM	10 minutes	65.8	Next to the SR-91 eastbound off-ramp to Norwalk Boulevard. North of the residence at 17200 Monaco Drive.	Residential	Traffic on SR-91, the eastbound SR-91 on-ramp, and Norwalk Boulevard
ST-47	6/29/2017	9:54 AM	10 minutes	63.3	12222 Cuesta Drive. ABC Adult School. Near room “N” at the southeast corner of the property.	School	Traffic on SR-91
ST-48	6/29/2017	10:36 AM	10 minutes	62.3	12418 Rancho Vista Drive. In the alley behind the residences.	Residential	Traffic on SR-91
ST-49	6/29/2017	10:36 AM	10 minutes	61.4	Between the balconies of 12456 and 12454 Ranch Vista Drive.	Residential	Traffic on SR-91
ST-50	6/29/2017	11:11 AM	10 minutes	57.3	16948 Sierra Vista Drive. In the alley behind the residences and in line with the upstairs patio.	Residential	Traffic on SR-91
ST-51	8/3/2017	11:40 AM	10 minutes	58.9	16938 Sierra Vista Way. Behind the buildings at a similar distance from the roadway as the balconies.	Residential	Traffic on SR-91 and the westbound SR-91 on-ramp from Bloomfield Avenue

Table 2.13.2 Short-Term Ambient Noise Monitoring Results

Monitor No.	Date	Start Time	Duration	dBA L_{eq}	Location Description	Land Use	Noise Sources
ST-52	6/29/2017	9:54 AM	10 minutes	65.6	Between 17100 and 17150 Norwalk Boulevard. In the parking lot.	Offices	Traffic on SR-91
ST-53	6/29/2017	9:54 AM	10 minutes	63.8	12305 Palm Street. In the backyard.	Residential	Traffic on SR-91
ST-54	6/29/2017	10:36 AM	10 minutes	64.2	12361 Palm Street. In the backyard.	Residential	Traffic on SR-91
ST-55	6/29/2017	10:36 AM	10 minutes	64.5	12477 Autumn Breeze Street. In the backyard.	Residential	Traffic on SR-91
ST-56	8/3/2017	11:40 AM	10 minutes	55.6	12533 Springsnow Circle. In the backyard.	Residential	Traffic on SR-91 and the eastbound SR-91 off-ramp to Bloomfield Avenue
ST-57	6/29/2017	11:48 AM	10 minutes	58.9	17113 Michaels Avenue. In the backyard.	Residential	Traffic on SR-91
ST-58	6/29/2017	11:48 AM	10 minutes	57.4	17227 Michaels Avenue. Outside wooden backyard gate.	Residential	Traffic on SR-91
ST-59	6/29/2017	11:48 AM	10 minutes	54.7	17343 De Groot Place. Next to the backyard.	Residential	Traffic on SR-91 and the westbound SR-91 on-ramp from Artesia Boulevard
ST-60	6/29/2017	1:24 PM	10 minutes	75.6	12611 Artesia Boulevard. Aria Apartment Homes, in line with the north facade of the second building from the west.	Residential	Traffic on SR-91
ST-61	6/29/2017	1:24 PM	10 minutes	71.0	At the northwest corner of 12741 Towne Center Drive. In the parking lot of Cerritos Towne Center.	Retail	Traffic on SR-91 and the parking lot

Source: *Noise Study Report* (2018).
dBA = A-weighted decibels
I-605 = Interstate 605
L_{eq} = equivalent continuous sound level
SR-91 = State Route 91



LEGEND

- Long-Term Monitoring Locations
- Short-Term Monitoring Locations
- Short-Term Interior Monitoring Locations
- Modeled Receptors
- Existing Right-of-Way
- Existing Wall

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SOURCE: Eagle Aerial (4/2014); Michael Baker (9/2017)

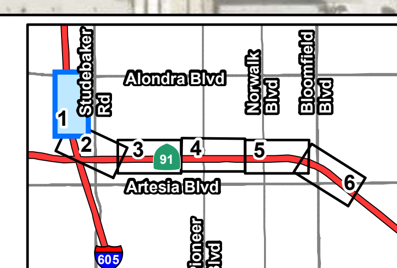

FIGURE 2.13-2
Sheet 1 of 6

Westbound SR-91 Improvement Project

Monitoring and Modeled Receptor Locations

07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

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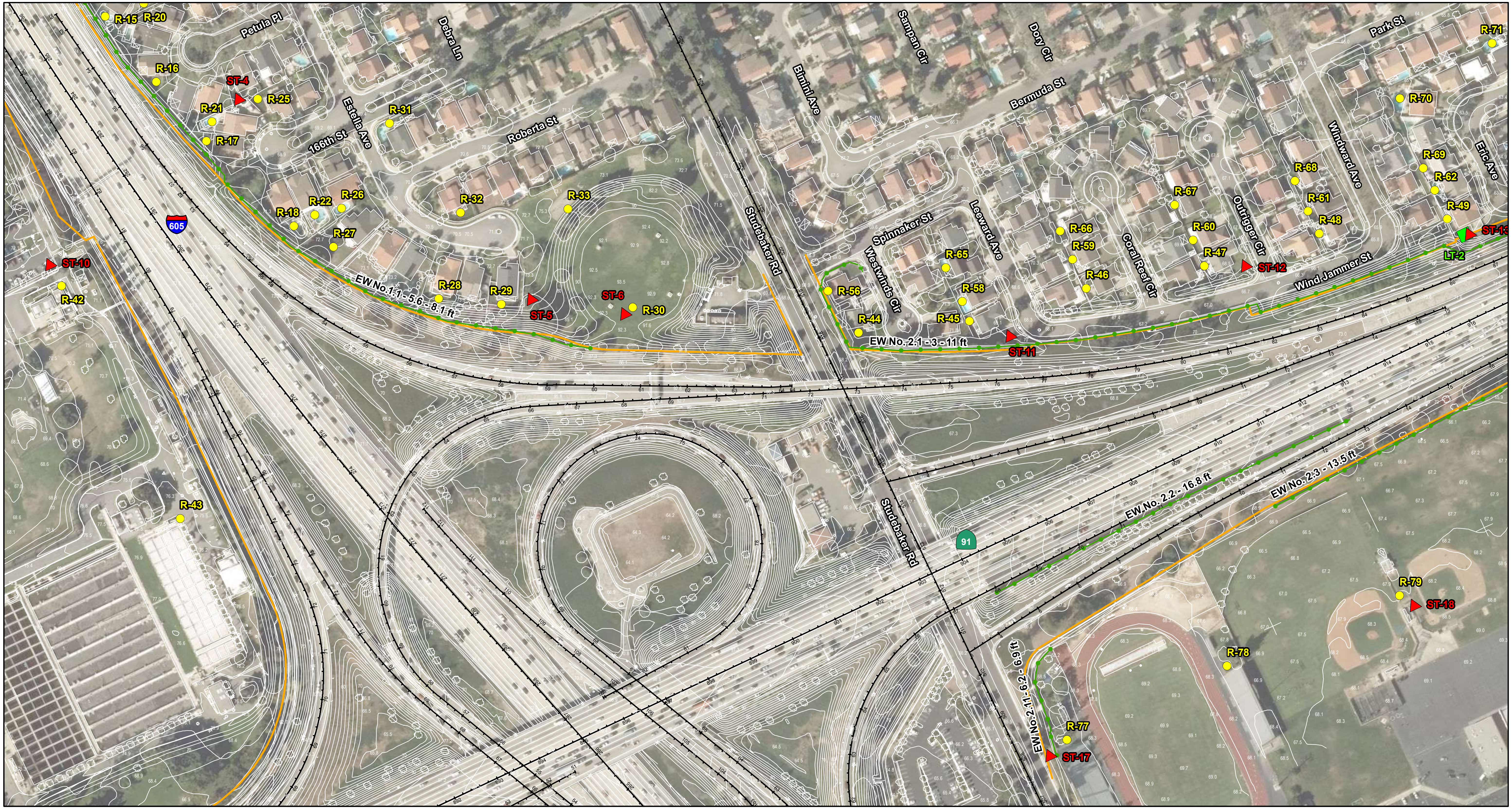

LEGEND

- Long-Term Monitoring Locations
- Short-Term Monitoring Locations
- Short-Term Interior Monitoring Locations
- Modeled Receptors
- Existing Right-of-Way
- Existing Wall

SOURCE: Eagle Aerial (4/2014); Michael Baker (9/2017)

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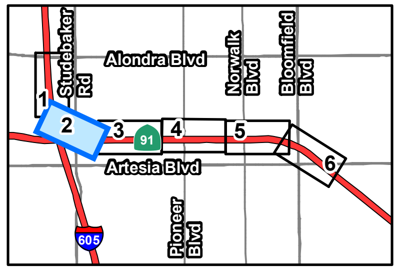

FIGURE 2.13-2

Sheet 2 of 6

Westbound SR-91 Improvement Project

Monitoring and Modeled Receptor Locations

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0716000284; EA 29811

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SOURCE: Eagle Aerial (4/2014); Michael Baker (9/2017)

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FIGURE 2.13-2

Sheet 3 of 6

Westbound SR-91 Improvement Project

Monitoring and Modeled Receptor Locations

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0716000284; EA 29811

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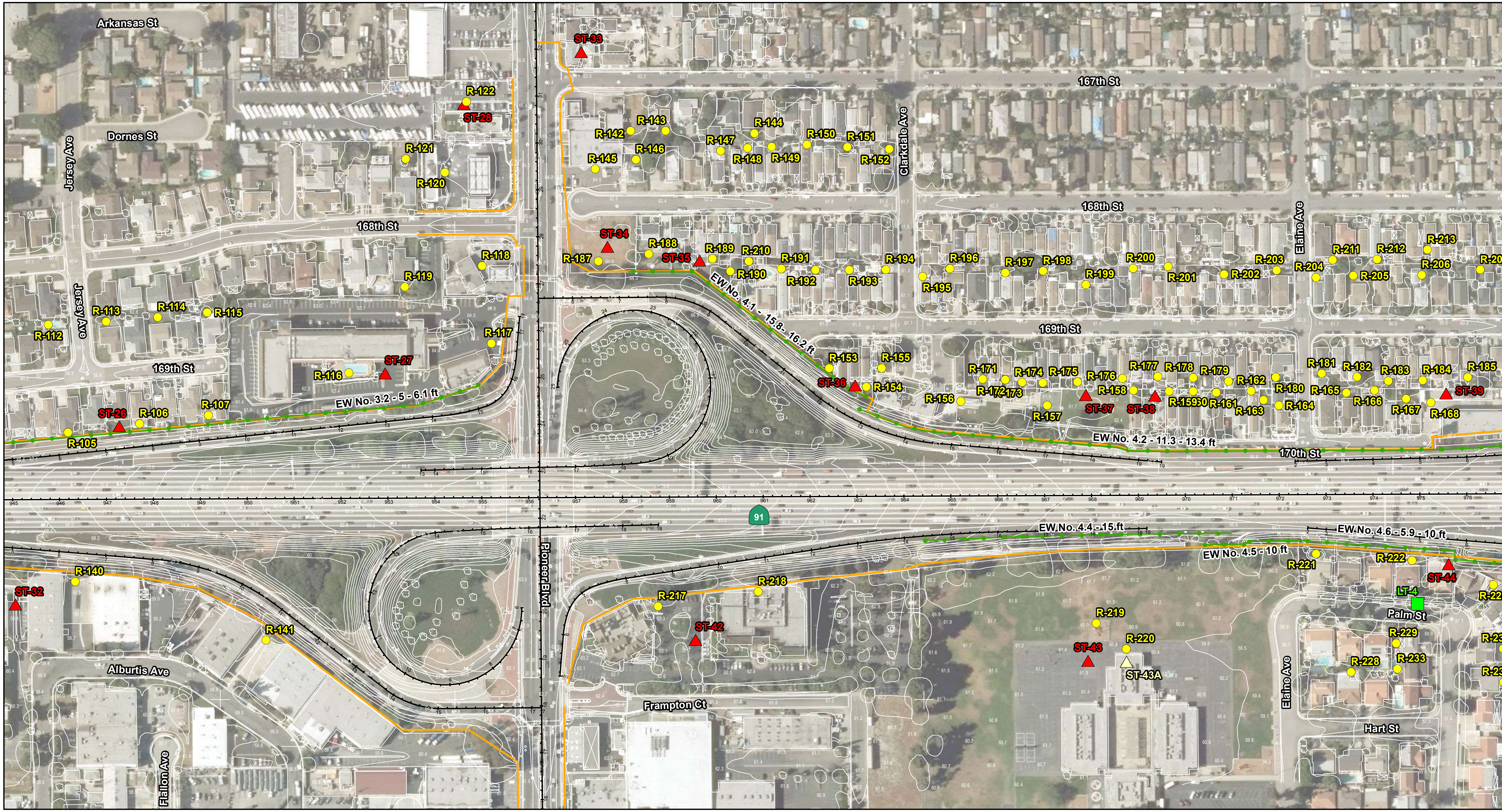

LEGEND

- Long-Term Monitoring Locations
- Short-Term Monitoring Locations
- Short-Term Interior Monitoring Locations
- Modeled Receptors
- Existing Right-of-Way
- Existing Wall

0 100 200
FEET

SOURCE: Eagle Aerial (4/2014); Michael Baker (9/2017)

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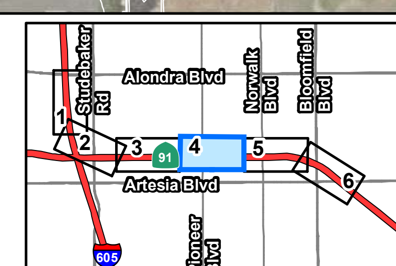

FIGURE 2.13-2
Sheet 4 of 6

Westbound SR-91 Improvement Project

Monitoring and Modeled Receptor Locations

07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

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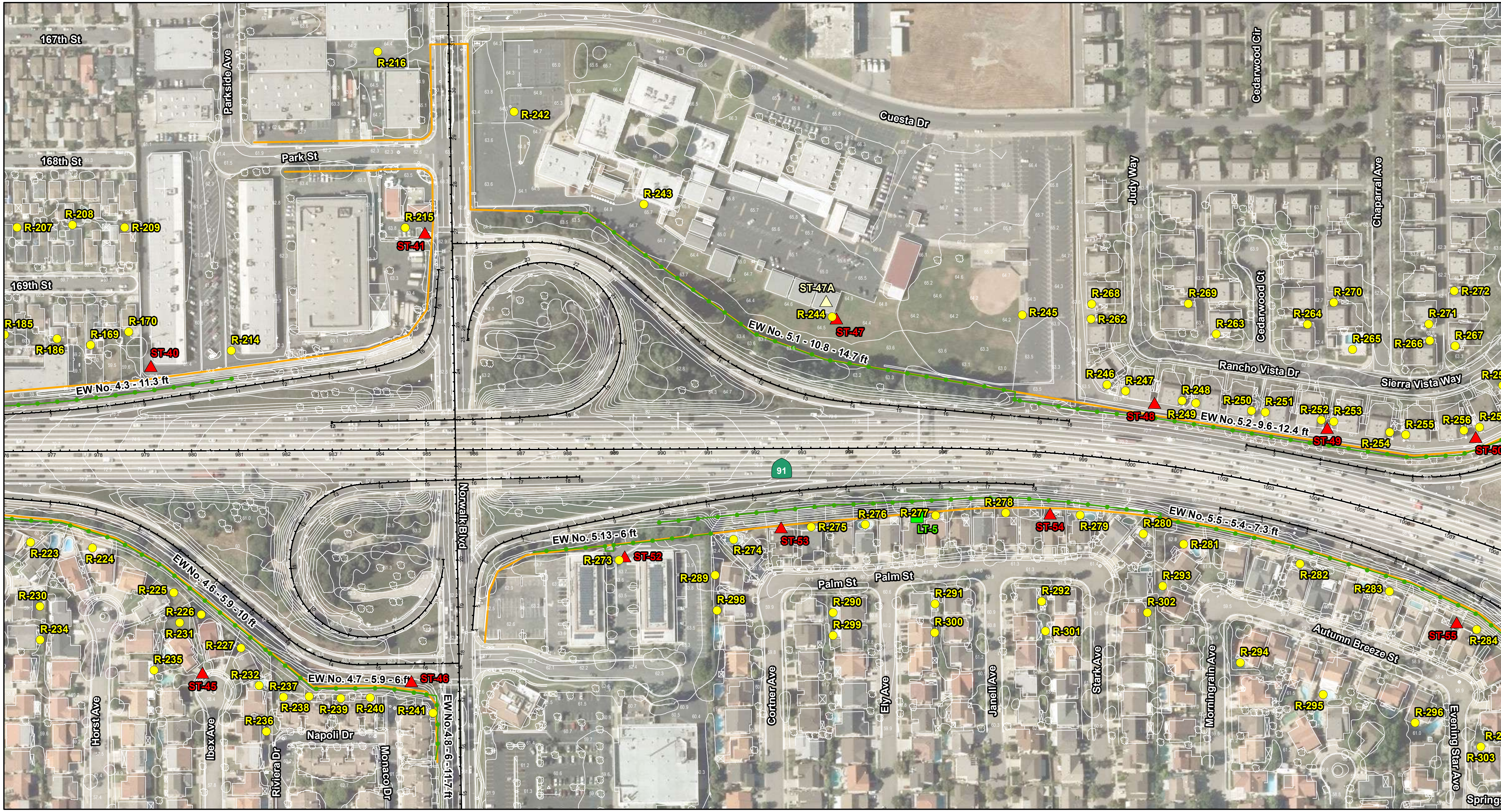

LEGEND

- Long-Term Monitoring Locations
- Short-Term Monitoring Locations
- Short-Term Interior Monitoring Locations
- Modeled Receptors
- Existing Right-of-Way
- Existing Wall

N

0 100 200
FEET

SOURCE: Eagle Aerial (4/2014); Michael Baker (9/2017)

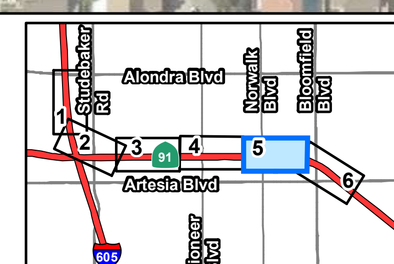

FIGURE 2.13-2
Sheet 5 of 6

Westbound SR-91 Improvement Project

Monitoring and Modeled Receptor Locations

07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

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LEGEND

- Long-Term Monitoring Locations
- Short-Term Monitoring Locations
- Short-Term Interior Monitoring Locations
- Modeled Receptors
- Existing Right-of-Way
- Existing Wall

0 100 200
FEET

SOURCE: Eagle Aerial (4/2014); Michael Baker (9/2017)

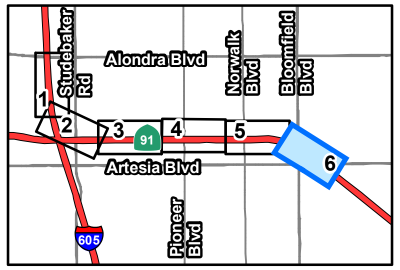

FIGURE 2.13-2
Sheet 6 of 6

Westbound SR-91 Improvement Project

Monitoring and Modeled Receptor Locations

07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
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2.13.2.3 Existing Noise Levels

Traffic volume counts and vehicle speeds measured during the ambient noise monitoring were coded into Traffic Noise Model (TNM) 2.5 with existing roadway conditions to calibrate the modeling result. The results of the existing traffic noise modeling are shown in Table 2.13.6 in Section 2.13.3.2, Permanent Impacts. Currently, of the 362 modeled receptor locations, 33 receptors would approach or exceed the NAC. Figure 2.13-2 shows the locations of the modeled receptors.

2.13.3 Environmental Consequences

The proposed project is considered a Type 1 project because it would use federal aid to add a mixed-flow lane and auxiliary lanes in the westbound direction of the existing SR-91. A noise analysis is required for all Type 1 projects. Therefore, noise impacts of the Build Alternative and design options are analyzed below.

2.13.3.1 Temporary Impacts

Build Alternative (includes Design Options)

Construction Noise

Two types of short-term noise impacts would occur during project construction. The first type would be from construction crew commutes and the transport of construction equipment and materials to the project site and would incrementally raise noise levels on the access roads leading to the site. The pieces of heavy equipment for grading and construction activities would be moved on site, would remain for the duration of each construction phase, and would not add to the daily traffic volume in the project vicinity. A high single-event noise exposure potential at a maximum level of 75 dBA maximum instantaneous noise level (L_{max}) from trucks passing at 50 ft from the noise receptor would exist. However, the projected construction traffic would be minimal when compared to existing traffic volumes on SR-91 and other affected streets, and its associated long-term noise level change would not be perceptible. Therefore, short-term construction-related worker commutes and equipment transport noise impacts would have no effect on ambient noise levels.

The second type of short-term noise impact is related to noise generated during roadway construction. Construction is performed in discrete steps, each of which has its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise generated and the noise levels in the study area as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. Table 2.13.3 lists typical construction

Table 2.13.3 Typical Construction Equipment Noise Levels

Type of Equipment	Actual Maximum Sound Levels at 50 ft (dBA)
Backhoe	78
Crane	81
Dozer	82
Drill Rig Truck	79
Dump Truck	76
Excavator	81
Flat Bed Truck	74
Front End Loader	79
Generator	81
Impact Pile Driver	101
Jackhammer	89
Pickup Truck	75
Pneumatic Tools	85
Pumps	81
Roller	80
Scraper	84

Source: Federal Highway Administration. *Roadway Construction Noise Model* (2006).
dBA = A-weighted decibels
ft = foot/feet

equipment noise levels (L_{max}) recommended for noise impact assessments, based on a distance of 50 ft between the equipment and a noise receptor.

With the exception of the impact pile driver and jackhammer, typical noise levels at 50 ft from an active construction area range up to 86 dBA L_{max} during the noisiest construction phases. The site preparation phase, which includes grading and paving, tends to generate the highest noise levels because the noisiest construction equipment is earthmoving equipment. Earthmoving equipment includes excavating machinery (e.g., backfillers, bulldozers, and front loaders). Earthmoving and compacting equipment includes compactors, scrapers, and graders. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full-power operation followed by 3 or 4 minutes at lower power settings.

The construction of the proposed project is expected to require the use of earthmovers, bulldozers, water trucks, and pickup trucks. Noise associated with the use of construction equipment is estimated to be between 75 and 84 dBA L_{max} at a distance of 50 ft from the active construction area for the grading phase. As seen in Table 2.13.3, the maximum noise level generated by each scraper is assumed to be approximately 84 dBA L_{max} at 50 ft from the scraper in operation. Each bulldozer would generate approximately 82 dBA L_{max} at 50 ft. The maximum noise level generated by water trucks and pickup trucks is approximately 75 dBA L_{max} at 50 ft from these vehicles. Each doubling of the sound source with equal strength increases the noise level by 3 dBA. Each piece of construction equipment operates as an individual point source. The worst-case composite noise level at the nearest residence during this phase of construction would be 86 dBA L_{max} (at a distance of 50 ft from an active construction area).

In addition to standard construction equipment, the proposed project may require the use of pile drivers. As shown in Table 2.13.3, pile driving generates noise levels of approximately 101 dBA L_{max} at 50 ft.

The closest sensitive receptors are within 50 ft of project construction areas and would be approximately 180 ft from pile driving activities. Sensitive receptor locations may be subject to short-term noise higher than 92 dBA L_{max} generated by construction activities along the project alignment. Project Feature N-1 requires compliance with Caltrans Standard Specifications Section 14-8.02 (2015) and would minimize construction noise impacts on sensitive land uses adjacent to the project site. The noise level from the contractor's operations between the hours of 9:00 p.m. and 6:00 a.m. shall not exceed 86 dBA L_{max} at a distance of 50 ft and contractors will not operate an internal combustion engine on the job site without the appropriate manufacturer-recommended muffler.

PF-N-1 The control of noise from construction activities shall conform to the California Department of Transportation (Caltrans) Standard Specifications, Section 14-8.02, Noise Control. The nighttime noise level from the contractor's operations, between the hours of 9:00 p.m. and 6:00 a.m., shall not exceed 86 dBA L_{eq}(h) (1-hour A-weighted equivalent continuous sound level) at a distance of 50 feet. In addition, the contractor shall equip all internal combustion engines with a manufacturer-recommended muffler and shall not operate any internal combustion engine on the job site without the appropriate muffler.

PF-N-2 During all project site excavation and grading, construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturers' standards.

PF-N-3 The construction contractor shall locate construction staging areas away from off-site sensitive uses during the later phases of project development.

PF-N-4 The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site whenever feasible.

Construction Vibration

Vibration generated by construction equipment can result in varying degrees of ground vibration, depending on the equipment. The operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings situated on soil near the active construction area respond to these vibrations, which range from imperceptible to low rumbling sounds with perceptible vibrations and slight damage at the highest vibration levels. Typically, construction-related vibrations do not reach vibration levels that would result in damage to nearby structures. However, old and fragile structures would require special consideration to avoid damage. The two types of short-term vibration impacts that would occur during project construction are evaluated below.

Short-term vibration impacts would be from construction equipment associated with the construction. The proposed project would require the use of loaded trucks, bulldozers, and pile driving. Based on the Federal Transit Administration *Transit Noise and Vibration Assessment* (2006), a loaded truck, a large bulldozer, and pile driving would generate a vibration level of 0.076 peak particle velocity (PPV) (inches per second [in/sec]) (86 vibration velocity decibels [VdB]), 0.089 PPV (in/sec) (87 VdB), and 0.644 PPV (in/sec) (104 VdB) when measured at 25 ft. The closest residential structure is located approximately 50 ft from the construction boundary and 180 ft from pile driving. The closest residential structure would be exposed to a vibration level of up to 0.033 PPV (in/sec) (78 VdB). As shown in Table 2.13.4, a vibration level of 87 VdB at the closest residence would result in community annoyance. However, Table 2.13.5 shows that this vibration level would not damage residential structures or other structures associated with residential land uses within the project area because these structures are constructed with non-engineered timber and the vibration damage threshold of 0.2 PPV (in/sec) (94 VdB) would not be exceeded.

No Build Alternative

The No Build Alternative would not result in the construction of improvements within the study area and, therefore, would not result in temporary noise or vibration effects.

Table 2.13.4 Groundborne Vibration Impact General Assessment

Land Use Category	Groundborne Vibration Impact Levels (VdB re 1 µin/sec)		
	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]
Category 1: Buildings where vibration would interfere with interior operations	65 VdB	65 VdB	65 VdB
Category 2: Residences and buildings where people normally sleep	72 VdB	75 VdB	80 VdB
Category 3: Institutional land uses with primarily daytime use	75 VdB	78 VdB	83 VdB

Source: *Transit Noise and Vibration Impact Assessment* (FTA 2006).

[1] Frequent Events are defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category.

[2] Occasional Events are defined as between 30 and 70 vibration events of the same kind per day. This category includes most commuter rail branch lines.

[3] Infrequent Events are defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines.

µin/sec = microinches per second
FTA = Federal Transit Administration
VdB = vibration velocity decibels

Table 2.13.5 Construction Vibration Damage Criteria

Building Category	PPV (in/sec)	Approximately L_v
Reinforced concrete, steel, or timber (no plaster)	0.5	102
Engineered concrete and masonry (no plaster)	0.3	98
Non-engineered timber and masonry buildings	0.2	94
Buildings extremely susceptible to vibration damage	0.12	90

Source: *Transit Noise and Vibration Impact Assessment* (FTA 2006).
FTA = Federal Transit Administration
in/sec = inches per second
L_V = root-mean-square (RMS) velocity in decibels (VdB) re 1 microinch per second
PPV = peak particle velocity

2.13.3.2 Permanent Impacts

Potential long-term noise impacts associated with project operations are solely from traffic noise. Traffic noise was evaluated for the worst-case traffic condition. Using coordinates obtained from topographic maps, a total of 362 receptor locations associated with existing single- and multifamily residences, schools, a hospital, a day-care facility, a community center, parks, sports areas, a golf course, recreational areas, a hotel, restaurants, vacant land, retail, office, utility, commercial, and light industrial uses were evaluated in the noise model.

Build Alternative (Includes Design Options)

Future traffic noise levels for all 362 receptor locations were determined with existing walls using the worst-case traffic operations (prior to speed degradation) or the future (2044) peak-hour traffic volumes obtained from the *Traffic Operations Analysis Report* (2018), whichever was lower. Table 2.13.6 along with Tables 2.13.7 and 2.13.8 show the traffic noise level results for the existing (2017), Future No Build, and Future Build (Build Alternative) conditions. Table 2.13.9 along with Tables 2.13.10 and 2.13.11 show the traffic noise level results for the Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width). Tables 2.13.12 through 2.13.15 show the traffic noise level results for the Build Alternative with Design Option 5 (Four-Lane Gridley Road Overcrossing), the Build Alternative with Design Option 2 (Pioneer Boulevard L-9), the Build Alternative with Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment), and the Build Alternative with Design Option 4 (Diamond Ramps), respectively.

The modeled future noise levels with the project were compared to the modeled existing noise levels (after calibration) from TNM 2.5 to determine whether a substantial noise increase would occur. The modeled future noise levels were also compared to the NACs under Activity Categories B, C, D, and E to determine whether a traffic noise impact would occur.

Traffic noise impacts occur when either of the following takes place: (1) if the traffic noise level at a sensitive receptor location is predicted to "approach or exceed" the NAC (i.e., be within 1 dBA or higher) or (2) if the predicted traffic noise level is 12 dBA or more over its corresponding modeled existing noise level at the sensitive receptor locations analyzed. When traffic noise impacts occur, noise abatement measures must be considered. Of the 362 modeled receptors, 56 receptors under the Build Alternative would approach or exceed the NAC. No additional impacts would occur under the Build Alternative with Design Option 5 (Four-Lane Gridley Road Overcrossing), Design Option 2 (Pioneer Boulevard L-9), or Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment). The Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width) would have 10 fewer impacted receptors compared to the Build Alternative (Receptors R-107, R-177 through R-183, R-248, and R-249). The Build Alternative with Design Option 4 (Diamond Ramps) would have two fewer impacted receptors compared to the Build Alternative (Receptors R-248 and R-249). No receptor would experience a substantial noise increase of 12 dBA or more over its corresponding existing noise levels under any scenario.

Table 2.13.6 Predicted Future Noise Level and Noise Barrier Analysis for the Build Alternative

Receptor No.	Existing Wall No.[1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA $L_{eq}(h)$	Future Worst-Hour Noise Levels, dBA $L_{eq}(h)$																							
							2044 Noise Level				Activity Category (NAC)	Impact Type[4]	Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR)																	
													6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
							Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions			$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR
R-1			Alondra Boulevard	Restaurant/Retail	1	64	65	66	1	2	E(72)	--	--[2]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-2			Alondra Boulevard	Commercial	0	66	66	66	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-3			College Place	Hospital	1	74 / 49[3]	75 / 50[3]	75 / 50[3]	0	1	D(52)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-4	EW No. 1.1	NB No. 1.1	Monica Circle	Residential	2	64	65	65	0	1	B(67)	--	--[4]	--	--	--	--	--	64	1	0	63	2	0	63	2	0	62	3	0
R-5	EW No. 1.1	NB No. 1.1	Monica Circle	Residential	2	**66**[5]	**66**	**66**	0	0	B(67)	A/E	--	--	--	--	--	--	65	1	0	65	1	0	64	2	0	63	3	0
R-6	EW No. 1.1	NB No. 1.1	Monica Circle	Residential	3	65	**66**	**66**	0	1	B(67)	A/E	--	--	--	--	--	--	65	1	0	64	2	0	64	2	0	63	3	0
R-7	EW No. 1.1	NB No. 1.1	Elena Street	Residential	2	**66**	**66**	**66**	0	0	B(67)	A/E	--	--	--	--	--	--	65	1	0	64	2	0	64	2	0	63	3	0
R-8	EW No. 1.1	NB No. 1.1	Monica Circle	Residential	1	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	62	1	0	62	1	0	62	1	0	62	1	0
R-9	EW No. 1.1	NB No. 1.1	Elena Street	Residential	1	63	63	63	0	0	B(67)	--	--	--	--	--	--	--	62	1	0	62	1	0	61	2	0	61	2	0
R-10	EW No. 1.1	NB No. 1.1	Monica Circle	Residential	2	60	60	61	1	1	B(67)	--	--	--	--	--	--	--	60	1	0	60	1	0	60	1	0	60	1	0
R-11	EW No. 1.1	NB No. 1.1	Monica Circle	Residential	2	57	58	58	0	1	B(67)	--	--	--	--	--	--	--	57	1	0	58	0	0	57	1	0	57	1	0
R-12	EW No. 1.1	NB No. 1.1	Monica Circle	Residential	2	58	58	58	0	0	B(67)	--	--	--	--	--	--	--	58	0	0	58	0	0	58	0	0	58	0	0
R-13	EW No. 1.1	NB No. 1.1	Elena Street	Residential	1	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	61	0	0	60	1	0	60	1	0	59	2	0
R-14	EW No. 1.1	NB No. 1.1	Carla Place	Residential	2	65	65	65	0	0	B(67)	--	--	--	--	--	--	--	65	0	0	64	1	0	63	2	0	62	3	0
R-15	EW No. 1.1	NB No. 1.1	Carla Place	Residential	1	**66**	**66**	**66**	0	0	B(67)	A/E	--	--	--	--	--	--	65	1	0	64	2	0	63	3	0	62	4	0
R-16	EW No. 1.1	NB No. 1.1	Petula Place	Residential	2	65	**66**	**66**	0	1	B(67)	A/E	--	--	--	--	--	--	65	1	0	64	2	0	63	3	0	62	4	0
R-17	EW No. 1.1	NB No. 1.1	166th Street	Residential	1	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	63	0	0	63	0	0	63	0	0	63	0	0
R-18	EW No. 1.1		166th Street	Residential	1	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-19	EW No. 1.1	NB No. 1.1	Carla Place	Residential	1	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	62	0	0	61	1	0	60	2	0	60	2	0
R-20	EW No. 1.1	NB No. 1.1	Carla Place	Residential	1	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	63	0	0	62	1	0	61	2	0	61	2	0
R-21	EW No. 1.1	NB No. 1.1	166th Street	Residential	2	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	62	1	0	63	0	0	62	1	0	62	1	0
R-22	EW No. 1.1		166th Street	Residential	1	60	61	61	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-23	EW No. 1.1	NB No. 1.1	Carla Place	Residential	1	59	59	59	0	0	B(67)	--	--	--	--	--	--	--	59	0	0	58	1	0	58	1	0	58	1	0
R-24	EW No. 1.1	NB No. 1.1	Carla Place	Residential	1	58	59	59	0	1	B(67)	--	--	--	--	--	--	--	58	1	0	58	1	0	58	1	0	57	2	0
R-25	EW No. 1.1	NB No. 1.1	166th Street	Residential	1	60	61	61	0	1	B(67)	--	--	--	--	--	--	--	61	0	0	60	1	0	60	1	0	60	1	0
R-26	EW No. 1.1		Estella Avenue	Residential	2	60	60	60	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
R-27	EW No. 1.1		Estella Avenue	Residential	2	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-28	EW No. 1.1		Estella Avenue	Residential	3	58	58	59	1	1	C[6]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-29	EW No. 1.1		Estella Avenue	Residential	1	58	58	58	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-30			Studebaker Road	Park	0	65	65	66	1	1	C	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-31	EW No. 1.1		Roberta Street	Residential	1	58	58	58	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-32	EW No. 1.1		Roberta Street	Residential	1	57	58	58	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-33	EW No. 1.1		Studebaker Road	Park	1	57	57	58	1	1	C(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-34			Piuma Avenue	Gas Station	0	71	72	72	0	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-35			Piuma Avenue	Retail	0	71	71	71	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-36			Piuma Avenue	Light Industrial	0	73	74	74	0	1		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-37			Piuma Avenue	Light Industrial	0	74	74	74	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-38			Piuma Avenue	Golf Course	0	74	75	75	0	1	C[6]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-39			Piuma Avenue	Golf Course	0	70	70	70	0	0	C[6]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-40			Piuma Avenue	Golf Course	0	71	72	72	0	1	C[6]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-41			Piuma Avenue	Golf Course	0	71	72	72	0	1	C[6]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-42			Piuma Avenue	Golf Course	0	73	73	73	0	0	C[6]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-43			Piuma Avenue	Utility	0	70	71	71	0	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-44	EW No. 2.1	NB No. 2.1	Westwinds Circle	Residential	1	64	65	**66**	1	2	B(67)	A/E	--	--	--	--	--	--	63	3	0	63	3	0	60	6[7]	1	59	7	1
R-45	EW No. 2.1	NB No. 2.1	Leeward Avenue	Residential	2	63	64	65	1	2	B(67)	--	--	--	--	--	--	--	64	1	0	64	1	0	61	4	0	60	5	2
R-46	EW No. 2.1	NB No. 2.1	Coral Reef Circle	Residential	2	62	62	64	2	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	62	2	0	62	2	0
R-47	EW No. 2.1	NB No. 2.1	Outrigger Circle	Residential	2	65	65	**66**	1	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	0	0	65	1	0
R-48	EW No. 2.1	NB No. 2.1	Windward Avenue	Residential	2	64	64	64	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	1	0	63	1	0
R-49	EW No. 2.1*	NB No. 2.1	Eric Avenue	Residential	1	64	65	65	0	1	B(67)	--	--	--	--	--	--	--	65	0	0	65	0	0	64	1	0	64	1	0
R-50	EW No. 2.1*	NB No. 2.1	Beach Street	Residential	4	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	62	0	0	62	0	0	62	0	0	61	1	0
R-51	EW No. 2.1*	NB No. 2.1	Beach Street	Residential	4	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	62	0	0	62	0	0	62	0	0	62	0	0

Table 2.13.6 Predicted Future Noise Level and Noise Barrier Analysis for the Build Alternative

Receptor No.	Existing Wall No. [1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA L_{eq}(h)	Future Worst-Hour Noise Levels, dBA L_{eq}(h): 2044 Noise Level: Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions	Activity Category (NAC)	Impact Type[4]	Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR): 6 feet L_{eq}(h)	6 feet I.L.	6 feet NBR	8 feet L_{eq}(h)	8 feet I.L.	8 feet NBR	10 feet L_{eq}(h)	10 feet I.L.	10 feet NBR	12 feet L_{eq}(h)	12 feet I.L.	12 feet NBR	14 feet L_{eq}(h)	14 feet I.L.	14 feet NBR	16 feet L_{eq}(h)	16 feet I.L.	16 feet NBR
R-52	EW No. 2.1*		Beach Street	Residential	4	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-53	EW No. 2.1*		Beach Street	Residential	6	60	60	60	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-54	EW No. 2.1*		Beach Street	Residential	2	60	60	61	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-55	EW No. 2.1*		Harvest Avenue	Residential	1	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-56	EW No. 2.1	NB No. 2.1	Westwinds Circle	Residential	1	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	63	1	0	62	2	0	61	3	0	61	3	0
R-57	EW No. 2.1*		Sunny Ridge Court	Residential	2	62	62	63	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-58	EW No. 2.1	NB No. 2.1	Leeward Avenue	Residential	1	63	64	65	1	2	B(67)	--	--	--	--	--	--	--	64	1	0	63	2	0	61	4	0	60	5	1
R-59	EW No. 2.1	NB No. 2.1	Coral Reef Circle	Residential	2	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	63	1	0	62	2	0	62	2	0
R-60	EW No. 2.1	NB No. 2.1	Outrigger Circle	Residential	2	65	**66**	**66**	0	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	**66**	0	0	65	1	0	64	2	0
R-61	EW No. 2.1	NB No. 2.1	Windward Avenue	Residential	1	63	64	64	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	64	0	0	63	1	0	62	2	0
R-62	EW No. 2.1*	NB No. 2.1	Eric Avenue	Residential	2	63	64	64	0	1	B(67)	--	--	--	--	--	--	--	64	0	0	64	0	0	63	1	0	63	1	0
R-63	EW No. 2.1*		Harvest Avenue	Residential	1	59	60	60	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-64	EW No. 2.1*		Sunny Ridge Court	Residential	1	58	59	58	-1	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-65	EW No. 2.1	NB No. 2.1	Leeward Avenue	Residential	2	64	64	64	0	0	B(67)	--	--	--	--	--	--	--	63	1	0	62	2	0	62	2	0	61	3	0
R-66	EW No. 2.1	NB No. 2.1	Coral Reef Circle	Residential	2	63	63	63	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	63	0	0	61	2	0	61	2	0
R-67	EW No. 2.1	NB No. 2.1	Outrigger Circle	Residential	2	**66**	**66**	**66**	0	0	B(67)	A/E	--	--	--	--	--	--	--	--	--	**66**	0	0	65	1	0	63	3	0
R-68	EW No. 2.1	NB No. 2.1	Windward Avenue	Residential	2	63	64	64	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	64	0	0	63	1	0	62	2	0
R-69	EW No. 2.1*	NB No. 2.1	Eric Avenue	Residential	2	63	63	63	0	0	B(67)	--	--	--	--	--	--	--	63	0	0	63	0	0	62	1	0	62	1	0
R-70	EW No. 2.1*	NB No. 2.1	Eric Avenue	Residential	2	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	61	0	0	61	0	0	60	1	0	60	1	0
R-71	EW No. 2.1*	NB No. 2.1	Lucas Street	Residential	3	57	57	57	0	0	B(67)	--	--	--	--	--	--	--	57	0	0	57	0	0	57	0	0	57	0	0
R-72	EW No. 2.1*		Lucas Street	Residential	3	56	57	57	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-73	EW No. 2.1*		Lucas Street	Residential	3	55	55	55	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-74	EW No. 2.1*		Lucas Street	Residential	2	56	56	56	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-75	EW No. 2.1*		Harvest Avenue	Residential	1	58	58	58	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-76	EW No. 2.1*		Sunny Ridge Court	Residential	1	57	57	57	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-77	EW No. 2.2	NB No. 2.3	Artesia Boulevard	Playground	1	**67**	**67**	**67**	0	0	C(67)	A/E	--	--	--	**66**	1	0	65	2	0	65	2	0	64	3	0	64	3	0
R-78	EW No. 2.2	NB No. 2.3	Artesia Boulevard	Playground	1	64	64	64	0	0	C(67)	--	64	0	0	64	0	0	64	0	0	64	0	0	64	0	0	64	0	0
R-79	EW No. 2.3	NB No. 2.3	Artesia Boulevard	Playground	2	57	57	57	0	0	C(67)	--	57	0	0	57	0	0	57	0	0	57	0	0	57	0	0	57	0	0
R-80	EW No. 2.3		Artesia Boulevard	Playground	2	62	62	62	0	0	C(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-81	EW No. 2.3		Artesia Boulevard	School Classroom	1	61 / 40[8]	61 / 40[8]	61 / 40[8]	0	0	D(52)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-82	EW No. 2.4		Palm Street	Residential	2	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-83	EW No. 2.4		Palm Street	Residential	1	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-84	EW No. 2.4		Palm Street	Residential	2	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-85	EW No. 2.4		Maples Avenue	Residential	1	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-86	EW No. 2.4		Maples Avenue	Residential	1	60	60	60	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-87	EW No. 2.4		Harvest Avenue	Residential	2	58	59	59	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-88	EW No. 2.4		Harvest Avenue	Residential	1	58	58	57	-1	-1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-89	EW No. 2.4		Maples Avenue	Residential	2	58	58	58	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-90	EW No. 2.4		Harvest Avenue	Residential	1	57	57	57	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-91	EW No. 2.4		Gridley Road	Park	1	58	58	58	0	0	C(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-92			Beach Street	Light Industrial	0	74	74	75	1	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-93			Beach Street	Light Industrial	0	74	74	75	1	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-94	EW No. 3.1		Beach Street	Light Industrial	0	70	70	71	1	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-95	EW No. 3.1		Hyde Park Court	Park	1	63	63	64	1	1	C(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-96	EW No. 3.1		Hyde Park Court	Residential	2	50	51	51	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-97	EW No. 3.1		Hyde Park Court	Residential	2	49	49	49	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-98	EW No. 3.1		Hyde Park Court	Residential	2	49	50	50	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-99	EW No. 3.1		Hyde Park Court	Residential	2	50	50	51	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-100	EW No. 3.1		Belvedere Court	Residential	2	55	55	55	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-101	EW No. 3.1*	NB No. 3.1	169th Street	Residential	2	**67**	**67**	**68**	1	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**67**	1	0	**66**	2	0
R-102	EW No. 3.1*	NB No. 3.1	169th Street	Residential	3	**66**	**67**	**68**	1	2	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**67**	1	0	**66**	2	0

Table 2.13.6 Predicted Future Noise Level and Noise Barrier Analysis for the Build Alternative

Receptor No.	Existing Wall No. [1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA $L_{eq}(h)$	Future Worst-Hour Noise Levels, dBA $L_{eq}(h)$																								
							2044 Noise Level				Activity Category (NAC)	Impact Type[4]	Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR)																	
													6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
							Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions			$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR
R-103	EW No. 3.1	NB No. 3.1	169th Street	Residential	3	**67**	**67**	**68**	1	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**68**	0	0	**66**	2	0
R-104	EW No. 3.1	NB No. 3.1	169th Street	Residential	3	65	65	**67**	2	2	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	65	2	0
R-105	EW No. 3.1	NB No. 3.1	169th Street	Residential	3	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	64	0	0	63	1	0
R-106	EW No. 3.1	NB No. 3.1	169th Street	Residential	3	63	63	65	2	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	64	1	0	63	2	0
R-107	EW No. 3.1	NB No. 3.1	169th Street	Residential	2	64	64	**66**	2	2	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	65	1	0	64	2	0
R-108	EW No. 3.1	NB No. 3.1	169th Street	Residential	1	60	61	61	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	61	0	0	60	1	0
R-109	EW No. 3.1	NB No. 3.1	169th Street	Residential	2	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	62	0	0	61	1	0
R-110	EW No. 3.1	NB No. 3.1	169th Street	Residential	2	62	62	63	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	62	1	0	62	1	0
R-111	EW No. 3.1	NB No. 3.1	169th Street	Residential	2	63	63	63	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	0	0	62	1	0
R-112	EW No. 3.1	NB No. 3.1	169th Street	Residential	1	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	0	0	63	0	0
R-113	EW No. 3.1	NB No. 3.1	169th Street	Residential	2	65	65	65	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	65	0	0	64	1	0
R-114	EW No. 3.1	NB No. 3.1	169th Street	Residential	2	62	62	63	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	62	1	0	62	1	0
R-115	EW No. 3.1	NB No. 3.1	169th Street	Residential	1	61	61	62	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	61	1	0	61	1	0
R-116	EW No. 3.1		Pioneer Boulevard	Hotel	1	64	65	65	0	1	E(72)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-117			Pioneer Boulevard	Restaurant	0	67	67	67	0	0	E[6]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-118			Pioneer Boulevard	Gas Station	0	65	65	0	--	--	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-119	EW No. 3.1		168th Street	Residential	1	56	57	57	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-120			Pioneer Boulevard	Gas Station	0	62	62	63	1	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-121			168th Street	Residential	1	57	57	57	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-122			Pioneer Boulevard	Light Industrial	0	59	59	59	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-123	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	2	**66**	**66**	**66**	0	0	B(67)	A/E	**66**	0	0	65	1	0	64	2	0	64	2	0	63	3	0	62	4	0
R-124	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	2	**66**	**66**	**66**	0	0	B(67)	A/E	**66**	0	0	65	1	0	64	2	0	63	3	0	63	3	0	62	4	0
R-125	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	3	65	65	65	0	0	B(67)	--	65	0	0	64	1	0	64	1	0	63	2	0	62	3	0	62	3	0
R-126	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	3	**67**	**67**	**67**	0	0	B(67)	A/E	**67**	0	0	65	2	0	64	3	0	63	4	0	63	4	0	62	5	3
R-127	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	3	**67**	**67**	**67**	0	0	B(67)	A/E	**67**	0	0	65	2	0	65	2	0	64	3	0	63	4	0	62	5	3
R-128	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	2	65	**66**	**66**	0	1	B(67)	A/E	64	2	0	64	2	0	63	3	0	63	3	0	63	3	0	63	3	0
R-129	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	1	64	64	64	0	0	B(67)	--	64	0	0	63	1	0	63	1	0	62	2	0	62	2	0	62	2	0
R-130	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	1	65	65	65	0	0	B(67)	--	64	1	0	64	1	0	63	2	0	63	2	0	63	2	0	63	2	0
R-131	EW No. 3.3	NB No. 3.2	Baber Avenue	Residential	1	60	60	60	0	0	B(67)	--	60	0	0	59	1	0	59	1	0	59	1	0	59	1	0	59	1	0
R-132	EW No. 3.3	NB No. 3.2	Hart Street	Residential	2	59	60	59	-1	0	B(67)	--	60	-1	0	59	0	0	59	0	0	59	0	0	59	0	0	59	0	0
R-133	EW No. 3.3	NB No. 3.2	Hart Street	Residential	3	61	61	61	0	0	B(67)	--	61	0	0	60	1	0	59	2	0	59	2	0	59	2	0	58	3	0
R-134	EW No. 3.3	NB No. 3.2	Hart Street	Residential	2	59	59	59	0	0	B(67)	--	59	0	0	59	0	0	59	0	0	59	0	0	59	0	0	58	1	0
R-135	EW No. 3.3	NB No. 3.2	Hart Street	Residential	2	61	61	62	1	1	B(67)	--	61	1	0	60	2	0	60	2	0	59	3	0	59	3	0	59	3	0
R-136	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	1	63	63	63	0	0	B(67)	--	63	0	0	62	1	0	62	1	0	62	1	0	61	2	0	61	2	0
R-137	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	1	61	61	61	0	0	B(67)	--	61	0	0	60	1	0	60	1	0	60	1	0	60	1	0	60	1	0
R-138			Roseton Avenue	Office	0	73	74	73	-1	0	E[6]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-139			Jersey Avenue	Light Industrial	0	73	74	74	0	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-140			Alburtis Avenue	Light Industrial	0	71	71	71	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-141			Alburtis Avenue	Office	0	65	66	66	0	1	E[6]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-142	EW No. 4.1		167th Street	Vacant Land	0	56	57	57	0	1	G	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-143	EW No. 4.1		167th Street	Residential	3	57	57	57	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-144	EW No. 4.1		167th Street	Residential	2	56	57	57	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-145	EW No. 4.1		Pioneer Boulevard	Light Industrial	0	61	61	61	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-146	EW No. 4.1		168th Street	Residential	2	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-147	EW No. 4.1		168th Street	Residential	2	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-148	EW No. 4.1		168th Street	Residential	3	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-149	EW No. 4.1		168th Street	Residential	2	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-150	EW No. 4.1		168th Street	Residential	3	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-151	EW No. 4.1		168th Street	Residential	3	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-152	EW No. 4.1		168th Street	Residential	2	56	56	57	1	1	B(67)	--	57	0	0	57	0	0	57	0	0	57	0	0	57	0	0	57	0	0
R-153	EW No. 4.1	NB No. 4.1	169th Street	Residential	2	60	61	61	0	1	B(67)	--	60	1	0	60	1	0	60	1	0	60	1	0	60	1	0	60	1	0

Table 2.13.6 Predicted Future Noise Level and Noise Barrier Analysis for the Build Alternative

Receptor No.	Existing Wall No. [1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA L_{eq}(h)	Future Worst-Hour Noise Levels, dBA L_{eq}(h)																									
							2044 Noise Level				Activity Category (NAC)	Impact Type[4]	Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR)																	
							Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions			6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
													L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR
R-154	EW No. 4.1	NB No. 4.1	169th Street	Residential	2	61	62	63	1	2	B(67)	--	62	1	0	62	1	0	62	1	0	62	1	0	62	1	0	62	1	0
R-155	EW No. 4.2	NB No. 4.1	169th Street	Playground	1	65	65	**66**	1	1	C(67)	A/E	--	--	--	--	--	--	--	--	--	65	1	0	65	1	0	65	1	0
R-156	EW No. 4.2	NB No. 4.1	169th Street	Community Center	1	66 / 46[9]	67 / 47[9]	68 / 48[9]	1	2	D(52)	--	--	--	--	--	--	--	--	--	--	66	2	0	66	2	0	66	2	0
R-157	EW No. 4.2	NB No. 4.1	169th Street	Playground	1	64	65	65	0	1	C(67)	--	--	--	--	--	--	--	--	--	--	65	0	0	65	0	0	65	0	0
R-158	EW No. 4.2*		170th Street	Residential	2	65	65	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-159	EW No. 4.2*		170th Street	Residential	2	60	60	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-160	EW No. 4.2*		170th Street	Residential	2	59	59	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-161	EW No. 4.2*		170th Street	Residential	2	58	58	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-162	EW No. 4.2*		170th Street	Residential	2	62	63	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-163	EW No. 4.2*		170th Street	Residential	1	62	62	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-164	EW No. 4.2*		170th Street	Residential	1	63	64	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-165	EW No. 4.2*		170th Street	Residential	1	64	65	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-166	EW No. 4.2*		170th Street	Residential	2	64	65	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-167	EW No. 4.2*		170th Street	Residential	2	64	64	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-168	EW No. 4.2*		170th Street	Light Industrial	0	61	61	0	--	--	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-169	EW No. 4.3	NB No. 4.1	169th Street	Residential	2	61	62	63	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	63	0	0	63	0	0	63	0	0
R-170	EW No. 4.3	NB No. 4.1	169th Street	Residential	1	61	61	62	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	62	0	0	62	0	0	62	0	0
R-171	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	63	1	0	63	1	0	63	1	0
R-172	EW No. 4.2	NB No. 4.1	169th Street	Residential	1	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	64	0	0	64	0	0	64	0	0
R-173	EW No. 4.2	NB No. 4.1	169th Street	Day Care Center	1	63 / 43[9]	64 / 44[9]	64 / 44[9]	0	1	D(52)	--	--	--	--	--	--	--	--	--	--	64	0	0	64	0	0	64	0	0
R-174	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	64	0	0	64	0	0	64	0	0
R-175	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	64	0	0	64	0	0	64	0	0
R-176	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	64	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	64	0	0	64	0	0
R-177	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	63	63	**67**	4	4	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	**66**	1	0
R-178	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	**67**	4	5	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	**66**	1	0
R-179	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	63	63	**67**	4	4	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	**66**	1	0
R-180	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	64	64	**67**	3	3	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	**66**	1	0
R-181	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	64	65	**67**	2	3	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	**66**	1	0
R-182	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	64	65	**67**	2	3	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**67**	0	0	**67**	0	0
R-183	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	65	65	**67**	2	2	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**67**	0	0	**67**	0	0
R-184	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	61	61	64	3	3	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	1	0	63	1	0
R-185	EW No. 4.3*	NB No. 4.1	169th Street	Residential	3	60	60	64	4	4	B(67)	--	--	--	--	--	--	--	--	--	--	63	1	0	63	1	0	63	1	0
R-186	EW No. 4.3*		169th Street	Residential	3	60	60	64	4	4	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-187			168th Street	Vacant Land	0	65	65	67	2	2	G	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-188	EW No. 4.1		168th Street	Residential	2	59	59	60	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-189	EW No. 4.1		168th Street	Residential	3	55	56	56	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-190	EW No. 4.1		169th Street	Residential	1	55	56	57	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-191	EW No. 4.1		169th Street	Residential	2	56	57	58	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-192	EW No. 4.1	NB No. 4.1	169th Street	Residential	3	57	58	58	0	1	B(67)	--	58	0	0	58	0	0	58	0	0	58	0	0	58	0	0	58	0	0
R-193	EW No. 4.1	NB No. 4.1	169th Street	Residential	3	58	58	59	1	1	B(67)	--	59	0	0	58	1	0	58	1	0	58	1	0	58	1	0	58	1	0
R-194	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	58	58	59	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	57	2	0	57	2	0	57	2	0
R-195	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	61	1	0	61	1	0	61	1	0
R-196	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	61	61	62	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	60	2	0	60	2	0	60	2	0
R-197	EW No. 4.2	NB No. 4.1	169th Street	Residential	3	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	60	1	0	60	1	0	60	1	0
R-198	EW No. 4.2	NB No. 4.1	169th Street	Residential	3	60	60	61	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	59	2	0	59	2	0	59	2	0
R-199	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	59	59	60	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	58	2	0	58	2	0	58	2	0
R-200	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	64	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	62	2	0	62	2	0
R-201	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	64	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	62	2	0	62	2	0
R-202	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	62	1	0	62	1	0
R-203	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	62	63	64	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	62	2	0	62	2	0
R-204	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	62	2	0	62	2	0

Table 2.13.6 Predicted Future Noise Level and Noise Barrier Analysis for the Build Alternative

Receptor No.	Existing Wall No. [1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA $L_{eq}(h)$	Future Worst-Hour Noise Levels, dBA $L_{eq}(h)$																								
							2044 Noise Level				Activity Category (NAC)	Impact Type[4]	Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR)																	
													6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
							Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions			$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR
R-205	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	64	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	62	2	0	62	2	0
R-206	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	63	64	65	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	2	0	63	2	0
R-207	EW No. 4.3*	NB No. 4.1	169th Street	Residential	3	60	60	61	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	60	1	0	60	1	0	60	1	0
R-208	EW No. 4.3	NB No. 4.1	169th Street	Residential	3	60	61	61	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	61	0	0	61	0	0	61	0	0
R-209	EW No. 4.3		169th Street	Residential	2	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-210	EW No. 4.1	NB No. 4.1	168th Street	Residential	2	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	57	0	0	57	0	0
R-211	EW No. 4.2*	NB No. 4.1	168th Street	Residential	2	62	63	64	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	62	2	0	62	2	0
R-212	EW No. 4.2*	NB No. 4.1	168th Street	Residential	3	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	1	0	63	1	0
R-213	EW No. 4.2*	NB No. 4.1	168th Street	Residential	3	64	64	65	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	0	0	0	0	0	0
R-214	EW No. 4.3		Park Street	Light Industrial	0	66	66	66	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-215			Norwalk Boulevard	Gas Station	0	69	69	69	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-216			Norwalk Boulevard	Light Industrial	0	63	63	63	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-217			Pioneer Boulevard	Restaurant	0	71	71	71	0	0	E[3]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-218			Pioneer Boulevard	Office/Classroom	0	70 / 45[3]	71 / 46[3]	71 / 46[3]	0	1	E/D(52)[6]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-219	EW No. 4.1		Aclare Street	School Playground	1	63	63	63	0	0	C(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-220	EW No. 4.1		Aclare Street	School Classroom	1	62 / 47[8]	62 / 47[8]	62 / 47[8]	0	0	D(52)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-221	EW No. 4.6	NB No. 4.2	Palm Street	Residential	2	**67**	**67**	**67**	0	0	B(67)	A/E	--	--	--	--	--	--	--	--	--	**66**	1	0	**66**	1	0	**66**	1	0
R-222	EW No. 4.6	NB No. 4.2	Palm Street	Residential	3	**66**	**67**	**67**	0	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	**66**	1	0	65	2	0	65	2	0
R-223	EW No. 4.6	NB No. 4.2	Palm Street	Residential	2	**69**	**69**	**69**	0	0	B(67)	A/E	**69**	0	0	**68**	1	0	**67**	2	0	**66**	3	0	65	4	0	65	4	0
R-224	EW No. 4.6	NB No. 4.2	Horst Avenue	Residential	3	**69**	**69**	**69**	0	0	B(67)	A/E	**69**	0	0	**68**	1	0	**67**	2	0	**66**	3	0	65	4	0	64	5	3
R-225	EW No. 4.6	NB No. 4.2	Horst Avenue	Residential	1	**67**	**67**	**67**	0	0	B(67)	A/E	**67**	0	0	**66**	1	0	65	2	0	64	3	0	63	4	0	63	4	0
R-226	EW No. 4.6	NB No. 4.2	Ibex Ave	Residential	1	61	62	62	0	1	B(67)	--	62	0	0	61	1	0	60	2	0	59	3	0	58	4	0	58	4	0
R-227	EW No. 4.6		Ibex Ave	Residential	1	59	59	59	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-228	EW No. 4.6	NB No. 4.2	Hart Street	Residential	2	64	64	65	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	63	2	0	63	2	0	63	2	0
R-229	EW No. 4.6	NB No. 4.2	Grayland Avenue	Residential	1	65	**66**	**66**	0	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	64	2	0	63	3	0	63	3	0
R-230	EW No. 4.6	NB No. 4.2	Grayland Avenue	Residential	2	**68**	**68**	**68**	0	0	B(67)	A/E	**68**	0	0	**67**	1	0	**66**	2	0	64	4	0	64	4	0	63	5	2
R-231	EW No. 4.6	NB No. 4.2	Ibex Ave	Residential	1	63	63	63	0	0	B(67)	--	63	0	0	62	1	0	61	2	0	60	3	0	59	4	0	59	4	0
R-232	EW No. 4.6		Ibex Ave	Residential	1	59	59	59	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-233	EW No. 4.6	NB No. 4.2	Grayland Avenue	Residential	3	63	64	64	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	62	2	0	62	2	0	62	2	0
R-234	EW No. 4.6	NB No. 4.2	Grayland Avenue	Residential	2	**66**	**66**	**66**	0	0	B(67)	A/E	**66**	0	0	65	1	0	64	2	0	62	4	0	62	4	0	62	4	0
R-235	EW No. 4.6	NB No. 4.2	Horst Avenue	Residential	2	63	63	63	0	0	B(67)	--	63	0	0	62	1	0	61	2	0	60	3	0	60	3	0	59	4	0
R-236	EW No. 4.6		Ibex Ave	Residential	1	57	57	57	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-237	EW No. 4.7		Napoli Drive	Residential	2	57	58	58	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-238	EW No. 4.7		Napoli Drive	Residential	2	55	56	56	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-239	EW No. 4.7		Napoli Drive	Residential	1	54	54	55	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-240	EW No. 4.7		Napoli Drive	Residential	2	55	55	55	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-241	EW No. 4.7		Napoli Drive	Residential	1	55	55	55	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-242		NB No. 5.1	Cuesta Drive	School Playground	1	**67**	**67**	**67**	0	0	C(67)	A/E	64	3	0	64	3	0	63	4	0	63	4	0	62	5	1	61	6	1
R-243	EW No. 5.1	NB No. 5.1	Cuesta Drive	School Classroom	1	62 / 42[9]	62 / 42[9]	63 / 43[9]	1	1	D(52)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	62	1	0
R-244	EW No. 5.1	NB No. 5.1	Cuesta Drive	School Classroom	1	64 / 37[8]	64 / 37[8]	65 / 38[8]	1	1	D(52)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	65	0	0
R-245	EW No. 5.2*	NB No. 5.2	Cuesta Drive	School Sports Area	1	63	63	65	2	2	C(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	63	2	0
R-246	EW No. 5.2*	NB No. 5.2	Rancho Vista Drive	Residential	1	65	65	**66**	1	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	64	2	0	63	3	0	61	5	1
R-247	EW No. 5.2*	NB No. 5.2	Rancho Vista Drive	Residential	1	65	**66**	**67**	1	2	B(67)	A/E	--	--	--	--	--	--	--	--	--	64	3	0	63	4	0	62	5	1
R-248	EW No. 5.2*	NB No. 5.2	Rancho Vista Drive	Residential	1	64	64	**66**	2	2	B(67)	A/E	--	--	--	--	--	--	--	--	--	63	3	0	62	4	0	60	6	1
R-249	EW No. 5.2*	NB No. 5.2	Rancho Vista Drive	Residential	1	64	64	**66**	2	2	B(67)	A/E	--	--	--	--	--	--	--	--	--	63	3	0	62	4	0	60	6	1
R-250	EW No. 5.2*	NB No. 5.2	Rancho Vista Drive	Residential	1	64	64	65	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	63	2	0	61	4	0	61	4	0
R-251	EW No. 5.2*	NB No. 5.2	Rancho Vista Drive	Residential	1	64	64	65	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	63	2	0	61	4	0	60	5	1
R-252	EW No. 5.2	NB No. 5.2	Rancho Vista Drive	Residential	1	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	63	0	0	62	1	0	62	1	0
R-253	EW No. 5.2	NB No. 5.2	Rancho Vista Drive	Residential	1	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	62	1	0	62	1	0	61	2	0
R-254	EW No. 5.2	NB No. 5.2	Rancho Vista Drive	Residential	1	62	62	63	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	62	1	0	62	1	0	62	1	0
R-255	EW No. 5.2	NB No. 5.2	Sierra Vista Way	Residential	1	62	62	63	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	63	0	0	62	1	0	62	1	0

Table 2.13.6 Predicted Future Noise Level and Noise Barrier Analysis for the Build Alternative

Receptor No.	Existing Wall No. [1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA L_{eq}(h)	Future Worst-Hour Noise Levels, dBA L_{eq}(h): 2044 Noise Level: Without Project, dBA L_{eq}	2044 Noise Level: With Project, dBA L_{eq}	2044 Noise Level: With Project Minus No Project Conditions	2044 Noise Level: With Project Minus Existing Conditions	Activity Category (NAC)	Impact Type[4]	Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR): 6 feet L_{eq}(h)	6 feet I.L.	6 feet NBR	8 feet L_{eq}(h)	8 feet I.L.	8 feet NBR	10 feet L_{eq}(h)	10 feet I.L.	10 feet NBR	12 feet L_{eq}(h)	12 feet I.L.	12 feet NBR	14 feet L_{eq}(h)	14 feet I.L.	14 feet NBR	16 feet L_{eq}(h)	16 feet I.L.	16 feet NBR
R-256	EW No. 5.2		Sierra Vista Way	Residential	1	59	59	60	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-257	EW No. 5.2		Sierra Vista Way	Residential	1	59	60	60	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-258	EW No. 5.2		Sierra Vista Way	Residential	0	54	54	55	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-259	EW No. 5.2		Sierra Vista Way	Residential	1	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-260	EW No. 5.2		Sierra Vista Way	Residential	1	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-261	EW No. 5.2		Sierra Vista Way	Residential	1	60	60	61	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-262	EW No. 5.2*	NB No. 5.2	Judy Way	Residential	1	65	65	**66**	1	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	65	1	0	65	1	0	64	2	0
R-263	EW No. 5.2*	NB No. 5.2	Cedarwood Court	Residential	1	61	62	62	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	62	0	0	62	0	0	62	0	0
R-264	EW No. 5.2	NB No. 5.2	Cedarwood Court	Residential	1	60	60	61	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	60	1	0	60	1	0	60	1	0
R-265	EW No. 5.2	NB No. 5.2	Chapparal Ave	Residential	1	58	58	58	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	58	0	0	57	1	0	57	1	0
R-266	EW No. 5.2		Chapparal Ave	Residential	1	58	58	59	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-267	EW No. 5.2		Sierra Vista Way	Residential	1	58	59	59	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-268	EW No. 5.2*	NB No. 5.2	Judy Way	Residential	1	65	65	65	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	65	0	0	65	0	0	64	1	0
R-269	EW No. 5.2*	NB No. 5.2	Judy Way	Residential	1	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	62	0	0	62	0	0	61	1	0
R-270	EW No. 5.2	NB No. 5.2	Chapparal Ave	Residential	1	60	60	61	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	60	1	0	60	1	0	60	1	0
R-271	EW No. 5.2		Chapparal Ave	Residential	1	58	58	59	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-272	EW No. 5.2		Sierra Vista Way	Residential	1	57	58	58	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-273	EW No. 5.13		Norwalk Boulevard	Office/Classroom	0	66 / 41[3]	66 / 41[3]	66 / 41[3]	0	0	E/D(52)[6]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-274	EW No. 5.5	NB No. 5.3	Palm Street	Residential	1	65	65	65	0	0	B(67)	--	--	--	--	65	0	0	64	1	0	64	1	0	64	1	0	64	1	0
R-275	EW No. 5.5	NB No. 5.3	Palm Street	Residential	2	65	65	65	0	0	B(67)	--	--	--	--	65	0	0	64	1	0	64	1	0	64	1	0	64	1	0
R-276	EW No. 5.5	NB No. 5.3	Palm Street	Residential	3	**66**	**66**	**66**	0	0	B(67)	A/E	--	--	--	**66**	0	0	65	1	0	65	1	0	65	1	0	65	1	0
R-277	EW No. 5.5	NB No. 5.3	Palm Street	Residential	3	**67**	**67**	**67**	0	0	B(67)	A/E	--	--	--	**67**	0	0	**66**	1	0	**66**	1	0	**66**	1	0	**66**	1	0
R-278	EW No. 5.5	NB No. 5.3	Palm Street	Residential	3	64	64	64	0	0	B(67)	--	--	--	--	64	0	0	63	1	0	63	1	0	63	1	0	63	1	0
R-279	EW No. 5.5	NB No. 5.3	Palm Street	Residential	2	65	**66**	**66**	0	1	B(67)	A/E	--	--	--	65	1	0	64	2	0	64	2	0	64	2	0	64	2	0
R-280	EW No. 5.5	NB No. 5.3	Palm Street	Residential	2	65	65	65	0	0	B(67)	--	--	--	--	65	0	0	64	1	0	64	1	0	64	1	0	64	1	0
R-281	EW No. 5.5	NB No. 5.3	Autumn Breeze Street	Residential	2	65	65	65	0	0	B(67)	--	--	--	--	64	1	0	63	2	0	63	2	0	62	3	0	61	4	0
R-282	EW No. 5.5	NB No. 5.3	Autumn Breeze Street	Residential	3	**68**	**69**	**69**	0	1	B(67)	A/E	**68**	1	0	**67**	2	0	**67**	2	0	**66**	3	0	65	4	0	65	4	0
R-283	EW No. 5.5	NB No. 5.3	Autumn Breeze Street	Residential	3	**67**	**67**	**67**	0	0	B(67)	A/E	**67**	0	0	**66**	1	0	**66**	1	0	65	2	0	65	2	0	64	3	0
R-284	EW No. 5.5	NB No. 5.3	Autumn Breeze Street	Residential	3	**66**	**66**	**66**	0	0	B(67)	A/E	**66**	0	0	65	1	0	64	2	0	64	2	0	63	3	0	63	3	0
R-285	EW No. 5.5	NB No. 5.3	Evening Star Avenue	Residential	2	59	59	60	1	1	B(67)	--	60	0	0	59	1	0	59	1	0	58	2	0	58	2	0	57	3	0
R-286	EW No. 5.5	NB No. 5.3	Springsnow Circle	Residential	2	57	57	58	1	1	B(67)	--	58	0	0	57	1	0	57	1	0	57	1	0	57	1	0	57	1	0
R-287	EW No. 5.5		Springsnow Circle	Residential	1	56	56	56	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-288	EW No. 5.5		Summerwind Street	Residential	2	60	60	60	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-289	EW No. 5.5	NB No. 5.3	Palm Street	Residential	1	**67**	**67**	**67**	0	0	B(67)	A/E	--	--	--	**67**	0	0	**66**	1	0	65	2	0	65	2	0	64	3	0
R-290	EW No. 5.5	NB No. 5.3	Ely Avenue	Residential	2	63	63	63	0	0	B(67)	--	--	--	--	63	0	0	63	0	0	63	0	0	62	1	0	61	2	0
R-291	EW No. 5.5	NB No. 5.3	Ely Avenue	Residential	2	62	62	62	0	0	B(67)	--	--	--	--	62	0	0	62	0	0	62	0	0	61	1	0	61	1	0
R-292	EW No. 5.5	NB No. 5.3	Janell Avenue	Residential	2	60	60	60	0	0	B(67)	--	--	--	--	60	0	0	60	0	0	59	1	0	59	1	0	58	2	0
R-293	EW No. 5.5	NB No. 5.3	Morningrain Avenue	Residential	1	62	62	62	0	0	B(67)	--	--	--	--	62	0	0	61	1	0	60	2	0	60	2	0	59	3	0
R-294	EW No. 5.5	NB No. 5.3	Autumn Breeze Street	Residential	2	60	60	61	1	1	B(67)	--	60	1	0	60	1	0	59	2	0	60	1	0	59	2	0	59	2	0
R-295	EW No. 5.5	NB No. 5.3	Autumn Breeze Street	Residential	3	59	60	60	0	1	B(67)	--	60	0	0	59	1	0	60	0	0	59	1	0	59	1	0	59	1	0
R-296	EW No. 5.5	NB No. 5.3	Autumn Breeze Street	Residential	1	60	60	60	0	0	B(67)	--	60	0	0	60	0	0	60	0	0	60	0	0	60	0	0	59	1	0
R-297	EW No. 5.5	NB No. 5.3	Springsnow Circle	Residential	1	54	54	54	0	0	B(67)	--	54	0	0	53	1	0	53	1	0	53	1	0	53	1	0	53	1	0
R-298	EW No. 5.5	NB No. 5.3	Cortner Avenue	Residential	1	65	65	65	0	0	B(67)	--	--	--	--	65	0	0	65	0	0	64	1	0	63	2	0	63	2	0
R-299	EW No. 5.5	NB No. 5.3	Ely Avenue	Residential	2	62	62	62	0	0	B(67)	--	--	--	--	62	0	0	61	1	0	61	1	0	60	2	0	60	2	0
R-300	EW No. 5.5	NB No. 5.3	Ely Avenue	Residential	2	60	61	61	0	1	B(67)	--	--	--	--	61	0	0	60	1	0	60	1	0	59	2	0	59	2	0
R-301	EW No. 5.5	NB No. 5.3	Janell Avenue	Residential	2	58	58	58	0	0	B(67)	--	--	--	--	58	0	0	58	0	0	57	1	0	57	1	0	56	2	0
R-302	EW No. 5.5	NB No. 5.3	Stark Avenue	Residential	1	60	60	60	0	0	B(67)	--	--	--	--	60	0	0	59	1	0	59	1	0	58	2	0	58	2	0
R-303	EW No. 5.5	NB No. 5.3	Springsnow Circle	Residential	1	53	54	53	-1	0	B(67)	--	53	0	0	53	0	0	53	0	0	53	0	0	52	1	0	52	1	0
R-304			Beach Street	Residential	2	58	58	58	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-305			Beach Street	Residential	2	57	57	57	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-306			Palm Street	Residential	2	56	56	56	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 2.13.6 Predicted Future Noise Level and Noise Barrier Analysis for the Build Alternative

Receptor No.	Existing Wall No.[1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA $L_{eq}(h)$	Future Worst-Hour Noise Levels, dBA $L_{eq}(h)$																							
							2044 Noise Level				Activity Category (NAC)	Impact Type[4]	Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR)																	
							Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions			6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
													$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR
R-307			Palm Street	Residential	2	55	56	56	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-308	EW No. 6.2		Palm Street	Residential	1	59	59	60	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-309	EW No. 6.2		Palm Street	Residential	3	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-310	EW No. 6.2		Michael Avenue	Residential	1	59	59	60	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-311	EW No. 6.2		Michael Avenue	Residential	3	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-312	EW No. 6.2		Michael Avenue	Residential	3	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-313	EW No. 6.2		Michael Avenue	Residential	3	64	64	65	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-314	EW No. 6.2		Michael Avenue	Residential	2	64	64	64	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-315	EW No. 6.2		Maria Avenue	Residential	1	63	63	63	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-316	EW No. 6.2		Alfred Avenue	Residential	2	60	61	61	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-317	EW No. 6.2		De Groot Place	Residential	2	59	60	60	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-318	EW No. 6.2		De Groot Place	Residential	1	59	59	60	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-319	EW No. 6.2		Yvette Avenue	Residential	1	59	59	60	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-320	EW No. 6.2		Palm Street	Residential	1	60	60	60	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-321	EW No. 6.2		Michaels Avenue	Residential	1	55	56	56	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-322	EW No. 6.2		Brian Court	Residential	1	54	54	55	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-323	EW No. 6.2		Michael Avenue	Residential	2	57	57	57	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-324	EW No. 6.2		Michael Avenue	Residential	3	57	57	58	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-325	EW No. 6.2		Maria Avenue	Residential	1	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-326	EW No. 6.2		Alfred Avenue	Residential	2	59	59	60	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-327	EW No. 6.2		De Groot Place	Residential	2	59	59	60	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-328	EW No. 6.2		De Groot Place	Residential	2	58	58	59	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-329	EW No. 6.2		Palm Street	Residential	1	58	58	58	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-330	EW No. 6.2		Palm Street	Residential	2	56	56	56	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-331	EW No. 6.2		Brian Court	Residential	2	55	55	55	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-332	EW No. 6.2		Brian Court	Residential	1	57	57	58	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-333	EW No. 6.2		Maria Avenue	Residential	1	57	57	58	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-334	EW No. 6.2		Maria Avenue	Residential	1	59	59	59	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-335	EW No. 6.2		Alfred Avenue	Residential	2	58	58	59	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-336	EW No. 6.2		De Groot Place	Residential	2	58	59	59	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-337	EW No. 6.2		De Groot Place	Residential	1	57	57	58	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-338	EW No. 6.2		Yvette Avenue	Residential	1	57	58	58	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-339	EW No. 6.5		Glenda Street	Residential	1	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-340	EW No. 6.5		Glenda Street	Residential	1	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-341	EW No. 6.5		Glenda Street	Residential	1	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-342			Artesia Boulevard	Residential	2	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-343			Artesia Boulevard	Residential	2	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-344		NB No. 6.1	Artesia Boulevard	Residential	1	**74**	**74**	**74**	0	0	B(67)	A/E	**69**	5	1	**67**	7	1	64	10	1	62	12	1	61	13	1	60	14	1
R-345		NB No. 6.1	Artesia Boulevard	Residential	2	**75**	**75**	**75**	0	0	B(67)	A/E	**75**	0	0	**75**	0	0	**74**	1	0	**72**	3	0	**69**	6	2	65	10	2
R-346		NB No. 6.1	Artesia Boulevard	Residential	2	**66**	**66**	**66**	0	0	B(67)	A/E	63	3	0	61	5	2	58	8	2	57	9	2	56	10	2	55	11	2
R-347		NB No. 6.1	Artesia Boulevard	Residential	2	**69**	**69**	**70**	1	1	B(67)	A/E	**70**	0	0	**70**	0	0	**67**	3	0	**66**	4	0	63	7	2	60	10	2
R-348			Artesia Boulevard	Residential	4	63	63	63	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-349			Artesia Boulevard	Residential	4	64	64	64	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-350		NB No. 6.1	Artesia Boulevard	Residential	2	63	63	63	0	0	B(67)	--	61	2	0	60	3	0	59	4	0	56	7	2	55	8	2	54	9	2
R-351		NB No. 6.1	Artesia Boulevard	Residential	2	**68**	**69**	**69**	0	1	B(67)	A/E	**68**	1	0	**67**	2	0	**66**	3	0	63	6	2	62	7	2	59	10	2
R-352		NB No. 6.1	Artesia Boulevard	Residential	2	62	62	62	0	0	B(67)	--	60	2	0	59	3	0	57	5	2	55	7	2	54	8	2	54	8	2
R-353		NB No. 6.1	Artesia Boulevard	Residential	3	57	57	58	1	1	B(67)	--	58	0	0	55	3	0	54	4	0	53	5	3	52	6	3	50	8	3
R-354			Artesia Boulevard	Residential	1	**67**	**67**	**68**[10]	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-355			Artesia Boulevard	Residential	1	**68**	**68**	**68**[10]	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-356		NB No. 6.1	Artesia Boulevard	Residential	2	58	58	59	1	1	B(67)	--	57	2	0	57	2	0	56	3	0	53	6	2	53	6	2	52	7	2
R-357		NB No. 6.1	Artesia Boulevard	Residential	2	65	65	65	0	0	B(67)	--	64	1	0	62	3	0	61	4	0	59	6	2	58	7	2	56	9	2

Table 2.13.6 Predicted Future Noise Level and Noise Barrier Analysis for the Build Alternative

Receptor No.	Existing Wall No. [1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA L_{eq}(h)	2044 Noise Level: Without Project, dBA L_{eq}	2044 Noise Level: With Project, dBA L_{eq}	2044 Noise Level: With Project Minus No Project Conditions	2044 Noise Level: With Project Minus Existing Conditions	Activity Category (NAC)	Impact Type[4]	6 feet L_{eq}(h)	6 feet I.L.	6 feet NBR	8 feet L_{eq}(h)	8 feet I.L.	8 feet NBR	10 feet L_{eq}(h)	10 feet I.L.	10 feet NBR	12 feet L_{eq}(h)	12 feet I.L.	12 feet NBR	14 feet L_{eq}(h)	14 feet I.L.	14 feet NBR	16 feet L_{eq}(h)	16 feet I.L.	16 feet NBR
R-358		NB No. 6.1	Artesia Boulevard	Residential	2	49	49	49	0	0	B(67)	--	49	0	0	49	0	0	49	0	0	49	0	0	49	0	0	49	0	0
R-359		NB No. 6.1	Artesia Boulevard	Residential	2	51	51	51	0	0	B(67)	--	51	0	0	51	0	0	51	0	0	51	0	0	51	0	0	51	0	0
R-360			Towne Center Drive	Retail	0	68	69	69	0	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-361			Towne Center Drive	Retail	0	71	72	72	0	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-362			Towne Center Drive	Retail	1	60	61	61	0	1	E(72)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Future Worst-Hour Noise Levels, dBA L_{eq}(h); Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR)

Source: Compiled by LSA Associates, Inc. (2018).

1 An * represents an existing wall that would be demolished as part of the project. The existing wall would be reconstructed to match the existing height at a minimum.

2 A dash (–) indicates that no barrier was analyzed at this location because the modeled receptor would not approach or exceed the NAC.

3 The exterior-to-interior noise level reduction was assumed to be 25 dBA lower because the building type is light frame with storm windows or masonry with single glazed windows.

4 Shaded cells indicate the approximate existing wall heights.

5 Numbers in **bold** represent noise levels that approach or exceed the NAC.

6 Activity Categories without outdoor frequent human use areas were not evaluated against the Noise Abatement Criteria (NAC).

7 Underlined numbers have been attenuated by at least 5 dBA (i.e., feasible wall height).

8 The exterior-to-interior noise level reduction was based on simultaneous exterior and interior measurements.

9 The exterior-to-interior noise level reduction was assumed to be 20 dBA lower because the building type is light frame with ordinary windows.

10 No noise barriers were evaluated at this location because Table B-11 shows that this receptor approaches or exceeds the NAC due to traffic on Bloomfield Avenue and not from traffic on SR-91.

A/E = Approach or Exceed
dBA = A-weighted decibels
dBA L_{eq}(h) = equivalent continuous sound level measured per hour in A-weighted decibels
IL = Insertion Loss
NAC = Noise Abatement Criteria
NBR = Number of Benefited Receptors

Table 2.13.7 Predicted Future Noise Level and Alternate Noise Barrier Analysis for the Build Alternative

Receptor No.	Existing Wall No.[1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA L_{eq}(h)	Future Worst-Hour Noise Levels, dBA L_{eq}(h): 2044 Noise Level: Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions	Activity Category (NAC)	Impact Type	Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR): 6 feet L_{eq}(h)	6 feet I.L.	6 feet NBR	8 feet L_{eq}(h)	8 feet I.L.	8 feet NBR	10 feet L_{eq}(h)	10 feet I.L.	10 feet NBR	12 feet L_{eq}(h)	12 feet I.L.	12 feet NBR	14 feet L_{eq}(h)	14 feet I.L.	14 feet NBR	16 feet L_{eq}(h)	16 feet I.L.	16 feet NBR
R-44	EW No. 2.1	NB No. 2.2	Westwinds Circle	Residential	1	64	65	**66**[2]	1	2	B(67)	A/E	65	1	0	65	1	0	65	1	0	65	1	0	65	1	0	65	1	0
R-45	EW No. 2.1	NB No. 2.2	Leeward Avenue	Residential	2	63	64	65	1	2	B(67)	--	63	2	0	62	3	0	61	4	0	60	5[3]	2	60	5	2	60	5	2
R-46	EW No. 2.1	NB No. 2.2	Coral Reef Circle	Residential	2	62	62	64	2	2	B(67)	--	63	1	0	62	2	0	61	3	0	60	4	0	59	5	2	59	5	2
R-47	EW No. 2.1	NB No. 2.2	Outrigger Circle	Residential	2	65	65	**66**	1	1	B(67)	A/E	**66**	0	0	**66**	0	0	65	1	0	64	2	0	63	3	0	63	3	0
R-48	EW No. 2.1	NB No. 2.2	Windward Avenue	Residential	2	64	64	64	0	0	B(67)	--	64	0	0	64	0	0	64	0	0	64	0	0	62	2	0	62	2	0
R-49	EW No. 2.1*	NB No. 2.2	Eric Avenue	Residential	1	64	65	65	0	1	B(67)	--	--[4]	--	--	--	--	--	65	0	0	64	1	0	63	2	0	63	2	0
R-50	EW No. 2.1*	NB No. 2.2	Beach Street	Residential	4	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	62	0	0	62	0	0	61	1	0	61	1	0
R-51	EW No. 2.1*	NB No. 2.2	Beach Street	Residential	4	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	62	0	0	62	0	0	62	0	0	62	0	0
R-52	EW No. 2.1*	NB No. 2.2	Beach Street	Residential	4	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	62	0	0	62	0	0	62	0	0	62	0	0
R-53	EW No. 2.1*		Beach Street	Residential	6	60	60	60	0	0	B(67)	--	--[5]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-54	EW No. 2.1*		Beach Street	Residential	2	60	60	61	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-55	EW No. 2.1*		Harvest Avenue	Residential	1	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-56	EW No. 2.1	NB No. 2.2	Westwinds Circle	Residential	1	63	63	64	1	1	B(67)	--	63	1	0	63	1	0	63	1	0	63	1	0	63	1	0	63	1	0
R-57	EW No. 2.1*		Sunny Ridge Court	Residential	2	62	62	63	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-58	EW No. 2.1	NB No. 2.2	Leeward Avenue	Residential	1	63	64	65	1	2	B(67)	--	62	3	0	62	3	0	60	5	1	60	5	1	60	5	1	59	6	1
R-59	EW No. 2.1	NB No. 2.2	Coral Reef Circle	Residential	2	63	63	64	1	1	B(67)	--	62	2	0	61	3	0	60	4	0	59	5	2	58	6	2	58	6	2
R-60	EW No. 2.1	NB No. 2.2	Outrigger Circle	Residential	2	65	**66**	**66**	0	1	B(67)	A/E	65	1	0	65	1	0	64	2	0	63	3	0	62	4	0	62	4	0
R-61	EW No. 2.1	NB No. 2.2	Windward Avenue	Residential	1	63	64	64	0	1	B(67)	--	64	0	0	64	0	0	63	1	0	63	1	0	62	2	0	62	2	0
R-62	EW No. 2.1*	NB No. 2.2	Eric Avenue	Residential	2	63	64	64	0	1	B(67)	--	--	--	--	--	--	--	64	0	0	63	1	0	62	2	0	62	2	0
R-63	EW No. 2.1*		Harvest Avenue	Residential	1	59	60	60	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-64	EW No. 2.1*		Sunny Ridge Court	Residential	1	58	59	58	-1	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-65	EW No. 2.1	NB No. 2.2	Leeward Avenue	Residential	2	64	64	64	0	0	B(67)	--	62	2	0	61	3	0	61	3	0	60	4	0	60	4	0	60	4	0
R-66	EW No. 2.1	NB No. 2.2	Coral Reef Circle	Residential	2	63	63	63	0	0	B(67)	--	61	2	0	60	3	0	60	3	0	58	5	2	58	5	2	57	6	2
R-67	EW No. 2.1	NB No. 2.2	Outrigger Circle	Residential	2	**66**	**66**	**66**	0	0	B(67)	A/E	64	2	0	63	3	0	63	3	0	62	4	0	61	5	2	61	5	2
R-68	EW No. 2.1	NB No. 2.2	Windward Avenue	Residential	2	63	64	64	0	1	B(67)	--	63	1	0	63	1	0	62	2	0	62	2	0	61	3	0	61	3	0
R-69	EW No. 2.1*	NB No. 2.2	Eric Avenue	Residential	2	63	63	63	0	0	B(67)	--	--	--	--	--	--	--	63	0	0	62	1	0	62	1	0	62	1	0
R-70	EW No. 2.1*	NB No. 2.2	Eric Avenue	Residential	2	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	60	1	0	60	1	0	59	2	0	59	2	0
R-71	EW No. 2.1*	NB No. 2.2	Lucas Street	Residential	3	57	57	57	0	0	B(67)	--	--	--	--	--	--	--	57	0	0	57	0	0	56	1	0	56	1	0
R-72	EW No. 2.1*	NB No. 2.2	Lucas Street	Residential	3	56	57	57	0	1	B(67)	--	--	--	--	--	--	--	57	0	0	57	0	0	56	1	0	56	1	0
R-101	EW No. 3.1*	NB No. 3.3	169th Street	Residential	2	**67**	**67**	**68**	1	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	**68**	0	0	**66**	2	0	**66**	2	0
R-102	EW No. 3.1*	NB No. 3.3	169th Street	Residential	3	**66**	**67**	**68**	1	2	B(67)	A/E	--	--	--	--	--	--	--	--	--	**68**	0	0	**67**	1	0	**66**	2	0
R-103	EW No. 3.1	NB No. 3.3	169th Street	Residential	3	**67**	**67**	**68**	1	1	B(67)	A/E	**68**	0	0	**68**	0	0	**68**	0	0	**67**	1	0	**66**	2	0	**66**	2	0
R-104	EW No. 3.1	NB No. 3.3	169th Street	Residential	3	65	65	**67**	2	2	B(67)	A/E	**67**	0	0	**66**	1	0	65	2	0	63	4	0	61	6	3	61	6	3
R-105	EW No. 3.1	NB No. 3.3	169th Street	Residential	3	63	63	64	1	1	B(67)	--	63	1	0	62	2	0	61	3	0	59	5	3	58	6	3	58	6	3
R-106	EW No. 3.1	NB No. 3.3	169th Street	Residential	3	63	63	65	2	2	B(67)	--	62	3	0	61	4	0	60	5	3	59	6	3	59	6	3	58	7	3
R-107	EW No. 3.1	NB No. 3.3	169th Street	Residential	2	64	64	**66**	2	2	B(67)	A/E	64	2	0	63	3	0	62	4	0	62	4	0	62	4	0	62	4	0
R-108	EW No. 3.1	NB No. 3.3	169th Street	Residential	1	60	61	61	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	60	1	0	60	1	0	60	1	0
R-109	EW No. 3.1	NB No. 3.3	169th Street	Residential	2	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	61	1	0	61	1	0	61	1	0
R-110	EW No. 3.1	NB No. 3.3	169th Street	Residential	2	62	62	63	1	1	B(67)	--	63	0	0	62	1	0	62	1	0	61	2	0	61	2	0	61	2	0
R-111	EW No. 3.1	NB No. 3.3	169th Street	Residential	2	63	63	63	0	0	B(67)	--	63	0	0	63	0	0	62	1	0	61	2	0	61	2	0	61	2	0
R-112	EW No. 3.1	NB No. 3.3	169th Street	Residential	1	62	63	63	0	1	B(67)	--	63	0	0	63	0	0	62	1	0	61	2	0	61	2	0	60	3	0
R-113	EW No. 3.1	NB No. 3.3	169th Street	Residential	2	65	65	65	0	0	B(67)	--	64	1	0	64	1	0	63	2	0	62	3	0	62	3	0	62	3	0
R-114	EW No. 3.1	NB No. 3.3	169th Street	Residential	2	62	62	63	1	1	B(67)	--	62	1	0	62	1	0	62	1	0	61	2	0	61	2	0	61	2	0
R-115	EW No. 3.1	NB No. 3.3	169th Street	Residential	1	61	61	62	1	1	B(67)	--	61	1	0	61	1	0	60	2	0	59	3	0	59	3	0	59	3	0

Source: Compiled by LSA Associates, Inc. (2018).

1 An * represents an existing wall that would be demolished as part of the project. The existing wall would be reconstructed to match the existing height at a minimum.

2 Numbers in **bold** represent noise levels that approach or exceed the NAC.

3 Underlined numbers have been attenuated by at least 5 dBA (i.e., feasible wall height).

4 Shaded cells indicate the approximate existing wall heights.

5 A dash (–) indicates that no barrier was analyzed at this location because the modeled receptor would not approach or exceed the NAC.

A/E = Approach or Exceed
dBA L_{eq}(h) = equivalent continuous sound level measured per hour in A-weighted decibels
NAC = Noise Abatement Criteria
dBA = A-weighted decibels
IL = Insertion Loss
NBR = Number of Benefited Receptors

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Table 2.13.8 Predicted Future Noise Level and Reduced Noise Barrier Analysis for the Build Alternative

Receptor No.	Existing Wall No. [1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA L_{eq}(h)	Future Worst-Hour Noise Levels, dBA L_{eq}(h)																							
							2044 Noise Level				Activity Category (NAC)	Impact Type	Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR)																	
													6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
							Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions			L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR
R-44	EW No. 2.1	NB No. 2.1a	Westwinds Circle	Residential	1	64	65	**66**[2]	1	2	B(67)	A/E	--[3]	--	--	--	--	--	63	3	0	62	4	0	60	6[4]	1	59	7	1
R-45	EW No. 2.1	NB No. 2.1a	Leeward Avenue	Residential	2	63	64	65	1	2	B(67)	--	--	--	--	--	--	--	64	1	0	62	3	0	61	4	0	60	5	2
R-46	EW No. 2.1	NB No. 2.1a	Coral Reef Circle	Residential	2	62	62	64	2	2	B(67)	--	--	--	--	--	--	--	--	--	--	63	1	0	62	2	0	62	2	0
R-47	EW No. 2.1	NB No. 2.1a	Outrigger Circle	Residential	2	65	65	**66**	1	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	65	1	0	65	1	0	65	1	0
R-48	EW No. 2.1	NB No. 2.1a	Windward Avenue	Residential	2	64	64	64	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	64	0	0	64	0	0	64	0	0
R-56	EW No. 2.1	NB No. 2.1a	Westwinds Circle	Residential	1	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	63	1	0	62	2	0	61	3	0	61	3	0
R-58	EW No. 2.1	NB No. 2.2a	Leeward Avenue	Residential	1	63	64	65	1	2	B(67)	--	--	--	--	--	--	--	64	1	0	63	2	0	61	4	0	60	5	1
R-59	EW No. 2.1	NB No. 2.2a	Coral Reef Circle	Residential	2	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	63	1	0	62	2	0	62	2	0
R-60	EW No. 2.1	NB No. 2.2a	Outrigger Circle	Residential	2	65	**66**	**66**	0	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	**66**	0	0	65	1	0	64	2	0
R-61	EW No. 2.1	NB No. 2.2a	Windward Avenue	Residential	1	63	64	64	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	64	0	0	64	0	0	64	0	0
R-65	EW No. 2.1	NB No. 2.1a	Leeward Avenue	Residential	2	64	64	64	0	0	B(67)	--	--	--	--	--	--	--	63	1	0	62	2	0	62	2	0	61	3	0
R-66	EW No. 2.1	NB No. 2.1a	Coral Reef Circle	Residential	2	63	63	63	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	63	0	0	61	2	0	61	2	0
R-67	EW No. 2.1	NB No. 2.1a	Outrigger Circle	Residential	2	**66**	**66**	**66**	0	0	B(67)	A/E	--	--	--	--	--	--	--	--	--	**66**	0	0	65	1	0	63	3	0
R-68	EW No. 2.1	NB No. 2.1a	Windward Avenue	Residential	2	63	64	64	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	64	0	0	63	1	0	63	1	0
R-44	EW No. 2.1	NB No. 2.2a	Westwinds Circle	Residential	1	64	65	**66**	1	2	B(67)	A/E	65	1	0	65	1	0	64	2	0	64	2	0	64	2	0	63	3	0
R-45	EW No. 2.1	NB No. 2.2a	Leeward Avenue	Residential	2	63	64	65	1	2	B(67)	--	63	2	0	63	2	0	61	4	0	60	5	2	60	5	2	59	6	2
R-46	EW No. 2.1	NB No. 2.2a	Coral Reef Circle	Residential	2	62	62	64	2	2	B(67)	--	63	1	0	62	2	0	61	3	0	60	4	0	60	4	0	59	5	2
R-47	EW No. 2.1	NB No. 2.2a	Outrigger Circle	Residential	2	65	65	**66**	1	1	B(67)	A/E	**66**	0	0	**66**	0	0	65	1	0	64	2	0	64	2	0	63	3	0
R-48	EW No. 2.1	NB No. 2.2a	Windward Avenue	Residential	2	64	64	64	0	0	B(67)	--	64	0	0	64	0	0	64	0	0	64	0	0	64	0	0	64	0	0
R-56	EW No. 2.1	NB No. 2.2a	Westwinds Circle	Residential	1	63	63	64	1	1	B(67)	--	63	1	0	63	1	0	63	1	0	62	2	0	62	2	0	62	2	0
R-58	EW No. 2.1	NB No. 2.2a	Leeward Avenue	Residential	1	63	64	65	1	2	B(67)	--	62	3	0	62	3	0	60	5	1	60	5	1	60	5	1	59	6	1
R-59	EW No. 2.1	NB No. 2.2a	Coral Reef Circle	Residential	2	63	63	64	1	1	B(67)	--	62	2	0	61	3	0	61	3	0	59	5	2	58	6	2	58	6	2
R-60	EW No. 2.1	NB No. 2.2a	Outrigger Circle	Residential	2	65	**66**	**66**	0	1	B(67)	A/E	65	1	0	65	1	0	64	2	0	63	3	0	62	4	0	62	4	0
R-61	EW No. 2.1	NB No. 2.2a	Windward Avenue	Residential	1	63	64	64	0	1	B(67)	--	64	0	0	64	0	0	64	0	0	63	1	0	63	1	0	63	1	0
R-65	EW No. 2.1	NB No. 2.2a	Leeward Avenue	Residential	2	64	64	64	0	0	B(67)	--	62	2	0	61	3	0	61	3	0	60	4	0	60	4	0	59	5	2
R-66	EW No. 2.1	NB No. 2.2a	Coral Reef Circle	Residential	2	63	63	63	0	0	B(67)	--	61	2	0	60	3	0	60	3	0	58	5	2	58	5	2	57	6	2
R-67	EW No. 2.1	NB No. 2.2a	Outrigger Circle	Residential	2	**66**	**66**	**66**	0	0	B(67)	A/E	64	2	0	63	3	0	63	3	0	62	4	0	61	5	2	61	5	2
R-68	EW No. 2.1	NB No. 2.2a	Windward Avenue	Residential	2	63	64	64	0	1	B(67)	--	63	1	0	63	1	0	63	1	0	62	2	0	62	2	0	62	2	0

Source: Compiled by LSA Associates, Inc. (2018).
[1] An * represents an existing wall that would be demolished as part of the project. The existing wall would be reconstructed to match the existing height at a minimum.
[2] Numbers in **bold** represent noise levels that approach or exceed the NAC.
[3] Shaded cells indicate the approximate existing wall heights.
[4] Underlined numbers have been attenuated by at least 5 dBA (i.e., feasible wall height).
A/E = Approach or Exceed
dBA = A-weighted decibels
dBA L_{eq}(h) = equivalent continuous sound level measured per hour in A-weighted decibels
IL = Insertion Loss
NAC = Noise Abatement Criteria
NBR = Number of Benefited Receptors

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Table 2.13.9 Predicted Future Noise Level and Noise Barrier Analysis for the Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width)

Receptor No.	Existing Wall No. [1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA L_{eq}(h)	Future Worst-Hour Noise Levels, dBA L_{eq}(h)																							
							2044 Noise Level				Activity Category (NAC)	Impact Type	Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR)																	
													6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
							Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions			L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR
R-18	EW No. 1.1		166th Street	Residential	1	61	61	61	0	0	B(67)	--[2]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-22	EW No. 1.1		166th Street	Residential	1	60	61	61	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-26	EW No. 1.1		Estella Avenue	Residential	2	60	60	60	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
R-27	EW No. 1.1		Estella Avenue	Residential	2	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-28	EW No. 1.1		Estella Avenue	Residential	3	58	58	59	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-29	EW No. 1.1		Estella Avenue	Residential	1	58	58	58	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-30			Studebaker Road	Park	0	65	65	66	1	1	C[3]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-31	EW No. 1.1		Roberta Street	Residential	1	58	58	58	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-32	EW No. 1.1		Roberta Street	Residential	1	57	58	58	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-33	EW No. 1.1		Studebaker Road	Park	1	57	57	57	0	0	C(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-43			Piuma Avenue	Utility	0	70	71	71	0	1	F	--		--	--	--	--	--	--	--	--	--	--	--	--		--	--	--	--
R-44	EW No. 2.1	NB No. 2.1	Westwinds Circle	Residential	1	64	65	**66**[4]	1	2	B(67)	A/E	--[5]	--	--	--	--	--	63	3	0	62	4	0	60	6[6]	1	59	7	1
R-45	EW No. 2.1	NB No. 2.1	Leeward Avenue	Residential	2	63	64	65	1	2	B(67)	--	--	--	--	--	--	--	64	1	0	62	3	0	61	4	0	60	5	2
R-46	EW No. 2.1	NB No. 2.1	Coral Reef Circle	Residential	2	62	62	63	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	62	1	0	62	1	0
R-47	EW No. 2.1	NB No. 2.1	Outrigger Circle	Residential	2	65	65	**66**	1	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	65	1	0	65	1	0
R-48	EW No. 2.1	NB No. 2.1	Windward Avenue	Residential	2	64	64	64	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	1	0	63	1	0
R-49	EW No. 2.1*	NB No. 2.1	Eric Avenue	Residential	1	64	65	65	0	1	B(67)	--	--	--	--	--	--	--	65	0	0	64	1	0	64	1	0	63	2	0
R-50	EW No. 2.1*	NB No. 2.1	Beach Street	Residential	4	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	62	0	0	62	0	0	62	0	0	61	1	0
R-51	EW No. 2.1*	NB No. 2.1	Beach Street	Residential	4	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	62	0	0	62	0	0	62	0	0	62	0	0
R-52	EW No. 2.1*		Beach Street	Residential	4	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-53	EW No. 2.1*		Beach Street	Residential	6	60	60	60	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-54	EW No. 2.1*		Beach Street	Residential	2	60	60	61	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-55	EW No. 2.1		Harvest Avenue	Residential	1	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-56	EW No. 2.1	NB No. 2.1	Westwinds Circle	Residential	1	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	63	1	0	62	2	0	61	3	0	61	3	0
R-57	EW No. 2.1		Sunny Ridge Court	Residential	2	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-58	EW No. 2.1	NB No. 2.1	Leeward Avenue	Residential	1	63	64	65	1	2	B(67)	--	--	--	--	--	--	--	63	2	0	63	2	0	61	4	0	60	5	1
R-59	EW No. 2.1	NB No. 2.1	Coral Reef Circle	Residential	2	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	63	1	0	62	2	0	62	2	0
R-60	EW No. 2.1	NB No. 2.1	Outrigger Circle	Residential	2	65	**66**	**66**	0	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	**66**	0	0	65	1	0	64	2	0
R-61	EW No. 2.1	NB No. 2.1	Windward Avenue	Residential	1	63	64	64	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	63	1	0	63	1	0	62	2	0
R-62	EW No. 2.1*	NB No. 2.1	Eric Avenue	Residential	2	63	64	64	0	1	B(67)	--	--	--	--	--	--	--	64	0	0	64	0	0	63	1	0	63	1	0
R-63	EW No. 2.1		Harvest Avenue	Residential	1	59	60	60	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-64	EW No. 2.1		Sunny Ridge Court	Residential	1	58	59	58	-1	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-65	EW No. 2.1	NB No. 2.1	Leeward Avenue	Residential	2	64	64	64	0	0	B(67)	--	--	--	--	--	--	--	63	1	0	62	2	0	62	2	0	61	3	0
R-66	EW No. 2.1	NB No. 2.1	Coral Reef Circle	Residential	2	63	63	63	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	63	0	0	61	2	0	61	2	0
R-67	EW No. 2.1	NB No. 2.1	Outrigger Circle	Residential	2	**66**	**66**	**66**	0	0	B(67)	A/E	--	--	--	--	--	--	--	--	--	**66**	0	0	64	2	0	63	3	0
R-68	EW No. 2.1	NB No. 2.1	Windward Avenue	Residential	2	63	64	64	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	64	0	0	63	1	0	62	2	0
R-69	EW No. 2.1*	NB No. 2.1	Eric Avenue	Residential	2	63	63	63	0	0	B(67)	--	--	--	--	--	--	--	63	0	0	63	0	0	62	1	0	62	1	0
R-70	EW No. 2.1*	NB No. 2.1	Eric Avenue	Residential	2	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	61	0	0	61	0	0	60	1	0	60	1	0
R-71	EW No. 2.1*	NB No. 2.1	Lucas Street	Residential	3	57	57	57	0	0	B(67)	--	--	--	--	--	--	--	57	0	0	57	0	0	57	0	0	57	0	0
R-72	EW No. 2.1*		Lucas Street	Residential	3	56	57	57	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-73	EW No. 2.1*		Lucas Street	Residential	3	55	55	55	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-74	EW No. 2.1*		Lucas Street	Residential	2	56	56	56	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-75	EW No. 2.1		Harvest Avenue	Residential	1	58	58	58	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-76	EW No. 2.1		Sunny Ridge Court	Residential	1	57	57	57	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-77	EW No. 2.2	NB No. 2.3	Artesia Boulevard	Playground	1	**67**	**67**	**67**	0	0	C(67)	A/E	--	--	--	**66**	1	0	65	2	0	65	2	0	64	3	0	64	3	0
R-78	EW No. 2.2	NB No. 2.3	Artesia Boulevard	Playground	1	64	64	64	0	0	C(67)	--	64	0	0	64	0	0	64	0	0	64	0	0	64	0	0	64	0	0
R-79	EW No. 2.3	NB No. 2.3	Artesia Boulevard	Playground	2	57	57	57	0	0	C(67)	--	57	0	0	57	0	0	57	0	0	57	0	0	57	0	0	57	0	0
R-80	EW No. 2.3		Artesia Boulevard	Playground	2	62	62	62	0	0	C(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-81	EW No. 2.3		Artesia Boulevard	School Classroom	1	61 / 40[7]	61 / 40[7]	61 / 40[7]	0	0	D(52)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-82	EW No. 2.4		Palm Street	Residential	2	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-83	EW No. 2.4		Palm Street	Residential	1	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-84	EW No. 2.4		Palm Street	Residential	2	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 2.13.9 Predicted Future Noise Level and Noise Barrier Analysis for the Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width)

Receptor No.	Existing Wall No. [1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA $L_{eq}(h)$	Future Worst-Hour Noise Levels, dBA $L_{eq}(h)$: 2044 Noise Level: Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions	Activity Category (NAC)	Impact Type	Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR): 6 feet $L_{eq}(h)$	6 feet I.L.	6 feet NBR	8 feet $L_{eq}(h)$	8 feet I.L.	8 feet NBR	10 feet $L_{eq}(h)$	10 feet I.L.	10 feet NBR	12 feet $L_{eq}(h)$	12 feet I.L.	12 feet NBR	14 feet $L_{eq}(h)$	14 feet I.L.	14 feet NBR	16 feet $L_{eq}(h)$	16 feet I.L.	16 feet NBR
R-85	EW No. 2.4		Maples Avenue	Residential	1	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-86	EW No. 2.4		Maples Avenue	Residential	1	60	60	60	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-87	EW No. 2.4		Harvest Avenue	Residential	2	58	59	59	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-88	EW No. 2.4		Harvest Avenue	Residential	1	58	58	58	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-89	EW No. 2.4		Maples Avenue	Residential	2	58	58	58	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-90	EW No. 2.4		Harvest Avenue	Residential	1	57	57	57	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-91	EW No. 2.4		Gridley Road	Park	1	58	58	58	0	0	C(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-92			Beach Street	Light Industrial	0	74	74	75	1	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-93			Beach Street	Light Industrial	0	74	74	75	1	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-94	EW No. 3.1		Beach Street	Light Industrial	0	70	70	71	1	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-95	EW No. 3.1		Hyde Park Court	Park	1	63	63	64	1	1	C(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-96	EW No. 3.1		Hyde Park Court	Residential	2	50	51	51	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-97	EW No. 3.1		Hyde Park Court	Residential	2	49	49	49	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-98	EW No. 3.1		Hyde Park Court	Residential	2	49	50	50	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-99	EW No. 3.1		Hyde Park Court	Residential	2	50	50	50	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-100	EW No. 3.1		Belvedere Court	Residential	2	55	55	55	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-101	EW No. 3.1	NB No. 3.1	169th Street	Residential	2	**67**	**67**	**67**	0	0	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**67**	0	0	65	2	0
R-102	EW No. 3.1	NB No. 3.1	169th Street	Residential	3	**66**	**67**	**67**	0	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**67**	0	0	**66**	1	0
R-103	EW No. 3.1	NB No. 3.1	169th Street	Residential	3	**67**	**67**	**68**	1	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**67**	1	0	**66**	2	0
R-104	EW No. 3.1	NB No. 3.1	169th Street	Residential	3	65	65	**66**	1	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	0	0	65	1	0
R-105	EW No. 3.1	NB No. 3.1	169th Street	Residential	3	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	64	0	0	64	0	0
R-106	EW No. 3.1		169th Street	Residential	3	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-107	EW No. 3.1		169th Street	Residential	2	64	64	65	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-108	EW No. 3.1	NB No. 3.1	169th Street	Residential	1	60	61	61	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	61	0	0	60	1	0
R-109	EW No. 3.1	NB No. 3.1	169th Street	Residential	2	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	62	0	0	61	1	0
R-110	EW No. 3.1	NB No. 3.1	169th Street	Residential	2	62	62	63	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	62	1	0	62	1	0
R-111	EW No. 3.1	NB No. 3.1	169th Street	Residential	2	63	63	63	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	0	0	63	0	0
R-112	EW No. 3.1	NB No. 3.1	169th Street	Residential	1	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	0	0	63	0	0
R-113	EW No. 3.1		169th Street	Residential	2	65	65	65	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-114	EW No. 3.1		169th Street	Residential	2	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-115	EW No. 3.1		169th Street	Residential	1	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-116	EW No. 3.1		Pioneer Boulevard	Hotel	1	64	65	65	0	1	E(72)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-117			Pioneer Boulevard	Restaurant	0	67	67	67	0	0	E[3]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-119	EW No. 3.1		168th Street	Residential	1	56	57	57	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-120			Pioneer Boulevard	Gas Station	0	62	62	62	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-121			168th Street	Residential	1	57	57	57	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-122			Pioneer Boulevard	Light Industrial	0	59	59	59	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-123	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	2	**66**	**66**	**66**	0	0	B(67)	A/E	**66**	0	0	65	1	0	65	1	0	64	2	0	63	3	0	62	4	0
R-124	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	2	**66**	**66**	**66**	0	0	B(67)	A/E	**66**	0	0	65	1	0	64	2	0	63	3	0	63	3	0	62	4	0
R-125	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	3	65	65	65	0	0	B(67)	--	65	0	0	64	1	0	64	1	0	63	2	0	62	3	0	62	3	0
R-126	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	3	**67**	**67**	**67**	0	0	B(67)	A/E	**67**	0	0	65	2	0	64	3	0	63	4	0	63	4	0	62	5	3
R-127	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	3	**67**	**67**	**67**	0	0	B(67)	A/E	**67**	0	0	65	2	0	65	2	0	64	3	0	63	4	0	63	4	0
R-128	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	2	65	**66**	**66**	0	1	B(67)	A/E	64	2	0	64	2	0	64	2	0	63	3	0	63	3	0	63	3	0
R-129	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	1	64	64	64	0	0	B(67)	--	64	0	0	63	1	0	63	1	0	62	2	0	62	2	0	62	2	0
R-130	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	1	65	65	65	0	0	B(67)	--	64	1	0	64	1	0	63	2	0	63	2	0	63	2	0	63	2	0
R-131	EW No. 3.3	NB No. 3.2	Baber Avenue	Residential	1	60	60	60	0	0	B(67)	--	60	0	0	59	1	0	59	1	0	59	1	0	59	1	0	59	1	0
R-132	EW No. 3.3	NB No. 3.2	Hart Street	Residential	2	59	60	60	0	1	B(67)	--	60	0	0	59	1	0	59	1	0	59	1	0	59	1	0	59	1	0
R-133	EW No. 3.3	NB No. 3.2	Hart Street	Residential	3	61	61	61	0	0	B(67)	--	61	0	0	60	1	0	59	2	0	59	2	0	59	2	0	58	3	0
R-134	EW No. 3.3	NB No. 3.2	Hart Street	Residential	2	59	59	59	0	0	B(67)	--	59	0	0	59	0	0	59	0	0	59	0	0	59	0	0	58	1	0
R-135	EW No. 3.3	NB No. 3.2	Hart Street	Residential	2	61	61	62	1	1	B(67)	--	62	0	0	60	2	0	60	2	0	59	3	0	59	3	0	59	3	0
R-136	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	1	63	63	63	0	0	B(67)	--	63	0	0	62	1	0	62	1	0	62	1	0	62	1	0	61	2	0
R-137	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	1	61	61	61	0	0	B(67)	--	61	0	0	60	1	0	60	1	0	60	1	0	60	1	0	60	1	0

Table 2.13.9 Predicted Future Noise Level and Noise Barrier Analysis for the Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width)

Receptor No.	Existing Wall No. [1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA $L_{eq}(h)$	Future Worst-Hour Noise Levels, dBA $L_{eq}(h)$: 2044 Noise Level: Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions	Activity Category (NAC)	Impact Type	Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR): 6 feet $L_{eq}(h)$	6 feet I.L.	6 feet NBR	8 feet $L_{eq}(h)$	8 feet I.L.	8 feet NBR	10 feet $L_{eq}(h)$	10 feet I.L.	10 feet NBR	12 feet $L_{eq}(h)$	12 feet I.L.	12 feet NBR	14 feet $L_{eq}(h)$	14 feet I.L.	14 feet NBR	16 feet $L_{eq}(h)$	16 feet I.L.	16 feet NBR
R-138			Roseton Avenue	Office	0	73	74	74	0	1	E[3]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-139			Jersey Avenue	Light Industrial	0	73	74	74	0	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-140			Alburtis Avenue	Light Industrial	0	71	71	71	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-141			Alburtis Avenue	Office	0	65	66	66	0	1	E[3]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-142	EW No. 4.1		167th Street	Vacant Land	0	56	57	57	0	1	G	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-143	EW No. 4.1		167th Street	Residential	3	57	57	57	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-144	EW No. 4.1		167th Street	Residential	2	56	57	57	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-145	EW No. 4.1		Pioneer Boulevard	Light Industrial	0	61	61	61	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-146	EW No. 4.1		168th Street	Residential	2	56	56	56	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-147	EW No. 4.1		168th Street	Residential	2	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-148	EW No. 4.1		168th Street	Residential	3	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-149	EW No. 4.1		168th Street	Residential	2	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-150	EW No. 4.1		168th Street	Residential	3	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-151	EW No. 4.1		168th Street	Residential	3	56	56	56	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-152	EW No. 4.1		168th Street	Residential	2	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-153	EW No. 4.1	NB No. 4.1	169th Street	Residential	2	60	61	61	0	1	B(67)	--	60	1	0	60	1	0	60	1	0	60	1	0	59	2	0	59	2	0
R-154	EW No. 4.1	NB No. 4.1	169th Street	Residential	2	61	62	62	0	1	B(67)	--	61	1	0	61	1	0	61	1	0	61	1	0	60	2	0	59	3	0
R-155	EW No. 4.2	NB No. 4.1	169th Street	Playground	1	65	65	**66**	1	1	C(67)	A/E	--	--	--	--	--	--	--	--	--	65	1	0	64	2	0	64	2	0
R-156	EW No. 4.2	NB No. 4.1	169th Street	Community Center	1	66 / 46[8]	67 / 47[8]	67 / 47[8]	0	1	D(52)	--	--	--	--	--	--	--	--	--	--	67	0	0	67	0	0	66	1	0
R-157	EW No. 4.2		169th Street	Playground	1	64	65	64	-1	0	C(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-158	EW No. 4.2		170th Street	Residential	2	65	65	65	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-159	EW No. 4.2		170th Street	Residential	2	60	60	61	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-160	EW No. 4.2		170th Street	Residential	2	59	59	59	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-161	EW No. 4.2		170th Street	Residential	2	58	58	58	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-162	EW No. 4.2		170th Street	Residential	2	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-163	EW No. 4.2		170th Street	Residential	1	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-164	EW No. 4.2		170th Street	Residential	1	63	64	64	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-165	EW No. 4.2		170th Street	Residential	1	64	65	65	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-166	EW No. 4.2		170th Street	Residential	2	64	65	65	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-167	EW No. 4.2		170th Street	Residential	2	64	64	65	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-168	EW No. 4.2		170th Street	Light Industrial	0	61	61	61	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-169	EW No. 4.3		169th Street	Residential	2	61	62	62	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-170	EW No. 4.3		169th Street	Residential	1	61	61	62	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-171	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	63	63	63	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	63	0	0	63	0	0	62	1	0
R-172	EW No. 4.2		169th Street	Residential	1	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-173	EW No. 4.2		169th Street	Day Care Center	1	63 / 43[8]	64 / 44[8]	64 / 44[8]	0	1	D(52)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-174	EW No. 4.2		169th Street	Residential	2	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-175	EW No. 4.2		169th Street	Residential	3	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-176	EW No. 4.2		169th Street	Residential	3	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-177	EW No. 4.2		169th Street	Residential	3	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-178	EW No. 4.2		169th Street	Residential	3	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-179	EW No. 4.2		169th Street	Residential	3	63	63	63	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-180	EW No. 4.2		169th Street	Residential	2	64	64	65	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-181	EW No. 4.2		169th Street	Residential	2	64	65	65	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-182	EW No. 4.2		169th Street	Residential	2	64	65	65	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-183	EW No. 4.2		169th Street	Residential	2	65	65	65	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-184	EW No. 4.2		169th Street	Residential	3	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-185	EW No. 4.3		169th Street	Residential	3	60	60	60	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-186	EW No. 4.3		169th Street	Residential	3	60	60	61	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-187			168th Street	Vacant Land	0	65	65	66	1	1	G	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-188	EW No. 4.1		168th Street	Residential	2	59	59	60	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-189	EW No. 4.1		168th Street	Residential	3	55	56	56	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 2.13.9 Predicted Future Noise Level and Noise Barrier Analysis for the Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width)

Receptor No.	Existing Wall No. [1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA L_{eq}(h)	Future Worst-Hour Noise Levels, dBA L_{eq}(h)																							
							2044 Noise Level				Activity Category (NAC)	Impact Type	Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR)																	
													6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
							Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions			L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR
R-190	EW No. 4.1		169th Street	Residential	1	55	56	56	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-191	EW No. 4.1		169th Street	Residential	2	56	57	57	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-192	EW No. 4.1	NB No. 4.1	169th Street	Residential	3	57	58	58	0	1	B(67)	--	58	0	0	58	0	0	58	0	0	58	0	0	58	0	0	58	0	0
R-193	EW No. 4.1	NB No. 4.1	169th Street	Residential	3	58	58	58	0	0	B(67)	--	58	0	0	58	0	0	58	0	0	58	0	0	58	0	0	58	0	0
R-194	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	58	58	59	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	58	1	0	58	1	0	57	2	0
R-195	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	61	1	0	61	1	0	61	1	0
R-196	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	61	61	62	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	61	1	0	60	2	0	60	2	0
R-197	EW No. 4.2		169th Street	Residential	3	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-198	EW No. 4.2		169th Street	Residential	3	60	60	61	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-199	EW No. 4.2		169th Street	Residential	3	59	59	59	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-200	EW No. 4.2		169th Street	Residential	3	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-201	EW No. 4.2		169th Street	Residential	3	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-202	EW No. 4.2		169th Street	Residential	3	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-203	EW No. 4.2		169th Street	Residential	2	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-204	EW No. 4.2		169th Street	Residential	2	63	63	63	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-205	EW No. 4.2		169th Street	Residential	3	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-206	EW No. 4.2		169th Street	Residential	3	63	64	64	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-207	EW No. 4.3		169th Street	Residential	3	60	60	60	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-208	EW No. 4.3		169th Street	Residential	3	60	61	61	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-209	EW No. 4.3		169th Street	Residential	2	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-210	EW No.4.1		168th Street	Residential	2	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-211	EW No. 4.2		168th Street	Residential	2	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-212	EW No. 4.2		168th Street	Residential	3	63	63	63	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-213	EW No. 4.2		168th Street	Residential	3	64	64	64	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-214	EW No. 4.3		Park Street	Light Industrial	0	66	66	66	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-215			Norwalk Boulevard	Gas Station	0	69	69	69	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-216			Norwalk Boulevard	Light Industrial	0	63	63	63	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-217			Pioneer Boulevard	Restaurant	0	71	71	71	0	0	E[3]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-218			Pioneer Boulevard	Office/Classroom	0	70 / 45[9]	71 / 46[9]	71 / 46[9]	0	1	E/D(52)[3]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-219	EW No.4.1		Aclare Street	School Playground	1	63	63	63	0	0	C(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-220	EW No.4.1		Aclare Street	School Classroom	1	62 / 47[7]	62 / 47[7]	62 / 47[7]	0	0	D(52)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-221	EW No. 4.6	NB No. 4.2	Palm Street	Residential	2	**67**	**67**	**67**	0	0	B(67)	A/E	--	--	--	--	--	--	--	--	--	**67**	0	0	**66**	1	0	**66**	1	0
R-222	EW No. 4.6	NB No. 4.2	Palm Street	Residential	3	**66**	**67**	**67**	0	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	**66**	1	0	**66**	1	0	65	2	0
R-223	EW No. 4.6	NB No. 4.2	Palm Street	Residential	2	**69**	**69**	**69**	0	0	B(67)	A/E	**69**	0	0	**68**	1	0	**67**	2	0	**66**	3	0	**66**	3	0	65	4	0
R-224	EW No. 4.6	NB No. 4.2	Horst Avenue	Residential	3	**69**	**69**	**69**	0	0	B(67)	A/E	**69**	0	0	**68**	1	0	**67**	2	0	**66**	3	0	65	4	0	64	5	3
R-225	EW No. 4.6	NB No. 4.2	Horst Avenue	Residential	1	**67**	**67**	**67**	0	0	B(67)	A/E	**67**	0	0	**66**	1	0	65	2	0	64	3	0	63	4	0	63	4	0
R-226	EW No. 4.6	NB No. 4.2	Ibex Ave	Residential	1	61	62	62	0	1	B(67)	--	62	0	0	61	1	0	60	2	0	59	3	0	58	4	0	58	4	0
R-227	EW No. 4.6		Ibex Ave	Residential	1	59	59	59	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-228	EW No. 4.6	NB No. 4.2	Hart Street	Residential	2	64	64	65	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	64	1	0	63	2	0	63	2	0
R-229	EW No. 4.6	NB No. 4.2	Grayland Avenue	Residential	1	65	66	66	0	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	64	2	0	64	2	0	63	3	0
R-230	EW No. 4.6	NB No. 4.2	Grayland Avenue	Residential	2	**68**	**68**	**68**	0	0	B(67)	A/E	**68**	0	0	**67**	1	0	**66**	2	0	65	3	0	64	4	0	63	5	2
R-231	EW No. 4.6	NB No. 4.2	Ibex Ave	Residential	1	63	63	63	0	0	B(67)	--	63	0	0	62	1	0	61	2	0	60	3	0	59	4	0	59	4	0
R-232	EW No. 4.6		Ibex Ave	Residential	1	59	59	59	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-233	EW No. 4.6	NB No. 4.2	Grayland Avenue	Residential	3	63	64	64	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	63	1	0	62	2	0	62	2	0
R-234	EW No. 4.6	NB No. 4.2	Grayland Avenue	Residential	2	**66**	**66**	**66**	0	0	B(67)	A/E	**66**	0	0	**66**	0	0	64	2	0	62	4	0	62	4	0	62	4	0
R-235	EW No. 4.6	NB No. 4.2	Horst Avenue	Residential	2	63	63	63	0	0	B(67)	--	63	0	0	62	1	0	61	2	0	60	3	0	60	3	0	59	4	0
R-236	EW No. 4.6		Ibex Ave	Residential	1	57	57	57	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-237	EW No. 4.7		Napoli Drive	Residential	2	57	58	58	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-238	EW No. 4.7		Napoli Drive	Residential	2	55	56	56	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-239	EW No. 4.7		Napoli Drive	Residential	1	54	54	55	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-240	EW No. 4.7		Napoli Drive	Residential	2	55	55	55	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-241	EW No. 4.7		Napoli Drive	Residential	1	55	55	55	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 2.13.9 Predicted Future Noise Level and Noise Barrier Analysis for the Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width)

Receptor No.	Existing Wall No. [1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA L_{eq}(h)	Future Worst-Hour Noise Levels, dBA L_{eq}(h)																						
							2044 Noise Level				Activity Category (NAC)	Impact Type	Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR)																	
													6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
							Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions			L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR
R-242		NB No. 5.1	Cuesta Drive	School Playground	1	**67**	**67**	**67**	0	0	C(67)	A/E	64	3	0	64	3	0	63	4	0	63	4	0	62	5	1	61	6	1
R-243	EW No. 5.1	NB No. 5.1	Cuesta Drive	School Classroom	1	62 / 42[8]	62 / 42[8]	63 / 43[8]	1	1	D(52)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	62	1	0
R-244	EW No. 5.1	NB No. 5.1	Cuesta Drive	School Classroom	1	64 / 37[7]	64 / 37[7]	65 / 38[7]	1	1	D(52)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	65	0	0
R-245	EW No. 5.2	NB No. 5.2	Cuesta Drive	School Sports Area	1	63	63	64	1	1	C(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	64	0	0
R-246	EW No. 5.2	NB No. 5.2	Rancho Vista Drive	Residential	1	65	65	66	1	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	64	2	0	63	3	0	62	4	0
R-247	EW No. 5.2	NB No. 5.2	Rancho Vista Drive	Residential	1	65	66	66	0	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	65	1	0	63	3	0	62	4	0
R-248	EW No. 5.2	NB No. 5.2	Rancho Vista Drive	Residential	1	64	64	65	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	64	1	0	63	2	0	63	2	0
R-249	EW No. 5.2	NB No. 5.2	Rancho Vista Drive	Residential	1	64	64	65	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	64	1	0	63	2	0	62	3	0
R-250	EW No. 5.2		Rancho Vista Drive	Residential	1	64	64	64	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-251	EW No. 5.2		Rancho Vista Drive	Residential	1	64	64	64	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-252	EW No. 5.2		Rancho Vista Drive	Residential	1	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-253	EW No. 5.2		Rancho Vista Drive	Residential	1	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-254	EW No. 5.2		Rancho Vista Drive	Residential	1	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-255	EW No. 5.2		Sierra Vista Way	Residential	1	62	62	63	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-256	EW No. 5.2		Sierra Vista Way	Residential	1	59	59	60	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-257	EW No. 5.2		Sierra Vista Way	Residential	1	59	60	60	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-258	EW No. 5.2		Sierra Vista Way	Residential	0	54	54	55	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-259	EW No. 5.2		Sierra Vista Way	Residential	1	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-260	EW No. 5.2		Sierra Vista Way	Residential	1	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-261	EW No. 5.2		Sierra Vista Way	Residential	1	60	60	61	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-262	EW No. 5.2	NB No. 5.2	Judy Way	Residential	1	65	65	**66**	1	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	65	1	0	65	1	0	65	1	0
R-263	EW No. 5.2	NB No. 5.2	Cedarwood Court	Residential	1	61	62	62	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	62	0	0	62	0	0	62	0	0
R-264	EW No. 5.2		Cedarwood Court	Residential	1	60	60	61	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-265	EW No. 5.2		Chapparal Ave	Residential	1	58	58	58	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-266	EW No. 5.2		Chapparal Ave	Residential	1	58	58	59	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-267	EW No. 5.2		Sierra Vista Way	Residential	1	58	59	59	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-268	EW No. 5.2	NB No. 5.2	Judy Way	Residential	1	65	65	65	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	65	0	0	65	0	0	65	0	0
R-269	EW No. 5.2	NB No. 5.2	Judy Way	Residential	1	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	62	0	0	62	0	0	62	0	0
R-270	EW No. 5.2		Chapparal Ave	Residential	1	60	60	61	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-271	EW No. 5.2		Chapparal Ave	Residential	1	58	58	59	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-272	EW No. 5.2		Sierra Vista Way	Residential	1	57	58	58	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-273	EW No. 5.13		Norwalk Boulevard	Office/Classroom	0	66 / 41[9]	66 / 41[9]	66 / 41[9]	0	0	E/D(52)[3]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-274	EW No. 5.5	NB No. 5.3	Palm Street	Residential	1	65	65	65	0	0	B(67)	--	--	--	--	65	0	0	64	1	0	64	1	0	64	1	0	63	2	0
R-275	EW No. 5.5	NB No. 5.3	Palm Street	Residential	2	65	65	65	0	0	B(67)	--	--	--	--	65	0	0	64	1	0	64	1	0	63	2	0	63	2	0
R-276	EW No. 5.5	NB No. 5.3	Palm Street	Residential	3	**66**	**66**	**66**	0	0	B(67)	A/E	--	--	--	**66**	0	0	65	1	0	65	1	0	64	2	0	64	2	0
R-277	EW No. 5.5	NB No. 5.3	Palm Street	Residential	3	67	67	**67**	0	0	B(67)	A/E	--	--	--	**67**	0	0	**66**	1	0	65	2	0	65	2	0	64	3	0
R-278	EW No. 5.5	NB No. 5.3	Palm Street	Residential	3	64	64	64	0	0	B(67)	--	--	--	--	64	0	0	63	1	0	62	2	0	62	2	0	61	3	0
R-279	EW No. 5.5	NB No. 5.3	Palm Street	Residential	2	65	**66**	**66**	0	1	B(67)	A/E	--	--	--	65	1	0	64	2	0	64	2	0	63	3	0	62	4	0
R-280	EW No. 5.5	NB No. 5.3	Palm Street	Residential	2	65	65	65	0	0	B(67)	--	--	--	--	65	0	0	64	1	0	63	2	0	63	2	0	62	3	0
R-281	EW No. 5.5	NB No. 5.3	Autumn Breeze Street	Residential	2	65	65	65	0	0	B(67)	--	--	--	--	64	1	0	63	2	0	63	2	0	62	3	0	62	3	0
R-282	EW No. 5.5	NB No. 5.3	Autumn Breeze Street	Residential	3	**68**	**69**	**69**	0	1	B(67)	A/E	**68**	1	0	**67**	2	0	**67**	2	0	**66**	3	0	65	4	0	65	4	0
R-283	EW No. 5.5	NB No. 5.3	Autumn Breeze Street	Residential	3	**67**	**67**	**68**	1	1	B(67)	A/E	**67**	1	0	**66**	2	0	**66**	2	0	65	3	0	65	3	0	64	4	0
R-284	EW No. 5.5	NB No. 5.3	Autumn Breeze Street	Residential	3	**66**	**66**	**66**	0	0	B(67)	A/E	66	0	0	65	1	0	64	2	0	64	2	0	63	3	0	63	3	0
R-285	EW No. 5.5	NB No. 5.3	Evening Star Avenue	Residential	2	59	59	60	1	1	B(67)	--	60	0	0	59	1	0	59	1	0	58	2	0	58	2	0	58	2	0
R-286	EW No. 5.5	NB No. 5.3	Springsnow Circle	Residential	2	57	57	58	1	1	B(67)	--	58	0	0	57	1	0	57	1	0	57	1	0	57	1	0	57	1	0
R-287	EW No. 5.5		Springsnow Circle	Residential	1	56	56	56	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-288	EW No. 5.5		Summerwind Street	Residential	2	60	60	60	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-289	EW No. 5.5	NB No. 5.3	Palm Street	Residential	1	**67**	**67**	**67**	0	0	B(67)	A/E	--	--	--	**67**	0	0	**66**	1	0	65	2	0	65	2	0	64	3	0
R-290	EW No. 5.5	NB No. 5.3	Ely Avenue	Residential	2	63	63	64	1	1	B(67)	--	--	--	--	63	1	0	63	1	0	63	1	0	62	2	0	61	3	0
R-291	EW No. 5.5	NB No. 5.3	Ely Avenue	Residential	2	62	62	62	0	0	B(67)	--	--	--	--	62	0	0	62	0	0	62	0	0	61	1	0	61	1	0
R-292	EW No. 5.5	NB No. 5.3	Janell Avenue	Residential	2	60	60	60	0	0	B(67)	--	--	--	--	60	0	0	60	0	0	59	1	0	59	1	0	58	2	0
R-293	EW No. 5.5	NB No. 5.3	Morningrain Avenue	Residential	1	62	62	62	0	0	B(67)	--	--	--	--	62	0	0	61	1	0	60	2	0	60	2	0	59	3	0

Table 2.13.9 Predicted Future Noise Level and Noise Barrier Analysis for the Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width)

Receptor No.	Existing Wall No. [1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA $L_{eq}(h)$	Future Worst-Hour Noise Levels, dBA $L_{eq}(h)$: 2044 Noise Level: Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions	Activity Category (NAC)	Impact Type	Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR): 6 feet $L_{eq}(h)$	6 feet I.L.	6 feet NBR	8 feet $L_{eq}(h)$	8 feet I.L.	8 feet NBR	10 feet $L_{eq}(h)$	10 feet I.L.	10 feet NBR	12 feet $L_{eq}(h)$	12 feet I.L.	12 feet NBR	14 feet $L_{eq}(h)$	14 feet I.L.	14 feet NBR	16 feet $L_{eq}(h)$	16 feet I.L.	16 feet NBR
R-294	EW No. 5.5	NB No. 5.3	Autumn Breeze Street	Residential	2	60	60	61	1	1	B(67)	--	60	1	0	60	1	0	60	1	0	60	1	0	59	2	0	59	2	0
R-295	EW No. 5.5	NB No. 5.3	Autumn Breeze Street	Residential	3	59	60	60	0	1	B(67)	--	60	0	0	60	0	0	60	0	0	59	1	0	59	1	0	59	1	0
R-296	EW No. 5.5	NB No. 5.3	Autumn Breeze Street	Residential	1	60	60	60	0	0	B(67)	--	60	0	0	60	0	0	60	0	0	60	0	0	60	0	0	59	1	0
R-297	EW No. 5.5	NB No. 5.3	Springsnow Circle	Residential	1	54	54	54	0	0	B(67)	--	54	0	0	54	0	0	54	0	0	53	1	0	53	1	0	53	1	0
R-298	EW No. 5.5	NB No. 5.3	Cortner Avenue	Residential	1	65	65	65	0	0	B(67)	--	--	--	--	65	0	0	65	0	0	64	1	0	63	2	0	63	2	0
R-299	EW No. 5.5	NB No. 5.3	Ely Avenue	Residential	2	62	62	62	0	0	B(67)	--	--	--	--	62	0	0	62	0	0	61	1	0	60	2	0	60	2	0
R-300	EW No. 5.5	NB No. 5.3	Ely Avenue	Residential	2	60	61	61	0	1	B(67)	--	--	--	--	61	0	0	60	1	0	60	1	0	59	2	0	59	2	0
R-301	EW No. 5.5	NB No. 5.3	Janell Avenue	Residential	2	58	58	58	0	0	B(67)	--	--	--	--	58	0	0	58	0	0	57	1	0	57	1	0	56	2	0
R-302	EW No. 5.5	NB No. 5.3	Stark Avenue	Residential	1	60	60	60	0	0	B(67)	--	--	--	--	60	0	0	59	1	0	59	1	0	58	2	0	58	2	0
R-303	EW No. 5.5	NB No. 5.3	Springsnow Circle	Residential	1	53	54	54	0	1	B(67)	--	54	0	0	53	1	0	53	1	0	53	1	0	53	1	0	53	1	0
R-304			Beach Street	Residential	2	58	58	58	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-305			Beach Street	Residential	2	57	57	57	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-306			Palm Street	Residential	2	56	56	56	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-307			Palm Street	Residential	2	55	56	56	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-308	EW No. 6.2		Palm Street	Residential	1	59	59	60	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-309	EW No. 6.2		Palm Street	Residential	3	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-310	EW No. 6.2		Michael Avenue	Residential	1	59	59	59	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-311	EW No. 6.2		Michael Avenue	Residential	3	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-312	EW No. 6.2		Michael Avenue	Residential	3	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-313	EW No. 6.2		Michael Avenue	Residential	3	64	64	64	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-314	EW No. 6.2		Michael Avenue	Residential	2	64	64	64	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-315	EW No. 6.2		Maria Avenue	Residential	1	63	63	63	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-316	EW No. 6.2		Alfred Avenue	Residential	2	60	61	61	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-317	EW No. 6.2		De Groot Place	Residential	2	59	60	60	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-318	EW No. 6.2		De Groot Place	Residential	1	59	59	60	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-319	EW No. 6.2		Yvette Avenue	Residential	1	59	59	60	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-320	EW No. 6.2		Palm Street	Residential	1	60	60	60	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-321	EW No. 6.2		Michaels Avenue	Residential	1	55	56	56	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-322	EW No. 6.2		Brian Court	Residential	1	54	54	55	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-323	EW No. 6.2		Michael Avenue	Residential	2	57	57	57	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-324	EW No. 6.2		Michael Avenue	Residential	3	57	57	58	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-325	EW No. 6.2		Maria Avenue	Residential	1	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-326	EW No. 6.2		Alfred Avenue	Residential	2	59	59	60	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-327	EW No. 6.2		De Groot Place	Residential	2	59	59	60	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-328	EW No. 6.2		De Groot Place	Residential	2	58	58	59	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-329	EW No. 6.2		Palm Street	Residential	1	58	58	58	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-330	EW No. 6.2		Palm Street	Residential	2	56	56	56	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-331	EW No. 6.2		Brian Court	Residential	2	55	55	55	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-332	EW No. 6.2		Brian Court	Residential	1	57	57	58	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-333	EW No. 6.2		Maria Avenue	Residential	1	57	57	58	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-334	EW No. 6.2		Maria Avenue	Residential	1	59	59	59	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-335	EW No. 6.2		Alfred Avenue	Residential	2	58	58	59	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-336	EW No. 6.2		De Groot Place	Residential	2	58	59	59	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-337	EW No. 6.2		De Groot Place	Residential	1	57	57	58	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-338	EW No. 6.2		Yvette Avenue	Residential	1	57	58	58	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-339	EW No. 6.5		Glenda Street	Residential	1	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-340	EW No. 6.5		Glenda Street	Residential	1	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-341	EW No. 6.5		Glenda Street	Residential	1	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-342			Artesia Boulevard	Residential	2	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-343			Artesia Boulevard	Residential	2	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-344		NB No. 6.1	Artesia Boulevard	Residential	1	**74**	**74**	**74**	0	0	B(67)	A/E	**69**	5	1	**67**	7	1	64	10	1	63	11	1	61	13	1	60	14	1
R-345		NB No. 6.1	Artesia Boulevard	Residential	2	**75**	**75**	**75**	0	0	B(67)	A/E	**75**	0	0	**75**	0	0	**74**	1	0	**72**	3	0	**69**	6	2	64	11	2

Table 2.13.9 Predicted Future Noise Level and Noise Barrier Analysis for the Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width)

Receptor No.	Existing Wall No. [1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA $L_{eq}(h)$	Future Worst-Hour Noise Levels, dBA $L_{eq}(h)$																					
							2044 Noise Level				Activity Category (NAC)	Impact Type	Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR)																	
													6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
							Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions			$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR
R-346		NB No. 6.1	Artesia Boulevard	Residential	2	**66**	**66**	**66**	0	0	B(67)	A/E	63	3	0	61	5	2	59	7	2	57	9	2	56	10	2	55	11	2
R-347		NB No. 6.1	Artesia Boulevard	Residential	2	**69**	**69**	**70**	1	1	B(67)	A/E	**70**	0	0	**70**	0	0	**67**	3	0	**66**	4	0	63	7	2	60	10	2
R-348			Artesia Boulevard	Residential	4	63	63	63	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-349			Artesia Boulevard	Residential	4	64	64	64	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-350		NB No. 6.1	Artesia Boulevard	Residential	2	63	63	63	0	0	B(67)	--	61	2	0	60	3	0	58	5	2	56	7	2	54	9	2	53	10	2
R-351		NB No. 6.1	Artesia Boulevard	Residential	2	**68**	**69**	**69**	0	1	B(67)	A/E	**68**	1	0	**66**	3	0	65	4	0	63	6	2	61	8	2	58	11	2
R-352		NB No. 6.1	Artesia Boulevard	Residential	2	62	62	62	0	0	B(67)	--	60	2	0	59	3	0	57	5	2	55	7	2	54	8	2	53	9	2
R-353		NB No. 6.1	Artesia Boulevard	Residential	3	57	57	58	1	1	B(67)	--	58	0	0	55	3	0	54	4	0	53	5	3	52	6	3	50	8	3
R-354			Artesia Boulevard	Residential	1	67	67	68	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-355			Artesia Boulevard	Residential	1	68	68	68	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-356		NB No. 6.1	Artesia Boulevard	Residential	2	58	58	59	1	1	B(67)	--	57	2	0	56	3	0	56	3	0	53	6	2	52	7	2	52	7	2
R-357		NB No. 6.1	Artesia Boulevard	Residential	2	65	65	65	0	0	B(67)	--	64	1	0	62	3	0	60	5	2	59	6	2	58	7	2	55	10	2
R-358		NB No. 6.1	Artesia Boulevard	Residential	2	49	49	49	0	0	B(67)	--	49	0	0	49	0	0	49	0	0	49	0	0	49	0	0	49	0	0
R-359		NB No. 6.1	Artesia Boulevard	Residential	2	51	51	51	0	0	B(67)	--	51	0	0	51	0	0	51	0	0	51	0	0	51	0	0	51	0	0
R-360			Towne Center Drive	Retail	0	68	69	69	0	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-361			Towne Center Drive	Retail	0	71	72	72	0	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-362			Towne Center Drive	Retail	1	60	61	61	0	1	E(72)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Source: Compiled by LSA Associates, Inc. (2018).

1 An * represents an existing wall that would be demolished as part of the project. The existing wall would be reconstructed to match the existing height at a minimum.
2 A dash (–) indicates that no barrier was analyzed at this location because the modeled receptor would not approach or exceed the NAC.
3 Activity Categories without outdoor frequent human use areas were not evaluated against the Noise Abatement Criteria (NAC).
4 Numbers in **bold** represent noise levels that approach or exceed the NAC.
5 Shaded cells indicate the approximate existing wall heights.
6 Underlined numbers have been attenuated by at least 5 dBA (i.e., feasible wall height).
7 The exterior-to-interior noise level reduction was based on simultaneous exterior and interior measurements.
8 The exterior-to-interior noise level reduction was assumed to be 20 dBA lower because the building type is light frame with ordinary windows.
9 The exterior-to-interior noise level reduction was assumed to be 25 dBA lower because the building type is light frame with storm windows or masonry with single glazed windows.

A/E = Approach or Exceed
dBA = A-weighted decibels
dBA $L_{eq}(h)$ = equivalent continuous sound level measured per hour in A-weighted decibels
IL = Insertion Loss
NAC = Noise Abatement Criteria
NBR = Number of Benefited Receptors

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Table 2.13.10 Predicted Future Noise Level and Alternate Noise Barrier Analysis for the Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width)

Receptor No.	Existing Wall No.[1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA $L_{eq}(h)$	Future Worst-Hour Noise Levels, dBA $L_{eq}(h)$						Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR)																	
							2044 Noise Level						6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
							Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions	Activity Category (NAC)[3]	Impact Type	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR
R-44	EW No. 2.1	NB No. 2.2	Westwinds Circle	Residential	1	64	65	**66**[2]	1	2	B(67)	A/E	65	1	0	65	1	0	65	1	0	65	1	0	65	1	0	65	1	0
R-45	EW No. 2.1	NB No. 2.2	Leeward Avenue	Residential	2	63	64	65	1	2	B(67)	--	63	2	0	63	2	0	61	4	0	60	5[3]	2	60	5	2	60	5	2
R-46	EW No. 2.1	NB No. 2.2	Coral Reef Circle	Residential	2	62	62	63	1	1	B(67)	--	63	0	0	62	1	0	61	2	0	60	3	0	59	4	0	59	4	0
R-47	EW No. 2.1	NB No. 2.2	Outrigger Circle	Residential	2	65	65	**66**	1	1	B(67)	A/E	**66**	0	0	65	1	0	65	1	0	64	2	0	63	3	0	63	3	0
R-48	EW No. 2.1	NB No. 2.2	Windward Avenue	Residential	2	64	64	64	0	0	B(67)	--	64	0	0	64	0	0	64	0	0	63	1	0	62	2	0	62	2	0
R-49	EW No. 2.1*	NB No. 2.2	Eric Avenue	Residential	1	64	65	65	0	1	B(67)	--	--[4]	--	--	--	--	--	64	1	0	64	1	0	63	2	0	62	3	0
R-50	EW No. 2.1*	NB No. 2.2	Beach Street	Residential	4	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	62	0	0	62	0	0	61	1	0	61	1	0
R-51	EW No. 2.1*	NB No. 2.2	Beach Street	Residential	4	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	62	0	0	62	0	0	62	0	0	61	1	0
R-52	EW No. 2.1*	NB No. 2.2	Beach Street	Residential	4	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	62	0	0	62	0	0	62	0	0	61	1	0
R-56	EW No. 2.1	NB No. 2.2	Westwinds Circle	Residential	1	63	63	64	1	1	B(67)	--	63	1	0	63	1	0	63	1	0	63	1	0	63	1	0	63	1	0
R-58	EW No. 2.1	NB No. 2.2	Leeward Avenue	Residential	1	63	64	65	1	2	B(67)	--	62	3	0	62	3	0	60	5	1	60	5	1	60	5	1	59	6	1
R-59	EW No. 2.1	NB No. 2.2	Coral Reef Circle	Residential	2	63	63	64	1	1	B(67)	--	62	2	0	61	3	0	60	4	0	59	5	2	58	6	2	58	6	2
R-60	EW No. 2.1	NB No. 2.2	Outrigger Circle	Residential	2	65	66	**66**	0	1	B(67)	A/E	65	1	0	65	1	0	64	2	0	63	3	0	62	4	0	62	4	0
R-61	EW No. 2.1	NB No. 2.2	Windward Avenue	Residential	1	63	64	64	0	1	B(67)	--	64	0	0	63	1	0	63	1	0	63	1	0	63	1	0	62	2	0
R-62	EW No. 2.1*	NB No. 2.2	Eric Avenue	Residential	2	63	64	64	0	1	B(67)	--	--	--	--	--	--	--	63	1	0	63	1	0	62	2	0	62	2	0
R-65	EW No. 2.1	NB No. 2.2	Leeward Avenue	Residential	2	64	64	64	0	0	B(67)	--	62	2	0	61	3	0	61	3	0	60	4	0	60	4	0	60	4	0
R-66	EW No. 2.1	NB No. 2.2	Coral Reef Circle	Residential	2	63	63	63	0	0	B(67)	--	61	2	0	60	3	0	60	3	0	58	5	2	58	5	2	57	6	2
R-67	EW No. 2.1	NB No. 2.2	Outrigger Circle	Residential	2	**66**	**66**	**66**	0	0	B(67)	A/E	64	2	0	63	3	0	63	3	0	62	4	0	61	5	2	61	5	2
R-68	EW No. 2.1	NB No. 2.2	Windward Avenue	Residential	2	63	64	64	0	1	B(67)	--	63	1	0	63	1	0	62	2	0	62	2	0	61	3	0	61	3	0
R-69	EW No. 2.1*	NB No. 2.2	Eric Avenue	Residential	2	63	63	63	0	0	B(67)	--	--	--	--	--	--	--	63	0	0	62	1	0	61	2	0	61	2	0
R-70	EW No. 2.1*	NB No. 2.2	Eric Avenue	Residential	2	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	60	1	0	60	1	0	59	2	0	59	2	0
R-71	EW No. 2.1*	NB No. 2.2	Lucas Street	Residential	3	57	57	57	0	0	B(67)	--	--	--	--	--	--	--	57	0	0	57	0	0	56	1	0	56	1	0
R-72	EW No. 2.1*	NB No. 2.2	Lucas Street	Residential	3	56	57	57	0	1	B(67)	--	--	--	--	--	--	--	57	0	0	57	0	0	56	1	0	56	1	0
R-101	EW No. 3.1	NB No. 3.3	169th Street	Residential	2	**67**	**67**	**67**	0	0	B(67)	A/E	--	--	--	--	--	--	--	--	--	**66**	1	0	62	5	2	62	5	2
R-102	EW No. 3.1	NB No. 3.3	169th Street	Residential	3	**66**	**67**	**67**	0	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	65	2	0	62	5	3	61	6	3
R-103	EW No. 3.1	NB No. 3.3	169th Street	Residential	3	**67**	**67**	**68**	1	1	B(67)	A/E	**68**	0	0	**68**	0	0	**67**	1	0	65	3	0	62	6	3	62	6	3
R-104	EW No. 3.1	NB No. 3.3	169th Street	Residential	3	65	65	**66**	1	1	B(67)	A/E	**66**	0	0	**66**	0	0	65	1	0	63	3	0	61	5	3	61	5	3
R-105	EW No. 3.1	NB No. 3.3	169th Street	Residential	3	63	63	64	1	1	B(67)	--	64	0	0	63	1	0	63	1	0	63	1	0	63	1	0	63	1	0
R-108	EW No. 3.1	NB No. 3.3	169th Street	Residential	1	60	61	61	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	60	1	0	60	1	0	60	1	0
R-109	EW No. 3.1	NB No. 3.3	169th Street	Residential	2	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	61	1	0	61	1	0	61	1	0
R-110	EW No. 3.1	NB No. 3.3	169th Street	Residential	2	62	62	63	1	1	B(67)	--	62	1	0	62	1	0	62	1	0	62	1	0	62	1	0	62	1	0
R-111	EW No. 3.1	NB No. 3.3	169th Street	Residential	2	63	63	63	0	0	B(67)	--	63	0	0	63	0	0	63	0	0	63	0	0	63	0	0	63	0	0
R-112	EW No. 3.1	NB No. 3.3	169th Street	Residential	1	62	63	63	0	1	B(67)	--	63	0	0	63	0	0	63	0	0	63	0	0	63	0	0	63	0	0

Source: Compiled by LSA Associates, Inc. (2018).

1 An * represents an existing wall that would be demolished as part of the project. The existing wall would be reconstructed to match the existing height at a minimum.

2 Numbers in **bold** represent noise levels that approach or exceed the NAC.

3 Underlined numbers have been attenuated by at least 5 dBA (i.e., feasible wall height).

4 Shaded cells indicate the approximate existing wall heights.

A/E = Approach or Exceed

dBA = A-weighted decibels

dBA $L_{eq}(h)$ = equivalent continuous sound level measured per hour in A-weighted decibels

IL = Insertion Loss

NAC = Noise Abatement Criteria

NBR = Number of Benefited Receptors

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Table 2.13.11 Predicted Future Noise Level and Reduced Noise Barrier Analysis for the Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width)

Receptor No.	Existing Wall No. [1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA L_{eq}(h)	Future Worst-Hour Noise Levels, dBA L_{eq}(h): 2044 Noise Level: Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions	Activity Category (NAC)[3]	Impact Type	Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR): 6 feet: L_{eq}(h)	6 feet: I.L.	6 feet: NBR	8 feet: L_{eq}(h)	8 feet: I.L.	8 feet: NBR	10 feet: L_{eq}(h)	10 feet: I.L.	10 feet: NBR	12 feet: L_{eq}(h)	12 feet: I.L.	12 feet: NBR	14 feet: L_{eq}(h)	14 feet: I.L.	14 feet: NBR	16 feet: L_{eq}(h)	16 feet: I.L.	16 feet: NBR
R-44	EW No. 2.1	NB No. 2.1a	Westwinds Circle	Residential	1	64	65	**66**[2]	1	2	B(67)	A/E	--[3]	--	--	--	--	--	63	3	0	62	4	0	60	6[4]	1	59	7	1
R-45	EW No. 2.1	NB No. 2.1a	Leeward Avenue	Residential	2	63	64	65	1	2	B(67)	--	--	--	--	--	--	--	64	1	0	62	3	0	61	4	0	60	5	2
R-46	EW No. 2.1	NB No. 2.1a	Coral Reef Circle	Residential	2	62	62	63	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	63	0	0	62	1	0	62	1	0
R-47	EW No. 2.1	NB No. 2.1a	Outrigger Circle	Residential	2	65	65	**66**	1	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	65	1	0	65	1	0	65	1	0
R-48	EW No. 2.1	NB No. 2.1a	Windward Avenue	Residential	2	64	64	64	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	64	0	0	64	0	0	64	0	0
R-56	EW No. 2.1	NB No. 2.1a	Westwinds Circle	Residential	1	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	63	1	0	62	2	0	61	3	0	61	3	0
R-58	EW No. 2.1	NB No. 2.1a	Leeward Avenue	Residential	1	63	64	65	1	2	B(67)	--	--	--	--	--	--	--	63	2	0	63	2	0	61	4	0	60	5	1
R-59	EW No. 2.1	NB No. 2.1a	Coral Reef Circle	Residential	2	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	63	1	0	62	2	0	62	2	0
R-60	EW No. 2.1	NB No. 2.1a	Outrigger Circle	Residential	2	65	**66**	**66**	0	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	**66**	0	0	65	1	0	64	2	0
R-61	EW No. 2.1	NB No. 2.1a	Windward Avenue	Residential	1	63	64	64	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	64	0	0	64	0	0	63	1	0
R-65	EW No. 2.1	NB No. 2.1a	Leeward Avenue	Residential	2	64	64	64	0	0	B(67)	--	--	--	--	--	--	--	63	1	0	62	2	0	62	2	0	61	3	0
R-66	EW No. 2.1	NB No. 2.1a	Coral Reef Circle	Residential	2	63	63	63	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	63	0	0	61	2	0	61	2	0
R-67	EW No. 2.1	NB No. 2.1a	Outrigger Circle	Residential	2	**66**	**66**	**66**	0	0	B(67)	A/E	--	--	--	--	--	--	--	--	--	**66**	0	0	65	1	0	63	3	0
R-68	EW No. 2.1	NB No. 2.1a	Windward Avenue	Residential	2	63	64	64	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	64	0	0	63	1	0	63	1	0
R-44	EW No. 2.1	NB No. 2.2a	Westwinds Circle	Residential	1	64	65	**66**	1	2	B(67)	A/E	65	1	0	65	1	0	64	2	0	64	2	0	64	2	0	63	3	0
R-45	EW No. 2.1	NB No. 2.2a	Leeward Avenue	Residential	2	63	64	65	1	2	B(67)	--	63	2	0	63	2	0	61	4	0	60	5	2	60	5	2	59	6	2
R-46	EW No. 2.1	NB No. 2.2a	Coral Reef Circle	Residential	2	62	62	63	1	1	B(67)	--	63	0	0	62	1	0	61	2	0	60	3	0	59	4	0	59	4	0
R-47	EW No. 2.1	NB No. 2.2a	Outrigger Circle	Residential	2	65	65	**66**	1	1	B(67)	A/E	**66**	0	0	**66**	0	0	65	1	0	64	2	0	64	2	0	63	3	0
R-48	EW No. 2.1	NB No. 2.2a	Windward Avenue	Residential	2	64	64	64	0	0	B(67)	--	64	0	0	64	0	0	64	0	0	64	0	0	64	0	0	64	0	0
R-56	EW No. 2.1	NB No. 2.2a	Westwinds Circle	Residential	1	63	63	64	1	1	B(67)	--	63	1	0	63	1	0	63	1	0	62	2	0	62	2	0	62	2	0
R-58	EW No. 2.1	NB No. 2.2a	Leeward Avenue	Residential	1	63	64	65	1	2	B(67)	--	62	3	0	62	3	0	60	5	1	60	5	1	60	5	1	59	6	1
R-59	EW No. 2.1	NB No. 2.2a	Coral Reef Circle	Residential	2	63	63	64	1	1	B(67)	--	62	2	0	61	3	0	61	3	0	59	5	2	58	6	2	58	6	2
R-60	EW No. 2.1	NB No. 2.2a	Outrigger Circle	Residential	2	65	**66**	**66**	0	1	B(67)	A/E	65	1	0	65	1	0	64	2	0	63	3	0	62	4	0	62	4	0
R-61	EW No. 2.1	NB No. 2.2a	Windward Avenue	Residential	1	63	64	64	0	1	B(67)	--	64	0	0	64	0	0	64	0	0	63	1	0	63	1	0	63	1	0
R-65	EW No. 2.1	NB No. 2.2a	Leeward Avenue	Residential	2	64	64	64	0	0	B(67)	--	62	2	0	61	3	0	61	3	0	60	4	0	60	4	0	59	5	2
R-66	EW No. 2.1	NB No. 2.2a	Coral Reef Circle	Residential	2	63	63	63	0	0	B(67)	--	61	2	0	60	3	0	60	3	0	58	5	2	58	5	2	57	6	2
R-67	EW No. 2.1	NB No. 2.2a	Outrigger Circle	Residential	2	**66**	**66**	**66**	0	0	B(67)	A/E	64	2	0	63	3	0	63	3	0	62	4	0	61	5	2	61	5	2
R-68	EW No. 2.1	NB No. 2.2a	Windward Avenue	Residential	2	63	64	64	0	1	B(67)	--	63	1	0	63	1	0	62	2	0	62	2	0	62	2	0	62	2	0

Source: Compiled by LSA Associates, Inc. (2018).

1 An * represents an existing wall that would be demolished as part of the project. The existing wall would be reconstructed to match the existing height at a minimum.

2 Numbers in **bold** represent noise levels that approach or exceed the NAC.

3 Shaded cells indicate the approximate existing wall heights.

4 Underlined numbers have been attenuated by at least 5 dBA (i.e., feasible wall height).

A/E = Approach or Exceed

dBA = A-weighted decibels

dBA L_{eq}(h) = equivalent continuous sound level measured per hour in A-weighted decibels

IL = Insertion Loss

NAC = Noise Abatement Criteria

NBR = Number of Benefited Receptors

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Table 2.13.12 Predicted Future Noise Level and Noise Barrier Analysis for the Build Alternative with Design Option 5 (Four-Lane Gridley Road Overcrossing)

Receptor No.	Existing Wall No.[1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA $L_{eq}(h)$	Future Worst-Hour Noise Levels, dBA $L_{eq}(h)$																								
							2044 Noise Level				Activity Category (NAC)	Impact Type	Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR)																	
													6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
							Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions			$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR
R-50	EW No. 2.1*		Beach Street	Residential	4	62	62	62	0	0	B(67)	--	--[2]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-51	EW No. 2.1*		Beach Street	Residential	4	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-52	EW No. 2.1*		Beach Street	Residential	4	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-53	EW No. 2.1*		Beach Street	Residential	6	60	60	60	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-54	EW No. 2.1*		Beach Street	Residential	2	60	60	61	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-55	EW No. 2.1*		Harvest Avenue	Residential	1	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-57	EW No. 2.1*		Sunny Ridge Court	Residential	2	62	62	63	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-63	EW No. 2.1*		Harvest Avenue	Residential	1	59	60	60	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-64	EW No. 2.1*		Sunny Ridge Court	Residential	1	58	59	58	-1	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-71	EW No. 2.1*		Lucas Street	Residential	3	57	57	57	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-72	EW No. 2.1*		Lucas Street	Residential	3	56	57	57	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-73	EW No. 2.1*		Lucas Street	Residential	3	55	55	55	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-74	EW No. 2.1*		Lucas Street	Residential	2	56	56	56	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-75	EW No. 2.1*		Harvest Avenue	Residential	1	58	58	58	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-76	EW No. 2.1*		Sunny Ridge Court	Residential	1	57	57	57	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-81	EW No. 2.3		Artesia Boulevard	School Classroom	1	61 / 40[3]	61 / 40[3]	61 / 40[3]	0	0	D(52)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-82	EW No. 2.4		Palm Street	Residential	2	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-83	EW No. 2.4		Palm Street	Residential	1	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-84	EW No. 2.4		Palm Street	Residential	2	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-85	EW No. 2.4		Maples Avenue	Residential	1	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-86	EW No. 2.4		Maples Avenue	Residential	1	60	60	60	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-87	EW No. 2.4		Harvest Avenue	Residential	2	58	59	59	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-88	EW No. 2.4		Harvest Avenue	Residential	1	58	58	58	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-89	EW No. 2.4		Maples Avenue	Residential	2	58	58	58	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-90	EW No. 2.4		Harvest Avenue	Residential	1	57	57	57	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-91	EW No. 2.4		Gridley Road	Park	1	58	58	59	1	1	C(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-92			Beach Street	Light Industrial	0	74	74	75	1	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-93			Beach Street	Light Industrial	0	74	74	75	1	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-94	EW No. 3.1		Beach Street	Light Industrial	0	70	70	71	1	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-95	EW No. 3.1		Hyde Park Court	Park	1	63	63	64	1	1	C(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-96	EW No. 3.1		Hyde Park Court	Residential	2	50	51	51	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-97	EW No. 3.1		Hyde Park Court	Residential	2	49	49	49	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-98	EW No. 3.1		Hyde Park Court	Residential	2	49	50	50	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-99	EW No. 3.1		Hyde Park Court	Residential	2	50	50	51	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-100	EW No. 3.1		Belvedere Court	Residential	2	55	55	55	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-123	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	2	**66**[4]	**66**	**67**	1	1	B(67)	A/E	**67**	0	0	**66**	1	0	65	2	0	64	3	0	64	3	0	63	4	0
R-124	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	2	**66**	**66**	**67**	1	1	B(67)	A/E	**67**	0	0	**66**	1	0	65	2	0	64	3	0	64	3	0	63	4	0
R-125	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	3	65	65	65	0	0	B(67)	--	65	0	0	65	0	0	64	1	0	63	2	0	62	3	0	62	3	0
R-126	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	3	**67**	**67**	**67**	0	0	B(67)	A/E	**67**	0	0	65	2	0	64	3	0	63	4	0	63	4	0	62	<u>5</u>[5]	3
R-127	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	3	**67**	**67**	**67**	0	0	B(67)	A/E	**67**	0	0	65	2	0	65	2	0	64	3	0	63	4	0	62	<u>5</u>	3
R-128	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	2	65	**66**	**66**	0	1	B(67)	A/E	64	2	0	64	2	0	63	3	0	63	3	0	63	3	0	63	3	0
R-129	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	1	64	64	64	0	0	B(67)	--	63	1	0	63	1	0	63	1	0	62	2	0	62	2	0	62	2	0
R-130	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	1	65	65	65	0	0	B(67)	--	64	1	0	64	1	0	63	2	0	63	2	0	63	2	0	63	2	0
R-131	EW No. 3.3	NB No. 3.2	Baber Avenue	Residential	1	60	60	60	0	0	B(67)	--	60	0	0	60	0	0	59	1	0	59	1	0	59	1	0	59	1	0
R-132	EW No. 3.3	NB No. 3.2	Hart Street	Residential	2	59	60	60	0	1	B(67)	--	60	0	0	59	1	0	59	1	0	59	1	0	59	1	0	59	1	0
R-133	EW No. 3.3	NB No. 3.2	Hart Street	Residential	3	61	61	61	0	0	B(67)	--	61	0	0	60	1	0	59	2	0	59	2	0	59	2	0	58	3	0
R-134	EW No. 3.3	NB No. 3.2	Hart Street	Residential	2	59	59	59	0	0	B(67)	--	59	0	0	59	0	0	59	0	0	59	0	0	59	0	0	58	1	0

Table 2.13.12 Predicted Future Noise Level and Noise Barrier Analysis for the Build Alternative with Design Option 5 (Four-Lane Gridley Road Overcrossing)

Receptor No.	Existing Wall No.[1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA L_{eq}(h)	Future Worst-Hour Noise Levels, dBA L_{eq}(h): 2044 Noise Level: Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions	Activity Category (NAC)	Impact Type	Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR): 6 feet L_{eq}(h)	6 feet I.L.	6 feet NBR	8 feet L_{eq}(h)	8 feet I.L.	8 feet NBR	10 feet L_{eq}(h)	10 feet I.L.	10 feet NBR	12 feet L_{eq}(h)	12 feet I.L.	12 feet NBR	14 feet L_{eq}(h)	14 feet I.L.	14 feet NBR	16 feet L_{eq}(h)	16 feet I.L.	16 feet NBR
R-135	EW No. 3.3	NB No. 3.2	Hart Street	Residential	2	61	61	62	1	1	B(67)	--	61	1	0	60	2	0	60	2	0	59	3	0	59	3	0	59	3	0
R-136	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	1	63	63	63	0	0	B(67)	--	63	0	0	62	1	0	62	1	0	62	1	0	62	1	0	61	2	0
R-137	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	1	61	61	61	0	0	B(67)	--	60	1	0	60	1	0	60	1	0	60	1	0	60	1	0	60	1	0

Source: Compiled by LSA Associates, Inc. (2018).

[1] An * represents an existing wall that would be demolished as part of the project. The existing wall would be reconstructed to match the existing height at a minimum.

[2] A dash (–) indicates that no barrier was analyzed at this location because the modeled receptor would not approach or exceed the NAC.

[3] The exterior-to-interior noise level reduction was based on simultaneous exterior and interior measurements.

[4] Numbers in **bold** represent noise levels that approach or exceed the NAC.

[5] Underlined numbers have been attenuated by at least 5 dBA (i.e., feasible wall height).

A/E = Approach or Exceed
dBA = A-weighted decibels
dBA L_{eq}(h) = equivalent continuous sound level measured per hour in A-weighted decibels
IL = Insertion Loss
NAC = Noise Abatement Criteria
NBR = Number of Benefited Receptors

Table 2.13.13 Predicted Future Noise Level and Noise Barrier Analysis for the Build Alternative with Design Option 2 (Pioneer Boulevard L-9)

Receptor No.	Existing Wall No. [1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA L_{eq}(h)	Future Worst-Hour Noise Levels, dBA L_{eq}(h): 2044 Noise Level				Activity Category (NAC)	Impact Type	Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR): 6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
							Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions			L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR
R-92			Beach Street	Light Industrial	0	74	74	75	1	1	F	--	--[2]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-93			Beach Street	Light Industrial	0	74	74	75	1	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-94	EW No. 3.1		Beach Street	Light Industrial	0	70	70	71	1	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-95	EW No. 3.1		Hyde Park Court	Park	1	63	63	64	1	1	C(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-96	EW No. 3.1		Hyde Park Court	Residential	2	50	51	51	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-97	EW No. 3.1		Hyde Park Court	Residential	2	49	49	49	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-98	EW No. 3.1		Hyde Park Court	Residential	2	49	50	50	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-99	EW No. 3.1		Hyde Park Court	Residential	2	50	50	51	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-100	EW No. 3.1		Belvedere Court	Residential	2	55	55	55	0	0	B(67)	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-101	EW No. 3.1*	NB No. 3.1	169th Street		2	**67**[3]	**67**	**68**	1	1	B(67)	A/E	--[4]	--	--	--	--	--	--	--	--	--	--	--	**67**	1	0	**66**	2	0
R-102	EW No. 3.1*	NB No. 3.1	169th Street	Residential	3	**66**	**67**	**68**	1	2	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**67**	1	0	**66**	2	0
R-103	EW No. 3.1	NB No. 3.1	169th Street	Residential	3	**67**	**67**	**68**	1	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**68**	0	0	**66**	2	0
R-104	EW No. 3.1	NB No. 3.1	169th Street	Residential	3	65	65	**67**	2	2	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	65	2	0
R-105	EW No. 3.1	NB No. 3.1	169th Street	Residential	3	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	64	0	0	63	1	0
R-106	EW No. 3.1	NB No. 3.1	169th Street	Residential	3	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	64	0	0	63	1	0
R-107	EW No. 3.1	NB No. 3.1	169th Street	Residential	2	64	64	**66**	2	2	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	65	1	0	64	2	0
R-108	EW No. 3.1	NB No. 3.1	169th Street	Residential	1	60	61	61	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	61	0	0	60	1	0
R-109	EW No. 3.1	NB No. 3.1	169th Street	Residential	2	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	62	0	0	61	1	0
R-110	EW No. 3.1	NB No. 3.1	169th Street	Residential	2	62	62	63	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	62	1	0	62	1	0
R-111	EW No. 3.1	NB No. 3.1	169th Street	Residential	2	63	63	63	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	0	0	62	1	0
R-112	EW No. 3.1	NB No. 3.1	169th Street	Residential	1	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	0	0	62	1	0
R-113	EW No. 3.1	NB No. 3.1	169th Street	Residential	2	65	65	65	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	65	0	0	64	1	0
R-114	EW No. 3.1	NB No. 3.1	169th Street	Residential	2	62	62	63	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	62	1	0	62	1	0
R-115	EW No. 3.1	NB No. 3.1	169th Street	Residential	1	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	61	0	0	61	0	0
R-116	EW No. 3.1		Pioneer Boulevard	Hotel	1	64	65	66	1	2	E(72)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-117			Pioneer Boulevard	Restaurant	0	67	67	67	0	0	E[5]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-118			Pioneer Boulevard	Gas Station	0	65	65	66	1	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-119	EW No. 3.1		168th Street	Residential	1	56	57	57	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-120			Pioneer Boulevard	Gas Station	0	62	62	63	1	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-121			168th Street	Residential	1	57	57	57	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-122			Pioneer Boulevard	Light Industrial	0	59	59	60	1	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-123	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	2	**66**	**66**	**66**	0	0	B(67)	A/E	**66**	0	0	65	1	0	64	2	0	64	2	0	63	3	0	62	4	0
R-124	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	2	**66**	**66**	**66**	0	0	B(67)	A/E	**66**	0	0	65	1	0	64	2	0	63	3	0	63	3	0	62	4	0
R-125	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	3	65	65	65	0	0	B(67)	--	65	0	0	64	1	0	64	1	0	63	2	0	62	3	0	62	3	0
R-126	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	3	**67**	**67**	**67**	0	0	B(67)	A/E	**67**	0	0	65	2	0	64	3	0	63	4	0	63	4	0	62	5[6]	3
R-127	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	3	**67**	**67**	**67**	0	0	B(67)	A/E	**67**	0	0	65	2	0	65	2	0	64	3	0	63	4	0	62	5	3
R-128	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	2	65	**66**	**66**	0	1	B(67)	A/E	64	2	0	64	2	0	63	3	0	63	3	0	63	3	0	63	3	0
R-129	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	1	64	64	64	0	0	B(67)	--	63	1	0	63	1	0	63	1	0	62	2	0	62	2	0	62	2	0
R-130	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	1	65	65	65	0	0	B(67)	--	64	1	0	64	1	0	63	2	0	63	2	0	63	2	0	63	2	0
R-131	EW No. 3.3	NB No. 3.2	Baber Avenue	Residential	1	60	60	60	0	0	B(67)	--	60	0	0	59	1	0	59	1	0	59	1	0	59	1	0	59	1	0
R-132	EW No. 3.3	NB No. 3.2	Hart Street	Residential	2	59	60	59	-1	0	B(67)	--	59	0	0	59	0	0	59	0	0	59	0	0	59	0	0	59	0	0
R-133	EW No. 3.3	NB No. 3.2	Hart Street	Residential	3	61	61	61	0	0	B(67)	--	61	0	0	60	1	0	59	2	0	59	2	0	59	2	0	58	3	0
R-134	EW No. 3.3	NB No. 3.2	Hart Street	Residential	2	59	59	59	0	0	B(67)	--	59	0	0	59	0	0	59	0	0	59	0	0	59	0	0	58	1	0
R-135	EW No. 3.3	NB No. 3.2	Hart Street	Residential	2	61	61	62	1	1	B(67)	--	61	1	0	60	2	0	60	2	0	59	3	0	59	3	0	59	3	0
R-136	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	1	63	63	63	0	0	B(67)	--	63	0	0	62	1	0	62	1	0	62	1	0	61	2	0	61	2	0
R-137	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	1	61	61	61	0	0	B(67)	--	60	1	0	60	1	0	60	1	0	60	1	0	60	1	0	60	1	0
R-138			Roseton Avenue	Office	0	73	74	73	-1	0	E[5]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-139			Jersey Avenue	Light Industrial	0	73	74	74	0	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-140			Alburtis Avenue	Light Industrial	0	71	71	71	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-141			Alburtis Avenue	Office	0	65	66	65	-1	0	E[5]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-142	EW No. 4.1		167th Street	Vacant Land	0	56	57	57	0	1	G	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-143	EW No. 4.1		167th Street	Residential	3	57	57	57	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-144	EW No. 4.1		167th Street	Residential	2	56	57	57	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 2.13.13 Predicted Future Noise Level and Noise Barrier Analysis for the Build Alternative with Design Option 2 (Pioneer Boulevard L-9)

Receptor No.	Existing Wall No. [1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA $L_{eq}(h)$	2044 Noise Level: Without Project, dBA L_{eq}	2044 Noise Level: With Project, dBA L_{eq}	2044 Noise Level: With Project Minus No Project Conditions	2044 Noise Level: With Project Minus Existing Conditions	Activity Category (NAC)	Impact Type	6 feet $L_{eq}(h)$	6 feet I.L.	6 feet NBR	8 feet $L_{eq}(h)$	8 feet I.L.	8 feet NBR	10 feet $L_{eq}(h)$	10 feet I.L.	10 feet NBR	12 feet $L_{eq}(h)$	12 feet I.L.	12 feet NBR	14 feet $L_{eq}(h)$	14 feet I.L.	14 feet NBR	16 feet $L_{eq}(h)$	16 feet I.L.	16 feet NBR
							Future Worst-Hour Noise Levels, dBA $L_{eq}(h)$						Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR)																	
R-145	EW No. 4.1		Pioneer Boulevard	Light Industrial	0	61	61	62	1	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-146	EW No. 4.1		168th Street	Residential	2	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-147	EW No. 4.1		168th Street	Residential	2	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-148	EW No. 4.1		168th Street	Residential	3	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-149	EW No. 4.1		168th Street	Residential	2	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-150	EW No. 4.1		168th Street	Residential	3	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-151	EW No. 4.1		168th Street	Residential	3	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-152	EW No. 4.1		168th Street	Residential	2	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-153	EW No. 4.1	NB No. 4.1	169th Street	Residential	2	60	61	61	0	1	B(67)	--	61	0	0	60	1	0	60	1	0	60	1	0	60	1	0	59	2	0
R-154	EW No. 4.1	NB No. 4.1	169th Street	Residential	2	61	62	63	1	2	B(67)	--	62	1	0	61	2	0	61	2	0	61	2	0	60	3	0	60	3	0
R-155	EW No. 4.2	NB No. 4.1	169th Street	Playground	1	65	65	**66**	1	1	C(67)	A/E	--	--	--	--	--	--	--	--	--	65	1	0	64	2	0	64	2	0
R-156	EW No. 4.2	NB No. 4.1	169th Street	Community Center	1	66 / 46[7]	67 / 47[7]	68 / 48[7]	1	2	D(52)	--	--	--	--	--	--	--	--	--	--	67	1	0	66	2	0	66	2	0
R-157	EW No. 4.2	NB No. 4.1	169th Street	Playground	1	64	65	65	0	1	C(67)	--	--	--	--	--	--	--	--	--	--	65	0	0	64	1	0	63	2	0
R-158	EW No. 4.2*		170th Street	Residential	2	65	65	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-159	EW No. 4.2*		170th Street	Residential	2	60	60	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-160	EW No. 4.2*		170th Street	Residential	2	59	59	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-161	EW No. 4.2*		170th Street	Residential	2	58	58	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-162	EW No. 4.2*		170th Street	Residential	2	62	63	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-163	EW No. 4.2*		170th Street	Residential	1	62	62	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-164	EW No. 4.2*		170th Street	Residential	1	63	64	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-165	EW No. 4.2*		170th Street	Residential	1	64	65	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-166	EW No. 4.2*		170th Street	Residential	2	64	65	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-167	EW No. 4.2*		170th Street	Residential	2	64	64	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-168	EW No. 4.2*		170th Street	Light Industrial	0	61	61	0	--	--	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-169	EW No. 4.3	NB No. 4.1	169th Street	Residential	2	61	62	63	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	63	0	0	62	1	0	62	1	0
R-170	EW No. 4.3	NB No. 4.1	169th Street	Residential	1	61	61	62	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	62	0	0	62	0	0	61	1	0
R-171	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	63	1	0	62	2	0	62	2	0
R-172	EW No. 4.2	NB No. 4.1	169th Street	Residential	1	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	64	0	0	63	1	0	62	2	0
R-173	EW No. 4.2	NB No. 4.1	169th Street	Day Care Center	1	63 / 43[7]	64 / 44[7]	64 / 44[7]	0	1	D(52)	--	--	--	--	--	--	--	--	--	--	64	0	0	63	1	0	62	2	0
R-174	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	64	0	0	63	1	0	62	2	0
R-175	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	64	0	0	63	1	0	62	2	0
R-176	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	64	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	1	0	62	2	0
R-177	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	63	63	**67**	4	4	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	65	2	0
R-178	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	**67**	4	5	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	65	2	0
R-179	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	63	63	**67**	4	4	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	65	2	0
R-180	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	64	64	**67**	3	3	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	65	2	0
R-181	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	64	65	**67**	2	3	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	65	2	0
R-182	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	64	65	**67**	2	3	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	65	2	0
R-183	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	65	65	**67**	2	2	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	**66**	1	0
R-184	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	61	61	64	3	3	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	1	0	62	2	0
R-185	EW No. 4.3*	NB No. 4.1	169th Street	Residential	3	60	60	64	4	4	B(67)	--	--	--	--	--	--	--	--	--	--	63	1	0	63	1	0	62	2	0
R-186	EW No. 4.3*	NB No. 4.1	169th Street	Residential	3	60	60	64	4	4	B(67)	--	--	--	--	--	--	--	--	--	--	64	0	0	63	1	0	62	2	0
R-187			168th Street	Vacant Land	0	65	65	66	1	1	G	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-188	EW No. 4.1		168th Street	Residential	2	59	59	60	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-189	EW No. 4.1		168th Street	Residential	3	55	56	56	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-190	EW No. 4.1		169th Street	Residential	1	55	56	57	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-191	EW No. 4.1		169th Street	Residential	2	56	57	58	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-192	EW No. 4.1	NB No. 4.1	169th Street	Residential	3	57	58	58	0	1	B(67)	--	58	0	0	58	0	0	58	0	0	58	0	0	58	0	0	58	0	0
R-193	EW No. 4.1	NB No. 4.1	169th Street	Residential	3	58	58	59	1	1	B(67)	--	59	0	0	58	1	0	58	1	0	58	1	0	58	1	0	58	1	0
R-194	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	58	58	59	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	58	1	0	57	2	0	57	2	0
R-195	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	61	1	0	61	1	0	61	1	0
R-196	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	61	61	62	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	61	1	0	60	2	0	60	2	0
R-197	EW No. 4.2	NB No. 4.1	169th Street	Residential	3	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	61	0	0	60	1	0	60	1	0

Table 2.13.13 Predicted Future Noise Level and Noise Barrier Analysis for the Build Alternative with Design Option 2 (Pioneer Boulevard L-9)

Receptor No.	Existing Wall No. [1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA L_{eq}(h)	Future Worst-Hour Noise Levels, dBA L_{eq}(h)																							
							2044 Noise Level				Activity Category (NAC)	Impact Type	Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR)																	
													6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
							Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions			L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR
R-198	EW No. 4.2	NB No. 4.1	169th Street	Residential	3	60	60	61	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	60	1	0	60	1	0	59	2	0
R-199	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	59	59	59	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	59	0	0	58	1	0	58	1	0
R-200	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	64	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	62	2	0	62	2	0
R-201	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	64	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	62	2	0	62	2	0
R-202	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	0	0	62	1	0
R-203	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	62	63	64	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	1	0	62	2	0
R-204	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	1	0	62	2	0
R-205	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	64	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	1	0	62	2	0
R-206	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	63	64	65	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	64	1	0	63	2	0
R-207	EW No. 4.3*	NB No. 4.1	169th Street	Residential	3	60	60	61	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	61	0	0	60	1	0	60	1	0
R-208	EW No. 4.3	NB No. 4.1	169th Street	Residential	3	60	61	61	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	61	0	0	61	0	0	61	0	0
R-209	EW No. 4.3	NB No. 4.1	169th Street	Residential	2	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	61	0	0	61	0	0	61	0	0
R-210	EW No. 4.1		168th Street	Residential	2	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-211	EW No. 4.2*	NB No. 4.1	168th Street	Residential	2	62	63	64	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	1	0	62	2	0
R-212	EW No. 4.2*	NB No. 4.1	168th Street	Residential	3	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	1	0	63	1	0
R-213	EW No. 4.2*	NB No. 4.1	168th Street	Residential	3	64	64	65	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	64	1	0	64	1	0
R-214	EW No. 4.3		Park Street	Light Industrial	0	66	66	66	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-215			Norwalk Boulevard	Gas Station	0	69	69	69	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-216			Norwalk Boulevard	Light Industrial	0	63	63	63	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Source: Compiled by LSA Associates, Inc. (2018).

1 An * represents an existing wall that would be demolished as part of the project. The existing wall would be reconstructed to match the existing height at a minimum.

2 A dash (–) indicates that no barrier was analyzed at this location because the modeled receptor would not approach or exceed the NAC.

3 Numbers in **bold** represent noise levels that approach or exceed the NAC.

4 Shaded cells indicate the approximate existing wall heights.

5 Activity Categories without outdoor frequent human use areas were not evaluated against the Noise Abatement Criteria (NAC).

6 Underlined numbers have been attenuated by at least 5 dBA (i.e., feasible wall height).

7 The exterior-to-interior noise level reduction was assumed to be 20 dBA lower because the building type is light frame with ordinary windows.

A/E = Approach or Exceed
dBA = A-weighted decibels
dBA L_{eq}(h) = equivalent continuous sound level measured per hour in A-weighted decibels
IL = Insertion Loss
NAC = Noise Abatement Criteria
NBR = Number of Benefited Receptors

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Table 2.13.14 Predicted Future Noise Level and Noise Barrier Analysis for the Build Alternative with Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment)

Receptor No.	Existing Wall No.[1]	Noise Barrier No.	Location	Land Use	No. of Receptors/Units	Existing Noise Level, dBA $L_{eq}(h)$	Future Worst-Hour Noise Levels, dBA $L_{eq}(h)$: 2044 Noise Level: Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions	Activity Category (NAC)	Impact Type	Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR): 6 feet $L_{eq}(h)$	6 feet I.L.	6 feet NBR	8 feet $L_{eq}(h)$	8 feet I.L.	8 feet NBR	10 feet $L_{eq}(h)$	10 feet I.L.	10 feet NBR	12 feet $L_{eq}(h)$	12 feet I.L.	12 feet NBR	14 feet $L_{eq}(h)$	14 feet I.L.	14 feet NBR	16 feet $L_{eq}(h)$	16 feet I.L.	16 feet NBR
R-92			Beach Street	Light Industrial	0	74	74	75	1	1	F	--	--[2]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-93			Beach Street	Light Industrial	0	74	74	75	1	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-94	EW No. 3.1		Beach Street	Light Industrial	0	70	70	71	1	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-95	EW No. 3.1		Hyde Park Court	Park	1	63	63	64	1	1	C(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-96	EW No. 3.1		Hyde Park Court	Residential	2	50	51	51	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-97	EW No. 3.1		Hyde Park Court	Residential	2	49	49	49	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-98	EW No. 3.1		Hyde Park Court	Residential	2	49	50	50	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-99	EW No. 3.1		Hyde Park Court	Residential	2	50	50	50	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-100	EW No. 3.1		Belvedere Court	Residential	2	55	55	55	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-101	EW No. 3.1*	NB No. 3.1	169th Street	Residential	2	**67**	**67**[3]	**68**	1	1	B(67)	A/E	--[4]	--	--	--	--	--	--	--	--	--	--	--	**67**	1	0	**67**	1	0
R-102	EW No. 3.1*	NB No. 3.1	169th Street	Residential	3	**66**	**67**	**68**	1	2	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**67**	1	0	**67**	1	0
R-103	EW No. 3.1	NB No. 3.1	169th Street	Residential	3	**67**	**67**	**68**	1	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**68**	0	0	**68**	0	0
R-104	EW No. 3.1	NB No. 3.1	169th Street	Residential	3	65	65	**67**	2	2	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	65	2	0
R-105	EW No. 3.1	NB No. 3.1	169th Street	Residential	3	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	64	0	0	63	1	0
R-106	EW No. 3.1	NB No. 3.1	169th Street	Residential	3	63	63	65	2	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	64	1	0	63	2	0
R-107	EW No. 3.1	NB No. 3.1	169th Street	Residential	2	64	64	**66**	2	2	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	65	1	0	64	2	0
R-108	EW No. 3.1	NB No. 3.1	169th Street	Residential	1	60	61	61	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	61	0	0	60	1	0
R-109	EW No. 3.1	NB No. 3.1	169th Street	Residential	2	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	62	0	0	61	1	0
R-110	EW No. 3.1	NB No. 3.1	169th Street	Residential	2	62	62	63	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	62	1	0	62	1	0
R-111	EW No. 3.1	NB No. 3.1	169th Street	Residential	2	63	63	63	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	0	0	62	1	0
R-112	EW No. 3.1	NB No. 3.1	169th Street	Residential	1	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	0	0	62	1	0
R-113	EW No. 3.1	NB No. 3.1	169th Street	Residential	2	65	65	65	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	65	0	0	64	1	0
R-114	EW No. 3.1	NB No. 3.1	169th Street	Residential	2	62	62	63	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	62	1	0	62	1	0
R-115	EW No. 3.1	NB No. 3.1	169th Street	Residential	1	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	61	0	0	61	0	0
R-116	EW No. 3.1		Pioneer Boulevard	Hotel	1	64	65	66	1	2	E(72)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-117			Pioneer Boulevard	Restaurant	0	67	67	67	0	0	E[5]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-118			Pioneer Boulevard	Gas Station	0	65	65	66	1	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-119	EW No. 3.1		168th Street	Residential	1	56	57	57	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-120			Pioneer Boulevard	Gas Station	0	62	62	63	1	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-121			168th Street	Residential	1	57	57	57	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-122			Pioneer Boulevard	Light Industrial	0	59	59	60	1	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-123	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	2	**66**	**66**	**66**	0	0	B(67)	A/E	**66**	0	0	**66**	0	0	**66**	0	0	**66**	0	0	**66**	0	0	62	4	0
R-124	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	2	**66**	**66**	**66**	0	0	B(67)	A/E	**66**	0	0	**66**	0	0	**66**	0	0	**66**	0	0	**66**	0	0	62	4	0
R-125	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	3	65	65	65	0	0	B(67)	--	65	0	0	65	0	0	65	0	0	65	0	0	65	0	0	62	3	0
R-126	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	3	**67**	**67**	**67**	0	0	B(67)	A/E	**67**	0	0	65	2	0	64	3	0	63	4	0	63	4	0	62	5[6]	3
R-127	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	3	**67**	**67**	**67**	0	0	B(67)	A/E	**67**	0	0	65	2	0	65	2	0	64	3	0	63	4	0	62	5	3
R-128	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	2	65	**66**	**66**	0	1	B(67)	A/E	64	2	0	64	2	0	63	3	0	63	3	0	63	3	0	63	3	0
R-129	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	1	64	64	64	0	0	B(67)	--	63	1	0	63	1	0	63	1	0	62	2	0	62	2	0	62	2	0
R-130	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	1	65	65	65	0	0	B(67)	--	64	1	0	64	1	0	63	2	0	63	2	0	63	2	0	63	2	0
R-131	EW No. 3.3	NB No. 3.2	Baber Avenue	Residential	1	60	60	60	0	0	B(67)	--	60	0	0	59	1	0	59	1	0	59	1	0	59	1	0	59	1	0
R-132	EW No. 3.3	NB No. 3.2	Hart Street	Residential	2	59	60	59	-1	0	B(67)	--	59	0	0	59	0	0	58	1	0	58	1	0	58	1	0	58	1	0
R-133	EW No. 3.3	NB No. 3.2	Hart Street	Residential	3	61	61	61	0	0	B(67)	--	61	0	0	60	1	0	59	2	0	59	2	0	59	2	0	58	3	0
R-134	EW No. 3.3	NB No. 3.2	Hart Street	Residential	2	59	59	59	0	0	B(67)	--	59	0	0	59	0	0	59	0	0	59	0	0	59	0	0	58	1	0
R-135	EW No. 3.3	NB No. 3.2	Hart Street	Residential	2	61	61	62	1	1	B(67)	--	61	1	0	61	1	0	60	2	0	59	3	0	59	3	0	59	3	0
R-136	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	1	63	63	63	0	0	B(67)	--	63	0	0	62	1	0	62	1	0	62	1	0	61	2	0	61	2	0
R-137	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	1	61	61	61	0	0	B(67)	--	60	1	0	60	1	0	60	1	0	60	1	0	60	1	0	60	1	0
R-138			Roseton Avenue	Office	0	73	74	73	-1	0	E[5]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-139			Jersey Avenue	Light Industrial	0	73	74	74	0	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-140			Alburtis Avenue	Light Industrial	0	71	71	71	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-141			Alburtis Avenue	Office	0	65	66	65	-1	0	E[5]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-142	EW No. 4.1		167th Street	Vacant Land	0	56	57	58	1	2	G	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-143	EW No. 4.1		167th Street	Residential	3	57	57	59	2	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-144	EW No. 4.1		167th Street	Residential	2	56	57	59	2	3	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 2.13.14 Predicted Future Noise Level and Noise Barrier Analysis for the Build Alternative with Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment)

Receptor No.	Existing Wall No. [1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA L_{eq}(h)	Future Worst-Hour Noise Levels, dBA L_{eq}(h)																							
							2044 Noise Level				Activity Category (NAC)	Impact Type	Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR)																	
													6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
							Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions			L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR
R-145	EW No. 4.1		Pioneer Boulevard	Light Industrial	0	61	61	63	2	2	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-146	EW No. 4.1		168th Street	Residential	2	56	56	59	3	3	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-147	EW No. 4.1		168th Street	Residential	2	56	56	59	3	3	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-148	EW No. 4.1		168th Street	Residential	3	56	56	59	3	3	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-149	EW No. 4.1		168th Street	Residential	2	56	56	58	2	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-150	EW No. 4.1		168th Street	Residential	3	56	56	58	2	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-151	EW No. 4.1		168th Street	Residential	3	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-152	EW No. 4.1		168th Street	Residential	2	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-153	EW No. 4.1	NB No. 4.1	169th Street	Residential	2	60	61	62	1	2	B(67)	--	61	1	0	60	2	0	60	2	0	60	2	0	60	2	0	60	2	0
R-154	EW No. 4.1	NB No. 4.1	169th Street	Residential	2	61	62	63	1	2	B(67)	--	62	1	0	62	1	0	61	2	0	61	2	0	60	3	0	60	3	0
R-155	EW No. 4.2	NB No. 4.1	169th Street	Playground	1	65	65	**66**	1	1	C(67)	A/E	--	--	--	--	--	--	--	--	--	65	1	0	64	2	0	64	2	0
R-156	EW No. 4.2	NB No. 4.1	169th Street	Community Center	1	66 / 46[7]	67 / 47[7]	68 / 48[7]	1	2	D(52)	--	--	--	--	--	--	--	--	--	--	67	1	0	66	2	0	66	2	0
R-157	EW No. 4.2	NB No. 4.1	169th Street	Playground	1	64	65	65	0	1	C(67)	--	--	--	--	--	--	--	--	--	--	65	0	0	64	1	0	63	2	0
R-158	EW No. 4.2*		170th Street	Residential	2	65	65	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-159	EW No. 4.2*		170th Street	Residential	2	60	60	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-160	EW No. 4.2*		170th Street	Residential	2	59	59	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-161	EW No. 4.2*		170th Street	Residential	2	58	58	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-162	EW No. 4.2*		170th Street	Residential	2	62	63	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-163	EW No. 4.2*		170th Street	Residential	1	62	62	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-164	EW No. 4.2*		170th Street	Residential	1	63	64	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-165	EW No. 4.2*		170th Street	Residential	1	64	65	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-166	EW No. 4.2*		170th Street	Residential	2	64	65	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-167	EW No. 4.2*		170th Street	Residential	2	64	64	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-168	EW No. 4.2*		170th Street	Light Industrial	0	61	61	0	--	--	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-169	EW No. 4.3	NB No. 4.1	169th Street	Residential	2	61	62	63	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	63	0	0	62	1	0	62	1	0
R-170	EW No. 4.3	NB No. 4.1	169th Street	Residential	1	61	61	62	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	62	0	0	62	0	0	61	1	0
R-171	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	63	1	0	62	2	0	62	2	0
R-172	EW No. 4.2	NB No. 4.1	169th Street	Residential	1	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	64	0	0	63	1	0	62	2	0
R-173	EW No. 4.2	NB No. 4.1	169th Street	Day Care Center	1	63 / 43[7]	64 / 44[7]	64 / 44[7]	0	1	D(52)	--	--	--	--	--	--	--	--	--	--	64	0	0	63	1	0	62	2	0
R-174	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	64	0	0	63	1	0	62	2	0
R-175	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	64	0	0	63	1	0	62	2	0
R-176	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	64	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	1	0	62	2	0
R-177	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	63	63	**67**	4	4	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	65	2	0
R-178	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	**67**	4	5	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	65	2	0
R-179	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	63	63	**67**	4	4	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	65	2	0
R-180	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	64	64	**67**	3	3	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	65	2	0
R-181	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	64	65	**67**	2	3	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	65	2	0
R-182	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	64	65	**67**	2	3	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	65	2	0
R-183	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	65	65	**67**	2	2	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	**66**	1	0
R-184	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	61	61	64	3	3	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	1	0	62	2	0
R-185	EW No. 4.3*	NB No. 4.1	169th Street	Residential	3	60	60	64	4	4	B(67)	--	--	--	--	--	--	--	--	--	--	63	1	0	63	1	0	62	2	0
R-186	EW No. 4.3*	NB No. 4.1	169th Street	Residential	3	60	60	64	4	4	B(67)	--	--	--	--	--	--	--	--	--	--	64	0	0	63	1	0	62	2	0
R-187			168th Street	Vacant Land	0	65	65	NA	NA	NA	G	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-188	EW No. 4.1		168th Street	Residential	2	59	59	NA	NA	NA	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-189	EW No. 4.1		168th Street	Residential	3	55	56	NA	NA	NA	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-190	EW No. 4.1		169th Street	Residential	1	55	56	63	7	8	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-191	EW No. 4.1		169th Street	Residential	2	56	57	59	2	3	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-192	EW No. 4.1	NB No. 4.1	169th Street	Residential	3	57	58	59	1	2	B(67)	--	59	0	0	59	0	0	59	0	0	59	0	0	59	0	0	59	0	0
R-193	EW No. 4.1	NB No. 4.1	169th Street	Residential	3	58	58	59	1	1	B(67)	--	59	0	0	59	0	0	59	0	0	59	0	0	59	0	0	59	0	0
R-194	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	58	58	59	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	58	1	0	58	1	0	58	1	0
R-195	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	62	62	63	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	62	1	0	61	2	0	61	2	0
R-196	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	61	61	62	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	61	1	0	61	1	0	60	2	0
R-197	EW No. 4.2	NB No. 4.1	169th Street	Residential	3	61	61	62	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	61	1	0	60	2	0	60	2	0

Table 2.13.14 Predicted Future Noise Level and Noise Barrier Analysis for the Build Alternative with Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment)

Receptor No.	Existing Wall No. [1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA L_{eq}(h)	Future Worst-Hour Noise Levels, dBA L_{eq}(h)																							
							2044 Noise Level				Activity Category (NAC)	Impact Type	Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR)																	
													6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
							Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions			L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR
R-198	EW No. 4.2	NB No. 4.1	169th Street	Residential	3	60	60	61	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	61	0	0	60	1	0	60	1	0
R-199	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	59	59	60	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	59	1	0	59	1	0	58	2	0
R-200	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	64	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	1	0	62	2	0
R-201	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	64	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	62	2	0	62	2	0
R-202	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	0	0	62	1	0
R-203	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	62	63	64	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	1	0	62	2	0
R-204	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	1	0	62	2	0
R-205	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	64	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	1	0	62	2	0
R-206	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	63	64	65	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	64	1	0	63	2	0
R-207	EW No. 4.3*	NB No. 4.1	169th Street	Residential	3	60	60	61	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	61	0	0	60	1	0	60	1	0
R-208	EW No. 4.3	NB No. 4.1	169th Street	Residential	3	60	61	61	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	61	0	0	61	0	0	61	0	0
R-209	EW No. 4.3	NB No. 4.1	169th Street	Residential	2	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	61	0	0	61	0	0	61	0	0
R-210	EW No. 4.1		168th Street	Residential	2	56	56	61	5	5	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-211	EW No. 4.2*	NB No. 4.1	168th Street	Residential	2	62	63	64	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	1	0	62	2	0
R-212	EW No. 4.2*	NB No. 4.1	168th Street	Residential	3	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	1	0	63	1	0
R-213	EW No. 4.2*	NB No. 4.1	168th Street	Residential	3	64	64	65	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	64	1	0	64	1	0
R-214	EW No. 4.3		Park Street	Light Industrial	0	66	66	66	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-215			Norwalk Boulevard	Gas Station	0	69	69	69	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-216			Norwalk Boulevard	Light Industrial	0	63	63	63	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Source: Compiled by LSA Associates, Inc. (2018).

1 An * represents an existing wall that would be demolished as part of the project. The existing wall would be reconstructed to match the existing height at a minimum.
2 A dash (–) indicates that no barrier was analyzed at this location because the modeled receptor would not approach or exceed the NAC.
3 Numbers in **bold** represent noise levels that approach or exceed the NAC.
4 Shaded cells indicate the approximate existing wall heights.
5 Activity Categories without outdoor frequent human use areas were not evaluated against the Noise Abatement Criteria (NAC).
6 Underlined numbers have been attenuated by at least 5 dBA (i.e., feasible wall height).
7 The exterior-to-interior noise level reduction was assumed to be 20 dBA lower because the building type is light frame with ordinary windows.

A/E = Approach or Exceed
dBA = A-weighted decibels
dBA L_{eq}(h) = equivalent continuous sound level measured per hour in A-weighted decibels
IL = Insertion Loss
NAC = Noise Abatement Criteria
NBR = Number of Benefited Receptors

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Table 2.13.15 Predicted Future Noise Level and Noise Barrier Analysis for the Build Alternative with Design Option 4 (Diamond Ramps)

Receptor No.	Existing Wall No. [1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA $L_{eq}(h)$	Future Worst-Hour Noise Levels, dBA $L_{eq}(h)$																							
							2044 Noise Level				Activity Category (NAC)	Impact Type	Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR)																	
													6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
							Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions			$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR
R-92			Beach Street	Light Industrial	0	74	74	75	1	1	F	--[2]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-93			Beach Street	Light Industrial	0	74	74	75	1	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-94	EW No. 3.1		Beach Street	Light Industrial	0	70	70	71	1	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-95	EW No. 3.1		Hyde Park Court	Park	1	63	63	64	1	1	C(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-96	EW No. 3.1		Hyde Park Court	Residential	2	50	51	51	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-97	EW No. 3.1		Hyde Park Court	Residential	2	49	49	49	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-98	EW No. 3.1		Hyde Park Court	Residential	2	49	50	50	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-99	EW No. 3.1		Hyde Park Court	Residential	2	50	50	50	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-100	EW No. 3.1		Belvedere Court	Residential	2	55	55	55	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-101	EW No. 3.1*	NB No. 3.1	169th Street	Residential	2	**67**[3]	**67**	**68**	1	1	B(67)	A/E	--[4]	--	--	--	--	--	--	--	--	--	--	--	**67**	1	0	**66**	2	0
R-102	EW No. 3.1*	NB No. 3.1	169th Street	Residential	3	**66**	**67**	**68**	1	2	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**67**	1	0	**66**	2	0
R-103	EW No. 3.1	NB No. 3.1	169th Street	Residential	3	**67**	**67**	**68**	1	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**68**	0	0	**66**	2	0
R-104	EW No. 3.1	NB No. 3.1	169th Street	Residential	3	65	65	**67**	2	2	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	65	2	0
R-105	EW No. 3.1	NB No. 3.1	169th Street	Residential	3	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	64	0	0	63	1	0
R-106	EW No. 3.1	NB No. 3.1	169th Street	Residential	3	63	63	65	2	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	64	1	0	63	2	0
R-107	EW No. 3.1	NB No. 3.1	169th Street	Residential	2	64	64	**66**	2	2	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	65	1	0	64	2	0
R-108	EW No. 3.1	NB No. 3.1	169th Street	Residential	1	60	61	61	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	61	0	0	60	1	0
R-109	EW No. 3.1	NB No. 3.1	169th Street	Residential	2	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	62	0	0	61	1	0
R-110	EW No. 3.1	NB No. 3.1	169th Street	Residential	2	62	62	63	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	62	1	0	62	1	0
R-111	EW No. 3.1	NB No. 3.1	169th Street	Residential	2	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	1	0	63	1	0
R-112	EW No. 3.1	NB No. 3.1	169th Street	Residential	1	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	0	0	63	0	0
R-113	EW No. 3.1	NB No. 3.1	169th Street	Residential	2	65	65	65	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	65	0	0	64	1	0
R-114	EW No. 3.1	NB No. 3.1	169th Street	Residential	2	62	62	63	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	62	1	0	62	1	0
R-115	EW No. 3.1	NB No. 3.1	169th Street	Residential	1	61	61	62	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	61	1	0	61	1	0
R-116	EW No. 3.1		Pioneer Boulevard	Hotel	1	64	65	66	1	2	E(72)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-117			Pioneer Boulevard	Restaurant	0	67	67	67	0	0	E[5]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-118			Pioneer Boulevard	Gas Station	0	65	65	65	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-119	EW No. 3.1		168th Street	Residential	1	56	57	57	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-120			Pioneer Boulevard	Gas Station	0	62	62	63	1	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-121			168th Street	Residential	1	57	57	57	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-122			Pioneer Boulevard	Light Industrial	0	59	59	60	1	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-123	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	2	**66**	**66**	**66**	0	0	B(67)	A/E	**66**	0	0	65	1	0	64	2	0	64	2	0	63	3	0	62	4	0
R-124	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	2	**66**	**66**	**66**	0	0	B(67)	A/E	**66**	0	0	65	1	0	64	2	0	63	3	0	63	3	0	62	4	0
R-125	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	3	65	65	65	0	0	B(67)	--	65	0	0	64	1	0	64	1	0	63	2	0	62	3	0	61	4	0
R-126	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	3	**67**	**67**	**67**	0	0	B(67)	A/E	**67**	0	0	65	2	0	64	3	0	63	4	0	63	4	0	62	5[6]	3
R-127	EW No. 3.3	NB No. 3.2	Jenkins Street	Residential	3	**67**	**67**	**67**	0	0	B(67)	A/E	**67**	0	0	65	2	0	65	2	0	64	3	0	63	4	0	62	5	3
R-128	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	2	65	**66**	**66**	0	1	B(67)	A/E	64	2	0	64	2	0	63	3	0	63	3	0	63	3	0	63	3	0
R-129	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	1	64	64	64	0	0	B(67)	--	63	1	0	63	1	0	63	1	0	62	2	0	62	2	0	62	2	0
R-130	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	1	65	65	65	0	0	B(67)	--	64	1	0	64	1	0	63	2	0	63	2	0	63	2	0	63	2	0
R-131	EW No. 3.3	NB No. 3.2	Baber Avenue	Residential	1	60	60	60	0	0	B(67)	--	60	0	0	59	1	0	59	1	0	59	1	0	59	1	0	59	1	0
R-132	EW No. 3.3	NB No. 3.2	Hart Street	Residential	2	59	60	59	-1	0	B(67)	--	59	0	0	59	0	0	59	0	0	59	0	0	59	0	0	59	0	0
R-133	EW No. 3.3	NB No. 3.2	Hart Street	Residential	3	61	61	61	0	0	B(67)	--	61	0	0	60	1	0	59	2	0	59	2	0	59	2	0	58	3	0
R-134	EW No. 3.3	NB No. 3.2	Hart Street	Residential	2	59	59	59	0	0	B(67)	--	59	0	0	59	0	0	59	0	0	59	0	0	59	0	0	58	1	0
R-135	EW No. 3.3	NB No. 3.2	Hart Street	Residential	2	61	61	62	1	1	B(67)	--	61	1	0	60	2	0	60	2	0	59	3	0	59	3	0	59	3	0
R-136	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	1	63	63	63	0	0	B(67)	--	63	0	0	62	1	0	62	1	0	62	1	0	61	2	0	61	2	0
R-137	EW No. 3.4	NB No. 3.2	Gard Avenue	Residential	1	61	61	61	0	0	B(67)	--	60	1	0	60	1	0	60	1	0	60	1	0	60	1	0	60	1	0
R-138			Roseton Avenue	Office	0	73	74	73	-1	0	E[5]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-139			Jersey Avenue	Light Industrial	0	73	74	73	-1	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-140			Alburtis Avenue	Light Industrial	0	71	71	71	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-141			Alburtis Avenue	Office	0	65	66	66	0	1	E[5]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-142	EW No. 4.1		167th Street	Vacant Land	0	56	57	57	0	1	G	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 2.13.15 Predicted Future Noise Level and Noise Barrier Analysis for the Build Alternative with Design Option 4 (Diamond Ramps)

Receptor No.	Existing Wall No. [1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA L_{eq}(h)	Future Worst-Hour Noise Levels, dBA L_{eq}(h)																								
							2044 Noise Level				Activity Category (NAC)	Impact Type	Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR)																	
													6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
							Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions			L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR
R-143	EW No. 4.1		167th Street	Residential	3	57	57	57	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-144	EW No. 4.1		167th Street	Residential	2	56	57	57	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-145	EW No. 4.1		Pioneer Boulevard	Light Industrial	0	61	61	61	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-146	EW No. 4.1		168th Street	Residential	2	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-147	EW No. 4.1		168th Street	Residential	2	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-148	EW No. 4.1		168th Street	Residential	3	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-149	EW No. 4.1		168th Street	Residential	2	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-150	EW No. 4.1		168th Street	Residential	3	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-151	EW No. 4.1		168th Street	Residential	3	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-152	EW No. 4.1		168th Street	Residential	2	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-153	EW No. 4.1	NB No. 4.1	169th Street	Residential	2	60	61	62	1	2	B(67)	--	61	1	0	60	2	0	60	2	0	60	2	0	59	3	0	59	3	0
R-154	EW No. 4.1	NB No. 4.1	169th Street	Residential	2	61	62	63	1	2	B(67)	--	62	1	0	61	2	0	61	2	0	61	2	0	60	3	0	59	4	0
R-155	EW No. 4.2	NB No. 4.1	169th Street	Playground	1	65	65	**66**	1	1	C(67)	A/E	--	--	--	--	--	--	--	--	--	65	1	0	64	2	0	64	2	0
R-156	EW No. 4.2	NB No. 4.1	169th Street	Community Center	1	66 / 46[7]	67 / 47[7]	68 / 48[7]	1	2	D(52)	--	--	--	--	--	--	--	--	--	--	67	1	0	66	2	0	66	2	0
R-157	EW No. 4.2	NB No. 4.1	169th Street	Playground	1	64	65	65	0	1	C(67)	--	--	--	--	--	--	--	--	--	--	65	0	0	64	1	0	63	2	0
R-158	EW No. 4.2*		170th Street	Residential	2	65	65	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-159	EW No. 4.2*		170th Street	Residential	2	60	60	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-160	EW No. 4.2*		170th Street	Residential	2	59	59	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-161	EW No. 4.2*		170th Street	Residential	2	58	58	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-162	EW No. 4.2*		170th Street	Residential	2	62	63	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-163	EW No. 4.2*		170th Street	Residential	1	62	62	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-164	EW No. 4.2*		170th Street	Residential	1	63	64	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-165	EW No. 4.2*		170th Street	Residential	1	64	65	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-166	EW No. 4.2*		170th Street	Residential	2	64	65	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-167	EW No. 4.2*		170th Street	Residential	2	64	64	0	--	--	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-168	EW No. 4.2*		170th Street	Light Industrial	0	61	61	0	--	--	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-169	EW No. 4.3	NB No. 4.1	169th Street	Residential	2	61	62	62	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	62	0	0	61	1	0	61	1	0
R-170	EW No. 4.3	NB No. 4.1	169th Street	Residential	1	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	61	0	0	61	0	0	61	0	0
R-171	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	63	1	0	62	2	0	62	2	0
R-172	EW No. 4.2	NB No. 4.1	169th Street	Residential	1	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	64	0	0	63	1	0	62	2	0
R-173	EW No. 4.2	NB No. 4.1	169th Street	Day Care Center	1	63 / 43[7]	64 / 44[7]	64 / 44[7]	0	1	D(52)	--	--	--	--	--	--	--	--	--	--	64	0	0	63	1	0	62	2	0
R-174	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	64	0	0	63	1	0	62	2	0
R-175	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	64	0	0	63	1	0	62	2	0
R-176	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	64	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	1	0	62	2	0
R-177	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	63	63	**67**	4	4	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	65	2	0
R-178	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	**67**	4	5	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	65	2	0
R-179	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	63	63	**67**	4	4	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	65	2	0
R-180	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	64	64	**67**	3	3	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	65	2	0
R-181	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	64	65	**67**	2	3	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	65	2	0
R-182	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	64	65	**67**	2	3	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	65	2	0
R-183	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	65	65	**67**	2	2	B(67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	**66**	1	0	65	2	0
R-184	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	61	61	63	2	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	62	1	0	62	1	0
R-185	EW No. 4.3*	NB No. 4.1	169th Street	Residential	3	60	60	63	3	3	B(67)	--	--	--	--	--	--	--	--	--	--	63	0	0	62	1	0	62	1	0
R-186	EW No. 4.3*	NB No. 4.1	169th Street	Residential	3	60	60	63	3	3	B(67)	--	--	--	--	--	--	--	--	--	--	63	0	0	62	1	0	62	1	0
R-187			168th Street	Vacant Land	0	65	65	65	0	0	G	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-188	EW No. 4.1		168th Street	Residential	2	59	59	59	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-189	EW No. 4.1		168th Street	Residential	3	55	56	56	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-190	EW No. 4.1		169th Street	Residential	1	55	56	56	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-191	EW No. 4.1		169th Street	Residential	2	56	57	58	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-192	EW No. 4.1	NB No. 4.1	169th Street	Residential	3	57	58	59	1	2	B(67)	--	59	0	0	59	0	0	59	0	0	59	0	0	59	0	0	58	1	0
R-193	EW No. 4.1	NB No. 4.1	169th Street	Residential	3	58	58	60	2	2	B(67)	--	59	1	0	59	1	0	59	1	0	59	1	0	59	1	0	59	1	0
R-194	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	58	58	59	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	59	0	0	59	0	0	58	1	0

Table 2.13.15 Predicted Future Noise Level and Noise Barrier Analysis for the Build Alternative with Design Option 4 (Diamond Ramps)

Receptor No.	Existing Wall No. [1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA $L_{eq}(h)$	Future Worst-Hour Noise Levels, dBA $L_{eq}(h)$: 2044 Noise Level: Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions	Activity Category (NAC)	Impact Type	Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR): 6 feet $L_{eq}(h)$	6 feet I.L.	6 feet NBR	8 feet $L_{eq}(h)$	8 feet I.L.	8 feet NBR	10 feet $L_{eq}(h)$	10 feet I.L.	10 feet NBR	12 feet $L_{eq}(h)$	12 feet I.L.	12 feet NBR	14 feet $L_{eq}(h)$	14 feet I.L.	14 feet NBR	16 feet $L_{eq}(h)$	16 feet I.L.	16 feet NBR
R-195	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	62	62	63	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	63	0	0	62	1	0	62	1	0
R-196	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	61	61	62	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	61	1	0	61	1	0	61	1	0
R-197	EW No. 4.2	NB No. 4.1	169th Street	Residential	3	61	61	62	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	61	1	0	61	1	0	60	2	0
R-198	EW No. 4.2	NB No. 4.1	169th Street	Residential	3	60	60	61	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	61	0	0	60	1	0	60	1	0
R-199	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	59	59	60	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	59	1	0	59	1	0	59	1	0
R-200	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	64	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	1	0	62	2	0
R-201	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	64	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	1	0	62	2	0
R-202	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	0	0	62	1	0
R-203	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	62	63	64	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	1	0	62	2	0
R-204	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	1	0	63	1	0
R-205	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	64	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	1	0	63	1	0
R-206	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	63	64	65	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	64	1	0	64	1	0
R-207	EW No. 4.3*	NB No. 4.1	169th Street	Residential	3	60	60	61	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	60	1	0	60	1	0	60	1	0
R-208	EW No. 4.3	NB No. 4.1	169th Street	Residential	3	60	61	61	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	61	0	0	61	0	0	61	0	0
R-209	EW No. 4.3	NB No. 4.1	169th Street	Residential	2	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	61	0	0	61	0	0	61	0	0
R-210	EW No. 4.1		168th Street	Residential	2	56	56	57	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-211	EW No. 4.2*	NB No. 4.1	168th Street	Residential	2	62	63	64	1	2	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	1	0	62	2	0
R-212	EW No. 4.2*	NB No. 4.1	168th Street	Residential	3	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	63	1	0	63	1	0
R-213	EW No. 4.2*	NB No. 4.1	168th Street	Residential	3	64	64	65	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	64	1	0	64	1	0
R-214	EW No. 4.3		Park Street	Light Industrial	0	66	66	67	1	1	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-215			Norwalk Boulevard	Gas Station	0	69	69	69	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-216			Norwalk Boulevard	Light Industrial	0	63	63	63	0	0	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-217			Pioneer Boulevard	Restaurant	0	71	71	71	0	0	E[5]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-218			Pioneer Boulevard	Office/Classroom	0	70 / 45[8]	71 / 46[8]	71 / 46[8]	0	1	E/D(52)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-219	EW No. 4.1		Aclare Street	School Playground	1	63	63	63	0	0	C(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-220	EW No. 4.1		Aclare Street	School Classroom	1	62 / 47[9]	62 / 47[9]	62 / 47[9]	0	0	D(52)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-221	EW No. 4.6	NB No. 4.2	Palm Street	Residential	2	**67**	**67**	**67**	0	0	B(67)	A/E	--	--	--	--	--	--	--	--	--	**67**	0	0	**66**	1	0	**66**	1	0
R-222	EW No. 4.6	NB No. 4.2	Palm Street	Residential	3	**66**	**67**	**67**	0	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	**66**	1	0	65	2	0	65	2	0
R-223	EW No. 4.6	NB No. 4.2	Palm Street	Residential	2	**69**	**69**	**69**	0	0	B(67)	A/E	**69**	0	0	**68**	1	0	**67**	2	0	**66**	3	0	**66**	3	0	65	4	0
R-224	EW No. 4.6	NB No. 4.2	Horst Avenue	Residential	3	**69**	**69**	**69**	0	0	B(67)	A/E	**69**	0	0	**68**	1	0	**66**	3	0	**66**	3	0	65	4	0	64	5	3
R-225	EW No. 4.6	NB No. 4.2	Horst Avenue	Residential	1	**67**	**67**	**67**	0	0	B(67)	A/E	**67**	0	0	**66**	1	0	65	2	0	64	3	0	63	4	0	63	4	0
R-226	EW No. 4.6	NB No. 4.2	Ibex Ave	Residential	1	61	62	62	0	1	B(67)	--	62	0	0	61	1	0	60	2	0	59	3	0	58	4	0	58	4	0
R-227	EW No. 4.6		Ibex Ave	Residential	1	59	59	59	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-228	EW No. 4.6	NB No. 4.2	Hart Street	Residential	2	64	64	65	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	63	2	0	63	2	0	63	2	0
R-229	EW No. 4.6	NB No. 4.2	Grayland Avenue	Residential	1	65	**66**	**66**	0	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	64	2	0	64	2	0	63	3	0
R-230	EW No. 4.6	NB No. 4.2	Grayland Avenue	Residential	2	**68**	**68**	**68**	0	0	B(67)	A/E	**68**	0	0	**67**	1	0	**66**	2	0	64	4	0	64	4	0	63	5	2
R-231	EW No. 4.6	NB No. 4.2	Ibex Ave	Residential	1	63	63	63	0	0	B(67)	--	63	0	0	62	1	0	61	2	0	60	3	0	59	4	0	59	4	0
R-232	EW No. 4.6		Ibex Ave	Residential	1	59	59	59	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-233	EW No. 4.6	NB No. 4.2	Grayland Avenue	Residential	3	63	64	64	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	63	1	0	62	2	0	62	2	0
R-234	EW No. 4.6	NB No. 4.2	Grayland Avenue	Residential	2	**66**	**66**	**66**	0	0	B(67)	A/E	**66**	0	0	65	1	0	64	2	0	62	4	0	62	4	0	62	4	0
R-235	EW No. 4.6	NB No. 4.2	Horst Avenue	Residential	2	63	63	63	0	0	B(67)	--	63	0	0	62	1	0	61	2	0	60	3	0	60	3	0	59	4	0
R-236	EW No. 4.6		Ibex Ave	Residential	1	57	57	57	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-237	EW No. 4.7		Napoli Drive	Residential	2	57	58	58	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-238	EW No. 4.7		Napoli Drive	Residential	2	55	56	56	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-239	EW No. 4.7		Napoli Drive	Residential	1	54	54	55	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-240	EW No. 4.7		Napoli Drive	Residential	2	55	55	55	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-241	EW No. 4.7		Napoli Drive	Residential	1	55	55	55	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-242		NB No. 5.1	Cuesta Drive	School Playground	1	**67**	**67**	**67**	0	0	C(67)	A/E	65	2	0	65	2	0	64	3	0	63	4	0	62	5	1	61	6	1
R-243	EW No. 5.1	NB No. 5.1	Cuesta Drive	School Classroom	1	62 / 42[7]	62 / 42[7]	63 / 43[7]	1	1	D(52)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	62	1	0
R-244	EW No. 5.1	NB No. 5.1	Cuesta Drive	School Classroom	1	64 / 37[9]	64 / 37[9]	65 / 38[9]	1	1	D(52)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	65	0	0
R-245	EW No. 5.2*	NB No. 5.2	Cuesta Drive	School Sports Area	1	63	63	65	2	2	C(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	64	1	0
R-246	EW No. 5.2*	NB No. 5.2	Rancho Vista Drive	Residential	1	65	65	**66**	1	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	64	2	0	63	3	0	62	4	0

Table 2.13.15 Predicted Future Noise Level and Noise Barrier Analysis for the Build Alternative with Design Option 4 (Diamond Ramps)

Receptor No.	Existing Wall No. [1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA L_{eq}(h)	2044 Noise Level: Without Project, dBA L_{eq}	2044 Noise Level: With Project, dBA L_{eq}	2044 Noise Level: With Project Minus No Project Conditions	2044 Noise Level: With Project Minus Existing Conditions	Activity Category (NAC)	Impact Type	6 feet: L_{eq}(h)	6 feet: I.L.	6 feet: NBR	8 feet: L_{eq}(h)	8 feet: I.L.	8 feet: NBR	10 feet: L_{eq}(h)	10 feet: I.L.	10 feet: NBR	12 feet: L_{eq}(h)	12 feet: I.L.	12 feet: NBR	14 feet: L_{eq}(h)	14 feet: I.L.	14 feet: NBR	16 feet: L_{eq}(h)	16 feet: I.L.	16 feet: NBR
													Future Worst-Hour Noise Levels, dBA L_{eq}(h) — Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR)																	
R-247	EW No. 5.2*	NB No. 5.2	Rancho Vista Drive	Residential	1	65	**66**	**67**	1	2	B(67)	A/E	--	--	--	--	--	--	--	--	--	65	2	0	64	3	0	63	4	0
R-248	EW No. 5.2*	NB No. 5.2	Rancho Vista Drive	Residential	1	64	64	65	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	64	1	0	64	1	0	64	1	0
R-249	EW No. 5.2*	NB No. 5.2	Rancho Vista Drive	Residential	1	64	64	65	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	64	1	0	64	1	0	64	1	0
R-250	EW No. 5.2*		Rancho Vista Drive	Residential	1	64	64	65	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-251	EW No. 5.2*		Rancho Vista Drive	Residential	1	64	64	65	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-252	EW No. 5.2		Rancho Vista Drive	Residential	1	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-253	EW No. 5.2		Rancho Vista Drive	Residential	1	62	63	63	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-254	EW No. 5.2		Rancho Vista Drive	Residential	1	62	62	63	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-255	EW No. 5.2		Sierra Vista Way	Residential	1	62	62	63	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-256	EW No. 5.2		Sierra Vista Way	Residential	1	59	59	62	3	3	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-257	EW No. 5.2		Sierra Vista Way	Residential	1	59	60	62	2	3	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-258	EW No. 5.2		Sierra Vista Way	Residential	0	54	54	55	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-259	EW No. 5.2		Sierra Vista Way	Residential	1	61	61	61	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-260	EW No. 5.2		Sierra Vista Way	Residential	1	63	63	64	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-261	EW No. 5.2		Sierra Vista Way	Residential	1	60	60	61	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-262	EW No. 5.2*	NB No. 5.2	Judy Way	Residential	1	65	65	**66**	1	1	B(67)	A/E	--	--	--	--	--	--	--	--	--	65	1	0	65	1	0	65	1	0
R-263	EW No. 5.2*	NB No. 5.2	Cedarwood Court	Residential	1	61	62	62	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	62	0	0	62	0	0	62	0	0
R-264	EW No. 5.2		Cedarwood Court	Residential	1	60	60	61	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-265	EW No. 5.2		Chapparal Ave	Residential	1	58	58	59	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-266	EW No. 5.2		Chapparal Ave	Residential	1	58	58	59	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-267	EW No. 5.2		Sierra Vista Way	Residential	1	58	59	59	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-268	EW No. 5.2*	NB No. 5.2	Judy Way	Residential	1	65	65	65	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	65	0	0	65	0	0	65	0	0
R-269	EW No. 5.2*	NB No. 5.2	Judy Way	Residential	1	62	62	62	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	62	0	0	62	0	0	62	0	0
R-270	EW No. 5.2		Chapparal Ave	Residential	1	60	60	61	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-271	EW No. 5.2		Chapparal Ave	Residential	1	58	58	59	1	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-272	EW No. 5.2		Sierra Vista Way	Residential	1	57	58	58	0	1	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-273	EW No. 5.13		Norwalk Boulevard	Office/Classroom	0	66 / 41[8]	66 / 41[8]	66 / 41[8]	0	0	E/D(52)[5]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-274	EW No. 5.5	NB No. 5.3	Palm Street	Residential	1	65	65	65	0	0	B(67)	--	--	--	--	65	0	0	64	1	0	64	1	0	63	2	0	63	2	0
R-275	EW No. 5.5	NB No. 5.3	Palm Street	Residential	2	65	65	65	0	0	B(67)	--	--	--	--	65	0	0	64	1	0	64	1	0	63	2	0	63	2	0
R-276	EW No. 5.5	NB No. 5.3	Palm Street	Residential	3	**66**	**66**	**66**	0	0	B(67)	A/E	--	--	--	**66**	0	0	65	1	0	65	1	0	64	2	0	64	2	0
R-277	EW No. 5.5	NB No. 5.3	Palm Street	Residential	3	**67**	**67**	**67**	0	0	B(67)	A/E	--	--	--	**67**	0	0	**66**	1	0	65	2	0	65	2	0	64	3	0
R-278	EW No. 5.5	NB No. 5.3	Palm Street	Residential	3	64	64	64	0	0	B(67)	--	--	--	--	64	0	0	63	1	0	62	2	0	62	2	0	61	3	0
R-279	EW No. 5.5	NB No. 5.3	Palm Street	Residential	2	65	**66**	**66**	0	1	B(67)	A/E	--	--	--	65	1	0	64	2	0	64	2	0	63	3	0	62	4	0
R-280	EW No. 5.5	NB No. 5.3	Palm Street	Residential	2	65	65	65	0	0	B(67)	--	--	--	--	65	0	0	64	1	0	63	2	0	62	3	0	62	3	0
R-281	EW No. 5.5	NB No. 5.3	Autumn Breeze Street	Residential	2	65	65	65	0	0	B(67)	--	--	--	--	64	1	0	63	2	0	63	2	0	62	3	0	61	4	0
R-282	EW No. 5.5	NB No. 5.3	Autumn Breeze Street	Residential	3	**68**	**69**	**69**	0	1	B(67)	A/E	**68**	1	0	**67**	2	0	**67**	2	0	**66**	3	0	65	4	0	65	4	0
R-283	EW No. 5.5	NB No. 5.3	Autumn Breeze Street	Residential	3	**67**	**67**	**67**	0	0	B(67)	A/E	**67**	0	0	**66**	1	0	**66**	1	0	65	2	0	65	2	0	64	3	0
R-284	EW No. 5.5	NB No. 5.3	Autumn Breeze Street	Residential	3	**66**	**66**	**66**	0	0	B(67)	A/E	**66**	0	0	65	1	0	64	2	0	64	2	0	63	3	0	63	3	0
R-285	EW No. 5.5	NB No. 5.3	Evening Star Avenue	Residential	2	59	59	60	1	1	B(67)	--	60	0	0	59	1	0	59	1	0	58	2	0	58	2	0	58	2	0
R-286	EW No. 5.5	NB No. 5.3	Springsnow Circle	Residential	2	57	57	58	1	1	B(67)	--	58	0	0	57	1	0	57	1	0	57	1	0	57	1	0	57	1	0
R-287	EW No. 5.5		Springsnow Circle	Residential	1	56	56	56	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-288	EW No. 5.5		Summerwind Street	Residential	2	60	60	60	0	0	B(67)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-289	EW No. 5.5	NB No. 5.3	Palm Street	Residential	1	**67**	**67**	**67**	0	0	B(67)	A/E	--	--	--	**67**	0	0	**66**	1	0	65	2	0	65	2	0	64	3	0
R-290	EW No. 5.5	NB No. 5.3	Ely Avenue	Residential	2	63	63	63	0	0	B(67)	--	--	--	--	63	0	0	63	0	0	63	0	0	62	1	0	61	2	0
R-291	EW No. 5.5	NB No. 5.3	Ely Avenue	Residential	2	62	62	62	0	0	B(67)	--	--	--	--	62	0	0	62	0	0	62	0	0	61	1	0	61	1	0
R-292	EW No. 5.5	NB No. 5.3	Janell Avenue	Residential	2	60	60	60	0	0	B(67)	--	--	--	--	60	0	0	60	0	0	59	1	0	59	1	0	58	2	0
R-293	EW No. 5.5	NB No. 5.3	Morningrain Avenue	Residential	1	62	62	62	0	0	B(67)	--	--	--	--	62	0	0	61	1	0	60	2	0	60	2	0	59	3	0
R-294	EW No. 5.5	NB No. 5.3	Autumn Breeze Street	Residential	2	60	60	61	1	1	B(67)	--	60	1	0	60	1	0	60	1	0	60	1	0	59	2	0	59	2	0
R-295	EW No. 5.5	NB No. 5.3	Autumn Breeze Street	Residential	3	59	60	60	0	1	B(67)	--	60	0	0	60	0	0	60	0	0	59	1	0	59	1	0	59	1	0
R-296	EW No. 5.5	NB No. 5.3	Autumn Breeze Street	Residential	1	60	60	60	0	0	B(67)	--	60	0	0	60	0	0	60	0	0	60	0	0	60	0	0	59	1	0
R-297	EW No. 5.5	NB No. 5.3	Springsnow Circle	Residential	1	54	54	54	0	0	B(67)	--	54	0	0	54	0	0	53	1	0	53	1	0	53	1	0	53	1	0
R-298	EW No. 5.5	NB No. 5.3	Cortner Avenue	Residential	1	65	65	65	0	0	B(67)	--	--	--	--	65	0	0	64	1	0	64	1	0	63	2	0	63	2	0

Table 2.13.15 Predicted Future Noise Level and Noise Barrier Analysis for the Build Alternative with Design Option 4 (Diamond Ramps)

Receptor No.	Existing Wall No. [1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA $L_{eq}(h)$	Future Worst-Hour Noise Levels, dBA $L_{eq}(h)$																							
							2044 Noise Level						Noise Prediction With Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR)																	
													6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
							Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions	Activity Category (NAC)	Impact Type	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR
R-299	EW No. 5.5	NB No. 5.3	Ely Avenue	Residential	2	62	62	62	0	0	B(67)	--	--	--	--	62	0	0	61	1	0	61	1	0	60	2	0	60	2	0
R-300	EW No. 5.5	NB No. 5.3	Ely Avenue	Residential	2	60	61	61	0	1	B(67)	--	--	--	--	61	0	0	60	1	0	60	1	0	59	2	0	59	2	0
R-301	EW No. 5.5	NB No. 5.3	Janell Avenue	Residential	2	58	58	58	0	0	B(67)	--	--	--	--	58	0	0	58	0	0	57	1	0	57	1	0	56	2	0
R-302	EW No. 5.5	NB No. 5.3	Stark Avenue	Residential	1	60	60	60	0	0	B(67)	--	--	--	--	60	0	0	59	1	0	59	1	0	58	2	0	58	2	0
R-303	EW No. 5.5	NB No. 5.3	Springsnow Circle	Residential	1	53	54	53	-1	0	B(67)	--	53	0	0	53	0	0	53	0	0	53	0	0	53	0	0	53	0	0

Source: Compiled by LSA Associates, Inc. (2018).
[1] An * represents an existing wall that would be demolished as part of the project. The existing wall would be reconstructed to match the existing height at a minimum.
[2] A dash (–) indicates that no barrier was analyzed at this location because the modeled receptor would not approach or exceed the NAC.
[3] Numbers in **bold** represent noise levels that approach or exceed the NAC.
[4] Shaded cells indicate the approximate existing wall heights.
[5] Activity Categories without outdoor frequent human use areas were not evaluated against the Noise Abatement Criteria (NAC).
[6] Underlined numbers have been attenuated by at least 5 dBA (i.e., feasible wall height).
[7] The exterior-to-interior noise level reduction was assumed to be 20 dBA lower because the building type is light frame with ordinary windows.
[8] The exterior-to-interior noise level reduction was assumed to be 25 dBA lower because the building type is light frame with storm windows or masonry with single glazed windows.
[9] The exterior-to-interior noise level reduction was based on simultaneous exterior and interior measurements.
A/E = Approach or Exceed
dBA = A-weighted decibels
dBA $L_{eq}(h)$ = equivalent continuous sound level measured per hour in A-weighted decibels
IL = Insertion Loss
NAC = Noise Abatement Criteria
NBR = Number of Benefited Receptors

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Build Alternative

The following receptor locations would be or would continue to be exposed to noise levels that approach or exceed the NAC under the Build Alternative.

- **Receptors R-5 through R-7, R-15, and R-16:** These receptor locations represent existing single-family residences located along Monica Circle, Carla Plaza, and Petula Place on the northbound side of I-605, between Alondra Boulevard and SR-91. Currently, an existing 8.1 ft high private property wall shields these residences. One noise barrier (Noise Barrier [NB] No. 1.1) was modeled along the property line to shield these residences.
- **Receptors R-44, R-47, R-60, and R-67:** These receptor locations represent existing single-family residences located along Westwinds Circle and Coral Reef Circle on the westbound side of SR-91, near the SR-91 westbound connector to I-605. Currently, an existing 6 to 11 ft high State ROW wall shields the residences. Four noise barrier locations were evaluated separately for their ability to shield these receptors and to compare their effectiveness. NB No. 2.1 was modeled along the State ROW on the westbound side of SR-91 to shield these residences. NB No. 2.2 was modeled at an alternate location along the edge of the shoulder on the westbound side of SR-91 to shield these residences. NB No. 2.1a was modeled as a reduced version of NB No. 2.1 along the State ROW. NB No. 2.2a was modeled as a reduced version of NB No. 2.2 along the edge of the shoulder and private property line on the westbound side of SR-91 to shield these residences.
- **Receptor R-77:** This receptor location represents an active sport area of a school located along Studebaker Road on the eastbound side of SR-91, near the SR-91 eastbound on-ramp from Studebaker Road. Currently, an existing 6.2 to 6.9 ft high private property wall shields the playground. One noise barrier (NB No. 2.3) was modeled along the private property line to shield the active sports area.
- **Receptors R-101 through R-104 and R-107:** These receptor locations represent existing single-family residences along 169th Street on the westbound side of SR-91, near the SR-91 westbound on-ramp from Pioneer Boulevard. Currently, an existing 12.4 to 13.1 ft high private property wall shields these residences. Two noise barrier locations were evaluated separately to shield these receptors and to compare the effectiveness of the two barriers. NB No. 3.1 was modeled along the private property line to shield these residences. NB No. 3.3 was modeled at an alternate location along the edge of the shoulder on the westbound side of SR-91 to shield these residences.

- **Receptors R-123, R-124, and R-126 through R-128:** These receptor locations represent existing single-family residences located along Jenkins Street and Gard Avenue on the eastbound side of SR-91, between Gridley Road and Pioneer Boulevard. Currently, a combination of an existing 5.6 to 11.8 ft high private property wall and an existing 14.6 to 18.1 ft high private property wall shields these residences. One noise barrier (NB No. 3.2) was modeled along the private property line to shield these residences.
- **Receptors R-155 and R-177 through R-183:** These receptor locations represent existing single-family residences along 169th Street on the westbound side of SR-91, near the SR-91 westbound off-ramp to Pioneer Boulevard. Currently, a combination of an existing 15.8 to 16.2 ft high private property wall and an existing 11.3 to 13.4 ft high edge-of-shoulder wall shield these residences. Two noise barrier locations were evaluated separately to shield these receptors and to compare the effectiveness of the two barriers. NB No. 4.1 was modeled along the State ROW on the westbound side of SR-91 to shield these residences.
- **Receptors R-221 through R-225, R-229, R-230, and R-234:** These receptor locations represent existing single-family residences located along Palm Street, Grayland Avenue, and Horst Avenue on the eastbound side of SR-91, near the SR-91 eastbound off-ramp to Norwalk Boulevard. Currently, an existing 5.9 to 10 ft high private property wall shields these residences. One noise barrier (NB No. 4.2) was modeled along the private property line to shield these residences.
- **Receptor R-242:** This receptor location represents the playground of a school located along Norwalk Boulevard and Cuesta Drive on the westbound side of SR-91, near the SR-91 westbound off-ramp to Norwalk Boulevard. Currently, an existing 10.8 to 14.7 ft high private property wall shields the playground. One noise barrier (NB No. 5.1) was modeled along the private property line to shield the playground.
- **Receptors R-246 through R-249 and R-262:** These receptor locations represent existing multifamily residences along Rancho Vista Drive and Judy Way on the westbound side of SR-91, between Norwalk Boulevard and Bloomfield Avenue. Currently, an existing 9.6 to 12.4 ft high State ROW wall shields these residences. One noise barrier (NB No. 5.2) was modeled along the State ROW on the westbound side of SR-91 to shield these residences.
- **Receptors R-276, R-277, R-279, R-282 through R-284, and R-389:** These receptor locations represent existing single-family residences located along Palm Street and Autumn Breeze Street on the eastbound side of SR-91, between Norwalk Boulevard and Bloomfield Avenue. Currently, an existing 5.4 to 7.3 ft

high State ROW wall shields these residences. One noise barrier (NB No. 5.3) was modeled along the State ROW on the eastbound side of SR-91 to shield the residences.

- **Receptors R-344 through R-347, R-351, R-354, and R-355:** These receptor locations represent existing multifamily residences located along Bloomfield Avenue and Artesia Boulevard on the eastbound side of SR-91. Currently, no existing walls shield these residences. One noise barrier (NB No. 6.1) was modeled along the edge of the shoulder on the eastbound side of SR-91 to shield Receptors R-344 through R-347 and R-351. Noise barriers were not modeled for R-354 and R-355 because these receptors approach or exceed the NAC due to traffic on Bloomfield Avenue and not from traffic on SR-91, as shown in Table 2.13.16.

Noise Abatement Consideration

Noise abatement measures such as noise barriers were considered in order to shield receptors within the study area that would become or would continue to be exposed to traffic noise levels approaching or exceeding the NAC. All properties requiring abatement consideration are within Activity Categories B, C, D, and E (67, 67, 52, and 72 dBA L_{eq} NAC, respectively). Noise barriers were analyzed for each of these receptor locations. Depending on the location of the potential barrier and existing barrier height, noise barrier heights from 6 to 16 ft were analyzed at 2 ft increments.

Build Alternative

The Build Alternative proposes standard lane and shoulder widths and a 2 ft wide HOV lane buffer, and includes a Type L-7 westbound ramp configuration at Pioneer Boulevard. Within the project limits, westbound SR-91 would have five 12 ft wide mixed-flow lanes, a 10 ft wide left median shoulder, one 12 ft wide HOV lane with a 2 ft wide HOV buffer between the HOV and mixed-flow lanes, and one 12 ft wide auxiliary lane between certain successive on- and off-ramps. The locations of the modeled noise barriers for the Build Alternative are shown on Figure 2.13-3. The locations of the alternate noise barriers (NB Nos. 2.2 and 3.3) for the Build Alternative are shown on Figure 2.13-4. The locations of the reduced noise barriers (NB Nos. 2.1a and 2.2a) for the Build Alternative are shown on Figure 2.13-5. The following noise barriers were analyzed to shield receptor locations that would be exposed to traffic noise levels approaching or exceeding the NAC for the Build Alternative and are summarized in Tables 2.13.6 through 2.13.8:

Table 2.13.16 Bloomfield Avenue Noise Level Analysis

Receptor No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA L_{eq}(h)	Future Worst-Hour Noise Levels, dBA Leq(h)						
					2044 Noise Level						Activity Category (NAC)
					Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus No Project Conditions	With Project Minus Existing Conditions	SR-91 Without Bloomfield Avenue, dBA L_{eq}[1]	Bloomfield Avenue Without SR-91, dBA L_{eq}[2]	
R-342	Artesia Boulevard	Residential	2	63	63	64	1	1	62	58	B(67)
R-343	Artesia Boulevard	Residential	2	62	62	62	0	0	56	61	B(67)
R-348	Artesia Boulevard	Residential	4	63	63	63	0	0	51	63	B(67)
R-349	Artesia Boulevard	Residential	4	67	64	64	0	0	53	64	B(67)
R-354	Artesia Boulevard	Residential	1	**67**[3]	**67**	**68**	1	1	58	**67**	B(67)
R-355	Artesia Boulevard	Residential	1	**68**	**68**	**68**	0	0	61	**67**	B(67)

Source: Compiled by LSA Associates, Inc. (2018).

[1] Noise levels modeled with no traffic volumes on Bloomfield Avenue.

[2] Noise levels modeled with no traffic volumes on SR-91.

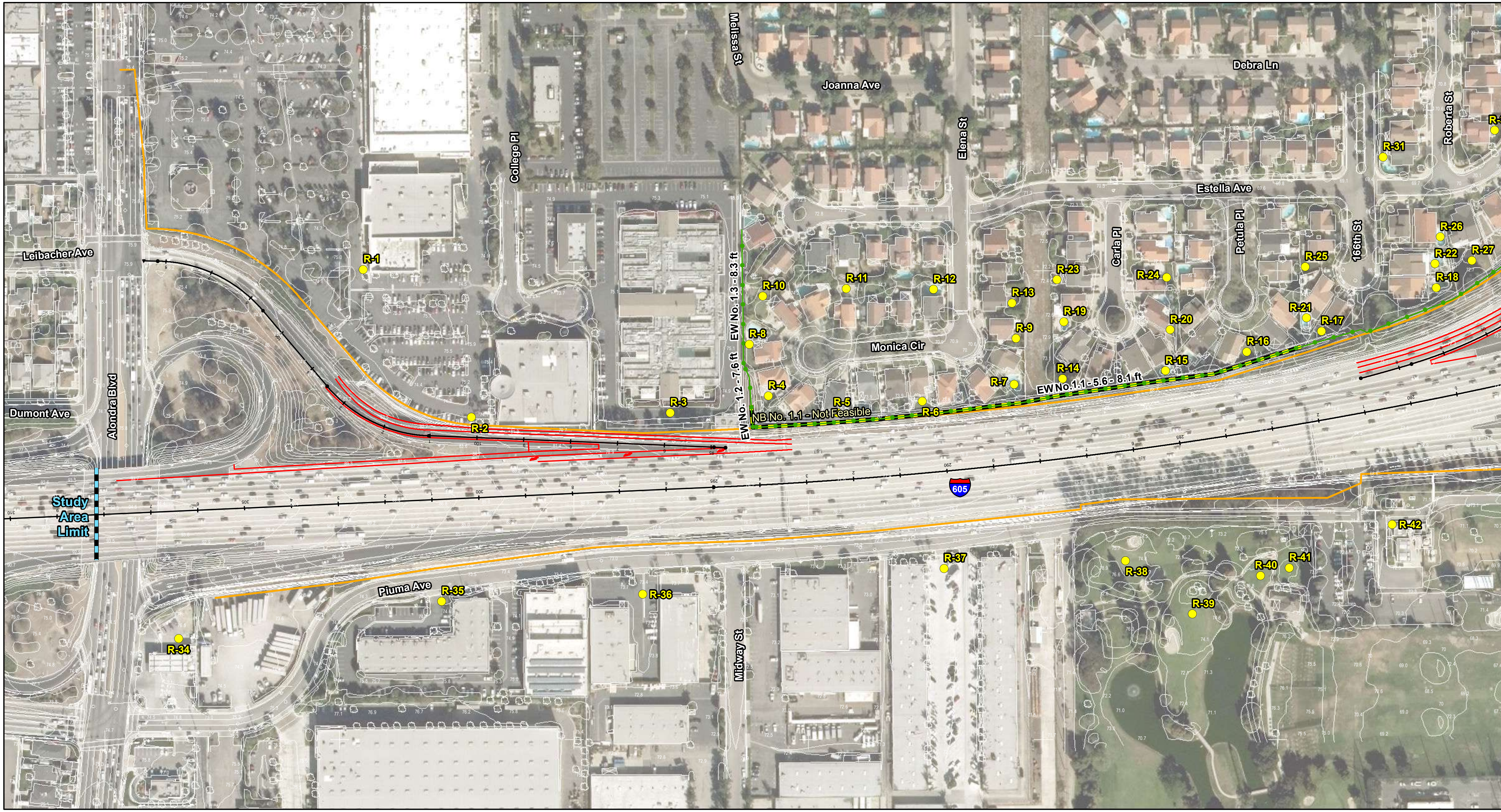
[3] Numbers in bold represent noise levels that approach or exceed the NAC.

dBA = A-weighted decibels

dBA L_{eq}(h) = equivalent continuous sound level measured per hour in A-weighted decibels

NAC = Noise Abatement Criteria

SR-91 = State Route 91



LEGEND

- Modeled Receptors*
- Build Alternative
- Existing Right-of-Way
- Proposed Right-Of-Way
- Existing Wall
- Existing Wall (Demolish)**
- Modeled Noise Barriers
- Acquisition

0 100 200
FEET

*Receptors R-118 and R-158 through R-168 are not shown because the properties would be acquired.
**The existing wall would be demolished as part of the project and replaced at the new location at a minimum.

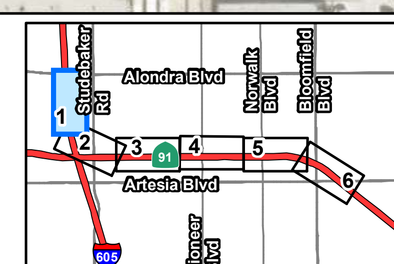


FIGURE 2.13-3
Sheet 1 of 6

Westbound SR-91 Improvement Project
Modeled Noise Barriers and Receptor Locations
Build Alternative
07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

SOURCE: Eagle Aerial (4/2014); Michael Baker (9/2017)
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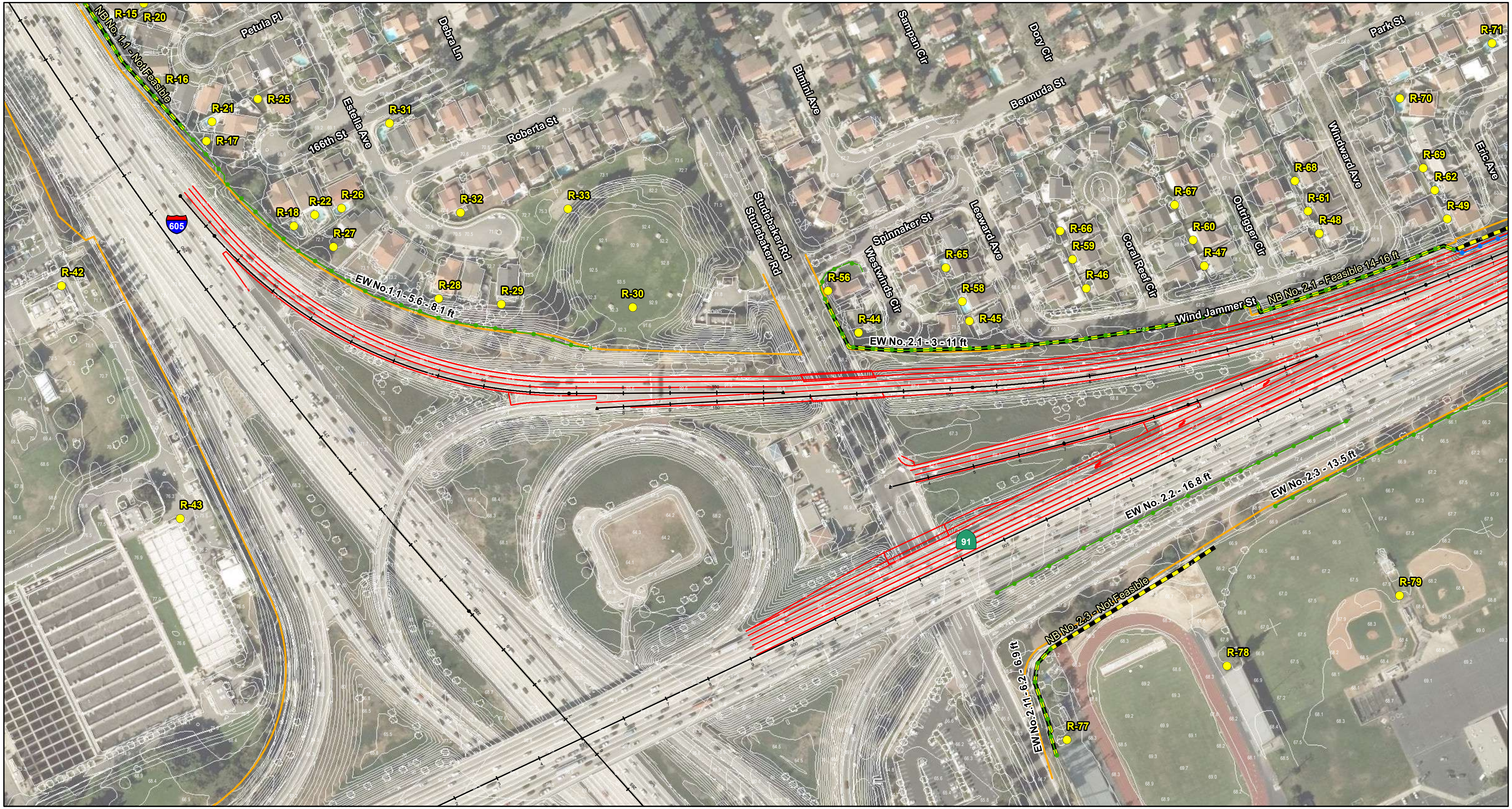

LEGEND

- Modeled Receptors*
- Build Alternative
- Existing Right-of-Way
- Proposed Right-Of-Way
- Existing Wall
- Existing Wall (Demolish)**
- Modeled Noise Barriers
- Acquisition

0 100 200
FEET

*Receptors R-118 and R-158 through R-168 are not shown because the properties would be acquired.
**The existing wall would be demolished as part of the project and replaced at the new location at a minimum.

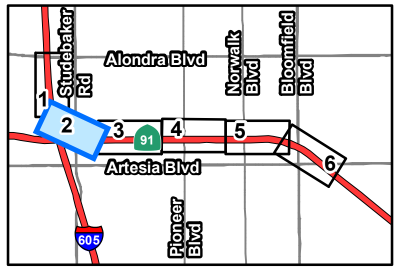

FIGURE 2.13-3
Sheet 2 of 6

Westbound SR-91 Improvement Project
Modeled Noise Barriers and Receptor Locations
Build Alternative

07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

SOURCE: Eagle Aerial (4/2014); Michael Baker (9/2017)
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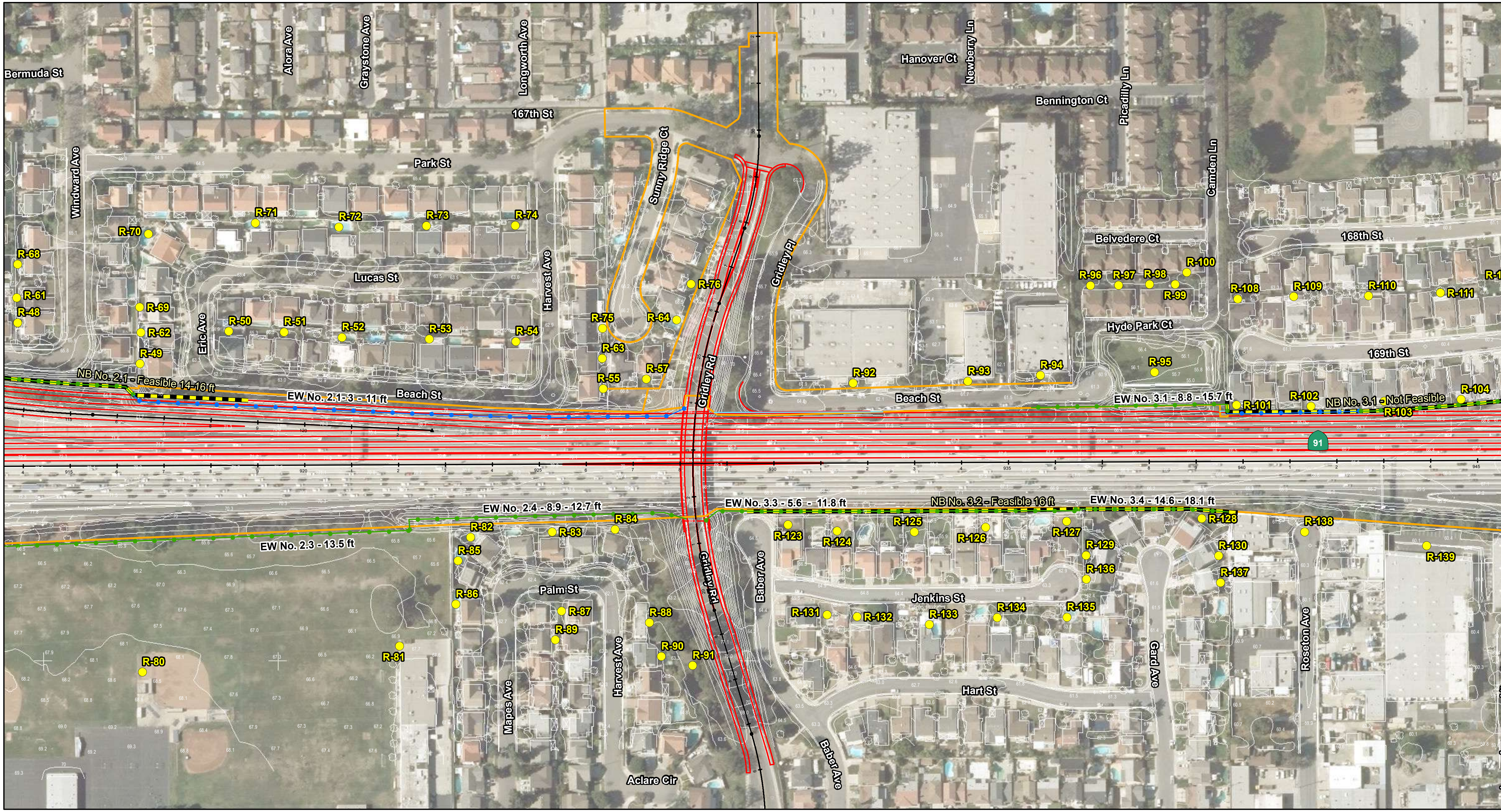

LEGEND

- Modeled Receptors*
- Build Alternative
- Existing Right-of-Way
- Proposed Right-Of-Way
- Existing Wall
- Existing Wall (Demolish)**
- Modeled Noise Barriers
- Acquisition

N

0 100 200
FEET

*Receptors R-118 and R-158 through R-168 are not shown because the properties would be acquired.
**The existing wall would be demolished as part of the project and replaced at the new location at a minimum.

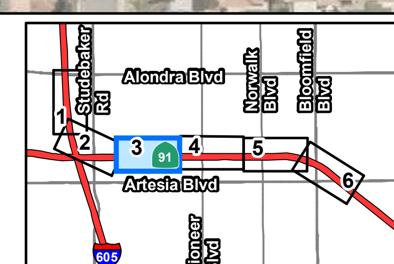

FIGURE 2.13-3
Sheet 3 of 6

Westbound SR-91 Improvement Project
Modeled Noise Barriers and Receptor Locations
Build Alternative
07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

SOURCE: Eagle Aerial (4/2014); Michael Baker (9/2017)
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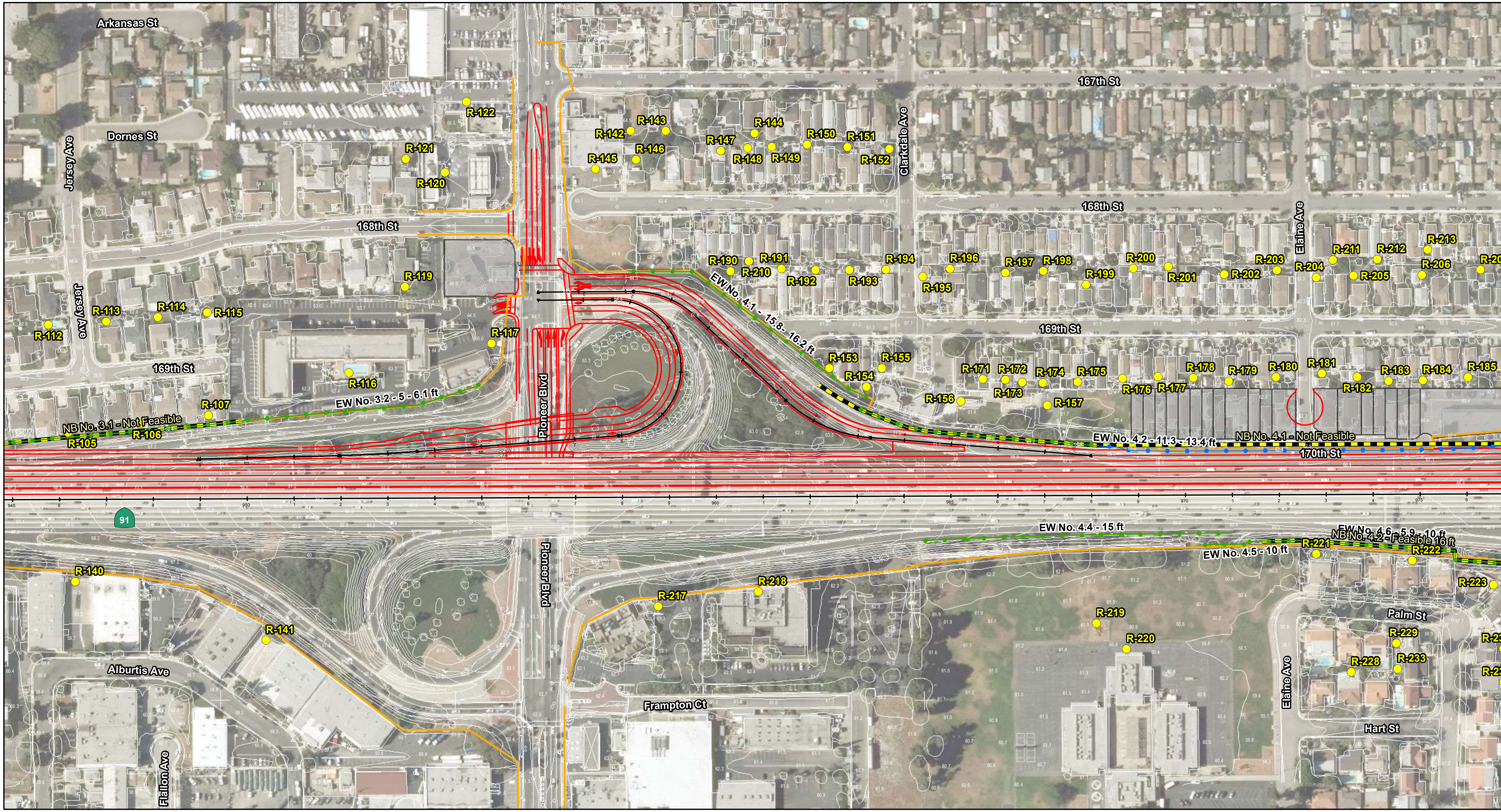

LEGEND

- Modeled Receptors*
- Build Alternative
- Existing Right-of-Way
- Proposed Right-Of-Way
- Existing Wall
- Existing Wall (Demolish)**
- Modeled Noise Barriers
- Acquisition

N

0 100 200
FEET

*Receptors R-118 and R-158 through R-168 are not shown because the properties would be acquired.
**The existing wall would be demolished as part of the project and replaced at the new location at a minimum.

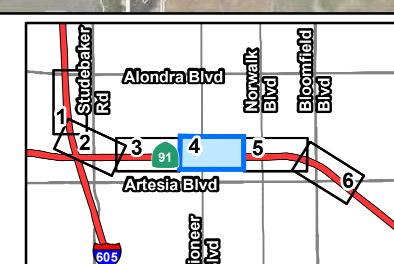

FIGURE 2.13-3
Sheet 4 of 6

Westbound SR-91 Improvement Project
Modeled Noise Barriers and Receptor Locations
Build Alternative
07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

SOURCE: Eagle Aerial (4/2014); Michael Baker (9/2017)
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LEGEND

- Modeled Receptors*
- Build Alternative
- Existing Right-of-Way
- Proposed Right-Of-Way
- Existing Wall
- Existing Wall (Demolish)**
- Modeled Noise Barriers
- Acquisition

0 100 200
FEET

*Receptors R-118 and R-158 through R-168 are not shown because the properties would be acquired.
**The existing wall would be demolished as part of the project and replaced at the new location at a minimum.

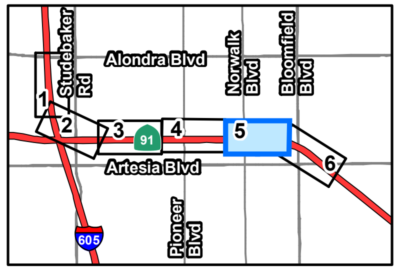

FIGURE 2.13-3
Sheet 5 of 6

Westbound SR-91 Improvement Project
Modeled Noise Barriers and Receptor Locations
Build Alternative
07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

SOURCE: Eagle Aerial (4/2014); Michael Baker (9/2017)
I:\RBF1601\GIS\MXD\Noise\ModeledNoiseBarriers.mxd (7/11/2018)

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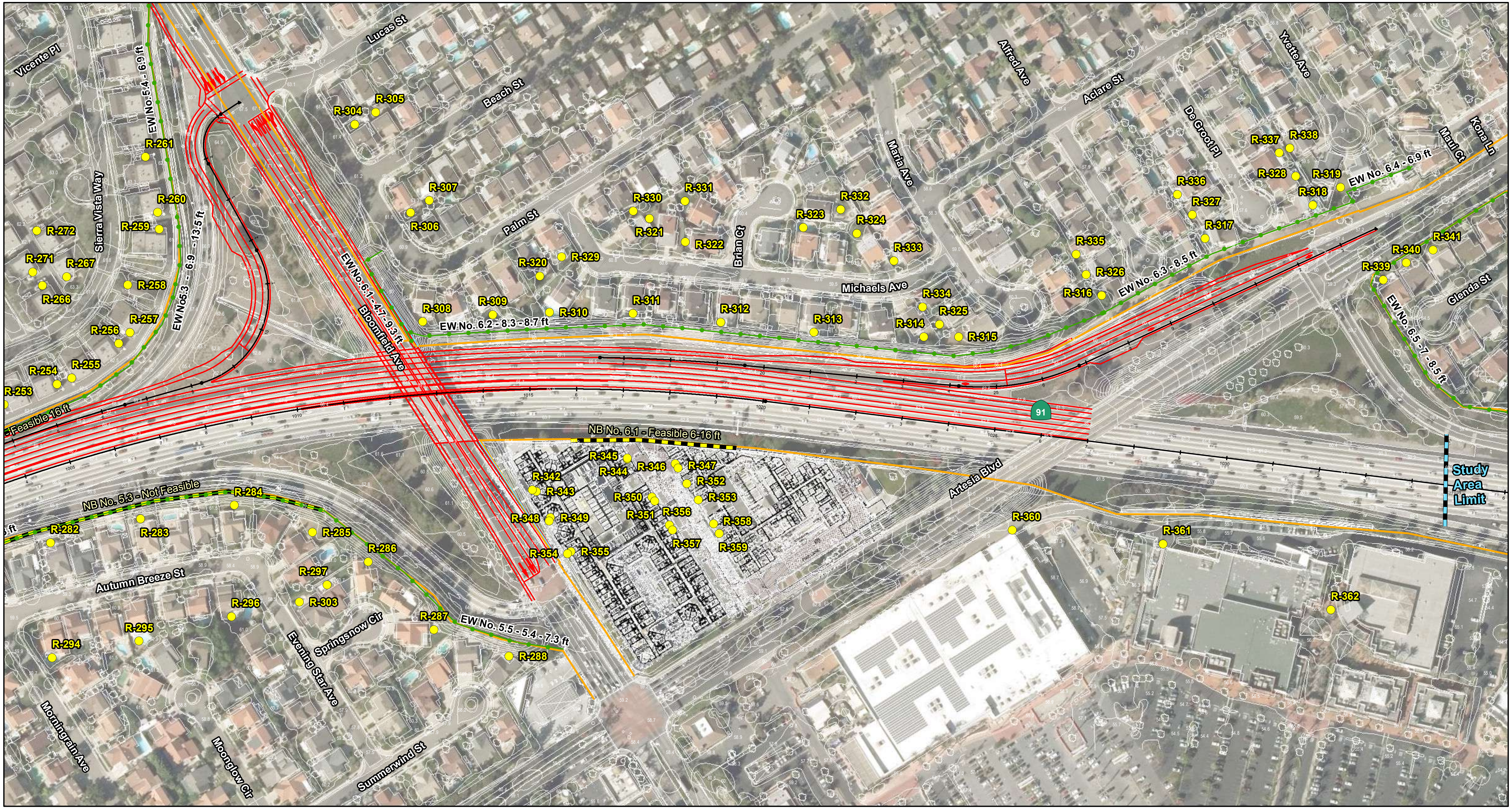

LEGEND

- Modeled Receptors*
- Build Alternative
- Existing Right-of-Way
- Proposed Right-Of-Way
- Existing Wall
- Existing Wall (Demolish)**
- Modeled Noise Barriers
- Acquisition

0 100 200
FEET

*Receptors R-118 and R-158 through R-168 are not shown because the properties would be acquired.
**The existing wall would be demolished as part of the project and replaced at the new location at a minimum.

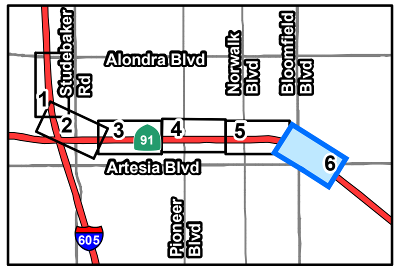

FIGURE 2.13-3
Sheet 6 of 6

Westbound SR-91 Improvement Project
Modeled Noise Barriers and Receptor Locations
Build Alternative
07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

SOURCE: Eagle Aerial (4/2014); Michael Baker (9/2017)
I:\RBF1601\GIS\MXD\Noise\ModeledNoiseBarriers.mxd (7/11/2018)

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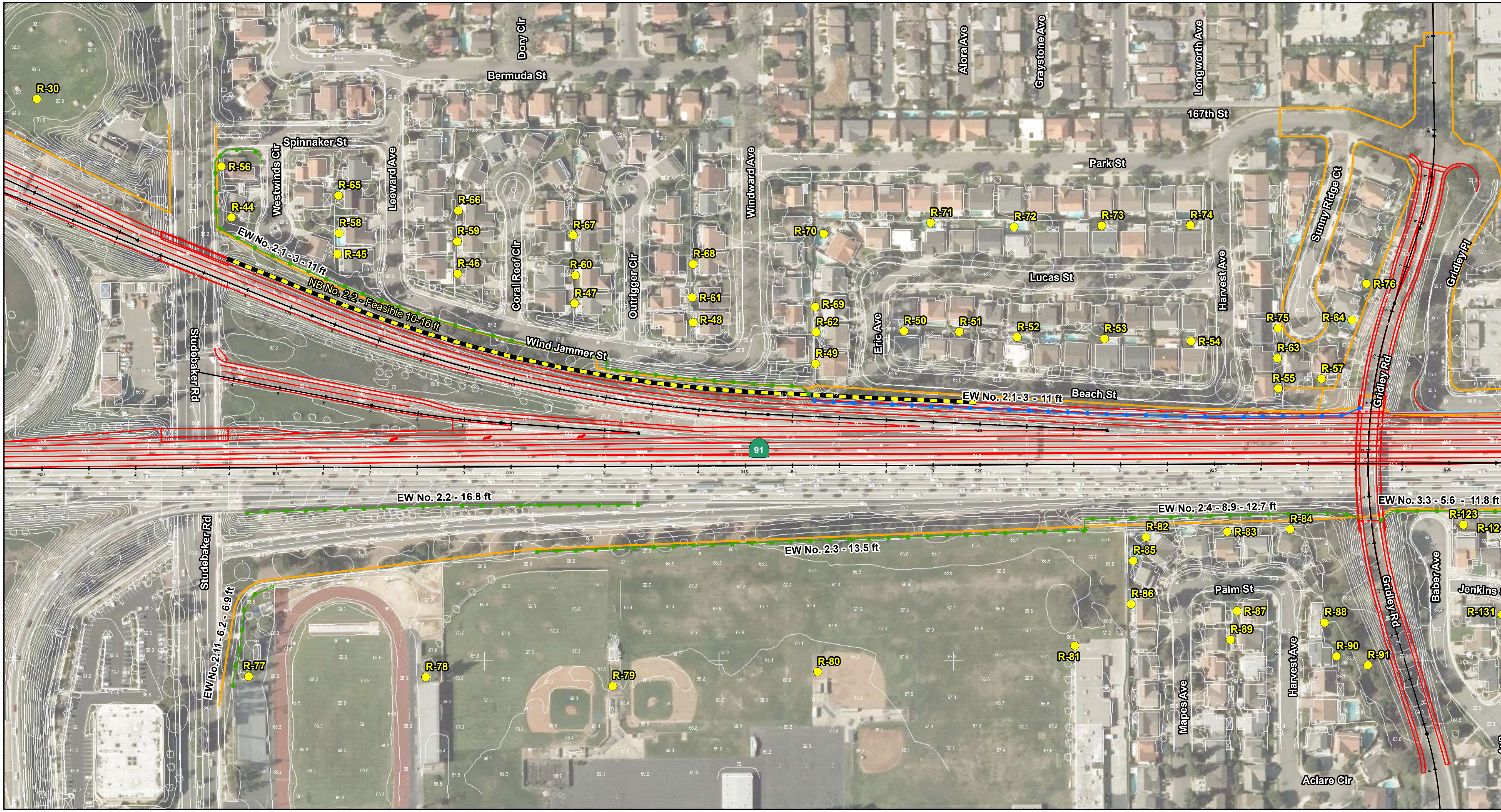
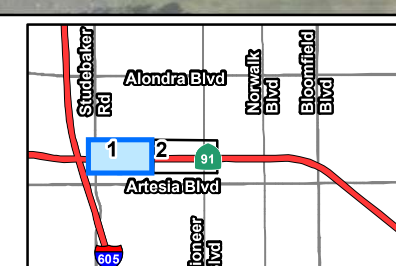


LEGEND

- Modeled Receptors*
- Build Alternative
- Existing Right-of-Way
- Proposed Right-of-Way
- Existing Wall
- Existing Wall (Demolish)**
- Modeled Noise Barriers
- Acquisition

0 100 200
FEET

*Receptor R-118 is not shown because the property would be acquired.
**The existing wall would be demolished as part of the project and replaced at the new location at a minimum.



SOURCE: Eagle Aerial (4/2014); Michael Baker (9/2017)

I:\RBF1601\GIS\MXD\Noise\ModeledNoiseBarriers_Alternate.mxd (7/11/2018)

FIGURE 2.13-4
Sheet 1 of 2

Westbound SR-91 Improvement Project

Modeled Noise Barriers and Receptor Locations
Build Alternative - Alternate Barriers

07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

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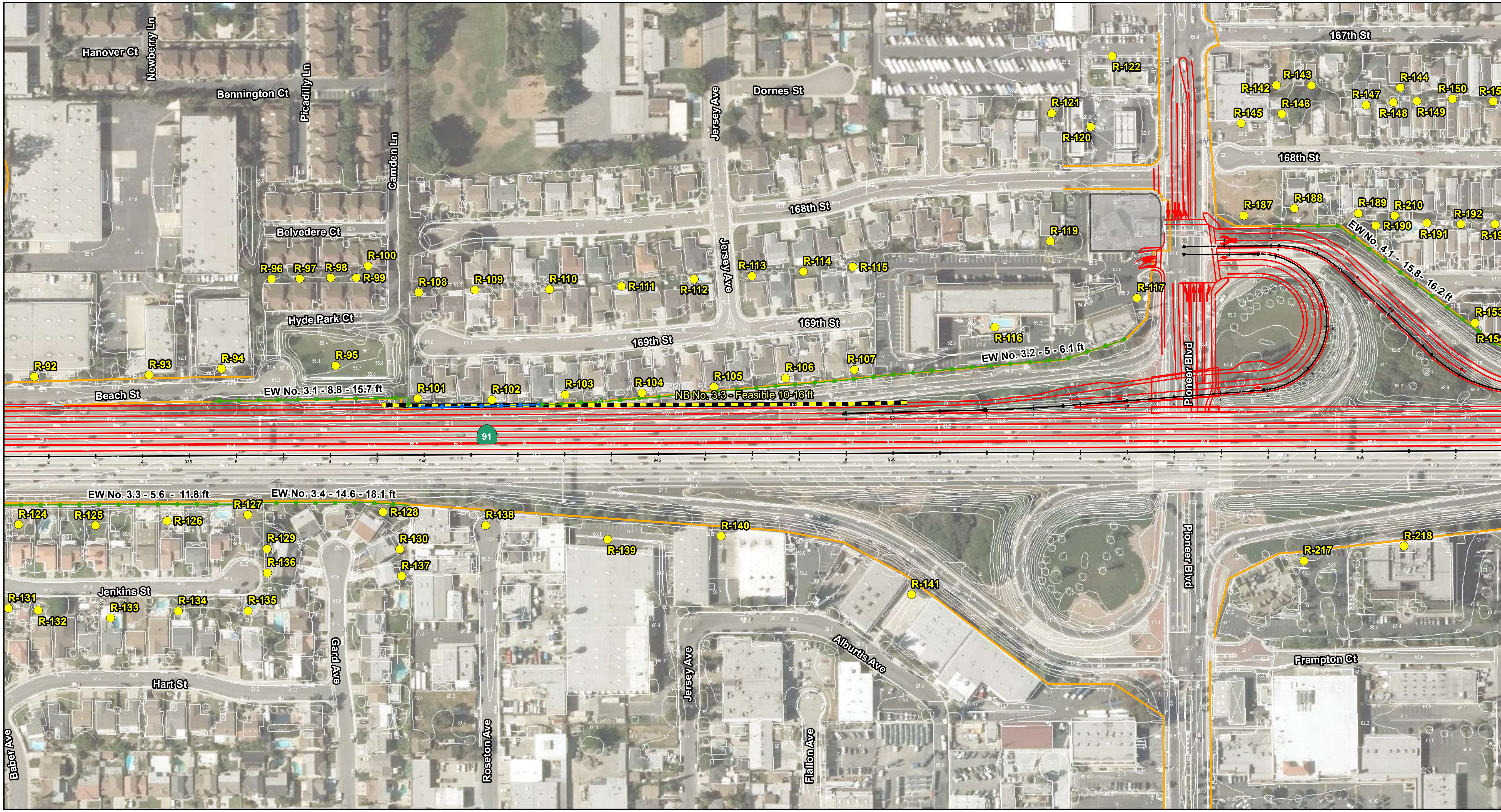

LEGEND

- Modeled Receptors*
- Build Alternative
- Existing Right-of-Way
- Proposed Right-of-Way
- Existing Wall
- Existing Wall (Demolish)**
- Modeled Noise Barriers
- Acquisition

N

0 100 200
FEET

*Receptor R-118 is not shown because the property would be acquired.
**The existing wall would be demolished as part of the project and replaced at the new location at a minimum.

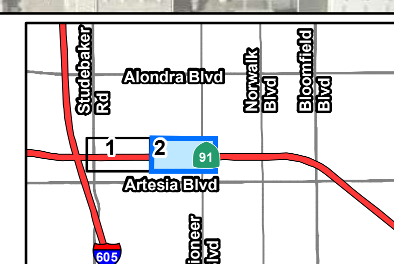

FIGURE 2.13-4
Sheet 2 of 2

Westbound SR-91 Improvement Project

Modeled Noise Barriers and Receptor Locations
Build Alternative - Alternate Barriers

07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

SOURCE: Eagle Aerial (4/2014); Michael Baker (9/2017)

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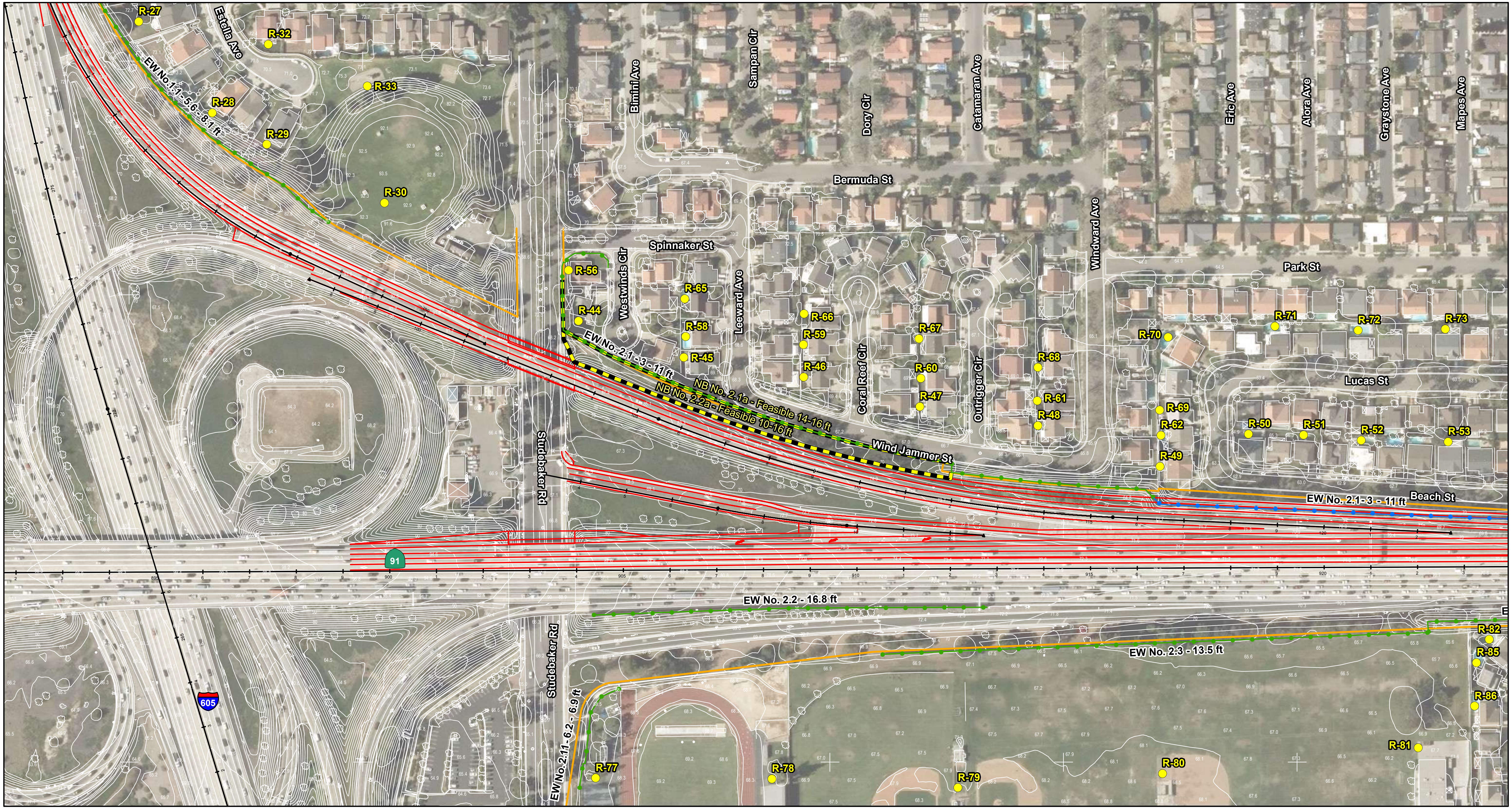

LEGEND

- Modeled Receptors
- Build Alternative
- Existing Right-of-Way
- Proposed Right-Of-Way
- Existing Wall
- Existing Wall (Demolish)*
- Modeled Noise Barriers

N

0 100 200

FEET

SOURCE: Eagle Aerial (4/2014); Michael Baker (9/2017)

*The existing wall would be demolished as part of the project and replaced at the new location at a minimum.

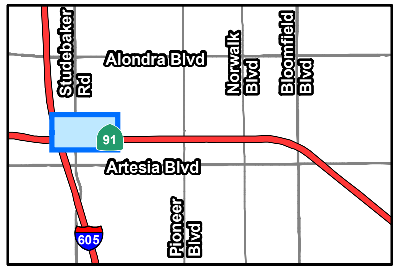

FIGURE 2.13-5

Westbound SR-91 Improvement Project

Modeled Noise Barriers and Receptor Locations

Build Alternative - Reduced Barriers

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0716000284; EA 29811

I:\RBF1601\GIS\MXD\Noise\ModeledNoiseBarriers_Reduced.mxd (7/11/2018)

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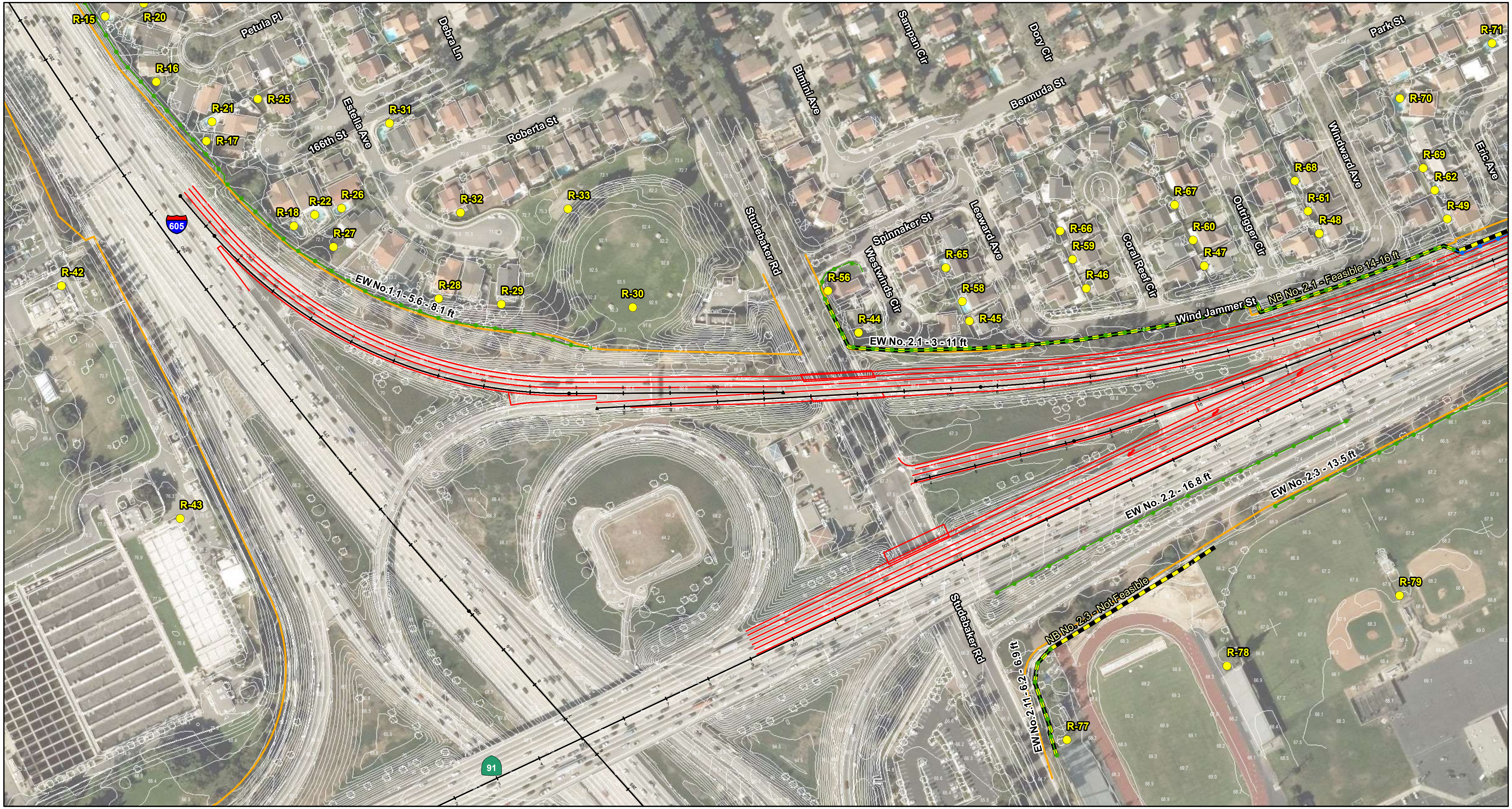
- **NB No. 1.1:** A 1,234 ft long barrier along the private property line on the northbound side of I-605 was analyzed to shield Receptors R-5 through R-7, R-15 and R-16.
- **NB No. 2.1:** A 1,697 ft long barrier along the private property line on the westbound side of SR-91 was analyzed to shield Receptors R-44, R-47, R-60, and R-67.
- **NB No. 2.2:** A 1,639 ft long barrier along the edge of the shoulder on the westbound side of SR-91 was analyzed to shield Receptors R-44, R-47, R-60, and R-67.
- **NB No. 2.1a:** A 991 ft long barrier along the private property line on the westbound side of SR-91 was analyzed to shield Receptors R-44, R-47, R-60, and R-67.
- **NB No. 2.2a:** A 932 ft long barrier along the edge of the shoulder and private property line on the westbound side of SR-91 was analyzed to shield Receptors R-44, R-47, R-60, and R-67.
- **NB No. 2.3:** A 664 ft long barrier along the private property line on the eastbound side of SR-91 was analyzed to shield Receptor R-77.
- **NB No. 3.1:** A 1,051 ft long barrier along the private property line and State ROW on the westbound side of SR-91 was analyzed to shield Receptors R-101 through R-104 and R-107.
- **NB No. 3.2:** A 1,047 ft long barrier along the private property line on the eastbound side of SR-91 was analyzed to shield Receptors R-123 through R-128.
- **NB No. 3.3:** A 1,122 ft long barrier along the edge of the shoulder on the westbound side of SR-91 was analyzed to shield Receptors R-101 through R-104 and R-107.
- **NB No. 4.1:** A 1,671 ft long barrier along the State ROW on the westbound side of SR-91 was analyzed to shield Receptors R-155 and R-177 through R-183.
- **NB No. 4.2:** A 971 ft long barrier along the private property line and State ROW on the eastbound side of SR-91 was analyzed to shield Receptors R-221 through R-225, R-229, R-230, and R-234.
- **NB No. 5.1:** A 1,028 ft long barrier along the State ROW on the westbound side of SR-91 was analyzed to shield Receptor R-242.
- **NB No. 5.2:** A 1,078 ft long barrier along the State ROW on the westbound side of SR-91 was analyzed to shield Receptors R-246 through R-249 and R-262.
- **NB No. 5.3:** A 2,008 ft long barrier along the State ROW on the eastbound side of SR-91 was analyzed to shield Receptors R-276, R-277, R-279, R-282 through R-284, and R-289.
- **NB No. 6.1:** A 355 ft long barrier along the edge of the shoulder on the eastbound side of SR-91 was analyzed to shield Receptors R-344 through R-347 and R-351.

Design Option 1: Reduced Lane/Shoulder Width

Design Option 1 (Reduced Lane/Shoulder Width) of the Build Alternative proposes non-standard lane and shoulder widths and no HOV lane buffer. Within the project limits, westbound SR-91 would have three 11 ft wide and two 12 ft wide mixed-flow lanes, a 2 ft wide left median shoulder, one 12 ft wide HOV lane with no HOV buffer in between the HOV and mixed-flow lanes, and one 12 ft wide auxiliary lane between certain successive on- and off-ramps. The locations of the modeled noise barriers for Design Option 1 (Reduced Lane/Shoulder Width) are shown on Figure 2.13-6. The locations of the alternate noise barriers (NB Nos. 2.2 and 3.3) for Design Option 1 (Reduced Lane/Shoulder Width) are shown on Figure 2.13-7. The locations of the reduced noise barriers (NB Nos. 2.1a and 2.2a) for Design Option 1 (Reduced Lane/Shoulder Width) are shown on Figure 2.13-8. The following noise barriers were analyzed to shield receptor locations that would be exposed to traffic noise levels approaching or exceeding the NAC for Design Option 1 (Reduced Lane/Shoulder Width) and are summarized in Tables 2.13.9 through 2.13.11:

- **NB No. 2.1:** A 1,700 ft long barrier along the private property line on the westbound side of SR-91 was analyzed to shield Receptors R-44, R-47, R-60, and R-67.
- **NB No. 2.2:** A 1,639 ft long barrier along the edge of the shoulder on the westbound side of SR-91 was analyzed to shield Receptors R-44, R-47, R-60, and R-67.
- **NB No. 2.1a:** A 991 ft long barrier along the private property line on the westbound side of SR-91 was analyzed to shield Receptors R-44, R-47, R-60, and R-67.
- **NB No. 2.2a:** A 936 ft long barrier along the edge of the shoulder and private property line on the westbound side of SR-91 was analyzed to shield Receptors R-44, R-47, R-60, and R-67.
- **NB No. 2.3:** A 664 ft long barrier along the private property line on the eastbound side of SR-91 was analyzed to shield Receptor R-77.
- **NB No. 3.1:** A 581 ft long barrier along the private property line and State ROW on the westbound side of SR-91 was analyzed to shield Receptors R-101 through R-104.
- **NB No. 3.2:** A 1,047 ft long barrier along the private property line on the eastbound side of SR-91 was analyzed to shield Receptors R-123 through R-128.
- **NB No. 3.3:** A 670 ft long barrier along the edge of the shoulder on the westbound side of SR-91 was analyzed to shield Receptors R-101 through R-104.
- **NB No. 4.1:** A 340 ft long barrier along the State ROW on the westbound side of SR-91 was analyzed to shield Receptor R-155.



LEGEND

- Modeled Receptors*
- Non-Standard Lane and Shoulder Widths Design Option
- Existing Right-of-Way
- Proposed Right-Of-Way
- Existing Wall
- Existing Wall (Demolish)**
- Modeled Noise Barriers
- Acquisition

0 100 200
FEET

*Receptor R-118 is not shown because the property would be acquired.
**The existing wall would be demolished as part of the project and replaced at the new location at a minimum.

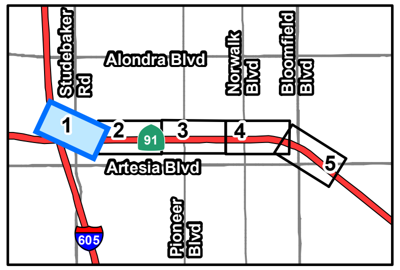


FIGURE 2.13-6
Sheet 1 of 5

Westbound SR-91 Improvement Project
Modeled Noise Barriers and Receptor Locations
Design Option 1: Reduced Lane/Shoulder Width

07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

SOURCE: Eagle Aerial (4/2014); Michael Baker (12/2017)
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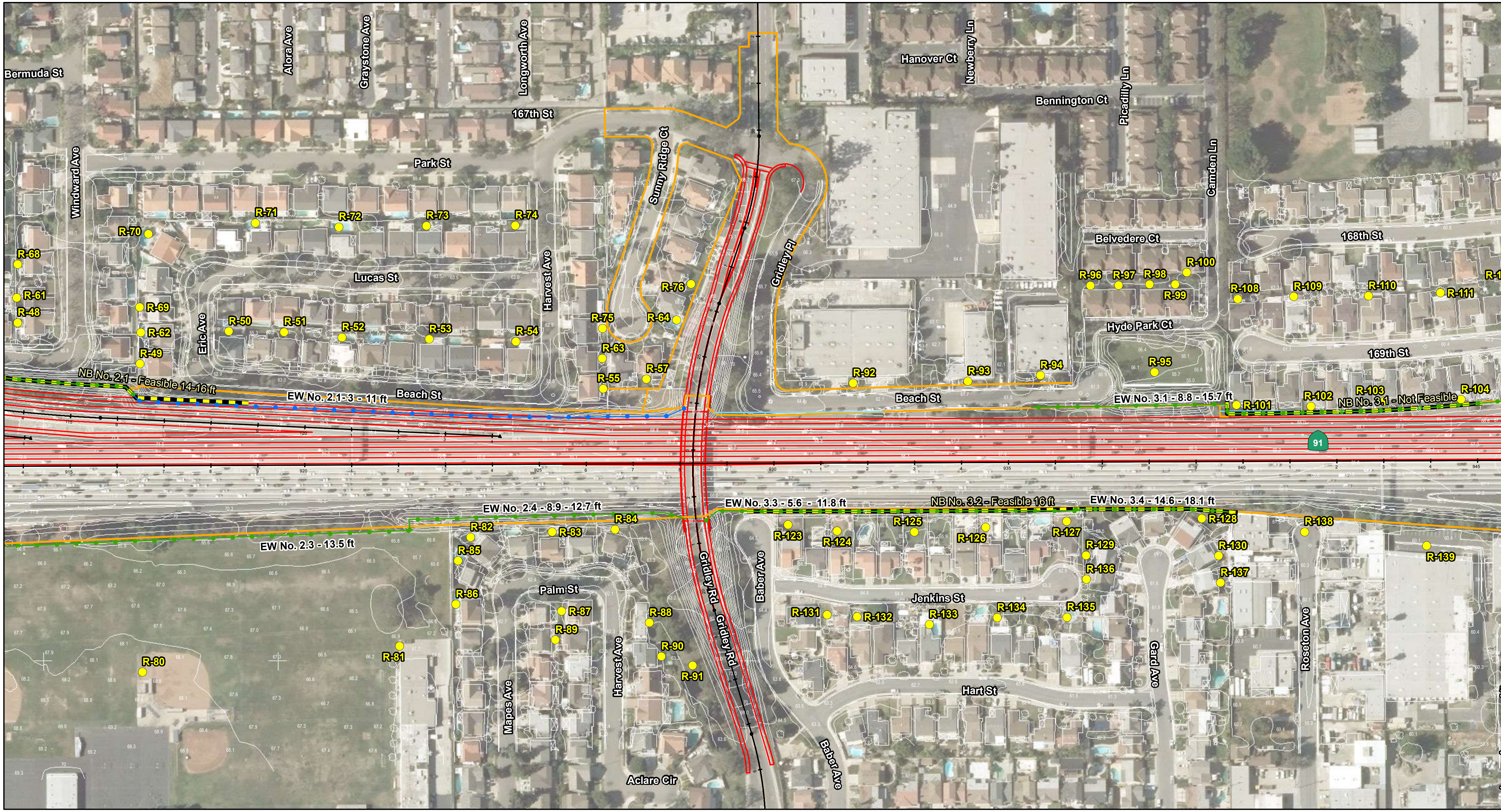

LEGEND

- Modeled Receptors*
- Non-Standard Lane and Shoulder Widths Design Option
- Existing Right-of-Way
- Proposed Right-Of-Way
- Existing Wall
- Existing Wall (Demolish)**
- Modeled Noise Barriers
- Acquisition

N

0 100 200
FEET

*Receptor R-118 is not shown because the property would be acquired.
**The existing wall would be demolished as part of the project and replaced at the new location at a minimum.

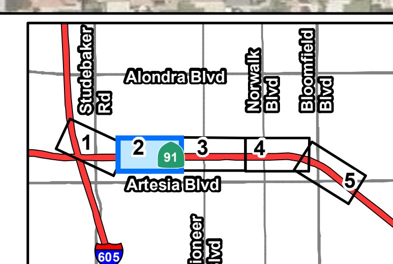

FIGURE 2.13-6
Sheet 2 of 5

Westbound SR-91 Improvement Project
Modeled Noise Barriers and Receptor Locations
Design Option 1: Reduced Lane/Shoulder Width
07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

SOURCE: Eagle Aerial (4/2014); Michael Baker (12/2017)
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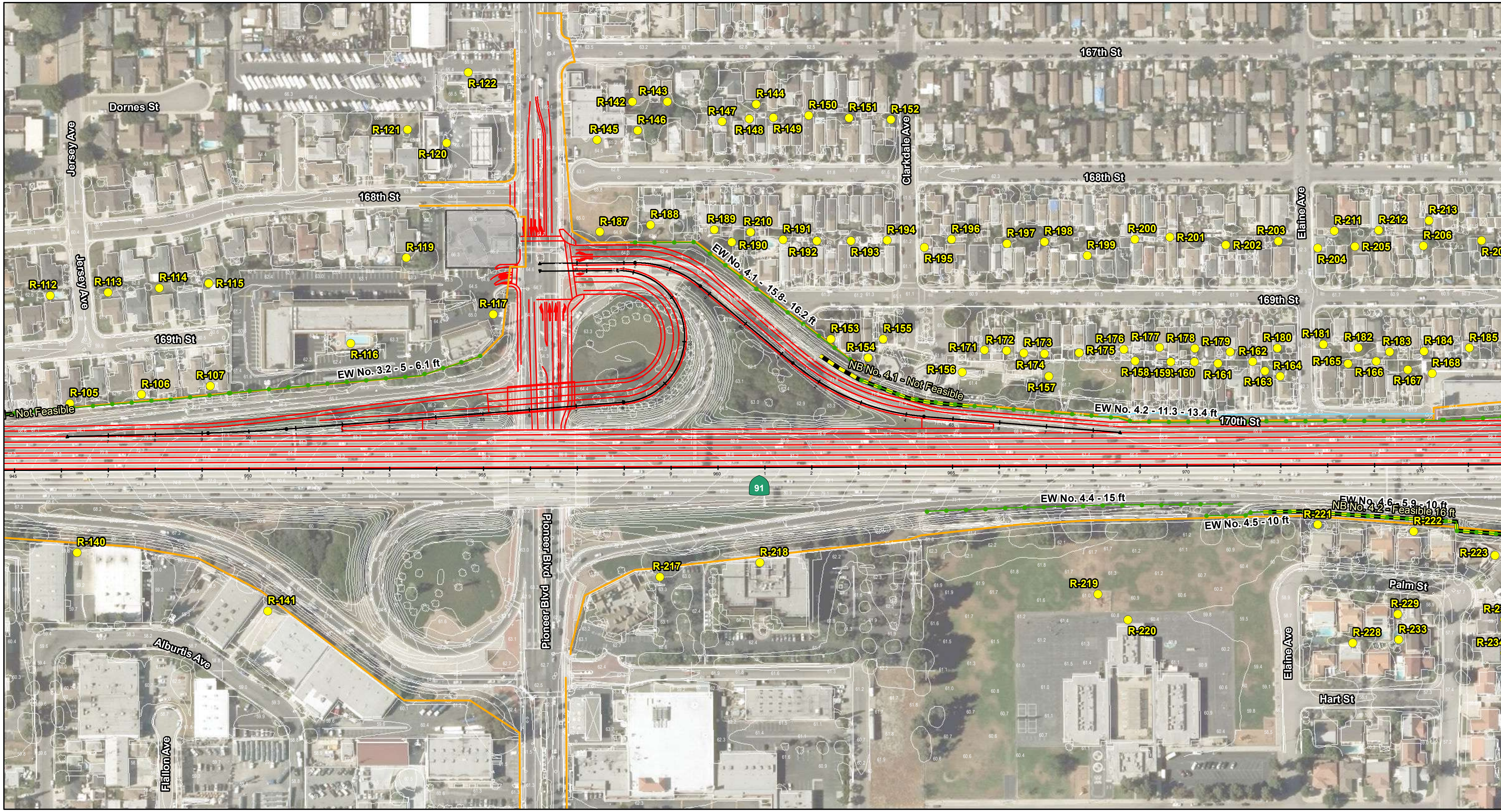

LEGEND

- Modeled Receptors*
- Non-Standard Lane and Shoulder Widths Design Option
- Existing Right-of-Way
- Proposed Right-Of-Way
- Existing Wall
- Existing Wall (Demolish)**
- Modeled Noise Barriers
- Acquisition

N

0 100 200
FEET

*Receptor R-118 is not shown because the property would be acquired.
**The existing wall would be demolished as part of the project and replaced at the new location at a minimum.

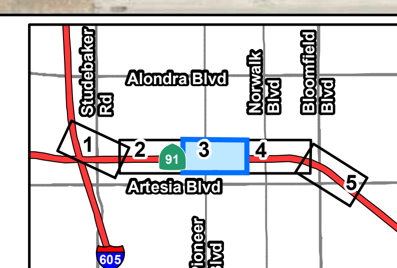

FIGURE 2.13-6
Sheet 3 of 5

Westbound SR-91 Improvement Project
Modeled Noise Barriers and Receptor Locations
Design Option 1: Reduced Lane/Shoulder Width

07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

SOURCE: Eagle Aerial (4/2014); Michael Baker (12/2017)

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LEGEND

- Modeled Receptors*
- Non-Standard Lane and Shoulder Widths Design Option
- Existing Right-of-Way
- Proposed Right-Of-Way
- Existing Wall
- Existing Wall (Demolish)**
- Modeled Noise Barriers
- Acquisition

N

0 100 200

FEET

SOURCE: Eagle Aerial (4/2014); Michael Baker (12/2017)

*Receptor R-118 is not shown because the property would be acquired.
**The existing wall would be demolished as part of the project and replaced at the new location at a minimum.

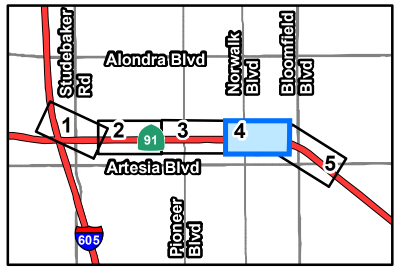

FIGURE 2.13-6

Sheet 4 of 5

Westbound SR-91 Improvement Project

Modeled Noise Barriers and Receptor Locations

Design Option 1: Reduced Lane/Shoulder Width

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0716000284; EA 29811

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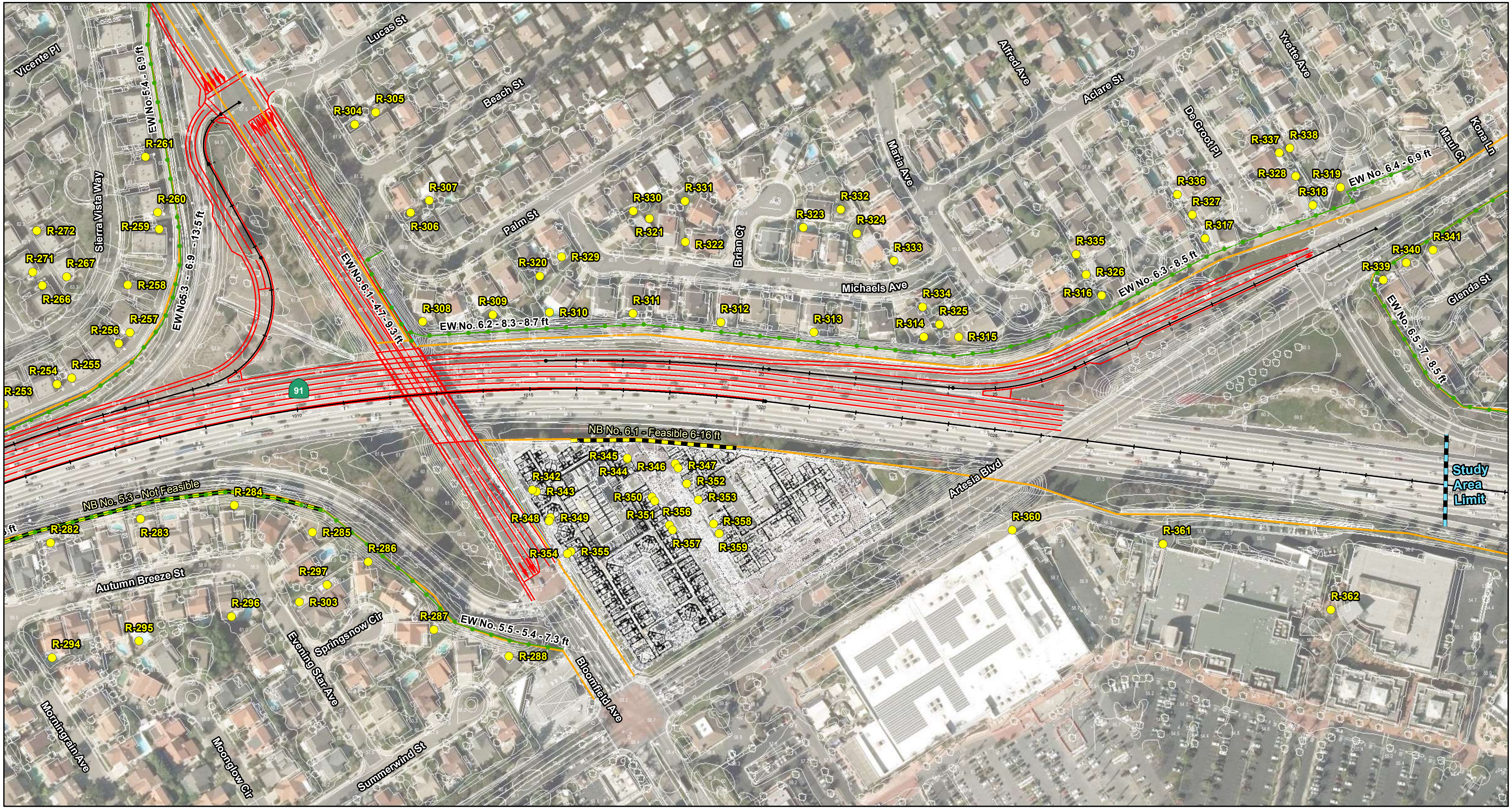

LEGEND

- Modeled Receptors*
- Non-Standard Lane and Shoulder Widths Design Option
- Existing Right-of-Way
- Proposed Right-Of-Way
- Existing Wall
- Existing Wall (Demolish)**
- Modeled Noise Barriers
- Acquisition

0 100 200
FEET

*Receptor R-118 is not shown because the property would be acquired.
**The existing wall would be demolished as part of the project and replaced at the new location at a minimum.

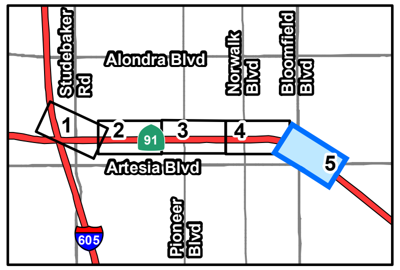

FIGURE 2.13-6
Sheet 5 of 5

Westbound SR-91 Improvement Project
Modeled Noise Barriers and Receptor Locations
Design Option 1: Reduced Lane/Shoulder Width

07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

SOURCE: Eagle Aerial (4/2014); Michael Baker (12/2017)

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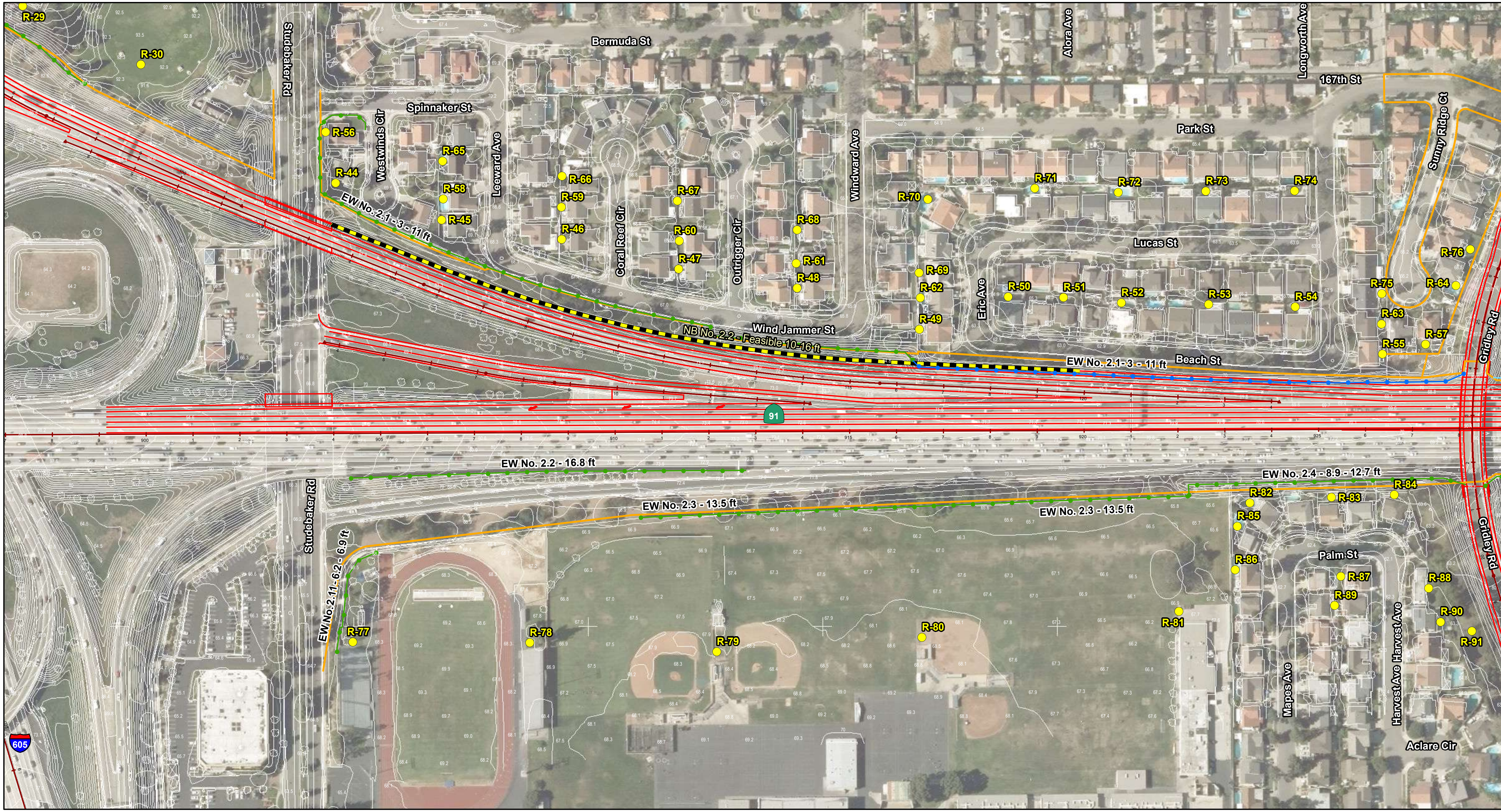

LEGEND

- Modeled Receptors*
- Non-Standard Lane and Shoulder Widths Design Option
- Existing Right-of-Way
- Proposed Right-Of-Way
- Existing Wall
- Existing Wall (Demolish)**
- Modeled Noise Barriers
- Acquisition

0 100 200
FEET

*Receptor R-118 is not shown because the property would be acquired.
**The existing wall would be demolished as part of the project and replaced at the new location at a minimum.

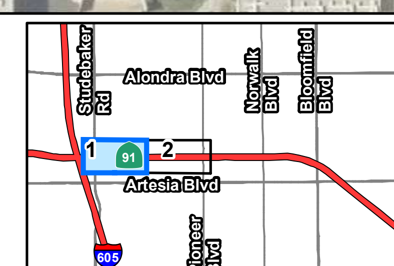

FIGURE 2.13-7
Sheet 1 of 2

Westbound SR-91 Improvement Project
Modeled Noise Barriers and Receptor Locations
Design Option 1: Reduced Lane/Shoulder Width – Alternate Barriers

07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

SOURCE: Eagle Aerial (4/2014); Michael Baker (12/2017)

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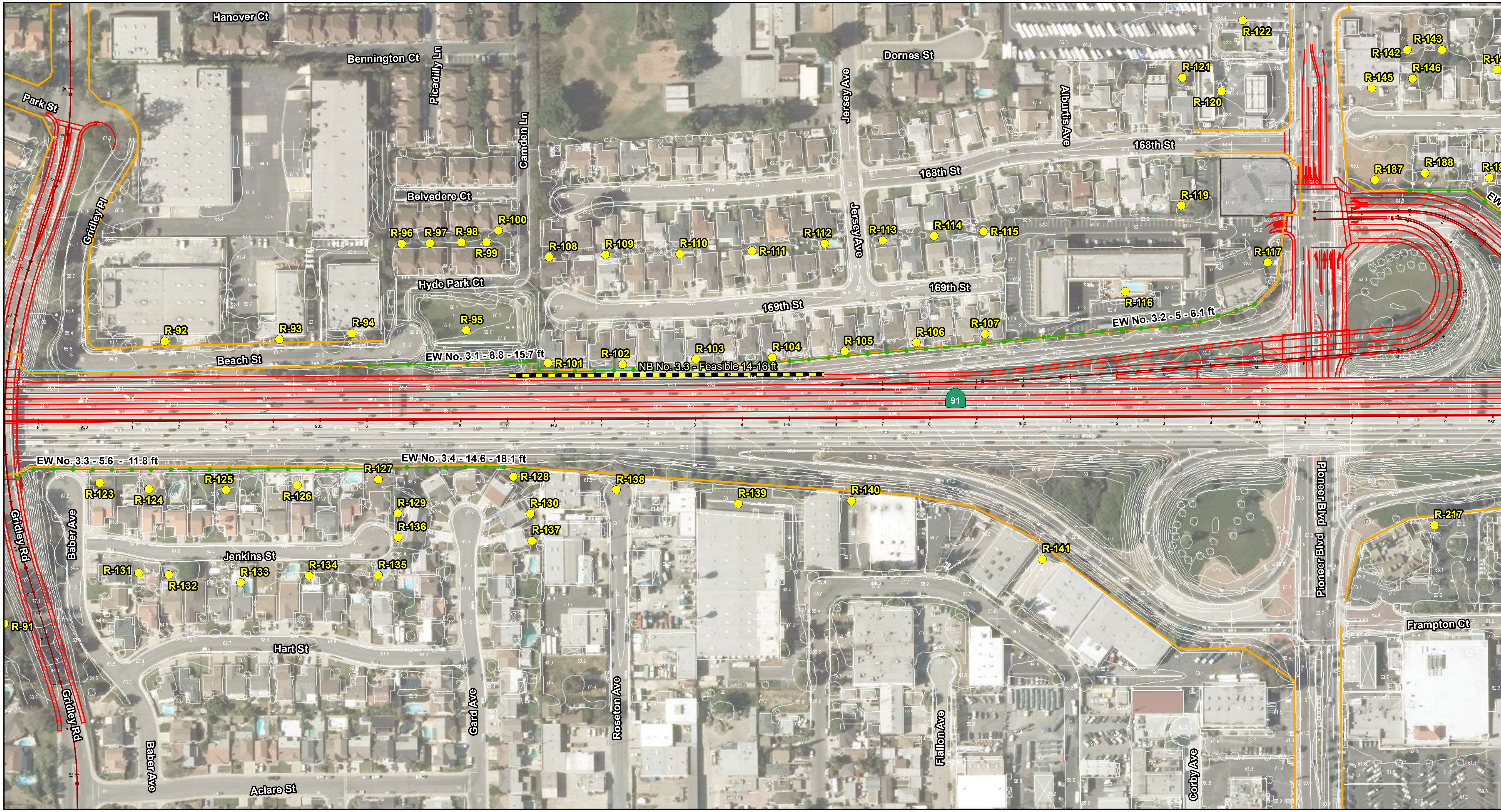

LEGEND

- Modeled Receptors*
- Non-Standard Lane and Shoulder Widths Design Option
- Existing Right-of-Way
- Proposed Right-Of-Way
- Existing Wall
- Existing Wall (Demolish)**
- Modeled Noise Barriers
- Acquisition

N

0 100 200
FEET

*Receptor R-118 is not shown because the property would be acquired.
**The existing wall would be demolished as part of the project and replaced at the new location at a minimum.

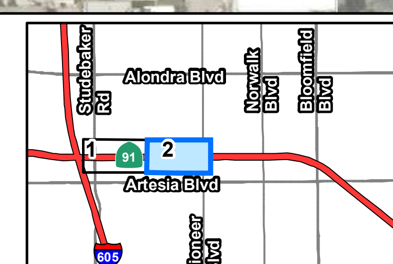

FIGURE 2.13-7
Sheet 2 of 2

Westbound SR-91 Improvement Project
Modeled Noise Barriers and Receptor Locations
Design Option 1: Reduced Lane/Shoulder Width – Alternate Barriers

07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

SOURCE: Eagle Aerial (4/2014); Michael Baker (12/2017)
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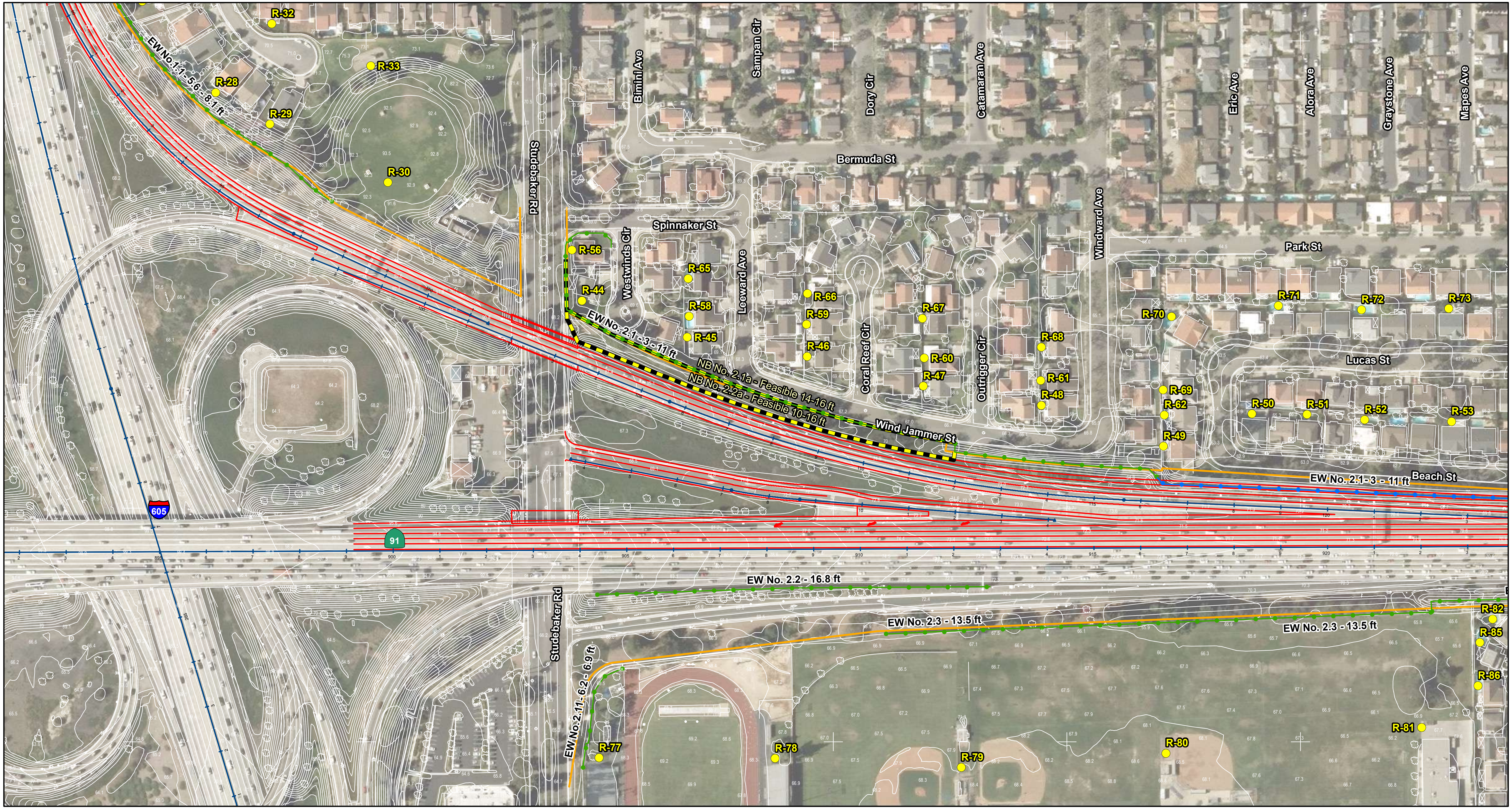

LEGEND

- Modeled Receptors
- Non-Standard Lane and Shoulder Widths Design Option
- Existing Right-of-Way
- Proposed Right-Of-Way
- Existing Wall
- Existing Wall (Demolish)*
- Modeled Noise Barriers

N

0 100 200

FEET

SOURCE: Eagle Aerial (4/2014); Michael Baker (12/2017)

*The existing wall would be demolished as part of the project and replaced at the new location at a minimum.

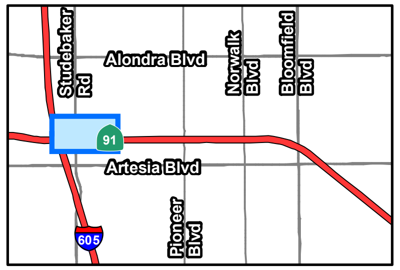

FIGURE 2.13-8

Westbound SR-91 Improvement Project

Modeled Noise Barriers and Receptor Locations

Design Option 1: Reduced Lane/Shoulder Width – Reduced Barriers

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0716000284; EA 29811

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- **NB No. 4.2:** A 971 ft long barrier along the private property line and the State ROW on the eastbound side of SR-91 was analyzed to shield Receptors R-221 through R-225, R-229, R-230, and R-234.
- **NB No. 5.1:** A 1,028 ft long barrier along the State ROW on the westbound side of SR-91 was analyzed to shield Receptor R-242.
- **NB No. 5.2:** A 408 ft long barrier along the State ROW on the westbound side of SR-91 was analyzed to shield Receptors R-246, R-247, and R-262.
- **NB No. 5.3:** A 2,008 ft long barrier along the State ROW on the eastbound side of SR-91 was analyzed to shield Receptors R-276, R-277, R-279, R-282 through R-284, and R-289.
- **NB No. 6.1:** A 355 ft long barrier along the edge of the shoulder on the eastbound side of SR-91 was analyzed to shield Receptors R-344 through R-347 and R-351.

Design Option 5: Four-Lane Gridley Road Overcrossing

The four-lane Gridley Road Overcrossing structure is a design option request by the City of Cerritos. No additional ROW acquisition would result. The location of the modeled noise barrier for Design Option 5 (Four-Lane Gridley Road Overcrossing) is shown on Figure 2.13-9. The following noise barrier was analyzed to shield receptor locations that would be exposed to traffic noise levels approaching or exceeding the NAC for Design Option 5 (Four-Lane Gridley Road Overcrossing) and is summarized in Table 2.13.12:

- **NB No. 3.2:** A 1,047 ft long barrier along the private property line on the eastbound side of SR-91 was analyzed to shield Receptors R-123, R-124, and R-126 through R-128.

Design Option 2: Pioneer Boulevard L-9

Design Option 2 (Pioneer Boulevard L-9) of the Build Alternative proposes a Type L-9 westbound ramp configuration at the Pioneer Boulevard interchange, which is the same configuration as the existing condition. However, the two westbound on-ramps would be squared up in relation to Pioneer Boulevard. The locations of the modeled noise barriers for Design Option 2 (Pioneer Boulevard L-9) is shown on Figure 2.13-10. The following noise barriers were analyzed to shield receptor locations that would be exposed to traffic noise levels approaching or exceeding the NAC for Design Option 2 (Pioneer Boulevard L-9) and are summarized in Table 2.13.13:

- **NB No. 3.1:** A 1,051 ft long barrier along the private property line and State ROW on the westbound side of SR-91 was analyzed to shield Receptors R-101 through R-104 and R-107.

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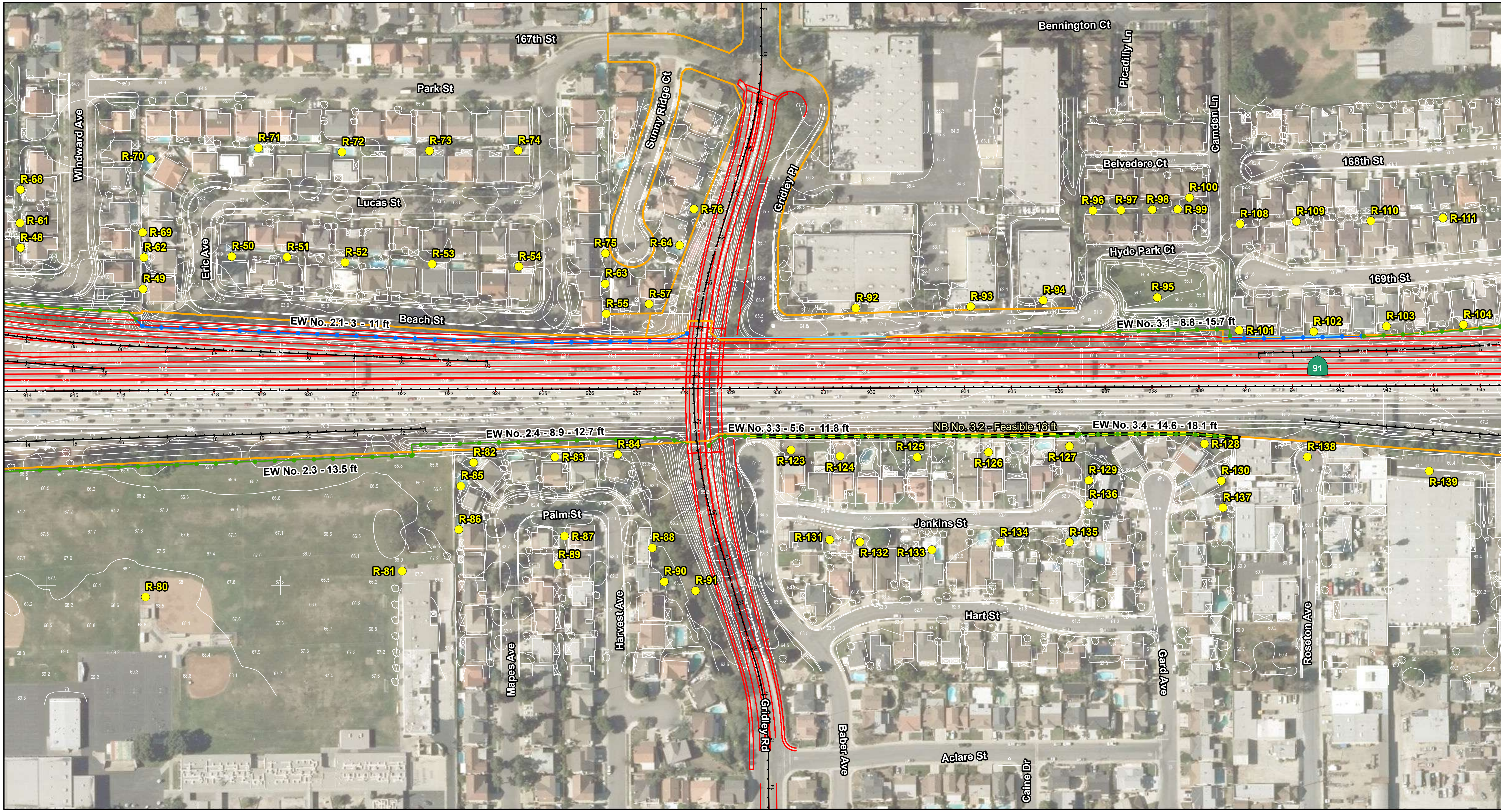

LEGEND

- Modeled Receptors
- Four-Lane Gridley Road Design Option
- Existing Right-of-Way
- Proposed Right-Of-Way
- Existing Wall
- Existing Wall (Demolish)*
- Modeled Noise Barriers

N

0 100 200
FEET

SOURCE: Eagle Aerial (4/2014); Michael Baker (9/2017)

*The existing wall would be demolished as part of the project and replaced at the new location at a minimum.

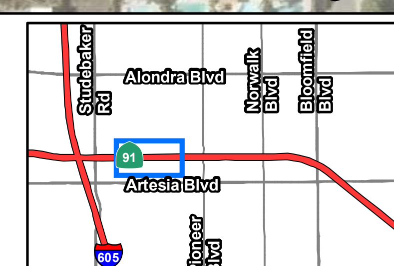

FIGURE 2.13-9

Westbound SR-91 Improvement Project
Modeled Noise Barriers and Receptor Locations
Design Option 5: Four-Lane Gridley Road Overcrossing
07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

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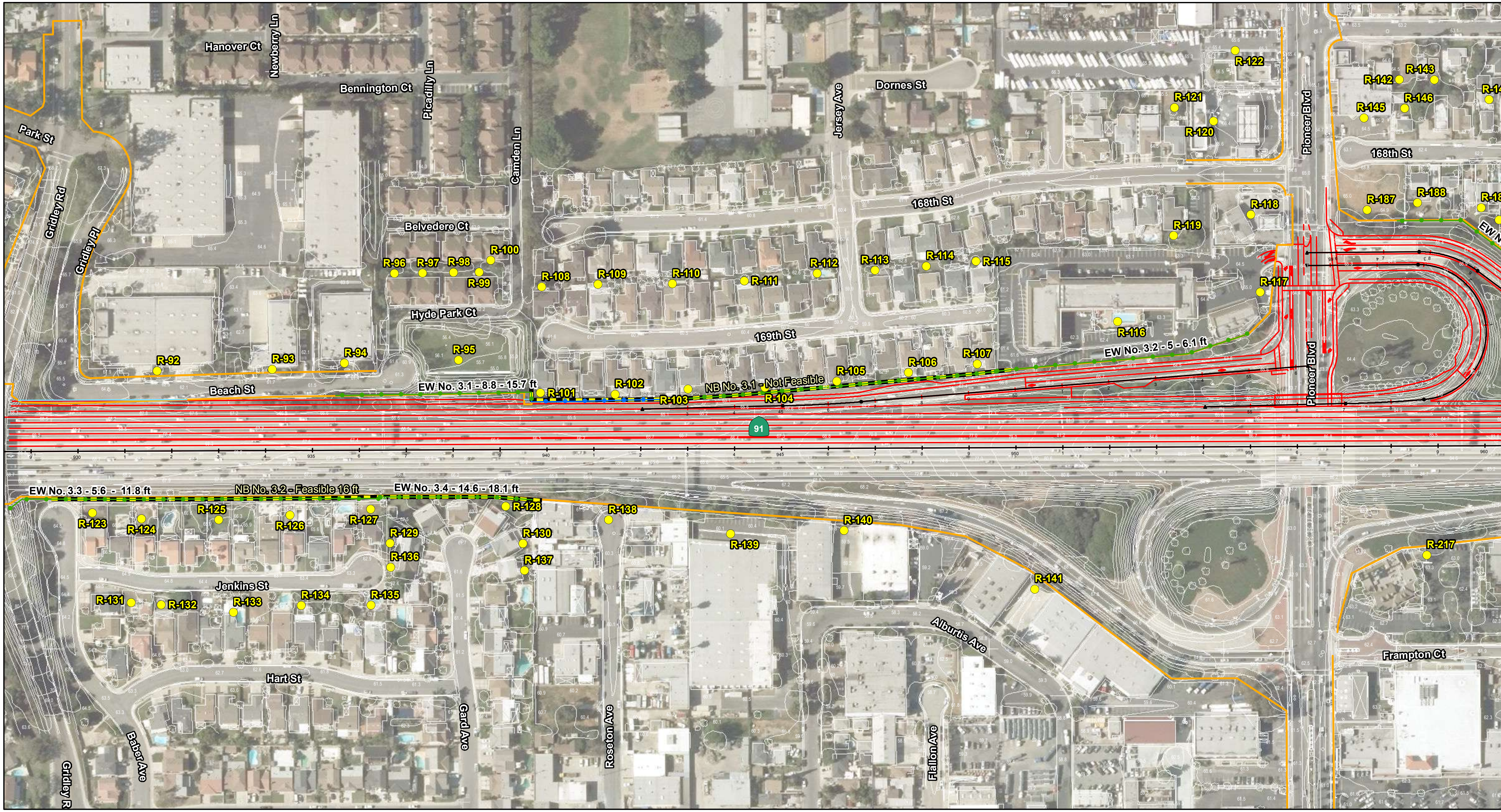

LEGEND

- Modeled Receptors*
- Pioneer Boulevard L-9 Design Option
- Existing Right-of-Way
- Proposed Right-Of-Way
- Existing Wall
- Existing Wall (Demolish)**
- Modeled Noise Barriers
- Acquisition

N

0 100 200
FEET

*Receptors R-158 through R-168 are not shown because the properties would be acquired.
**The existing wall would be demolished as part of the project and replaced at the new location at a minimum.

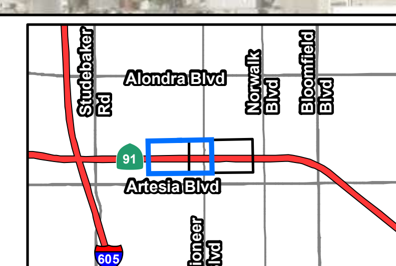

FIGURE 2.13-10
Sheet 1 of 2

Westbound SR-91 Improvement Project
Modeled Noise Barriers and Receptor Locations
Design Option 2: Pioneer Boulevard L-9
07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

SOURCE: Eagle Aerial (4/2014); Michael Baker (12/2017)

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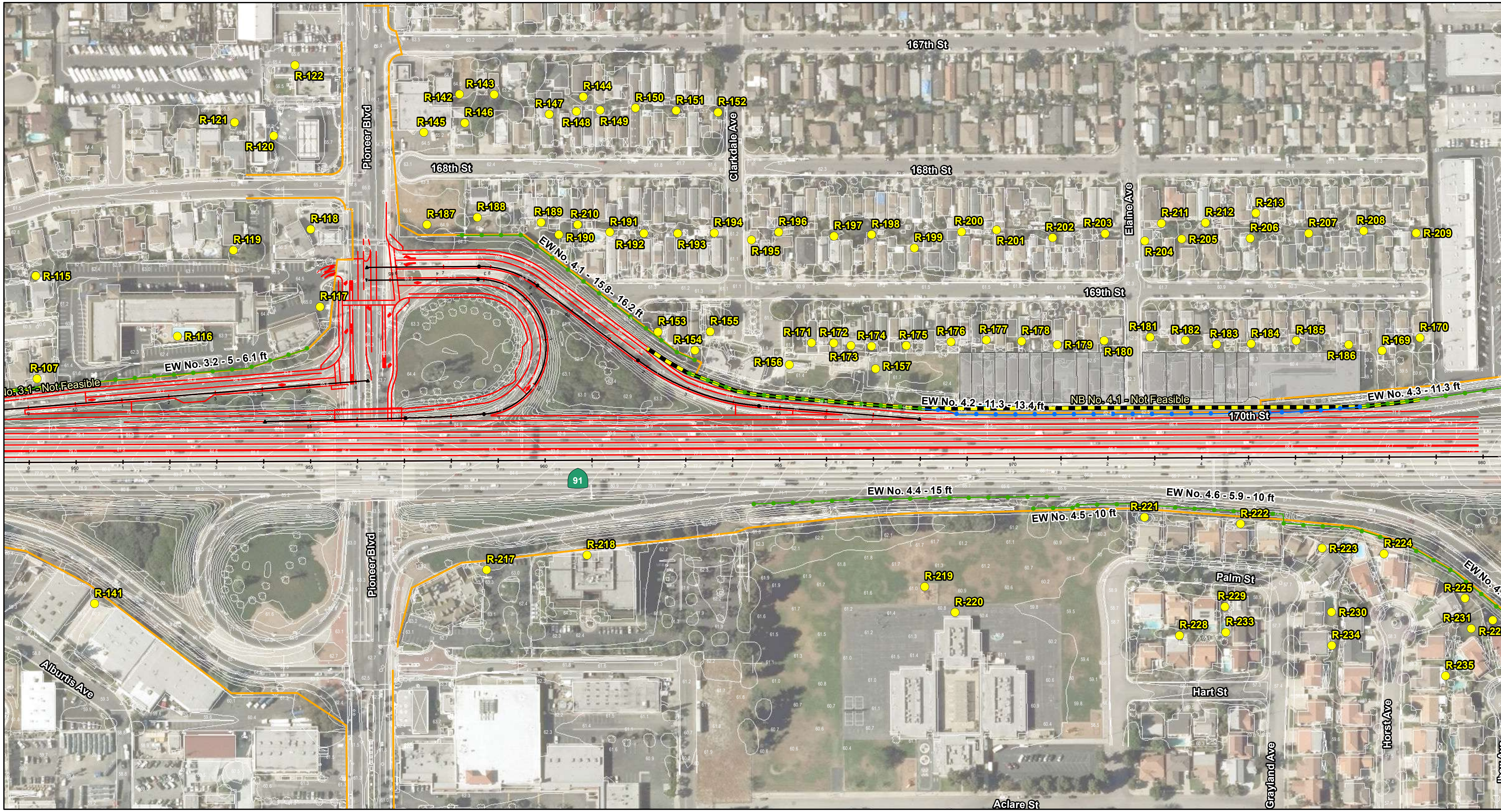

LEGEND

- Modeled Receptors*
- Pioneer Boulevard L-9 Design Option
- Existing Right-of-Way
- Proposed Right-Of-Way
- Existing Wall
- Existing Wall (Demolish)**
- Modeled Noise Barriers
- Acquisition

*Receptors R-158 through R-168 are not shown because the properties would be acquired.
**The existing wall would be demolished as part of the project and replaced at the new location at a minimum.

0 100 200 FEET

SOURCE: Eagle Aerial (4/2014); Michael Baker (12/2017)

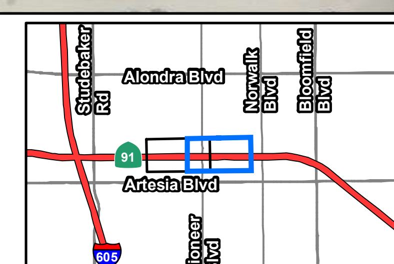

FIGURE 2.13-10
Sheet 2 of 2

Westbound SR-91 Improvement Project
Modeled Noise Barriers and Receptor Locations
Design Option 2: Pioneer Boulevard L-9
07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

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- **NB No. 3.2:** A 1,047 ft long barrier along the private property line on the eastbound side of SR-91 was analyzed to shield Receptors R-123, R-124, and R-126 through R-128.
- **NB No. 4.1:** A 1,671 ft long barrier along the State ROW on the westbound side of SR-91 was analyzed to shield Receptors R-155 and R-177 through R-183.

Design Option 3: Pioneer Boulevard Westbound Ramps/168th Alignment

Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment) of the Build Alternative proposes to align the SR-91 westbound ramps with 168th Street in Artesia, creating a four-legged intersection with Pioneer Boulevard as the north-south legs, the westbound ramps being the east leg, and 168th Street being the west leg. This option requires additional ROW acquisition of six properties within Artesia and demolition and replacement of the western portion of EW No. 4.1, which is shown on Figure 2.13-11. The noise level reduction provided by the replacement of EW No. 4.1 is shown in Table 2.13.17. The locations of the modeled noise barriers for Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment) are shown on Figure 2.13-11. The following noise barriers were analyzed to shield receptor locations that would be exposed to traffic noise levels approaching or exceeding the NAC for Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment) and are summarized in Table 2.13.14:

- **NB No. 3.1:** A 1,051 ft long barrier along the private property line and State ROW on the westbound side of SR-91 was analyzed to shield Receptors R-101 through R-104 and R-107.
- **NB No. 3.2:** A 1,047 ft long barrier along the private property line on the eastbound side of SR-91 was analyzed to shield Receptors R-123, R-124, and R-126 through R-128.
- **NB No. 4.1:** A 1,671 ft long barrier along the State ROW on the westbound side of SR-91 was analyzed to shield Receptors R-155 and R-177 through R-183.

Design Option 4: Diamond Ramps

Design Option 4 (Diamond Ramps) of the Build Alternative proposes diamond configuration ramps at westbound Pioneer Boulevard and Norwalk Boulevard interchanges. The locations of the modeled noise barriers for Design Option 4 (Diamond Ramps) are shown on Figure 2.13-12. The following noise barriers were analyzed to shield receptor locations that would be exposed to traffic noise levels approaching or exceeding the NAC for Design Option 4 (Diamond Ramps) and are summarized in Table 2.13.15:

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LEGEND

- Modeled Receptors*
- Pioneer Boulevard Westbound Ramps/168th Alignment Design Option
- Existing Right-of-Way
- Proposed Right-Of-Way
- Existing Wall
- Existing Wall (Demolish)**
- Existing Wall (Replace)***
- Modeled Noise Barriers
- Acquisition

0 100 200
FEET

*Receptors R-158 through R-168 and R-187 through R-189 are not shown because the properties would be acquired.
**The existing wall would be demolished as part of the project and replaced at the new location at a minimum.
***Replacement location for EW No. 4.1.

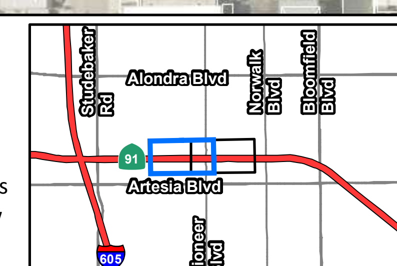

FIGURE 2.13-11
Sheet 1 of 2

Westbound SR-91 Improvement Project
Modeled Noise Barriers and Receptor Locations
Design Option 3: Pioneer Boulevard Westbound Ramps/168th
07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

SOURCE: Eagle Aerial (4/2014); Michael Baker (12/2017)

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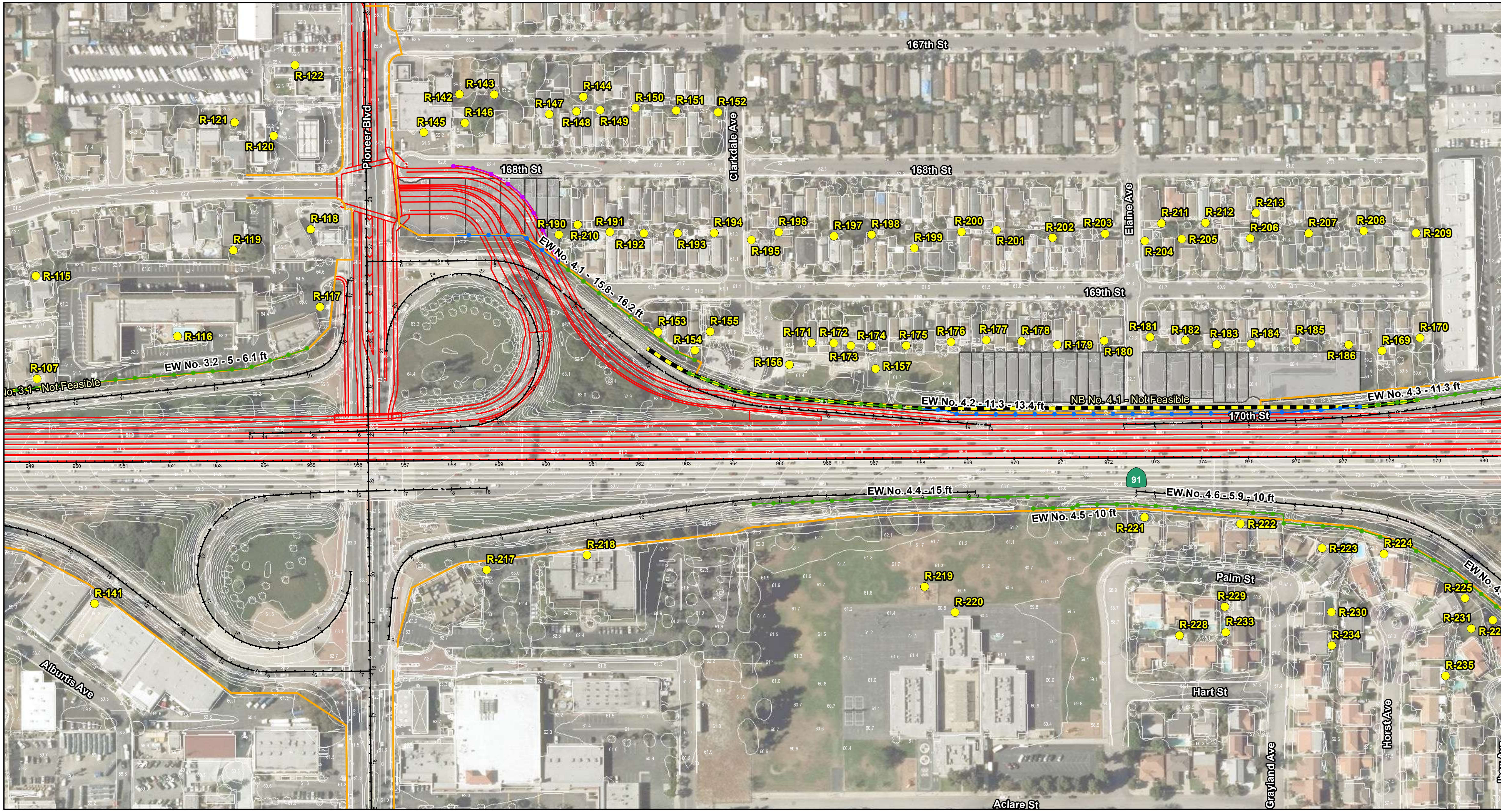

LEGEND

- Modeled Receptors*
- Pioneer Boulevard Westbound Ramps/168th Alignment Design Option
- Existing Right-of-Way
- Proposed Right-Of-Way
- Existing Wall
- Existing Wall (Demolish)**
- Existing Wall (Replace)***
- Modeled Noise Barriers
- Acquisition

0 100 200 FEET

*Receptors R-158 through R-168 and R-187 through R-189 are not shown because the properties would be acquired.
**The existing wall would be demolished as part of the project and replaced at the new location at a minimum.
***Replacement location for EW No. 4.1.

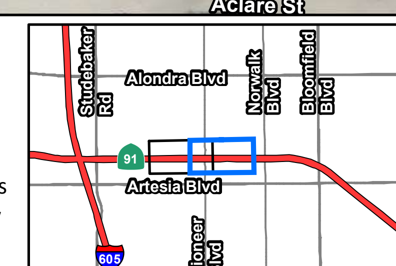

FIGURE 2.13-11
Sheet 2 of 2

Westbound SR-91 Improvement Project
Modeled Noise Barriers and Receptor Locations
Design Option 3: Pioneer Boulevard Westbound Ramps/168th
07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

SOURCE: Eagle Aerial (4/2014); Michael Baker (12/2017)
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Table 2.13.17 Change in Noise Level from the Replacement of EW No. 4.1 for Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment)

Receptor No.	Existing Wall No.[1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA L_{eq}(h)	Future Worst-Hour Noise Levels, dBA L_{eq}(h) — 2044 Noise Level: Without Project, dBA L_{eq}	With Project without Replacement of EW No. 4.1, dBA L_{eq}	With Project with Replacement of EW No. 4.1, dBA L_{eq}	Change in Noise Level
R-142	EW No. 4.1		167th Street	Vacant Land	0	56	57	58	57	1
R-143	EW No. 4.1		167th Street	Residential	3	57	57[2]	59	56	3
R-144	EW No. 4.1		167th Street	Residential	2	56	57	59	57	2
R-145	EW No. 4.1		Pioneer Boulevard	Light Industrial	0	61	61	63	63	0
R-146	EW No. 4.1		168th Street	Residential	2	56	56	59	58	1
R-147	EW No. 4.1		168th Street	Residential	2	56	56	59	58	1
R-148	EW No. 4.1		168th Street	Residential	3	56	56	59	56	3
R-149	EW No. 4.1		168th Street	Residential	2	56	56	58	56	2
R-150	EW No. 4.1		168th Street	Residential	3	56	56	58	56	2
R-151	EW No. 4.1		168th Street	Residential	3	56	56	57	56	1
R-152	EW No. 4.1		168th Street	Residential	2	56	56	57	57	0
R-153	EW No. 4.1	NB No. 4.1	169th Street	Residential	2	60	61	62	62	0
R-154	EW No. 4.1	NB No. 4.1	169th Street	Residential	2	61	62	63	63	0
R-155	EW No. 4.2	NB No. 4.1	169th Street	Playground	1	65	65	**66**	**66**	0
R-156	EW No. 4.2	NB No. 4.1	169th Street	Community Center	1	66 / 46[3]	67 / 47[3]	68 / 48[3]	68 / 48[3]	0
R-157	EW No. 4.2	NB No. 4.1	169th Street	Playground	1	64	65	65	65	0
R-158	EW No. 4.2*		170th Street	Residential	2	65	65	NA	NA	NA
R-159	EW No. 4.2*		170th Street	Residential	2	60	60	NA	NA	NA
R-160	EW No. 4.2*		170th Street	Residential	2	59	59	NA	NA	NA
R-161	EW No. 4.2*		170th Street	Residential	2	58	58	NA	NA	NA
R-162	EW No. 4.2*		170th Street	Residential	2	62	63	NA	NA	NA
R-163	EW No. 4.2*		170th Street	Residential	1	62	62	NA	NA	NA
R-164	EW No. 4.2*		170th Street	Residential	1	63	64	NA	NA	NA
R-165	EW No. 4.2*		170th Street	Residential	1	64	65	NA	NA	NA
R-166	EW No. 4.2*		170th Street	Residential	2	64	65	NA	NA	NA
R-167	EW No. 4.2*		170th Street	Residential	2	64	64	NA	NA	NA
R-168	EW No. 4.2*		170th Street	Light Industrial	0	61	61	NA	NA	NA
R-169	EW No. 4.3	NB No. 4.1	169th Street	Residential	2	61	62	63	63	0
R-170	EW No. 4.3	NB No. 4.1	169th Street	Residential	1	61	61	62	62	0
R-171	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	63	63	64	64	0
R-172	EW No. 4.2	NB No. 4.1	169th Street	Residential	1	63	63	64	64	0
R-173	EW No. 4.2	NB No. 4.1	169th Street	Day Care Center	1	63 / 43[3]	64 / 44[3]	64 / 44[3]	64 / 44[3]	0
R-174	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	63	63	64	64	0
R-175	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	63	63	64	64	0

Table 2.13.17 Change in Noise Level from the Replacement of EW No. 4.1 for Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment)

Receptor No.	Existing Wall No.[1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA L_{eq}(h)	Future Worst-Hour Noise Levels, dBA L_{eq}(h) 2044 Noise Level			
							Without Project, dBA L_{eq}	With Project without Replacement of EW No. 4.1, dBA L_{eq}	With Project with Replacement of EW No. 4.1, dBA L_{eq}	Change in Noise Level
R-176	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	64	64	0
R-177	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	63	63	**67**	**67**	0
R-178	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	**67**	**67**	0
R-179	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	63	63	**67**	**67**	0
R-180	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	64	64	**67**	**67**	0
R-181	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	64	65	**67**	**67**	0
R-182	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	64	65	**67**	**67**	0
R-183	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	65	65	**67**	**67**	0
R-184	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	61	61	64	64	0
R-185	EW No. 4.3*	NB No. 4.1	169th Street	Residential	3	60	60	64	64	0
R-186	EW No. 4.3*	NB No. 4.1	169th Street	Residential	3	60	60	64	64	0
R-187			168th Street	Vacant Land	0	65	65	NA	NA	NA
R-188	EW No. 4.1		168th Street	Residential	2	59	59	NA	NA	NA
R-189	EW No. 4.1		168th Street	Residential	3	55	56	NA	NA	NA
R-190	EW No. 4.1		169th Street	Residential	1	55	56	63	56	7
R-191	EW No. 4.1		169th Street	Residential	2	56	57	59	58	1
R-192	EW No. 4.1	NB No. 4.1	169th Street	Residential	3	57	58	59	58	1
R-193	EW No. 4.1	NB No. 4.1	169th Street	Residential	3	58	58	59	59	0
R-194	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	58	58	59	59	0
R-195	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	62	62	63	62	1
R-196	EW No. 4.2	NB No. 4.1	169th Street	Residential	2	61	61	62	62	0
R-197	EW No. 4.2	NB No. 4.1	169th Street	Residential	3	61	61	62	61	1
R-198	EW No. 4.2	NB No. 4.1	169th Street	Residential	3	60	60	61	61	0
R-199	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	59	59	60	59	1
R-200	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	64	64	0
R-201	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	64	64	0
R-202	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	63	63	0
R-203	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	62	63	64	64	0
R-204	EW No. 4.2*	NB No. 4.1	169th Street	Residential	2	63	63	64	64	0
R-205	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	62	63	64	64	0
R-206	EW No. 4.2*	NB No. 4.1	169th Street	Residential	3	63	64	65	65	0
R-207	EW No. 4.3*	NB No. 4.1	169th Street	Residential	3	60	60	61	61	0
R-208	EW No. 4.3	NB No. 4.1	169th Street	Residential	3	60	61	61	61	0
R-209	EW No. 4.3	NB No. 4.1	169th Street	Residential	2	61	61	61	61	0

Table 2.13.17 Change in Noise Level from the Replacement of EW No. 4.1 for Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment)

Receptor No.	Existing Wall No.[1]	Noise Barrier No.	Location	Land Use	No. of Receptors/ Units	Existing Noise Level, dBA L_{eq}(h)	Future Worst-Hour Noise Levels, dBA L_{eq}(h) 2044 Noise Level			
							Without Project, dBA L_{eq}	With Project without Replacement of EW No. 4.1, dBA L_{eq}	With Project with Replacement of EW No. 4.1, dBA L_{eq}	Change in Noise Level
R-210	EW No.4.1		168th Street	Residential	2	56	56	61	57	4
R-211	EW No. 4.2*	NB No. 4.1	168th Street	Residential	2	62	63	64	64	0
R-212	EW No. 4.2*	NB No. 4.1	168th Street	Residential	3	63	63	64	64	0
R-213	EW No. 4.2*	NB No. 4.1	168th Street	Residential	3	64	64	65	65	0
R-214	EW No. 4.3		Park Street	Light Industrial	0	66	66	66	66	0
R-215			Norwalk Boulevard	Gas Station	0	69	69	69	69	0
R-216			Norwalk Boulevard	Light Industrial	0	63	63	63	63	0

Source: Compiled by LSA Associates, Inc. (2018).

1 An * represents an existing wall that would be demolished as part of the project. The existing wall would be reconstructed to match the existing height at a minimum.

2 Numbers in **bold** represent noise levels that approach or exceed the NAC.

3 The exterior-to-interior noise level reduction was assumed to be 20 dBA lower because the building type is light frame with ordinary windows.

dBA = A-weighted decibels

NAC = Noise Abatement Criteria

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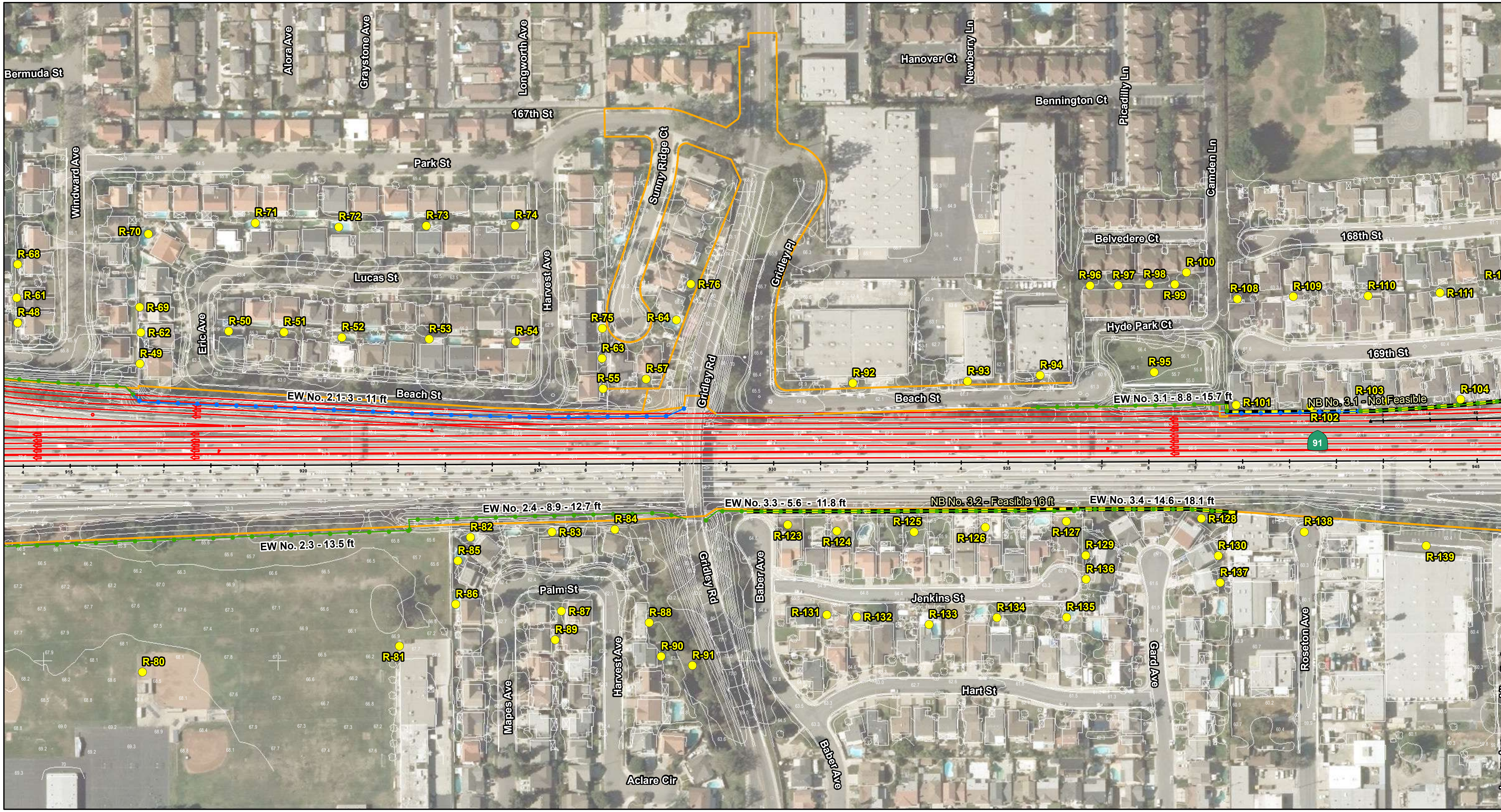

LEGEND

- Modeled Receptors*
- Diamond Ramps Design Option
- Existing Right-of-Way
- Proposed Right-Of-Way
- Existing Wall
- Existing Wall (Demolish)**
- Modeled Noise Barriers
- Acquisition

0 100 200
FEET

*Receptors R-158 through R-168 are not shown because the properties would be acquired.
**The existing wall would be demolished as part of the project and replaced at the new location at a minimum.

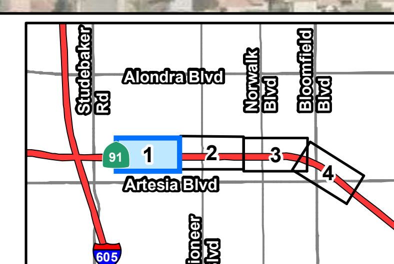

FIGURE 2.13-12
Sheet 1 of 4

Westbound SR-91 Improvement Project
Modeled Noise Barriers and Receptor Locations
Design Option 4: Diamond Ramps
07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

SOURCE: Eagle Aerial (4/2014); Michael Baker (9/2017)
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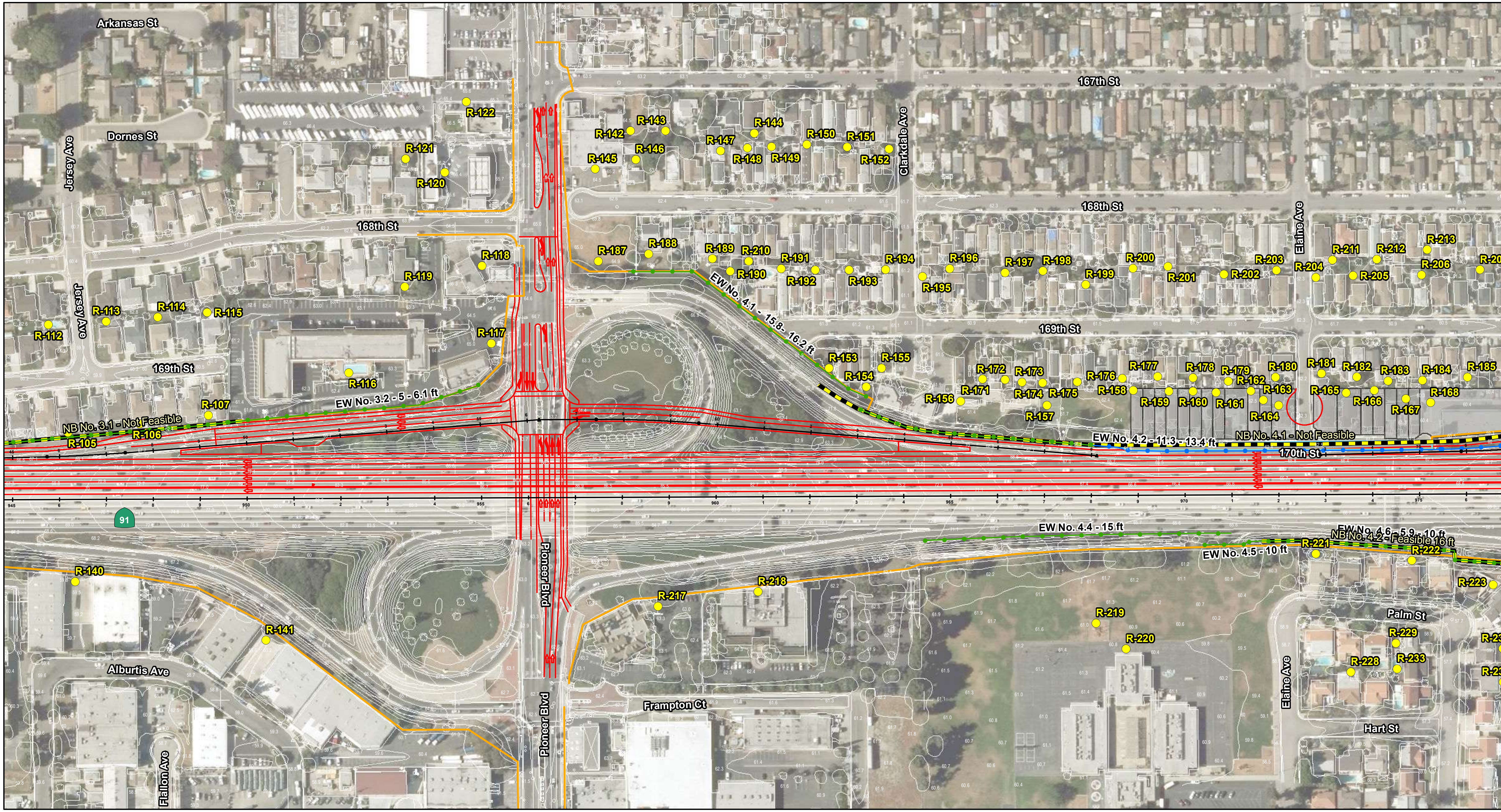

LEGEND

- Modeled Receptors*
- Diamond Ramps Design Option
- Existing Right-of-Way
- Proposed Right-Of-Way
- Existing Wall
- Existing Wall (Demolish)**
- Modeled Noise Barriers
- Acquisition

N

0 100 200
FEET

*Receptors R-158 through R-168 are not shown because the properties would be acquired.
**The existing wall would be demolished as part of the project and replaced at the new location at a minimum.

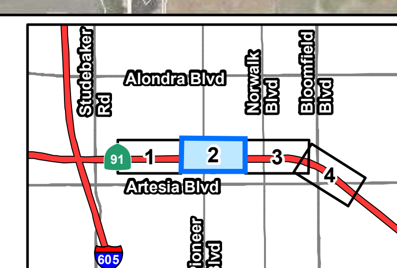

FIGURE 2.13-12
Sheet 2 of 4

Westbound SR-91 Improvement Project
Modeled Noise Barriers and Receptor Locations
Design Option 4: Diamond Ramps
07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

SOURCE: Eagle Aerial (4/2014); Michael Baker (9/2017)
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LEGEND

- Modeled Receptors*
- Diamond Ramps Design Option
- Existing Right-of-Way
- Proposed Right-Of-Way
- Existing Wall
- Existing Wall (Demolish)**
- Modeled Noise Barriers
- Acquisition

N

0 100 200
FEET

*Receptors R-158 through R-168 are not shown because the properties would be acquired.
**The existing wall would be demolished as part of the project and replaced at the new location at a minimum.

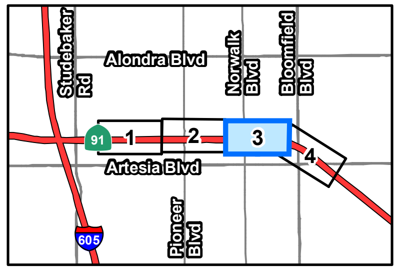

FIGURE 2.13-12
Sheet 3 of 4

Westbound SR-91 Improvement Project

Modeled Noise Barriers and Receptor Locations
Design Option 4: Diamond Ramps

07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

SOURCE: Eagle Aerial (4/2014); Michael Baker (9/2017)

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LEGEND

- Modeled Receptors*
- Diamond Ramps Design Option
- Existing Right-of-Way
- Proposed Right-Of-Way
- Existing Wall
- Existing Wall (Demolish)**
- Modeled Noise Barriers
- Acquisition

0 100 200
FEET

SOURCE: Eagle Aerial (4/2014); Michael Baker (9/2017)

I:\RBF1601\GIS\MXD\Noise\ModeledNoiseBarriers_Diamond.mxd (7/11/2018)

*Receptors R-158 through R-168 are not shown because the properties would be acquired.
**The existing wall would be demolished as part of the project and replaced at the new location at a minimum.

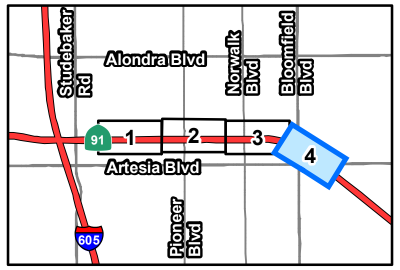

FIGURE 2.13-12
Sheet 4 of 4

Westbound SR-91 Improvement Project
Modeled Noise Barriers and Receptor Locations
Design Option 4: Diamond Ramps
07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0716000284; EA 29811

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- **NB No. 3.1:** A 1,051 ft long barrier along the private property line and State ROW on the westbound side of SR-91 was analyzed to shield Receptors R-101 through R-104 and R-107.
- **NB No. 3.2:** A 1,047 ft long barrier along the private property line on the eastbound side of SR-91 was analyzed to shield Receptors R-123, R-124, and R-126 through R-128.
- **NB No. 4.1:** A 1,667 ft long barrier along the State ROW on the westbound side of SR-91 was analyzed to shield Receptors R-155 and R-177 through R-183.
- **NB No. 4.2:** A 971 ft long barrier along the private property line and State ROW on the eastbound side of SR-91 was analyzed to shield Receptors R-221 through R-225, R-229, R-230, and R-234.
- **NB No. 5.1:** A 1,028 ft long barrier along the State ROW on the eastbound side of SR-91 was analyzed to shield Receptor R-234.
- **NB No. 5.2:** A 359 ft long barrier along the State ROW on the westbound side of SR-91 was analyzed to shield Receptors R-246, R-247, and R-262.
- **NB No. 5.3:** A 2,008 ft long barrier along the State ROW on the eastbound side of SR-91 was analyzed to shield Receptors R-276, R-277, R-279, R-282 through R-284, and R-289.

Feasibility and Reasonable Allowance

Section 3 of the Noise Protocol states that a minimum noise reduction of 5 dBA must be achieved at the impacted receptors in order for the proposed noise abatement measure to be considered feasible. Greater noise reductions are encouraged if they can be reasonably achieved. Feasibility may also be restricted by the following factors: (1) topography, (2) access requirements for driveways, (3) the presence of local cross-streets, (4) underground utilities, (5) other noise sources in the area, and (6) safety considerations.

Tables 2.13.18 through 2.13.23 summarize the feasibility of the modeled noise barriers and list the noise barrier heights, the approximate lengths, the noise attenuation range, the number of benefited units/receptors, and the total reasonable allowance. Table 2.13.18 summarizes those factors under the Build Alternative. Table 2.13.19 summarizes those factors under the Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width). Table 2.13.20 summarizes those factors under the Build Alternative with Design Option 5 (Four-Lane Gridley Road Overcrossing). Table 2.13.21 summarizes those factors under the Build Alternative with Design Option 2 (Pioneer Boulevard L-9). Table 2.13.22 summarizes those factors under

Table 2.13.18 Summary of Feasible Noise Barriers for the Build Alternative

Noise Barrier No.	Height (ft)	Approximate Length (ft)	Noise Attenuation (dBA)	Number of Benefited Receptors/ Units[1]	Total Reasonable Allowance[2]	Noise Barrier Location	Noise Barrier Station Number		Top of Wall Elevation	
							Begin	End	Begin	End
2.1	14	1,697	6	1	$95,000	PL	903+75	918+80	98	88.65
	16[3]	1,697	7	4	$380,000		903+75	918+80	100	90.65
2.2	10[4]	1,639	5	1	$95,000	EOS	903+95	918+90	98	84.25
	12	1,639	5	7	$665,000		903+95	918+90	100	86.25
	14	1,639	6	11	$1,045,000		903+95	918+90	102	88.25
	16	1,639	6	11	$1,045,000		903+95	918+90	104	90.25
2.1a	14	991	6	1	$95,000	PL	903+75	912+00	84	82.6
	16[3]	991	7	4	$380,000		903+75	912+00	86	84.6
2.2a	14[5]	932	6	9	$855,000	EOS/PL	903+75	912+05	82.94	90
	16	932	6	13	$1,235,000		903+75	912+05	84.94	92
3.2	16[4]	1,047	5	6	$570,000	PL	929+45	939+90	82.2	82
3.3	14[4]	1,122	6	9	$855,000	EOS	939+10	950+30	80.2	80
	16	1,122	7	9	$855,000		939+10	950+30	82.2	82
4.2	16[4]	971	5	5	$475,000	ROW/PL	971+65	980+60	86	82
5.1	14[4]	1,028	5	1	$95,000	ROW	986+15	992+00	78	78
	16	1,028	6	1	$95,000		986+15	992+00	80	80
5.2	16[3]	1,078	6	5	$475,000	ROW	993+85	1004+10	80	87.39
6.1	6	355	5	1	$95,000	ROW	1015+85	1019+50	68	68
	8	355	7	3	$285,000		1015+85	1019+50	70	70
	10	355	10	5	$475,000		1015+85	1019+50	72	72
	12	355	12	16	$1,520,000		1015+85	1019+50	74	74
	14	355	13	20	$1,900,000		1015+85	1019+50	76	76
	16[5]	355	14	20	$1,900,000		1015+85	1019+50	78	78

Source: *Noise Abatement Decision Report* (2018).

[1] Number of receptors/units that are attenuated by 5 dBA or more by the modeled barrier.

[2] Calculated by multiplying the number of benefited receptors by $95,000 (the dollar amount per benefited receptor/unit).

[3] Denotes that the maximum feasible barrier height modeled would not break the line-of-sight between the receptor and a truck exhaust stack.

[4] Denotes that the minimum wall height required to break the line-of-sight between the receptor and a truck exhaust stack is lower than the minimum feasible barrier height.

[5] Denotes the minimum barrier height required to break the line-of-sight between the receptor and a truck exhaust stack.

dBA = A-weighted decibels
EOS = edge of shoulder
ft = foot/feet
PL = property line
ROW = right-of-way

Table 2.13.19 Summary of Feasible Noise Barriers for the Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width)

Noise Barrier No.	Height (ft)	Approximate Length (ft)	Noise Attenuation (dBA)	Number of Benefited Receptors/ Units[1]	Total Reasonable Allowance[2]	Noise Barrier Location	Noise Barrier Station Number		Top of Wall Elevation	
							Begin	End	Begin	End
2.1	14	1,700	6	1	$95,000	PL	903+75	918+75	98	88.65
	16[3]	1,700	7	4	$380,000		903+75	918+75	100	90.65
2.2	14[4]	1,639	6	9	$855,000	EOS	903+95	918+90	102	88.25
	16	1,639	6	9	$855,000		903+95	918+90	104	90.25
2.1a	14	991	6	1	$95,000	PL	903+75	912+00	84	82.6
	16[3]	991	7	4	$380,000		903+75	912+00	86	84.6
2.2a	14	936	6	9	$855,000	EOS/PL	903+75	912+05	82.94	90
	16[3]	936	6	11	$1,045,000		903+75	912+05	84.94	92
3.2	16[4]	1,047	5	3	$285,000	PL	929+45	939+90	82.2	82
3.3	14[5]	670	6	11	$1,045,000	EOS	939+10	945+75	78	80.67
	16	670	6	11	$1,045,000		939+10	945+75	80	82.67
4.2	16[4]	971	5	5	$475,000	ROW/PL	971+65	980+60	86	82
5.1	14	1,028	5	1	$95,000	ROW	986+15	992+00	78	78
	16[5]	1,028	6	1	$95,000		986+15	992+00	80	80
6.1	6	355	5	1	$95,000	ROW	1015+85	1019+50	68	68
	8	355	7	3	$285,000		1015+85	1019+50	70	70
	10	355	10	9	$855,000		1015+85	1019+50	72	72
	12	355	11	16	$1,520,000		1015+85	1019+50	74	74
	14	355	13	20	$1,900,000		1015+85	1019+50	76	76
	16[5]	355	14	20	$1,900,000		1015+85	1019+50	78	78

Source: *Noise Abatement Decision Report* (2018).

[1] Number of receptors/units that are attenuated by 5 dBA or more by the modeled barrier.

[2] Calculated by multiplying the number of benefited receptors by $95,000 (the dollar amount per benefited receptor/unit).

[3] Denotes that the maximum feasible barrier height modeled would not break the line-of-sight between the receptor and a truck exhaust stack.

[4] Denotes that the minimum wall height required to break the line-of-sight between the receptor and a truck exhaust stack is lower than the minimum feasible barrier height.

[5] Denotes the minimum barrier height required to break the line-of-sight between the receptor and a truck exhaust stack.

dBA = A-weighted decibels

EOS = edge of shoulder

ft = foot/feet

PL = property line

ROW = right-of-way

Table 2.13.20 Summary of Feasible Noise Barriers for the Build Alternative with Design Option 5 (Four-Lane Gridley Road Overcrossing)

Noise Barrier No.	Height (ft)	Approximate Length (ft)	Noise Attenuation (dBA)	Number of Benefited Receptors/ Units[1]	Total Reasonable Allowance[2]	Noise Barrier Location	Noise Barrier Station Number		Top of Wall Elevation	
							Begin	End	Begin	End
3.2	16[3]	1,047	5	6	$570,000	PL	929+45	939+90	82.2	82

Source: *Noise Abatement Decision Report* (2018).
[1] Number of receptors/units that are attenuated by 5 dBA or more by the modeled barrier.
[2] Calculated by multiplying the number of benefited receptors by $95,000 (the dollar amount per benefited receptor/unit).
[3] Denotes that the minimum wall height required to break the line-of-sight between the receptor and a truck exhaust stack is lower than the minimum feasible barrier height.
dBA = A-weighted decibels
EOS = edge of shoulder
ft = foot/feet
PL = property line
ROW = right-of-way

Table 2.13.21 Summary of Feasible Noise Barriers for the Build Alternative with Design Option 2 (Pioneer Boulevard L-9)

Noise Barrier No.	Height (ft)	Approximate Length (ft)	Noise Attenuation (dBA)	Number of Benefited Receptors/ Units[1]	Total Reasonable Allowance[2]	Noise Barrier Location	Noise Barrier Station Number		Top of Wall Elevation	
							Begin	End	Begin	End
3.2	16[3]	1,047	5	6	$570,000	PL	929+45	939+90	82.2	82

Source: *Noise Abatement Decision Report* (2018).
[1] Number of receptors/units that are attenuated by 5 dBA or more by the modeled barrier.
[2] Calculated by multiplying the number of benefited receptors by $95,000 (the dollar amount per benefited receptor/unit).
[3] Denotes that the minimum wall height required to break the line-of-sight between the receptor and a truck exhaust stack is lower than the minimum feasible barrier height.
dBA = A-weighted decibels
ft = foot/feet
PL = property line

Table 2.13.22 Summary of Feasible Noise Barriers for the Build Alternative with Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment)

Noise Barrier No.	Height (ft)	Approximate Length (ft)	Noise Attenuation (dBA)	Number of Benefited Receptors/ Units[1]	Total Reasonable Allowance[2]	Noise Barrier Location	Noise Barrier Station Number		Top of Wall Elevation	
							Begin	End	Begin	End
3.2	16[3]	1,047	5	6	$570,000	PL	929+45	939+90	82.2	82

Source: *Noise Abatement Decision Report* (2018).

[1] Number of receptors/units that are attenuated by 5 dBA or more by the modeled barrier.

[2] Calculated by multiplying the number of benefited receptors by $95,000 (the dollar amount per benefited receptor/unit).

[3] Denotes the minimum wall height required to break the line-of-sight between the receptor and a truck exhaust stack.

dBA = A-weighted decibels

ft = foot/feet

PL = property line

Table 2.13.23 Summary of Feasible Noise Barriers for the Build Alternative with Design Option 4 (Diamond Ramps)

Noise Barrier No.	Height (ft)	Approximate Length (ft)	Noise Attenuation (dBA)	Number of Benefited Receptors/ Units[1]	Total Reasonable Allowance[2]	Noise Barrier Location	Noise Barrier Station Number		Top of Wall Elevation	
							Begin	End	Begin	End
3.2	16[3]	1,047	5	6	$570,000	PL	929+45	939+90	82.2	82
4.2	16[4]	971	5	5	$475,000	ROW/PL	971+65	980+60	86	82
5.1	14[4]	1,028	5	1	$95,000	ROW	986+15	992+00	78	78
	16	1,028	6	1	$95,000		986+15	992+00	80	80

Source: *Noise Abatement Decision Report* (2018).

[1] Number of receptors/units that are attenuated by 5 dBA or more by the modeled barrier.

[2] Calculated by multiplying the number of benefited receptors by $95,000 (the dollar amount per benefited receptor/unit).

[3] Denotes that the maximum feasible barrier height modeled would not break the line-of-sight between the receptor and a truck exhaust stack.

[4] Denotes that the minimum wall height required to break the line-of-sight between the receptor and a truck exhaust stack is lower than the minimum feasible barrier height..

dBA = A-weighted decibels

ft = foot/feet

PL = property line

ROW = right-of-way

the Build Alternative with Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment). Table 2.13.23 summarizes those factors under the Build Alternative with Design Option 4 (Diamond Ramps).

Of the 15 modeled noise barriers evaluated for the Build Alternative, 10 noise barriers were determined to be feasible. The remaining 5 noise barriers (NB Nos. 1.1, 2.3, 3.1, 4.1, and 5.3) were determined to be not feasible because the barriers were not capable of reducing noise levels by 5 dBA or more. Of the 14 modeled noise barriers evaluated for the Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width), 9 noise barriers were determined to be feasible. The remaining 5 noise barriers (NB Nos. 2.3, 3.1, 4.1, 5.2, and 5.3) were determined to be not feasible because the barriers were not capable of reducing noise levels by 5 dBA or more. One modeled noise barrier was evaluated for the Build Alternative with Design Option 5 (Four-Lane Gridley Road Overcrossing) and was determined to be feasible. Of the 3 modeled noise barriers evaluated for the Build Alternative with Design Option 2 (Pioneer Boulevard L-9), 1 noise barrier was determined to be feasible. The remaining 2 noise barriers (NB Nos. 3.1 and 4.1) were determined to be not feasible because the barriers were not capable of reducing noise levels by 5 dBA or more. Of the 3 modeled noise barriers evaluated for the Build Alternative with Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment), 1 noise barrier was determined to be feasible. The remaining 2 noise barriers (NB Nos. 3.1 and 4.1) were determined to be not feasible because the barriers were not capable of reducing noise levels by 5 dBA or more. Of the 7 modeled noise barriers evaluated for the Build Alternative with Design Option 4 (Diamond Ramps), 3 noise barriers were determined to be feasible. The remaining 4 noise barriers (NB Nos. 3.1, 4.1, 5.2, and 5.3) were determined to be not feasible because the barriers were not capable of reducing noise levels by 5 dBA or more.

Noise Barrier Reasonableness

The reasonableness of a noise barrier is determined by comparing the estimated cost of constructing the noise barrier against the total reasonable allowance. The total reasonable allowance is determined based on the number of benefited residences/receptors multiplied by the reasonable allowance per residence/receptor. Additionally, in accordance with the Caltrans Noise Protocol, each noise barrier must provide at least 7 dBA of noise reduction at one or more benefited residences/receptors to be considered reasonable. Therefore, if the estimated noise barrier construction cost exceeds the total reasonable allowance or was not predicted to provide at least 7 dBA of noise reduction at one or more benefited residences/receptors, the noise barrier is determined to be not reasonable. However, if the estimated noise barrier construction cost is less than the total reasonable allowance and is predicted to provide at least 7 dBA of noise reduction at one or more benefited residences/receptors, the noise barrier is determined to be reasonable.

The estimated noise barrier construction cost for each barrier under the Build Alternative and the Build Alternative with design options was developed by the project engineer. Tables 2.13.24 through 2.13.29 summarize the abatement information and list all the feasible noise barriers, along with their heights, approximate lengths, highest noise attenuation, number of benefited units/receptors, total reasonable allowance per barrier, and whether the noise barrier is reasonable. Table 2.13.24 summarizes those factors under the Build Alternative. Table 2.13.25 summarizes those factors under the Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width). Table 2.13.26 summarizes those factors under the Build Alternative with Design Option 5 (Four-Lane Gridley Road Overcrossing). Table 2.13.27 summarizes those factors under the Build Alternative with Design Option 2 (Pioneer Boulevard L-9). Table 2.13.28 summarizes those factors under the Build Alternative with Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment). Table 2.13.29 summarizes those factors under the Build Alternative with Design Option 4 (Diamond Ramps).

As shown in Tables 2.13.24 and 2.13.25, NB No. 6.1 under the Build Alternative and the Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width) is the only noise barrier determined to be reasonable. No noise barriers were determined to be reasonable for the Build Alternative with Design Option 5 (Four-Lane Gridley Road Overcrossing), the Build Alternative with Design Option 2 (Pioneer Boulevard L-9), the Build Alternative with Design Option 3 (Pioneer Boulevard Westbound Ramps/168th Alignment), and the Build Alternative with Design Option 4 (Diamond Ramps).

Calculations based on preliminary design data indicate that NB No. 6.1 is both feasible and reasonable as shown in Tables 2.13.24 and 2.13.25, respectively. Although NB No. 6.1 is both feasible and reasonable, it is not recommended for construction as part of the Westbound SR-91 Improvement Project because NB No. 6.1 protects receptors in the Aria and Sage apartment complexes in Cerritos. The Aria and Sage apartment complexes were approved by the City of Cerritos in June 2013 and October 2014, respectively, and constructed/occupied in 2017.

Table 2.13.24 Summary of Abatement Key Information for the Build Alternative

Noise Barrier No.	Noise Barrier Location	Height (ft)	Approximate Length (ft)	Noise Attenuation Range (dBA)	Number of Benefited Receptors/ Units[1]	Total Reasonable Allowance	Estimated Construction Cost	Reasonable?
2.1	PL	14	1,697	6	1	$95,000	--[2]	No
		16	1,697	7	4	$380,000	$1,446,121	No
2.2	EOS	10	1,639	5	1	$95,000	--	No
		12	1,639	5	7	$665,000	--	No
		14	1,639	6	11	$1,045,000	--	No
		16	1,639	6	11	$1,045,000	--	No
2.1a	PL	14	991	6	1	$95,000	--	No
		16	991	7	4	$380,000	$849,396	No
2.2a	EOS/PL	14	932	6	9	$855,000	--	No
		16	932	6	13	$1,235,000	--	No
3.2	PL	16	1,047	5	6	$570,000	--	No
3.3	EOS	14	1,122	6	9	$855,000	--	No
		16	1,122	7	9	$855,000	$1,486,249	No
4.2	ROW/PL	16	971	5	5	$475,000	--	No
5.1	ROW	14	1,028	5	1	$95,000	--	No
		16	1,028	6	1	$95,000	--	No
5.2	ROW	16	1,078	6	5	$475,000	--	No
6.1	ROW	6	355	5	1	$95,000	--	No
		8	355	7	3	$285,000	$310,733	No
		10	355	10	5	$475,000	$328,774	Yes
		12	355	12	16	$1,520,000	$350,106	Yes
		14	355	13	20	$1,900,000	$374,728	Yes
		16	355	14	20	$1,900,000	$399,350	Yes

Source: *Noise Abatement Decision Report* (2018).
[1] Number of receptors/units that are attenuated 5 dBA or more by the modeled barrier.
[2] Shaded area represents barrier heights that have been determined to be not reasonable because the barrier would not reduce noise levels by 7 dBA or more.
dBA = A-weighted decibels
EOS = Edge of Shoulder
ft = foot/feet
PL = property line
ROW = right-of-way

Table 2.13.25 Summary of Abatement Key Information for the Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width)

Noise Barrier No.	Noise Barrier Location	Height (ft)	Approximate Length (ft)	Noise Attenuation Range (dBA)	Number of Benefited Receptors/ Units[1]	Total Reasonable Allowance	Estimated Construction Cost	Reasonable?
2.1	PL	14	1,700	6	1	$95,000	--[2]	No
		16	1,700	7	4	$380,000	$1,447,763	No
2.2	EOS	14	1,639	6	9	$855,000	--	No
		16	1,639	6	9	$855,000	--	No
2.1a	PL	14	991	6	1	$95,000	--	No
		16	991	7	4	$380,000	$849,396	No
2.2a	EOS/PL	14	936	6	9	$855,000	--	No
		16	936	6	11	$1,045,000	--	No
3.2	PL	16	1,047	5	3	$285,000	--	No
3.3	EOS	14	670	6	11	$1,045,000	--	No
		16	670	6	11	$1,045,000	--	No
4.2	ROW/PL	16	971	5	5	$475,000	--	No
5.1	ROW	14	1,028	5	1	$95,000	--	No
		16	1,028	6	1	$95,000	--	No
6.1	ROW	6	355	5	1	$95,000	--	No
		8	355	7	3	$285,000	--	No
		10	355	10	9	$855,000	$328,774	Yes
		12	355	11	16	$1,520,000	$350,106	Yes
		14	355	13	20	$1,900,000	$374,728	Yes
		16	355	14	20	$1,900,000	$399,350	Yes

Source: *Noise Abatement Decision Report* (2018).
[1] Number of receptors/units that are attenuated 5 dBA or more by the modeled barrier.
[2] Shaded area represents barrier heights that have been determined to be not reasonable because the barrier would not reduce noise levels by 7 dBA or more.
dBA = A-weighted decibels
EOS = Edge of Shoulder
ft = foot/feet
PL = property line
ROW = right-of-way

Table 2.13.26 Summary of Abatement Key Information for the Build Alternative with Design Option 5 (Four-Lane Gridley Road Overcrossing)

Noise Barrier No.	Noise Barrier Location	Height (ft)	Approximate Length (ft)	Noise Attenuation Range (dBA)	Number of Benefited Receptors/ Units[1]	Total Reasonable Allowance	Estimated Construction Cost	Reasonable?
3.2	PL	16	1,047	5	6	$570,000	--[2]	No

Source: *Noise Abatement Decision Report* (2018).
[1] Number of receptors/units that are attenuated 5 dBA or more by the modeled barrier.
[2] Shaded area represents barrier heights that have been determined to be not reasonable because the barrier would not reduce noise levels by 7 dBA or more.
dBA = A-weighted decibels
ft = foot/feet
PL = property line

Table 2.13.27 Summary of Abatement Key Information for the Build Alternative with Design Option 2 (Pioneer Boulevard L-9)

Noise Barrier No.	Noise Barrier Location	Height (ft)	Approximate Length (ft)	Noise Attenuation Range (dBA)	Number of Benefited Receptors/ Units[1]	Total Reasonable Allowance	Estimated Construction Cost	Reasonable?
3.2	PL	16	1,047	5	6	$570,000	--[2]	No

Source: *Noise Abatement Decision Report* (2018).
[1] Number of receptors/units that are attenuated 5 dBA or more by the modeled barrier.
[2] Shaded area represents barrier heights that have been determined to be not reasonable because the barrier would not reduce noise levels by 7 dBA or more.
dBA = A-weighted decibels
ft = foot/feet
PL = property line

Table 2.13.28 Summary of Abatement Key Information for the Build Alternative with Design Option 3 (Pioneer Boulevard Westbound/168th Alignment)

Noise Barrier No.	Noise Barrier Location	Height (ft)	Approximate Length (ft)	Noise Attenuation Range (dBA)	Number of Benefited Receptors/ Units[1]	Total Reasonable Allowance	Estimated Construction Cost	Reasonable?
3.2	PL	16	1,047	5	6	$570,000	--[2]	No

Source: *Noise Abatement Decision Report* (2018).
[1] Number of receptors/units that are attenuated 5 dBA or more by the modeled barrier.
[2] Shaded area represents barrier heights that have been determined to be not reasonable because the barrier would not reduce noise levels by 7 dBA or more.
dBA = A-weighted decibels
ft = foot/feet
PL = property line

Table 2.13.29 Summary of Abatement Key Information for the Build Alternative with Design Option 4 (Diamond Ramps)

Noise Barrier No.	Noise Barrier Location	Height (ft)	Approximate Length (ft)	Noise Attenuation Range (dBA)	Number of Benefited Receptors/ Units[1]	Total Reasonable Allowance	Estimated Construction Cost	Reasonable?
3.2	PL	16	1,047	5	6	$570,000	--[2]	No
4.2	ROW/PL	16	971	5	5	$475,000	--	No
5.1	ROW	14	1,028	5	1	$95,000	--	No
		16	1,028	6	1	$95,000	--	No

Source: *Noise Abatement Decision Report* (2018).
[1] Number of receptors/units that are attenuated 5 dBA or more by the modeled barrier.
[2] Shaded area represents barrier heights that have been determined to be not reasonable because the barrier would not reduce noise levels by 7 dBA or more.
dBA = A-weighted decibels
ft = foot/feet
PL = property line
ROW = right-of-way

In accordance with 23 CFR 772.15(b), which requires highway agencies to provide officials within whose jurisdiction a highway project is located information that may be useful to protect future land development from becoming incompatible with anticipated highway noise levels, Caltrans and the Los Angeles County Metropolitan Transportation Authority (Metro) actively engaged the City of Cerritos as part of the Project Development Team for the *SR-91/I-605/I-405 Congestion Hot Spots Feasibility Study* (Feasibility Study), which included a list of freeway and arterial projects that would reduce existing and forecasted congestion in the SR-91/I-605/I-405 corridors in March 2013. Thereafter, a Project Study Report/Project Development Support (PSR/PDS) document was completed for the I-605/SR-91 in July 2014. Because this information about the Westbound SR-91 Improvement Project was included in the Feasibility Study and PSR/PDS, the City of Cerritos could have worked with the developer of the apartment complexes to provide noise attenuation as part of the land development project and/or re-orient frequent human use areas in the site plans to not be directly exposed to traffic noise from SR-91. This preliminary decision on noise abatement may change based on input received from the public. The final decision on noise abatement will be made upon completion of the project design.

Nonacoustical Factors Relating to Feasibility

Nonacoustical factors relating to feasibility were considered for the reasonable noise barriers. These factors include: geometric standards, safety, maintenance, security, drainage, geotechnical considerations, and utility relocations. The nonacoustical factors relating to feasibility are addressed below for the feasible and reasonable noise barriers.

Build Alternative

The nonacoustical factors relating to feasibility of NB No. 6.1 under the Build Alternative and the Build Alternative with Design Option 1 (Reduced Lane/Shoulder Width) are addressed below.

- **Geometric Standards:** NB No. 6.1 would not affect the geometric standards of adjacent roadways.
- **Safety:** NB No. 6.1 would not affect sight distance for vehicular or pedestrian traffic.
- **Maintenance:** NB No. 6.1 would be placed on the edge of State ROW. Maintenance of the private side of the noise barrier would not be accessible to Caltrans and would be the responsibility of the private property owner.

- **Security:** NB No. 6.1 would not change the security conditions of the site and therefore would not create potential security risks by providing cover for people or articles trying to remain out of sight.
- **Drainage:** NB No. 6.1 would not affect the existing and proposed drainage system.
- **Geotechnical Considerations:** NB No. 6.1 would be constructed at a similar grade to the existing condition in native soil.
- **Utility Relocations:** No utility impacts are anticipated as a result of NB No. 6.1.

No Build Alternative

Potential long-term noise effects under the No Build Alternative would be solely from traffic noise. Future No Build noise levels are shown in Table 2.13.6. Of the 362 modeled receptor locations, 40 receptors would continue to approach or exceed the NAC under the future No Build condition.

2.13.4 Avoidance, Minimization, and/or Mitigation Measures

Because the project will incorporate the project features and noise abatement described above in Sections 2.13.3.1 and 2.13.3.2, no adverse impacts related to noise would occur. Therefore, no avoidance, minimization, and/or mitigation measures are required.

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BIOLOGICAL ENVIRONMENT

2.14 Wetlands and Other Waters

2.14.1 Regulatory Setting

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Federal Water Pollution Control Act, more commonly referred to as the Clean Water Act (CWA) (33 United States Code [USC] 1344), is the primary law regulating wetlands and surface waters. One purpose of the CWA is to regulate the discharge of dredged or fill material into waters of the U.S., including wetlands. Waters of the U.S. include navigable waters, interstate waters, territorial seas, and other waters that may be used in interstate or foreign commerce. The lateral limits of jurisdiction over non-tidal water bodies extend to the ordinary high water mark (OHWM), in the absence of adjacent wetlands. When adjacent wetlands are present, CWA jurisdiction extends beyond the OHWM to the limits of the adjacent wetlands. To classify wetlands for the purposes of the CWA, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils formed during saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the CWA.

Section 404 of the CWA establishes a regulatory program that provides that discharge of dredged or fill material cannot be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by the U.S. Army Corps of Engineers (USACE) with oversight by the U.S. Environmental Protection Agency (U.S. EPA).

The USACE issues two types of 404 permits: General and Individual. There are two types of General permits: Regional and Nationwide. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Regional or Nationwide Permit may be permitted under one of USACE's Individual permits. There are two types of Individual permits: Standard permits and Letters of Permission. For Individual permits, the USACE decision to approve is based on compliance with U.S. EPA's Section 404(b)(1) Guidelines (40 Code of Federal Regulations [CFR] 230), and whether permit approval is in the public interest. The Section 404 (b)(1) Guidelines (Guidelines) were developed by the U.S. EPA in conjunction with the USACE, and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that the USACE may not issue a permit if there is a "least environmentally damaging practicable alternative" (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S., and not have any other significant adverse environmental consequences.

The Executive Order for the Protection of Wetlands (EO 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, EO 11990 states that a federal agency, such as FHWA and/or Caltrans, as assigned, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds: (1) that there is no practicable alternative to the construction and (2) the proposed project includes all practicable measures to minimize harm. A Wetlands Only Practicable Finding must be made.

At the state level, wetlands and waters are regulated primarily by the State Water Resources Control Board (SWRCB), the Regional Water Quality Control Boards (RWQCBs) and the California Department of Fish and Wildlife (CDFW). In certain circumstances, the Coastal Commission (or Bay Conservation and Development Commission or the Tahoe Regional Planning Agency) may also be involved. Sections 1600-1607 of the California Fish and Game Code require any agency that proposes a project that will substantially divert or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify CDFW before beginning construction. If CDFW determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. CDFW jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of the USACE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the CDFW.

The RWQCBs were established under the Porter-Cologne Water Quality Control Act to oversee water quality. Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDRs) and may be required even when the discharge is already permitted or exempt under the CWA. In compliance with Section 401 of the CWA, the RWQCBs also issue water quality certifications for activities which may result in a discharge to waters of the U.S. This is most frequently required in tandem with a Section 404 permit request. Please see Section 2.8 Water Quality and Storm Water Runoff, for additional details.

2.14.2 Affected Environment

The information in this section is based on the *Natural Environment Study (Minimal Impacts)* (NES[MI]) (2017 and 2018 errata) and the *Jurisdictional Delineation* (2017 and 2018 errata) for the proposed project. The *Jurisdictional Delineation*, which was conducted in accordance with current USACE and CDFW criteria, is provided in Appendix C of the *Natural Environment Study (Minimal Impacts)*.

The drainage features within the biological study area (BSA) consist of unnamed storm water runoff and concrete flood control channels, which drain urban runoff from upland areas, generally run parallel to State Route 91 (SR-91), Interstate 605 (I-605), and the on-/off-ramps, and are presumed to drain into the San Gabriel River. The San Gabriel River connects directly to the Pacific Ocean (a traditional navigable water [TNW] of the United States), thereby establishing a nexus to navigable waters as defined by USACE guidance.

Fourteen drainage features identified within the BSA are designated as Drainage Features A through N and are shown on Figure 2.14-1, included at the end of the section. Drainage Features C, D, G, M, and N are concrete lined or dominated by upland vegetation, lack riparian habitat, and either have limited weedy vegetation growth or vegetation growth in less than 6 inches of accumulated sediment on concrete. The USACE is not expected to assert jurisdiction over Drainage Features C, D, G, M, or N because the USACE typically does not assert jurisdiction over nontidal drainage and irrigation ditches that are excavated on dry land, that drain adjacent upland areas, and that do not convey relatively permanent water (RPW).

Drainage Features E, I, J, K, and L as well as portions of Drainage Features A, B, F, and H are human altered and surrounded by urban habitat but appear to contain RPW and function like streams with a nexus to a TNW. The USACE is expected to assert jurisdiction over Drainage Features E, I, J, K, and L as well as portions of Drainage Features A, B, F, and H.

The *Jurisdictional Delineation* indicated there are a total of 0.88 acre (ac) of nonwetland waters that are potentially subject to USACE jurisdiction. There are no areas in the BSA satisfying the USACE wetland criteria.

Since Drainage Features E, I, J, K, and L and portions of Drainage Features A, B, F, and H satisfy the USACE jurisdictional criteria for waters of the United States (waters of the U.S.), as described above, they are also subject to CDFW jurisdiction pursuant to Section 1602 of the California Fish and Game Code. Streambed banks and riparian habitat extending beyond the limits of USACE jurisdiction are considered to be subject to CDFW jurisdiction. However, there were no areas within the BSA where riparian habitat exists in association with the drainage features. As such, CDFW jurisdiction corresponds with the upper limits of the jurisdictional drainage channels (or portions of channels that contain RPW), as the sides of the man-made drainages serve as artificial banks.

The *Jurisdictional Delineation* indicated there are a total of 1.17 ac of potential CDFW jurisdiction within the BSA.

Because there is no current public guidance on determining RWQCB jurisdictional areas, potential jurisdiction was determined based on the federal definition of wetlands and other waters of the U.S. as recommended by the *Workplan: Filling the Gaps in Wetland Protection* (SWRCB 2004). RWQCB potential jurisdiction would be considered coincident with USACE potential jurisdiction for the purposes of Section 401 certification. If CWA jurisdiction is determined to be absent, these features may be regulated by the RWQCB pursuant to the California Porter-Cologne Water Quality Control Act (Porter-Cologne Act). The total area of potential RWQCB jurisdiction is the same as the USACE jurisdiction (i.e., 0.88 ac).

Table 2.14.1 provides the area in acres of each of the fourteen potentially jurisdictional and nonjurisdictional drainage features, respectively, in the BSA.

2.14.3 Environmental Consequences

The discussions regarding the potential temporary and permanent project impacts on jurisdictional waters and nonjurisdictional drainage features in the following sections should be considered preliminary until verified by the USACE, CDFW, and RWQCB.

Based on the preliminary project design, it is anticipated that some of the flood control channels within the BSA, particularly on the westbound side of SR-91, may be impacted by the project (Figure 2.14-2, included at the end of the section). Therefore, the project is expected to have impacts to the jurisdictional waters that are located within the BSA, and permits (i.e., USACE Section 404 Nationwide Permit authorization, CDFW Section 1602 Streambed Alteration Agreement, and RWQCB Section 401 Water Quality Certification) are expected to be necessary.

Table 2.14.1 Potentially Jurisdictional and Nonjurisdictional Drainage Feature Area Measurements

Drainage Features	Potential Jurisdictional USACE Area (acres)	Potential Jurisdictional CDFW Area (acres)	Potential Nonjurisdictional Drainage Area (acres)
A	0.29	0.38	0.42
B	0.02	0.03	0.34
C	0	0	0.009
D	0	0	0.006
E	0.08	0.11	0
F	0.010	0.006	0.11
G	0	0	0.22
H	0.013	0.018	0.14
I	0.05	0.07	0
J	0.37	0.44	0
K	0.008	0.008	0
L	0.05	0.09	0
M	0	0	0.012
N	0	0	0.08
TOTAL	**0.88**	**1.17**	**1.33**

Source: *Natural Environment Study (Minimal Impacts)* (2017 and 2018 Errata).
Note: Totals may not appear to sum correctly due to rounding.
CDFW = California Department of Fish and Wildlife
USACE = United States Army Corps of Engineers

2.14.3.1 Temporary Impacts

Build Alternative (includes Design Options)

United States Army Corps of Engineers Jurisdictional Areas and Nonjurisdictional Drainage Areas

Table 2.14.2 shows the temporary and permanent impacts to USACE jurisdictional areas, as well as on drainage areas anticipated to be deemed nonjurisdictional, in the BSA as a result of construction and operation of the Build Alternative.

The Build Alternative is expected to result in 0.01 ac of temporary impacts to nonwetland waters subject to USACE jurisdiction due to construction. The potential impact area is within Drainage Feature J.

Construction of the Build Alternative would potentially result in 0.002 ac of temporary impacts to nonjurisdictional drainage areas. The potential impact areas are within Drainage Features C and D.

Table 2.14.2 Temporary and Permanent Project Impacts to USACE Jurisdictional Areas and Nonjurisdictional Drainage Areas

Potential Jurisdictional Areas		Potential Nonjurisdictional Areas	
Temporary Impacts (acres)	**Permanent Impacts (acres)**	**Temporary Impacts (acres)**	**Permanent Impacts (acres)**
0.01	0.43	0.002	0.461

Source: *Natural Environment Study (Minimal Impacts)* (2017 and 2018 Errata).
USACE = United States Army Corps of Engineers

California Department of Fish and Wildlife Jurisdictional Areas and Nonjurisdictional Drainage Areas

Table 2.14.3 shows the amount of temporary and permanent impacts to CDFW jurisdictional areas, as well as on drainage areas anticipated to be deemed nonjurisdictional, in the BSA as a result of construction and operation of the Build Alternative.

Table 2.14.3 Temporary and Permanent Project Impacts to CDFW Jurisdictional Areas and Nonjurisdictional Drainage Areas

Potential Jurisdictional Areas		Potential Nonjurisdictional Areas	
Temporary Impacts (acres)	**Permanent Impacts (acres)**	**Temporary Impacts (acres)**	**Permanent Impacts (acres)**
0.02	0.52	0.002	0.461

Source: *Natural Environment Study (Minimal Impacts)* (2017 and 2018 Errata).
CDFW = California Department of Fish and Wildlife

The Build Alternative will result in temporary impacts to 0.02 ac of nonwetland area subject to CDFW jurisdiction as a result of construction. The potential temporary impacts would occur within Drainage Feature J.

Construction of the Build Alternative would potentially result in 0.002 ac of temporary impacts to nonjurisdictional drainage areas. The potential impact areas are within Drainage Features C and D.

Regional Water Quality Control Board Jurisdictional Areas and Nonjurisdictional Drainage Areas

As noted earlier, Table 2.14.2 shows the temporary impacts to USACE jurisdictional areas. The temporary impacts to RWQCB areas would be the same as shown in Table 2.14.2 for the USACE areas, 0.01 ac.

No Build Alternative

None of the proposed project improvements would be constructed under the No Build Alternative. Therefore, the No Build Alternative would not result in temporary impacts to USACE, CDFW, or RWQCB areas in the BSA.

2.14.3.2 Permanent Impacts

Build Alternative (includes Design Options)

United States Army Corps of Engineers Jurisdictional Areas and Nonjurisdictional Drainage Areas

As shown in Table 2.14.2, the Build Alternative will result in permanent impacts to 0.43 ac of nonwetland waters potentially subject to USACE jurisdiction (i.e., Drainage Features B, H, I, and J).

The Build Alternative will result in 0.461 ac of permanent impacts to nonjurisdictional drainage areas. The potential nonjurisdictional impact areas are within portions of Drainage Features B, C, D, G, and H.

California Department of Fish and Wildlife Jurisdictional Areas and Nonjurisdictional Drainage Areas

As shown in Table 2.14.3, the Build Alternative will result in permanent impacts to 0.52 ac of nonwetland areas subject to CDFW jurisdiction. The permanent impacts would occur within Drainage Features B, H, I, and J.

The Build Alternative would result in permanent impacts to 0.461 ac of nonjurisdictional drainage areas. The impact areas are within Drainage Features B, C, D, G, and H.

Regional Water Quality Control Board Jurisdictional Areas and Nonjurisdictional Drainage Areas

The permanent impacts on RWQCB areas under the Build Alternative would be the same as shown in Table 2.14.2 for the USACE areas, 0.43 ac.

The following project features outline the permits that will be obtained prior to initiation of construction:

PF-WET-1 Prior to initiation of construction, a permit will be obtained through the United States Army Corps of Engineers (USACE) pursuant to Section 404 of the Clean Water Act. As part of coordination with the USACE, a Letter of Permission (LOP) will be pursued, if appropriate.

PF-WET-2 Prior to initiation of construction, either a Watershed Streambed Alteration Agreement (WSAA; in combination with an LOP) or a Streambed Alternation Agreement (SAA; in combination with an Individual Permit) with the California Department of Fish and Wildlife (CDFW) will be obtained and any specifications in the WSAA or SAA will be implemented.

PF-WET-3 Prior to initiation of construction, a Section 401 Water Quality Certification (Certification) from the Los Angeles Regional Water Quality Control Board (RWQCB) will be obtained and any specifications in the Certification will be implemented.

PF-WET-4 In order to avoid impacts to adjacent jurisdictional drainage features, best management practices (BMPs) to prevent loose soil or pollutants associated with the project from inadvertently entering the drainage features located within and adjacent to the BSA will be implemented. Example BMPs include silt fencing and straw wattle placed in such a manner so as to catch or filter sediment and other construction-related debris to prevent them from eroding into the nearby drainage channels.

No Build Alternative

None of the proposed project improvements would be constructed or operated under the No Build Alternative. Therefore, the No Build Alternative would not result in adverse permanent impacts to USACE, CDFW, or RWQCB areas in the BSA.

2.14.4 Avoidance, Minimization, and/or Mitigation Measures

Although jurisdictional areas are likely to be affected by the project, compensatory mitigation is not expected to be required for impacts to waters that are subject to USACE, CDFW, and RWQCB regulatory authority permitting requirements because the drainage features proposed to be impacted consist of concrete-lined ditches that are excavated on dry land and did not replace previously existing natural drainages.

If compensatory mitigation is ultimately required by the resource agencies for the project impacts on waters, that mitigation will be determined in coordination with the regulatory agencies based on the quality and quantity of jurisdictional resources affected by the project.

LEGEND

- Biological Study Area Limits
- Drainage Features (A-N)
- Potential USACE Jurisdiction (0.88 acres)
- Potential CDFW Jurisdiction (1.17 acres)
- Likely Non-Jurisdictional Drainage Features (1.33 acres)
- Permanent Impact
- Temporary Impact
- Temporary Construction Easement

N

0 100 200
FEET

SOURCE: Bing Maps (2015); Michael Baker (4/2017)

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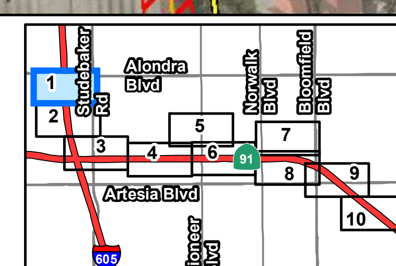

FIGURE 2.14-1
Sheet 1 of 10

Westbound SR-91 Improvement Project

Drainage Features

07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0700000191; EA 07-29811

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LEGEND

Biological Study Area Limits

Drainage Features (A-N)

Potential USACE Jurisdiction (0.88 acres)

Potential CDFW Jurisdiction (1.17 acres)

Likely Non-Jurisdictional Drainage Features (1.33 acres)

Permanent Impact

Temporary Impact

Temporary Construction Easement

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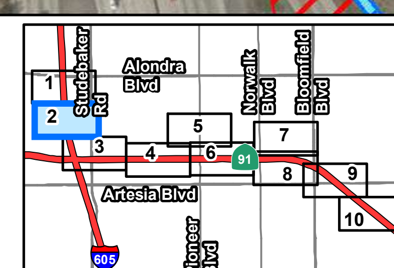
FEET



SOURCE: Bing Maps (2015); Michael Baker (4/2017)

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FIGURE 2.14-1
Sheet 2 of 10

Westbound SR-91 Improvement Project

Drainage Features

07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0700000191; EA 07-29811

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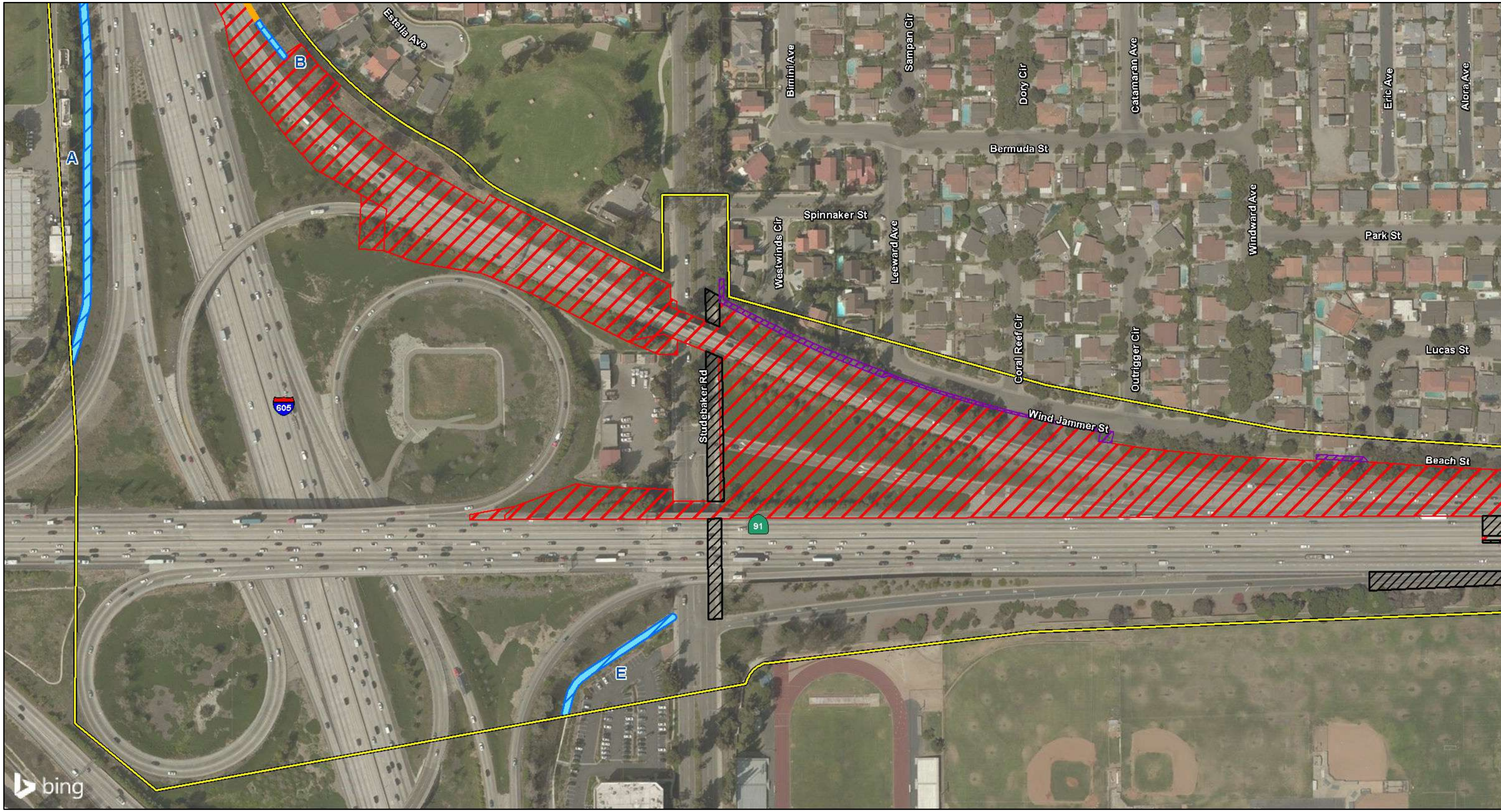

LEGEND

Biological Study Area Limits

Drainage Features (A-N)

Potential USACE Jurisdiction (0.88 acres)

Potential CDFW Jurisdiction (1.17 acres)

Likely Non-Jurisdictional Drainage Features (1.33 acres)

Permanent Impact

Temporary Impact

Temporary Construction Easement

N

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SOURCE: Bing Maps (2015); Michael Baker (4/2017)

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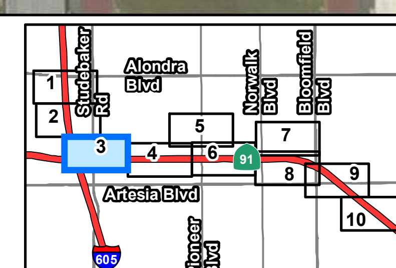

FIGURE 2.14-1

Sheet 3 of 10

Westbound SR-91 Improvement Project

Drainage Features

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SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

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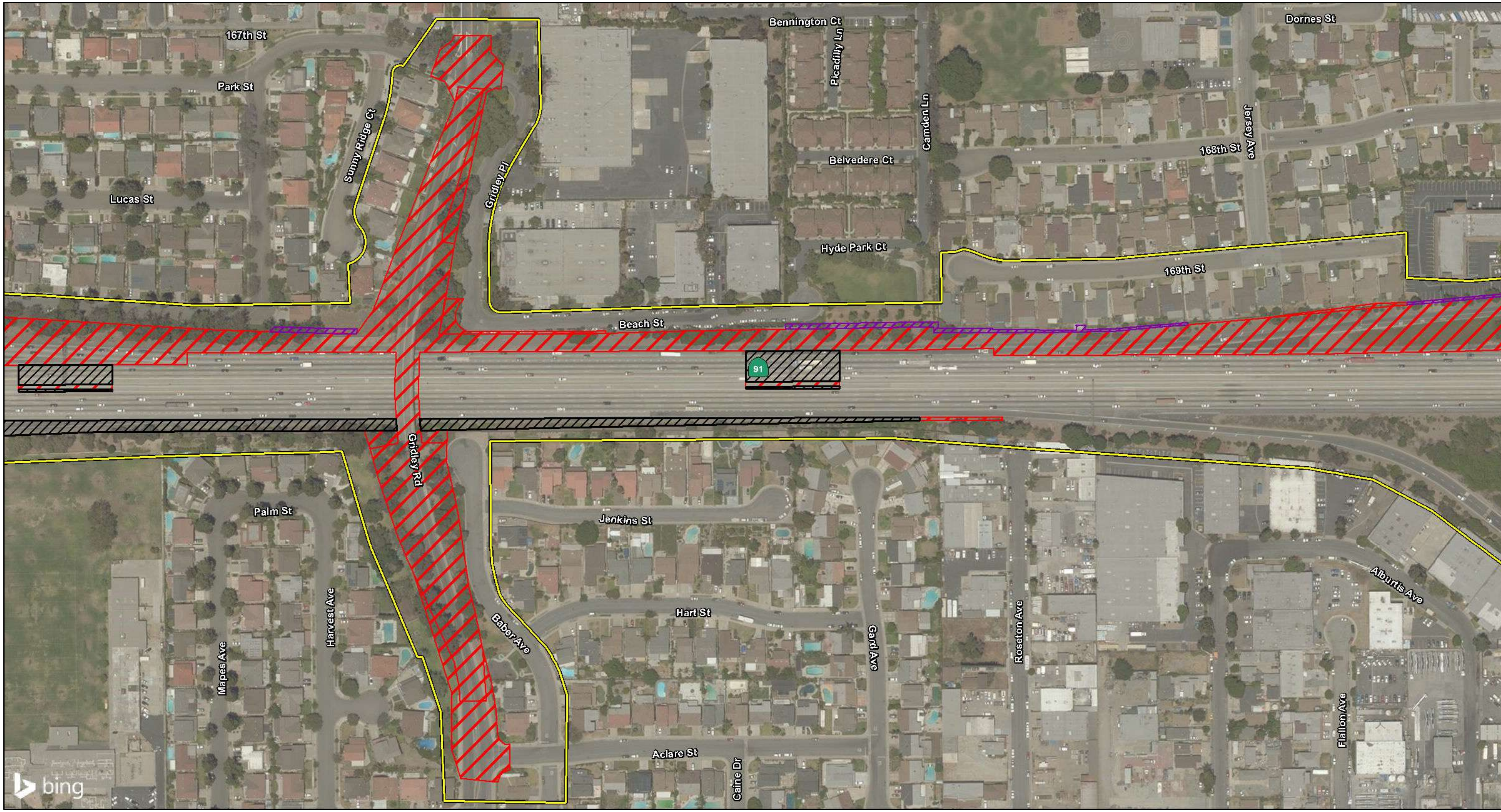

LEGEND

Biological Study Area Limits

Drainage Features (A-N)

Potential USACE Jurisdiction (0.88 acres)

Potential CDFW Jurisdiction (1.17 acres)

Likely Non-Jurisdictional Drainage Features (1.33 acres)

Permanent Impact

Temporary Impact

Temporary Construction Easement

N

0 100 200
FEET

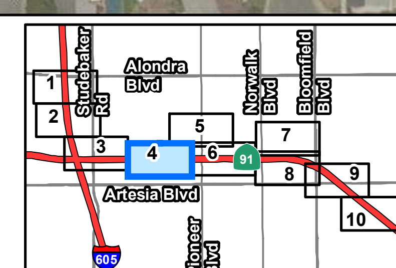

FIGURE 2.14-1
Sheet 4 of 10

Westbound SR-91 Improvement Project

Drainage Features

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SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0700000191; EA 07-29811

SOURCE: Bing Maps (2015); Michael Baker (4/2017)

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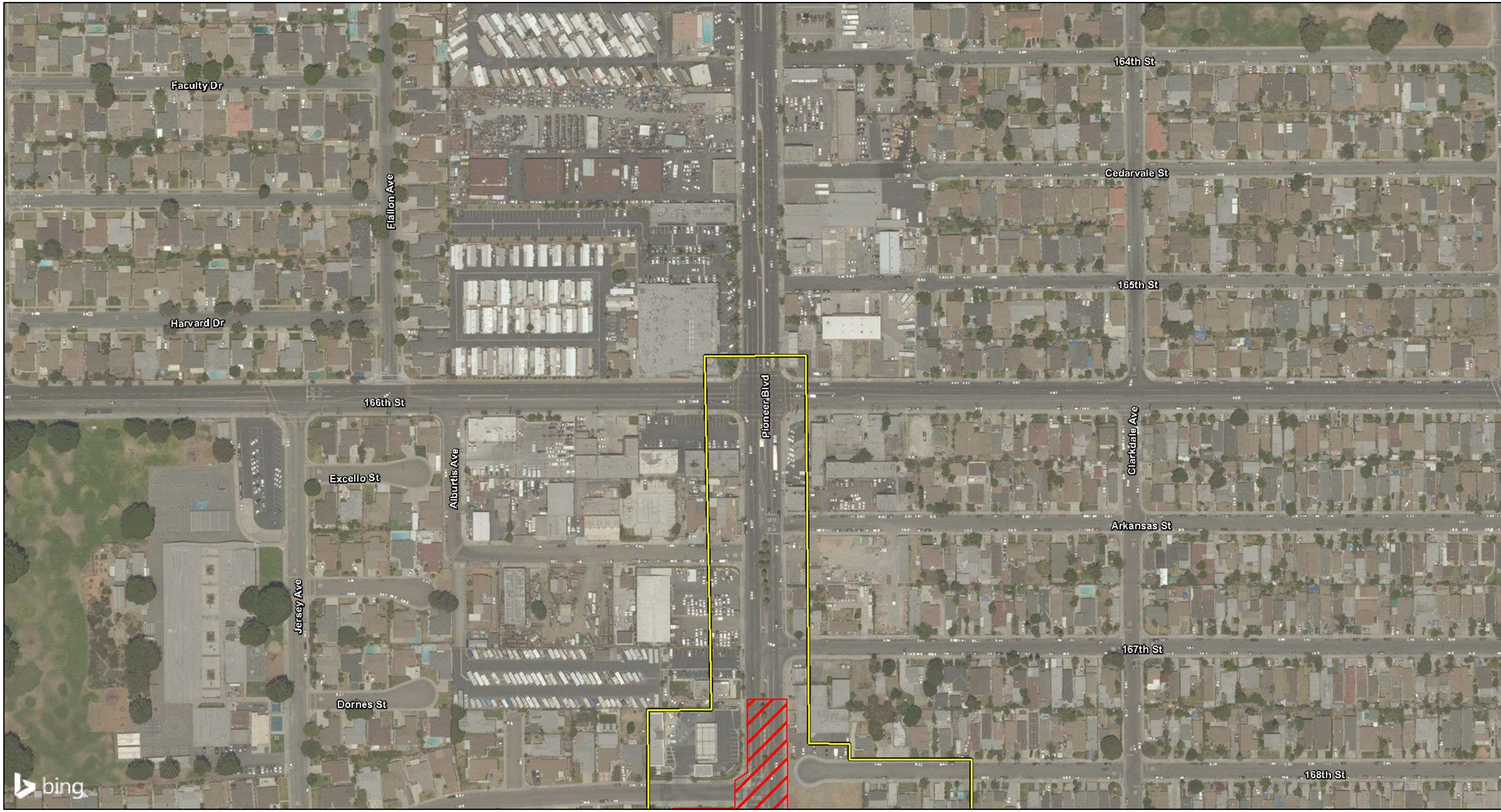

LEGEND

Biological Study Area Limits

Drainage Features (A-N)

Potential USACE Jurisdiction (0.88 acres)

Potential CDFW Jurisdiction (1.17 acres)

Likely Non-Jurisdictional Drainage Features (1.33 acres)

Permanent Impact

Temporary Impact

Temporary Construction Easement

N

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SOURCE: Bing Maps (2015); Michael Baker (4/2017)

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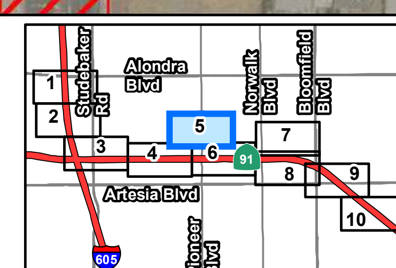

FIGURE 2.14-1
Sheet 5 of 10

Westbound SR-91 Improvement Project

Drainage Features

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SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0700000191; EA 07-29811

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LEGEND

Biological Study Area Limits

Drainage Features (A-N)

Potential USACE Jurisdiction (0.88 acres)

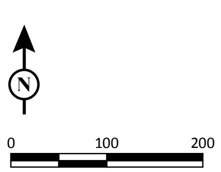
Potential CDFW Jurisdiction (1.17 acres)

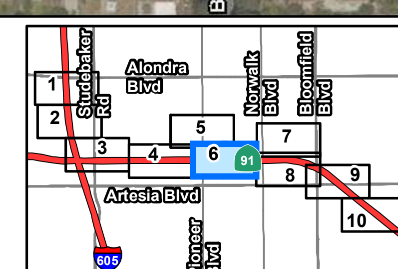
Likely Non-Jurisdictional Drainage Features (1.33 acres)

Permanent Impact

Temporary Impact

Temporary Construction Easement





SOURCE: Bing Maps (2015); Michael Baker (4/2017)

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FIGURE 2.14-1

Sheet 6 of 10

Westbound SR-91 Improvement Project

Drainage Features

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0700000191; EA 07-29811

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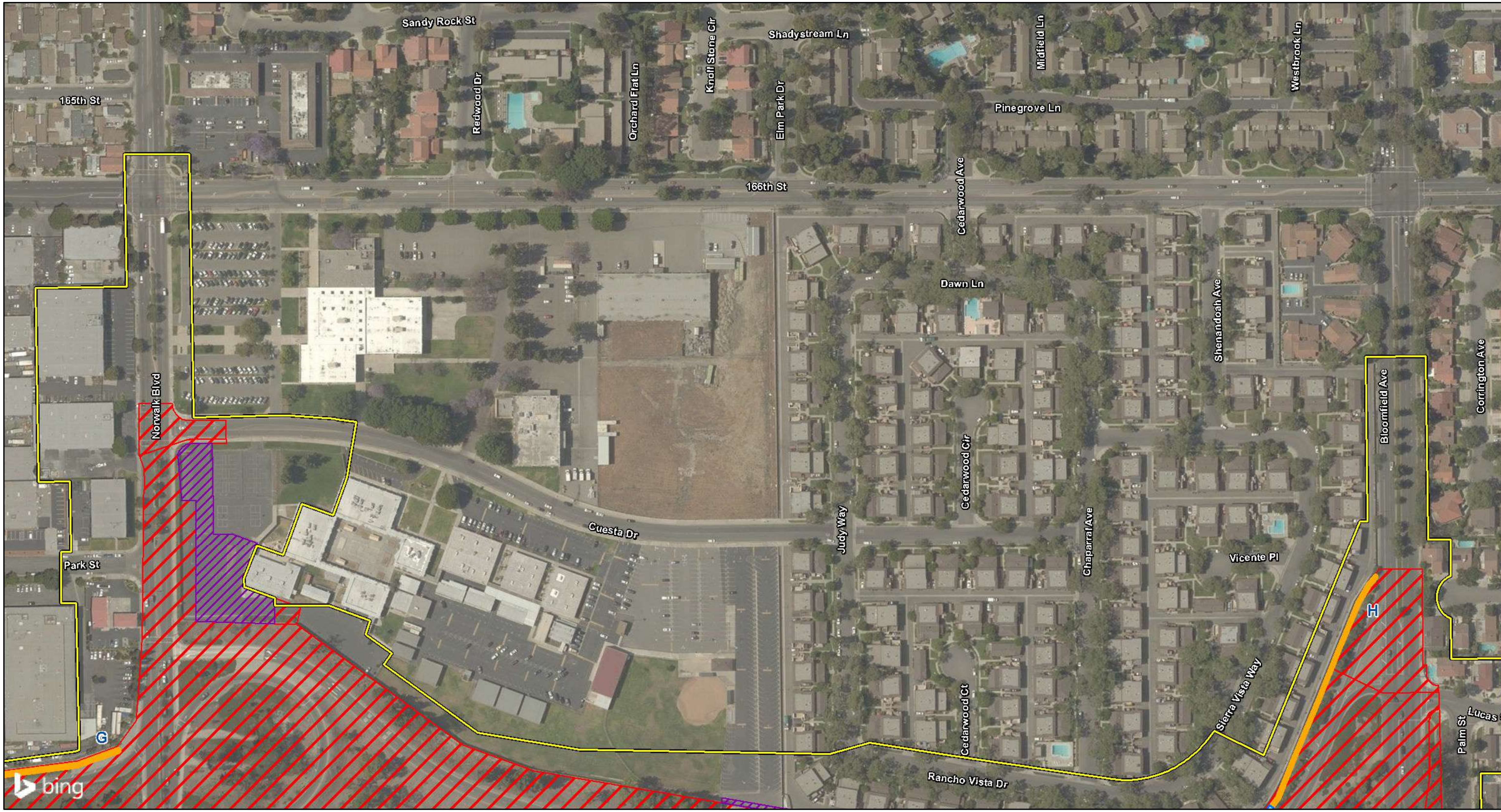

LEGEND

Biological Study Area Limits

Drainage Features (A-N)

Potential USACE Jurisdiction (0.88 acres)

Potential CDFW Jurisdiction (1.17 acres)

Likely Non-Jurisdictional Drainage Features (1.33 acres)

Permanent Impact

Temporary Impact

Temporary Construction Easement

N

0 100 200
FEET

SOURCE: Bing Maps (2015); Michael Baker (4/2017)

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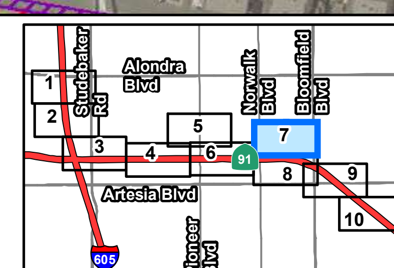

FIGURE 2.14-1
Sheet 7 of 10

Westbound SR-91 Improvement Project

Drainage Features

07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0700000191; EA 07-29811

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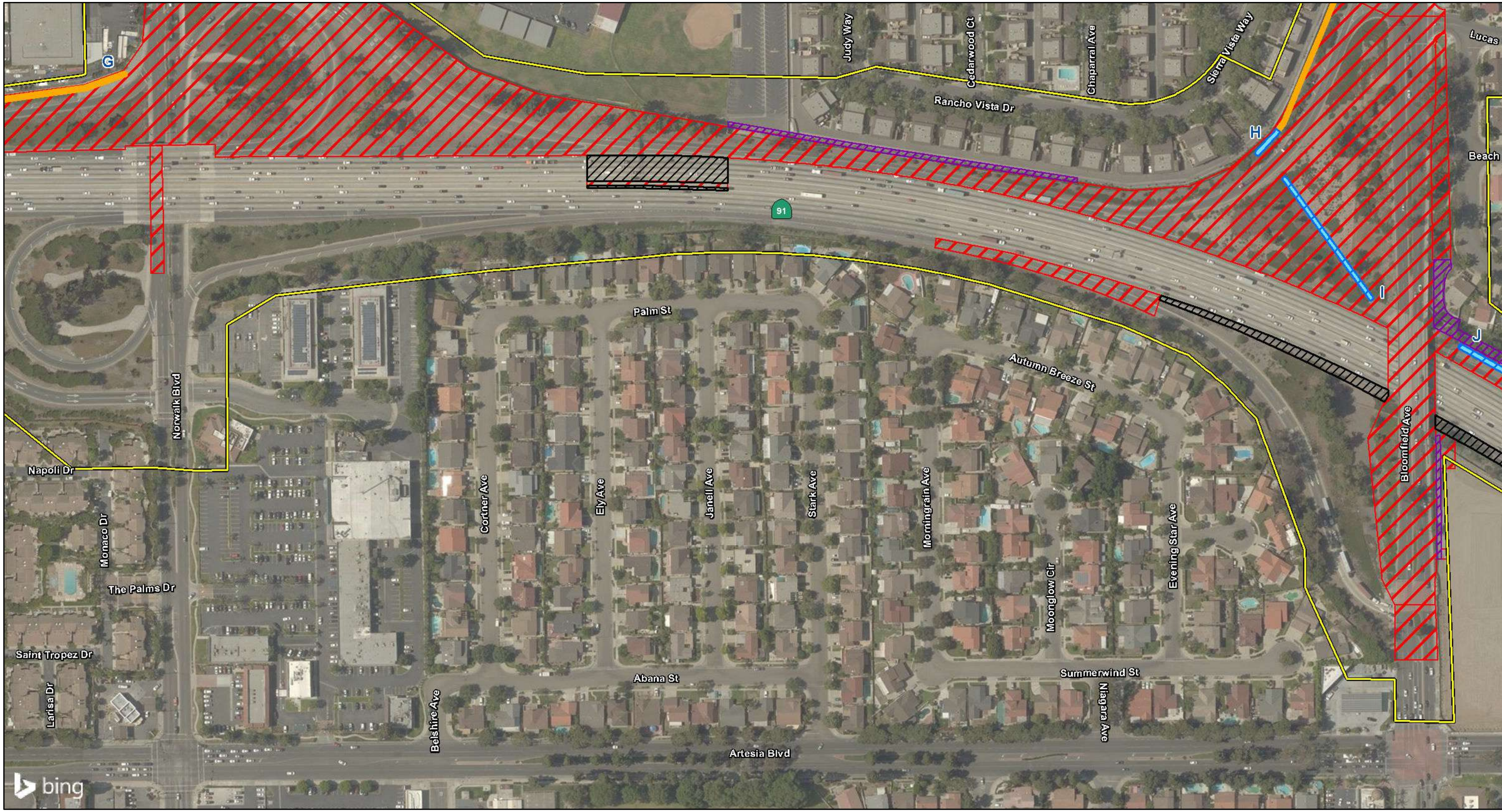


LEGEND

Biological Study Area Limits

Drainage Features (A-N)

Potential USACE Jurisdiction (0.88 acres)

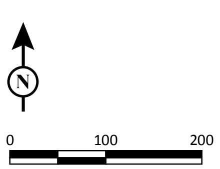
Potential CDFW Jurisdiction (1.17 acres)

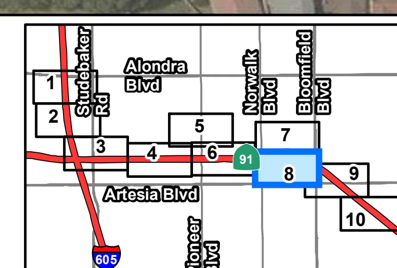
Likely Non-Jurisdictional Drainage Features (1.33 acres)

Permanent Impact

Temporary Impact

Temporary Construction Easement





SOURCE: Bing Maps (2015); Michael Baker (4/2017)

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FIGURE 2.14-1

Sheet 8 of 10

Westbound SR-91 Improvement Project

Drainage Features

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0700000191; EA 07-29811

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LEGEND

Biological Study Area Limits

Drainage Features (A-N)

Potential USACE Jurisdiction (0.88 acres)

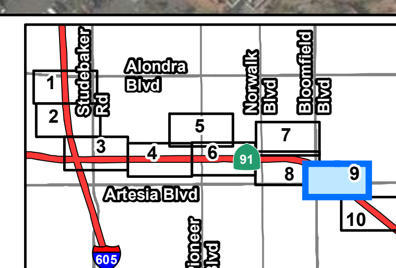
Potential CDFW Jurisdiction (1.17 acres)

Likely Non-Jurisdictional Drainage Features (1.33 acres)

Permanent Impact

Temporary Impact

Temporary Construction Easement



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SOURCE: Bing Maps (2015); Michael Baker (4/2017)

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FIGURE 2.14-1

Sheet 9 of 10

Westbound SR-91 Improvement Project

Drainage Features

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0700000191; EA 07-29811

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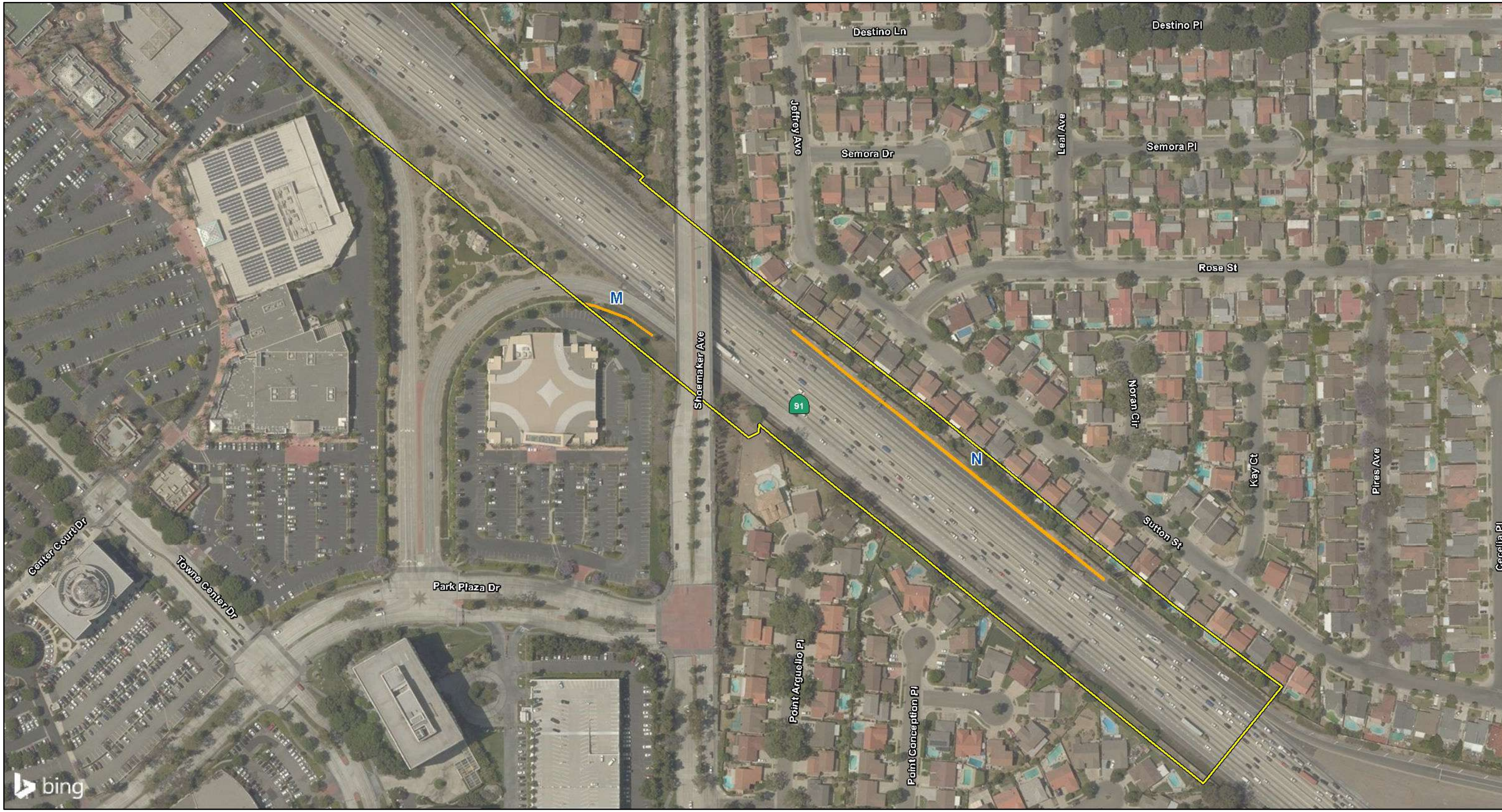

LEGEND

Biological Study Area Limits

Drainage Features (A-N)

Potential USACE Jurisdiction (0.88 acres)

Potential CDFW Jurisdiction (1.17 acres)

Likely Non-Jurisdictional Drainage Features (1.33 acres)

Permanent Impact

Temporary Impact

Temporary Construction Easement

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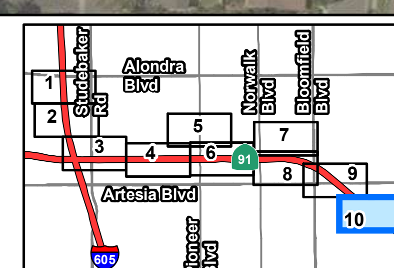

FIGURE 2.14-1

Sheet 10 of 10

Westbound SR-91 Improvement Project

Drainage Features

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0700000191; EA 07-29811

SOURCE: Bing Maps (2015); Michael Baker (4/2017)

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LEGEND

Biological Study Area (BSA)

Permanent Impact

Temporary Impact

Temporary Construction Easement (TCE)

Bat Habitat

Structure Number with ID[1]

Bat Roosting Confirmed (Bats, Roosting Bats, or Bat Sign)

Structure with Low Probability of Roosting Bats

Structure with Moderate to High Probability of Roosting Bats

([1]Structure Number Corresponds with Table A in Bat Memo)

Land Cover Types

Developed and Transportation

Disturbed or Barren

Ornamental

Flood Control Channels Drainage Features (A-N)

Potential USACE Jurisdiction (0.88 acres)

Potential CDFW Jurisdiction (1.17 acres)

Likely Non-Jurisdictional Drainage Features (1.33 acres)

N

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FEET

SOURCE: Bing Maps (2015); Michael Baker (4/2017)

FIGURE 2.14-2

Sheet 1 of 10

Westbound SR-91 Improvement Project

Project Impacts to Biological Resources

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0700000191; EA 07-29811

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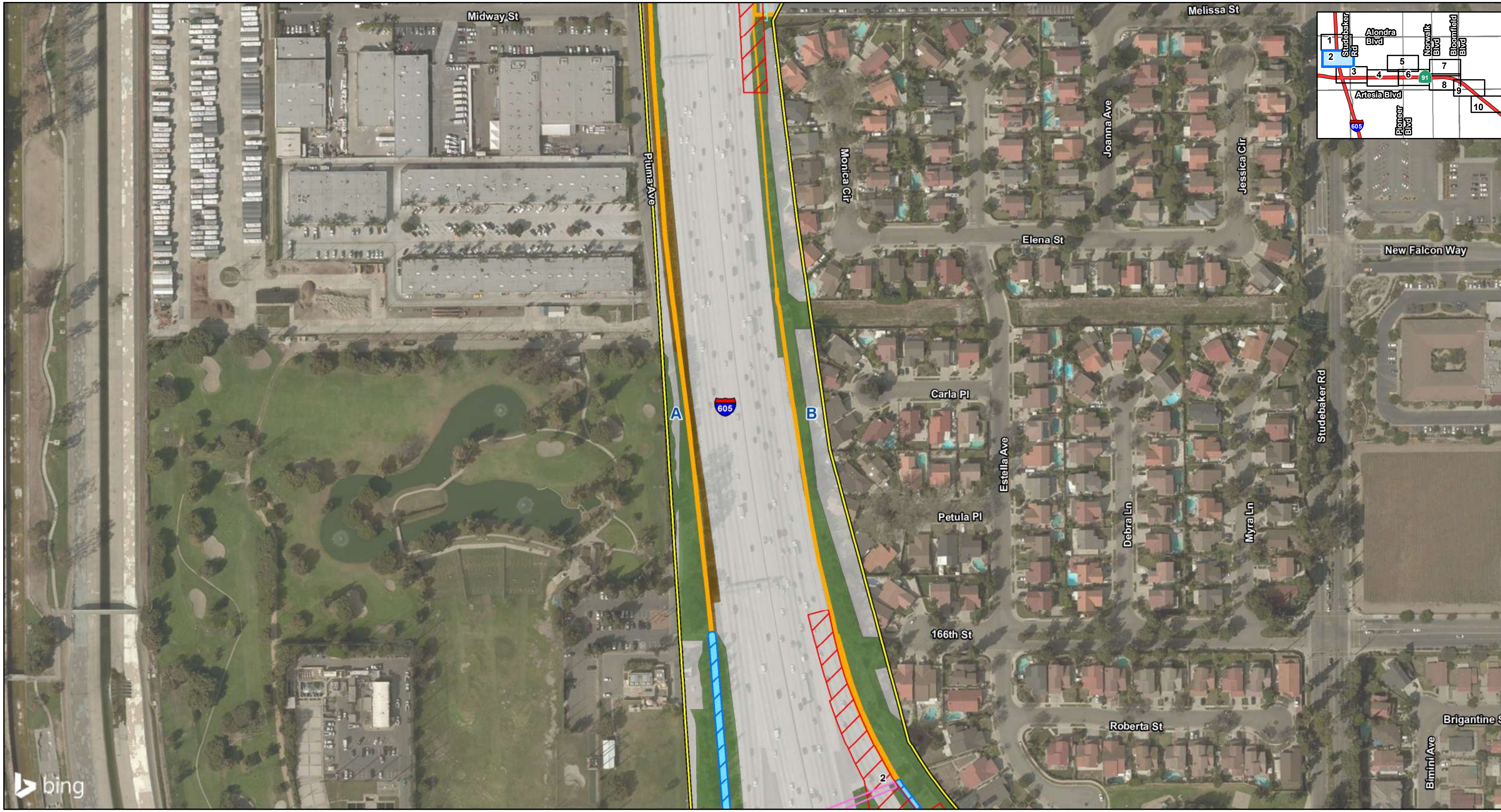

LEGEND

Biological Study Area (BSA)

Permanent Impact

Temporary Impact

Temporary Construction Easement (TCE)

Bat Habitat

Structure Number with ID[1]

Bat Roosting Confirmed (Bats, Roosting Bats, or Bat Sign)

Structure with Low Probability of Roosting Bats

Structure with Moderate to High Probability of Roosting Bats

([1]Structure Number Corresponds with Table A in Bat Memo)

Land Cover Types

Developed and Transportation

Disturbed or Barren

Ornamental

Flood Control Channels Drainage Features (A-N)

Potential USACE Jurisdiction (0.88 acres)

Potential CDFW Jurisdiction (1.17 acres)

Likely Non-Jurisdictional Drainage Features (1.33 acres)

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SOURCE: Bing Maps (2015); Michael Baker (4/2017)

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FIGURE 2.14-2

Sheet 2 of 10

Westbound SR-91 Improvement Project

Project Impacts to Biological Resources

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0700000191; EA 07-29811

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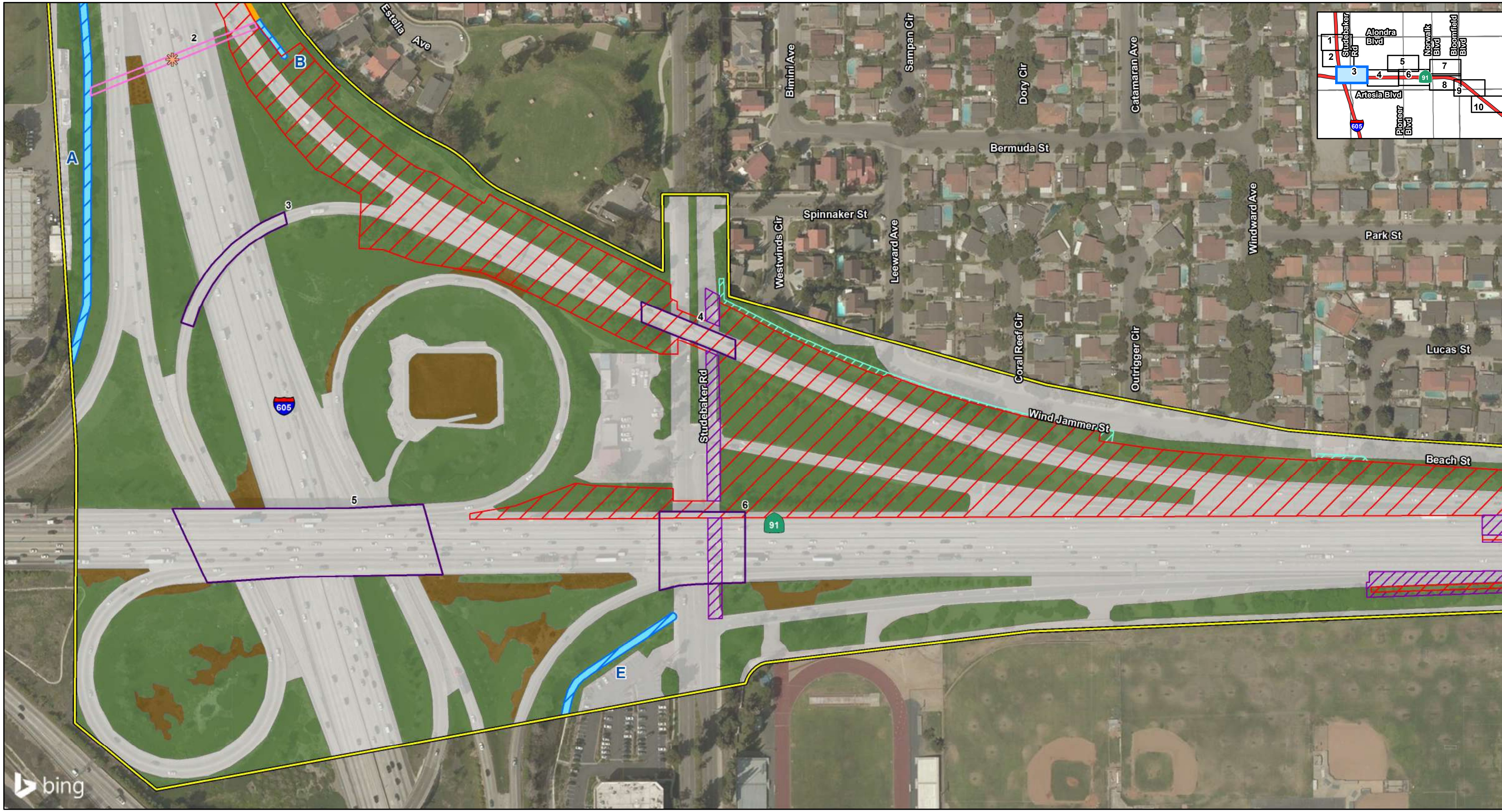

LEGEND

Biological Study Area (BSA)

Permanent Impact

Temporary Impact

Temporary Construction Easement (TCE)

Bat Habitat

\# Structure Number with ID[1]

Bat Roosting Confirmed (Bats, Roosting Bats, or Bat Sign)

Structure with Low Probability of Roosting Bats

Structure with Moderate to High Probability of Roosting Bats

([1]Structure Number Corresponds with Table A in Bat Memo)

Land Cover Types

Developed and Transportation

Disturbed or Barren

Ornamental

Flood Control Channels Drainage Features (A-N)

Potential USACE Jurisdiction (0.88 acres)

Potential CDFW Jurisdiction (1.17 acres)

Likely Non-Jurisdictional Drainage Features (1.33 acres)

N

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FEET

SOURCE: Bing Maps (2015); Michael Baker (4/2017)

FIGURE 2.14-2

Sheet 3 of 10

Westbound SR-91 Improvement Project

Project Impacts to Biological Resources

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0700000191; EA 07-29811

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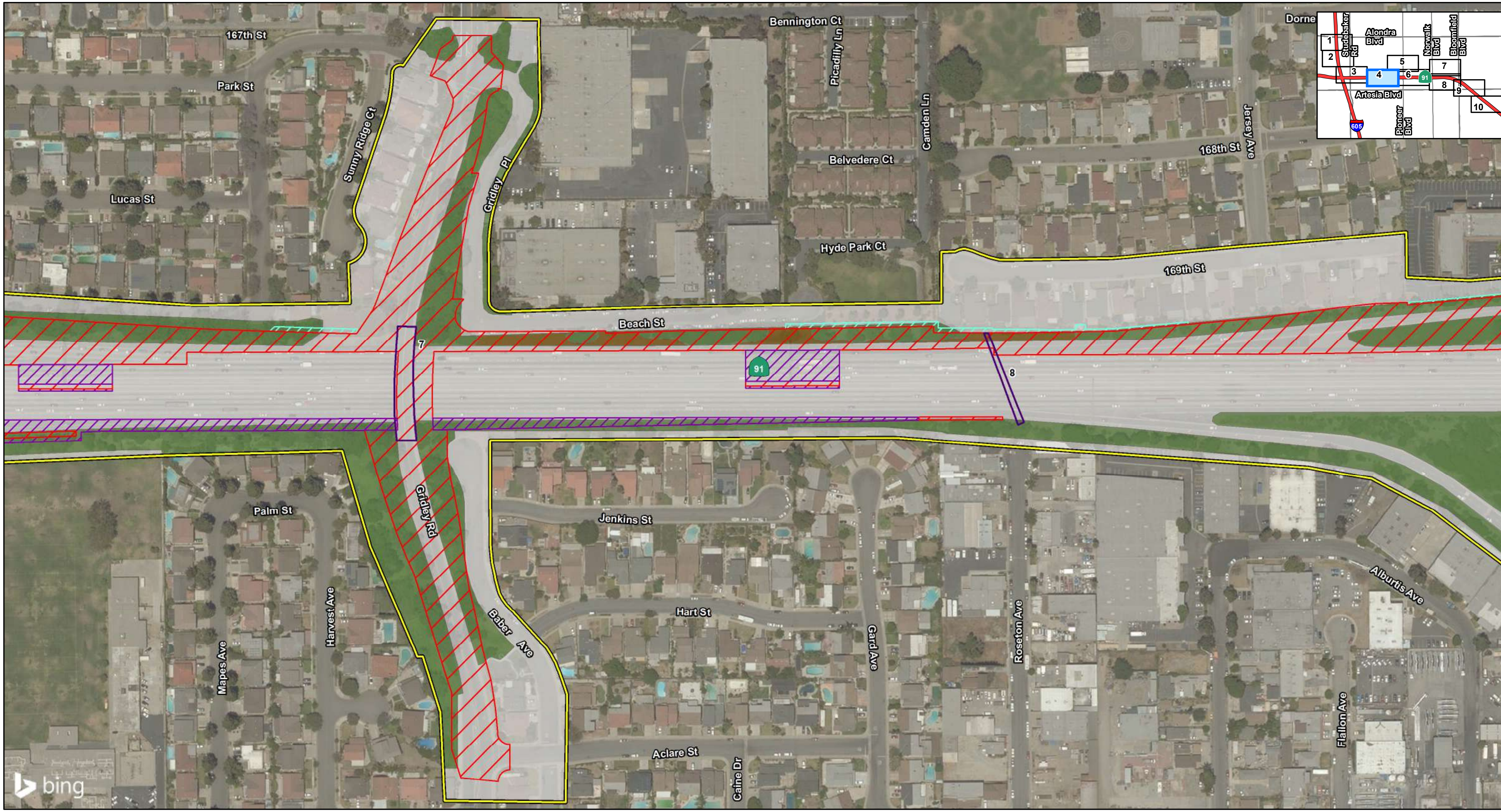

LEGEND

Biological Study Area (BSA)
Permanent Impact
Temporary Impact
Temporary Construction Easement (TCE)

Bat Habitat

Structure Number with ID[1]
Bat Roosting Confirmed (Bats, Roosting Bats, or Bat Sign)
Structure with Low Probability of Roosting Bats
Structure with Moderate to High Probability of Roosting Bats
([1]Structure Number Corresponds with Table A in Bat Memo)

Land Cover Types

Developed and Transportation
Disturbed or Barren
Ornamental

Flood Control Channels Drainage Features (A-N)

Potential USACE Jurisdiction (0.88 acres)
Potential CDFW Jurisdiction (1.17 acres)
Likely Non-Jurisdictional Drainage Features (1.33 acres)

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SOURCE: Bing Maps (2015); Michael Baker (4/2017)

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FIGURE 2.14-2
Sheet 4 of 10

Westbound SR-91 Improvement Project

Project Impacts to Biological Resources

07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0700000191; EA 07-29811

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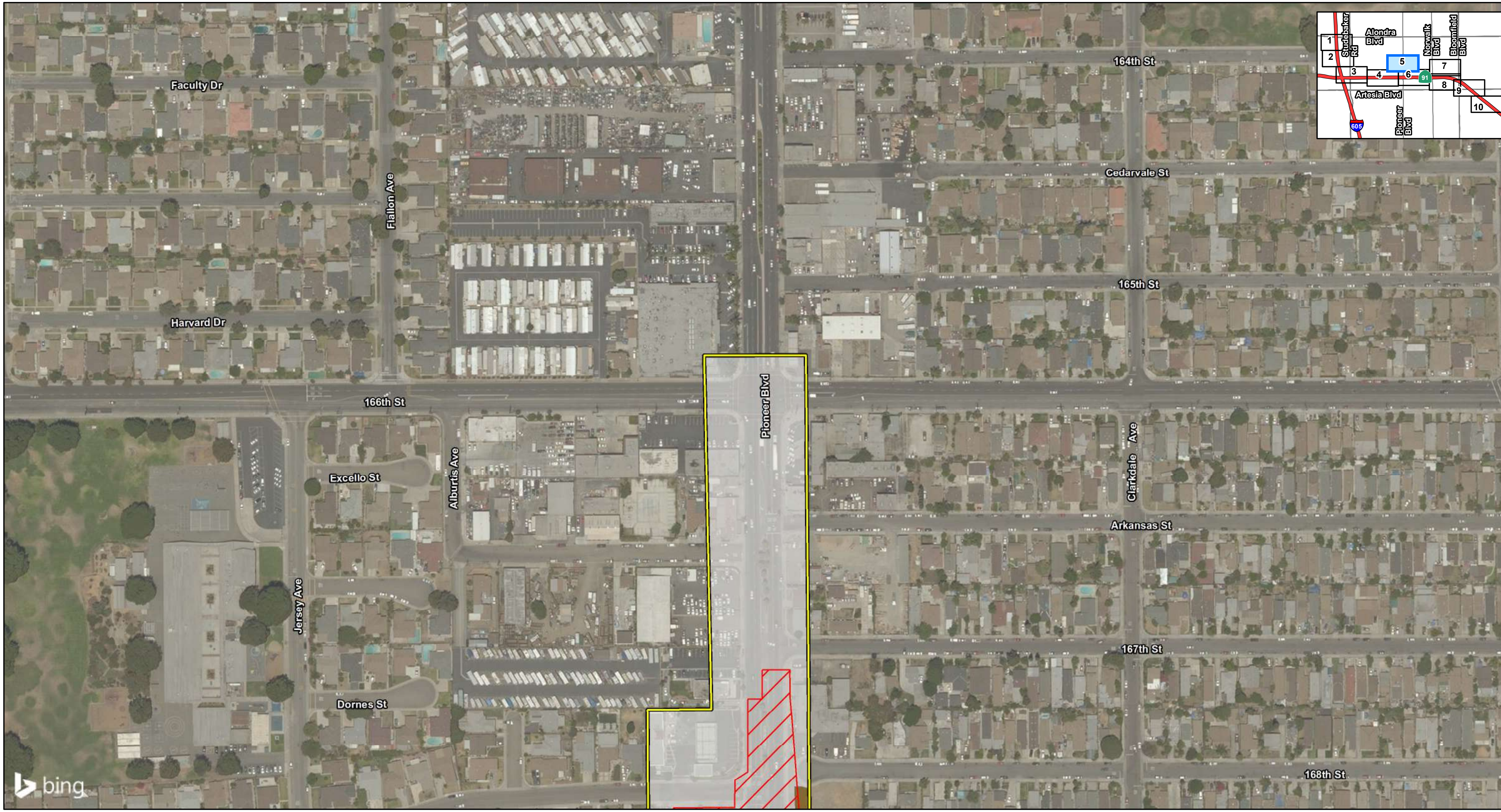

LEGEND

- Biological Study Area (BSA)
- Permanent Impact
- Temporary Impact
- Temporary Construction Easement (TCE)

Bat Habitat

- # Structure Number with ID[1]
- Bat Roosting Confirmed (Bats, Roosting Bats, or Bat Sign)
- Structure with Low Probability of Roosting Bats
- Structure with Moderate to High Probability of Roosting Bats

([1]Structure Number Corresponds with Table A in Bat Memo)

Land Cover Types

- Developed and Transportation
- Disturbed or Barren
- Ornamental

Flood Control Channels Drainage Features (A-N)

- Potential USACE Jurisdiction (0.88 acres)
- Potential CDFW Jurisdiction (1.17 acres)
- Likely Non-Jurisdictional Drainage Features (1.33 acres)

N

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SOURCE: Bing Maps (2015); Michael Baker (4/2017)

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FIGURE 2.14-2
Sheet 5 of 10

Westbound SR-91 Improvement Project

Project Impacts to Biological Resources

07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0700000191; EA 07-29811

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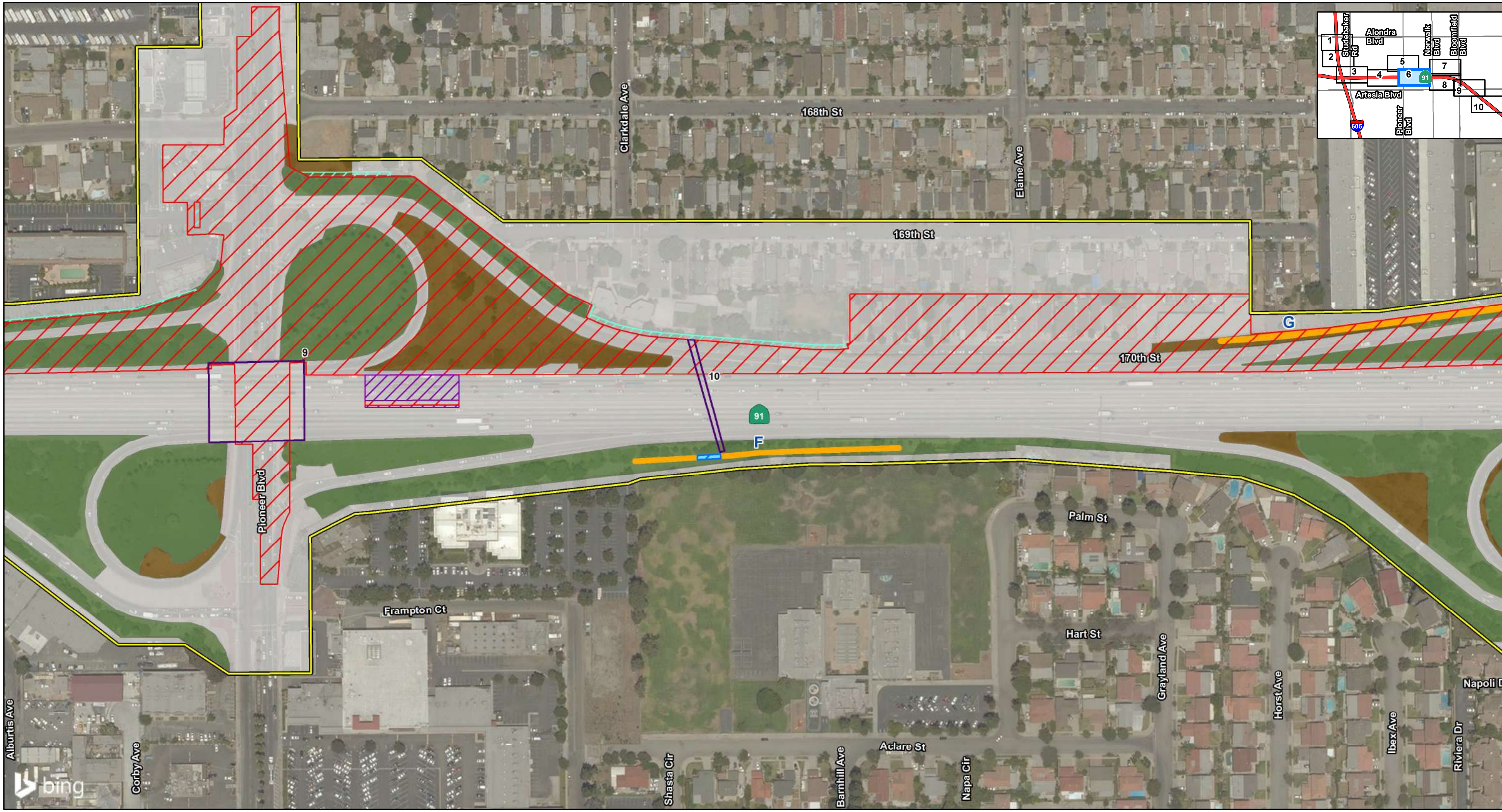

LEGEND

Biological Study Area (BSA)
Permanent Impact
Temporary Impact
Temporary Construction Easement (TCE)

Bat Habitat

- # Structure Number with ID[1]
- Bat Roosting Confirmed (Bats, Roosting Bats, or Bat Sign)
- Structure with Low Probability of Roosting Bats
- Structure with Moderate to High Probability of Roosting Bats

([1]Structure Number Corresponds with Table A in Bat Memo)

Land Cover Types

- Developed and Transportation
- Disturbed or Barren
- Ornamental

Flood Control Channels Drainage Features (A-N)

- Potential USACE Jurisdiction (0.88 acres)
- Potential CDFW Jurisdiction (1.17 acres)
- Likely Non-Jurisdictional Drainage Features (1.33 acres)

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SOURCE: Bing Maps (2015); Michael Baker (4/2017)

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FIGURE 2.14-2

Sheet 6 of 10

Westbound SR-91 Improvement Project

Project Impacts to Biological Resources

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0700000191; EA 07-29811

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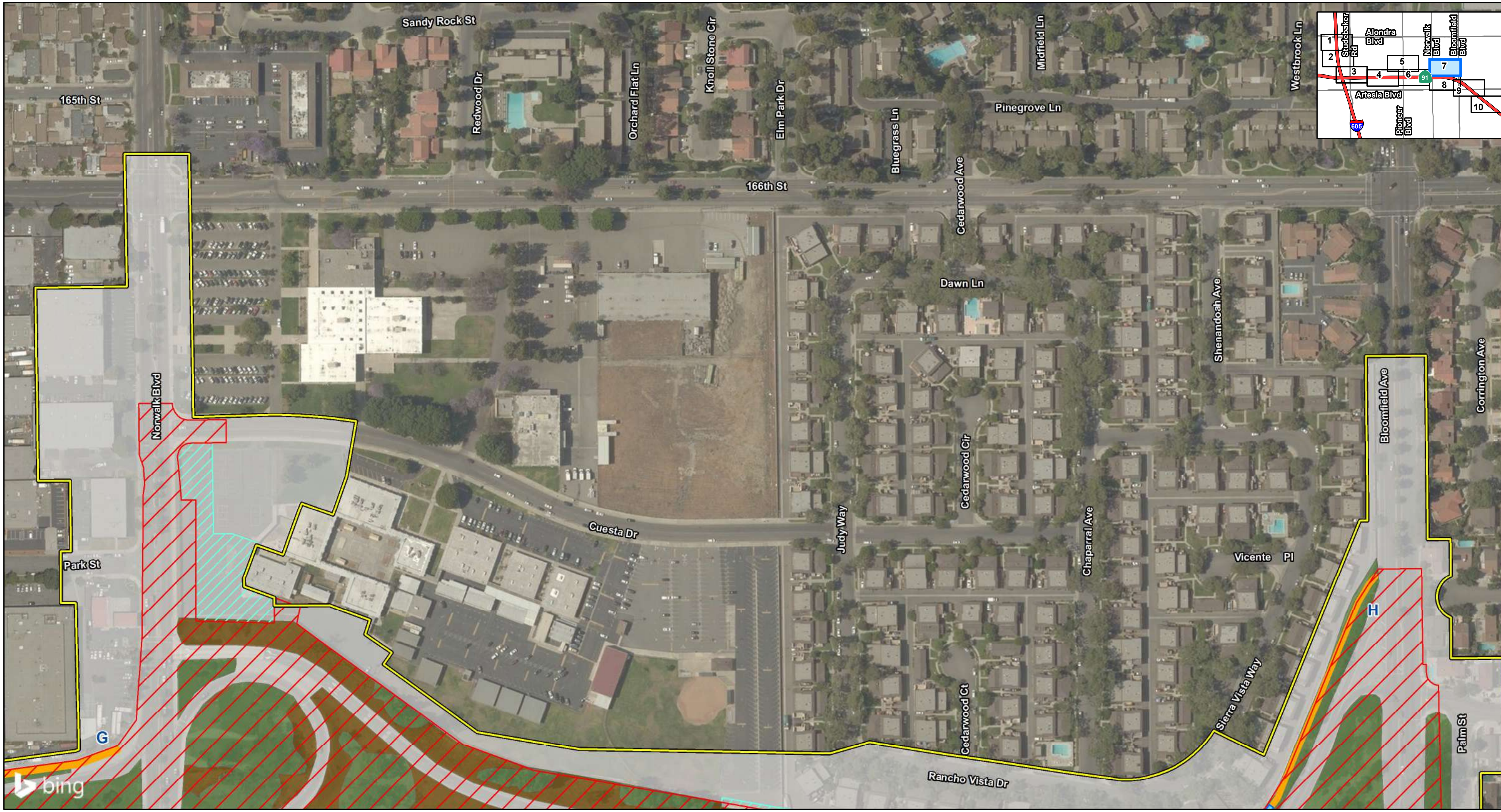

LEGEND

Biological Study Area (BSA)

Permanent Impact

Temporary Impact

Temporary Construction Easement (TCE)

Bat Habitat

Structure Number with ID[1]

Bat Roosting Confirmed (Bats, Roosting Bats, or Bat Sign)

Structure with Low Probability of Roosting Bats

Structure with Moderate to High Probability of Roosting Bats

([1]Structure Number Corresponds with Table A in Bat Memo)

Land Cover Types

Developed and Transportation

Disturbed or Barren

Ornamental

Flood Control Channels Drainage Features (A-N)

Potential USACE Jurisdiction (0.88 acres)

Potential CDFW Jurisdiction (1.17 acres)

Likely Non-Jurisdictional Drainage Features (1.33 acres)

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SOURCE: Bing Maps (2015); Michael Baker (4/2017)

FIGURE 2.14-2

Sheet 7 of 10

Westbound SR-91 Improvement Project

Project Impacts to Biological Resources

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0700000191; EA 07-29811

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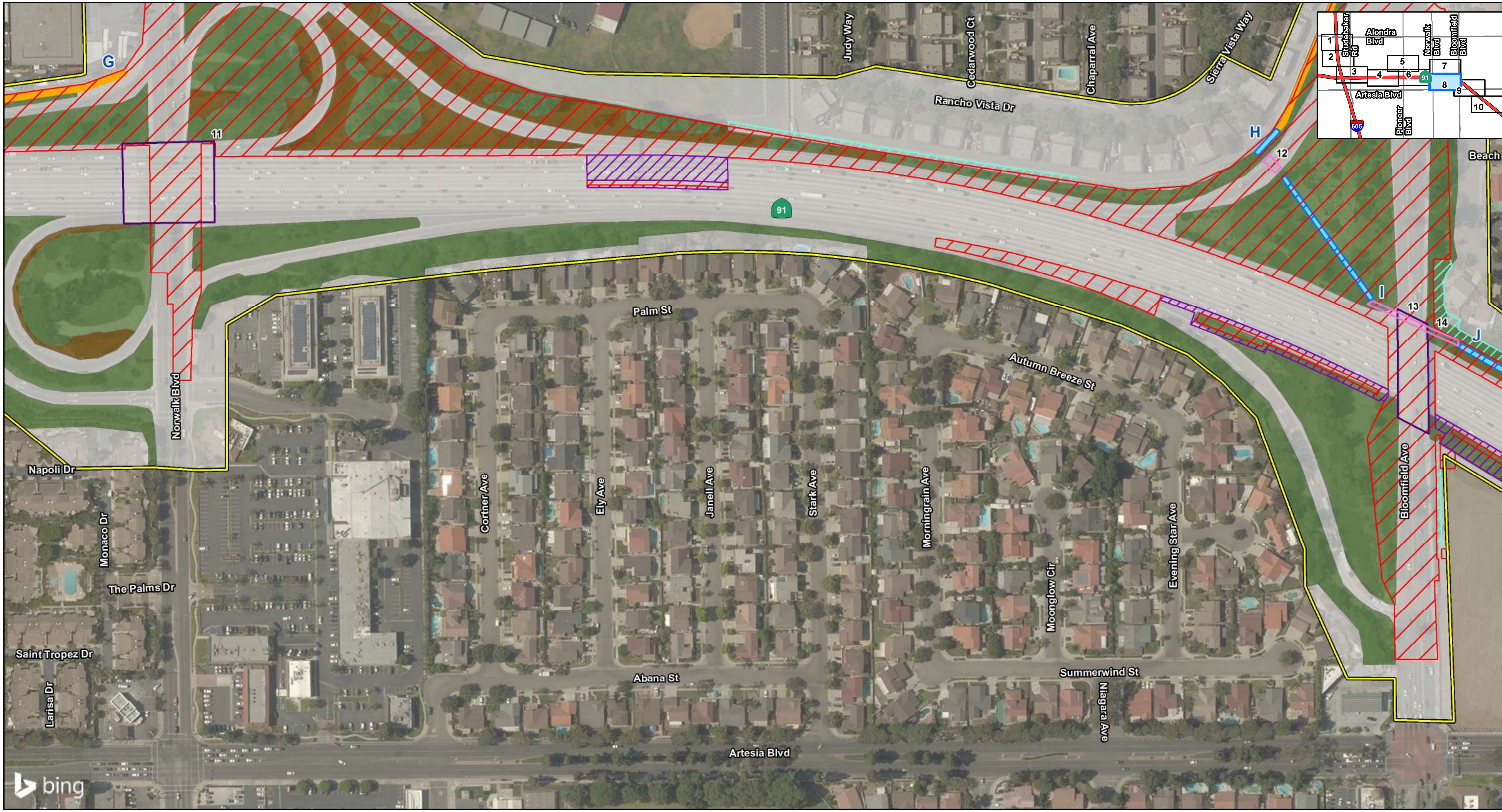

LEGEND

Biological Study Area (BSA)
Permanent Impact
Temporary Impact
Temporary Construction Easement (TCE)

Bat Habitat

Structure Number with ID[1]
Bat Roosting Confirmed (Bats, Roosting Bats, or Bat Sign)
Structure with Low Probability of Roosting Bats
Structure with Moderate to High Probability of Roosting Bats
([1]Structure Number Corresponds with Table A in Bat Memo)

Land Cover Types

Developed and Transportation
Disturbed or Barren
Ornamental

Flood Control Channels Drainage Features (A-N)

Potential USACE Jurisdiction (0.88 acres)
Potential CDFW Jurisdiction (1.17 acres)
Likely Non-Jurisdictional Drainage Features (1.33 acres)

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SOURCE: Bing Maps (2015); Michael Baker (4/2017)

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FIGURE 2.14-2
Sheet 8 of 10

Westbound SR-91 Improvement Project

Project Impacts to Biological Resources

07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0700000191; EA 07-29811

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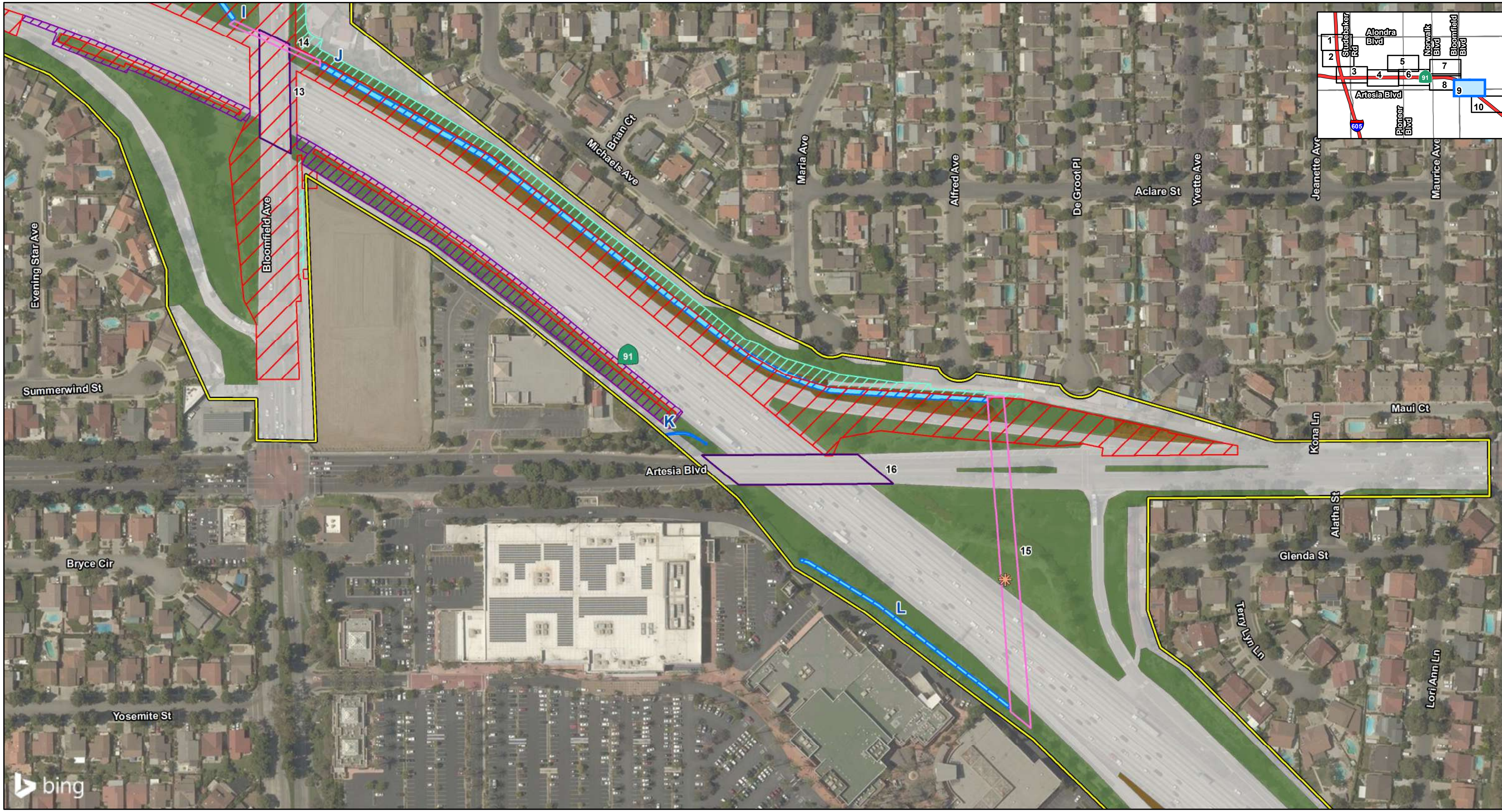

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Biological Study Area (BSA)
Permanent Impact
Temporary Impact
Temporary Construction Easement (TCE)

Bat Habitat

Structure Number with ID[1]
Bat Roosting Confirmed (Bats, Roosting Bats, or Bat Sign)
Structure with Low Probability of Roosting Bats
Structure with Moderate to High Probability of Roosting Bats
([1]Structure Number Corresponds with Table A in Bat Memo)

Land Cover Types

Developed and Transportation
Disturbed or Barren
Ornamental

Flood Control Channels Drainage Features (A-N)

Potential USACE Jurisdiction (0.88 acres)
Potential CDFW Jurisdiction (1.17 acres)
Likely Non-Jurisdictional Drainage Features (1.33 acres)

FIGURE 2.14-2
Sheet 9 of 10

Westbound SR-91 Improvement Project

Project Impacts to Biological Resources

07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0700000191; EA 07-29811

SOURCE: Bing Maps (2015); Michael Baker (4/2017)

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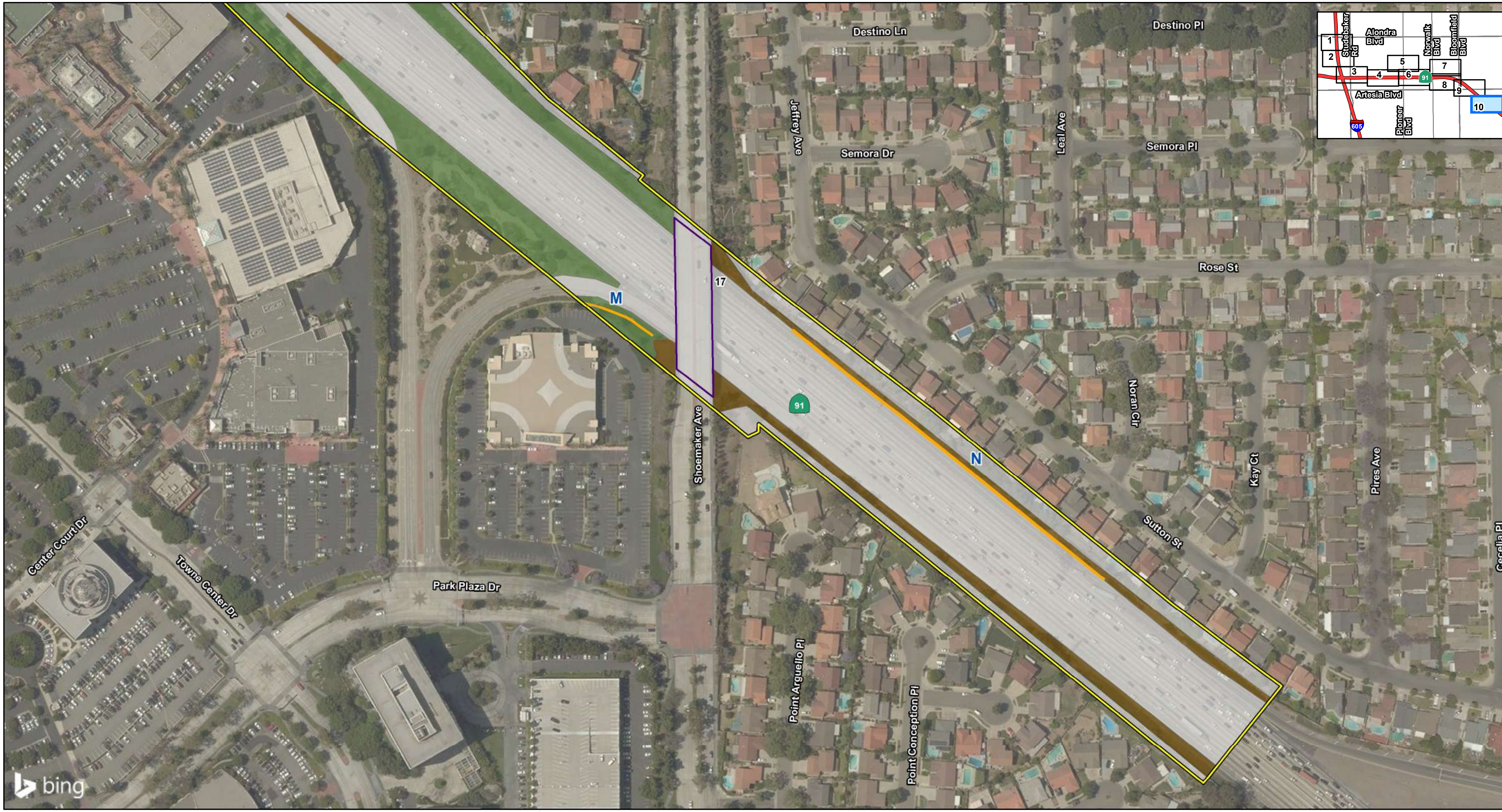

LEGEND

Biological Study Area (BSA)
Permanent Impact
Temporary Impact
Temporary Construction Easement (TCE)

Bat Habitat

Structure Number with ID[1]
Bat Roosting Confirmed (Bats, Roosting Bats, or Bat Sign)
Structure with Low Probability of Roosting Bats
Structure with Moderate to High Probability of Roosting Bats
([1]Structure Number Corresponds with Table A in Bat Memo)

Land Cover Types

Developed and Transportation
Disturbed or Barren
Ornamental

Flood Control Channels Drainage Features (A-N)

Potential USACE Jurisdiction (0.88 acres)
Potential CDFW Jurisdiction (1.17 acres)
Likely Non-Jurisdictional Drainage Features (1.33 acres)

N

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FEET

SOURCE: Bing Maps (2015); Michael Baker (4/2017)

FIGURE 2.14-2
Sheet 10 of 10

Westbound SR-91 Improvement Project

Project Impacts to Biological Resources

07-LA-91
SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
EFIS 0700000191; EA 07-29811

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2.15 Plant Species

2.15.1 Regulatory Setting

The U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) have regulatory responsibility for the protection of special-status plant species. “Special-status” species are selected for protection because they are rare and/or subject to population and habitat declines. Special status is a general term for species that are provided varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under the Federal Endangered Species Act (FESA) and/or the California Endangered Species Act (CESA). The proposed project would not impact any species listed or proposed for listing as threatened or endangered as discussed earlier in the introduction to Chapter 2.

This section of the document discusses all other special-status plant species, including CDFW species of special concern, USFWS candidate species, and California Native Plant Society (CNPS) rare and endangered plants.

The regulatory requirements for FESA can be found at 16 United States Code (USC) Section 1531, et seq. See also 50 Code of Federal Regulations (CFR) Part 402. The regulatory requirements for CESA can be found at California Fish and Game Code, Section 2050, et seq. Caltrans projects are also subject to the Native Plant Protection Act, found at California Fish and Game Code, Section 1900-1913, and the California Environmental Quality Act (CEQA), found at California Public Resources Code, Sections 21000-21177.

2.15.2 Affected Environment

The information in this section is based on the 2017 *Natural Environment Study (Minimal Impacts)* (NES [MI]) prepared for the project.

A literature review and records search were conducted to identify the existence or potential occurrence of sensitive or special-status plant species located within or in the vicinity of the biological study area (BSA). The results of the literature review identified 37 special-status plant species with the potential to occur within the nine United States Geological Service (USGS) topographical quadrangles surrounding the BSA. Of the 37 special-status plant species, 3 were identified by USFWS and the CDFW California Natural Diversity Database (CNDDB) as potentially occurring within the vicinity of the BSA. A figure of the BSA is provided in the NES (MI) prepared for this project.

Of the three special-status plant species, two are federally and/or State-listed as endangered or threatened and are not discussed in this document because, as noted earlier in the introduction to Chapter 2, there are no threatened or endangered species in or near the BSA; therefore, the Build Alternative will not impact any threatened or endangered species. The remaining special-status plant species identified as potentially occurring in or near the vicinity of the BSA is Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*).

Coulter's goldfields is a perennial herb that occurs in coastal bluff scrub, coastal dunes, coastal scrub, and valley and foothill grasslands, usually on ocean bluffs and ridgetops in alkaline or clay soils (from 10 to 1,510 feet [ft] in elevation). Coulter's goldfields is identified as occurring within 2 miles (mi) of the BSA. However, no suitable habitat to support this plant species occurs within the BSA, and the species was not observed during the surveys, which were conducted during the species' blooming period. Therefore, the species is not expected to occur within the BSA or to be affected by the proposed project.

The BSA does not contain, nor is it adjacent to, suitable habitat for any special-status plant species identified in the literature search.

In addition to the literature review, reconnaissance-level field surveys were conducted on May 25 and June 15, 2017, to characterize the general biological resources and to ascertain the presence or absence of special-status plant species and the likelihood of their occurrence in or near the BSA. No special-status plant species (i.e., listed, proposed for listing, or candidate species) were observed or otherwise detected in the BSA during the field surveys.

The BSA is composed of disturbed habitat and landscaped and nonvegetated urban/developed areas. Plant species occurring in the BSA are characteristic of those found in regularly disturbed and landscaped areas, consisting primarily of nonnative weeds, Hottentot-fig (*Carpobrotus edulis*), and mature pine (*Pinus* sp.) and eucalyptus (*Eucalyptus* sp.) trees.

2.15.3 Environmental Consequences

The proposed project has been determined to have no effect on any of the federally or State listed species identified as potentially occurring within the vicinity of the proposed project (refer to Table 2.15.1).

2.15.3.1 Temporary Impacts

Build Alternative (includes Design Options)

The project is not expected to affect any special-status plant species because they are considered absent from the BSA. As a result, the construction of the Build Alternative would not result in temporary impacts to special-status plant species.

No Build Alternative

The No Build Alternative would not include construction of any of the proposed project improvements. Therefore, the No Build Alternative would not result in adverse temporary impacts to special-status plant species.

2.15.3.2 Permanent Impacts

Build Alternative (includes Design Options)

The project is not expected to affect any special-status plant species because they are considered absent from the BSA. As a result, the construction and operation of the Build Alternative would not result in permanent impacts on special-status plant species.

No Build Alternative

The No Build Alternative would not include construction of any of the proposed project improvements and, as noted above, there is no suitable habitat for special-status plant species in the BSA. Therefore, the No Build Alternative would not result in adverse permanent impacts to special-status plant species.

2.15.4 Avoidance, Minimization, and/or Mitigation Measures

As the Build Alternative would not result in any temporary or permanent impacts related to plant species, no avoidance, minimization, or mitigation measures are required.

Table 2.15.1 Effects Determination for Federally Listed Plant Species

Common Name	Scientific Name	Federal Status	General Habitat Description	Habitat Present/ Absent	Rationale	Effect Determination
Ventura marsh milk-vetch	*Astragalus pycnostachyus* var. *lanosissimus*	Endangered	Perennial herb. Coastal salt marsh within reach of high tide or protected by barrier beaches, or more rarely near seeps on sandy bluffs, below 120 ft elevation.	Absent	Known only from Santa Barbara and Ventura Counties. Believed extirpated from Los Angeles and Orange Counties. No suitable habitat in BSA, and species not observed during survey.	The proposed project would have no effect on this species.
Salt marsh bird's-beak	*Chloropyron maritimum* ssp. *maritimum*	Endangered	Annual herb. Coastal dunes and salt marshes.	Absent	No suitable habitat in BSA, and species not observed during survey.	The proposed project would have no effect on this species.

Source: *Natural Environment Study (Minimal Impacts)* (2017 and 2018 errata).
BSA = biological study area
ft = feet

2.16 Animal Species

2.16.1 Regulatory Setting

Many state and federal laws regulate impacts to wildlife. The U.S. Fish and Wildlife Service (USFWS), the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries Service), and the California Department of Fish and Wildlife (CDFW) are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with animals not listed or proposed for listing under the federal or state Endangered Species Act. As stated earlier in the introduction to Section 2.0, the proposed project would not impact any animal species listed or proposed for listing as threatened or endangered, and they are therefore not further discussed in this document. All other special-status animal species are discussed here, including CDFW Fully Protected Species and Species of Special Concern, and USFWS or NOAA Fisheries Service Candidate Species.

Federal laws and regulations relevant to wildlife include the following:

- National Environmental Policy Act
- Migratory Bird Treaty Act
- Fish and Wildlife Coordination Act

State laws and regulations relevant to wildlife include the following:

- California Environmental Quality Act
- Sections 1600 – 1603 of the California Fish and Game Code
- Sections 4150 and 4152 of the California Fish and Game Code

2.16.2 Affected Environment

The information in this section is based on the *Natural Environment Study (Minimal Impacts)* (2017 and 2018 errata) prepared for the project.

2.16.2.1 Literature Review, Records Search, and Field Survey Results

A literature review and records search were conducted to identify the presence or potential occurrence of sensitive or special-status animal species within or in the vicinity of the biological study area (BSA). The literature review and records searches identified 56 listed, proposed, and special-status animal species as having potential to occur within the nine United States Geological Service (USGS) topographical quadrangles surrounding the BSA. Unofficial species lists were received from the USFWS on May 24, 2017, and from the NOAA Fisheries Service on June 30, 2017, and updated official species lists were received from the USFWS on March 19, 2018, and from the NOAA Fisheries Service on March 19, 2018, the most recent of which are provided in Chapter 4. Five wildlife species that are federally and/or State-listed as endangered or threatened were identified by the USFWS as potentially occurring within the vicinity of the BSA. These species are western snowy plover, coastal California gnatcatcher, California least tern, least Bell's vireo, and Pacific pocket mouse. One species, California steelhead trout, was reported on the NOAA Fisheries Service list to potentially have critical habitat occurring in the United States Geological Survey (USGS) *Los Alamitos, California* or *Whittier, California* 7.5 minute quadrangle areas; however, this habitat is not within or adjacent to the BSA. None of these species were observed during field surveys and none are expected to occur within the BSA because no suitable habitat for these species is in the BSA.

The following 10 special-status animal species (5 CDFW Species of Special Concern and 5 CDFW Special Animals) that are not federally and/or State-listed endangered or threatened were identified in the literature and record searches as potentially occurring in or near the BSA due to the presence of suitable habitat:

- Rufous hummingbird (*Selasphorus rufus*)
- Cooper's hawk (*Accipiter cooperii*)
- Silver-haired bat (*Lasionycteris noctivagans*)
- Pallid bat (*Antrozous pallidus*)
- Western mastiff bat (*Eumops perotis californicus*)
- Western yellow bat (*Lasiurus xanthinus*)
- Pocketed free-tailed bat (*Nyctinomops femorosaccus*)
- Big free-tailed bat (*Nyctinomops macrotis*)
- Hoary bat (*Lasiurus cinereus*)
- Yuma myotis (*Myotis yumanensis*)

Reconnaissance-level field surveys were conducted on May 25 and June 15, 2017, to characterize the general biological resources and to ascertain the presence or absence of special-status animal species and the likelihood of their occurrence in and near the BSA.

A habitat suitability assessment for bats was conducted on May 25 and June 15, 2017, to examine suitable roosting habitat (e.g., crevices or cavities) at various bridge and culvert structures and to identify the presence of bats or bat sign (e.g., guano, staining, or vocalizations) within the BSA and immediate surrounding areas.

No special-status animal species were observed in the BSA during field surveys, but the Rufous hummingbird, Cooper's hawk, and six special-status bats have the potential to occur within the BSA due to the presence of suitable habitat. In addition, two structures with guano evidence indicating bat use of these structures for roosting were observed during the surveys.

Based on the literature search and field surveys, the overall habitat type in the BSA is classified as developed and includes flood control channels, transportation, ornamental landscaping, and disturbed or barren areas. The BSA has low biological value to native wildlife species. Wildlife species occurring in the BSA are characteristic of those found in a well-developed urban setting and are adapted to noise and other human-related disturbances. Animal species observed in the BSA during reconnaissance-level field surveys for the project include western fence lizard (*Sceloporus occidentalis*), rock pigeon (*Columba livia*), mourning dove (*Zenaida macroura*), Allen's hummingbird (*Selasphorus sasin*), red-tailed hawk (*Buteo jamaicensis*), black phoebe (*Sayornis nigricans*), California scrub-jay (*Aphelocoma californica*), American crow (*Corvus brachyrhynchos*), common raven (*Corvus corax*), northern rough-winged swallow (*Stelgidopteryx serripennis*), bushtit (*Psaltriparus minimus*), northern mockingbird (*Mimus polyglottos*), scaly-breasted munia (*Lonchura punctulata*), house sparrow (*Passer domesticus*), house finch (*Haemorhous mexicanus*), lesser goldfinch (*Spinus psaltria*), orange-crowned warbler (*Oreothlypis celata*), song sparrow (*Melospiza melodia*), California ground squirrel (*Otospermophilus beecheyi*), and raccoon (*Procyon lotor*).

2.16.2.2 Rufous Hummingbird, Cooper's Hawk, and Migratory Birds

The rufous hummingbird is included on the CDFW Special Animals List (July 2017) as a CDFW Special Animal and is classified as a USFWS Bird of Conservation Concern (BCC). The Cooper's hawk is also included on the CDFW Special Animals List and is a California Watch List species. The nest locations for both of these species are protected. Both species are also protected under the Migratory Bird Treaty Act (MBTA) (16 United States Code [USC] Sections 703–711) and under Sections 3503 and 3800 of the California Fish and Game Code.

The rufous hummingbird is well adapted to suburban environments and has the potential to occur in the BSA. The BSA contains suitable nesting habitat (mainly ornamental vegetation) for the rufous hummingbird and other migratory birds. The typical nesting season extends from February 15 through September 1, but hummingbirds have been found to nest year-round.

Cooper's hawk lives primarily in forests and woodlands, but has recently adapted to suburban areas and can nest in tall ornamental trees. The BSA contains marginally suitable foraging and nesting habitat for the Cooper's hawk and other migratory birds.

Migratory birds are protected under the MBTA. In addition, Sections 3503, 3503.5, and 3800 of the California Fish and Game Code prohibit the take, possession, or destruction of migratory birds, their nests, or their eggs.

2.16.2.3 Special-Status Bridge/Culvert- and Crevice-Dwelling Animal Species

Special-status bat species that may roost within the BSA include western yellow bat (a CDFW Species of Special Concern), Yuma myotis (a CDFW Special Animal), pallid bat (a CDFW Special Animal), silver-haired bat (a CDFW Special Animal), and hoary bat (a CDFW Special Animal). However, all bat species (regardless of listing status) and other nongame mammals are protected by California Fish and Game Code Section 4150, which states that all nongame mammals or parts thereof may not be taken or possessed except as provided otherwise in the code or in accordance with regulations adopted by the California Fish and Game Commission. Activities resulting in the mortality of nongame mammals (e.g., destruction of an occupied bat roost, resulting in the death of bats) or disturbance that results in the loss of a maternity colony of bats (including the death of young) may be considered "take" by the CDFW. Furthermore, any structure occupied by a bat maternity colony of any species is considered a native wildlife nursery site that is essential to the viability of local populations. Bat species that may form maternity colonies in or near the BSA include Mexican free-tailed bat, Yuma myotis, and big brown bat.

A habitat suitability assessment for bats was conducted on May 25 and June 15, 2017. Bat roosting was confirmed through the presence of bat sign at two structures within the BSA, and the probability of roosting is moderate to high at an additional three structures. Although the habitat assessment surveys were performed during the bat maternity season, no evidence of any maternity colonies was observed within the BSA. However, the presence or absence of bats could not be confirmed at many of these structures during the daytime assessments, nor could the numbers or species of bats be determined, because the type of day-roosting habitat present at these locations consists of the hollow interior spaces of the bridges accessed by bats via weep holes designed for drainage.

Based on the presence and distribution of bat sign, it is assumed that night roosting occurs at many of the culvert structures throughout the BSA.

Although roosts in structures such as bridges and culverts can be relatively easy to identify, tree roosts are more difficult to identify. Since roosting activity in trees is difficult to confirm (foliage-roosting species tend to roost singly, beneath leaves, and may roost in a different location each night), trees were not closely examined during the bat habitat suitability assessment. However, the presence of large trees and palm trees that are suitable for foliage-roosting species were noted within the BSA during the surveys.

There are no special-status bridge- and crevice-dwelling bird species with the potential to occur within the BSA. However, there is a potential for non-listed bird species to roost or nest in the BSA.

2.16.2.4 Wildlife Movement

Wildlife crossings are generally structural passages beneath or above roadways. “Wildlife crossing” is the umbrella term encompassing undercrossings, overcrossings, and culverts. All of these structures provide seminatural corridors above or below roads, and in some cases adjacent to roads, so that animals can safely cross without endangering themselves and motorists. Species of primary interest for wildlife movement within the BSA are medium-sized mammals such as raccoon.

The State Route 91 (SR-91) and Interstate 605 (I-605) freeways generally present barriers to wildlife movement and do not facilitate habitat connectivity. Specifically, these two freeways have high traffic volumes and are lined with fences and walls. The various flood control channels crossing under the two freeways may facilitate some wildlife movement, though very little evidence of this was observed. The only evidence observed was raccoon tracks in the drainage feature near Iron-Wood Nine Golf Course. However, raccoons are well adapted to the urban environment and are increasingly present in urban drainage channels. The drainage feature near Iron-Wood Nine Golf Course does not connect to any upstream natural habitat and therefore does not serve as a wildlife movement corridor. The BSA consists of developed areas, of which the mature ornamental shrubs and trees may serve as habitat linkages for urban-tolerant bird species.

2.16.3 Environmental Consequences

The proposed project has been determined to have no impact on any of the federally listed species identified as potentially occurring within the vicinity of the proposed project (refer to Table 2.16.1). The following provides a discussion of potential impacts on nonlisted animal species.

2.16.3.1 Temporary Impacts

Build Alternative (includes Design Options)

Construction of the Build Alternative could impact nesting birds, including the Rufous hummingbird and Cooper's hawk, protected under the MBTA and the California Fish and Game Code, either directly as a result of the removal of trees occupied by nesting birds or disturbances to bridge and crevice habitat, or indirectly as a result of disturbances near trees occupied by nesting birds.

In compliance with the requirements of the MBTA and California Fish and Game Code regarding nesting birds, to the maximum extent feasible, vegetation clearing and construction activities that impact existing vegetation will be conducted outside the primary nesting season for birds. The typical nesting season extends from February 15 through September 1, but hummingbirds have been found to nest year-round.

Structure Nos. 2, 12, 14, and 15 have moderate to high probabilities of supporting roosting bats (see Figure 2.16-1). Construction activities associated with the Build Alternative at these structures could result in temporary impacts to bats and other bridge- and crevice-nesting special-status species. During construction activities, indirect temporary impacts to bats and bat-roosting habitat include impacts from dust, lighting, and noise in the vicinity of the roost sites. Direct temporary impacts include destruction or loss of roosting habitat through demolition or removal of a structure or portions of a structure that contain roost features. The loss of a night roost can negatively affect the use of a foraging area, and consequently may result in reduced reproduction rates in species that are already slow to reproduce.

Humane eviction and exclusion of bats from a roost would be considered a temporary impact if alternative habitat is provided and if the bats are permitted to recolonize the original roost site following construction. In addition, construction of the Build Alternative could also impact tree-roosting habitat for bats through the removal of palm trees or their fronds within the BSA.

Table 2.16.1 Impacts Determination for Federally Listed Animal Species

Common Name	Scientific Name	Federal Status	Species Requirements	Species Habitat Present/Absent	Rationale	Impact Determination
Fishes						
Steelhead (Southern California Distinct Population Segment)	*Oncorhynchus mykiss irideus*	Endangered	Occurs in cool water streams; spawns in areas of gravelly substrate in riffles or pool tails. Federal listing refers to naturally spawned anadromous steelhead originating below natural and manmade impassable barriers from the Santa Maria River to the U.S.-Mexico Border.	Absent	The BSA is outside of the range for this species.	The proposed project would have no impact on this species.
Birds						
California least tern	*Sternula antillarum browni*	Endangered	Nests along the coast from the San Francisco Bay south to northern Baja California. Forages in shallow water. Colonial breeder on bare or sparsely vegetated, flat substrates, sand beaches, alkali flats, landfills, or paved areas.	Absent	No suitable habitat in BSA, and species not observed during survey.	The proposed project would have no impact on this species.
Coastal California gnatcatcher	*Polioptila californica californica*	Threatened	Inhabits coastal sage scrub in low-lying foothills and valleys up to about 500 meters (1,640 feet) in elevation in cismontane southwestern California and Baja California.	Absent	No suitable habitat in BSA, and species not observed during survey.	The proposed project would have no impact on this species.
Least Bell's vireo	*Vireo bellii pusillus*	Endangered	Riparian forests and willow thickets. The most critical structural component of Least Bell's Vireo habitat in California is a dense shrub layer 0.6–3 meters (2–10 feet) above ground. Nests from Central California to northern Baja California. Winters in southern Baja California.	Absent	No suitable habitat in BSA, and species not observed during survey.	The proposed project would have no impact on this species.

Table 2.16.1 Impacts Determination for Federally Listed Animal Species

Common Name	Scientific Name	Federal Status	Species Requirements	Species Habitat Present/Absent	Rationale	Impact Determination
Western snowy plover	*Charadrius nivosus nivosus*	Threatened	Sandy coastal beaches, lakes, and alkaline playas. Scattered locations along coastal California and the Channel Islands and inland at Salton Sea and various alkaline lakes.	Absent	No suitable habitat in BSA, and species not observed during survey.	The proposed project would have no impact on this species.
Mammals						
Pacific pocket mouse	*Perognathus longimembris pacificus*	Endangered	Historically occupied open habitats on sandy soils along the coast from Los Angeles to the Mexican border. Now known from only four sites in Orange and San Diego Counties.	Absent	No suitable habitat in BSA, and no sign of species observed during survey.	The proposed project would have no impact on this species.

Source: *Natural Environment Study (Minimal Impacts)* (2017 and 2018 errata).
BSA = biological study area

LEGEND

Biological Study Area (BSA)

Permanent Impact

Temporary Impact

Temporary Construction Easement

Bat Habitat

Structure Number with ID[1]

Bat Roosting Confirmed (Bats, Roosting Bats, or Bat Sign)

Structure with Low Probability of Roosting Bats

Structure with Moderate to High Probability of Roosting Bats

([1]Structure Number Corresponds with Table A in Bat Memo)

Land Cover Types

Developed and Transportation

Disturbed or Barren

Ornamental

Flood Control Channels Drainage Features (A-N)

Potential USACE Jurisdiction (0.88 acres)

Potential CDFW Jurisdiction (1.17 acres)

Likely Non-Jurisdictional Drainage Features (1.33 acres)

0 100 200

FEET

SOURCE: Bing Maps (2015); Michael Baker (4/2017)

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FIGURE 2.16-1

Sheet 1 of 10

Westbound SR-91 Improvement Project

Project Impacts to Biological Resources

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0700000191; EA 07-29811

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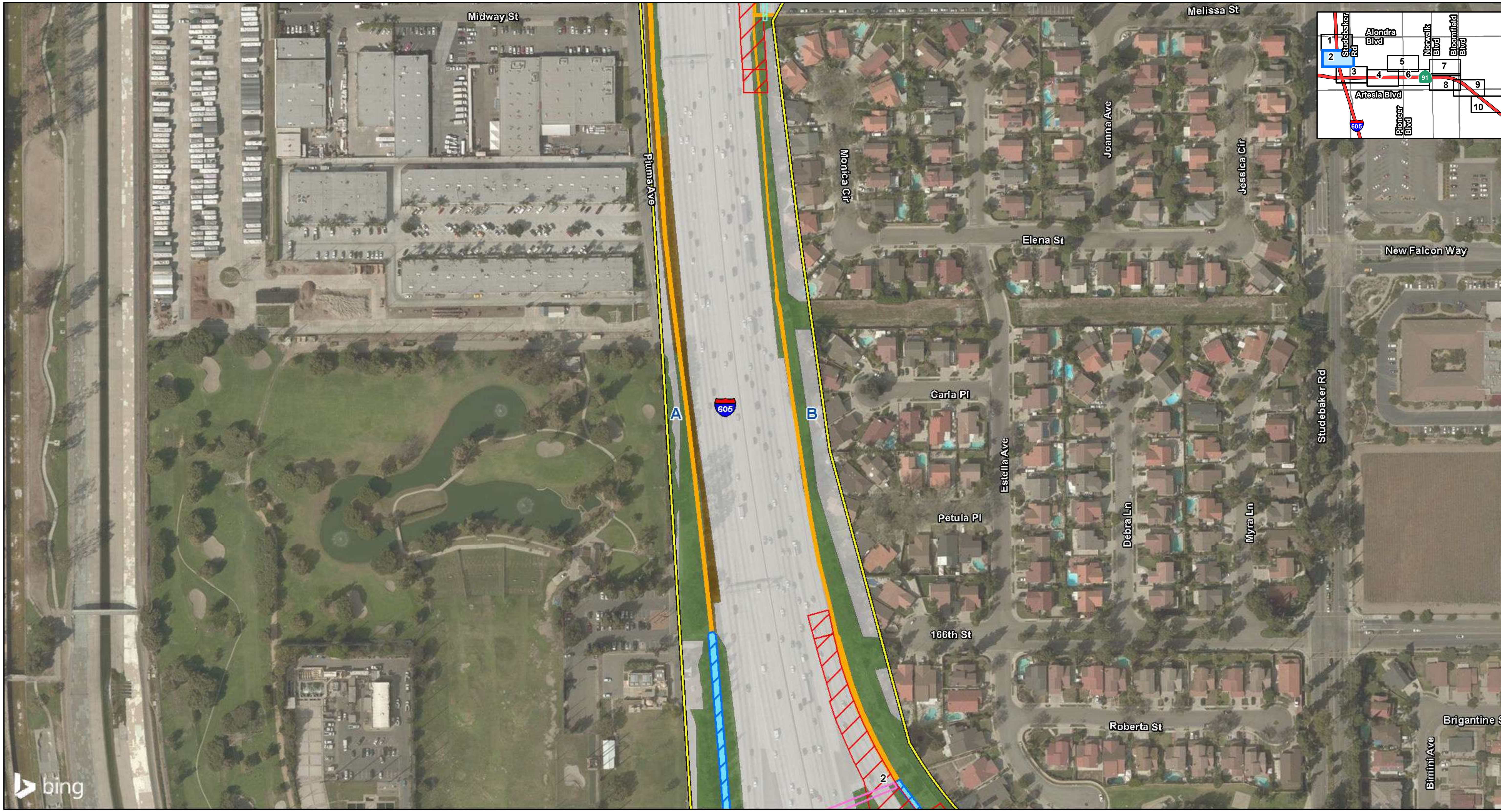

LEGEND

- Biological Study Area (BSA)
- Permanent Impact
- Temporary Impact
- Temporary Construction Easement

Bat Habitat

- # Structure Number with ID[1]
- Bat Roosting Confirmed (Bats, Roosting Bats, or Bat Sign)
- Structure with Low Probability of Roosting Bats
- Structure with Moderate to High Probability of Roosting Bats

([1]Structure Number Corresponds with Table A in Bat Memo)

Land Cover Types

- Developed and Transportation
- Disturbed or Barren
- Ornamental

Flood Control Channels Drainage Features (A-N)

- Potential USACE Jurisdiction (0.88 acres)
- Potential CDFW Jurisdiction (1.17 acres)
- Likely Non-Jurisdictional Drainage Features (1.33 acres)

N

0 100 200
FEET

SOURCE: Bing Maps (2015); Michael Baker (4/2017)

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FIGURE 2.16-1

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Westbound SR-91 Improvement Project

Project Impacts to Biological Resources

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

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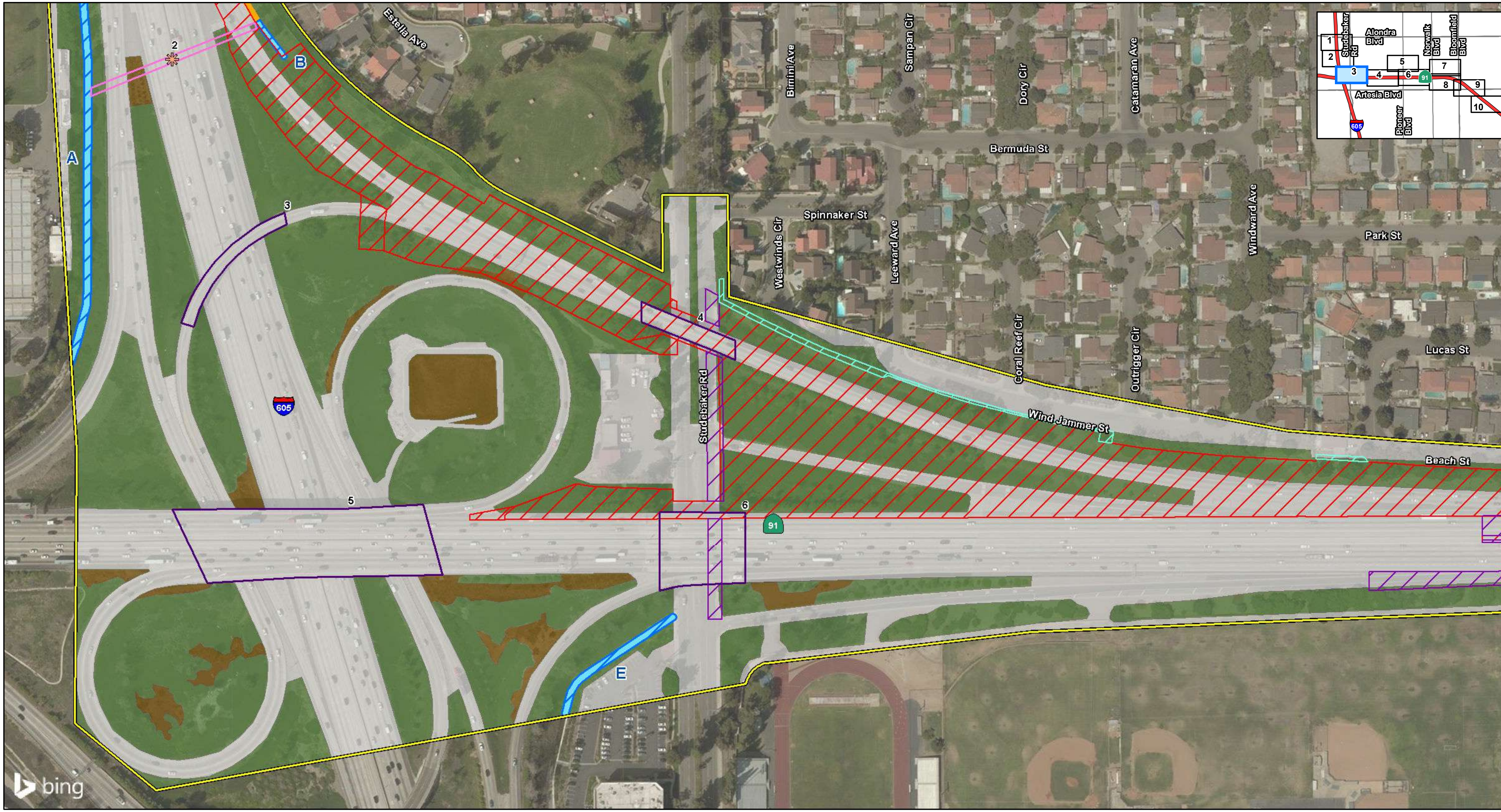

LEGEND

Biological Study Area (BSA)
Permanent Impact
Temporary Impact
Temporary Construction Easement

Bat Habitat
Structure Number with ID[1]
Bat Roosting Confirmed (Bats, Roosting Bats, or Bat Sign)
Structure with Low Probability of Roosting Bats
Structure with Moderate to High Probability of Roosting Bats
([1]Structure Number Corresponds with Table A in Bat Memo)

Land Cover Types
Developed and Transportation
Disturbed or Barren
Ornamental

Flood Control Channels Drainage Features (A-N)
Potential USACE Jurisdiction (0.88 acres)
Potential CDFW Jurisdiction (1.17 acres)
Likely Non-Jurisdictional Drainage Features (1.33 acres)

0 100 200
FEET

SOURCE: Bing Maps (2015); Michael Baker (4/2017)

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FIGURE 2.16-1
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Westbound SR-91 Improvement Project

Project Impacts to Biological Resources

07-LA-91
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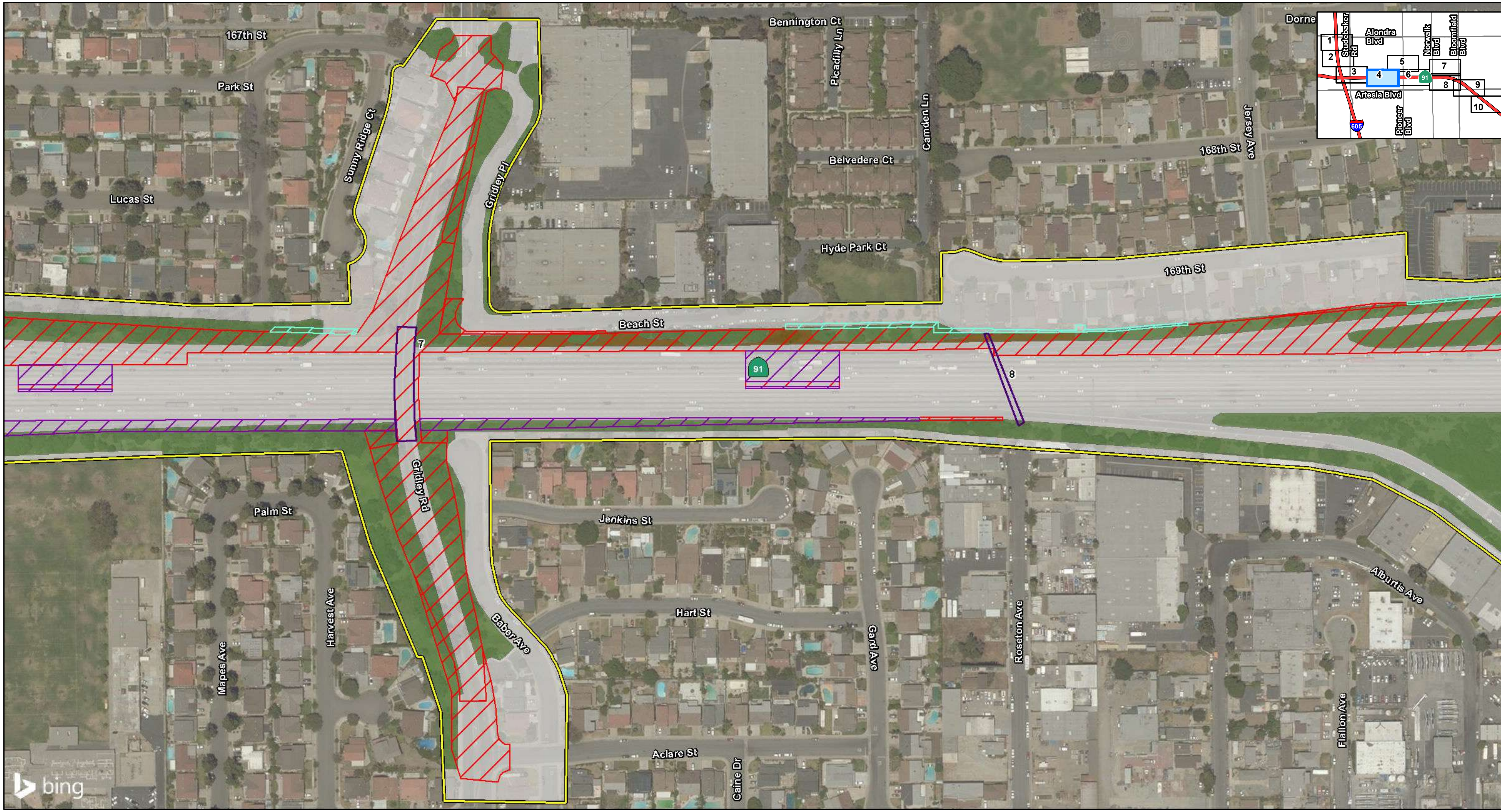

LEGEND

Biological Study Area (BSA)

Permanent Impact

Temporary Impact

Temporary Construction Easement

Bat Habitat

\# Structure Number with ID[1]

Bat Roosting Confirmed (Bats, Roosting Bats, or Bat Sign)

Structure with Low Probability of Roosting Bats

Structure with Moderate to High Probability of Roosting Bats

([1]Structure Number Corresponds with Table A in Bat Memo)

Land Cover Types

Developed and Transportation

Disturbed or Barren

Ornamental

Flood Control Channels Drainage Features (A-N)

Potential USACE Jurisdiction (0.88 acres)

Potential CDFW Jurisdiction (1.17 acres)

Likely Non-Jurisdictional Drainage Features (1.33 acres)

N

0 100 200

FEET

SOURCE: Bing Maps (2015); Michael Baker (4/2017)

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FIGURE 2.16-1

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Westbound SR-91 Improvement Project

Project Impacts to Biological Resources

07-LA-91

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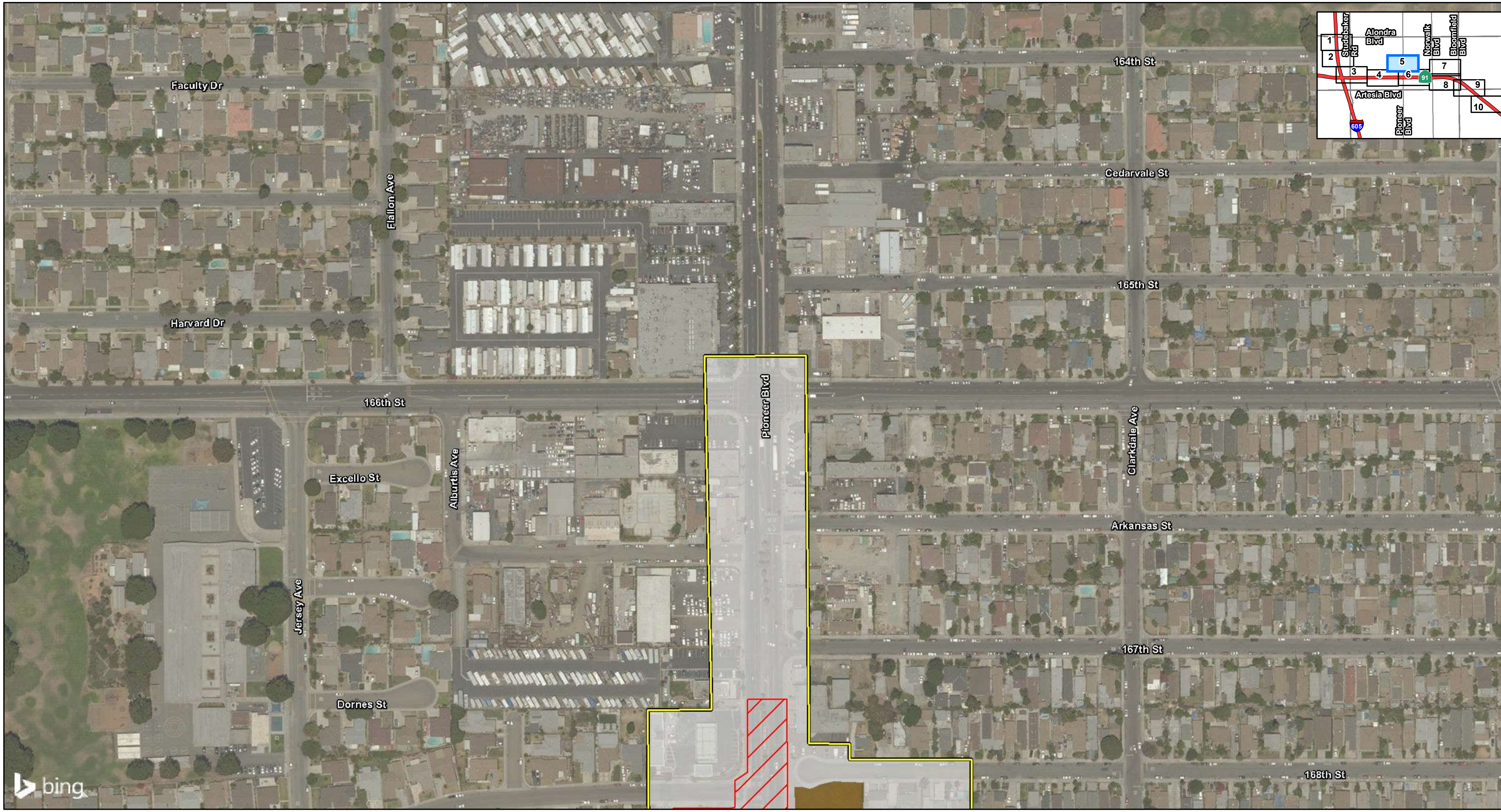

LEGEND

Biological Study Area (BSA)
Permanent Impact
Temporary Impact
Temporary Construction Easement

Bat Habitat
Structure Number with ID[1]
Bat Roosting Confirmed (Bats, Roosting Bats, or Bat Sign)
Structure with Low Probability of Roosting Bats
Structure with Moderate to High Probability of Roosting Bats
([1]Structure Number Corresponds with Table A in Bat Memo)

Land Cover Types
Developed and Transportation
Disturbed or Barren
Ornamental

Flood Control Channels Drainage Features (A-N)
Potential USACE Jurisdiction (0.88 acres)
Potential CDFW Jurisdiction (1.17 acres)
Likely Non-Jurisdictional Drainage Features (1.33 acres)

N
0 100 200
FEET

SOURCE: Bing Maps (2015); Michael Baker (4/2017)

FIGURE 2.16-1
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Westbound SR-91 Improvement Project
Project Impacts to Biological Resources
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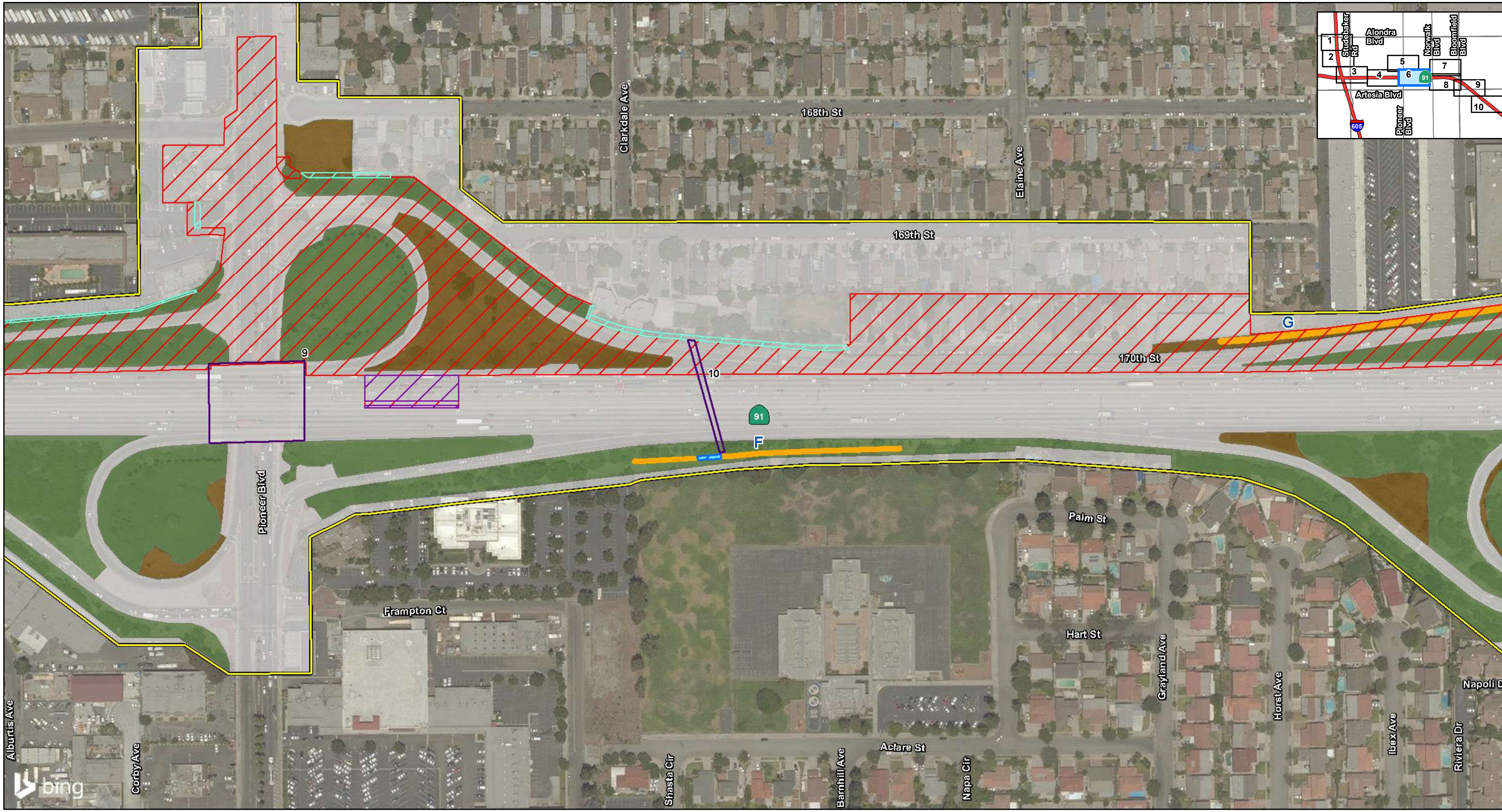

LEGEND

Biological Study Area (BSA)

Permanent Impact

Temporary Impact

Temporary Construction Easement

Bat Habitat

Structure Number with ID[1]

Bat Roosting Confirmed (Bats, Roosting Bats, or Bat Sign)

Structure with Low Probability of Roosting Bats

Structure with Moderate to High Probability of Roosting Bats

([1]Structure Number Corresponds with Table A in Bat Memo)

Land Cover Types

Developed and Transportation

Disturbed or Barren

Ornamental

Flood Control Channels Drainage Features (A-N)

Potential USACE Jurisdiction (0.88 acres)

Potential CDFW Jurisdiction (1.17 acres)

Likely Non-Jurisdictional Drainage Features (1.33 acres)

N

0 100 200

FEET

SOURCE: Bing Maps (2015); Michael Baker (4/2017)

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FIGURE 2.16-1

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Westbound SR-91 Improvement Project

Project Impacts to Biological Resources

07-LA-91

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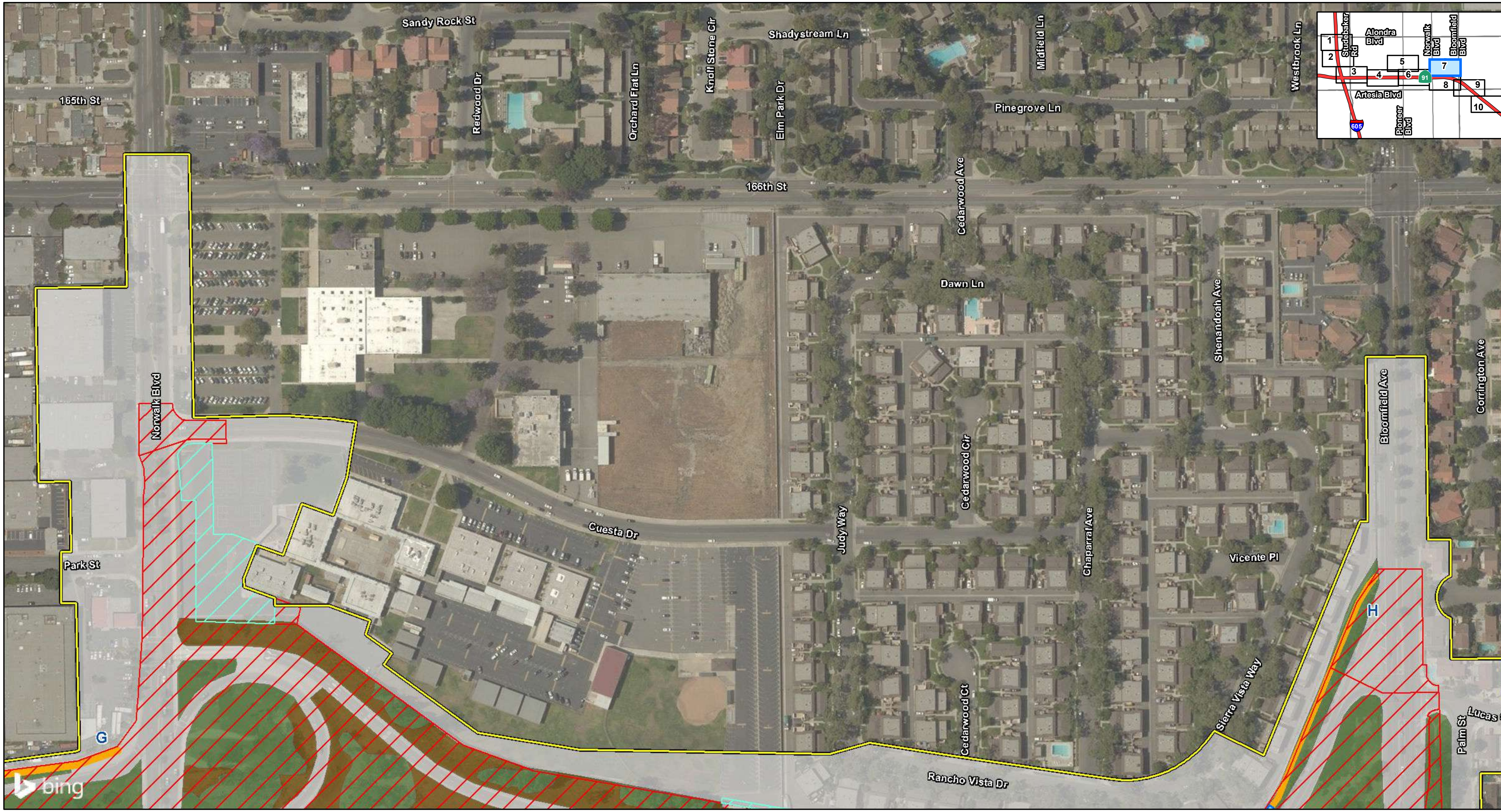

LEGEND

Biological Study Area (BSA)

Permanent Impact

Temporary Impact

Temporary Construction Easement

Bat Habitat

\# Structure Number with ID[1]

Bat Roosting Confirmed (Bats, Roosting Bats, or Bat Sign)

Structure with Low Probability of Roosting Bats

Structure with Moderate to High Probability of Roosting Bats

([1]Structure Number Corresponds with Table A in Bat Memo)

Land Cover Types

Developed and Transportation

Disturbed or Barren

Ornamental

Flood Control Channels Drainage Features (A-N)

Potential USACE Jurisdiction (0.88 acres)

Potential CDFW Jurisdiction (1.17 acres)

Likely Non-Jurisdictional Drainage Features (1.33 acres)

N

0 100 200

FEET

SOURCE: Bing Maps (2015); Michael Baker (4/2017)

FIGURE 2.16-1

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Westbound SR-91 Improvement Project

Project Impacts to Biological Resources

07-LA-91

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EFIS 0700000191; EA 07-29811

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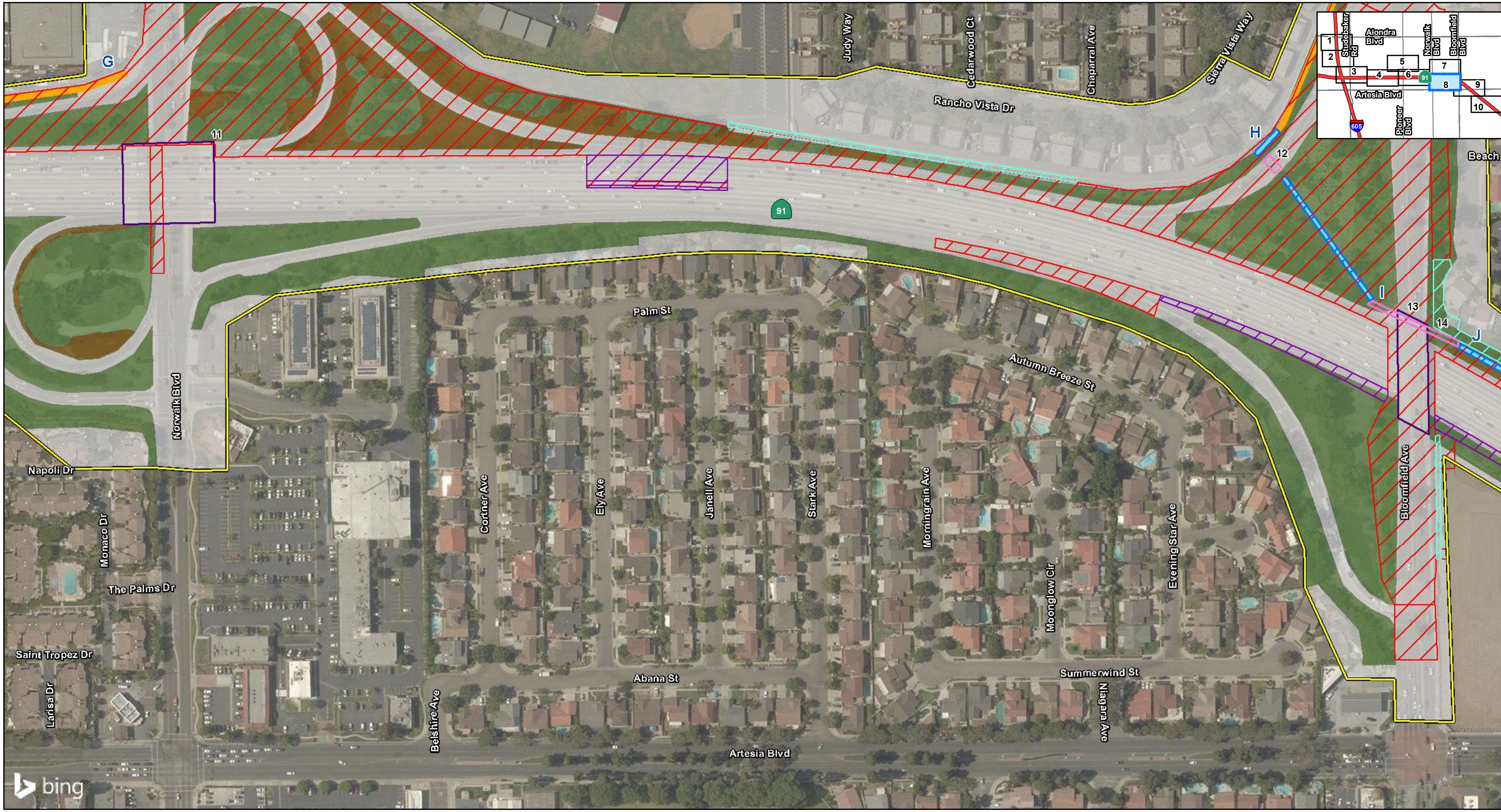

LEGEND

- Biological Study Area (BSA)
- Permanent Impact
- Temporary Impact
- Temporary Construction Easement

Bat Habitat

- # Structure Number with ID[1]
- Bat Roosting Confirmed (Bats, Roosting Bats, or Bat Sign)
- Structure with Low Probability of Roosting Bats
- Structure with Moderate to High Probability of Roosting Bats

([1]Structure Number Corresponds with Table A in Bat Memo)

Land Cover Types

- Developed and Transportation
- Disturbed or Barren
- Ornamental

Flood Control Channels Drainage Features (A-N)

- Potential USACE Jurisdiction (0.88 acres)
- Potential CDFW Jurisdiction (1.17 acres)
- Likely Non-Jurisdictional Drainage Features (1.33 acres)

N

0 100 200
FEET

SOURCE: Bing Maps (2015); Michael Baker (4/2017)

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FIGURE 2.16-1
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Westbound SR-91 Improvement Project

Project Impacts to Biological Resources

07-LA-91
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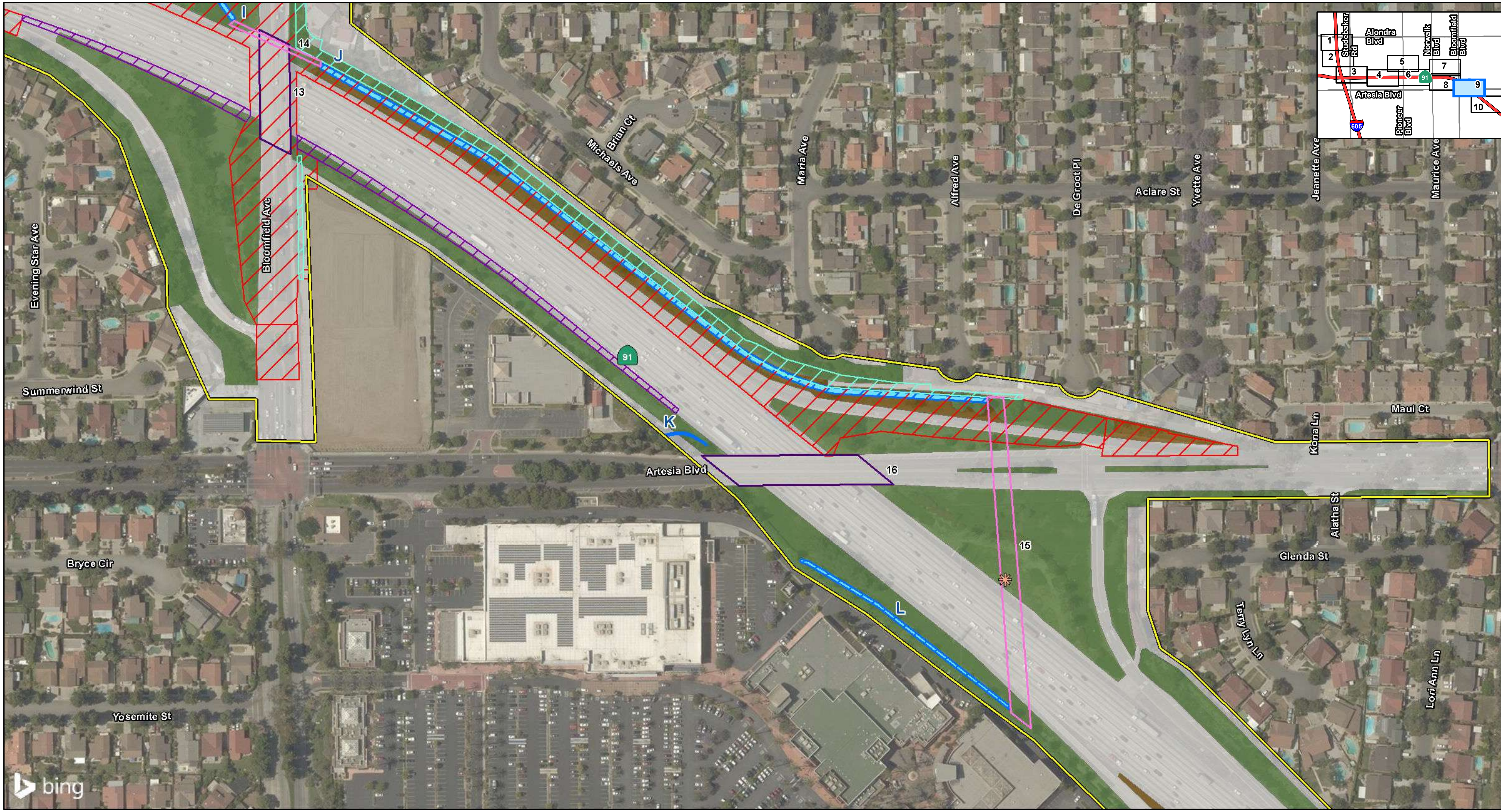

LEGEND

Biological Study Area (BSA)
Permanent Impact
Temporary Impact
Temporary Construction Easement

Bat Habitat

Structure Number with ID[1]
Bat Roosting Confirmed (Bats, Roosting Bats, or Bat Sign)
Structure with Low Probability of Roosting Bats
Structure with Moderate to High Probability of Roosting Bats
([1]Structure Number Corresponds with Table A in Bat Memo)

Land Cover Types

Developed and Transportation
Disturbed or Barren
Ornamental

Flood Control Channels Drainage Features (A-N)

Potential USACE Jurisdiction (0.88 acres)
Potential CDFW Jurisdiction (1.17 acres)
Likely Non-Jurisdictional Drainage Features (1.33 acres)

N
0 100 200
FEET

SOURCE: Bing Maps (2015); Michael Baker (4/2017)

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FIGURE 2.16-1
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Westbound SR-91 Improvement Project

Project Impacts to Biological Resources

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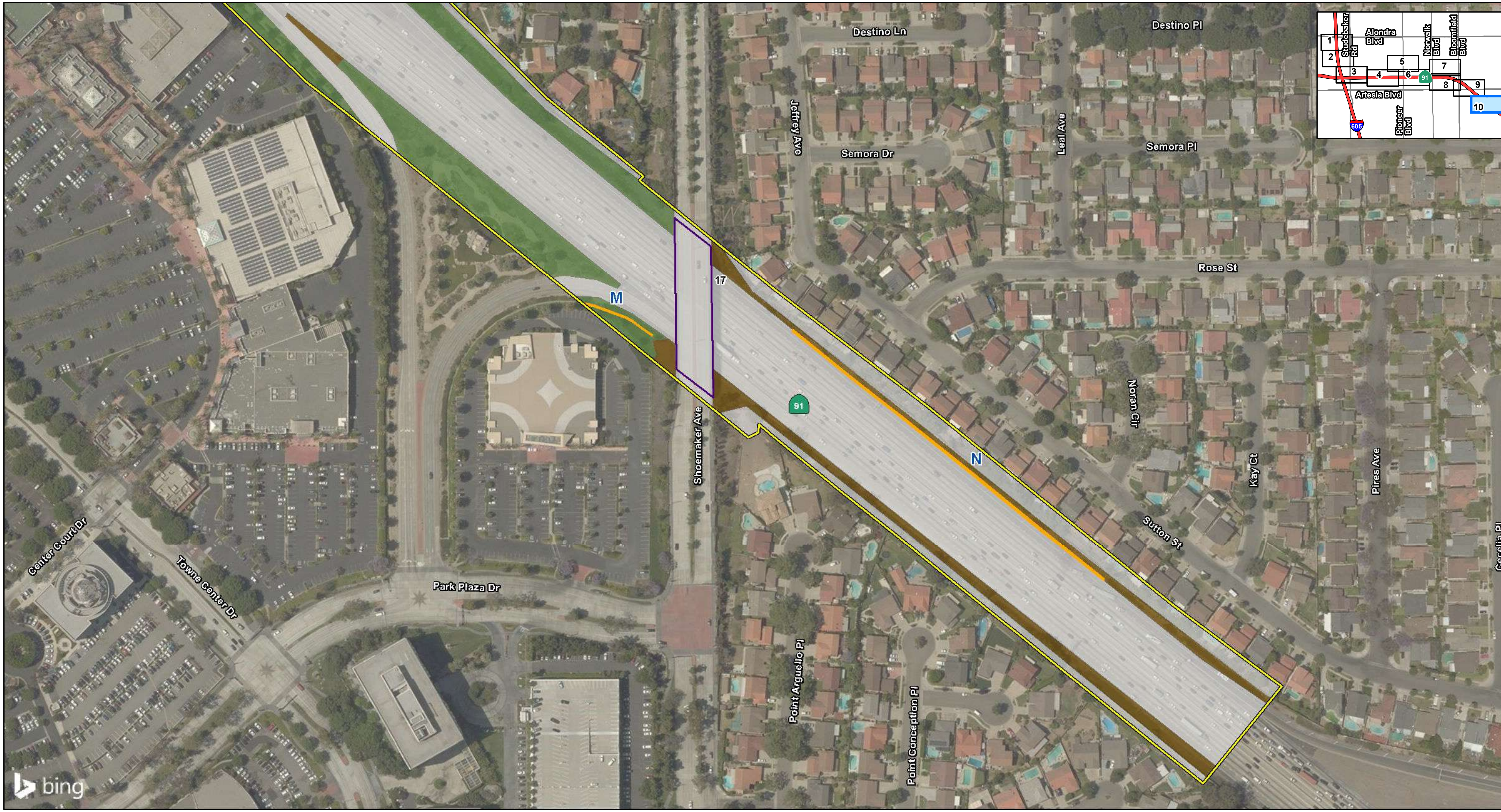

LEGEND

Biological Study Area (BSA)
Permanent Impact
Temporary Impact
Temporary Construction Easement

Bat Habitat

Structure Number with ID[1]
Bat Roosting Confirmed (Bats, Roosting Bats, or Bat Sign)
Structure with Low Probability of Roosting Bats
Structure with Moderate to High Probability of Roosting Bats
([1]Structure Number Corresponds with Table A in Bat Memo)

Land Cover Types

Developed and Transportation
Disturbed or Barren
Ornamental

Flood Control Channels Drainage Features (A-N)

Potential USACE Jurisdiction (0.88 acres)
Potential CDFW Jurisdiction (1.17 acres)
Likely Non-Jurisdictional Drainage Features (1.33 acres)

N

0 100 200
FEET

SOURCE: Bing Maps (2015); Michael Baker (4/2017)

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FIGURE 2.16-1
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Westbound SR-91 Improvement Project

Project Impacts to Biological Resources

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SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8
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To minimize potential impacts to day-roosting bats (including maternity colonies) during the construction of the Build Alternative, the following project features shall be incorporated into the project:

PF-BIO-2 **Nighttime Exit Counts and Acoustic Surveys.** Nighttime exit counts and acoustic surveys shall be performed by a Qualified Bat Biologist at all structures that contain suitable bat-roosting habitat and that may be subject to project-related impacts. These surveys shall be performed within 2 weeks of commencement of construction activities in order to provide adequate time for mitigation planning.

PF-BIO-3 **Avoidance of Bat Roosts.** Upon confirmation of the presence of bats, construction shall avoid structures where bat day and night roosts have been confirmed to the maximum extent feasible. Where maternity roosting has been confirmed, demolition and pile-driving activities shall avoid the recognized bat maternity season (April 1–August 31) to prevent potential mortality of flightless young bats.

PF-BIO-4 **Avoidance of Maternity Colonies.** Upon confirmation of the presence of bats, construction activities at structures housing maternity colonies shall be coordinated with a Qualified Bat Biologist and the CDFW.

PF-BIO-5 **Humane Bat Eviction.** Upon confirmation of the presence of bats, if direct impacts to bat-roosting habitat are anticipated, humane evictions and exclusions of roosting bats shall be performed under the supervision of a Qualified Bat Biologist in the fall (September or October) prior to any work activities that would result in direct impacts or direct mortality to roosting bats. This action will be performed in coordination with the CDFW. To avoid potential mortality of flightless juvenile bats, evictions and exclusions of bats cannot be performed during the maternity season (April 1–August 31). Winter months (December–February) are also inappropriate for bat eviction because not all individuals in a roost will emerge on any given night and long-distance movements to other roost sites are more difficult during the winter when prey availability is scarce, resulting in high mortality rates of evicted bats.

PF-BIO-6 **Installation of Alternate Roosting Habitat.** Upon confirmation of the presence of bats, if permanent, direct impacts to bat-roosting habitat are anticipated and a humane eviction/exclusion is performed, alternate roosting habitat shall be provided to ensure no net loss of bat-roosting habitat. This alternate roosting habitat should be installed on the structure prior to the eviction/exclusion of bats from that structure. This action shall be coordinated with the CDFW and a Qualified Bat Biologist to ensure that the installed habitat will provide adequate mitigation for impacts.

PF-BIO-7 **Night Lighting During Construction.** At structures where night roosting is suspected or confirmed, work shall be limited to the daylight hours to the greatest extent feasible to avoid potential disruption of night foraging. If night work cannot be avoided, night lighting shall be focused only on the area of direct work, airspace access to and from the roost features of the structure shall not be obstructed, and light spillover into the adjacent foraging areas shall be minimized to the greatest extent feasible.

PF-BIO-8 **Avoidance of Foliage-Roosting Bats.** Foliage-roosting bat species such as western yellow bats and hoary bats may roost in trees throughout the biological study area (BSA). If mature ornamental trees (particularly palm trees) are removed or trimmed for project construction, measures should be implemented to avoid direct mortality to tree-roosting bats. To reduce potential impacts to tree-roosting bats, tree trimming/removal activities shall be performed outside the bat maternity season (April 1–August 31) to avoid direct impacts to flightless young bats that may roost in trees within the BSA. This period also coincides with the bird nesting season of March 15–September 15.

PF-BIO-9 **Biological Monitoring by a Bat Specialist.** A Qualified Biologist shall monitor construction activities near suitable bat-roost structures and tree removal/tree trimming during the bat maternity season (April 1–August 31). If bats are encountered, activities shall halt and remain halted until (a) the roost is confirmed to have been vacated by a Qualified Biologist or (b) a Qualified Biologist has coordinated with the CDFW to develop alternative measures up to and including bat removal from the structure(s) or tree(s).

PF-BIO-10 **Access to Bat-Roosting Habitat.** If bird exclusion netting is installed to prevent birds from nesting on the bridge, care should be taken to ensure that access to the bat-roosting habitat is not obstructed. The bird exclusion netting shall have a mesh size no greater than ½ inch by ½ inch to prevent potential entrapment of bats in the netting.

PF-BIO-11 **Inspection of Swallow Nests.** If swallow nests are removed to prevent swallows from nesting in the project area during construction activities, the nests should be inspected for roosting bats and removed in the fall (September or October) in a manner that ensures they do not fall to the ground before lack of occupancy has been established. To avoid mortality by diurnal predators, any bats discovered in removed nests will need to be either housed in temporary shelters by a Qualified Bat Biologist and released that evening on site or, with the approval of the CDFW, released immediately into one of the previously existing or alternative bat roosts installed on site.

In order to prevent any impacts to Southern California steelhead trout that may occur in existing downstream suitable habitat, if any, the following project features will be incorporated into the project.

PF-BIO-12 **Best Management Practices During Construction.** All equipment maintenance, staging, and dispensing of fuel, oil, or any other such activities will occur in developed or designated non-sensitive upland habitat areas. The designated upland areas will be located to prevent runoff from any spills or other discharge from entering waters of the United States.

Construction activities associated with the Build Alternative within the drainage feature near Iron-Wood Nine Golf Course would temporarily discourage raccoon presence in that relatively short section of the drainage, but raccoons would likely continue to utilize the adjacent areas. Therefore, construction of the Build Alternative would not result in any adverse temporary impacts to wildlife movement.

No Build Alternative

The No Build Alternative would not include construction of any improvements and would not result in any disturbance on or near suitable bird and bat habitat. Therefore, the No Build Alternative would not result in temporary impacts to special-status animal species in the BSA, including bats and nesting birds.

2.16.3.2 Permanent Impacts

Build Alternative (includes Design Options)

The Build Alternative would not result in any permanent direct impacts on the rufous hummingbird, Cooper's hawk, or other nesting birds because operations on SR-91, I-605, and the connecting arterial streets would be similar to existing conditions. Indirect noise impacts on nesting birds from traffic on SR-91, I-605, their connectors, and area streets would be similar to existing conditions.

In order to avoid and/or minimize potential impacts to fully protected raptors, special-status bird species, and other nesting birds protected by the MBTA and the California Fish and Game Code, the following project feature will be implemented:

PF-BIO-1 **Avoidance of Breeding Season.** All vegetation removal shall occur outside of bird nesting season, which is generally from February 15 to September 1. Should vegetation need to be removed during this period, the District Biologist shall be notified 2 weeks prior to the start of construction to determine whether nesting birds are present. In the event that nesting birds are observed, the Resident Engineer (RE) should stop work until a Qualified Biologist has determined that fledglings have left the nest. If this is not possible, the RE should coordinate with the District Biologist to minimize the risk of violating the Migratory Bird Treaty Act (MBTA) or California Fish and Game Code. Potential protective measures include establishing a buffer of an appropriate distance, as determined by the District Biologist, around any active nests during all phases of construction. Other measures to protect nesting birds include:

- Flagging, stakes, and/or construction fencing will be used to demarcate the inside boundary of the buffer between the project activities and the nest. California Department of Transportation (Caltrans) personnel, including all contractors working on site, will be instructed on the sensitivity of the area. Caltrans will document the results of the recommended protective measures described above to demonstrate compliance with applicable State and federal laws pertaining to the protection of birds.

- The Biological Monitor will be present on site during all clearing and grubbing of vegetation to ensure that these activities remain within the project footprint (i.e., outside the demarcated buffer); to ensure that the flagging/stakes/fencing is being maintained; and to minimize the likelihood that active nests are abandoned or fail due to project construction activities. The Biological Monitor will send weekly monitoring reports to Caltrans and will notify Caltrans immediately if project activities take, possess, or needlessly destroy any active bird nests or eggs of species. Caltrans will notify the United States Fish and Wildlife Service (USFWS)/California Department of Fish and Wildlife (CDFW) within 48 hours if damage to an active nest or eggs or death or injury of birds protected under State law or the MBTA is observed.

To prevent any impacts to the Southern California steelhead Distinct Population Segment that may occur in existing downstream suitable habitat, if any, a construction Storm Water Pollution Prevention Plan (SWPPP) and soil erosion and sedimentation plan will be developed to minimize erosion and identify specific pollution prevention measures that will eliminate or control potential point and nonpoint pollution sources on site during construction and operation. More details regarding the SWPPP are provided in Section 2.8, Water Quality, of this document.

Permanent impacts to bats and bat-roosting habitat include destruction or loss of roosting habitat through demolition or removal of a structure (Structure Nos. 2, 12, 14, and 15) or portions of a structure that contain roost features. Humane eviction and exclusion of bats from a roost would be considered a permanent impact if the roost site remained sealed.

Indirect noise impacts to bat species from traffic on SR-91, I-605, their connectors, and area streets would be expected to be the same as from existing conditions.

Since the BSA does not appear to function as a wildlife movement corridor, the Build Alternative would not result in any permanent impacts to wildlife movement.

No Build Alternative

The No Build Alternative would not include the operation of any of the project improvements. Therefore, the No Build Alternative would not result in permanent impacts to special-status animal species in the BSA, including bats and nesting birds.

2.16.4 Avoidance, Minimization, and/or Mitigation Measures

Because the Build Alternative would not result in any temporary or permanent impacts related to animal species with the implementation of Project Features PF-BIO-1 through PF-BIO-12, no avoidance, minimization, or mitigation measures are required.

2.17 Invasive Species

2.17.1 Regulatory Setting

On February 3, 1999, President William J. Clinton signed Executive Order (EO) 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as “any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health.” Federal Highway Administration (FHWA) guidance issued August 10, 1999 directs the use of the State’s invasive species list, maintained by the California Invasive Species Council to define the invasive species that must be considered as part of the National Environmental Policy Act (NEPA) analysis for a proposed project.

2.17.2 Affected Environment

The information in this section is based on the 2017 *Natural Environment Study (Minimal Impacts)* (NES [MI]) (2017 and 2018 errata) prepared for this project.

The California Invasive Plant Council (Cal-IPC) 2006 Invasive Plant Inventory highlights nonnative plants that are serious problems in wildlands (i.e., natural areas that support native ecosystems, including national, State, and local parks; ecological reserves; wildlife areas; national forests; and Bureau of Land Management [BLM] lands). The inventory categorizes plants as High, Moderate, or Limited based on each species’ negative ecological impact in California. Plants categorized as High have severe ecological impacts. Plants categorized as Moderate have substantial and apparent, but not severe, ecological impacts. Plants categorized as Limited are invasive, but their ecological impacts are minor on a Statewide level.

As shown in Table 2.17.1, a total of 22 nonnative plant species occurring on the Cal-IPC Invasive Plant Inventory (1 High, 11 Moderate, and 10 Limited) were identified in the biological study area (BSA). A figure showing the BSA is provided in the NES (MI) prepared for this project.

No invasive animal species were observed in the BSA. Three nonnative bird species were observed but are not necessarily considered invasive.

Table 2.17.1 Invasive Plant Species in the Biological Study Area

Scientific Name	Common Name	Rating
Aizoaceae	Iceplant Family	
Carpobrotus edulis	Hottentot-fig	High
Anacardiaceae	Sumac Family	
Schinus molle	Peruvian pepper tree	Limited
Asteraceae	Sunflower Family	
Carduus pycnocephalus	Italian thistle	Moderate
Cirsium vulgare	Bull thistle	Moderate
Helminthotheca echiodes	Bristly ox-tongue	Limited
Brassicaceae	Mustard Family	
Brassica nigra	Black mustard	Moderate
Hirschfeldia incana	Shortpod mustard	Moderate
Raphanus sativus	Wild radish	Limited
Chenopodiaceae	Goosefoot Family	
Salsola tragus	Russian-thistle	Limited
Euphorbiaceae	Spurge Family	
Ricinus communis	Castor bean	Limited
Moraceae	Mulberry Family	
Ficus carica	Edible fig	Moderate
Scrophulariaceae	Figwort Family	
Myoporum laetum	Myoporum	Moderate
Simaroubaceae	Simarouba Family	
Ailanthus altissima	Tree of heaven	Moderate
Solanaceae	Nightshade Family	
Nicotiana glauca	Tree tobacco	Moderate
Arecaceae	Palm Family	
Phoenix canariensis	Canary Island palm	Limited
Washingtonia robusta	Mexican fan palm	Moderate
Poaceae	Grass Family	
Agrostis stolonifera	Creeping bentgrass	Limited
Bromus diandrus	Ripgut grass	Moderate
Bromus hordeaceus	Soft chess	Limited
Cynodon dactylon	Bermuda grass	Moderate
Polypogon monspeliensis	Rabbitfoot grass	Limited
Stipa miliacea var. *miliacea*	Smilo grass	Limited

Source: *Natural Environment Study (Mitigated Impacts)* (2017 and 2018 errata).

2.17.3 Environmental Consequences

2.17.3.1 Temporary Impacts

Build Alternative (includes Design Options)

Potential impacts from invasive species associated with the construction and operation of transportation projects are considered permanent. Refer to Section 2.18.3.2, Permanent Impacts, for the discussion regarding invasive species.

No Build Alternative

The No Build Alternative would not include the construction of any of the proposed project improvements. As a result, as described under Permanent Impacts, the No Build Alternative would not result in new impacts related to invasive species.

2.17.3.2 Permanent Impacts

Build Alternative (includes Design Options)

Potential impacts from invasive species associated with construction and operation of transportation projects are considered permanent because the introduction of invasive species into previously undisturbed areas would result in permanent impacts to any affected native habitats. However, although invasive plant species are present in the BSA, the BSA is not located adjacent to any native or open space areas. Because the BSA is fully developed and not adjacent to any native habitats or open space areas, the Build Alternative is not expected to cause an increase in the spread of invasive species into native and open space areas. Additionally, Project Features PF-BIO-13 and PF-BIO-14 will be implemented.

PF-BIO-13 **Plant Removal.** Any plants removed or soil disturbed during the course of construction should be contained and properly disposed of off the site. The project also will adhere to City tree removal requirements.

PF-BIO-14 **Prevention of the Spread of Invasive Species.** All mulch, topsoil, seed mixes, or other plantings used during landscaping activities and erosion-control best management practices (BMPs) implemented will be free of invasive plant species seeds or propagules. No vegetation listed on the California Invasive Plant Council (Cal-IPC) Invasive Plant Inventory will be installed on the proposed project. All plant palettes proposed for the project will be reviewed by a Qualified Biologist during the Plans, Specifications, and Estimates phase. The project will also adhere to City tree planting requirements.

As a result, construction and operation of the Build Alternative would not result in impacts related to invasive species.

No Build Alternative

The No Build Alternative would not include the construction or operation of any of the proposed project improvements. Therefore, the No Build Alternative would not result in impacts related to invasive species.

2.17.4 Avoidance, Minimization, and/or Mitigation Measures

As the Build Alternative would not result in any temporary or permanent impacts related to invasive species, no avoidance, minimization, or mitigation measures are required.

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2.18 Cumulative Impacts

2.18.1 Regulatory Setting

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of the proposed project. A cumulative effect assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor but collectively substantial impacts taking place over a period of time.

Cumulative impacts to resources in the project area may result from residential, commercial, industrial, and highway development, as well as from agricultural development and the conversion to more intensive agricultural cultivation. These land use activities can degrade habitat and species diversity through consequences such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, changes in water quality, and introduction or promotion of predators. They can also contribute to potential community impacts identified for the project, such as changes in community character, traffic patterns, housing availability, and employment.

The California Environmental Quality Act (CEQA) Guidelines Section 15130 describes when a cumulative impact analysis is necessary and what elements are necessary for an adequate discussion of cumulative impacts. The definition of cumulative impacts under CEQA can be found in Section 15355 of the CEQA Guidelines. A definition of cumulative impacts under the National Environmental Policy Act (NEPA) can be found in 40 Code of Federal Regulations (CFR) Section 1508.7.

2.18.2 Methodology

The cumulative impact analysis methodology utilized was based on the eight-step process set forth in the California Department of Transportation (Caltrans) Standard Environmental Reference (SER) *Guidance for Preparers of Cumulative Impact Analysis* (Guidance) (2005). The eight-step process is as follows:

- Identify/define the project-specific resources to consider in a cumulative effect analysis.
- Define the geographic boundary or Resource Study Area (RSA) for each resource to be addressed in the cumulative impact analysis.

- Describe the current health and the historical context of each resource.
- Identify the direct and indirect impacts of the proposed project that might contribute to a cumulative impact on the identified resources.
- Identify other current and reasonably foreseeable future actions or projects and their associated environmental impacts.
- Assess the potential cumulative impacts.
- Report the results of the cumulative impact analysis in the environmental document.
- Assess the need for avoidance, minimization, and/or mitigation measures and/or recommendations for actions by other agencies to address a cumulative impact.

2.18.2.1 Resources Excluded from Cumulative Impacts Analysis

As specified in the Guidance, if the proposed project would not result in a direct or indirect impact to a resource, it would not contribute to a cumulative impact on that resource and need not be evaluated with respect to potential cumulative impacts.

Those resources for which cumulative effects are not anticipated or for which the impacts were already analyzed in a cumulative context are briefly discussed below.

- **Farmlands and Timberlands:** The project is located in a heavily developed urban area surrounded by industrial and commercial properties. There are no timberlands or farmlands (including lands protected under the Williamson Act or lands designated under the Farmland Mapping and Monitoring Program) within the study area. Therefore, the project would not result in substantially adverse impacts on farmlands and timberlands.
- **Growth:** The project would not establish new businesses or homes or extend roads or infrastructure to undeveloped areas. As discussed in Section 2.2, Growth, of this Draft Initial Study/Environmental Assessment (IS/EA), the Build Alternative would not result in growth-inducing impacts.
- **Hydrology and Floodplain:** As discussed in Section 2.0 of this Draft IS/EA, there will be no effect on hydrology and floodplain because the project is not located within the 100-year base flood zone.
- **Natural Communities:** The project is located within developed areas of Los Angeles County, either adjacent to the highway corridor or directly adjacent to the highway. There are no habitats or natural communities of concern within or immediately adjacent to the Biological Study Area (BSA). The BSA consists of areas of ornamental landscaping, weeds, and bare ground and has low biological

value to native plant and wildlife species. Therefore, the project would not result in substantially adverse impacts on natural communities.

- **Plant Species:** Vegetation in the BSA consists primarily of ornamental landscaping and ruderal/weedy vegetation cover. No special-status plant species were observed or are expected to occur within the BSA due to a lack of suitable habitat. Therefore, the project would not result in substantially adverse impacts on plant species.

2.18.3 Resources Evaluated for Cumulative Impacts

The following discussion of potential cumulative impacts is presented by environmental resource area. The reasonably foreseeable action and projects considered in this analysis are presented in Table 2.18.1 and are shown on Figure 2.18-1.

The reasonably foreseeable actions discussed in this section include the proposed developments in proximity to the RSA that could contribute to a cumulative effect. Information on proposed developments was obtained from the Cities of Artesia and Cerritos, as well as the State Governor's Office of Planning and Research (OPR). Information on future transportation projects was obtained from the Los Angeles County Metropolitan Transportation Authority (Metro), Gateway Cities Council of Governments (GCCOG), Caltrans, and Southern California Association of Governments (SCAG).

In general, most of the development projects listed are infill projects, and the listed transportation projects would improve existing facilities rather that construct new facilities.

The following resources are evaluated in this section for cumulative impacts: land use, parks and recreation, community impacts, utilities/emergency services, traffic and transportation/pedestrian and bicycle facilities, visual/Aesthetics, cultural resources, water quality and storm water runoff, geology, soils seismicity, topography, paleontological resources, hazardous waste, air quality, noise, energy, wetlands and other waters, animal species, threatened and endangered species and invasive species. The Build Alternative and Build Alternative Design Options studied would have a similar potential contribution to cumulative impacts for these resources and are, therefore, discussed as one.

Table 2.18.1 Reasonably Foreseeable Actions and Projects

ID No.	Project Name	Status	Address	Planned Use
1	Aria Apartment Homes	Built	12611 Artesia Boulevard	Apartment complex with 198 units.
2	Artesia Corridor Adaptive Traffic Control System (ATCS) Enhancement Project	Included in the 2016 RTP/SCS	City of Artesia and surrounding area	Upgrades traffic signals along Artesia Boulevard between Long Beach Boulevard and Downey Avenue to connect with the ATCS. Installs CCTV and CMSs on Artesia Boulevard. Installs fiber-optic cable and devices to connect signals to each other and to the traffic management center. Installs two new traffic signals in Compton. Installs a Class II Bike Lane in both directions from Atlantic Avenue to Susana Road. Pedestrian Improvements.
3	Artesia LIVE II Specific Plan	Pre-Construction	18600 Gridley Road	Mixed-use building with 130 residential units, commercial and restaurant uses, and parking.
4	Burlington Northern Santa Fe Railroad Grade Separations	Ongoing	Gateway Cities	Construction of rail and roadway grade separations in the Gateway Cities area at five locations, including: Rosecrans Avenue and Marquardt Avenue, Passons Boulevard, Los Nietos Road and Norwalk Boulevard, and Lakeland Road and Pioneer Boulevard.
5	Castella	Built	11042 Excelsior Drive	Townhomes.
6	City of Cerritos Transit Amenities	Included in the 2016 RTP/SCS	City of Cerritos	Implementation of citywide street furniture plan. The new amenities will increase transit use because they will serve as a marketing tool for public transit. The new amenities will be very visible and will increase pedestrian and potential transit users. The plan identifies all shared bus stops lacking transit amenities.
7	Garfield Avenue Improvements	Pre-Construction	Garfield Avenue from 70th Street to Howery Street	Street widening, lane addition in each direction, additional left turn lane in all directions, street resurfacing, and improvements to traffic signals, street lights, and storm water, as well as watershed best management practices (BMPs).
8	Gateway Cities Forum Traffic Signal Corridors	Included in the 2016 RTP/SCS	Gateway Cities	Design and construction of multijurisdictional traffic signal synchronization and intersection operational improvements on regional arterials in the Gateway Cities Region.
9	I-5/Carmenita Road Interchange	Under Construction	Gateway Cities	Removes existing two-lane structure and constructs a new eight-lane interchange with carpool lane on-ramps. Project is located in the cities of Santa Fe Springs and Norwalk, and could enable widening of I-5 in the area.
10	I-5 Widening and HOV: I-605 to Orange County Line	Under Construction	Gateway Cities	Constructs one carpool lane and one mixed-flow lane in each direction extending 6.4 mi through the cities of Cerritos, La Mirada, Santa Fe Springs, and Norwalk. Includes interchange reconstruction and arterial modifications.

Table 2.18.1 Reasonably Foreseeable Actions and Projects

ID No.	Project Name	Status	Address	Planned Use
11	I-605 Corridor (Hot Spot) Interchanges	Pre-Construction	Gateway Cities	Improvements to interchanges along the I-605 corridor, such as at the SR-60, I-5, SR-91, and I-405 interchanges. Examples of improvements include roadway widening, ramp expansion, and added signage within the interchange.
12	I-710 Corridor Project	Environmental	Gateway Cities	Evaluating upgrades for the freeway and to improve truck and traffic flows between the Ports of Los Angeles and Long Beach and the SR-60 freeway. Also to be considered are upgrades to the I-710 freeway between Pacific Coast Highway and downtown city of Long Beach.
13	Sage at Cerritos	Built	12651 Artesia Boulevard	Apartment complex with 132 units.
14	Studebaker Road at Alondra Road Intersection Improvements	Under Construction	Studebaker Road at Alondra Road	Addition of an additional southbound left turn lane on Studebaker, an eastbound right turn overlap phasing, increased northbound left turn storage on Studebaker, and modifications to the median island, traffic signal, and street lights
15	West Santa Ana Branch Transit Corridor	Environmental	City of Los Angeles, Gateway Cities	Provides for the development of a grade-separated transit corridor. Phase I is designed to go from the southern terminus in the city of Artesia toward downtown city of Los Angeles.

Source: *Draft Cumulative Impacts Assessment* (2018)
CCTV = closed-circuit television
CMS = changeable message sign
EIR/EIS = Environmental Impact Report/Environmental Impact Statement
HOV = high-occupancy vehicle
I-5 = Interstate 5
I-405 = Interstate 405
I-605 = Interstate 605
I-710 = Interstate 710
mi = mile/miles
RTP/SCS = Regional Transportation Plan/Sustainable Communities Strategy
SR-60 = State Route 60
SR-91 = State Route 91

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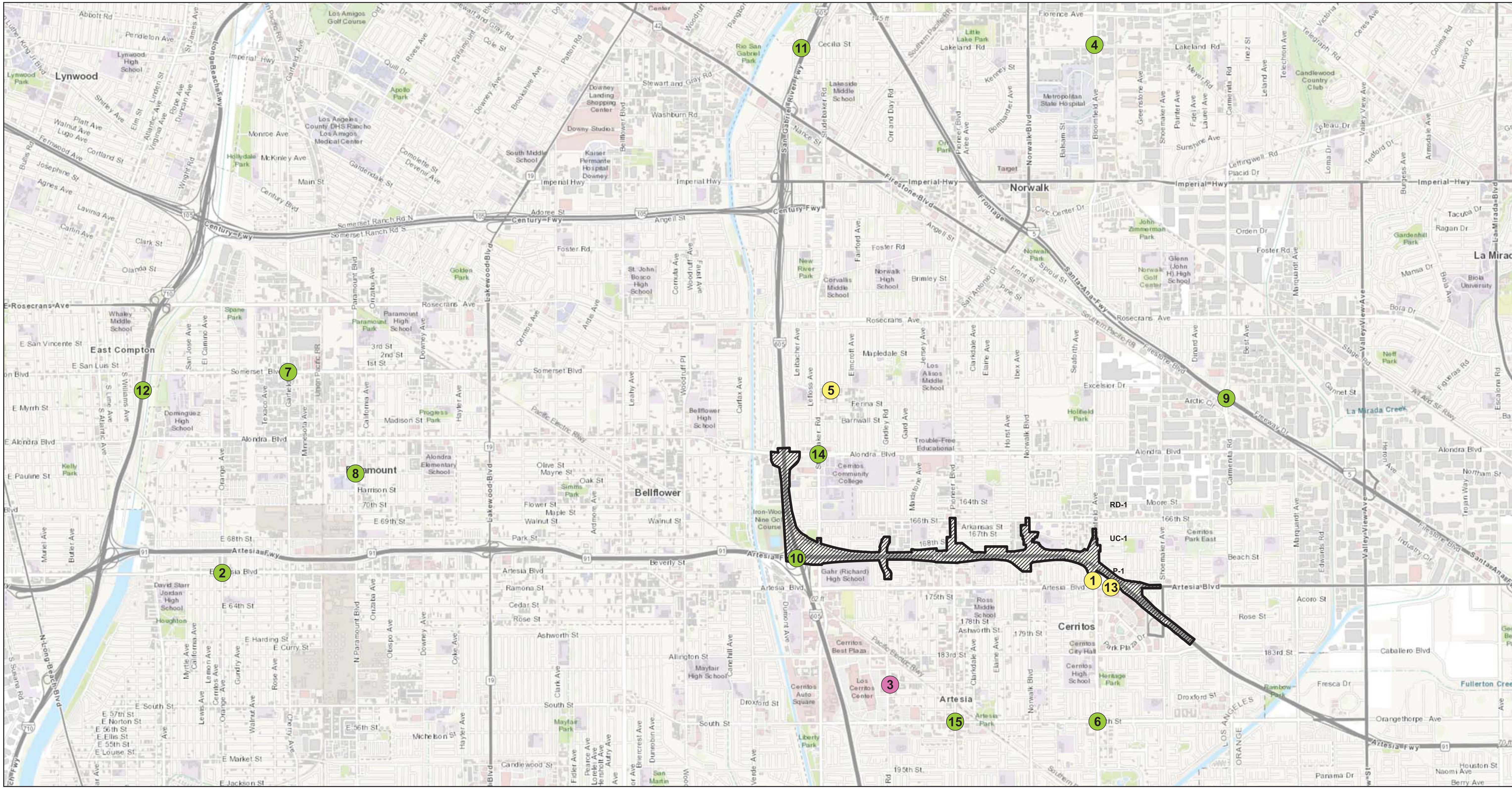

FIGURE 2.18-1

Legend

Environmental Study Area

Planned Projects*

- Mixed Use
- Residential
- Transportation

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MILES

SOURCE: Metro

Westbound SR-91 Improvement Project

Planned Projects

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2.18.3.1 Land Use

The cumulative RSA for land use is the Build Alternative RSA (i.e., Build Alternative footprint and construction areas, which are depicted as the environmental study area on Figure 2.18-1) because land use impacts would occur where construction and operation of the Build Alternative is occurring. The RSA includes a mixture of various types of residential, open space, commercial, and light industrial land use designations within the cities of Artesia and Cerritos (City of Artesia, 2013; City of Cerritos, 2013). The city of Cerritos also includes low density, medium density, educational use, and public and quasi-public land use designations (City of Cerritos, 2013). The RSA is highly developed with transportation infrastructure, commercial and industrial buildings, residential buildings, schools, and parks, with a limited availability of undeveloped land.

As described in the *Community Impact Assessment* (2018), operation of the Build Alternative would require the expansion of existing transportation facilities, which may encroach into residential areas. As a result, some properties would be acquired and incorporated into the project, and the existing residential and commercial uses would be relocated and replaced with transportation uses. However, property acquisition would be implemented in accordance with the federal Uniform Relocation Assistance and Real Property Acquisition Act of 1970 (Uniform Act), and sufficient replacement residential and business properties have been identified in the *Relocation Impact Report* (2018) (refer to Section 2.18.3.3 for further discussion on relocations).

The RSA is within an existing highway corridor, and would not include the construction of land uses that are inconsistent with the zoning and land use designations for the Cities of Artesia and Cerritos. In addition, the Build Alternative would be consistent with the goals, objectives, and policies in the General Plans of the Cities of Artesia and Cerritos. The Build Alternative is also consistent with the SCAG Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), and is included in the 2017 Federal Transportation Improvement Program (FTIP) as Project LA0G1119 (SCAG 2016). Therefore, impacts related to land use would not be substantially adverse.

Other reasonably foreseeable actions include new development and transportation improvement projects (see Table 2.18.1). These projects could result in changes in land use in the cumulative RSA. However, these actions would be planned to be consistent with land use policies and designations, as well as the goals, objectives, and policies within the cities of Artesia and Cerritos.

Other reasonably foreseeable actions would be evaluated on a project-by-project basis to determine the potential for impacts on land use and the appropriate measures required to reduce impacts. Because project impacts would not be adverse with adherence to federal policies regarding property acquisition and relocation assistance, the Build Alternative, in conjunction with past, present, and reasonably foreseeable projects, would not result in a cumulative effect related to land use (with regards to conflicts with existing plans, policies, or regulations, or conflicts with surrounding land uses). Therefore, no avoidance, minimization, and/or mitigation measures for cumulative impacts are required.

2.18.3.2 Parks and Recreation

The cumulative RSA for parks and recreation is the Build Alternative RSA (i.e., the Build Alternative footprint and construction areas, which are depicted as the environmental study area on Figure 2.18-1) because parks and recreation impacts would occur where construction and operation of the Build Alternative is occurring. There are four existing parks adjacent to State Route 91 (SR-91), and 23 parks and recreation centers within a 0.5 mile (mi) buffer around the maximum disturbance limit, which is equivalent to the Build Alternative RSA.

In compliance with Section 4(f) of the United States Department of Transportation (USDOT) Act of 1966, a Section 4(f) analysis was completed for the project. All parks and recreation resources in the RSA were evaluated for potential Section 4(f) uses associated with the Build Alternative (GPA Consulting 2017a). Of the potential Section 4(f) resources evaluated, five were found to have *de minimis* impacts, and the remaining resources would not be impacted. Implementation of project features pertaining to air quality would be required to make the *de minimis* findings (see Section 2.12.3 for project features). Therefore, the Build Alternative would not adversely affect the activities, features, or attributes qualifying a park, recreation area, or refuge for protection under Section 4(f).

Other reasonably foreseeable actions within the Build Alternative RSA would be evaluated on a project-by-project basis to determine the potential for impacts on parks and recreation facilities and the appropriate measures required to reduce impacts. The transportation projects listed in Table 2.18.1 would be required to comply with the provisions outlined in Section 4(f) of the USDOT Act of 1966 to minimize impacts on parks and recreation resources. Because project impacts would not be adverse, the Build Alternative, in conjunction with past, present, and reasonably foreseeable projects, would not result in a cumulative effect related to parks and recreation.

Therefore, no avoidance, minimization, and/or mitigation measures for cumulative impacts are required.

2.18.3.3 Community Impacts

The cumulative RSA for community impacts is the Build Alternative RSA (i.e., Build Alternative footprint and construction areas, which are depicted as the environmental study area on Figure 2.18-1) because land use impacts would occur where construction and operation of the Build Alternative is occurring. The RSA includes approximately 3 mi along westbound SR-91, bounded by approximately Shoemaker Avenue to the east, the Interstate 605 (I-605) interchange to the west, and the I-605 northbound off-ramp to Alondra Boulevard to the northwest. The RSA includes portions of the cities of Cerritos and Artesia.

Community Character and Cohesion

The existing conditions for the communities of Artesia and Cerritos have been identified using the 2015 American Community Survey (ACS) (2011–2015 5-Year Estimates), provided by the United States Census Bureau, including 20 census tract block groups that surround the project area, within the cities of Artesia and Cerritos, and Los Angeles County.

The cities of Artesia and Cerritos began as farming and agricultural communities and have become increasingly urbanized, with a balance of residential, commercial, and industrial developments. Both cities are located approximately one hour south of the city of Los Angeles. The RSA is located along SR-91, which serves as a physical barrier between the northern and southern portions of both the cities of Artesia and Cerritos, essentially dividing the communities surrounding the RSA.

The following information is based on the *Community Impact Assessment* (2018):

- **Population Growth:** Although the majority of the identified census tracts in and around the RSA have demonstrated a steady growth in population from 2010 to 2015, three census tracts have shown a decrease in population over the 5-year period.
- **Age:** The median ages of residents of the cities of Artesia and Cerritos are 39.3 and 44.5 years old, respectively.
- **Ethnicity and Race:** The populations in the cities of Artesia and Cerritos are largely Non-Hispanic Asians, making up an average of 38.5 percent and 60.5 percent of the population, respectively. On average, the Hispanic or Latino

population makes up 36.5 percent of the population in the city of Artesia and 12.5 percent in the city of Cerritos.

- **Housing:** On average, a greater proportion of residents tend to own housing units rather than rent in the census tract block groups in the RSA.
- **Economic Conditions:** In 2013 and 2014 the personal income and per capita personal income (i.e., average income) in the city of Artesia both declined from 2012, but rebounded in 2015. In the city of Cerritos, personal income and per capita personal income have increased regularly since 2011, but declined in 2015.
- **Employment:** The unemployment rates in both the cities of Artesia and Cerritos are 6.5 percent, which are lower than the unemployment rate for Los Angeles County. In the city of Artesia, the largest industry occupation is Sales and Office Occupations, in which 31 percent of the civilian population over the age of 16 is employed, followed by Management, Business, Science and Arts Occupations, at 30.4 percent. The leading industry occupation in the city of Cerritos is Management Business, Science and Arts Occupations, in which 51 percent of residents over the age of 16 is employed, followed by Sales and Office Occupations at 26.8 percent.

The communities in the RSA may experience impacts from construction activities, which include but are not limited to traffic detours, lane closures, and increased noise. However, these impacts would be temporary and would cease once construction is completed. Therefore, community disruptions and displacements would be minimal, and construction of the Build Alternative is not expected to result in substantially adverse impacts on community character and cohesion.

The construction of transportation infrastructure in an existing residential neighborhood (further discussed in Relocations, below) could result in changes to community character. However, the acquired land may be developed to extend recreational areas to provide additional community resources for the existing residents.

In addition, operation of the Build Alternative would include improvements to existing roadways and to the circulation system and would not divide existing neighborhoods or affect community cohesion. The Build Alternative would also be consistent with the land use goals for the Cities of Artesia and Cerritos and the County of Los Angeles and would be compatible with adjacent and surrounding land uses. Aesthetics for surrounding residents and businesses would be similar to existing conditions with the exception of some additional infrastructure. Therefore, implementation of the Build Alternative would not result in substantially adverse impacts on community character and cohesion.

Other reasonably foreseeable actions are primarily in-fill development and transportation improvement projects, which are not expected to substantially affect community character and cohesion (see Table 2.18.1). These actions would be evaluated on a project-by-project basis to determine the potential for impacts related to community character and cohesion, and the appropriate measures required to reduce impacts. Because project impacts would not be adverse, the Build Alternative, in conjunction with past, present, and reasonably foreseeable projects, would not result in a cumulative effect related to community character and cohesion. Therefore, no avoidance, minimization, and/or mitigation measures for cumulative impacts are required.

Environmental Justice

The RSA contains environmental justice populations that may be impacted by the Build Alternative. The proportion of minority groups in the census tract block groups in and around the RSA, which include Hispanic or Latino, Asian, and African American populations, is substantially higher than that of Los Angeles County. There are no census tract block groups in and around the RSA with a median income below the United States Department of Health and Human Services (HHS) threshold. Therefore, the RSA contains minority populations, but not low-income populations.

Construction of the Build Alternative would result in short-term effects related to access and circulation, aesthetics, noise, hazardous materials, and air quality. Because these effects would be temporary and would affect all populations equally, the Build Alternative would not result in a disproportionately high and adverse effect on environmental justice populations, in comparison to general population within the RSA.

Operation of the Build Alternative would result in additional traffic noise in areas with meaningfully greater (i.e., greater than 5 percent) percentages of environmental justice populations. However, with implementation of minimization measures, noise impacts would not result in a disproportionately high and adverse effect on environmental justice populations in the RSA.

The Build Alternative would result in the permanent acquisition of 18 residential and one non-residential property in Census Tract 5548.01, as well as one non-residential property in Census Tract 5548.02. The Pioneer Boulevard Westbound Ramps/168th

Alignment Design Option would require the acquisition of an additional eight properties, including five residential properties and three vacant lots, within Census Tract 5548.01. These eight properties are located along 168th Street in the city of Artesia, in a cul-de-sac adjacent to the east side of Pioneer Boulevard. These census tracts contain block groups that have at least one minority population that would be considered meaningfully greater, when compared to the city of Artesia and Los Angeles County. Acquisition of properties would result in the displacement of residents and businesses within the RSA. Property acquisition would be implemented in accordance with the Uniform Act. Sufficient replacement residential and business properties have been identified in the *Relocation Impact Report* (2018). Though there are sufficient replacement properties, relocations may have physical, financial, and psychological effects on displaced residents. Therefore, the Build Alternative would result in an adverse effect on environmental justice populations in the RSA.

The Project, however, would implement the avoidance, minimization, and/or mitigation measures listed in Section 2.18.4, which include relocation assistance services for all affected individuals and businesses. Environmental justice populations would not be denied benefits or receive fewer benefits than the general population. Therefore, relocation impacts on environmental justice populations would not be disproportionately high and adverse.

The Non-Standard Lane and Shoulder Widths Design Option under the Build Alternative is being considered at 170th Street and would result in non-standard mainline features. This design option would eliminate the right-of-way (ROW) impacts at 170th Street under the Build Alternative and would not require the acquisition of the 18 residential properties and 1 non-residential property in the census tracts with minority populations. Under this design option, the project would not result in a disproportionately high and adverse effect on environmental justice populations in the RSA.

Other reasonably foreseeable actions within the Build Alternative RSA would be evaluated on a project-by-project basis to determine the potential for impacts related to environmental justice populations and the appropriate measures would be required to reduce impacts. Because impacts on environmental justice populations would not be substantially high and adverse with implementation of the avoidance, minimization, and/or mitigation measures listed in Section 2.18.4, the project, in conjunction with past, present, and reasonably foreseeable projects, would not result in a cumulative effect related to environmental justice.

Relocations

The Build Alternative would require full acquisitions of 20 total properties within the city of Artesia, including 18 residential properties (with approximately 80 residents) and 2 non-residential properties (with two commercial businesses). The Pioneer Boulevard Westbound Ramps/168th Alignment Design Option would require the acquisition of an additional 8 properties along 168th Street, including 5 residential properties (with approximately 22 residents) and 3 vacant lots adjacent to the east side of Pioneer Boulevard/168th Street.

Under the Build Alternative, sufficient replacement residential and business properties have been identified in the *Relocation Impact Report* (2018). All property acquisition and relocation assistance would comply with the regulations and programs outlined under the Uniform Act, Title VI of the Civil Rights Act, and California Relocation Assistance Act. In addition, potential impacts would be minimized through implementation of Caltrans' Relocation Assistance Program (RAP) (see Section 2.3.1.3). Therefore, impacts related to relocations would not be substantially adverse.

As discussed in the Environmental Justice portion of Section 2.18.3.3, two design options to the Build Alternative at 170th Street and Pioneer Boulevard are also being considered that would alter the number of required property acquisitions. The Non-Standard Lane and Shoulder Widths Design Option would eliminate the need for property acquisitions at 170th Street. However, the Pioneer Boulevard Westbound Ramps/168th Alignment Design Option would require the acquisition of eight additional properties. Under these design options, impacts related to relocations would not be substantially adverse.

Other reasonably foreseeable actions within the Build Alternative RSA would be evaluated on a project-by-project basis to determine the potential for impacts related to relocations and the appropriate measures required to reduce impacts. Because project impacts would not be adverse with adherence to regulations and policies regarding property acquisition and relocation assistance, the Build Alternative, in conjunction with past, present, and reasonably foreseeable projects, would not result in a cumulative effect related to relocations. Therefore, no avoidance, minimization, and/or mitigation measures for cumulative impacts are required.

Community Facilities

Community facilities in the RSA include 17 parks, 6 community and recreation facilities, 1 golf course, 6 government facilities (i.e., post offices, city halls, civic centers, and libraries), and 11 religious facilities. The RSA also includes 30 educational facilities, including 3 public K-12 school districts, private schools, and colleges.

Construction activities could result in temporary noise from construction equipment and vehicles; traffic from construction vehicles on roadways; dust emissions from earth-moving activities and exhaust from construction vehicles/equipment; and visual impacts from construction equipment and debris that could affect community facilities and services in the RSA. However, impacts would be temporary and would cease once construction is completed. Therefore, construction impacts on community facilities from the Build Alternative would not be substantially adverse.

Operation of the Build Alternative would not require the construction of new community services because the existing facilities are expected to accommodate the needs of the community. In addition, the Build Alternative would not affect existing facilities through an increase in resident populations, or through the loss of facilities elsewhere.

The Build Alternative would require permanent and temporary incorporation of land at four parks and one school. However, the incorporation would not adversely affect accessibility, visual quality, noise, vegetation, air quality, or water quality at the parks or school. Therefore, operational impacts on community facilities from the Build Alternative would not be substantially adverse.

Other reasonably foreseeable actions within the Build Alternative RSA would be evaluated on a project-by-project basis to determine the potential for impacts on community facilities and the appropriate measures required to reduce impacts. Because project impacts would not be adverse, the Build Alternative, in conjunction with past, present, and reasonably foreseeable projects, would not result in a cumulative effect related to community facilities and avoidance, minimization, and/or mitigation measures are not be required.

2.18.3.4 Utilities/Emergency Services

The cumulative RSA for utilities/emergency services is the Build Alternative RSA (i.e., the Build Alternative footprint and construction areas, which are depicted as the environmental study area on Figure 2.18-1), which includes approximately 3 mi along westbound SR-91, bounded by approximately Shoemaker Avenue to the east, the I-605 interchange to the west, and the I-605 northbound off-ramp to Alondra Boulevard to the northwest.

Local facilities include power distribution systems, gas distribution pipelines, telephone systems, cable television systems, water distribution mains, sanitary sewer mains, and city telecommunication systems. Regional facilities include power transmission systems, gas transmission pipelines, petroleum pipelines, and sewer trunk lines.

A total of 22 utility facilities would be potentially impacted. Facilities in the RSA would be relocated, adjusted to grade, or protected in place to accommodate the Build Alternative. Utilities that are realigned outside of the public ROW would require the re-establishment of new utility easements along the new alignment. As required by California State law, Underground Service Alert Southern California (USA) would be contacted a minimum of 2 working days before initiating fieldwork. Prior to contacting USA, each boring location will be delineated with white spray paint to outline the proposed limits of subsurface work. A ticket number would be obtained to request utility clearance by parties with underground utilities in the areas. Following notification, utility owners and/or representatives will mark the approximate location of each subsurface utility. Prior to conducting subsurface fieldwork, each location will be visually inspected to verify potential conflicts. With compliance with State regulations related to subsurface utilities, the Build Alternative would not result in substantially adverse impacts on utilities.

There are currently two law enforcement stations within the project area, and no fire stations or hospitals and medical centers directly in the RSA.

Temporary traffic impacts could affect emergency response services, as well as access to other community service centers. However, with adherence to local policies and the implementation of construction best management practices (BMPs), including measures to limit construction hours and implement traffic management plans, these temporary impacts would not be substantially adverse.

The Build Alternative would not accommodate or result in a permanent increase in traffic volume in the project area and would not displace existing emergency facilities. Existing facilities are expected to accommodate the needs of the community after project implementation. Therefore, the Build Alternative would not affect existing emergency services through an increase in resident populations or through the loss of facilities elsewhere.

Other reasonably foreseeable actions within the Build Alternative RSA would be evaluated on a project-by-project basis to determine the potential for impacts on utilities/emergency services and the appropriate measures required to reduce impacts. Because project impacts would not be adverse with adherence to local and State policies and implementation of construction BMPs, the Build Alternative, in conjunction with past, present, and reasonably foreseeable projects, would not result in a cumulative effect related to utilities/emergency services. Therefore, no avoidance, minimization, and/or mitigation measures for cumulative impacts are required.

2.18.3.5 Traffic and Transportation/Pedestrian and Bicycle Facilities

The cumulative RSA for traffic and transportation/pedestrian and bicycle facilities is the Build Alternative RSA (i.e., the Build Alternative footprint and construction areas, which are depicted as the environmental study area on Figure 2.18-1), which includes approximately 3 mi along westbound SR-91, bounded by approximately Shoemaker Avenue to the east, the I-605 interchange to the west, and the I-605 northbound off-ramp to Alondra Boulevard to the northwest.

The RSA has a dense street network ranging from major highways to local city streets. In addition, there are various bicycle and pedestrian facilities and public transportation services in the RSA. Public parking facilities in the RSA consist of on-road street parking.

The area around the I-605/SR-91 system interchange currently experiences traffic congestion. In the future, congestion in this area is forecast to increase if the existing traffic issues are not addressed. The examination of existing travel conditions along SR-91 and projected future (2044) traffic showed that capacity and operational problems are a result of several interrelated factors. These factors include: insufficient freeway mainline capacity on both SR-91 and I-605, closely spaced freeway entrance and exit ramps, and inadequate older design features at the freeway-to-freeway interchange.

The following information is based on the *Community Impact Assessment* (2018), which includes the findings from the *Traffic Operations Analysis Report* (2018):

- **Access and Circulation:** Construction of the Build Alternative may require temporary ramp and street closures on arterial streets. In addition, the movement of construction equipment on arterial roadways may result in additional congestion. Therefore, the Build Alternative has the potential to result in direct temporary impacts on access to homes or businesses. However, these impacts would be temporary and access would be re-established following construction. Therefore, construction impacts on access and circulation would not be substantially adverse.

  During operation of the Build Alternative, interchange modifications could change arterial street operations and circulation patterns. Additionally, the Pioneer Boulevard Westbound Ramps/168th Alignment Design Option would result in the loss of driveway access to three businesses on the west side of Pioneer Boulevard, including Denny's Restaurant, Artesia Inn and Suites, and El Pollo Loco Restaurant. Therefore, operation of the Build Alternative could result in direct impacts on access to homes or businesses in the study area. However, the Build Alternative would construct new interchange configurations to maintain and improve access in the study area. Therefore, operational impacts on access and circulation would not be substantially adverse.

- **Parking:** Construction of the Build Alternative would temporarily restrict access to residential parking. However, impacts would be short-term and access would be restored following construction. With implementation of the project features listed in Section 2.5.3, impacts on parking would not be substantially adverse.

  Operation of the Build Alternative could result in the removal and/or relocation of parking spaces, depending on the selected design option. Because the project will incorporate the project feature outlined in Section 2.5.3, impacts on parking would not be substantially adverse.

- **Traffic Volumes:** The Build Alternative would reduce congestion and improve local and system freeway operations. The improvements are expected to result in substantial improved operating conditions throughout the RSA, including substantial reductions in vehicle delay, reductions in travel time, and increased speeds. The reduction in congestion, operational improvements to traffic flow, and improvements to the geometric design features of the corridor would improve safety throughout the corridor and in high-accident locations. Therefore, impacts related to traffic volumes would not be substantially adverse.

- **Public Transportation:** Construction and operation of the Build Alternative would not result in access reduction, displacement, or relocation of transit stops. Temporary lane closures during the construction period are anticipated to occur for approximately 24 months. However, such closures would not affect any existing transit stops. Therefore, impacts related to public transportation would not be substantially adverse.
- **Pedestrian and Bicycle Facilities:** During construction of the Build Alternative, the staging and moving of equipment on the roadways may temporarily restrict bicycle and pedestrian access; however, temporary measures and a construction staging plan would be implemented to minimize hazards on the roadways for bicyclists and pedestrians. Therefore, construction impacts on bicycle and pedestrian facilities would not be substantially adverse.

The Build Alternative would not impede pedestrian or bicycle access to existing transit services. Rather, the Build Alternative would provide improvements to transit access for pedestrians where possible. Therefore, the Build Alternative is expected to result in beneficial impacts on bicycle and pedestrian facilities in the RSA.

The *Traffic Operations Analysis Report* (2018) takes into account planned future transportation projects (see Table 2.18.1) and population growth when determining impacts. Therefore, no additional cumulative impacts beyond those disclosed in the traffic analysis are anticipated.

Other reasonably foreseeable actions within the Build Alternative RSA would be evaluated on a project-by-project basis to determine the potential for impacts on traffic and transportation/pedestrian and bicycle facilities, and the appropriate measures required to reduce impacts. Because adverse impacts on traffic and transportation/pedestrian and bicycle facilities are not anticipated, the Build Alternative, in conjunction with past, present, and reasonably foreseeable projects, would not result in a cumulative effect related to traffic and transportation/pedestrian and bicycle facilities. Therefore, no avoidance, minimization, and/or mitigation measures for cumulative impacts are required.

2.18.3.6 Visual/Aesthetics

The cumulative RSA for visual resources/aesthetics is the Build Alternative RSA (i.e., the Build Alternative footprint and construction areas, which are depicted as the environmental study area on Figure 2.18-1), including Visual Assessment Unit 1 (VAU1) and six key views defined in the *Visual Impact Assessment* (VIA) (2018).

VAU1 is in the northern portion of the city of Artesia, and in the eastern and western portions of the city of Cerritos. The RSA is within a highly developed area and is surrounded by residential, commercial, recreational, institutional, light industrial, and transportation uses. The landscape in VAU1 is generally characterized by surrounding urban development, transportation uses (I-605), and other man-made features. Background views of the Angeles National Forest hillsides and ridgelines approximately 25 miles to the north are afforded throughout the project limits. The relatively flat topography of VAU1 provides for visually uniform views for viewers within the Build Alternative corridor. Vegetation within the area generally consists of numerous areas of ornamental landscaping.

During construction of the Build Alternative, sensitive uses (e.g., residents and motorists) would be exposed to views of construction areas. As described in the VIA, the Build Alternative would require staging areas to allow for construction activities and the storage of equipment. Construction vehicle access and staging of construction materials would be visible from motorists traveling along the project site as well as residents located in the project vicinity. These impacts would be short-term and would cease upon project completion. The Build Alternative would be required to comply with the Caltrans Standard Specifications for Construction, which would minimize visual impacts through the use of opaque temporary construction fencing that would be situated around construction staging areas. Therefore, construction impacts on visual resources/aesthetics would not be substantially adverse.

During operation, the Build Alternative would feature visual elements, which include a new mixed-flow lane on westbound SR-91, two new overcrossing structures (replacing the existing structures along Gridley Road and Bloomfield Avenue), reconfigured interchanges (at Pioneer Boulevard and Norwalk Boulevard), full ROW acquisition of 18 residences and a business along 170th Street, partial acquisition of an ARCO Gas Station, upgraded traffic signals, the construction of several noise barriers (up to 16 feet [ft] in height) and a combination noise barrier/retaining wall, and some vegetation removal. The Build Alternative would result in an increase in hardscape in the area that would be visible to local residents, local roadway travelers (i.e., roadway motorists, bicyclists, and pedestrians), SR-91 motorists, recreational uses, institutional (school) uses, and commercial and light industrial uses.

As described in the VIA, all freeway improvements and new overcrossing structures would be similar in character and quality to the existing transportation facilities in the surrounding area. Visual impacts associated with the Build Alternative are determined by a measurement of the resource change and viewer response, and the overall visual impact of the Build Alternative is considered to be moderate. With implementation of project features identified in Section 2.6.4, all landscaping plans and architectural treatments would be designed by the Caltrans District Landscape Architect in cooperation with the Cities of Artesia and Cerritos, and all tree-removal activities and roadway improvements would be conducted in compliance with the applicable City codes and policies. Therefore, operational impacts on visual resources/aesthetics would not be substantially adverse.

Other reasonably foreseeable actions have the potential to affect resource change and viewer response in proximity to the RSA. Many of the reasonably foreseeable actions in proximity to the RSA are infrastructure improvement and in-fill development projects that would not substantially change the highly urbanized and developed character of the area. These actions would be evaluated on a project-by-project basis to determine impacts on visual resources/aesthetics and the appropriate measures required to reduce impacts. Because project impacts would not be adverse with implementation of project features, the Build Alternative, in conjunction with past, present, and reasonably foreseeable projects, would not result in a cumulative effect related to visual resources/aesthetics. Therefore, no avoidance, minimization, and/or mitigation measures for cumulative impacts are required.

2.18.3.7 Cultural Resources

The cumulative RSA for cultural resources is the Area of Potential Effects (APE) used in the *Historic Property Survey Report* (HPSR) (2018) and *Archaeological Survey Report* (ASR) (2018). The APE covers 190.23 acres (ac) and includes the direct APE (i.e., the area of proposed and existing ROW, including the horizontal and vertical limits associated with ground-disturbing activities), which is 74.84 ac. The vertical APE extends to a maximum depth of 30 ft.

As documented in the HPSR, the horizontal APE includes transportation infrastructure as well as 85 private parcels. Buildings in the horizontal APE consist primarily of small single-family residences, but also include low-rise commercial buildings and institutional facilities. No historical resources listed in or determined eligible for the National Register of Historic Places (National Register), California Register of Historical Resources (California Register), California Historical Resources Information System (CHRIS), California Historical Landmarks, or California Points of Historical Interest have been recorded within the APE (HPSR 2017). Caltrans has determined a Finding of No Historic Properties Affected is appropriate for this undertaking because there are no historic properties within the APE. Therefore, impacts on historical resources are not anticipated.

As documented in the ASR (2017), the APE primarily consists of disturbed sediment mixed with asphalt, concrete, gravel, and abundant modern trash. Most areas contain either local sediment or artificial fill placed during the construction of existing freeways, overcrossings, undercrossings, drainage culverts, noise barriers, and intersections. Most areas within the direct APE were developed, and most open areas contained ornamental vegetation. All areas were highly disturbed from previous construction. No archaeological resources were identified in the APE through archival research or during the survey. Based on the findings in the ASR, the likelihood of encountering intact archaeological resources is very low. Therefore, impacts on archaeological resources are not anticipated. There is always a potential for previously undocumented cultural materials or human remains to be unearthed during site preparation, grading, or excavation for the Build Alternative. Those potential effects would be avoided or minimized by the project features described in Section 2.7.3.2. With implementation of the project features, potential impacts on previously unidentified cultural resources would not be substantially adverse.

Other reasonably foreseeable actions have the potential to unearth archaeological and cultural resources within the proposed project area. These actions would be evaluated on a project-by-project basis to determine impacts on cultural resources and the appropriate measures required to reduce impacts. Because impacts on cultural resources are not anticipated, and appropriate measures would be taken in the case that cultural materials are unearthed, the project, in conjunction with past, present, and reasonably foreseeable projects, would not result in a cumulative effect related to cultural resources. Therefore, no avoidance, minimization, and/or mitigation measures for cumulative impacts are required.

2.18.3.8 Water Quality and Storm Water Runoff

The cumulative RSA for water quality and storm water runoff is the San Gabriel River Subbasin, which spans 409,600 ac. The subbasin is further divided into the Lower San Gabriel River Watershed, which receives runoff from approximately 78.5 sq mi of urbanized area. The watershed is predominately served by storm drain systems, which connect drainages in urbanized areas to the watershed’s main tributaries.

The main reach through the Watershed is the San Gabriel River, which Flows through a concrete-lined channel parallel to I-605 within the Watershed. The river passes through 19 different cities and discharges to the Pacific Ocean in the city of Long Beach, California (County of Los Angeles Department of Public Works 2006). The main tributaries, Coyote Creek and San Jose Creek, are also channelized at their confluence with the San Gabriel River. Other tributaries of the river include Big and Little Dalton Wash, San Dimas Wash, Walnut Creek, San Jose Creek, Fullerton Creek, and Coyote Creek (California RWQCB 2000).

The California Clean Water Act Section 303(d) List for 2012 includes the following impaired water bodies near the project area and associated pollutants with established total maximum daily loads (TMDLs) (California State Water Resources Control Board 2012):

- **San Gabriel River Reach 1 (Estuary to Firestone):** Coliform bacteria and pH
- **Coyote Creek, North Fork:** Indicator bacteria and selenium
- **Coyote Creek:** Diazinon, indicator bacteria, pH, toxicity, copper (dissolved), lead, and ammonia
- **Artesia-Norwalk Drain:** Indicator bacteria and selenium

The RSA is located in the South Coast Hydrologic Region (HR), which consists of 56 delineated groundwater basins. Within the South Coast HR, the RSA is in the Central Subbasin of the Coastal Plain of Los Angeles Basin. The groundwater supply in the Subbasin comes primarily from surface flows through Whittier Narrows. Groundwater also enters from surface and subsurface flow, percolation of precipitation, stream flow, and imported and recycled water (California Department of Water Resources 2004). Percolation is limited in some areas due the amount of paved surfaces, and saltwater intrusion occurs in the basin.

According to the *Water Quality Assessment Report* (2017), the Build Alternative would increase impervious surface area by 5.83 ac within the RSA, contributing to 19.85 ac of new impervious surface area (i.e., the sum of net new impervious surface area and replaced impervious surface area). The increase in impervious surfaces would contribute to an increase in runoff, which could contribute to exceeding the waste load allocations in approved TMDLs and impairments in the 2012 303(d)-listed waterbodies. To address impacts on water quality, BMPs would be implemented based on the requirements in the National Pollutant Discharge Elimination System (NPDES) Construction General Permits (CGPs) and Caltrans' NPDES permit (see

Section 2.8.3). With implementation of BMPs to minimize impacts related to runoff and pollutants, impacts on water quality would not be substantially adverse. Standard drainage design practices would also be implemented to minimize scour and sedimentation. Therefore, impacts on water quality and storm water runoff would not be substantially adverse.

In the event that groundwater and any other non-storm water dewatering are necessary during construction, these activities would be subject to the requirements of NPDES Permit No. CAS004001. With compliance with the NPDES permit, impacts on groundwater would not be substantially adverse.

The 19.85 ac of impervious surface area constructed from the Build Alternative would make up approximately 0.005 percent of the San Gabriel River Subbasin area (409,600 ac). Due to the minor increase in impervious surface area, impacts on water quality would be minimal. The implementation of appropriate treatment BMPs as a part of the Build Alternative to treat the pollutants generated by the Build Alternative is expected to adequately address any potential cumulative impacts due to construction, as well as long-term maintenance and operation of the Build Alternative.

Other reasonably foreseeable actions may increase impervious surface area within the RSA, but increases in impervious surfaces would be minimal because the RSA is already highly developed. These actions would be evaluated on a project-by-project basis to determine the impacts on water quality and storm water runoff and the appropriate measures required to reduce impacts. Because project impacts would not be adverse with implementation of BMPs, the project, in conjunction with past, present, and reasonably foreseeable projects, would not result in a cumulative effect related to water quality and storm water runoff. Therefore, no avoidance, minimization, and/or mitigation measures for cumulative impacts are required.

2.18.3.9 Geology, Soils, Seismicity, and Topography

The cumulative RSA for geology, soils, seismicity, and topography is the Build Alternative RSA (i.e., the Build Alternative footprint and construction areas) because impacts would occur where construction and operation of the build Alternative is occurring.

As described in the *Preliminary Geotechnical Report* (2018), the RSA is characterized by the following features:

- **Geology:** The RSA is within the Los Angeles Basin, an actively subsiding basin with northwest-trending mountain ranges separated by subparallel fault zones and a coastal plan. The RSA is primarily underlain by rock types originating in the Quaternary period, along with rock types of marine origin from the Pliocene and Miocene. Quaternary rocks include unconsolidated (i.e., loose materials such as clay and sand) and semi-consolidated sediments that are formed from alluvium, lake, playa, and terrace deposits and are mostly non-marine in origin. Pliocene rocks are moderately consolidated (i.e., solid rock) and include sandstone, siltstone, shale, and conglomerate. Miocene rocks are moderately to well consolidated and include sandstone, siltstone, conglomerate, and breccia.
- **Soils:** The upper 60 ft of the underlying soils include fine- to medium-grained, loose- to medium-dense, silty and clayey sand; sandy silt; poorly graded sand; and clayey silt. Interbeds of soft silt and clay and occasionally organic materials were also observed. Below 60 ft, the soils become generally fine to coarse, dense silty sand with varying amounts of gravel.
- **Seismicity:** No faults, including those identified under the Alquist-Priolo Earthquake Fault Zoning Act, were identified within the RSA; however, the project is located in a seismically active area of Southern California. The RSA is in an area where there has been a historic occurrence of liquefaction, with potential for permanent ground displacements. There is also a potential for ground shaking events to occur from distant earthquakes.
- **Topography:** The RSA is located in the Peninsular Ranges geomorphic province, which is distinguished by northwest-trending mountain ranges and valleys following faults branching from the San Andreas Fault (California Geological Survey 2002). The terrain in the RSA is relatively flat, except for the interchange and ramp locations where the highway and adjacent roadways intersect.

Grading activities may result in a temporary, short-term increase in erosion. The Build Alternative would comply with standard engineering practices for erosion control, and a Storm Water Pollution Prevention Plan (SWPPP) would be implemented to minimize soil erosion impacts. In addition, the Build Alternative would implement BMPs, including erosion-control measures, and would adhere to the NPDES permit requirements.

Increased development in the RSA could expose people and property to potential impacts associated with seismic activities. The Build Alternative and other reasonably foreseeable actions would be constructed in accordance with the California Building Code, standard engineering practices, and other applicable local standards; therefore, the potential for structural damage due to seismic activity, landslides, liquefaction, and other geologic hazards would be minimized. Therefore, impacts on geology, soils, seismicity, and topography would not be substantially adverse.

Other reasonably foreseeable actions could also increase erosion and sedimentation in the RSA. These actions would be evaluated on a project-by-project basis to determine impacts on geology, soils, seismicity, and topography, and the appropriate measures required to reduce impacts. Because project impacts would not be adverse with the implementation of BMPs and other standard practices, the Build Alternative, in conjunction with past, present, and reasonably foreseeable projects, would not result in a cumulative effect related to geology, soils, seismicity, and topography. Therefore, no avoidance, minimization, and/or mitigation measures for cumulative impacts are required.

2.18.3.10 Paleontological Resources

The RSA for paleontological resources includes areas where excavation would occur for the Build Alternative. The RSA includes approximately 3 mi along westbound SR-91, bounded by approximately Shoemaker Avenue to the east, the I-605 interchange to the west, and the I-605 northbound off-ramp to Alondra Boulevard to the northwest.

The entire RSA is underlain by Holocene to late Pleistocene (less than 126,000 years ago) Alluvial Fan and Valley Deposits, Undivided (California Geological Survey 2016). There is potential to find fossils from large and small mammals, reptiles, fish, invertebrates, and plants in the older sediments of this geologic unit. Fossils may be encountered below a depth of approximately 10 ft. However, artificial fill is likely present from the surface to varying depths throughout much of the project area where it was placed during construction of the existing freeways, streets, overcrossings, and undercrossings. Because of its disturbed context, artificial fill does not have the potential to contain scientifically significant paleontological resources.

Based on the findings in the *Paleontological Identification Report and Paleontological Evaluation Report* (PIR/PER) (2017 and 2018 Errata), no vertebrate fossil localities were found within the boundaries of the Build Alternative, and no paleontological resources were observed during the field survey. No special paleontological situations that would require project redesign to avoid critical fossil localities or deposits are anticipated for the Build Alternative. However, the Build Alternative requires excavation that will reach paleontologically sensitive sediments and, therefore, has the potential to impact scientifically significant, nonrenewable paleontological resources. With the preparation of a Paleontological Mitigation Plan (PMP) and development of minimization measures, impacts on paleontological resources would not be adverse. The PMP is a project feature of the Build Alternative.

Other reasonably foreseeable actions have the potential to disturb paleontological resources within the RSA. These actions would be evaluated on a project-by-project basis to determine impacts on paleontological resources and the appropriate measures required to reduce impacts. Because project impacts would not be adverse with implementation of a PMP, the Build Alternative, in conjunction with past, present, and reasonably foreseeable projects, would not result in a cumulative effect related to paleontological resources. Therefore, no avoidance, minimization, and/or mitigation measures for cumulative impacts are required.

2.18.3.11 Hazardous Waste

The cumulative RSA for hazardous waste is the same as the Build Alternative RSA (i.e., the Build Alternative footprint and construction areas), which includes approximately 3 mi along westbound SR-91, bounded by approximately Shoemaker Avenue to the east, the I-605 interchange to the west, and the I-605 northbound off-ramp to Alondra Boulevard to the northwest.

The *Preliminary Site Investigation for Hazardous Waste* (2018) prepared for the Build Alternative identified nine potential hazardous materials sites located in areas of proposed construction. Site disturbance at these locations could result in the potential for the release of petroleum, volatile organic compounds (VOCs), and/or other chemicals and hazardous materials. In addition, there is potential to encounter aerially deposited lead (ADL), lead-based paints, and pesticides during construction (i.e., during the excavation of soil or the disturbance of structures).

Hazardous and potentially hazardous materials used in or encountered during construction, as well as the transport and disposal of such materials, would be conducted in accordance with applicable federal, State, and local requirements so that potential risks are reduced or avoided. To avoid, minimize, and/or mitigate for potential impacts related to hazardous waste, a Phase II Site Investigation will be conducted. The Phase II Site Investigation will also address appropriate methods for handling and disposing of any present hazardous materials. Therefore, impacts related to hazardous waste would not be substantially adverse.

Construction of other reasonably foreseeable actions may expose or require handling contaminated soils. These actions would be evaluated on a project-by-project basis to determine the potential for encountering hazardous materials and the appropriate measures required to reduce impacts. Because project impacts would not be adverse with compliance with applicable federal, State, and local requirements and the implementation of avoidance and minimization measures that will be determined after the Phase II Site Investigation, the Build Alternative, in conjunction with past, present, and reasonably foreseeable projects, would not result in a cumulative effect related to hazardous waste. Therefore, no avoidance, minimization, and/or mitigation measures for cumulative impacts are required.

2.18.3.12 Air Quality

The air quality cumulative RSA includes the areas in proximity to active construction areas and nearby construction sites for the assessment of short-term construction impacts. At a regional level, the cumulative RSA also includes the South Coast Air Basin for the assessment of long-term operation impacts. The RSA is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD), which operates several air quality monitoring stations in the Basin. The closest monitoring station with data for all five criteria pollutants (carbon monoxide [CO], ozone [O_3], nitrogen dioxide [NO_2], particulate matter less than 2.5 microns in size [$PM_{2.5}$], and particulate matter less than 10 microns in size [PM_{10}]) is the Anaheim-Pampas Lane Station. The RSA is in a heavily urbanized area, and changes in air quality depend on emissions levels in the RSA and the Basin.

According to the *Air Quality Analysis* (2018), construction of the Build Alternative would result in short-term degradation of air quality due to the release of particulate emissions generated by excavation, grading, hauling, and other activities related to construction. Emissions from construction equipment are also anticipated and would include CO, nitrogen oxides (NO_X), sulfur dioxide (SO_2), VOCs, directly emitted particulate matter (PM) (i.e., $PM_{2.5}$ and PM_{10}), and toxic air contaminants (TACs) (e.g., diesel exhaust PM). The Build Alternative may also expose sensitive receptors and workers to valley fever from fugitive dust generated during construction. With implementation of project features identified in Section 2.12.3, fugitive dust and exhaust emissions from construction activities would not result in substantially adverse air quality impacts.

Operation of the Build Alternative may result in an increase in vehicle miles traveled (VMT) in the RSA because traffic currently using other routes may choose to use the new facilities. According to the models in the *Revised Draft Traffic Analysis Report* (2017), both the No Build and Build Alternative criteria pollutant emissions are all lower than the existing condition emissions. With the exception of $PM_{2.5}$ and PM_{10}, the Build Alternative criteria pollutant emissions are all less than the No Build Alternative emissions. The increased $PM_{2.5}$ and PM_{10} emissions are due to the increase in re-entrained dust emissions associated with the increased regional VMT. However, the increases in $PM_{2.5}$ and PM_{10} emissions are low compared to the total emissions. Therefore, impacts related to air quality would not be substantially adverse.

Construction of other reasonably foreseeable actions may contribute to short-term air quality impacts in the SCAG region. However, the transportation projects listed in Table 2.18.1 are included in the SCAG RTP/SCS and the 2017 FTIP, which were found to be conforming by the Federal Highway Administration (FHWA)/Federal Transit Administration (FTA) on December 16, 2016. These strategies help the region achieve federal Clean Air Act (CAA) requirements and provide beneficial impacts related to long-term air quality (SCAG 2016b). The reasonably foreseeable actions within the Build Alternative RSA would be evaluated on a project-by-project basis to determine air quality impacts and the appropriate measures required to reduce impacts. Because project impacts would not be adverse, the Build Alternative, in conjunction with past, present, and reasonably foreseeable projects, would not result in a cumulative effect related to air quality. Therefore, no avoidance, minimization, and/or mitigation measures for cumulative impacts are required.

2.18.3.13 Noise

The cumulative RSA for noise includes all areas adjacent to the Build Alternative where there are sensitive land uses that would be affected by noise from construction and traffic noise from operation of the Build Alternative. The cumulative RSA focuses on areas in the vicinity of the Build Alternative with potential noise-sensitive uses, including residential uses, parks, open spaces, and areas of frequent human activity. The cumulative RSA is a heavily urbanized area, with noise sources that include traffic on surrounding freeways and local roads, commercial and industrial facilities, construction activities, commercial centers, performing arts centers, and ambient noises from other land uses (e.g., schools, parks, hospitals, and churches).

As described in the *Noise Study Report* (NSR) (2018), short-term noise impacts occurring during construction of the Build Alternative include:

- **Transportation Noise:** Additional noise would be generated from construction crew commutes and the transport of construction equipment and materials. However, the noise would be minimal when compared to existing traffic volumes in the RSA, and long-term changes in noise level would not be perceptible.
- **Construction Noise:** Noise levels vary depending on the phase of construction and type of equipment. Typical noise levels at 50 ft from an active construction area range up to 86 A-weighted decibels (dBA) maximum instantaneous noise level (L_{max}) during the noisiest construction phases (i.e., the site preparation phase). Sensitive receptors within 50 ft of the construction area may be subject to short-term noise higher than 86 dBA L_{max}.

Compliance with Caltrans Standard Specifications Section 14-8.02 (2015) will be required to minimize construction noise impacts on sensitive land uses adjacent to the Build Alternative. The noise level from the contractor's construction operations between the hours of 9:00 p.m. and 6:00 a.m. shall not exceed 86 dBA L_{max} at a distance of 50 ft. Contractors will not operate an internal combustion engine on the job site without the appropriate manufacturer-recommended muffler. With compliance with Caltrans Standard Specifications Section 14-8.02, the Build Alternative would not result in adverse construction noise impacts.

Long-term noise impacts associated with Build Alternative operation are solely from traffic noise. The Build Alternative would result in a portion of the highway being located closer to sensitive receptors, and, in many cases, travel lanes would be located beyond the current freeway ROW. In a variety of neighborhoods, noise barriers would be located less than 50 ft from residential structures. In addition, expansion of the highway would increase the capacity of the highway, further increasing the ambient noise.

The NSR includes traffic modeling results of future traffic noise levels based on worst-case traffic operations in the RSA. The NSR indicates that noise would approach or exceed the Noise Abatement Criteria (NAC) in several receptor locations within the RSA. Of the 362 modeled receptors, 56 receptors under the Build Alternative would approach or exceed the NAC. No additional impacts would occur under the Build Alternative with the Four-Lane Gridley Road Overcrossing Design Option, the Pioneer Boulevard L-9 Design Option, or the Pioneer Boulevard Westbound Ramps/168th Alignment Design Option. The Build Alternative with the Non-Standard Lane and Shoulder Widths Design Option would have 10 fewer impacted receptors compared to the Build Alternative (Receptors R-107, R-177 through R-183, R-248, and R-249). The Build Alternative with the Diamond Ramps Design Option would have 2 fewer impacted receptors compared to the Build Alternative (Receptors R-248 and R-249). No receptor would experience a substantial noise increase of 12 dBA or more over its corresponding existing noise levels under any scenario. Therefore, the Build Alternative would not result in substantially adverse impacts related to noise.

The operational noise impact analysis takes into account future projections of traffic noise, which assume that other planned projects in the region will contribute to projected noise levels. Therefore, no additional cumulative impacts beyond those disclosed in the NSR are anticipated.

Other reasonably foreseeable actions within the Build Alternative RSA would be evaluated on a project-by-project basis to determine noise impacts and the appropriate measures required to reduce impacts. Each project would be responsible for following applicable noise ordinances during construction. Because long-term noise would not be adverse, and NAC would be implemented, the Build Alternative, in conjunction with past, present, and reasonably foreseeable projects, would not result in a cumulative effect on noise. Therefore, no avoidance, minimization, and/or mitigation measures for cumulative impacts are required.

2.18.3.14 Energy

The cumulative RSA for energy consumption is the SCAG planning region because energy consumption is typically tracked on a regional or State level.

The Build Alternative would result in substantial increases in energy consumption in the RSA as a result of construction, including energy consumption from the use of construction equipment, materials delivery, and additional travel as a result of detours associated with lane and ramp closures. However, increases in energy consumption would be short-term and temporary, and would not be substantial at the regional level. In addition, the Build Alternative would provide substantial long-term benefits, including increased mobility in the region, enhanced safety, and improvements to non-standard design features. Though substantially adverse effects on energy consumption are not anticipated, and no avoidance, minimization, or mitigation measures are required, the Build Alternative would implement a construction efficiency plan to further reduce energy consumption during construction.

At the regional level, the cumulative increase in energy consumption for the Build Alternative would be negligible. Based on the data in the *Energy Technical Report*

(2017), the Build Alternative would not substantially contribute to overall energy consumption at the regional level, and would not be expected to result in substantially adverse energy impacts.

Other reasonably foreseeable actions could contribute to increased short-term energy consumption within the region. The transportation projects listed in Table 2.18.1 that are included in the SCAG RTP/SCS, which includes strategies to help the region achieve State greenhouse gas (GHG) emission reduction goals and federal CAA requirements, may provide beneficial impacts related to energy consumption. All reasonably foreseeable actions would be evaluated on a project-by-project basis to determine the energy consumption and the appropriate measures required to reduce impacts. Because project impacts would not be adverse, the Build Alternative, in conjunction with past, present, and reasonably foreseeable projects, would not result in a cumulative effect on energy consumption. Therefore, no avoidance, minimization, and/or mitigation measures for cumulative impacts are required.

2.18.3.15 Wetlands and Other Waters

The cumulative RSA for wetlands and other waters is the BSA used in the *Natural Environment Study (Minimal Impacts)* (NES [MI]) (2017 and 2018 Errata) and the *Jurisdictional Delineation Report* (2017 and 2018 Errata). The BSA is in the cities of Cerritos and Artesia in Los Angeles County along westbound SR-91 from Shoemaker Avenue to I-605, and northbound I-605 to Alondra Boulevard. The 283 ac BSA encompasses the potential impact areas (temporary and permanent) for the Build Alternative, as well as a buffer area to account for any potential indirect impacts to adjacent potentially jurisdictional features. The majority of the drainage features within the BSA consist of unnamed storm water runoff and concrete flood control channels, which generally run parallel to SR-91, I-605, and the on/off-ramps, and are presumed to eventually drain into the San Gabriel River.

A total of 14 drainage features were described in the *Jurisdictional Delineation Report* (2017 and 2018 Errata). The Build Alternative is expected to result in the following impacts to areas within potentially jurisdictional drainage features: (1) 0.43 ac of permanent impacts and 0.01 ac of temporary impacts to potential United States Army Corps of Engineers (USACE) jurisdiction; and (2) 0.52 ac of permanent impacts and 0.02 ac of temporary impacts to potential California Department of Fish and Wildlife (CDFW) jurisdiction. RWQCB jurisdiction is expected to coincide with USACE jurisdiction. Therefore, permits (i.e., USACE Section 404 authorization, CDFW Section 1602 Streambed Alteration Agreement, and RWQCB Section 401 Water Quality Certification) are expected to be necessary.

Although jurisdictional areas are likely to be affected by the project, compensatory mitigation is not expected to be required for impacts to waters that are subject to USACE, CDFW, or RWQCB regulatory authority permitting requirements because the drainage features proposed to be impacted consist of concrete-lined ditches that are excavated on dry land and did not replace previously existing natural drainages. With implementation of project features and BMPs (see Sections 2.14.3 and 2.14.4) to prevent loose soil or pollutants from entering the drainage features within and adjacent to the BSA, impacts on jurisdictional drainage features would be avoided. Therefore, impacts on wetlands and other waters would not be substantially adverse.

Other reasonably foreseeable actions may result in temporary and permanent impacts to jurisdictional drainage features. These actions would be evaluated on a project-by-project basis to determine the acreage of impacts to jurisdictional drainage features and the appropriate measures required to reduce impacts. Because project impacts would not be adverse with the implementation of project features and BMPs, the Build Alternative, in conjunction with past, present, and reasonably foreseeable projects, would not result in a cumulative effect on wetlands and other waters. Therefore, no avoidance, minimization, and/or mitigation measures for cumulative impacts are required.

2.18.3.16 Animal Species

The cumulative RSA for animal species is the BSA used in the NES (MI) (2017). The BSA is in the cities of Cerritos and Artesia in Los Angeles County along westbound SR-91 from Shoemaker Avenue to I-605, and northbound I-605 to Alondra Boulevard. The 283 ac BSA encompasses the potential impact areas (temporary and permanent) for the Build Alternative, as well as a buffer area to account for any potential indirect impacts to adjacent biological resources. Land uses surrounding the BSA include transportation, commercial, residential, educational (i.e., schools), and recreational (e.g., neighborhood parks and golf courses).

Several California Species of Special Concern (SSC) and California Special Animals have the potential to occur within the BSA due to the presence of suitable habitat. However, no special-status animal species were observed during field surveys for the project. Animal species that can potentially occur in the BSA include:

- **Nesting Migratory Birds:** The BSA provides nesting habitat, consisting primarily of ornamental vegetation, for migratory birds.
- **Rufous Hummingbird:** This species is well adapted to suburban environments. The BSA provides nesting habitat (mainly ornamental vegetation) for this species.
- **Cooper's Hawk:** This hawk species lives primarily in forests and woodlands, but can nest in tall ornamental trees. The BSA provides marginally suitable foraging and nesting habitat for this species.
- **Special-Status Bat Species:** Bat species that may roost within the BSA include western yellow bat, Yuma myotis, pallid bat, silver-haired bat, and hoary bat. During the surveys, bat roosting was confirmed at two structures and was determined moderately to highly probable at three additional structures in the BSA. The surveys indicated that night roosting may occur at several structures throughout the BSA. The loss of a night roost can negatively affect the use of a foraging area, and consequently may result in reduced fecundity in species that are already slow to reproduce.

With the implementation of avoidance and minimization measures outlined in the NES (MI) (included in Section 2.16.4), the Build Alternative is not expected to result in substantially adverse impacts on nesting migratory birds, rufous hummingbirds, Cooper's hawks, or special-status bat species.

Other reasonably foreseeable actions may result loss of foraging, roosting, or nesting habitat for animal species. These actions would be evaluated on a project-by-project basis to determine the presence of animal species and the appropriate measures required to reduce impacts. Because project impacts would not be adverse with the implementation of avoidance and minimization measures identified in Section 2.16.4, the Build Alternative, in conjunction with past, present, and reasonably foreseeable projects, would not result in a cumulative effect on animal species. Therefore, no additional avoidance, minimization, and/or mitigation measures for cumulative impacts are required.

2.18.3.17 Threatened and Endangered Species

The cumulative RSA for threatened and endangered species is the BSA used in the NES (MI) and is described above in Section 2.18.3.17. Three federally and/or State-listed plant species potentially occur or are known to occur within the vicinity of the BSA, which are salt marsh bird's-beak (*Chloropyron maritimum* ssp. *maritimum*), Ventura marsh milk-vetch (*Astragalus pycnostachyus* var. *lanosissimus*), and Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*). However, no suitable habitat to support these plant species occurs within the BSA, and the species were not observed during the surveys. Therefore, no special-status plant species are expected to occur within the BSA or to be affected by the Build Alternative.

In addition, five wildlife species that are federally and/or State-listed as endangered or threatened were identified by the United States Fish and Wildlife Service (USFWS) as potentially occurring within the vicinity of the BSA. These species are western snowy plover (*Charadrius nivosus nivosus*), coastal California gnatcatcher (*Polioptila californica californica*), California least tern (*Sternula antillarum browni*), least Bell's vireo (*Vireo bellii pusillus*), and Pacific pocket mouse (*Perognathus longimembris pacificus*). However, no special-status animal species were observed during surveys. With the implementation of the project feature outlined in Section 2.16.3, the project is not expected to result in substantially adverse impacts on special-status species.

Other reasonably foreseeable actions within the Build Alternative BSA would be evaluated on a project-by-project basis to determine the presence of threatened or endangered species, the presence of critical habitat, and the appropriate measures required to reduce impacts. Because project impacts would not be adverse with the implementation of the project feature identified in Section 2.16.3, the Build Alternative, in conjunction with past, present, and reasonably foreseeable projects, would not result in a cumulative effect on threatened or endangered species. Therefore, no avoidance, minimization, and/or mitigation measures for cumulative impacts are required.

2.18.3.18 Invasive Species

The cumulative RSA for invasive species is the BSA used in the NES (MI) and is described in Section 2.18.3.17. Vegetation in the BSA consists primarily of ornamental landscaping and ruderal/weedy vegetation cover. A number of the plants observed within the BSA are classified as invasive species and listed on the California Invasive Plant Council (Cal-IPC) Inventory Database.

To ensure compliance with Executive Order (EO) 13112 (federal law that governs the prevention of introducing and spreading invasive species and supports efforts to eradicate and control the establishment of invasive species), invasive species would be removed from the Build Alternative work area and controlled during construction. With implementation of the project feature outlined in in Section 2.17.3.2, the Build Alternative is not expected to disperse exotic plant species seeds or otherwise contribute to the invasion of exotic species into natural habitats. Therefore, impacts related to invasive species would not be substantially adverse.

Other reasonably foreseeable actions would be required to comply with EO 13112, and are not expected to result in substantially adverse impacts related to invasive species. These actions would be evaluated on a project-by-project basis to determine impacts related to invasive species and the appropriate measures to reduce these impacts. Because project impacts would not be adverse, the Build Alternative, in conjunction with past, present, and reasonably foreseeable projects, would not result in a cumulative effect on invasive species. Therefore, no avoidance, minimization, and/or mitigation measures for cumulative impacts are required.

2.18.4 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, and/or mitigation measures for cumulative impacts are required.

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Chapter 3 California Environmental Quality Act (CEQA) Evaluation

The Westbound State Route 91 (SR-91) Improvement Project (project) is a joint project by the California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA) and is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). FHWA's responsibility for environmental review, consultation, and any other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by Caltrans pursuant to 23 United States Code Section 327 (23 USC 327) and the Memorandum of Understanding dated December 23, 2016 and executed by FHWA and Caltrans. Caltrans is the lead agency under CEQA and NEPA.

One of the primary differences between NEPA and CEQA is the way significance is determined. Under NEPA, significance is used to determine whether an EIS, or a lower level of documentation, will be required. NEPA requires that an EIS be prepared when the proposed federal action (project) as a *whole* has the potential to "significantly affect the quality of the human environment." The determination of significance is based on context and intensity. Some impacts determined to be significant under CEQA may not be of sufficient magnitude to be determined significant under NEPA. Under NEPA, once a decision is made regarding the need for an EIS, it is the magnitude of the impact that is evaluated and no judgment of its individual significance is deemed important for the text. NEPA does not require that a determination of significant impacts be stated in the environmental documents.

CEQA, on the other hand, does require Caltrans to identify each "significant effect on the environment" resulting from the project and ways to mitigate each significant effect. If the project may have a significant effect on any environmental resource, then an EIR must be prepared. Each and every significant effect on the environment must be disclosed in the EIR and mitigated if feasible. In addition, the CEQA Guidelines list a number of "mandatory findings of significance," which also require the preparation of an EIR. There are no types of actions under NEPA that parallel the findings of mandatory significance of CEQA. This chapter discusses the effects of this project and CEQA significance.

3.1 CEQA Environmental Checklist

This checklist identifies physical, biological, social, and economic factors that might be affected by the proposed project. In many cases, background studies performed in connection with the projects will indicate that there are no impacts to a particular resource. A NO IMPACT answer in the last column reflects this determination. The words "significant" and "significance" used throughout the following checklist are related to CEQA, not NEPA, impacts. The questions in this form are intended to encourage the thoughtful assessment of impacts and do not represent thresholds of significance.

Project features, which can include both design elements of the project, and standardized measures that are applied to all or most Caltrans projects such as Best Management Practices (BMPs) and measures included in the Standard Plans and Specifications or as Standard Special Provisions, are considered to be an integral part of the project and have been considered prior to any significance determinations documented below; see Chapters 1 and 2 for a detailed discussion of these features. The annotations to this checklist are summaries of information contained in Chapter 2 in order to provide the reader with the rationale for significance determinations; for a more detailed discussion of the nature and extent of impacts, please see Chapter 2. This checklist incorporates by reference the information contained in Chapters 1 and 2.

3.1.1 Aesthetics

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

3.1.1.1 CEQA Significance Determinations for Aesthetics

The potential for the Build Alternative (including design options) to adversely impact aesthetics was assessed in the *Visual Impact Assessment* (2018) and Section 2.6, Visual/Aesthetics, of this Initial Study/Environmental Assessment (IS/EA). The following discussion is based on those analyses.

a, b) No Impact. The project is located within a highly urbanized area and the landscape is characterized by developed land and an extensive transportation network. The land use within the study area for the Westbound SR-91 Improvement Project is primarily urban residential and transportation uses, but also includes areas of commercial and recreational uses. No scenic resources have been identified for this project, and no scenic corridors or designated scenic highways are located within the vicinity of the project. Therefore, a substantial adverse effect on a scenic vista or substantial damage to scenic resources would not occur.

c) Less Than Significant Impact. As discussed in more detail in Section 2.6, Visual/Aesthetics, of this IS/EA, the study area can be treated as a single landscape unit, defined as Visual Assessment Unit 1 (VAU1). The landscape in VAU1 is generally characterized by surrounding urban development, transportation uses, and other man-made features. Six key views were analyzed that would most clearly demonstrate the change in the project's visual resources and represent the viewer groups that have the highest potential to be affected by the project, considering visual exposure and visual sensitivity. The selected key view locations simulations can be found on Figures 2.6-1 through 2.6-7 provided in Section 2.6. In general, the project would result in moderate visual impacts at Key Views 1 through 4, moderate-high visual impacts at Key View 5, and moderate-low visual impacts at Key View 6.

However, with the inclusion of Project Features PF-VIS-1 through PF-VIS-3, provided in Section 2.6.3, potential impacts that may degrade the existing visual character would be minimized with the inclusion of landscaping, architectural treatments, and review of the usage of construction lighting. Impacts would be less than significant, and no mitigation is required.

d) Less Than Significant Impact. Please also refer to the response to checklist question c), above. The proposed project would construct improvements to an existing freeway facility located within a highly urbanized area and would not introduce a new source of substantial light or glare which would adversely affect day or nighttime views in the area. During construction, lighting types, plans and placement shall be reviewed at the discretion of the Caltrans District Landscape Architect in order to minimize light and glare impacts on surrounding sensitive uses, as provided in measure PF-VIS-3. Therefore, impacts would be less than significant and no mitigation is required.

3.1.2 Agriculture and Forest Resources

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.				
Would the project:	**Significant and Unavoidable Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

3.1.2.1 CEQA Significance Determinations for Agriculture and Forest Resources

a, b) No Impact. The proposed project is located in a highly urbanized area and involves improvements to an existing freeway facility. As discussed in more detail in Section 2.1, Land Use, there are no existing or general plan agricultural land uses in the study area; therefore, no agricultural land would be converted as part of the project. In addition, a review of the maps prepared pursuant to the Farmland Mapping and Monitoring Program (FMMP) of the California Resources Agency as well as a review of the California Department of Conservation's (CDC) California Important Farmland Finder tool (online at https://maps.conservation.ca.gov/DLRP/CIFF/) indicated that no Prime or Unique Farmland, Farmland of Statewide Importance, or land subject to a Williamson Act contract is present within the study area. No impact would occur.

c, d) No Impact. As discussed in more detail in Section 2.1, there are no currently zoned forest lands or timberland zoned Timberland Production areas within the study area; therefore, there would be no conflict with or conversion of these lands as part of the project. No impact would occur.

e) No Impact. See also responses to questions a) through d) above. Because there are no farmland, timberland, or agricultural land uses within the study area, changes to the existing environment as a result of the project that, due to their location or nature, could result in the conversion of Farmland to non-agricultural use or the conversion of forest land to non-forest use are not reasonably foreseeable. No impact would occur.

3.1.3 Air Quality

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations.				
Would the project:	**Significant and Unavoidable Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non- attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

3.1.3.1 CEQA Significance Determinations for Air Quality

The potential for the Build Alternative to adversely impact air quality was assessed in the *Air Quality Analysis* (2018) and Section 2.13, Air Quality, of this IS/EA. The following discussion is based on those analyses.

a, b, c, d) Less Than Significant Impact. The proposed project is located in an area of attainment for federal 1-hour nitrogen dioxide (NO_2) and 24-hour sulfur dioxide (SO_2) attainment/maintenance for federal carbon monoxide (CO), particulate matter less than 10 microns in size (PM_{10}), and annual nitrogen dioxide (NO_2), and nonattainment for federal ozone (O_3), particulate matter less than 2.5 microns in size ($PM_{2.5}$) and lead (Los Angeles County only) standards. The proposed project is located in an area of attainment for State CO and NO_2 and nonattainment for State O_3, PM_{10}, annual $PM_{2.5}$, and lead (Los Angeles County only). The applicable Air Quality Plan is the current South Coast Air Quality Management District (SCAQMD) Air Quality Management Plan (AQMP) that was adopted by the SCAQMD in 2017, which is submitted as part of the California State Implementation Plan (SIP). Implementation of the SIP would bring the region into conformance with the applicable air quality standards. If a project “conforms” with the SIP, it would not conflict with or obstruct implementation of the applicable air quality plan. Project conformity with the SIP is demonstrated by inclusion of the project in the current Regional Transportation Plan (RTP) and detailed project-level analyses demonstrating that the project will not contribute to any new violations of the national ambient air quality standards (NAAQS), increase the frequency or severity of NAAQS violations, or delay timely attainment of the NAAQS or any required interim milestone.

As described in Section 2.12.3.2, the project is listed in Amendment #3 to the 2016 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) as Project ID 1163S012, with a description as follows: "Improvements to the I-605/ SR-91interchange consist of adding an additional general purpose lane, adding auxiliary lanes, and on- and off-ramp improvements." The 2016 RTP/SCS was approved by the Regional Council of the Southern California Association of Governments (SCAG) on April 7, 2016, and Amendment #3 is scheduled to be adopted in December 2018. However, the proposed project is not currently programmed in the Federal Transportation Improvement Program (FTIP). The proposed project will be added to the FTIP prior to completion of the Project Approval/Environmental Documentation (PA/ED) phase. The RTP/SCS listing is included in the *Air Quality Analysis* (2018).

Thus, once RTP/SCS Amendment #3 is approved, the proposed Build Alternative will be included in the regional emissions analysis used to meet regional air quality conformity. Once the project is programmed in the FTIP, the FHWA will conduct its determination that the project conforms with the SIP in accordance with 40 CFR Part 93. Construction and long-term operation of the project would then be considered consistent with the purpose of the SIP, and the project Build Alternative would conform to the requirements of the federal Clean Air Act (CAA).

Air quality models were used to demonstrate the potential contribution of the project's emissions to the deterioration of or impediment to progress of air quality goals as stated in the AQMP. The project has been determined to not be a project of air quality concern (POAQC) by the Transportation Conformity Working Group (TCWG) (a copy of the determination is included in Appendix C).

As described in Section 2.12.2.4, six pollutants have been established as criteria pollutants. Table 2.12.2 lists them, their associated thresholds of significance, and the health effects associated with exposure. As Table 2.12.1 shows, the background PM_{10} concentrations currently exceed the State 24-hour and annual standards.

Section 2.12.3.2 describes the project permanent impacts, including detailed analyses of CO Hot Spots. The analyses conclude that the project is not expected to result in any concentrations exceeding the 1-hour or 8-hour State CO standards. However, the

Build Alternative emissions listed in Table 2.12.11 would likely contribute to more violations of the PM_{10} California ambient air quality standards (CAAQS) compared with the No Build Alternative. Similarly, because the Basin is in nonattainment for $PM_{2.5}$, the increase in $PM_{2.5}$ emissions from the Build Alternative as listed in Table 2.12.11 would likely worsen the existing violation of the $PM_{2.5}$ CAAQS in the Basin compared with the No Build Alternative. However, these increases in PM_{10} and $PM_{2.5}$ are primarily due to tire wear and brake dust rather than exhaust emissions, and are relatively minor (less than 2 pounds/day regionally). Additionally, when compared to the Existing (2016) conditions as shown in Table 2.12.11, PM_{10} and $PM_{2.5}$ exhaust emissions would be lower in the Build Alternative. Thus, the proposed Build Alternative would not create a new violation or worsen an existing violation of the federal PM_{10} or $PM_{2.5}$ standards.

As described in more detail in Section 2.12.3.2, the project is not expected to result in higher CO concentrations than those existing within the region at the time of attainment demonstration, the project is not expected to result in any concentrations exceeding the 1-hour or 8-hour CO standards, and a detailed California Line Source Dispersion Model, version 4 (CALINE4), CO hot-spot analysis is not required for the project. The proposed project will not conflict with the AQMP, violate any air quality standard, result in a net increase of any criteria pollutant, or expose sensitive receptors to substantial pollutant concentrations. Impacts would be less than significant, and mitigation is not required.

e) Less Than Significant Impact. During construction, short-term degradation of air quality may occur due to the release of particulate emissions generated by excavation, grading, hauling, and other activities. Emissions from construction equipment are also anticipated. However, SCAQMD Rule 403 regarding fugitive dust minimization requirements would reduce potential dust emissions during construction. Also, project features and standard measures PF-AQ-1 through PF-AQ-6 would be implemented during construction to avoid and minimize air quality-related impacts. Some phases of construction, particularly asphalt paving, would result in short-term odors in the immediate area of each paving site(s). Such odors would quickly disperse to below-detectable levels as distance from the site(s) increases. Therefore, objectionable odors affecting a substantial number of people would be less than significant, and no mitigation is required.

3.1.4 Biological Resources

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☒	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☐	☒	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☒	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

3.1.4.1 CEQA Significance Determinations for Biological Resources

The potential for the Build Alternative to result in adverse impacts to biological resources was assessed in the *Natural Environment Study (Minimal Impacts)* (NES [MI]) (2017 and 2018 Errata), the *Jurisdictional Delineation Report* (2017 and 2018 Errata), and Sections 2.15, Plant Species; 2.16, Animal Species; and 2.17, Invasive Species, in this IS/EA. The following discussions are based on those analyses.

a, b) Less Than Significant Impact. A literature review and records search as well as reconnaissance-level field surveys were conducted to identify the existence or potential occurrence of sensitive or special-interest plant species located in or within the vicinity of the biological study area (BSA). The BSA is composed of disturbed habitat and landscaped and nonvegetated urban/developed areas. Plant species occurring in the BSA are characteristic of those found in landscaped and regularly disturbed areas. The results of the literature review indicated three special-status plant species as potentially occurring in the BSA. Of these three species, two are federally designated and/or State-listed endangered or threatened species: Ventura marsh milk-vetch (*Astragalus pycnostachyus* var. *lanosissimus*) and Salt marsh bird's-beak (*Chloropyron maritimum* ssp. *maritimum*). Neither of these species was observed during surveys, and no suitable habitat was observed within the BSA. Therefore, the proposed project would have no impact on these species. The remaining special-status plant species identified as potentially occurring in or within the vicinity of the BSA is Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*), a perennial herb that occurs in coastal bluff scrub, coastal dunes, coastal scrub, and valley and foothill grasslands, usually on ocean bluffs and ridgetops in alkaline or clay soils (from 10 to 1,510 ft (ft) in elevation). The Coulter's goldfields is identified as occurring within 2 miles (mi) of the BSA. However, no suitable habitat to support this plant species occurs within the BSA, and the species was not observed during surveys. Therefore, the species will not be impacted by the proposed project.

The following 10 special-species animal species (5 California Species of Special Concern [SSC] and 5 California Special Animals) that are not federally and/or State-listed endangered or threatened were identified as potentially occurring in or near the BSA due to the presence of suitable habitat: rufous hummingbird (*Selasphorus rufus*), Cooper's hawk (*Accipiter cooperii*), silver-haired bat (*Lasionycteris noctivagans*), pallid bat (*Antrozous pallidus*), western mastiff bat (*Eumops perotis californicus*), southwestern yellow bat (*Lasiurus xanthinus*), pocketed free-tailed bat (*Nyctinomops femorosaccus*), big free-tailed bat (*Nyctinomops macrotis*), hoary bat (*Lasiurus cinereus*), and Yuma myotis (*Myotis yumanensis*). No special-status animal species were observed in the BSA during field surveys, but the rufous hummingbird, Cooper's hawk and six special-status bats have the potential to occur within the BSA due to the presence of suitable habitat, and two structures with guano evidence indicating bat use for roosting were observed during surveys. To avoid impacts to special-status bird species during construction, and in compliance with the requirements of the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code regarding nesting birds, vegetation clearing and construction activities that impact existing vegetation will be conducted, to the maximum extent feasible, outside the primary nesting season for birds (typically February 15–September 1), as described in Project Feature PF-BIO-1. To avoid impacts to special-status bat species during construction, humane eviction and exclusion of bats from a roost would be employed and alternate habitat provided, with the bats permitted to recolonize the original roost site following construction. These and other avoidance strategies are outlined in Project Features PF-BIO-2 through PF-BIO-12.

With the inclusion of applicable project features, BMPs, and other measures, impacts to candidate, sensitive, or special status species, riparian habitat, or other sensitive natural communities would be less than significant, and no mitigation is required.

c) Less Than Significant Impact. There is preliminarily 0.88 acre (ac) of jurisdictional United States Army Corps of Engineers (USACE) area, 1.17 ac of jurisdictional CDFW area, and 1.33 ac of nonjurisdictional USACE area within the BSA. These are entirely across 14 concrete-lined drainage features within the highly urbanized study area (designated as Drainage Features A through N). Drainages E, I, J, K, and L, as well as portions of Drainage Features A, B, F, and H, are human-altered and surrounded by urban habitat but appear to contain relatively permanent water (RPW) and function like streams with a nexus to a traditional navigable water (TNW). Based on preliminary project design, it is anticipated that some of the flood control channels within the BSA, particularly on the westbound side of SR-91, may be impacted by the project. Specifically, the Build Alternative is expected to result in 0.01 ac of temporary effects to nonwetland waters subject to USACE jurisdiction due to construction within Drainage Feature J. The Build Alternative is expected to result in 0.002 ac of temporary effects to nonjurisdictional USACE areas within Drainage Features C and D. The Build Alternative would result in the temporary removal of 0.02 ac of nonwetland water subject to CDFW jurisdiction during construction within Drainage Feature J. Construction of the Build Alternative would also potentially result in 0.002 ac of temporary impacts to nonjurisdictional CDFW areas within Drainage Features C and D. Finally, temporary impacts to Regional Water Quality Control Board (RWQCB) areas would be the same as noted above for USACE areas (0.01 ac).

Permanent impacts to these drainage features are outlined in Tables 2.14.2 and 2.14.3 in Section 2.14, Wetlands and Other Waters. As shown in Table 2.14.2, the Build Alternative will result in the permanent loss of 0.43 ac of nonwetland waters potentially subject to USACE jurisdiction (i.e., Drainage Features B, H, I, and J). The Build Alternative will result in 0.461 ac of permanent effects to nonjurisdictional USACE areas. The potential nonjurisdictional impact areas are within portions of Drainage Features B, C, D, G, and H. As shown in Table 2.14.3, the Build Alternative will result in the permanent loss of 0.52 ac of nonwetland waters subject to CDFW jurisdiction. The permanent impacts would occur within Drainage Features B, H, I, and J. The Build Alternative would result in the permanent loss of 0.461 ac of nonjurisdictional CDFW areas. The impact areas are within Drainage Features B, C, D, G, and H. The permanent impacts to RWQCB areas under the Build Alternative would be the same as shown in Table 2.14.2 for the USACE areas, 0.43 ac.

Project Features PF-WET-1 through PF-WET-4 provide for securing permits prior to construction initiation, which would also implement specifications outlined in those permits as required by the USACE, CDFW, and RWQCB. In addition to permits and permit requirements, BMPs will be utilized to prevent loose soil or pollutants associated with the project from inadvertently entering the drainage features located within and adjacent to the BSA. Because impacts to these drainage features will be minor and addressed by implementation of project features and standard BMPs, impacts will be less than significant and no mitigation is necessary.

d) Less Than Significant Impact. Seminatural corridors above or below roads that are utilized for wildlife crossings include undercrossings, overcrossings, and culverts. Species of primary interest for wildlife movement within the BSA are medium-sized mammals such as raccoon (*Procyon lotor*). The existing SR-91 and Interstate 605 (I-605) freeways generally present barriers to wildlife movement and do not facilitate habitat connectivity or movement, as the freeway facilities have high traffic volumes and are lined with fences and walls. The various flood-control channels crossing under the two freeways may facilitate some wildlife movement, though little evidence of this was observed. Raccoon tracks were observed in the drainage feature near Iron-Wood Nine Golf Course. However, raccoons are well adapted to the urban environment and are increasingly present in urban drainage channels. The drainage feature near Iron-Wood Nine Golf Course does not connect to any upstream natural habitat and therefore does not serve as a wildlife movement corridor. Construction activities associated with the Build Alternative within the drainage feature near Iron-Wood Nine Golf Course would temporarily discourage raccoon presence in that relatively short section of the drainage, but raccoons would likely continue to utilize the adjacent areas. No native wildlife nursery sites are present within the BSA. Therefore, a less than significant impact would occur with regards to substantial interference with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impediment to the use of native wildlife nursery sites.

e) Less Than Significant Impact. Although the Cities of Cerritos and Artesia do have several ordinances and policies governing biological resources, the project will not have a significant impact to biological resources. Several project features and standard BMPs will address the potential for effects on animal and plant species, but the project area is generally within an area of developed and ornamental landscaping. Per the requirements of Project Features PF-BIO-13 and PF-BIO-14, Prevention of the Spread of Invasive Species, provided in Section 2.17.3, city tree planting and removal requirements would be adhered to. Therefore, the project would not conflict with local policies or ordinances protecting biological resources, and no mitigation is necessary.

f) No Impact. The project is not located within or near a Los Angeles County regional habitat linkage or wildlife corridor, existing or proposed significant ecological area, or adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved local, regional, or state habitat conservation plan. Therefore, no impact would occur.

3.1.5 Cultural Resources

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☒	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☒	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐
d) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☐	☒	☐

3.1.5.1 CEQA Significance Determinations for Cultural Resources

The potential for the proposed project to result in adverse impacts related to cultural and paleontological resources was assessed in the *Historic Property Survey Report* (HPSR) (2018) and its attachments, the *Paleontological Identification Report and Paleontological Evaluation Report* (PIR/PER) (2017 and 2018 Errata), and Sections 2.7, Cultural Resources, and 2.10, Paleontology, of this IS/EA. The following discussions are based on those analyses. In accordance with Public Resource Code (PRC) section 21080.3.1 and Assembly Bill (AB) 52, Caltrans initiated early consultation with California Native American tribes in May 2017. Refer to Chapter 4 of this IS/EA for detailed information pertaining to California Native American tribal consultation.

a, b) Less Than Significant Impact. It was determined that there are no National Register of Historic Places (National Register) listed or eligible cultural resources within the project's Area of Potential Effect (APE). As a result, no cultural resources qualify as historical resources pursuant to CEQA, or are exempt per the Section 106 Programmatic Agreement (PA). In addition, it has been determined that a finding of No Historic Properties Affected is appropriate for the project because there are no historical resources within the APE and there are no impacts to historical resources pursuant to *State CEQA Guidelines* Section 15064.5(b)(3). Six built environment resources were evaluated for the proposed project and determined ineligible for listing on the National Register and also determined ineligible as a historical resource under CEQA. These resources were listed in Table 2.7.1.

No archaeological resources were identified within the APE through archival research, Native American consultation, or field surveys, and the majority of the direct APE is within Caltrans' right-of-way (ROW). Pedestrian surveys for archaeological resources showed that all surveyable areas in the direct APE exhibited high levels of disturbance from the freeway, adjacent drainages, and nearby road construction. The entire direct APE has been substantially altered from previous construction activities, indicating that the likelihood of encountering intact archaeological resources is very low.

However, there is always a potential for previously undocumented cultural materials to be unearthed during construction activities. It is Caltrans' policy that if cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be halted and diverted until a qualified archaeologist can assess the nature and significance of the find. Potential effects to these materials would be avoided or minimized with the inclusion of Project Features PF-CR-1 and PF-CR-2, provided in Section 2.7.3. Therefore, any impacts would be less than significant.

c) Less Than Significant Impact. Geologic mapping indicates the entire study area is underlain by Holocene to late Pleistocene (less than 126,000 years ago) Alluvial Fan and Valley Deposits, Undivided. Although not mapped, artificial fill is likely present from the surface to varying depths throughout much of the study area where it was placed during construction of the existing freeways, streets, overcrossings, and undercrossings. Because of its disturbed context, artificial fill does not have the potential to contain scientifically significant paleontological resources. Young Alluvial Fan and Valley Deposits below a depth of 10 ft may be old enough to contain scientifically significant paleontological resources. The results of the locality search through the Natural History Museum of Los Angeles County (LACM) indicated that there are no vertebrate fossil localities within the study area. However, LACM has records of several fossil localities near the project from deposits similar to those found in the study area. The museum notes that these deposits are not usually paleontologically sensitive in the uppermost layers, but that scientifically important fossils may be encountered in the older deposits found at varying depths. Various vertebrate fossil localities have been recorded in cities surrounding the study area. Similarly, the pedestrian survey indicated that most of the study area is underlain by artificial fill. Other sediments observed are consistent with the Young Alluvial Fan and Valley Deposits, Undivided mapped in the study area.

Construction of the Build Alternative may require excavation that extends more than 10 ft below the original ground surface, potentially resulting in impacts to paleontological resources. Excavation depths and locations of retaining walls, bridge abutments and piers, sewer lines, power and signal poles, drainage improvements, and noise barriers would be established during final design. A project feature addressing the development of a Paleontological Mitigation Plan (PMP) would provide procedures for the treatment of paleontological resources discovered during construction. As described in Project Feature PF-PAL-1, provided in Section 2.10.3.2, Paleontology, a qualified paleontologist will prepare the PMP following the guidelines in the Caltrans Standard Environmental Reference (SER), Environmental Handbook, Volume 1, Chapter 8 – Paleontology (June 2016 or more current) and those developed by the Society of Vertebrate Paleontology (SVP) (2010). The PMP shall be prepared concurrently with final design plans during the Plans, Specifications, and Estimates (PS&E) phase. The PMP would detail the work plan to mitigate project effects, monitoring to be conducted, excavation methods, and curation agreement. Therefore, with implementation of the PMP during construction, impacts to paleontological resources would be less than significant, and no mitigation is required.

d) Less Than Significant Impact. As discussed previously and in Section 2.7, all surveyable areas in the direct APE exhibited high levels of disturbance from the freeway, adjacent drainages, and nearby road construction. The entire direct APE has been substantially altered from those previous construction activities and the likelihood of encountering intact archaeological resources, including human remains, is very low. However, there is always a potential for previously undocumented cultural materials or human remains to be unearthed during site preparation, grading, or excavation for construction of the Build Alternative. If human remains are discovered, the State of California Health and Safety Code (H&SC) Section 7050.5 states that further disturbances and activities shall stop in any area or nearby area suspected to overlie remains, and the Los Angeles County Medical Examiner-Coroner shall be contacted. Pursuant to California PRC Section 5097.98, if the remains are thought by the Coroner to be Native American, the Coroner will notify the Native American Heritage Commission (NAHC), which, pursuant to PRC Section 5097.98, will then notify the Most Likely Descendent (MLD). At that time, the person who discovered the remains will contact the Caltrans Resident Engineer, who will then contact the Caltrans District 7 Environmental Branch so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC Section 5097.98 will be followed as applicable. This provision is included as Project Feature PF-CR-2. Therefore, any potential impacts to human remains would be less than significant.

3.1.6 Geology and Soils

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☒	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

3.1.6.1 CEQA Significance Determinations for Geology and Soils

The potential for the proposed project to result in adverse impacts related to geology and soils was assessed in the *Preliminary Geotechnical Report* (2018) and the *Preliminary Geotechnical Materials Report* (2017). The findings of the report are discussed in Section 2.9, Geology/Soils/Seismic/Topography, in this IS/EA. The following discussions are based on those analyses.

a) i) Less Than Significant Impact. The study area is located within a seismically active region of Southern California. Earthquakes within the region occur primarily as loose clusters along the Newport-Inglewood Structural Zone, along the southern margin of the Santa Monica Mountains, the southern margin of the Santa Susana and San Gabriel Mountains, and in the Coyote Hills-Puente Hills area. The study area is not located within an Alquist-Priolo Fault Zone. The closest noteworthy active fault with Holocene surface rupture is the Newport-Inglewood-Rose Canyon Fault, crossing approximately 6 mi southwest of the I-605/SR-91 interchange. The closest mapped active fault with surface rupture is the late Quaternary Los Alamitos Fault, located approximately 3 mi southwest of the I-605/SR-91 interchange. Additionally, the Anaheim Fault crosses SR-91 at the on-ramp from Bloomfield Avenue; however, the top of the rupture plane of this Holocene-age fault is approximately 2.4 mi below ground surface (bgs). Therefore, given the distance of the study area to active faults which may be subject to surface rupture, the project would have a less than significant impact with regards to exposure of people or structures to potential substantial adverse effects involving rupture of a known earthquake fault.

a) ii) Less Than Significant Impact. The nearest substantial local sources of earthquakes and estimated peak ground acceleration (PGA) was summarized in Table 2.9.1 in Section 2.9, Geology/Soils/Seismic/Topography, in this IS/EA. PGA is a measurement of maximum ground acceleration in a particular area and can be described as how hard the ground may shake in a given geographic area based on several factors. The study area is likely to experience strong ground motion with an approximate PGA of 0.61 g. During construction, activities could be affected by ground motion from seismic activities. Possible ground rupture, liquefaction, and consolidation settlement could occur in the study area if an earthquake were to occur during construction. Implementation of safe construction practices and compliance with Caltrans and the California Division of Occupational Safety and Health (Cal-OSHA) safety requirements would minimize the impacts to worker safety during construction activities. Since the potential for strong seismic ground shaking is currently present within the study area, and construction or operation of the project would not further expose people or structures to substantial adverse effects involving strong seismic ground shaking. Therefore, impacts would be less than significant.

a) iii) Less Than Significant Impact. Liquefaction occurs when loose, saturated, generally fine sands and silts are subjected to strong ground shaking. The soils lose shear strength and become liquid; potentially resulting in large total and differential ground surface settlements as well as possible lateral spreading during an earthquake. Based on the California Geological Survey (CGS) Seismic Hazard Maps, the study area is located within a liquefaction study zone. Underlying soils within the study area are expected to consist of fine to medium grained, loose to medium dense sand. The groundwater table is relatively shallow and the site is subject to strong ground motion. Therefore, liquefaction potential is high. The preliminary estimate for free-field liquefaction settlement is in the range of between 4 and 8 inches at different locations of the study area. According to the City of Cerritos General Plan Safety Element (2004), the entire city is located within a liquefaction hazard zone.

According to the City of Artesia General Plan (2010), the city of Artesia is located within a mapped Liquefaction Zone of Required Investigation. Project Feature PF-GEO-1, provided in Section 2.9.3.2 in this IS/EA, would provide for a detailed geotechnical investigation and make project-specific recommendations to be incorporated into the final design of the selected Build Alternative. Project Features PF-GEO-2 and PF-GEO-3 would minimize soil erodibility and address slope stability and reduce the compressibility of soils and potential for liquefaction. Construction and operation of the project would not have substantial effects on seismic-related ground failure, including liquefaction. Therefore, impacts that would expose people or structures to substantial adverse effects involving seismic-related ground failure, including liquefaction, would be less than significant.

a) iv) No Impact. The study area is not located within an earthquake-induced landslide zone (CGS 1999). Evidence of landslides was not observed during the site investigation and the study area topography is relatively flat. Additionally, according to the City of Cerritos General Plan Safety Element (2004), the city does not have the potential for landslides. The City of Artesia General Plan Geology and Soils Element (2010) states that the city is not located within a mapped Earthquake-Induced Landslide Zone of Required Investigation and earthquake-induced landsliding is not anticipated to occur. The existing embankment slopes along the proposed project alignment are generally inclined 1.5:1 (horizontal:vertical) or flatter and are generally vegetated. No sign of slope instability was observed during site investigation. No hazardous geologic structure exists near the surface that may cause instability of the existing embankments. Therefore, no impact related to exposure of people or structures to substantial adverse effects involving landslides would occur.

b) Less Than Significant Impact. According to the *Preliminary Geotechnical Materials Report* (2017), due to a predominance of granular soils throughout the study area, the soils are not expected to be corrosive. Construction of the Build Alternative would result in a total Disturbed Soil Area (DSA) of approximately 29.25 ac. Excavated soil in the construction areas would be exposed and, as a result, there would be an increased potential for soil erosion during construction compared to existing conditions. During a storm event, soil erosion could occur at an accelerated rate. Temporary cut slopes would follow the guidelines of Caltrans Trenching and Shoring Manual (2011) and Occupational Safety and Health Administration (OSHA) 29 Code of Federal Regulations (CFR) 1926 Subpart-P would be followed for temporary excavations.

During all construction activities for the Build Alternative, the construction contractor will be required to adhere to the requirements of the Construction General Permit (CGP) and to implement erosion and sediment control BMPs specifically identified in the project Storm Water Pollution Prevention Plan (SWPPP) to keep sediment from moving off site into receiving waters and impacting water quality. Refer to Section 2.8, Water Quality and Storm Water Runoff, for additional discussion regarding construction-related water quality issues and mitigation, including BMPs.

Worker safety hazards resulting from erosion during construction of the Build Alternative would be minimized based on implementation of the requirements in the CGP and erosion and sediment control BMPs in the SWPPP.

Adherence to recommendations within the detailed geotechnical recommendation report provided in Project Feature PF-GEO-1 would substantially reduce substantial adverse effects from geologic hazards. In addition, surficial soils that are sandy can be susceptible to soil erosion produced by running water. The clayey surficial soils are expected to expand when wet, and crack upon drying. Cracking allows infiltration of water from storms and irrigation, ultimately causing loosening of the surficial soils. This results in an increase of soil erodibility. Proposed fill slopes are generally 4:1 (horizontal:vertical) which satisfy Caltrans *Highway Design Manual* (HDM) (2016) requirements for side slopes. Other proposed grading requires 1.5:1 or flatter cut slopes. Revegetation and engineering of graded slopes specified in Project Feature PF-GEO-2 will be performed prior to construction that would minimize the soil erodibility and slope stability. Therefore, impacts related to substantial soil erosion or the loss of topsoil would be less than significant.

c) Less Than Significant Impact. The main geotechnical considerations for the study area are the presence of potentially compressible (shallow and deep) and liquefiable soils. Settlement is anticipated at the SR-91 crossing street off/on ramps where approach fills are required. Preliminary liquefaction settlement estimates indicate settlements between 4 and 8 inches could occur within the study area. Future subsidence of the site should also be expected. Recommendations to reduce the compressibility of soils and potential for liquefaction would be followed, as included in Project Feature PF-GEO-3. The proposed project would not be, and the existing facility is not, located on a geologic unit or soil that is unstable, and the geologic unit or soil would not become unstable as a result of the proposed project. Therefore, potential for on- or off-site landslides, lateral spreading, subsidence, liquefaction, or collapse is considered less than significant.

d) Less Than Significant Impact. Soils within the study area are predominantly silty and clayey sand, sandy silt, poorly graded sand, and clayey silt. The sandy soils are primarily silty sand, which are not considered to be expansive. The clayey soils consist of sandy and clayey silt and silty clay; the corresponding expansion potential is considered to be moderate to high. Design and construction of the proposed improvements would comply with the HDM and other required standards, and recommendations from the Geotechnical Report, as included in Project Feature PF-GEO-1. Adherence to recommendations within these reports would substantially reduce substantial adverse effects from geologic hazards. Therefore, impacts related to soil expansion will be less than significant.

e) No Impact. As discussed in detail in Section 2.8, construction work related to the disposal of waste water will include the construction of drainage structures, protection in place and possible extension of existing drainage facilities, and creation of permanent water quality BMPs. The use of septic tanks or alternative waste water systems is not applicable, and current sewer systems within this highly urbanized area are available. No impact related to soils that are incapable of adequately supporting use of septic tanks or alternative waste water disposal systems would occur.

3.1.7 Greenhouse Gas Emissions

<table>
<tr><th>Would the project:</th><th>Significant and Unavoidable Impact</th><th>Less Than Significant with Mitigation Incorporated</th><th>Less Than Significant Impact</th><th>No Impact</th></tr>
<tr><td>a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?</td><td colspan="4" rowspan="2">Caltrans has used the best available information based to the extent possible on scientific and factual information, to describe, calculate, or estimate the amount of greenhouse gas emissions that may occur related to this project. The analysis included in the climate change section of this document provides the public and decision-makers as much information about the project as possible. It is Caltrans' determination that in the absence of statewide-adopted thresholds or GHG emissions limits, it is too speculative to make a significance determination regarding an individual project's direct and indirect impacts with respect to global climate change. Caltrans remains committed to implementing measures to reduce the potential effects of the project. These measures are outlined in the climate change section that follows the CEQA checklist and related discussions.</td></tr>
<tr><td>b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?</td></tr>
</table>

3.1.8 Hazards and Hazardous Materials

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒

3.1.8.1 CEQA Significance Determinations for Hazards and Hazardous Materials

The potential for the proposed project to result in significant impacts related to hazards and hazardous materials was assessed in the *Phase I Initial Site Assessment* (ISA) (2018), Section 2.11, Hazardous Waste/Materials, and Section 2.4, Utilities and Emergency Services, of this IS/EA. The following discussions are based on those analyses.

a) Less Than Significant Impact. Construction of the project would result in temporary impacts related to hazardous materials/waste that could occur within the maximum disturbance limits for the Build Alternative and design options, although no hazardous waste concerns were observed or reported within parcels on which temporary construction easements (TCEs) and/or partial acquisitions would occur. An aerially deposited lead (ADL) site investigation report indicated that concentrations of lead in soil samples along on- and off-ramp locations along SR-91 between I-605 and Shoemaker Road exceed regulatory limits. Project Feature PF-HAZ-1, in Section 2.11.3.1, would reduce the effects of ADL by implementing a project-specific ADL site investigation to evaluate and regulate the handling, reuse, and disposal of excess soils.

Yellow traffic striping and pavement marking materials (paint, thermoplastic, permanent and temporary tape) that would be removed during construction may contain elevated concentrations of metals such as lead, and the removal of these materials during construction could impact workers and the surrounding environment. Project Feature PF-HAZ-2, in Section 2.11.3.1, would minimize effects related to yellow traffic striping by mandating testing and regulating disposal of materials in accordance with Caltrans' *Construction Manual* (2017).

The Build Alternative would require the acquisition of 18 single-family residences and two commercial parcels. Based on the construction dates of the affected structures, asbestos-containing materials (ACM) and lead-based paint (LBP) may be present within these structures and represent a concern during demolition of these structures. Project Features PF-HAZ-3 through PF-HAZ-5, in Section 2.11.3.1, would address these concerns by requiring proper testing, monitoring, removal, and disposal of ACMs and LBP.

Soils within the study area may contain residue pesticide, based on the historical use of many areas within or in the vicinity. It is likely that the previous construction of SR-91 and I-605 will have reduced the potential for pesticide contamination within the project limits, but Project Feature PF-HAZ-6, in Section 2.11.3.1, requires a site investigation be performed for any undeveloped areas that might contain elevated contaminations of pesticide to identify residual contamination that might be present and determine if associated potential hazards could occur during construction. Project Feature PF-HAZ-6 also requires sampling, handling, and disposal of soils contaminated with pesticides in accordance with applicable federal, State, and local regulations.

Construction could disturb potentially contaminated soil and/or groundwater originating at properties beyond the maximum disturbance limits and the boundaries of property. Six properties located in the vicinity of the maximum disturbance limits of the Build Alternative have been identified as contributing to known groundwater impacts. These six properties are located at 16821 Norwalk Boulevard, 16604/16620 Pioneer Boulevard, 16632 Pioneer Boulevard, 16905 Pioneer Boulevard, 16849 Studebaker Road, and 10802 College Place. None of these properties would be fully or partially acquired for the proposed project; however, there is potential that contaminated groundwater originating at these parcels could be encountered during project construction. Measure HAZ-7, in Section 2.11.4, requires a site investigation be performed on these parcels to identify potential hazards associated with contaminated soil and groundwater that could occur during project construction, and to provide appropriate measures to address these hazards.

Operation and maintenance of the transportation facilities proposed as part of the Build Alternative and/or design options would not introduce new sources of hazardous materials or waste. Routine maintenance activities would be required to follow applicable regulations with respect to the handling and disposal of potentially hazardous materials.

With the incorporation of applicable project features and measures as outlined above, a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials would not occur. Impacts associated with hazardous materials would be less than significant. No mitigation is necessary.

b) Less Than Significant Impact. Vehicles utilizing SR-91 would continue to transport hazardous substances that could spill and impact the roadway and adjacent properties or resources. However, one purpose of the proposed project is to improve traffic safety on this roadway segment, which would help to minimize impact related to hazardous waste spills. In addition, transport of hazardous materials is subject to strict regulation. Caltrans, the California Highway Patrol, and local police and fire departments are trained in emergency response procedures for safely responding to accidental spills of hazardous substances on public roads, which further reduces impacts. For these reasons, operation of the Build Alternative and/or design options would not result in a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Impacts would be less than significant, and no mitigation is necessary.

c) Less Than Significant Impact. Table 2.3.6, provided in Section 2.3, Community Impacts, lists the community facilities, including schools, that are within 0.5 mi of the Build Alternative. Although construction of the project would result in temporary impacts related to hazardous materials/waste that could occur within the maximum disturbance limits for the Build Alternative and design options (although no hazardous waste concerns were observed or reported within parcels on which TCEs and/or partial acquisitions would occur), with the implementation of project features and measures intended to address the handling of hazards and hazardous materials, impacts would be less than significant. Additionally, the proposed project would operate in the same manner as existing conditions, and would not result in new hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mi of an existing or proposed school in a manner that would differ from existing conditions. Therefore, impacts would be less than significant and no mitigation is required.

d) No Impact. The project is not located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would not create a significant hazard to the public or the environment.

e) No Impact. The study area is not located within an airport land use plan, nor is it within 2 mi of a public airport or public use airport. The nearest public airport is the Long Beach Airport (Daugherty Field), approximately 4.5 mi southwest of the study area. The project would not result in a safety hazard for persons residing or working within the project area.

f) No Impact. The project is not within the vicinity of a private airstrip and would not result in a safety hazard for persons residing or working within the project area.

g) Less Than Significant Impact. Construction of the project could require partial or complete closures of local streets and ramps during night time and off-peak hours during critical construction phases. Some impairment to the delivery of emergency services, including fire and response times, may occur due to limited lane closures on the freeway mainline, ramps, and arterials. Emergency service providers, including local fire and police departments and the California Highway Patrol (CHP), could experience travel delays when traveling to and from emergency scenes during closures. Detour routes would be provided to direct traffic around any mainline or ramp closures using the local arterial street network. Project features would be incorporated into the Build Alternative to address the temporary impacts of project construction on emergency services and to ensure that no impairment of an adopted emergency response plan would occur. Project Feature PF-UES-2 (refer to Section 2.4.2.1 for more detailed information) states that prior to and during construction, the construction contractor will coordinate all temporary mainline, ramp, and arterial roadway closures and detour plans with law enforcement, fire protection, and emergency medical service providers to minimize temporary delays in emergency response times, including the identification of alternative routes for emergency vehicles and routes across the construction areas that are developed in coordination with the affected agencies. In addition, Project Feature PF-T-1 (refer to Section 2.5.3.2 for more detailed information) requires the development and implementation of a Transportation Management Plan (TMP) during construction of the Build Alternative to address traffic delays, maintain traffic flow in the study area, manage detours and temporary road, lane, and ramp closures, provide ongoing information to the public regarding construction activities, closures, and detours, and maintain a safe environment for construction works and travelers. Implementation of these project features would reduce the likelihood of impaired implementation of an adopted emergency response plan or emergency evacuation plan. The proposed project would add lanes to an existing freeway facility and would not construct structures which would physically interfere with an adopted emergency response plan or emergency evacuation plan. No mitigation is required.

h) No Impact. The project is located in a highly urbanized area, not near wildlands, and would add lanes to an existing freeway facility. The project would not expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

3.1.9 Hydrology and Water Quality

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☒	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☒	☐
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐
f) Otherwise substantially degrade water quality?	☐	☐	☒	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Inundation by seiche, tsunami, or mudflow	☐	☐	☒	☐

3.1.9.1 CEQA Significance Determination for Hydrology and Water Quality

The potential for the Build Alternative to adversely impact hydrology and water quality was assessed in the *Water Quality Assessment Report* (WQAR) (2017), and Section 2.8, Water Quality and Storm Water Runoff, of this IS/EA. The following discussions are based on those analyses.

a) Less Than Significant Impact. The State Water Resources Control Board (SWRCB) administers water rights, sets water pollution control policy, and issues water board orders on matters of statewide application, and oversees water quality functions throughout the state by approving basin plans, total maximum daily loads (TMDLs) and National Pollutant Discharge Elimination System (NPDES) permits. RWQCBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility. The SWRCB has identified Caltrans as an owner/operator of an Municipal Separate Storm Sewer System (MS4) under federal regulations. Caltrans' MS4 permit covers all Caltrans ROW, properties, facilities, and activities in the state. The permit has three basic requirements: Caltrans must comply with the requirements of the CGP; Caltrans must implement a year-round program in all parts of the State to effectively control storm water and non-storm water discharges; and Caltrans storm water discharges must meet water quality standards through implementation of permanent and temporary (construction) BMPs, to the maximum extent practicable, and other measures as the SWRCB determines necessary to meet water quality standards. To comply with the MS4 permit, Caltrans developed the Statewide Storm Water Management Plan (SWMP) to address storm water pollution controls related to highway planning, design, construction, and maintenance activities throughout California, and describes the minimum procedures and practices Caltrans uses to reduce pollutants in storm water and non-storm water discharges. The proposed project will be programmed to follow the guidelines and procedures outlined in the latest SWMP to address storm water runoff. Adherence to the applicable permits as well as the inclusion of project features and standard BMPs outlined in Section 2.8.3.1 would ensure that impacts related to the violation of water quality standards or waste discharge requirements would be less than significant.

b) Less Than Significant Impact. Previous studies have estimated the depth to historically high groundwater in the vicinity of the study area to range from 8 to 35 ft bgs. The nearest groundwater wells with current groundwater level and quality data is nearly 2 mi south of the southern limits of the study area. Depletion or dewatering of groundwater, or interference with groundwater recharge, is not anticipated to occur during construction or operation of the proposed project. In the event that groundwater and any other non-storm water dewatering activities become necessary, these activities would be subject to the requirements and permitting authority of the RWQCB. Any impacts to groundwater would be less than significant.

c, d) Less Than Significant Impact. As described in Section 2.8 of this IS/EA, construction activities under the Build Alternative involve construction of drainage structures, protection in place of existing drainage facilities where feasible and extension to the widening limits, and creation of permanent water quality BMPs. The existing man-made drainage pattern in the study area would not be substantially changed as a result of the proposed project, and no alteration to the course of a stream or river would occur, including those to which the project's storm water runoff would discharge. Construction BMPs addressing erosion and siltation would be implemented during the construction phase, and Design Pollution Prevention and Treatment BMPs would be designed, implemented, and maintained during operation of the proposed project, reducing any impacts related to erosion or siltation on- or off-site. The Build Alternative results in a 5.83 ac increase in impervious surface area over the baseline conditions due to new roadway area, interchanges, and bridges, as well as alteration of drainage patterns on roadways. This permanent increase in impervious surface area will result in a permanent increase in runoff and pollutant loading by increasing peak loads and runoff volumes, in turn increasing the potential for erosion and sedimentation in surface waters. Turbidity in downstream water bodies may increase due to the increase in impervious surface area. Overall, once Design Pollution Prevention and Treatment pollution BMPs are properly designed, implemented, and maintained, impacts related to substantial erosion, siltation, or flooding would be less than significant.

e) Less Than Significant Impact. As stated previously, the Build Alternative represents a 5.83 ac increase in impervious surface over existing conditions due to new roadway area, interchanges, and bridges, as well as an alteration of drainage patterns on roadways. This permanent increase in impervious surface area will result in a permanent increase in runoff and pollutant loading by increasing peak loads and runoff volumes, in turn increasing the potential for erosion and sedimentation in surface waters. Contaminants in the runoff from the widened roadway could include sediments, oils, grease, and metals, similar to existing contaminants within the study area. Targeted Design Constituents are defined in the Caltrans NPDES Permit as pollutants that are expected to be generated by the proposed project and may "cause a condition of pollution or nuisance due to the discharge of excessive amounts, proximity to receiving waters," or their properties, or may cause the impairment of Section 303(d) listed receiving waters. Targeted Design Constituents anticipated to be generated by the proposed project include copper, lead, pesticides, and nutrients. As required by the Caltrans NPDES Permit, the proposed project is required to prepare a Storm Water Data Report (SWDR) and evaluate the project for the feasibility of Treatment BMPs that will be implemented during construction to the maximum extent practicable. The SWDR will document the Caltrans-approved Treatment BMPs that will treat the Targeted Design Constituents listed above. Also included as a project element is the incorporation of Design Pollution Prevention BMPs that include the preservation of existing vegetation and slope and surface protection systems (e.g., permanent soil stabilization), as well as the use of 4:1 or flatter slopes. A new substantial source of pollutants would not be introduced, as the project is proposed to accommodate existing uses. Turbidity in downstream water bodies may increase due to the increase in impervious surface area. Overall, once Treatment and Design Pollution Prevention BMPs are properly designed, implemented, and maintained, a less than significant impact related to the creation of runoff water that would exceed the capacity of existing or planned storm water drainage systems or substantial additional sources of polluted runoff would occur.

f) Less Than Significant Impact. As discussed in the responses to questions a) through e) above and in Section 2.8, the inclusion of project features and standard temporary and permanent BMPs intended to address potential impacts to water quality would minimize and prevent substantial degradation of water quality in general. Impacts would be less than significant.

g) No Impact. The proposed project is a highway improvement project and would add lanes and modify an interchange at an existing facility. The proposed project is not within a 100-year flood hazard area, and would not construct housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map (FIRM) or other flood hazard delineation map, nor would construction of such housing be reasonably foreseeable as a result of the project. No impact would occur.

h) No Impact. The study area is not within the 100-year flood hazard area, and therefore construction of the project would not place structures that would impede or redirect flood flows within a 100-year flood hazard area. No impact would occur.

i) No Impact. The proposed project involves addition of lanes and alteration of an interchange at an existing facility, and would not make alterations to a levee or dam. No work to be done during construction or operation of the Build Alternative would substantially alter the baseline conditions so as to expose people or structure to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam. No impact would occur.

j) Less Than Significant Impact. Seiches are large waves generated in enclosed bodies of waters, such as lakes, in response to ground shaking. Tsunamis are waves generated in large bodies of water as a result of fault displacement or major ground movement. There are no enclosed bodies of water near the study area and the Pacific Ocean is approximately 17.25 mi west of the study area. As a result, the existing potential risks related to tsunamis and seiches are considered negligible. Mudflows generally occur on steep slopes lacking sufficient vegetation. The study area is generally flat, and existing embankment slopes along the proposed project alignment are generally inclined 1.5:1 (horizontal:vertical) or flatter and are generally vegetated. Therefore, a less than significant impact would occur related to seiches, tsunamis, and mudflows.

3.1.10 Land Use and Planning

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Physically divide an established community?	☐	☐	☒	☐
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒	☐
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

3.1.10.1 CEQA Significance Determinations for Land Use and Planning

The potential for the Build Alternative to result in adverse impacts related to land use and planning was assessed in Sections 2.1, Land Use, and 2.3, Community Impacts, in this IS/EA. The following discussions are based on those analyses.

a) Less Than Significant Impact. The proposed project would add lanes and widen an existing freeway facility. Up to 20 residential and non-residential acquisitions would be needed to construct the project; however, the acquisitions would occur on the fringes of neighborhoods. Therefore, the proposed improvements would not result in the physical division of an established community.

b) Less Than Significant Impact. The Build Alternative would require the permanent conversion from current and planned land uses to transportation uses to accommodate the proposed project improvements. As shown in Table 2.1.4 in Section 2.1.1.4, the Build Alternative would result in the conversion of approximately 0.76 ac of land for commercial and services uses, approximately 1.24 ac of existing educational/institutional uses, approximately 0.57 ac of existing industrial uses, approximately 1.74 ac of existing single-family residential uses, approximately 0.08 ac of existing multi-family residential uses, approximately 0.13 ac of open space and recreation uses, approximately 0.002 ac of transportation, communications, and utility uses, and approximately 1.07 ac of vacant land, as identified in local General Plans. With the inclusion of the design options, the Build Alternative would result in the conversion of a slightly smaller overall amount of General Plan land uses

The local land use policy consistency analysis for the Build Alternative can be found in Table 2.1.3 in Section 2.1.4.1. The Build Alternative would be generally consistent with the applicable policies and objectives contained in the General Plans of the

Cities of Artesia and Cerritos, including those intended to improve regional transportation facilities, maximize the efficiency of the circulation system, and improve access to city streets. Changes to existing land use patterns along SR-91 and I-605 after implementation of the Build Alternative would not occur because these freeways are existing transportation facilities located in a highly developed area, and a limited number of acquisitions would occur. No amendments to the General Plans of the Cities of Artesia and Cerritos would be required. Therefore, a less than significant impact would occur, and no mitigation would be required.

c) No Impact. The project is not located within or near a Los Angeles County regional habitat linkage or wildlife corridor, existing or proposed significant ecological area, or adopted HCP, NCCP, or other approved local, regional, or State HCP. Therefore, no impact would occur.

3.1.11 Mineral Resources

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

3.1.11.1 CEQA Significance Determinations for Mineral Resources

The potential for the Build Alternative to result in adverse impacts related to mineral resources was assessed based on information from the Cities of Cerritos and Artesia General Plans.

a) No Impact. The General Plans of the Cities of Cerritos or Artesia and the CGS Map of the Aggregate Sustainability in California do not identify any known mineral resource deposits that would be of value to the region and the residents of the state within their respective city limits. Therefore, construction and operation of the proposed project would have no impact on any known mineral resources.

b) No Impact. The General Plans of the Cities of Cerritos and Artesia, the City of Artesia's Artesia Boulevard Corridor Specific Plan, land use maps for the Cities of Cerritos and Artesia, and the CGS Map of the Aggregate Sustainability in California do not identify or delineate any mineral resource recovery sites, locally-important or otherwise. Therefore, construction and operation of the proposed project would have no impact on any such site.

3.1.12 Noise

Would the project result in:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

3.1.12.1 CEQA Significance Determinations for Noise

The potential for the proposed project to result in significant noise impacts was assessed in the *Noise Study Report* (NSR) (2018) and *Noise Abatement Decision Report* (NADR) (2018), and in Section 2.13, Noise, of this IS/EA. The following discussion is based on those analyses.

a, c) Less Than Significant Impact. The Caltrans *Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects* (Noise Protocol) specifies the policies, procedures, and practices to be used by agencies that sponsor new construction or reconstruction of federal or federal-aid highway projects. The Noise Abatement Criteria (NAC) specified in the Noise Protocol are the same as those specified in 23 CFR 772. The FHWA NAC were established by considering hearing impairment, annoyance, sleep, and task interference or disturbance, and interference with speech communication. The Noise Protocol defines a noise increase as “substantial” when the predicted noise levels under build conditions exceed existing noise levels by 12 A-weighted decibels (dBA). For this CEQA analysis, which is independent of the 23 CFR 772 analysis contained in Section 2.13, Noise, the “substantial increase” of 12 dBA has been used as the “applicable standards of other agencies” referred to in checklist question a).

Noise analysis for projects under CEQA centers on whether the proposed project or the proposed noise abatement would result in significant adverse environmental effects. Whether an increase in future noise level would result in a significant effect for purposes of CEQA is determined by comparison of the existing noise level (the baseline environmental setting) to the predicted noise level with the project. The assessment entails looking at the setting of the noise impact and the perceptibility of the noise increase. Key considerations include the uniqueness of the setting, sensitive nature of the receptors, magnitude of the noise increase, number of residences affected, and the absolute noise level.

Future with-project noise levels for Horizon Year 2044 were modeled and are included in Tables B-1 through B-11 in Appendix B of this IS/EA. Generally, with-project noise increases over the existing conditions under the Build Alternative and all design options will be imperceptible (e.g., less than a 5 dBA increase in noise levels is considered not readily perceptible to the human ear[1]). Noise increases across all receptor locations and Build Alternative/options range from zero to four dBA. There is one residential location (receptor No. R-190) at which a perceptible (5 dBA) increase was projected to occur in the with-project condition over existing baseline conditions for the Build Alternative, the Build Alternative with Design Option 2 (Pioneer Boulevard L-9), and the Build Alternative with Design Option 4 (Diamond Ramps). A 5 dBA noise increase is not considered significant under CEQA. Additionally, this location contains three noise-sensitive receptors currently shielded from the freeway facility by an existing sound wall. The existing sound wall would be removed and reconstructed to accommodate widening of the freeway, and the replacement wall would reduce the noise increase at this receptor to, which is below the level of perceptibility by the human ear. Therefore, under CEQA, there would be no substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project. Impacts would be less than significant, and no mitigation is required.

b) Less Than Significant Impact. For purposes of determining significance under CEQA, the Caltrans *Transportation- and Construction-Induced Vibration Guidance Manual* (2013) shows that the vibration damage threshold for continuous/frequent

[1] Federal Highway Administration (FHWA). Highway Traffic Noise Analysis and Abatement Policy and Guidance. Website: https://www.fhwa.dot.gov/environment/noise/regulations_and_guidance/polguide/polguide02.cfm (accessed January 24, 2018).

intermittent sources is 0.25 peak particle velocity (PPV) inches per second (in/sec) for historic and old buildings, 0.3 PPV in/sec for old residential structures, and 0.5 PPV in/sec for new residential structures. The same manual shows the vibration annoyance potential criteria to be barely perceptible at 0.01 PPV in/sec, distinctly perceptible at 0.04 PPV in/sec, strongly perceptible at 0.1 PPV in/sec, and severe at 0.4 PPV in/sec. Both of these criteria for damage and annoyance were used to evaluate short-term, construction-related ground-borne vibration.

Because the rubber tires and suspension systems of trucks and other on-road vehicles provide vibration isolation, it is unusual for on-road vehicles to cause ground-borne noise or vibration problems. When on-road vehicles cause effects such as rattling of windows, the source is almost always airborne noise. Groundborne vibrations are mostly associated with passenger vehicles and trucks traveling on roadways with poor conditions such as potholes, bumps, expansion joints, or other discontinuities in the road surface. Smoothing the bump or filling the pothole will usually solve the problem. As the proposed project will use new asphalt pavement followed with proper maintenance, there will be no potholes, bumps, expansion joints, or other discontinuities in the road surface that would generate ground-borne vibration or direct or indirect noise impacts from vehicular traffic traveling on SR-91.

Vibration generated by construction equipment can result in varying degrees of ground vibration, depending on the equipment. The operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings situated on soil near the active construction area respond to these vibrations, which range from imperceptible to low rumbling sounds with perceptible vibrations and slight damage at the highest vibration levels. Typically, construction-related vibrations do not reach vibration levels that would result in damage to nearby structures. However, old and fragile structures would require special consideration to avoid damage.

The proposed project may require the use of pile drivers and other heavy-tracked construction equipment during construction. The FTA, in its *Transit Noise and Vibration Impact Assessment* (2006), shows that a typical-impact pile driver would generate approximately 0.644 PPV in/sec when measured at 25 ft. It also shows that typical heavy-tracked construction equipment would generate approximately 0.003 to 0.089 PPV in/sec when measured at 25 ft.

The closest sensitive receptors are within 50 ft of project construction areas for the Build Alternative and design options, so therefore, potential pile-driving activities could be located approximately 50 ft from the closest residence. The closest residence would be subject to a vibration level of 0.3 PPV in/sec. This vibration level is considered to be strongly perceptible and would have the potential to damage residential structures that are considered old, such as many of the structures that could be exposed to these vibration levels during construction activities. Other construction equipment and activities would generate vibration levels much lower than those of pile driving and heavy-tracked construction equipment and would therefore result in lower vibration levels at adjacent receiver locations. A review of the structures evaluated for inclusion on the National Register of Historic Places (and thereby may be “considered old”) shows that none of these structures are residential in nature, and moreover, none are within 50 ft of potential pile-driving activities. Therefore, ground-borne vibration levels generated by the proposed project would be less than significant.

d) Less Than Significant Impact. As described in more detail in Section 2.13.3.1, two types of short-term noise impacts would occur during construction of the proposed project. Construction crew commute and equipment transportation would have the potential to result in a high single-event noise exposure to receptors at a maximum of 75 dBA maximum instantaneous noise level (L_{max}), due to trucks passing at 50 ft from the receptor. Noise generated during roadway construction would take a variety of forms and are generally categorized by work phase. Types of construction equipment and their actual maximum sound levels at 50 ft can be found in Table 2.13-9 in Section 2.13.3.1. Sensitive receptor locations may be subject to short-term noise higher than 86 dBA Lmax generated by construction activities along the project alignment. However, existing conditions within the project vicinity include the operation of the existing SR-91 freeway facility, and temporary noise impacts from the project would not dominate the noise environment. However, Project Feature PF-N-1 would control noise levels during construction between the hours of 9:00 p.m. and 6:00 a.m. to minimize construction noise impacts on sensitive land uses adjacent to the project site, as well as requiring internal combustion engines on the job site to be equipped with the appropriate manufacturer-recommended muffler. With the incorporation of this project feature, impacts would be less than significant, and no mitigation is required.

e) No Impact. The study area is not located within an airport land use plan, nor is it within 2 mi of a public airport or public use airport. The nearest public airport is the

Long Beach Airport (Daugherty Field), approximately 4.5 mi southwest of the study area. The project would not result in the exposure of people residing or working in the project area to excessive noise levels. No impact would occur.

f) No Impact. The project is not within the vicinity of a private airstrip and would not result in a safety hazard for persons residing or working within the project area.

3.1.13 Population and Housing

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☒	☐
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☒	☐

3.1.13.1 CEQA Significance Determinations for Population and Housing

The potential for the Build Alternative to result in adverse impacts related to population and housing was assessed in the *Relocation Impact Report* (2018), and Sections 2.2, Growth, and 2.3, Community Impacts, of this IS/EA. The following discussions are based on those analyses.

a) No Impact. As discussed in detail in Section 2.2 of this IS/EA, the Build Alternative proposes only improvements to an existing freeway facility and intends to accommodate projected growth that is already expected to occur with or without the project (3 percent for the City of Cerritos and 8 percent for the City of Artesia by 2040 as projected by the SCAG 2016–2040 RTP/SCS Final Growth Forecasts). The proposed project is located in a highly urbanized and built-out area, with little land available for new development, and the proposed improvements do not provide a new transportation facility or provide access to previously inaccessible areas. Although the improvements made to alleviate congestion and enhance the capacity of the existing facilities could make growth in the study area more attractive, a number of development projects were proposed and approved prior to the initiation of the planning studies for the proposed project. This indicates that development in the study area cities is not dependent or otherwise related to the completion of this transportation project. Table 2.18.1 in Section 2.18, Cumulative Impacts, provides a status of developments proximate to the study area. These developments would presumably be developed with or without the proposed project. Therefore, the project would not influence the rate, type, or amount of growth that would otherwise occur, and reasonably foreseeable growth that is anticipated to occur in the study area is not project-related. The project would not induce substantial population growth, either directly or indirectly. No impact would occur.

b, c) Less Than Significant Impact. According to the *Relocation Impact Report* (2018) and as described in Section 2.3.2, Relocations and Real Property Acquisition, the Build Alternative (as well as all design options except Design Option 1 [Reduced Lane/Shoulder Width]) would result in the displacement of 18 residential units and approximately 80 residents. This estimate was determined based on an average of 4.42 persons per household according to the American Community Survey (ACS) 2015 Estimates (utilizing the average of the three average household size figures of the applicable census tract block groups in the displacement area). The displaced properties are entirely single-family residences. The replacement area is defined as the local area where residential and business displacees would likely secure replacement sites. Generally, displacees prefer to remain in existing school systems and their immediate familial and cultural settings. The communities within the replacement area are located within the boundaries of the existing school district, ABC Unified School District (ABCUSD), which serves the city of Artesia, most of the cities of Cerritos and Hawaiian Gardens, the portion of the city of Lakewood east of the San Gabriel River, as well as small portions of the cities of Long Beach, Norwalk, and La Mirada. The replacement neighborhoods are generally located less than 3 mi from the displacement areas and are homogenous to the displacement areas. They are comparable in terms of amenities, public utilities, and accessibility to public services, transportation, and shopping.

Currently there are a limited number of available properties for sale within the specific displacement neighborhood. Therefore, adjacent neighborhoods within the ABCUSD boundaries were also analyzed for replacement housing availability. The results of the analysis indicated that there are affordable replacement properties within the identified replacement areas, but there could be relocation problems for displacees as a result of overcrowded residences, higher rents, real estate market competition, among other issues. Therefore, a longer timeline to vacate properties may be required, and Last Resort Housing Program payments may be required to relocate residential households being displaced. The construction of replacement housing under the Last Resort Housing Program would not be required, because there are adequate availability of replacement properties with similar purchase prices and amenities as the displaced properties, and there are currently no scheduling constraints for the project related to replacement housing. Therefore, as the project does not displace substantial numbers of people or housing, and the construction of replacement housing would not be required, this impact would be less than significant and no mitigation is required.

3.1.14 Public Services

	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
i) Fire protection?	☐	☐	☒	☐
ii) Police protection?	☐	☐	☒	☐
iii) Schools?	☐	☐	☒	☐
iv) Parks?	☐	☐	☒	☐
v) Other public facilities?	☐	☐	☒	☐

3.1.14.1 CEQA Significance Determinations for Public Services

The potential for the Build Alternative to impact public services and facilities is assessed in the *Utility Impacts and Relocation Report* (2018) and Sections 2.1, Land Use, and 2.4, Utilities and Emergency Services, in this IS/EA. The following discussions are based on those analyses.

a) i, ii) Less Than Significant Impact. Potential impacts to fire and police protection response times due to construction activity may occur due to traffic diversion resulting from temporary closures to local roadways, sidewalks, and bikeways, and freeway lanes, and would be addressed by Project Feature PF-T-1, provided in Section 2.5.3.2. Project Feature PF-T-1 provides for a TMP to be developed in detail during final design and include elements intended to reduce traveler delays and enhance traveler safety during project construction. Project Feature PF-UES-2, provided in Section 2.4.2.1, would require the construction contractor to coordinate all temporary mainline, ramp, and arterial roadway closures and detour plans with law enforcement, fire protection, and emergency medical service providers to minimize temporary delays in emergency response times, including identification of alternate routes. With the inclusion of these project features, acceptable service ratios, response times, and other performance objectives for fire and police protection would be maintained, and the provision of new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, would not be necessary. Impacts would be less than significant, and no mitigation is necessary.

a) iii, iv, and v) Less Than Significant Impact. No schools, parks, or other public facilities would be substantially impacted or displaced by construction or operation of the proposed project and so current acceptable service ratios of these resources would be maintained. In addition, and as discussed in more detail in Section 2.2, Growth, the proposed project is planned to accommodate existing and planned growth in the study area and would not induce growth that would require the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives. Impacts would be less than significant, and no mitigation is necessary.

3.1.15 Recreation

	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

3.1.15.1 CEQA Significance Determinations for Recreation

The potential for the Build Alternative to adversely impact recreation resources was assessed in Section 2.1, Land Use, in this IS/EA. The following discussions are based on the findings of that analysis.

a) Less Than Significant Impact. As described in more detail in Section 2.2, Growth, the proposed project would is located within an existing highly urbanized area, and would not provide accessibility to a previously inaccessible area or provide a new transportation facility. Rather, the project would help alleviate existing and forecasted traffic volumes and improve operations on SR-91, I-605, and surrounding arterials. Growth is not a reasonably foreseeable outcome of the proposed project, and therefore, an increase in the use of existing neighborhood and/or regional parks or other recreational facilities such that substantial physical deterioration of the facility would not occur or be accelerated. In addition, although the project would require small temporary acquisitions for TCEs at three park or recreational facilities and small permanent acquisitions at five park or recreational facilities, these acquisitions would occur at the peripheries of the facilities and would not contribute to the deterioration of the facilities or inhibit the facility’s ability to function normally. Impacts would be less than significant and no mitigation is required.

b) No Impact. Please also refer to the response given for checklist question a) above. The proposed project consists of improvements to an existing freeway facility and does not include the construction or expansion of recreational facilities which might have an adverse physical effect on the environment. No impact would occur.

3.1.16 Transportation/Traffic

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☒	☐
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
e) Result in inadequate emergency access?	☐	☐	☒	☐
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☒	☐

3.1.16.1 CEQA Significance Determinations for Transportation/Traffic

The potential for Build Alternative to result in adverse traffic impacts was assessed in the *Traffic Operations Analysis Report* (2018) and in Section 2.5, Traffic and Transportation/Pedestrian and Bicycle Facilities, in this IS/EA. The following discussions are based on those analyses.

a) Less Than Significant Impact. The analysis evaluation criteria used to determine acceptable traffic operation conditions are based on the level of service (LOS) policies identified by Caltrans. Caltrans strives for freeway facilities to operate at either LOS C or D. Based on Caltrans policy, LOS D was used as the threshold for the freeway facilities analysis. Any future freeway facilities projected to operate at an unacceptable LOS (LOS E or F) would be considered to be significantly impacted and require mitigation, as follows:

- Degrade the LOS on the freeway facility from LOS D to LOS E or F, or
- Impact (worsen) a facility that is already operating at an unacceptable LOS (E or F) when compared to the 2016 Baseline (and is not projected to operate at unacceptable LOS under the Future No Build Alternative scenario, indicating that the degradation in LOS is attributable to the proposed project)

In addition to freeway facilities, six local study area intersections were also analyzed utilizing *Highway Capacity Manual* (HCM) 2010 methodology. Intersections would be impacted if they are projected to operate at an unacceptable LOS (E or F) under the Build Alternative (and are not projected to operate at unacceptable LOS under the No Build Alternative scenario, indicating that the degradation in LOS is attributable to the proposed project).

The traffic analysis evaluated the existing baseline conditions (2016) as well as two future scenarios: the Opening Year (2024) and the Horizon Year (2044), for the Build Alternative and design options, as well as the No Build Alternative.

As shown in Table 2.5.6 provided in Section 2.5.4, some freeway segments experience a worsening of LOS (from LOS C to LOS D) in the p.m. peak hour when compared to existing baseline conditions, including the segments from Carmenita Road off-ramp to 183rd Street on-ramp and from Artesia Boulevard off-ramp to Artesia Boulevard on-ramp, but other segments would experience an improvement from LOS D to LOS C when compared to existing baseline conditions, including the segments from Artesia Boulevard on-ramp to Bloomfield Avenue on-ramp and from Norwalk Boulevard off-ramp to Norwalk Boulevard Loop on-ramp. None of the segments analyzed for the Opening Year (2024) would experience a degradation in LOS to E or F.

Freeway weave and merge/diverge areas were also analyzed for the Opening Year (2024) and can be found in Tables 2.5.7 and 2.5.8 in Section 2.5.4. One segment experiences a degradation in LOS when compared to existing baseline conditions (183rd Street on-ramp to Artesia Boulevard off-ramp). During both the a.m. and p.m. peak hours, LOS at this weave segment would worsen from LOS C in the existing baseline condition to LOS D for both the 2024 Build Alternative and 2024 Build Alternative with Design Option 4 (Diamond Ramps). Similarly, the Artesia Boulevard on-ramp merge junction LOS would worsen slightly from LOS C in the existing baseline condition to LOS D in both the 2024 Build Alternative and 2024 Build Alternative with Design Option 4 (Diamond Ramps) scenarios. However, none of the weave and merge/diverge areas analyzed for the Opening Year (2024) would experience a degradation in LOS to E or F.

Intersection LOS analysis for the Opening Year (2024) can be found in Table 2.5.9. Some intersections experience a worsening of LOS in the Opening Year (2024) when compared to existing baseline conditions. For example, in the a.m. peak period, the Studebaker Road/WB SR-91 off-ramp would operate at LOS C under the 2024 Build Alternative and 2024 Build Alternative with Design Option 4 (Diamond Ramps) scenarios compared to LOS B under the existing baseline condition. However, none of the analyzed intersections would experience a degradation of LOS to E or F in Opening Year (2024).

Freeway mainline LOS analysis for Horizon Year (2044) can be found in Table 2.5.10, in Section 2.5.4. Similar to the Opening Year (2024), some segments experience a worsening of LOS when compared to the existing baseline conditions. For example, during the p.m. peak hour, the freeway mainline segments from Carmenita Road off-ramp to 183rd Street on-ramp, Artesia Boulevard off-ramp to Artesia Boulevard on-ramp, and northbound I-605/westbound SR-91 loop on-ramp to southbound I-605/westbound SR-91 on-ramp, would experience a worsening in LOS from C to D when compared to the existing baseline conditions. An improvement in LOS from D to C also occurs during the p.m. peak hour for the freeway mainline segments between the Artesia Boulevard on-ramp to the Bloomfield Avenue off-ramp and the I-605 off-ramp (northbound and southbound) to the Studebaker Road off-ramp. No mainline freeway segments are projected to degrade to LOS E or F in the Horizon Year (2044) under the Build Alternative or any design options when compared to the existing baseline condition.

The freeway weave and merge/diverge analyses for Horizon Year (2044) are contained in Tables 2.5.11 and 2.5.12 in Section 2.5.4. During both the a.m. and p.m. peak hours, the LOS of the weave segment between the 183rd Street on-ramp to Artesia Boulevard off-ramp would worsen from LOS C in existing conditions to LOS D under the 2044 Build Alternative and 2044 Build Alternative with Design Option 4 (Diamond Ramps). Also similarly to the Opening Year 2024 conditions, the merge junction at the Artesia Boulevard on-ramp would worsen to LOS D under the 2044 Build Alternative and 2044 Build Alternative with Design Option 4 (Diamond Ramps) scenarios when compared to existing baseline conditions (LOS C). However, during the p.m. peak hour, the Studebaker Road off-ramp diverge area would experience an improvement in LOS under the 2044 Build Alternative and 2044 Build

Alternative with Design Option 4 (Diamond Ramps) scenarios when compared to the existing baseline conditions (from LOS D to LOS C). No weave or merge/diverge areas would degrade to LOS E or F in the Horizon Year (2044) Build Alternative or any design option scenario when compared to the existing baseline condition.

Table 2.5.13 in Section 2.5.4 illustrates the intersection LOS analysis for Horizon Year (2044). In both the a.m. and p.m. peak hours, the Studebaker Road/WB SR-91 off-ramp would experience a worsening of LOS when compared to existing baseline conditions (from LOS B to LOS C during a.m. peak hour, and from LOS A to LOS B during p.m. peak hour). However, no intersections are projected to degrade to LOS E or F in the Horizon Year (2044) Build Alternative or any design option scenario when compared to the existing baseline condition.

Because no freeway mainline segments, weave, merge/diverge areas, or intersections would degrade to LOS E or F in any future with-project condition when compared to the existing baseline condition, impacts would be less than significant and no mitigation is necessary.

b) Less Than Significant Impact. As the Congestion Management Agency for the County of Los Angeles, the Los Angeles County Metropolitan Transportation Authority (Metro) is responsible for implementing the Congestion Management Program (CMP). As identified in the CMP, the County of Los Angeles LOS standard is LOS E, except where base year (for the 2010 CMP, the base year has been identified as 1992) LOS is worse than E, in which case the base year LOS is the standard. Please refer to the response to checklist question a) above. No freeway mainline segments, weave, merge/diverge areas, or intersections would degrade to LOS E or F in any future with-project condition when compared to the existing baseline condition, impacts would be less than significant and no mitigation is necessary.

c) No Impact. The proposed project would add mixed flow and auxiliary lanes to an existing freeway facility as well as make modifications to interchanges, and would not result in any change in air traffic patterns that would result in either an increase in traffic levels or a change in location that results in substantial safety risks.

d) Less Than Significant Impact. The proposed project would add mixed flow and auxiliary lanes to an existing freeway facility as well as make modifications to interchanges. No features that would substantially increase hazards, such as a sharp curve or dangerous intersection, would be included in the project design, as the project would be designed and constructed to the standards as specified in the HDM (Caltrans 2017). Any mandatory or advisory design exceptions to these standards would be required to proceed through an approval process. These design exceptions are outlined in Section 1.3.3.1. Additionally, the proposed project would correct some existing nonstandard features that are inconsistent with the HDM, including (but not limited to) stopping sight distance, superelevation and transition, ramp curvature, and lane and shoulder width. The project would also not introduce any incompatible uses to the facility; it would remain a controlled-access highway in the same manner as it currently exists.

e) Less Than Significant Impact. During construction of the proposed project, some impairment to the delivery of emergency services, including fire and police response times, may occur due to limited lane closures on the mainline, ramps and arterials. Detour routes would be provided to direct traffic around any mainline or ramp closures using the local arterial street network. Emergency services providers (including the local fire and police departments and California Highway Patrol) could experience these travel delays when traveling to/from emergency scenes during these closures. Project Feature PF-UES-2, in Section 2.4.2.1, addressing coordination with emergency service providers regarding closures and alternative routes, and Project Feature PF-T-1, in Section 2.5.3.2, providing for development and implementation of a TMP during construction, would minimize potential impacts to emergency access. Because the proposed project would not remove access points to or from the freeway facility, no impacts to emergency access would occur during operation of the project. Overall, impacts would be less than significant.

f) Less Than Significant Impact. As discussed in the Section 2.1, Land Use, in this IS/EA, the Build Alternative would not conflict with adopted policies, plans, or programs supporting alternative transportation modes. The design of the freeway and ramp improvements in the Build Alternative would accommodate public and private buses. The improvements to arterials at their crossings of SR-91 would be designed to accommodate transit vehicles, pedestrians, and bicyclists. The arterial improvements would also include features consistent with Americans with Disabilities Act requirements. As a result, the Build Alternative would not conflict with alternative transportation modes. No mitigation is required.

3.1.17 Tribal Cultural Resources

Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☐	☐	☒
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☐	☒

3.1.17.1 CEQA Significance Determinations for Tribal Cultural Resources

The potential for Build Alternative to adversely impact Tribal Cultural Resources was assessed in the HPSR (2018), the attachments to the HPSR, Section 2.7, Cultural Resources; and through tribal consultation as required by AB 52. AB 52 went into effect on July 1, 2015, and introduced a new class of resources into the CEQA analysis: Tribal Cultural Resources. The California Office of Administrative Law approved the changes to the CEQA Checklist to incorporate the Tribal Cultural Resources Questions on September 27, 2016. The proposed project is subject to the requirements of AB 52, the CEQA Tribal Consultation law. As such, additional Native American coordination under AB 52 was initiated by Caltrans in May 2017. Details on this coordination and copies of the correspondence is provided in Chapter 4, Comments and Coordination, of this IS/EA. The tribes and representatives contacted per the requirements of AB 52 include the NAHC (Gayle Totton, Associate Governmental Program Analyst), Gabrieleño Band of Mission Indians – Kizh Nation (Andrew Salas, Chairperson), Gabrieleño/Tongva San Gabriel Band of Mission Indians (Anthony Morales, Chairperson), Gabrielino/Tongva Nation (Sandonne Goad, Chairperson), Gabrielino Tongva Indians of California Tribal Council (Robert F. Dorame, Chairperson), Gabrielino-Tongva Tribe (Linda Candelaria, Co-Chairperson), Juaneño Band of Mission Indians Acjachemen Nation – Belardes (Matias Belardes, Chairperson, and Joyce Perry, Tribal Manager). An initial project notification letter was sent as well as follow up contact via phone and/or email.

During a follow-up phone call, Mr. Morales of the Gabrieleño/Tongva San Gabriel Band of Mission Indians asked to be informed of the recommendations for monitoring and recommended that a monitor from his group specifically be present. Ms. Perry of the Juaneño Band of Mission Indians Acjachemen Nation – Belardes indicated on a follow-up phone call that her group does not have any concerns regarding the proposed project work. No other responses were received from the tribes contacted. Further detail of the tribal coordination process subject to the requirements of AB 52 can be found in Chapter 4, Comments and Coordination.

a) No Impact. Six properties were identified as falling within the APE requiring formal evaluation for the California Register of Historical Resources (California Register). No archaeological resources were identified within the APE through archival research, Native American Consultation, or field survey. All six of these properties are built environment resources, and none of them are listed in a local register of historical resources or that have been identified as significant in a historical resources survey. None of these resources appear to be eligible for the California Register. Therefore, the proposed project would have no impact on a tribal cultural resource that is listed or eligible for listing on the California Register or in a local register of historical resources as defined in PRC Section 5020.1(k).

b) No Impact. Based on the information provided above in the response to question a), as well as the results of AB 52 tribal coordination summarized above and outlined in more detail in Chapter 4, Comments and Coordination, there would be no impact to a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of PRC Section 5024.1, or a resource considered significant to a California Native American tribe, as a result of the proposed project.

3.1.18 Utilities and Service Systems

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☒	☐
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

3.1.18.1 CEQA Significance Determinations for Utilities and Service Systems

The potential for the Build Alternative to adversely impact utilities and service systems was assessed in Section 2.4, Utilities and Emergency Services, in this IS/EA. The following discussions are based on those analyses.

a) Less Than Significant Impact. The proposed project would reconstruct and incrementally expand storm water treatment facilities that currently exist to serve the existing SR-91. The project is required to meet the requirements of the SWRCB NPDES CGP, along with any other permits deemed necessary that may be issued by the State or Los Angeles RWQCB. Because there are already existing storm water treatment facilities serving the existing SR-91, and the expansion of said facilities under the Build Alternative would be minor, there would not be a significant increase in wastewater treatment requirements under the Build Alternative, and the project would incorporate project features to address potential water quality impacts and standard BMPs for construction and operation. No mitigation is necessary.

b, c) Less Than Significant Impact. The proposed project would reconstruct and incrementally expand storm water treatment facilities that currently exist to serve the existing SR-91 as part of the project description. The environmental impacts of that expansion is analyzed and discussed in Section 2.8, Water Quality. The construction of these facilities would not have significant environmental effects. BMPs would be employed both during construction and operation to avoid and minimize impacts to water quality, and impacts would be less than significant. No mitigation is necessary.

d, e, f) No Impact. The proposed project is a highway improvement project and would not require a substantially greater water supply, wastewater treatment facilities, or landfill accommodation during construction or operation. An increase of water supply entitlements, increased wastewater treatment capacity, or landfill capacity will not be necessary; therefore, no impact would occur.

g) No Impact. The proposed project is a highway improvement project and would not conflict with federal, state, or local statutes and regulations related to solid waste. No impact would occur.

3.1.19 Mandatory Findings of Significance

	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☒	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☒	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

3.1.19.1 CEQA Significance Determinations for Mandatory Findings of Significance

a) Less Than Significant Impact. As described in more detail in the various resource sections contained in Chapter 2 of this IS/EA, the proposed project consists of modifications to an existing freeway facility within a highly urbanized area. With appropriate project features and measures contained within the various sections of Chapter 2 that address potential impacts to the quality of the environment, the project would not cause degradation of the quality of the environment. As there is little to no suitable fish or wildlife habitat in the highly urbanized study area, the project would not substantially reduce such habitat. Therefore, there is no correlative impact to fish or wildlife populations that would cause any populations to drop below self-sustaining levels. As discussed in more detail in Section 2.15, Plant Species, and 2.16, Animal Species, the project would not result in permanent impacts to any federally or State-listed special status plant or animal species of concern. Any temporary impacts to day-roosting bats, fully protected raptors, special-status bird species, and other nesting birds protected by the MBTA or the California Fish and Game Code, as well as any southern steelhead that may occur in existing downstream suitable habitat, would be avoided and minimized with the incorporation of project features PF-BIO-1 through PF-BIO-12. There are no species listed or proposed for listing as threatened or endangered occurring within the study area. Similarly, there are no known important examples of the major periods of California history or prehistory that would be eliminated by construction and operation of the project, and any potential impacts to currently unknown paleontological resources would be addressed by incorporation of Project Feature PF-PAL-1, which would implement a PMP. Therefore, impacts would be less than significant, and no mitigation is necessary.

b) Less Than Significant. Cumulative impacts were assessed by looking at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor but collectively substantial impacts taking place over a period of time. As described in detail in Section 2.18, Cumulative Impacts, potential cumulative impacts are presented by environmental resource area, and reasonably foreseeable actions and projects discussed in that section can be found in Table 2.18.1 and are shown geographically on Figure 2.18-1. In general, for all resource areas, impacts resulting from the project would not be adverse and, therefore, not cumulatively considerable. Therefore, impacts would be less than significant and no mitigation is required.

c) Less Than Significant Impact. Because of the nature of the project (the addition of lanes to an existing freeway facility) and the highly urbanized setting, and taking into account the impact analyses detailed in Chapter 2 of this IS/EA and the CEQA significance determinations included in this chapter, none of the environmental effects resulting from the project would have a substantial adverse effects on human beings, either directly or indirectly. Impacts would be less than significant, and no mitigation is necessary.

3.1.20 Climate Change

Climate change refers to long-term changes in temperature, precipitation, wind patterns, and other elements of the earth's climate system. An ever-increasing body of scientific research attributes these climatological changes to greenhouse gas (GHG) emissions, particularly those generated from the production and use of fossil fuels.

While climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations and World Meteorological Organization in 1988 has led to increased efforts devoted to GHG emissions reduction and climate change research and policy. These efforts are primarily concerned with the emissions of GHGs generated by human activity, including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), tetrafluoromethane, hexafluoroethane, sulfur hexafluoride (SF_6), HFC-23 (fluoroform), HFC-134a (1,1,1,2-tetrafluoroethane), and HFC-152a (difluoroethane).

In the U.S., the main source of GHG emissions is electricity generation, followed by transportation.[1] In California, however, transportation sources (including passenger cars, light-duty trucks, other trucks, buses, and motorcycles) are the largest contributors of GHG emissions.[2] The dominant GHG emitted is CO_2, mostly from fossil fuel combustion.

Two terms are typically used when discussing how we address the impacts of climate change: “greenhouse gas mitigation” and “adaptation.” Greenhouse gas mitigation covers the activities and policies aimed at reducing GHG emissions to limit or “mitigate” the impacts of climate change. Adaptation, on the other hand, is concerned with planning for and responding to impacts resulting from climate change (e.g., adjusting transportation design standards to withstand more intense storms and higher sea levels).

3.1.20.1 Regulatory Setting

This section outlines federal and State efforts to comprehensively reduce GHG emissions from transportation sources.

Federal

To date, no national standards have been established for nationwide mobile-source GHG reduction targets, nor have any regulations or legislation been enacted specifically to address climate change and GHG emissions reduction at the project level.

NEPA (42 USC Part 4332) requires federal agencies to assess the environmental effects of their proposed actions prior to making a decision on the action or project.

1 United States Environmental Protection Agency. 2017. U.S. Greenhouse Gas Inventory Report: 1990–2014 (last updated February 23, 2017). Website: https://www.epa.gov/ghgemissions/us-greenhouse-gas-inventory-report-1990-2014.

2 California Air Resources Board (ARB). 2017. California Greenhouse Gas Emission Inventory. 2017 Edition. Website: https://www.arb.ca.gov/cc/inventory/data/data.htm.

The FHWA recognizes the threats that extreme weather, sea-level change, and other changes in environmental conditions pose to valuable transportation infrastructure and those who depend on it. FHWA therefore supports a sustainability approach that assesses vulnerability to climate risks and incorporates resilience into planning, asset management, project development and design, and operations and maintenance practices.[1] This approach encourages planning for sustainable highways by addressing climate risks while balancing environmental, economic, and social values—"the triple bottom line of sustainability."[2] Program and project elements that foster sustainability and resilience also support economic vitality and global efficiency, increase safety and mobility, enhance the environment, promote energy conservation, and improve the quality of life. Addressing these factors up front in the planning process will assist in decision-making and improve efficiency at the program level, and will inform the analysis and stewardship needs of project-level decision-making.

Various efforts have been promulgated at the federal level to improve fuel economy and energy efficiency to address climate change and its associated effects.

The Energy Policy Act of 1992 (EPACT92, 102nd Congress H.R.776.ENR): With this act, Congress set goals, created mandates, and amended utility laws to increase clean energy use and improve overall energy efficiency in the United States. EPACT92 consists of 27 titles detailing various measures designed to lessen the nation's dependence on imported energy, provide incentives for clean and renewable energy, and promote energy conservation in buildings. Title III of EPACT92 addresses alternative fuels. It gave the U.S. Department of Energy administrative power to regulate the minimum number of light-duty alternative fuel vehicles required in certain federal fleets beginning in fiscal year 1993. The primary goal of this Program is to cut petroleum use in the United States by 2.5 billion gallons per year by 2020.

Energy Policy Act of 2005 (109th Congress H.R.6 (2005–2006): This act sets forth an energy research and development program covering: (1) energy efficiency; (2)

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1 Federal Highway Administration (FHWA). 2017. Sustainability (last updated October 19, 2017). Website: https://www.fhwa.dot.gov/environment/sustainability/resilience/.

2 FHWA. Sustainable Highways Initiative. Website: https://www.sustainablehighways.dot.gov/overview.aspx.

renewable energy; (3) oil and gas; (4) coal; (5) Indian energy; (6) nuclear matters and security; (7) vehicles and motor fuels, including ethanol; (8) hydrogen; (9) electricity; (10) energy tax incentives; (11) hydropower and geothermal energy; and (12) climate change technology.

Energy Policy and Conservation Act of 1975 (42 USC Section 6201) and Corporate Average Fuel Standards: This act establishes fuel economy standards for on-road motor vehicles sold in the United States. Compliance with federal fuel economy standards is determined through the Corporate Average Fuel Economy (CAFE) program on the basis of each manufacturer's average fuel economy for the portion of its vehicles produced for sale in the United States.

The Environmental Protection Agency's (EPA's) authority to regulate GHG emissions stems from the U.S. Supreme Court decision in *Massachusetts* v. *EPA* (2007). The Supreme Court ruled that GHGs meet the definition of air pollutants under the existing Clean Air Act and must be regulated if these gases could be reasonably anticipated to endanger public health or welfare. Responding to the Court's ruling, the EPA finalized an endangerment finding in December 2009. Based on scientific evidence it found that six GHGs constitute a threat to public health and welfare. Thus, it is the Supreme Court's interpretation of the existing Act and EPA's assessment of the scientific evidence that form the basis for EPA's regulatory actions.

The EPA in conjunction with the National Highway Traffic Safety Administration (NHTSA) issued the first of a series of GHG emission standards for new cars and light-duty vehicles in April 2010[1] and significantly increased the fuel economy of all new passenger cars and light trucks sold in the United States. The standards required these vehicles to meet an average fuel economy of 34.1 miles per gallon by 2016. In August 2012, the federal government adopted the second rule that increases fuel economy for the fleet of passenger cars, light-duty trucks, and medium-duty passenger vehicles for model years 2017 and beyond to average fuel economy of 54.5 miles per gallon by 2025. Because NHTSA cannot set standards beyond model year 2021 due to statutory obligations and the rules' long timeframe, a mid-term evaluation is included in the rule. The Mid-Term Evaluation is the overarching process by which NHTSA, EPA, and ARB will decide on CAFE and GHG emissions standard stringency for model years 2022–2025. NHTSA has not formally adopted

1 https://one.nhtsa.gov/Laws-&-Regulations/CAFE-%E2%80%93-Fuel-Economy, accessed March 15, 2018..

standards for model years 2022 through 2025. However, the EPA finalized its mid-term review in January 2017, affirming that the target fleet average of at least 54.5 miles per gallon by 2025 was appropriate. In March 2017, President Trump ordered the EPA to reopen the review and reconsider the mileage target.[1,2]

NHTSA and EPA issued a Final Rule for "Phase 2" for medium- and heavy-duty vehicles to improve fuel efficiency and cut carbon pollution in October 2016. The agencies estimate that the standards will save up to 2 billion barrels of oil and reduce CO_2 emissions by up to 1.1 billion metric tons over the lifetimes of model year 2018–2027 vehicles.

State

With the passage of legislation including State Senate and Assembly Bills and Executive Orders, California has been innovative and proactive in addressing GHG emissions and climate change.

- **Assembly Bill 1493, Pavley Vehicular Emissions: Greenhouse Gases, 2002:** This bill requires the California ARB to develop and implement regulations to reduce automobile and light truck GHG emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009-model year.
- **Executive Order S-3-05 (June 1, 2005):** The goal of this EO is to reduce California's GHG emissions to: (1) year 2000 levels by 2010, (2) year 1990 levels by 2020, and (3) 80 percent below year 1990 levels by 2050. This goal was further reinforced with the passage of AB 32 in 2006 and SB 32 in 2016.

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1 NBC News. 2017. Websites: http://www.nbcnews.com/business/autos/trump-rolls-back-obama-era-fuel-economy-standards-n734256, and Federal Register 14671. Website: https://www.federalregister.gov/documents/2017/03/22/2017-05316/notice-of-intention-to-reconsider-the-final-determination-of-the-mid-term-evaluation-of-greenhouse.

2 *Federal Register*. 2017. Notice of Intention to Reconsider the Final Determination of the Mid-Term Evaluation of Greenhouse Gas Emissions Standards for model Year 2022–2025 Light Duty Vehicles. March 22. Website: https://www.federalregister.gov/documents/2017/03/22/2017-05316/notice-of-intention-to-reconsider-the-final-determination-of-the-mid-term-evaluation-of-greenhouse (accessed October 2017).

- **Assembly Bill 32 (AB 32), Chapter 488, 2006: Núñez and Pavley, The Global Warming Solutions Act of 2006:** AB 32 codified the 2020 GHG emissions reduction goals as outlined in EO S-3-05, while further mandating that ARB create a scoping plan and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." The Legislature also intended that the statewide GHG emissions limit continue in existence and be used to maintain and continue reductions in emissions of GHGs beyond 2020 (Health and Safety Code Section 38551(b)). The law requires ARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG reductions.
- **Executive Order S-01-07 (January 18, 2007):** This order sets forth the low carbon fuel standard (LCFS) for California. Under this EO, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by the year 2020. ARB re-adopted the LCFS regulation in September 2015, and the changes went into effect on January 1, 2016. The program establishes a strong framework to promote the low-carbon fuel adoption necessary to achieve the Governor's 2030 and 2050 GHG reduction goals.
- **Senate Bill 97 (SB 97), Chapter 185, 2007, Greenhouse Gas Emissions:** This bill requires the Governor's Office of Planning and Research (OPR) to develop recommended amendments to the *State CEQA Guidelines* for addressing GHG emissions. The amendments became effective on March 18, 2010.
- **Senate Bill 375 (SB 375), Chapter 728, 2008, Sustainable Communities and Climate Protection:** This bill requires ARB to set regional emissions reduction targets for passenger vehicles. The Metropolitan Planning Organization (MPO) for each region must then develop a "Sustainable Communities Strategy" (SCS) that integrates transportation, land-use, and housing policies to plan how it will achieve the emissions target for its region.
- **Senate Bill 391 (SB 391), Chapter 585, 2009, California Transportation Plan:** This bill requires the State's long-range transportation plan to meet California's climate change goals under AB 32.
- **Executive Order B-16-12 (March 2012):** This EO orders State entities under the direction of the Governor, including ARB, the California Energy Commission, and the Public Utilities Commission, to support the rapid commercialization of zero-emission vehicles. It directs these entities to achieve various benchmarks related to zero-emission vehicles.
- **Executive Order B-30-15 (April 2015):** This EO establishes an interim statewide GHG emission reduction target of 40 percent below 1990 levels by 2030 in order

to ensure California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050. It further orders all State agencies with jurisdiction over sources of GHG emissions to implement measures, pursuant to statutory authority, to achieve reductions of GHG emissions to meet the 2030 and 2050 GHG emissions reductions targets. It also directs ARB to update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent (MMT CO_2e). Finally, it requires the Natural Resources Agency to update the State's climate adaptation strategy, *Safeguarding California*, every 3 years, and to ensure that its provisions are fully implemented.

- **Senate Bill 32, (SB 32) Chapter 249, 2016:** This bill codifies the GHG reduction targets established in EO B-30-15 to achieve a mid-range goal of 40 percent below 1990 levels by 2030.

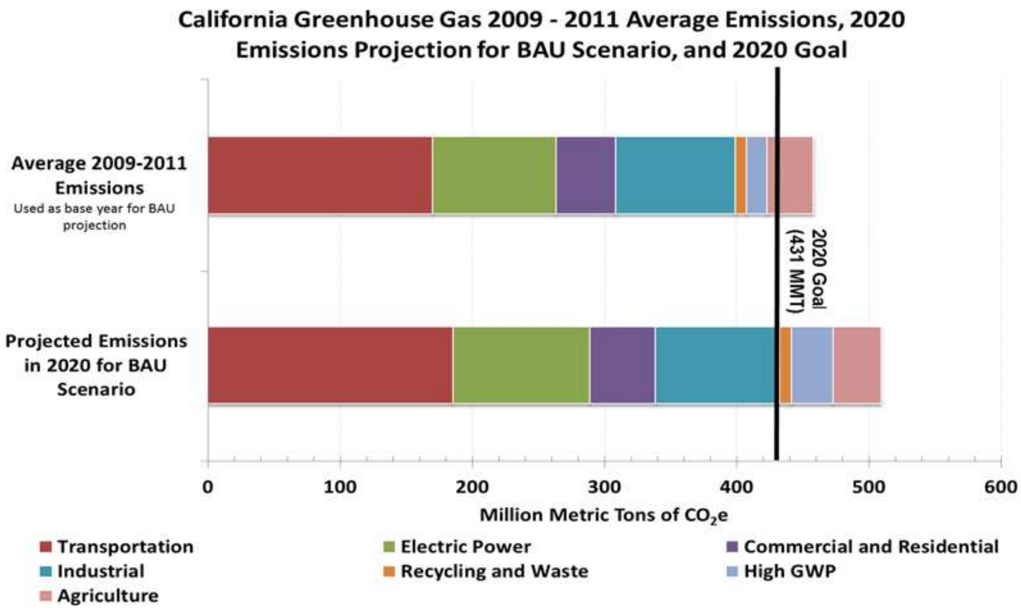
3.1.20.2 Environmental Setting

In 2006, the Legislature passed the California Global Warming Solutions Act of 2006 (AB 32), which created a comprehensive, multi-year program to reduce GHG emissions in California. AB 32 required ARB to develop a Scoping Plan that describes the approach California will take to achieve the goal of reducing GHG emissions to 1990 levels by 2020. The Scoping Plan was first approved by ARB in 2008 and must be updated every 5 years. The second updated plan, *California's 2017 Climate Change Scoping Plan*, adopted on December 14, 2017, reflects the 2030 target established in EO B-30-15 and SB 32.

The AB 32 Scoping Plan and the subsequent updates contain the main strategies California will use to reduce GHG emissions. As part of its supporting documentation for the updated Scoping Plan, ARB released the GHG inventory for California.[1] ARB is responsible for maintaining and updating California's GHG Inventory per Health and Safety Code Section 39607.4. The associated forecast/projection is an estimate of the emissions anticipated to occur in the year 2020 if none of the foreseeable measures included in the Scoping Plan were implemented.

An emissions projection estimates future emissions based on current emissions, expected regulatory implementation, and other technological, social, economic, and behavioral patterns. The projected 2020 emissions provided in Figure 3.2-1 represent

[1] ARB. 2017. California Greenhouse Gas Emission Inventory (Released June 2017). Website: https://www.arb.ca.gov/cc/inventory/data/data.htm.



Source: ARB. Greenhouse Gas Inventory. Website: https://www.arb.ca.gov/cc/inventory/data/bau.htm.

Figure 3.2-1 2020 Business as Usual (BAU) Emissions Projection 2014 Edition

a business-as-usual (BAU) scenario assuming none of the Scoping Plan measures are implemented. The 2020 BAU emissions estimate assists ARB in demonstrating progress toward meeting the 2020 goal of 431 MMT CO_2e.[1] The 2017 edition of the GHG emissions inventory (released in June 2017) found total California emissions of 440.4 MMT CO_2e, showing progress towards meeting the AB 32 goals.

The 2020 BAU emissions projection was revisited in support of the First Update to the Scoping Plan (2014). This projection accounts for updates to the economic forecasts of fuel and energy demand as well as other factors. It also accounts for the effects of the 2008 economic recession and the projected recovery.

The total emissions expected in the 2020 BAU scenario include reductions anticipated from Pavley I and the Renewable Electricity Standard (30 MMT CO_2e total). With these reductions in the baseline, estimated 2020 statewide BAU emissions are 509 MMT CO_2e.

[1] The revised target using Global Warming Potentials (GWP) from the IPCC Fourth Assessment Report (AR4).

3.1.20.3 Project Analysis

An individual project does not generate enough GHG emissions to significantly influence global climate change. Rather, global climate change is a cumulative impact. This means that a project may contribute to a potential impact through its *incremental* change in emissions when combined with the contributions of all other sources of GHG.[1] In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable" (*State CEQA Guidelines* Sections 15064(h)(1) and 15130). To make this determination, the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects to make this determination is a difficult, if not impossible, task.

GHG emissions for transportation projects can be divided into those produced during operations and those produced during construction. The following represents a best-faith effort to describe the potential GHG emissions related to the proposed project.

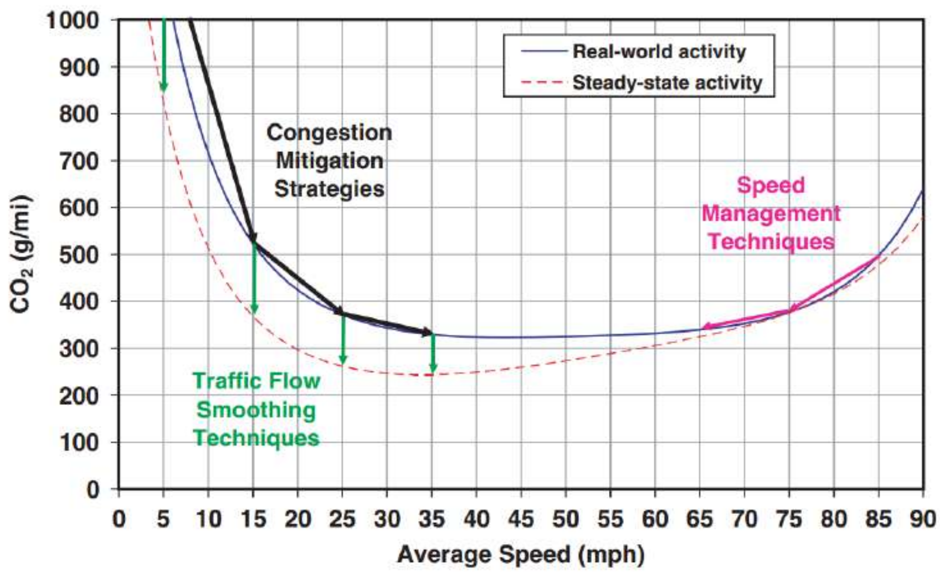
Operational Emissions

Four primary strategies can reduce GHG emissions from transportation sources: (1) improving the transportation system and operational efficiencies, (2) reducing travel activity, (3) transitioning to lower GHG-emitting fuels, and (4) improving vehicle technologies/efficiency. To be most effective, all four strategies should be pursued concurrently.

FHWA supports these strategies to lessen climate change impacts, which correlate with efforts that the State of California is undertaking to reduce GHG emissions from the transportation sector.

The highest levels of CO_2 from mobile sources such as automobiles occur at stop-and-go speeds (0–25 miles per hour) and speeds over 55 miles per hour; the most severe emissions occur from 0–25 miles per hour (see Figure 3.2-2). To the extent

[1] This approach is supported by the AEP: *Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate Change in CEQA Documents* (March 5, 2007), as well as the SCAQMD (Chapter 6: The CEQA Guide, April 2011), and the United States Forest Service (Climate Change Considerations in Project Level NEPA Analysis, July 13, 2009).



Source: Matthew Barth and Kanok Boriboonsomsin, University of California, Riverside (May 2010). Website: http://uctc.berkeley.edu/research/papers/846.pdf.

Figure 3.2-2 Possible Use of Traffic Operation Strategies in Reducing On-Road CO_2 Emissions

that a project relieves congestion by enhancing operations and improving travel times in high-congestion travel corridors, GHG emissions, particularly CO_2, may be reduced.

SCAG's 2016 RTP/SCS complies with the emission reduction targets established by the California Air Resources Board (ARB) and meets the requirements of SB 375 as codified in Government Code §65080(b) et seq. by achieving per capita GHG emission reductions relative to 2005 of 8 percent by 2020 and 18 percent by 2035, which meets or exceeds targets set by ARB. As required by SB 375, the SCS outlines growth strategies that better integrate land use and transportation planning and help reduce the State's GHG emissions from cars and light trucks. The proposed project is listed in Amendment #3 of the 2016 RTP/SCS (project ID: 1163S012), which can be found in Appendix E. The project will assist the region with its overall goals to reduce vehicle-related GHGs by relieving congestion and improving traffic flow, thereby reducing emissions. This is consistent with the RTP/SCS's identified strategies to manage congestion by maximizing the current system and ensuring it operates with maximum efficiency and effectiveness.

The 2016 RTP/SCS commits $6.9 billion toward transportation demand management (TDM) strategies and $9.2 billion for transportation systems management (TSM) improvements in the region. As described in Section 1.3.3, both TSM and TDM elements may be incorporated into the Build Alternative for the proposed project. Together, congestion management, TDM, and TSM strategies will all help the region achieve its goals of VMT and VHT reduction.

Quantitative Analysis

The regional vehicle miles traveled (VMT) for the Existing (2016), No Build Alternative, and Build Alternative were estimated using the daily traffic volumes included in the *Traffic Operations Analysis Report* (2018). The VMT data, along with the Caltrans Emissions Factor Model (CT-EMFAC2014) emission rates, were used to calculate and compare the CO_2 emissions for the 2016, 2024, and 2044 regional conditions.

The results of the modeling were used to calculate the CO_2 emissions listed in Tables 3.2.1 and 3.2.2. These tables show that both the future No Build and Build Alternatives would result in a net decrease in CO_2 emissions in 2024 and 2044, compared to the existing (2016) condition. The Build Alternative in both opening and horizon years would result in an increase in CO_2 emissions in the region when compared to the No Build Alternative in each year. The CO_2 emissions numbers in Tables 3.2.1 and 3.2.2 are only useful for a comparison between project alternatives. The numbers are not necessarily an accurate reflection of what the true CO_2 emissions would be because CO_2 emissions are dependent on other factors that are not part of the model (e.g., the fuel mix [EMFAC model emission rates are only for direct engine-out CO_2 emissions, not full fuel cycle; fuel cycle emission rates can vary dramatically depending on the amount of additives such as ethanol and the source of the fuel components], rate of acceleration, and the aerodynamics and efficiency of the vehicles).

Table 3.2.1 2024 Opening Year Greenhouse Gas Emissions and Vehicle Miles Traveled

Alternative	Annual VMT	CO_2 (MT/yr)	CH_4 (MT/yr)	CO_2e (MT/yr)
Existing (2016)	131,516,161	49,810	1.8	49,861
2024 No Build	109,391,887	36,938	1.0	36,966
Change from Existing (2016)	*-22,124,274*	*-12,872*	*-0.8*	-12,895
2024 Build Alternative	114,828,749	38,170	1.0	38,197
Change from Existing (2016)	*-16,687,412*	*-11,640*	*-0.9*	-11,664
Change from No Build	*5,436,862*	*1,232*	*0.0*	1,231

Source: *Air Quality Analysis* (2018).
Note: Totals may not appear to sum correctly due to rounding.
Caltrans = California Department of Transportation
CH_4 = methane
CO_2 = carbon dioxide
CO_2e = carbon dioxide equivalent
CT-EMFAC = Caltrans Emissions Factors Model
MT/yr = metric tons per year
VMT = vehicle miles traveled

Table 3.2.2 2044 Horizon Year Greenhouse Gas Emissions and Vehicle Miles Traveled

Alternative	Annual VMT	CO_2 (MT/yr)	CH_4 (MT/yr)	CO_2e (MT/yr)
Existing (2016)	131,516,161	49810	1.816	49,861
2044 No Build	109,391,887	29449	0.572	29,465
Change from Existing (2016)	-22,124,274	*-20361*	*-1.244*	-20,396
2044 Build Alternative	114,828,749	30380	0.541	30,395
Change from Existing (2016)	-16,687,412	*-19430*	*-1.275*	-19,466
Change from No Build	5,436,862	*931*	*0.0*	930

Source: *Air Quality Analysis* (2018).

Caltrans = California Department of Transportation
CH_4 = methane
CO_2 = carbon dioxide
CO_2e = carbon dioxide equivalent
CT-EMFAC = Caltrans Emissions Factors Model
MT/yr = metric tons per year
VMT = vehicle miles traveled

Limitations and Uncertainties with Modeling

EMFAC

Although EMFAC can calculate CO_2 emissions from mobile sources, the model does have limitations when it comes to accurately reflecting changes in CO_2 emissions due to impacts on traffic. According to the National Cooperative Highway Research Program report, *Development of a Comprehensive Modal Emission Model* (April 2008) and a 2009 University of California study,[1] brief but rapid accelerations, such as those occurring during congestion, can contribute significantly to a vehicle's CO_2 emissions during a typical urban trip. Current emission-factor models do not distinguish the emission of such modal events (i.e., acceleration, deceleration) in the operation of a vehicle and instead estimate emissions by average trip speed. It is difficult to model this because the frequency and rate of acceleration or deceleration that drivers chose to operate their vehicles depend on each individual’s human behavior, their reaction to other vehicles’ movements around them, and their acceptable safety margins. Currently, the EPA and the California Air Resources Board (CARB) have not approved a modal emissions model that is capable of conducting such detailed modeling. This limitation is a factor to consider when comparing the model’s estimated emissions for various project alternatives against a baseline value to determine impacts.

[1] Matthew Barth, Kanok Boriboonsomsin. 2009. *Energy and emissions impacts of a freeway-based dynamic eco-driving system*. Transportation Research Part D: Transport and Environment Volume 14, Issue 6, August 2009, Pages 400–410

Other Variables

With the current understanding, project-level analysis of GHG emissions has limitations. Although a GHG analysis is included for this project, there are numerous external variables that could change during the design life of the proposed project and would thus change the projected CO_2 emissions.

First, vehicle fuel economy is increasing. The EPA's annual report, "Light-Duty Automotive Technology and Fuel Economy Trends: 1975 through 2016,"[1] which provides data on the fuel economy and technology characteristics of new light-duty vehicles including cars, minivans, sport utility vehicles, and pickup trucks, confirms that average fuel economy improves each year with a noticeable rate of change beginning in 2005. Corporate Average Fuel Economy (CAFE) standards remained the same between model years 1995 and 2003, subsequently increasing to higher fuel economy standards for future vehicle model years. The EPA estimates that light duty fuel economy rose by 29 percent from model year 2004 to 2015 and is attributed to new technology that improved fuel economy while keeping vehicle weight relatively constant. Table 3.2.3 shows the increases in required fuel economy standards for cars and trucks between Model Years 2012 and 2025, from the National Highway Traffic Safety Administration for the 2012–2016 and 2017–2025 CAFE Standards.

Table 3.2.3 Average Required Fuel Economy (mpg)

	2012	2013	2014	2015	2016	2017	2018	2020	2025
Passenger Cars	33.3	34.2	34.9	36.2	37.8	39.6-40.1	41.1-41.6	44.2-44.8	55.3-56.2
Light Trucks	25.4	26	26.6	27.5	28.8	29.1-29.4	29.6-30.0	30.6-31.2	39.3-40.3
Combined	29.7	30.5	31.3	32.6	34.1	35.1-35.4	36.1-36.5	38.3-38.9	48.7-49.7

Source 1: Environmental Protection Agency (2013), http://www.epa.gov/fueleconomy/fetrends/1975-2012/420r13001.pdf.

Source 2: Environmental Protection Agency (2012), https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-model-year-2017-and-later-light-duty-vehicle#rule-summary.

mpg = miles per gallon

Second, new lower-emission and zero-emission vehicles will come into the market within the expected design life of this project. According to the 2013 Annual Energy Outlook (AEO 2013):

[1] https://www.epa.gov/fueleconomy/light-duty-automotive-technology-carbon-dioxide-emissions-and-fuel-economy-trends-1975-1

> "LDVs that use diesel, other alternative fuels, hybrid-electric, or all-electric systems play a significant role in meeting more stringent GHG emissions and CAFE standards over the projection period. Sales of such vehicles increase from 20 percent of all new LDV sales in 2011 to 49 percent in 2040 in the AEO2013 Reference case."[1]

The greater percentage of lower-emissions and zero-emissions vehicles on the road in the future will reduce overall GHG emissions as compared to scenarios in which vehicle technologies and fuel efficiencies do not change.

Third, California adopted a low-carbon transportation fuel standard in 2009 to reduce the carbon intensity of transportation fuels by 10 percent by 2020. The regulation became effective on January 12, 2010 (codified in Title 17, California Code of Regulations [CCR], Sections 95480–95490). Beginning January 1, 2011, transportation fuel producers and importers must meet specified average carbon intensity requirements for fuel in each calendar year.

Limitations and Uncertainties with Impact Assessment

Figure 3.2-3 illustrates how the range of uncertainties in assessing GHG impacts grows with each step of the analysis, as noted in the *National Highway Traffic Safety Administration Final EIS for MY2017–2025 CAFE Standards* (NHTSA 2012):

> "Moss and Schneider (2000) characterize the 'cascade of uncertainty' in climate change simulations (Figure 3.2-3). As indicated in Figure 3.2-3, the emission estimates … have narrower bands of uncertainty than the global climate effects, which are less uncertain than regional climate change effects. The effects on climate are, in turn, less uncertain than the impacts of climate change on affected resources (such as terrestrial and coastal ecosystems, human health, and other resources …). Although the uncertainty bands broaden with each successive step in the analytic chain, all values within the bands are not equally likely; the mid-range values have the highest likelihood."[2]

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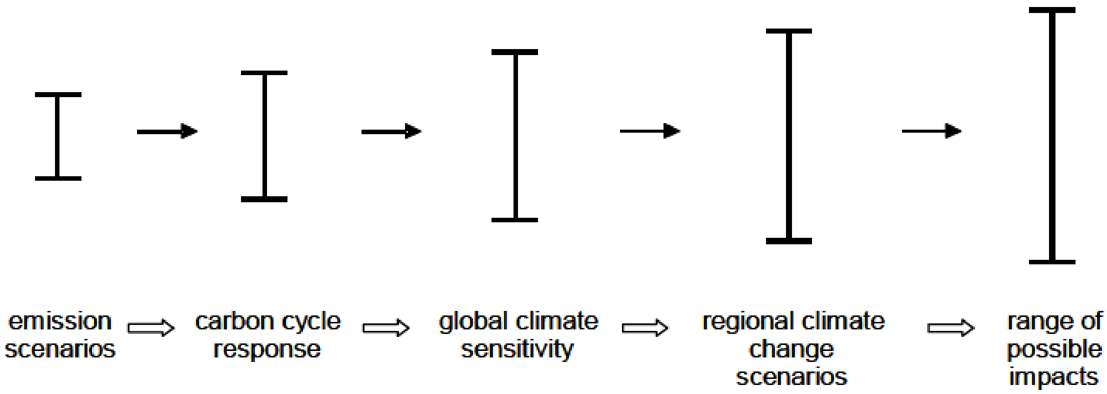
1 http://www.eia.gov/forecasts/aeo/pdf/0383(2013).pdf

2 http://www.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/FINAL_EIS.pdf. page 5-21



Source: *National Highway Traffic Safety Administration Final EIS for MY2017-2025 CAFE Standards* (July 2012). Page 5-22.

Figure 3.2-3 Cascade of Uncertainty in Climate Change Simulations

Much of the uncertainty in assessing an individual project's impact on climate change surrounds the global nature of the climate change. Even assuming that the target of meeting the 1990 levels of emissions is met, there is no regulatory or other framework in place that would allow for a ready assessment of what any modeled increase in CO_2 emissions would mean for climate change given the overall California GHG emissions inventory of approximately 430 million tons of CO_2e. This uncertainty only increases when viewed globally. The IPCC has created multiple scenarios to project potential future global GHG emissions as well as to evaluate potential changes in global temperature, other climate changes, and their effect on human and natural systems. These scenarios vary in terms of the type of economic development, the amount of overall growth, and the steps taken to reduce GHG emissions. Non-mitigation IPCC scenarios project an increase in global GHG emissions of 9.7 billion metric tons CO_2, which would represent an increase up to 36.7 billion metric tons CO_2 from 2000 to 2030 (i.e., between 25 percent and 90 percent increase).[1]

The assessment is further complicated by the fact that changes in GHG emissions can be difficult to attribute to a particular project because the projects often cause shifts in the locale for some type of GHG emissions rather than causing "new" GHG emissions. It is difficult to assess the extent to which any project-level increase in CO_2 emissions represents a net global increase, reduction, or no change; there are no

[1] Intergovernmental Panel on Climate Change (IPCC). 2007. *Climate Change 2007: The Physical Science Basis: Summary for Policy Makers*. February. https://www.ipcc.ch/publications_and_data/ar4/wg1/en/spm.html

models approved by regulatory agencies that operate at the global or even statewide scale.

Construction Emissions

Construction GHG emissions would result from material processing, on-site construction equipment, and traffic delays due to construction. These emissions will be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases.

Table 3.2.4 shows maximum construction CO_2e emissions for the Build Alternative.

Table 3.2.4 Construction Greenhouse Gas Emissions

Project Phases	CO_2	CH_4	N_2O	CO_2e
Grubbing/Land Clearing (metric tons/phase)	73.65	0.02	0.00	67.42
Grading/Excavation (metric tons/phase)	1,250.56	0.36	0.01	1,145.84
Drainage/Utilities/Sub-Grade (metric tons/phase)	505.20	0.10	0.00	461.86
Paving (metric tons/phase)	135.94	0.03	0.00	124.44
Maximum (metric tons/phase)	1250.56	0.36	0.01	1,145.84
Total (metric tons/construction project)	1965.36	0.51	0.02	1,799.55

Source: *Air Quality Analysis* (2018).
Note: Totals may not appear to sum correctly due to rounding.
CH_4 = methane　CO_2e = carbon dioxide equivalent
CO_2 = carbon dioxide　N_2O = nitrous oxide

In addition, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, the GHG emissions produced during construction can be offset to some degree by longer intervals between maintenance and rehabilitation activities.

Project features to reduce construction GHG emissions are included as part of the proposed project and can be found in Section 2.12, Air Quality. Project Feature PF-AQ-2 includes maintaining construction equipment engines to reduce and control air quality emissions, and Project Feature PF-AQ-6 requires all construction vehicles both on and off site to be prohibited from idling in excess of 5 minutes. Project Feature PF-AQ-4 requires compliance with Caltrans Standard Specifications Section 14-9.02, which requires contractors to adhere to all CARB, regional, and local air quality rules, regulations, ordinances, and statutes for air pollution control. Proper engine maintenance, idling restrictions on construction vehicles, and some air pollution control measures also help reduce GHG emissions due to construction.

3.1.20.4 CEQA Conclusion

As discussed above, both the No Build and Build Alternatives show a reduction in GHGs in 2024 and 2044 compared to existing conditions, due to improvements in fuel efficiency and engine technologies. However, the Build Alternative shows an increase in GHG emissions in 2024 and 2044 compared to the No Build Alternative. Nonetheless, there are also limitations with EMFAC and with assessing what a given CO_2 emissions increase means for climate change. Therefore, it is Caltrans' determination that in the absence of further regulatory or scientific information related to GHG emissions and CEQA significance, it is too speculative to make a determination regarding significance of the project's direct impact and its contribution on the cumulative scale to climate change. However, Caltrans is firmly committed to implementing measures to help reduce the potential effects of the project. These measures are outlined in the following section.

Greenhouse Gas Reduction Strategies

Statewide Efforts

In an effort to further the vision of California's GHG reduction targets outlined in AB 32 and SB 32, Governor Brown identified key climate change strategy pillars (concepts). These pillars highlight the idea that several major areas of the California economy will need to reduce emissions to meet the 2030 GHG emissions target. These pillars include: (1) reducing today's petroleum use in cars and trucks by up to 50 percent; (2) increasing from one-third to 50 percent of the State's electricity derived from renewable sources; (3) doubling the energy efficiency savings achieved at existing buildings and making heating fuels cleaner; (4) reducing the release of methane, black carbon, and other short-lived climate pollutants; (5) managing farm and rangelands, forests, and wetlands so they can store carbon; and (6) periodically updating the State's climate adaptation strategy, *Safeguarding California*.

The transportation sector is integral to the people and economy of California. To achieve GHG emission reduction goals, it is vital that we build on our past successes in reducing criteria and toxic air pollutants from transportation and goods movement activities. GHG emission reductions will come from cleaner vehicle technologies, lower-carbon fuels, and reduction in VMT. One of Governor Brown's key pillars sets the ambitious goal of reducing today's petroleum use in cars and trucks by up to 50 percent by 2030. See Figure 3.2-4.

Figure 3.2-4 The Governor's Climate Change Pillars: 2030 Greenhouse Gas Reduction Goals

Governor Brown called for support to manage natural and working lands, including forests, rangelands, farms, wetlands, and soils, so they can store carbon. These lands have the ability to remove carbon dioxide from the atmosphere through biological processes, and to then sequester carbon in above- and below-ground matter.

Caltrans Activities

Caltrans continues to be involved on the Governor's Climate Action Team as the ARB works to implement EOs S-3-05 and S-01-07 and help achieve the targets set forth in AB 32. EO B-30-15, issued in April 2015, and SB 32 (2016), set a new interim target to cut GHG emissions to 40 percent below 1990 levels by 2030. The following major initiatives are underway at Caltrans to help meet these targets.

California Transportation Plan (CTP 2040)

The California Transportation Plan (CTP) is a statewide, long-range transportation plan to meet our future mobility needs and reduce GHG emissions. The CTP defines performance-based goals, policies, and strategies to achieve our collective vision for California's future statewide, integrated, multimodal transportation system. It serves as an umbrella document for all of the other statewide transportation planning documents.

SB 391(Liu 2009) requires the CTP to meet California's climate change goals under AB 32. Accordingly, the CTP 2040 identifies the statewide transportation system needed to achieve maximum feasible GHG emission reductions while meeting the State's transportation needs. While MPOs have primary responsibility for identifying land use patterns to help reduce GHG emissions, CTP 2040 identifies additional strategies in Pricing, Transportation Alternatives, Mode Shift, and Operational Efficiency.

Caltrans Strategic Management Plan

The Strategic Management Plan, released in 2015, creates a performance-based framework to preserve the environment and reduce GHG emissions, among other goals. Specific performance targets in the plan that will help to reduce GHG emissions include:

- Increasing percentage of non-auto mode share
- Reducing VMT per capita
- Reducing Caltrans' internal operational (buildings, facilities, and fuel) GHG emissions

Funding and Technical Assistance Programs

In addition to developing plans and performance targets to reduce GHG emissions, Caltrans also administers several funding and technical assistance programs that have GHG reduction benefits. These include the Bicycle Transportation Program, Safe Routes to School, Transportation Enhancement Funds, and Transit Planning Grants. A more extensive description of these programs can be found in *Activities to Address Climate Change* (Caltrans 2013).

Caltrans Director's Policy 30 (DP-30) Climate Change (June 22, 2012) is intended to establish a department policy that will ensure coordinated efforts to incorporate climate change into departmental decisions and activities.

Activities to Address Climate Change (Caltrans 2013) provides a comprehensive overview of activities undertaken by Caltrans statewide to reduce GHG emissions resulting from agency operations.

Project-Level Greenhouse Gas Reduction Strategies

The following measures will also be implemented in the project to reduce GHG emissions and potential climate change impacts from the project:

- Project Feature PF-AQ-2 includes maintaining construction equipment engines to reduce and control air quality emissions. Proper engine maintenance can also help reduce vehicle GHG emissions.
- Project Feature PF-AQ-4 requires compliance with Caltrans Standard Specifications Section 14-9.02, which requires contractors to adhere to all CARB, regional, and local air quality rules, regulations, ordinances, and statutes for air pollution control. Measures that reduce emission of air pollutants may also reduce GHG emissions.
- Project Feature PF-AQ-6 requires all construction vehicles both on and off site to be prohibited from idling in excess of 5 minutes. Restricting idling reduces vehicle GHG emissions.
- Project Feature PF-T-1 requires a Transportation Management Plan (TMP) be implemented during construction of the Build Alternative to address changes in traffic flows and pedestrian and bicycle circulation and to provide measures to minimize the adverse effects of construction activities on traffic flows and pedestrian and bicycle travel within the study area. Managing traffic flows to reduce delays reduces excess emissions, including GHG emissions, from idling vehicles.
- Caltrans Standard Specification 7-1.02C, Emissions Reduction, requires contractors to certify they are aware of, and will comply with, the emissions reduction regulations being mandated by the CARB throughout the duration of the contract.

Adaptation Strategies

"Adaptation strategies" refer to how Caltrans and others can plan for the effects of climate change on the state's transportation infrastructure and strengthen or protect the facilities from damage—or, put another way, planning and design for resilience. Climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, variability in storm surges and their intensity, and the frequency and intensity of wildfires. These changes may affect the transportation infrastructure in various ways, such as damage to roadbeds from longer periods of intense heat; increasing storm damage from flooding and erosion; and inundation from rising sea levels. These effects will vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. These types of impacts to the transportation infrastructure may also have economic and strategic ramifications.

Federal Efforts

At the federal level, the Climate Change Adaptation Task Force, co-chaired by the CEQ, the Office of Science and Technology Policy (OSTP), and the National Oceanic and Atmospheric Administration (NOAA), released its interagency task force progress report on October 28, 2011[1], outlining the federal government's progress in expanding and strengthening the nation's capacity to better understand, prepare for, and respond to extreme events and other climate change impacts. The report provided an update on actions in key areas of federal adaptation, including: building resilience in local communities, safeguarding critical natural resources such as fresh water, and providing accessible climate information and tools to help decision-makers manage climate risks.

The United States Department of Transportation issued USDOT Policy Statement on Climate Adaptation in June 2011, committing to "integrate consideration of climate change impacts and adaptation into the planning, operations, policies, and programs of DOT in order to ensure that taxpayer resources are invested wisely and that transportation infrastructure, services and operations remain effective in current and future climate conditions."[2]

To further the USDOT Policy Statement, on December 15, 2014, FHWA issued order 5520 (Transportation System Preparedness and Resilience to Climate Change and Extreme Weather Events).[3] This directive established FHWA policy to strive to identify the risks of climate change and extreme weather events to current and planned transportation systems. The FHWA will work to integrate consideration of these risks into its planning, operations, policies, and programs in order to promote preparedness and resilience; safeguard federal investments; and ensure the safety, reliability, and sustainability of the nation's transportation systems.

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1 Obama White House. 2017. Council on Environmental Quality Climate Change Resilience. Website: https://www.whitehouse.gov/sites/whitehouse.gov/files/ceq/2011_adaptation_progress_report.pdf.

2 FHWA. Sustainability (Guidance withdrawn on May 19, 2017). Website: https://www.fhwa.dot.gov/environment/sustainability/resilience/policy_and_guidance/usdot.cfm.

3 FHWA. 2014. FHWA Order 5520. Website: https://www.fhwa.dot.gov/legsregs/directives/orders/5520.cfm.

FHWA has developed guidance and tools for transportation planning that fosters resilience to climate effects and sustainability at the federal, State, and local levels.[1]

State Efforts

On November 14, 2008, then-Governor Arnold Schwarzenegger signed EO S-13-08, which directed a number of State agencies to address California's vulnerability to sea-level rise caused by climate change. This EO set in motion several agencies and actions to address the concern of sea-level rise and directed all State agencies planning to construct projects in areas vulnerable to future sea-level rise to consider a range of sea-level rise scenarios for the years 2050 and 2100, assess project vulnerability and, to the extent feasible, reduce expected risks and increase resiliency to sea-level rise. Sea-level rise estimates should also be used in conjunction with information on local uplift and subsidence, coastal erosion rates, predicted higher high water levels, and storm surge and storm wave data.

Governor Schwarzenegger also requested the National Academy of Sciences, Engineering, and Medicine to prepare an assessment report to recommend how California should plan for future sea-level rise. The final report, *Sea-Level Rise for the Coasts of California, Oregon, and Washington* (Sea-Level Rise Assessment Report),[2] was released in June 2012 and included relative sea-level rise projections for the three states, taking into account coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge, and land subsidence rates as well as the range of uncertainty in selected sea-level rise projections. It provided a synthesis of existing information on projected sea-level rise impacts to State infrastructure (e.g., roads, public facilities, and beaches), natural areas, and coastal and marine ecosystems as well as a discussion of future research needs regarding sea-level rise.

In response to EO S-13-08, the California Natural Resources Agency (Resources Agency), in coordination with local, regional, State, federal, and public and private

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[1] FHWA. 2017. Sustainability Resilience (updated October 19, 2017). Website: https://www.fhwa.dot.gov/environment/sustainability/resilience/.

[2] National Academy of Sciences, Engineering, and Medicine. 2012. *Sea Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future*. Website: https://www.nap.edu/read/13389/chapter/1.

entities, developed *The California Climate Adaptation Strategy* (December 2009),[1] which summarized the best available science on climate change impacts to California, assessed California's vulnerability to the identified impacts, and outlined solutions that can be implemented within and across State agencies to promote resiliency. The adaptation strategy was updated and rebranded in 2014 as *Safeguarding California: Reducing Climate Risk* (Safeguarding California Plan).

Governor Jerry Brown enhanced the overall adaptation planning effort by signing EO B-30-15 in April 2015, requiring State agencies to factor climate change into all planning and investment decisions. In March 2016, sector-specific Implementation Action Plans that demonstrate how State agencies are implementing EO B-30-15 were added to the Safeguarding California Plan. This effort represents a multi-agency, cross-sector approach to addressing adaptation to climate change-related events statewide.

EO S-13-08 also gave rise to the *State of California Sea-Level Rise Interim Guidance Document* (SLR Guidance), produced by the Coastal and Ocean Working Group of the California Climate Action Team (CO-CAT), of which Caltrans is a member. First published in 2010, the document provided “guidance for incorporating sea-level rise (SLR) projections into planning and decision making for projects in California,” specifically, “information and recommendations to enhance consistency across agencies in their development of approaches to SLR.”[2]

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system from increased precipitation, and flooding; the increased frequency and intensity of storms and wildfires; rising temperatures; and rising sea levels. Caltrans is actively engaged in in working towards identifying these risks throughout the state and will work to incorporate this information into all planning and investment decisions as directed in EO B-30-15.

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1 State of California. Climate Change – California Climate Adaptation Strategy. 2011–2017. Website: http://www.climatechange.ca.gov/adaptation/strategy/index.html.

2 http://www.opc.ca.gov/2013/04/update-to-the-sea-level-rise-guidance-document/

The proposed project is outside the coastal zone and not in an area subject to sea-level rise. Accordingly, direct impacts to transportation facilities due to projected sea-level rise are not expected.

Chapter 4 Comments and Coordination

Early and continuing coordination with the general public and public agencies is an essential part of the environmental process. It helps planners determine the necessary scope of environmental documentation and the level of analysis required and to identify potential impacts, as well as avoidance, minimization, and/or mitigation measures and related environmental requirements. Agency and tribal consultation and public participation for the Westbound State Route 91 (SR-91) Improvement Project (project) have been accomplished through a variety of formal and informal methods, including interagency coordination meetings, public meetings, public notices, and Project Development Team (PDT) meetings. This chapter summarizes the results of the California Department of Transportation's (Caltrans) efforts to fully identify, address, and resolve project-related issues through early and continuing coordination.

4.1 Notice of Initiation of Studies

The environmental scoping process to involve the public on the project Draft Initial Study/Environmental Assessment (IS/EA) was initiated with two public information meetings held by the Los Angeles County Metropolitan Transportation Authority (Metro) in October 2016. These public information meetings were held at two different locations: the North Artesia Community Center in the City of Artesia on October 18, 2016, at 6:30 p.m.; and Cerritos High School in the City of Cerritos on October 19, 2016, at 6:30 p.m.

The Notice of Initiation of Studies and the dates and locations of the open houses were advertised in three local newspapers. Additionally, Metro compiled a project-specific mailing list of stakeholders that includes over 2,300 property owners within the study area. An invitation was mailed to the stakeholders on this list with information about the project, the dates of the two open house meetings, and contact information. The meetings began with an open house segment, featured a formal presentation, and closed with a question-and-answer session. Meetings were scheduled in the evenings to allow residents the opportunity to attend after their workday. Public agencies were invited to attend the open houses; additional meetings for public agencies were not scheduled.

The meetings included a presentation and informational handouts to help participants understand the scope and schedule of the project, and learn about the planning and environmental review process as well as the proposed alternative concepts.

Participants were encouraged to sign in, provided with informational materials and a comment card, and invited to review the display boards with project staff. Fifteen comment cards were received at the meeting in the City of Artesia and six were received at the meeting in the City of Cerritos. Areas of concern included the right-of-way impacts (e.g., property acquisitions), acquisition of specific properties, and noise and vibration impacts.

Attendance at the October 18, 2016, meeting included 71 persons, and attendance at the October 19, 2016, meeting included 59 persons.

Copies of the Notice of Initiation of Studies and the attendance sign-in sheets are provided at the end of this chapter.

4.2 Interagency Coordination and Consultation

The formulation of project alternatives and mitigation has been carried out through a cooperative dialogue among representatives of the following agencies or organizations:

- Metro
- Caltrans
- The City of Cerritos
- The City of Artesia
- Native American Tribes
- Local historical societies/historic preservation groups
- Southern California Association of Governments (SCAG) Transportation Conformity Working Group (TCWG)
- United States Fish and Wildlife Service (USFWS)
- United States Army Corps of Engineers (USACE)

The following sections summarize the results of the efforts of both Caltrans and Metro to fully identify, address, and resolve project-related issues through early and continuing coordination.

4.2.1 Native American Tribes

Consultation with a number of Native American Tribes (groups and individuals) was conducted in May 2017 in compliance with Section 106 of the National Historic Preservation Act (NHPA). Assembly Bill 52 (AB 52), which amended the California Environmental Quality Act (CEQA) to require consultation with Native American

Tribes, became effective July 1, 2015. As a result, additional Native American coordination under AB 52 was initiated by Caltrans in May 2017. The consultation with the Native American Heritage Commission (NAHC) and Native American representatives is summarized in Table 4.1. A copy of the NAHC correspondence is included at the end of this chapter.

4.2.2 Local Historical Societies/Historic Preservation Groups

The following local historical societies/historic preservation groups were contacted by letter on July 11, 2017. The purpose of the letters was to inform each organization/interested party of the proposed undertaking and to solicit information on known historic properties in the vicinity of the project area.

- Clifton M. Brakensiek Library
- D.D. Johnston-Hargitt House Museum
- Artesia Library
- Angelo M. Iacoboni Library
- Norwalk Library
- Artesia Historical Museum
- George Nye Jr. Library
- Cerritos Library Local History Room

The Clifton M. Brakensiek Library confirmed receipt via email on August 11, 2017, but did not respond with comments nor reply that it had no comments. The Norwalk Library confirmed receipt via email on August 15, 2017, and requested an extension of time to submit its response. The Artesia Historical Museum confirmed receipt via telephone on July 13, 2017, and forwarded the letter to the Artesia Historical Society on that same date; the historical society did not confirm receipt or respond with comments. Non-responsive organizations and interested parties were contacted again by email on August 11, 2017. No additional responses have been received.

Table 4.1 Summary of Native American Consultation

Agency and Agency Representative	Date of First Contact (Formal Letter)	Date of Reply	Dates of Follow-up Contact	Consultation Topic
NAHC Gayle Totton, Associate Governmental Program Analyst	May 18, 2017 (Section 106), and May 18, 2017 (AB 52)	May 22, 2017	N/A	**May 18, 2017:** A letter was sent to the NAHC requesting a search of the SLF in order to identify areas of religious or cultural significance to Native Americans. The NAHC request letter is included at the end of this chapter. **May 22, 2017:** The NAHC responded on May 22, 2017, to say that the SLF search was negative for the immediate APE, but recommended that seven Native American individuals representing the Gabrielino, Gabrielino Tongva, and Juaneño groups be contacted for possible additional information.
Gabrieleño Band of Mission Indians – Kizh Nation Andrew Salas, Chairperson	May 24, 2017 (Section 106), and May 26, 2017 (AB 52)	June 29, 2017	June 12, 2017, June 19, 2017, June 30, 2017, and August 3, 2017	**May 24, 2017:** Per the NAHC recommendation, the Gabrieleño Band of Mission Indians – Kizh Nation was contacted under Section 106 for information regarding cultural resources that could be affected by the project. **May 26, 2017:** The group was sent a letter for consultation under AB 52. **June 12, 2017:** No initial response was received as a result of the project notification letter. A follow-up email was sent to the group. **June 19, 2017:** A follow-up phone call was made to Mr. Salas. He did not answer, so a voicemail was left for him. **June 29, 2017:** Mr. Salas responded by letter and requested consultation. However, the request was for consultation regarding a different project. **June 30, 2017:** Caltrans sent Mr. Salas an email to request clarification as to which project the June 29 letter pertained. **August 3, 2017:** A follow-up phone call was made to Mr. Salas. No response was received.
Gabrieleño/Tongva San Gabriel Band of Mission Indians Anthony Morales Chairperson	May 24, 2017 (Section 106), and May 26, 2017 (AB 52)	June 19, 2017	June 12, 2017, June 19, 2017, August 3, 2017, and January 10, 2018	**May 24, 2017:** Per the NAHC recommendation, the Gabrieleño/Tongva San Gabriel Band of Mission Indians was contacted under Section 106 for information regarding cultural resources that could be affected by the project. **May 26, 2017:** The group was sent a letter for consultation under AB 52. **June 12, 2017:** No initial response was received as a result of the project notification letter. A follow-up email was sent to the group. **June 19, 2017:** A follow-up phone call was made to Mr. Morales. He asked to be informed of the Caltrans and consultant recommendations for monitoring and recommended that a monitor from this group specifically be present. **August 3, 2017:** Another follow-up phone call was made to Mr. Morales. He again requested that, if monitoring is deemed necessary, a Native American monitor from his group also be present. **January 10, 2018:** LSA contacted Mr. Morales on behalf of Caltrans to notify him that Caltrans determined monitoring for the project is not warranted because no cultural resources were identified through Native American consultation, background research, field surveys, and records searches. No response was received.

Table 4.1 Summary of Native American Consultation

Agency and Agency Representative	Date of First Contact (Formal Letter)	Date of Reply	Dates of Follow-up Contact	Consultation Topic
Gabrielino/Tongva Nation Sandonne Goad Chairperson	May 24, 2017 (Section 106), and May 26, 2017 (AB 52)	None	June 12, 2017, June 19, 2017, and August 3, 2017	**May 24, 2017:** Per the NAHC recommendation, the Gabrielino/Tongva Nation group was contacted under Section 106 for information regarding cultural resources that could be affected by the project. **May 26, 2017:** The group was sent a letter for consultation under AB 52. **June 12, 2017:** No initial response was received as a result of the project notification letter. A follow-up email was sent to the group. **June 19, 2017:** A follow-up phone call was made to Ms. Goad. She did not answer, so a voicemail was left for her. **August 3, 2017:** A follow-up phone call was made to Ms. Goad. She did not answer, so a voicemail was left. No response was received.
Gabrielino Tongva Indians of California Tribal Council Robert F. Dorame Chairperson	May 24, 2017 (Section 106), and May 26, 2017 (AB 52)	None	June 12, 2017, June 19, 2017, August 3, 2017, August 4, 2017, August 11, 2017, and November 20, 2017	**May 24, 2017:** Per the NAHC recommendation, the Gabrielino Tongva Indians of California Tribal Council was contacted under Section 106 for information regarding cultural resources that could be affected by the project. **May 26, 2017:** The group was sent a letter for consultation under AB 52. **June 12, 2017:** No initial response was received as a result of the project notification letter. A follow-up email was sent to the group. **June 19, 2017:** A follow-up phone call was made to Mr. Dorame. It was answered, and a request was made to call back in 1 hour. When the call back was made, an automated message said that the voicemail was not set up and a follow-up email was sent in its place. **August 3, 2017:** A follow-up phone call was made to Mr. Dorame. He expressed concern about the project and stated that the area is culturally sensitive. Mr. Dorame also stated that Native American monitoring should occur during project work. LSA sent Mr. Dorame an email to document the phone call and copied Caltrans on the message. Caltrans called Mr. Dorame to discuss his concerns, and Mr. Dorame requested that the initial AB 52 letter be re-sent to him for review along with information on project excavation depths and methods. **August 4, 2017:** The letter and additional information were emailed to Mr. Dorame. **August 11, 2017:** Mr. Dorame called Caltrans to state the presence of a Traditional Indian Cultural Property. When Caltrans asked for more information, Mr. Dorame was hesitant to respond and said the in-house archaeological background research should provide that information. Mr. Dorame also noted the presence of midden deposits. **November 20, 2017:** Mr. Dorame was provided a letter containing a summary of LSA's background research regarding his statements.

Table 4.1 Summary of Native American Consultation

Agency and Agency Representative	Date of First Contact (Formal Letter)	Date of Reply	Dates of Follow-up Contact	Consultation Topic
Gabrielino-Tongva Tribe Linda Candelaria Co-Chairperson	May 24, 2017 (Section 106), and May 26, 2017 (AB 52)	None	June 12, 2017, June 19, 2017, and August 3, 2017	**May 24, 2017:** Per the NAHC recommendation, the Gabrielino-Tongva Tribe was contacted under Section 106 for information regarding cultural resources that could be affected by the project. **May 26, 2017:** The group was sent a letter for consultation under AB 52. **June 12, 2017:** No initial response was received as a result of the project notification letter. A follow-up email was sent to the group. **June 19, 2017:** A follow-up phone call was made to Ms. Candelaria. She did not answer, so a voicemail was let for her.. **August 3, 2017:** A follow-up phone call was made to Ms. Candelaria. She did not answer, so a voicemail was left. No response was received.
Juaneño Band of Mission Indians Acjachemen Nation – Belardes Matias Belardes Chairperson	May 24, 2017 (Section 106), and May 26, 2017 (AB 52)	June 19, 2017	June 12, 2017, June 19, 2017, and August 3, 2017	**May 24, 2017:** Per the NAHC recommendation, the Juaneño Band of Mission Indians Acjachemen Nation – Belardes was contacted under Section 106 for information regarding cultural resources that could be affected by the project. **May 26, 2017:** The group was sent a letter for consultation under AB 52. **June 12, 2017:** A voicemail was left for Joyce Perry (Whose number is listed as the contact for Mr. Belardes). See the correspondence for Ms. Perry below; she is the spokesperson for cultural resources.
Juaneño Band of Mission Indians Acjachemen Nation – Belardes Joyce Perry, Tribal Manager	May 24, 2017 (Section 106), and May 26, 2017 (AB 52)	June 19, 2017	June 12, 2017, June 19, 2017, and August 3, 2017	**May 24, 2017:** Per the NAHC recommendation, the Juaneño Band of Mission Indians Acjachemen Nation – Belardes group was contacted under Section 106 for information regarding cultural resources that could be affected by the project. **May 26, 2017:** The group was sent a letter for consultation under AB 52. **June 12, 2017:** No initial response was received as a result of the project notification letter. A follow-up email was sent to the group. **June 19, 2017:** A follow-up phone call was made to Ms. Perry. She said that the group does not have any concerns about the project work. **August 3, 2017:** A follow-up phone call was made to Ms. Perry. She stated that her group has no concerns about the project.

AB 52 = Assembly Bill 52
APE = Area of Potential Effects
Caltrans = California Department of Transportation
N/A = not applicable
NAHC = Native American Heritage Commission
project = Westbound State Route 91 Improvement Project
SLF = Sacred Lands File

4.2.3 Southern California Association of Governments Transportation Conformity Working Group

The proposed project was presented at a TCWG meeting in June 2017, pursuant to the interagency consultation requirement of 40 Code of Federal Regulations (CFR) 93.105 (c)(1)(i). The United States Environmental Protection Agency (EPA), California Air Resources Board (ARB), South Coast Air Quality Management District (SCAQMD), and other interagency consultation participants concurred that the project is not a project of air quality concern (POAQC) under 40 CFR 93.123(b)(1). The project would not add diesel-truck capacity or be a major truck traffic generator as diesel heavy-truck traffic makes up approximately 13 percent of the total traffic volumes within the project limits. Therefore, the proposed project would not be considered a POAQC under 40 CFR 93.126 as it would not create a new or worsen an existing violation of the National Ambient Air Quality Standard for particulate matter less than 2.5 microns in size ($PM_{2.5}$).

Copies of the TCWG determinations are included at the end of this chapter.

4.2.4 United States Fish and Wildlife Service

Unofficial species lists were obtained from the USFWS on May 24, 2017, and updated official species lists were provided on March 19, 2018. The species lists provide information about the threatened, endangered, and proposed species, designated critical habitat, and candidate species that may occur in the vicinity of a proposed project. The species lists provided by the USFWS are included at the end of this chapter.

4.2.5 United States Army Corps of Engineers

A jurisdictional delineation was conducted in July 2017 to determine the potential for federal and State jurisdictional waters and wetland resources. The biological study area (BSA) contains potentially jurisdictional waters. The project is expected to impact some of the jurisdictional waters that are within the BSA, and permits from the USACE, California Department of Fish and Wildlife (CDFW), and Regional Water Quality Control Board (RWQCB) are expected to be required. The jurisdictional delineation is considered preliminary until verified by the appropriate regulatory agencies because it has not yet been submitted for approval. The project is anticipated to require the following agency permits:

- A federal Clean Water Act (CWA) Section 404 permit authorization from the USACE

- A CWA Section 401 Water Quality Certification from the RWQCB
- A Fish and Game Code Section 1602 Streambed Alteration Agreement from the CDFW

4.3 Community Outreach and Public Involvement

Metro developed a community engagement program with the goals of building project awareness, sharing project information, identifying key issues and concerns important to the public, and integrating public feedback into the project planning process to the greatest extent possible.

4.3.1 Public Information Meetings

Metro conducted two (2) rounds of public information meetings, two in 2016 during scoping as described in Section 4.1 and another two meetings in January of 2018. A total of four (4) public information meetings were conducted for the environmental process. Each of these meetings were supported by a notification campaign. Collectively, the meetings engaged 320 participants and gathered approximately 129 comments. Comments were collected in a variety of formats, including comment cards received at the meetings, through US mail, via email and an electronic comment form provided through the project website.

The first round of meetings initiated the studies and shared the goals of the PA/ED phase by presenting the history for the highway corridor, status and schedule of the project, outlining the intentions of the environmental process and technical studies, and soliciting public feedback on the project. Comments gathered informed the technical team of the shared public concerns and aided in directing their technical studies and in the creation of this draft document.

The second round of public information meetings were scheduled and held to report on project activity and progress made toward completing this draft IS/EA. As with the first round of meetings, public comments received during the second round of meetings provided an opportunity for the technical team to further refine their work and this report. Attendance sign-in sheets are provided at the end of this chapter.

- Public Meeting on Tuesday, January 30, 2018, from 6:00 to 8:00 p.m. at the Cerritos High School Theatre (12500 183rd St, Cerritos)
- Public Meeting on Wednesday, January 31, 2018, from 6:00 to 8:00 p.m. at the AJ Padelford Park, North Artesia Community Center (11870 169th St, Artesia)

In support of the Release of this environmental document Metro will continue to reach out to stakeholders by holding an additional two public hearings in late July or early August of 2018. Metro will continue to document and gather public comments and input for consideration and inclusion in the Final IS/EA.

Metro also engaged in multiple briefings with local agencies, specifically the Cities of Artesia and Cerritos, elected officials, special districts, and key stakeholders to garner insight on their communities in order to help inform and improve upon the technical and environmental work. These briefings were held throughout the course of the environmental process:

- May 22, 2017: Artesia City Manager Briefing at the City of Artesia
- August 2, 2017: Artesia City Council Briefing at the City of Artesia
- September 21, 2017: ABC Unified School District Briefing at the ABC Unified School District Office
- October 5, 2017:Artesia City Mayor Briefing at the City of Artesia
- December 12, 2017: Gateway Cities Regional Legislative Briefing at the Cerritos Library
- January 23, 2018: SR-91/I-605/I-405 Technical Advisory Committee Meeting at the Gateway Cities Council of Governments (GCCOG) Office
- January 24, 2018: SR-91/I-605/I-405 Technical Advisory Committee Meeting at the GCCOG Office
- February 9, 2018: Gateway Cities COG Transportation Summit at the GCCOG Office
- February 14, 2018: Artesia City Briefing at the City of Artesia Notifications & Resources

Metro developed a comprehensive notification plan in support of the Project’s outreach goals and the four public meetings. The outreach activities consisted of direct-mail notices, electronic mail notices, newspaper advertisements, social media posts, and a variety of other engagement methods. All notices provided a brief summary of the Project, stated the purpose of the meetings, and highlighted meeting details. The tools listed in Table 4.2 were used to inform the public of the meetings and gather public input.

Table 4.2 Notification Outreach Methods

Outreach Method	2016 Meetings (2)	2018 Meetings (2)
Postal notice invitations	2,503	4,165
Press releases	0	1
Print newspaper ads	3	4
Bulk notice deliveries to public counter locations	31	33
Electronic invitation tool kits shared with active community organizations	30	34
Flyer invitations	0	1,500
Electronic mail notifications to Project identified key stakeholders and interested parties	4	4
Social media posts via Twitter	0	2
Blog posts “The Source” and “El Pasajero”	0	2

Sources: Westbound SR-91 Improvement Project Open House Summary Report; January 2017; and Westbound SR-91 Improvement Project Public Meetings Summary Report, April 2018.

In addition to the targeted outreach efforts, Metro established a website (https://www.metro.net/projects/wb-sr-91/) to serve as the project’s main portal and repository, providing visitors with a project summary, schedule, and links to reports and presentations. During the public comment period, materials that had been provided during the public meetings were posted and accessible on the project website. The project website also contains phone and email information, an electronic comment form where comments or inquiries can be submitted, and a link that will allow users to opt-into the project contact list. Metro also created a Project helpline as an additional resource for public comment and engagement. Both, website and helpline were monitored and updated routinely. As with previous rounds of public meetings, the website and helpline will both publicize the future public hearings.

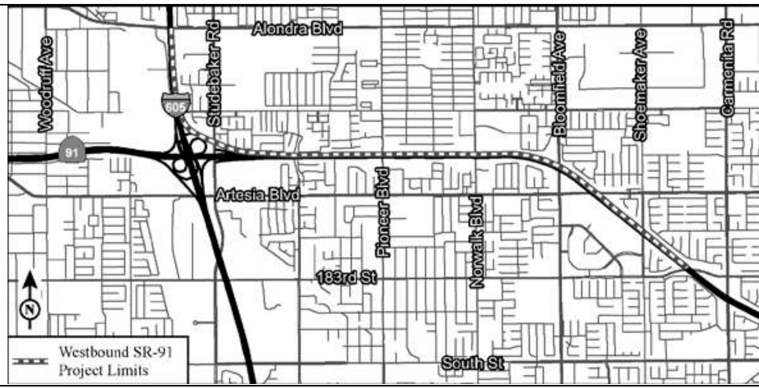
4.4 Project Development Team

The Cities of Cerritos and Artesia participate in the monthly PDT meetings conducted by Metro and Caltrans for the SR-91 Westbound Widening Project Approval/Environmental Documentation (PA/ED) project. The PDT meetings cover a wide range of topics related to the proposed project, including development and evaluation of alternatives, engineering considerations, environmental issues, and the environmental document and documentation process.

ENVIRONMENTAL INITIATION NOTICE

Notice of Initiation of Environmental Studies for the Westbound SR-91 (between Shoemaker Avenue and the I-605 Interchange) Project

Project Location Map



What is Being Planned?

The California Department of Transportation (Caltrans) is initiating environmental studies for the proposed Westbound State Route 91 (SR-91) Project, between Shoemaker Avenue and the Interstate 605 (I-605) interchange, in the cities of Artesia and Cerritos, Los Angeles County, California. The purpose of the project is to reduce congestion and improve freeway operations (both mainline and ramps), improve safety and improve local and system interchange operations while minimizing adjacent right-of-way, environmental and economic impacts.

A No-Build Alternative and Build Alternatives, which include design option configurations, are proposed for the project and include the addition of travel lanes, modification of existing interchanges, removal of some existing non-standard design features, and other operational improvements.

Why This Notice?

Caltrans is initiating environmental studies for this project. In order to better identify the issues to be addressed for the proposed project, Caltrans is soliciting comments from public agencies, private entities and interested individuals regarding potential social, economic, traffic, safety, environmental issues, and agency permit and review requirements related to the project.

Where do you come in?

The first public open house will be held for the project on Tuesday, October 18, 2016 from **6:30pm** to **8:30pm** at: **North Artesia Community Center, 11870 169th Street, Artesia, CA 90701**

The second public open house will be held for the project on Wednesday, October 19, 2016 from 6**:30pm** to **8:30pm** at: **Cerritos High School, 12500 183rd Street, Cerritos, CA 90703**

Written comments regarding the Notice of Initiation of Environmental Studies will be accepted at the meeting. You may also send comments, suggestions or inquiries by **November 18, 2016,** to:

Jinous Saleh, Senior Environmental Planner
Caltrans Division of Environmental Planning – Westbound SR-91
100 South Main Street, MS 16A
Los Angeles, CA 90012

Contact

More information can also be found at https://www.metro.net/projects/i-605/wb-sr-91/.
If you have further questions, Ms. Saleh can be reached at jinous.saleh@dot.ca.gov or at (213) 897-0683.

Thank you for your interest and participation in this transportation project.

Westbound SR-91 Improvement Project

Public Open House

Tuesday, October 18, 2016, 6:30 – 8:30pm

A J Padleford Park – North Artesia Community Center

Sign-in Sheet

Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number / Cell Number Número de Teléfono y Cellular	EMail Correo Electrónico
Stephen Poon	[redacted]			
JAKE VU				
Jina Perin				
NIE-LONG TSE				
Harry [illegible]				
RAJEN BUDHIR				
Ken Russell				
Agn Ibazrin				

Westbound SR-91 Improvement Project

Public Open House

Tuesday, October 18, 2016, 6:30 – 8:30pm

A J Padleford Park – North Artesia Community Center

Sign-in Sheet

Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number / Cell Number Número de Teléfono y Cellular	EMail Correo Electrónico
ROBERT GRAY	[redacted]	[redacted]	[redacted]	[redacted]
Robert Witt Joanne Witt	[redacted]	[redacted]	[redacted]	[redacted]
Vicki Hickam	[redacted]	[redacted]	[redacted]	[redacted]

Westbound SR-91 Improvement Project

Public Open House

Tuesday, October 18, 2016, 6:30 – 8:30pm

A J Padleford Park – North Artesia Community Center

Sign-in Sheet

Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number / Cell Number Número de Teléfono y Cellular	EMail Correo Electrónico
JOANNA CERVIDO	[redacted]	[redacted]	[redacted]	[redacted]
Miguel [illegible]	[redacted]	[redacted]	[redacted]	[redacted]
Brianne Shelly	[redacted]	[redacted]	[redacted]	[redacted]
Dolce Martinez	[redacted]	[redacted]	[redacted]	[redacted]
PHIL CUNNOW	[redacted]	[redacted]	[redacted]	[redacted]
MANUK KAPOUJIAN	[redacted]	[redacted]	[redacted]	[redacted]
ROSA JASSO	[redacted]	[redacted]	[redacted]	[redacted]
DON VEGTER	[redacted]	[redacted]	[redacted]	[redacted]

Westbound SR-91 Improvement Project

Public Open House

Tuesday, October 18, 2016, 6:30 – 8:30pm

A J Padleford Park – North Artesia Community Center

Sign-in Sheet

Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number / Cell Number Número de Teléfono y Cellular	EMail Correo Electrónico
ANICETO JASSO	[redacted]			
RAMON LIZARRAGA				
DEWEY LEE JACKSON				
Dewey A. Jackson				
SOSAMMA JOSEPH				
Maria Rivera				
Van Duong				
Amalia Cenido				

Westbound SR-91 Improvement Project

Public Open House

Tuesday, October 18, 2016, 6:30 – 8:30pm

A J Padleford Park – North Artesia Community Center

Sign-in Sheet

Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number / Cell Number Número de Teléfono y Cellular	EMail Correo Electrónico
Alicia Oropeza	[redacted]			
Esperanza				
FRANCISCO, Ed				
GUILLERMINA SOTO				
LAWRENCE STERN				
Wilbert J. PALACO				
Sandra Sun				
Tommie Wong [redacted]				

Westbound SR-91 Improvement Project

Public Open House

Tuesday, October 18, 2016, 6:30 – 8:30pm

A J Padleford Park – North Artesia Community Center

Sign-in Sheet

Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number / Cell Number Número de Teléfono y Cellular	EMail Correo Electrónico
Sharon Morton	[redacted]			
DAVE ALBRIGHT				
Gerald SOTO				
Gustavo Ledesma Martinez				
antonio Parada				
Yamira Begazo				
Michael Vuong				
Monique Kennedy				

Opal Kennedy [redacted]

Westbound SR-91 Improvement Project

Public Open House

Tuesday, October 18, 2016, 6:30 – 8:30pm

A J Padleford Park – North Artesia Community Center

Sign-in Sheet

Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number / Cell Number Número de Teléfono y Cellular	EMail Correo Electrónico
Enrique Quinto	[redacted]			
David Quintanar	[redacted]			
Jacquelyn Morgenthaler	[redacted]			
KATHERINE GEORGE CHU	[redacted]			
CARLITO CENIDO	[redacted]			
JOYCE CENIDO	[redacted]			
James Nieuwdorp	[redacted]			
David Hudson	[redacted]			

Westbound SR-91 Improvement Project

Public Open House

Tuesday, October 18, 2016, 6:30 – 8:30pm

A J Padleford Park – North Artesia Community Center

Sign-in Sheet

Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number / Cell Number Número de Teléfono y Cellular	EMail Correo Electrónico
CECILIA RAHBAN	[redacted]			
AC ROHBAN				
Jean Halfenley				
MARIA & RAUL ROMANA				
Hugh C. Villegas				
Christina Ayala-Alcantar				
MARCUS BEDFORD				
Carlos, Martinez				

Westbound SR-91 Improvement Project

Public Open House

Tuesday, October 18, 2016, 6:30 – 8:30pm

A J Padleford Park – North Artesia Community Center

Sign-in Sheet

Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number / Cell Number Número de Teléfono y Cellular	EMail Correo Electrónico
PAUL HO	[redacted]			
PAULO MENEZES				
Mel Cortez				
Juan Garza				

Westbound SR-91 Improvement Project

Public Open House

Tuesday, October 18, 2016, 6:30 – 8:30pm

A J Padleford Park – North Artesia Community Center

Sign-in Sheet

Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number / Cell Number Número de Teléfono y Cellular	EMail Correo Electrónico
ARLENE CHUNG	[redacted]	[redacted]	[redacted]	[redacted]
Thelma Gonzalez	[redacted]	[redacted]	[redacted]	[redacted]
Sophia Tse	[redacted]	[redacted]	[redacted]	[redacted]
Menaka Peiris	[redacted]	[redacted]	[redacted]	[redacted]
Maria Alonso	[redacted]	[redacted]	[redacted]	[redacted]
Linda Kusuda	[redacted]	[redacted]	[redacted]	[redacted]
MIKE BHAKTA	[redacted]	[redacted]	[redacted]	[redacted]

Westbound SR-91 Improvement Project

Public Open House

Wednesday, October 19, 2016, 6:30 – 8:30pm

Cerritos High School

Sign-in Sheet

Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number / Cell Number Número de Teléfono y Cellular	EMail Correo Electrónico
Guillermina Soto	[redacted]	[redacted]	[redacted]	[redacted]
PATERNO CABEBE	[redacted]	[redacted]	[redacted]	[redacted]
RISHI GOEL	[redacted]	[redacted]	[redacted]	[redacted]
Maria Alonso	[redacted]	[redacted]	[redacted]	[redacted]
Thelma Gonzalez	[redacted]	[redacted]	[redacted]	[redacted]
HERMES ABELLA	[redacted]	[redacted]	[redacted]	[redacted]

Westbound SR-91 Improvement Project

Public Open House

Wednesday, October 19, 2016, 6:30 – 8:30pm

Cerritos High School

Sign-in Sheet

Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number / Cell Number Número de Teléfono y Cellular	EMail Correo Electrónico
Rosanna chung	[redacted]			
~~EDUARDO~~ Ken Cha	[redacted]			
Fresy BONILLA	[redacted]			
Menaka Peiris	[redacted]			
Nancy Garcia	[redacted]			
Mary Shin	[redacted]			
Nilesh Bhakta	[redacted]			
VICTORIA SOTO	[redacted]			

Westbound SR-91 Improvement Project

Public Open House

Wednesday, October 19, 2016, 6:30 – 8:30pm

Cerritos High School

Sign-in Sheet

Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number / Cell Number Número de Teléfono y Cellular	EMail Correo Electrónico
Sue Carter	[redacted]	[redacted]	[redacted]	[redacted]
Joan Pylman	[redacted]	[redacted]	[redacted]	[redacted]
Craig Wehrman	[redacted]	[redacted]	[redacted]	[redacted]
Jim + Lynn Bugher	[redacted]	[redacted]	[redacted]	[redacted]
Jean Halfinberg	[redacted]	[redacted]	[redacted]	[redacted]
MARILOU McSHERRY	[redacted]	[redacted]	[redacted]	[redacted]
SANDRA BRUBSCH	[redacted]	[redacted]	[redacted]	[redacted]
DEBRA THOMAS	[redacted]	[redacted]	[redacted]	[redacted]

Westbound SR-91 Improvement Project

Public Open House

Wednesday, October 19, 2016, 6:30 – 8:30pm

Cerritos High School

Sign-in Sheet

Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number / Cell Number Número de Teléfono y Cellular	EMail Correo Electrónico
Robert Olivas	[redacted]			
Sandra Morgan				
Norma Shiota				
Peter Barton				
~~[illegible] CHEN~~				
JIALUNG YU				
MARK PULIDO				
Margaret Chapman				

Westbound SR-91 Improvement Project

Public Open House

Wednesday, October 19, 2016, 6:30 – 8:30pm

Cerritos High School

Sign-in Sheet

Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number / Cell Number Número de Teléfono y Cellular	EMail Correo Electrónico
Sophia Te	[redacted]	[redacted]	[redacted]	[redacted]
MADHURI PETKAR	[redacted]	[redacted]	[redacted]	[redacted]
Treva Blackwell	[redacted]	[redacted]	[redacted]	[redacted]
Hugo H	[redacted]	[redacted]	[redacted]	[redacted]
Victor Blackwell	[redacted]	[redacted]	[redacted]	[redacted]

Westbound SR-91 Improvement Project

Public Open House

Wednesday, October 19, 2016, 6:30 – 8:30pm

Cerritos High School

Sign-in Sheet

Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number / Cell Number Número de Teléfono y Cellular	EMail Correo Electrónico
Joseph A. Chapm	[redacted]			
Gabriela Martinez				
Elia Burgin				
Vipul Vineel				
Vicki DePirro				
GARRET SHIOTA				
Dixie PRimosch				

Metro

Westbound SR-91 Improvement Project

Public Open House

Wednesday, October 19, 2016, 6:30 – 8:30pm

Cerritos High School

Sign-in Sheet

Caltrans

Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number / Cell Number Número de Teléfono y Cellular	EMail Correo Electrónico
Mike Rosario	[redacted]	[redacted]	[redacted]	[redacted]
KIRSTEN ABUNDO	[redacted]	[redacted]	[redacted]	[redacted]
MUKUND BHAKTA	[redacted]	[redacted]	[redacted]	[redacted]
Guillermina SOTO	[redacted]	[redacted]	[redacted]	[redacted]
EVAN OWEN	[redacted]	[redacted]	[redacted]	[redacted]

Westbound SR-91 Improvement Project

Public Open House

Wednesday, October 19, 2016, 6:30 – 8:30pm

Cerritos High School

Sign-in Sheet

Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number / Cell Number Número de Teléfono y Cellular	EMail Correo Electrónico
Rogelio Chua	[redacted]			
Maria Campos	[redacted]			
Jose Campos	[redacted]			
Al Rahban	[redacted]			
Shauna Olea	[redacted]			
Rene Olea	[redacted]			
Maria Roman	[redacted]			
Claudia Gastelum	[redacted]			

Metro

Westbound SR-91 Improvement Project

Public Open House

Wednesday, October 19, 2016, 6:30 – 8:30pm

Cerritos High School

Business Card Sign-in Sheet

Caltrans

Take Action Now !
Energy Integration Services
Alan Williamson
C - 46 SOLAR 984380
562 / 712 - 4703
alan.action.now@gmail.com

MARK E. PULIDO
Councilmember
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P.O. BOX 3130 · CERRITOS, CALIFORNIA 90703-3130
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LAC DMH
LOS ANGELES COUNTY DEPARTMENT OF MENTAL HEALTH
Direct: (213) 738-2529
Cell: (213) 434-5116
Fax: (213) 384-0729
tblackwell@dmh.lacounty.gov
TREVA BLACKWELL,MPA
Health Program Analyst II
Service Area 7 Administration
550 S. Vermont Avenue
Los Angeles, CA 90020
recycled paper

Sophia Tse
YOUR BUSINESS CARD HERE
ABCUSD
Board Member

YOUR BUSINESS CARD HERE

YOUR BUSINESS CARD HERE

YOUR BUSINESS CARD HERE

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Sign-in Sheet

Community Meeting #1 ✱

Cerritos High School - Theatre Building
12500 183rd St, Cerritos, CA 90703
Tuesday, January 30, 2018, 6 - 8 pm

Community Meeting #2

AJ Padelford Park
11870 169th St, Artesia, CA 90701
Wednesday, January 31, 2018, 6 - 8 pm

Robert Kay
Manager
Maintenance & Facilities
ABC Unified School District
11865 E. 178th Street, Artesia, California 90701
16700 Norwalk Boulevard
Cerritos, California 90703
Email: Robert.Kay@abcusd.us
(562) 926-5566 Ext. 22455
Cell (562) 254-5031
Fax (562) 229-7927

Sophia Tse
Board of Education
Board Member

ABC Unified School District
16700 Norwalk Boulevard
Cerritos, California 90703
607-1871
Cell (562) ~~565-0988~~
(562) 926-5566 Ext. 21161
Fax (562) 404-1092

TEL: (562) 420-2641 ext. 240
FAX: (562) 496-3708
CITY OF HAWAIIAN GARDENS
LUCIE COLOMBO
ASSISTANT CITY CLERK/
ASSISTANT RECORDS MANAGER
21815 PIONEER BLVD., HAWAIIAN GARDENS, CA 90716-1237
E-MAIL: LColombo@hgcity.org

DARIO SIMOES
Assistant City Engineer
Public Works Department
Phone: (562) 916-1219
E-mail: dsimoes@cerritos.us
CITY OF CERRITOS℠
18125 BLOOMFIELD AVENUE • FAX: (562) 916-1211
P.O. BOX 3130 • CERRITOS, CALIFORNIA 90703-3130

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send ppt

LINDA T. SÁNCHEZ
MEMBER OF CONGRESS
38TH DISTRICT, CALIFORNIA
IRMA GORROCINO
CASEWORKER/FIELD REPRESENTATIVE
17906 CRUSADER AVE., SUITE 100
CERRITOS, CA 90703
http://www.lindasanchez.house.gov
PHONE: (562) 860-5050
FAX: (562) 924-2914
Irma.Gorrocino@mail.house.gov

Sharon L. Weissman
Board Deputy to Mayor Robert Garcia
Metro Board Office
213.418.3112 Tel
weissmans@metro.net
Los Angeles County Metropolitan Transportation Authority
One Gateway Plaza
Mail Stop: 99-3-1
Los Angeles, CA 90012-2952
metro.net
Metro

MARK E. PULIDO
Mayor Pro Tem and Former Mayor
Phone: (562) 916-1310
Residence Phone: (562) 404-2343
E-mail: markpulido@yahoo.com
CITY OF CERRITOS℠
18125 BLOOMFIELD AVENUE • FAX: (562) 468-1095
P.O. BOX 3130 • CERRITOS, CALIFORNIA 90703-3130
cerritos.us

JANICE HAHN
Supervisor, Fourth District
County of Los Angeles
LYNDA P. JOHNSON
Field Deputy
Bellflower Field Office
10025 East Flower Street
Bellflower, California 90706
Office: (562) 804-8208
Fax: (562) 804-2746
LyJohnson@bos.lacounty.gov

Sign-in Sheet

Community Meeting #1
Cerritos High School - Theatre Building
12500 183rd St, Cerritos, CA 90703
Tuesday, January 30, 2018, 6 - 8 pm

Community Meeting #2
AJ Padelford Park
11870 169th St, Artesia, CA 90701
Wednesday, January 31, 2018, 6 - 8 pm

Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number Número de Teléfono	E-mail Correo Electrónico
Don W. Good, Sr.	[redacted]			
S. CRONES				
Alan Williamson				
Madhuri Petkar				
Eileen McKinney				
John McKinney				
Shirley & Juan Montes				
James Nieuwdorp				

Sign-in Sheet

Community Meeting #1
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Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number Número de Teléfono	E-mail Correo Electrónico
SUE CARRUTHERS	[redacted]	[redacted]	[redacted]	[redacted]
Stanley Harris	[redacted]	[redacted]	[redacted]	[redacted]
Reyna Reynoso	[redacted]	[redacted]	[redacted]	[redacted]
Alfonso Ochoa	[redacted]	[redacted]	[redacted]	[redacted]
Linda & Julio Hernandez	[redacted]	[redacted]	[redacted]	[redacted]
Bill Zimmerman	[redacted]	[redacted]	[redacted]	[redacted]
Olli Robertshaw WAYNE ROBERTSHAW	[redacted]	[redacted]	[redacted]	[redacted]
PHIL CUNNEW	[redacted]	[redacted]	[redacted]	[redacted]

Sign-in Sheet

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Community Meeting #2
AJ Padelford Park
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Wednesday, January 31, 2018, 6 - 8 pm

Name Nombre	**Affiliation** Afiliación	**Address** Dirección	**Phone Number** Número de Teléfono	**E-mail** Correo Electrónico
JACQUE & ROGER KLINE	[redacted]			
Glenn Nishibayashi				
Maria Cortez				
Murali Vasudevan				
Sheila Advani				
Jean Halfinberg				
Robert Ky				
Steve Warner				

Community Meeting #1
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Sign-in Sheet

Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number Número de Teléfono	E-mail Correo Electrónico
Glen Tedtsutso	[redacted]			
RONALD + Guadalupe Allen				
Mark & Nancy Nagayama				
Cynthia Yoshimoto				
Dixie Primosch				
Julie Abeyta				
Frank Abeyta				
George Soto				

Sign-in Sheet

Community Meeting #1
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Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number Número de Teléfono	E-mail Correo Electrónico
Sandra Morgan	[redacted]	[redacted]	[redacted]	[redacted]
DAVID & CAROL HORN	[redacted]	[redacted]	[redacted]	[redacted]
Melissa Astudillo	[redacted]	[redacted]	[redacted]	[redacted]
David & Patty Trammell	[redacted]	[redacted]	[redacted]	[redacted]
F. ALVARADO	[redacted]	[redacted]	[redacted]	[redacted]
RAPHAEL PERERA	[redacted]	[redacted]	[redacted]	[redacted]
Johny [illegible]	[redacted]	[redacted]	[redacted]	[redacted]
James Yee	[redacted]	[redacted]	[redacted]	[redacted]

Sign-in Sheet

Community Meeting #1
Cerritos High School - Theatre Building
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AJ Padelford Park
11870 169th St, Artesia, CA 90701
Wednesday, January 31, 2018, 6 - 8 pm

Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number Número de Teléfono	E-mail Correo Electrónico
RAUL ROMANA & MARIA	[redacted]			
Jim Bughn	[redacted]			
PETER JAZMIN	[redacted]			
Linda Kusuda	[redacted]			
LAWRENCE P. & JUDITH STERN	[redacted]			
STEVE & CYNTHIA YUSHIMOTO	[redacted]			
Sue Carter	[redacted]			
Maced Maravilla	[redacted]			

Sign-in Sheet

Community Meeting #1
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Wednesday, January 31, 2018, 6 - 8 pm

Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number Número de Teléfono	E-mail Correo Electrónico
Isabel Valdivia	[redacted]			
Steve Patel				
Irma Gavacino				
Maria Wasserman				
Gerald SOTO				
ROBERT GRAY				
JAKE VU				
VIPUL VINEET				

Sign-in Sheet

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Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number Número de Teléfono	E-mail Correo Electrónico
DEBRA THOMAS	[redacted]			
KATHERINE GEORGE	CAM [redacted]			
HUBERT FOK	[redacted]			
Tom Zepko	[redacted]			
AL RAILBAU	[redacted]			
Teri Chapman	[redacted]			
Sarah Montes	[redacted]			
Joseph A Chapman	[redacted]			

Sign-in Sheet

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Wednesday, January 31, 2018, 6 - 8 pm

Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number Número de Teléfono	E-mail Correo Electrónico
RANDY HEYLAND	[redacted]			
ERROC CRONES				
ALEX VILLARIN				
VIRGINIA NGEAMWICHIT				
BEN WAIA				
GARRET SHIOTA				
Debra Gomez				
MARGARET E. FASSBINDER				

Westbound SR-91 Improvement Project

Sign-in Sheet

Community Meeting #1
Cerritos High School - Theatre Building
12500 183rd St, Cerritos, CA 90703
Tuesday, January 30, 2018, 6 - 8 pm

Community Meeting #2
AJ Padelford Park
11870 169th St, Artesia, CA 90701
Wednesday, January 31, 2018, 6 - 8 pm

Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number Número de Teléfono	E-mail Correo Electrónico
Opal Kennedy	[redacted]			
Cheryl Roth				
Dan Klaffke				
John Rhee				
Diana Wehrman				
Sam Desa				
Quintin Sumabat				
Erlinda Garcia				

Westbound SR-91 Improvement Project

Sign-in Sheet

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Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number Número de Teléfono	E-mail Correo Electrónico
Sharon Weissman	[redacted]	[redacted]	[redacted]	[redacted]
SopHIA TSE	[redacted]	[redacted]	[redacted]	[redacted]
Victor Blackwell	[redacted]	[redacted]	[redacted]	[redacted]
Urie Colombo	[redacted]	[redacted]	[redacted]	[redacted]
Nancy	[redacted]	[redacted]	[redacted]	[redacted]
Margaret Chapman		[redacted]	[redacted]	[redacted]
Susan Tse Koo & Mike Koo	[redacted]	[redacted]	[redacted]	[redacted]

Sign-in Sheet

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Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number Número de Teléfono	E-mail Correo Electrónico
JIA Yu	[redacted]	[redacted]	[redacted]	[redacted]
MARK PULIDO	[redacted]	[redacted]	[redacted]	[redacted]
Mei Pan	[redacted]	[redacted]	[redacted]	[redacted]

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Sign-in Sheet

ALI SAJJAD TAJ
Councilman

18747 Clarkdale Avenue
Artesia, California 90701
Phone (562) 865-6262
Fax (562) 865-6240

Cell (562) 450-3214
ataj@cityofartesia.us
www.cityofartesia.us

SENATOR TONY MENDOZA
THIRTY-SECOND SENATE DISTRICT

URSULA PARRA NUÑEZ
DISTRICT REPRESENTATIVE

CAPITOL OFFICE
STATE CAPITOL, ROOM 5061
SACRAMENTO, CA 95814
TEL (916) 651-4032
FAX (916) 651-4932
URSULA.PARRA@SEN.CA.GOV

DISTRICT OFFICE
17315 STUDEBAKER ROAD
SUITE 332
CERRITOS, CA 90703
TEL (562) 860-3202
FAX (562) 924-4802

JANICE HAHN
Supervisor, Fourth District
County of Los Angeles

LYNDA P. JOHNSON
Field Deputy

Bellflower Field Office
10025 East Flower Street
Bellflower, California 90706

Office: (562) 804-8208
Fax: (562) 804-2746
LyJohnson@bos.lacounty.gov

Westbound SR-91 Improvement Project

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Wednesday, January 31, 2018, 6 - 8 pm

[redacted]

Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number Número de Teléfono	E-mail Correo Electrónico
Lillian M. Montoya	[redacted]	[redacted]	[redacted]	[redacted]
Narae Han	[redacted]	[redacted]	[redacted]	[redacted]
Gustavo Ledesma	[redacted]	[redacted]	[redacted]	[redacted]
Lourdes Francisco	[redacted]	[redacted]	[redacted]	[redacted]
Ed Francisco	[redacted]	[redacted]	[redacted]	[redacted]
Lourdes Alva[illegible]	[redacted]	[redacted]	[redacted]	[redacted]
David Arana	[redacted]	[redacted]	[redacted]	[redacted]
Young-Gi Kim Harabedian	[redacted]	[redacted]	[redacted]	[redacted]

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Wednesday, January 31, 2018, 6 - 8 pm

Sign-in Sheet

Name Nombre	**Affiliation** Afiliación	**Address** Dirección	**Phone Number** Número de Teléfono	**E-mail** Correo Electrónico
Peter Lin	[redacted]			
Samer Momani				
Mamie Cummins				
Gerardo Moreno				
Pat Tan.				
Daniel Ham				
Thelma Gonzalez				
Maria Alonso				

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Sign-in Sheet

Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number Número de Teléfono	E-mail Correo Electrónico
Hilario Salinas	[redacted]			
Mario Chacón				
Baldomero Lopez				
Joseph M Glynn				
DAVE				
Carlos, Martinez				
Marina Sanchez				
MARTIN MEDINA				

Sign-in Sheet

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Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number Número de Teléfono	E-mail Correo Electrónico
Enrique [illegible]	[redacted]			
JAIME EQUIHUA				
Maria A. Marquez				
Santiago & Susana Cruz				
RENE TREVINO				
Steve Leon				
Ma				
MARTIN [illegible]				

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Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number Número de Teléfono	E-mail Correo Electrónico
Ramón Quesada	[redacted]			
Tara Griffith	[redacted]			
CECI LOPEZ	[redacted]			
SYLVIA Collier	[redacted]			
Ursula Parra	[redacted]			
Ariana Yuri Mendoza	[redacted]			
ROBERT JWITT	[redacted]			
Wilbert Palaco	[redacted]			

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Name Nombre	**Affiliation** Afiliación	**Address** Dirección	**Phone Number** Número de Teléfono	**E-mail** Correo Electrónico
JUAN BORJA	[redacted]			
GUILLERMINA Jorge Escobar				
Rafael BORJAS				
ANICETO JASSO				
FCO. CARDENAS				
Juan Gracian				
MANUEL PEREZ				
GREG WEAR				

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Name Nombre	**Affiliation** Afiliación	**Address** Dirección	**Phone Number** Número de Teléfono	**E-mail** Correo Electrónico
Carlos Peregrina	[redacted]			
Maria Torres				
Luisa Moreno				
Natalie Chavero				
Qiaoei Ma				
SRIVARA WATABUTR				
Maria Quintanar				
Noemi J Mora				

Westbound SR-91 Improvement Project

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Sign-in Sheet

Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number Número de Teléfono	E-mail Correo Electrónico
KENNY, James	[redacted]			
LEN GOLDSMITH				
Norma Altamirano				
Ma Luisa Carbajal				
Isabel Salinas				
BRYAN HILL				
Ken Russell				
James Nieuwdorf				

Sign-in Sheet

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Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number Número de Teléfono	E-mail Correo Electrónico
Irene Flores	[redacted]			
Rosa Paredes				
Ratana Watabdr				
Joseph Carbajal				
Rocky Pavone				
Maria Subol				

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Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number Número de Teléfono	E-mail Correo Electrónico
Araceli Martinez	[redacted]			
Allen Nich				
Tom Kotcha				
Gerardo Martinez				

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Name Nombre	Affiliation Afiliación	Address Dirección	Phone Number Número de Teléfono	E-mail Correo Electrónico
Sean Ashton	[redacted]			
Dulce Martinez	[redacted]			
Reyna Reynoso	[redacted]			
milagro Rivera	[redacted]			
ROBERTO ALVAREZ	[redacted]			
Teresa Bardales	[redacted]			

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Name Nombre	**Affiliation** Afiliación	**Address** Dirección	**Phone Number** Número de Teléfono	**E-mail** Correo Electrónico
Alicia Oropeza	[redacted]			
Esperanza Jasso				

LSA

BERKELEY
CARLSBAD
FRESNO
IRVINE
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROCKLIN
SAN LUIS OBISPO

May 18, 2017

Gayle Totton, M.A., PhD.
Associate Governmental Program Analyst
Native American Heritage Commission
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691

Subject: Section 106 Consultation List and Sacred Lands File Search Request for the Westbound SR-91 Improvement Project, Cities of Artesia, Cerritos, and Norwalk, County of Los Angeles, California

Dear Ms. Totton:

Attached please find a map showing the location of the Westbound SR-91 Improvement Project in the Cities of Artesia, Cerritos, and Norwalk, County of Los Angeles, California. Specifically, the project is in the following Townships (T), Ranges (R), and Sections (S) of the *Whittier, California* and *Los Alamitos, California* 7.5-minute United States Geological Survey (USGS) topographic quadrangle maps as identified below:

T: 03 S; R: 11 W; S: 29

T: 03 S; R: 11 W; S: 30

T: 03 S; R: 12 W; S: 25

T: 03 S; R: 12 W; S: 26

T: 03 S; R: 11 W; S: 32

LSA is assisting the California Department of Transportation (Caltrans) in preparing the cultural resources assessment for the project. Per Section 106 of the National Historic Preservation Act, please notify us of any Native American cultural resources that might be impacted, and include a list of potential Native Americans that may be contacted for Section 106 Native American consultation.

Thank you very much for your assistance. If you have any questions or comments, please contact me at (949) 553-0666, or at kerrie.collison@lsa.net.

Best Regards,

LSA Associates, Inc.

Kerrie N Collison

Kerrie Collison, M.A., RPA
Archaeologist

Attachments: Figure 1: Project Location Map

5/18/17 «P:\RBF1601\LSA Technical Studies\Cultural\Native American consultation\2017 05 18 NAHC SLF request Section 106.docx»

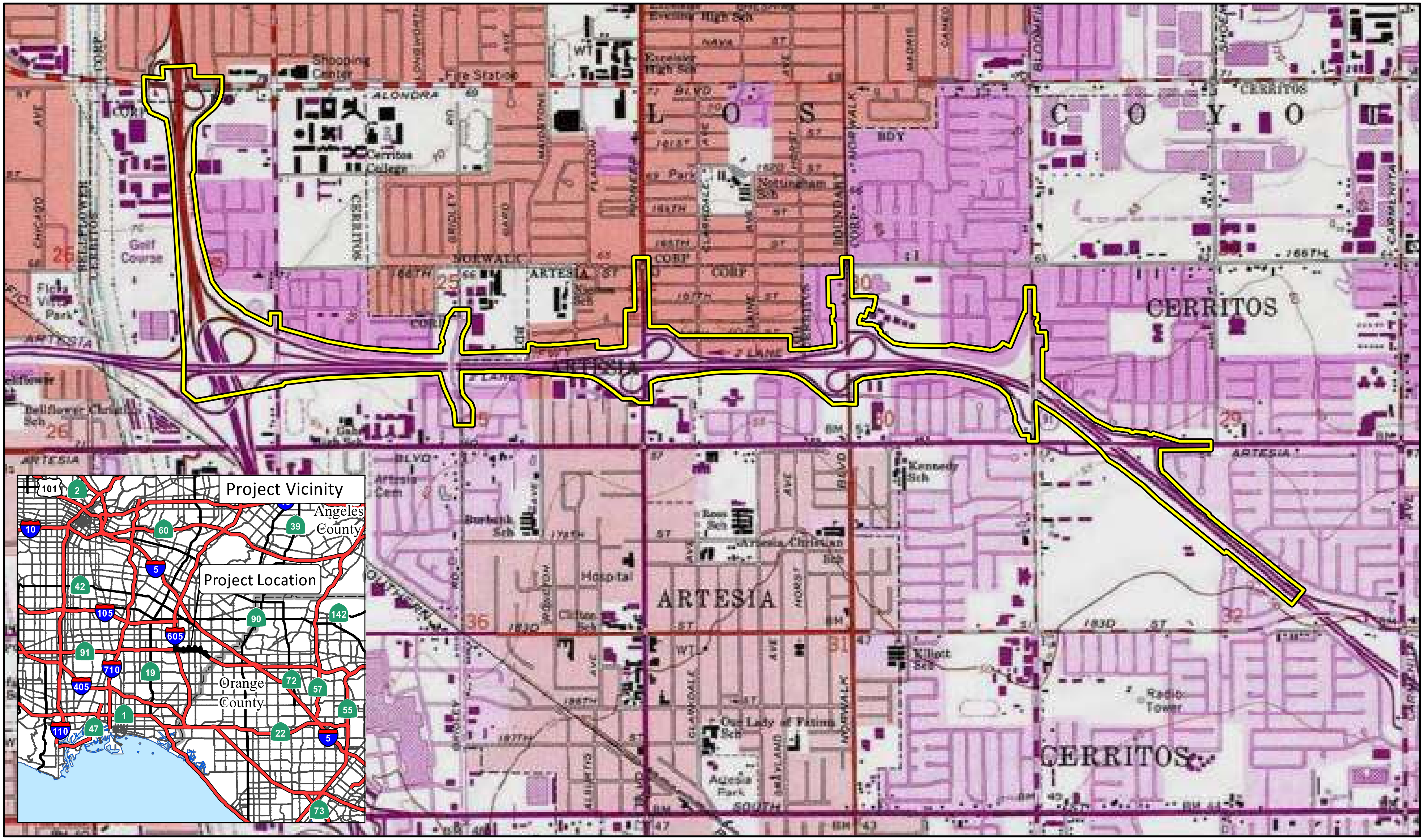

FIGURE 1

LEGEND

Study Area Limits

0 1000 2000
FEET

SOURCE: USGS 7.5' Quad - Whittier (1981) and Los Alamitos (1981); Michael Baker (3/2017)

Westbound SR-91 Improvement Project

Project Location

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0716000284; EA 07-29811

I:\RBF1601\GIS\MXD\ProjectLocation_USGS.mxd (3/29/2017)

STATE OF CALIFORNIA Edmund G. Brown, Jr., Governor

NATIVE AMERICAN HERITAGE COMMISSION
Environmental and Cultural Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
(916) 373-3710

May 22, 2017

Kerrie Collison
LSA

Sent by E-mail: Kerrie.collison@lsa.net

RE: Proposed Westbound SR-91 Improvement, Cities of Artesia, Cerritos, and Norwalk; Whittier and Los Alamitos USGS Quadrangles, Los Angeles County, California

Dear Ms. Collison:

A record search of the Native American Heritage Commission (NAHC) *Sacred Lands File* was completed for the area of potential project effect (APE) referenced above with negative results. Please note that the absence of specific site information in the *Sacred Lands File* does not indicate the absence of Native American cultural resources in any APE.

Attached is a list of tribes culturally affiliated to the project area. I suggest you contact all of the listed Tribes. If they cannot supply information, they might recommend others with specific knowledge. The list should provide a starting place to locate areas of potential adverse impact within the APE. By contacting all those on the list, your organization will be better able to respond to claims of failure to consult. If a response has not been received within two weeks of notification, the NAHC requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact via email: gayle.totton@nahc.ca.gov.

Sincerely,

Gayle Totton

Gayle Totton, M.A., PhD.
Associate Governmental Program Analyst

Native American Heritage Commission
Native American Contact List
Los Angeles County
5/22/2017

Gabrieleno Band of Mission Indians - Kizh Nation
Andrew Salas, Chariperson
P.O. Box 393 — Gabrieleno
Covina, CA, 91723
Phone: (626) 926 - 4131
gabrielenoindians@yahoo.com

Gabrieleno/Tongva San Gabriel Band of Mission Indians
Anthony Morales, Chairperson
P.O. Box 693 — Gabrieleno
San Gabriel, CA, 91778
Phone: (626) 483 - 3564
Fax: (626)286-1262
GTTribalcouncil@aol.com

Gabrielino /Tongva Nation
Sandonne Goad, Chairperson
106 1/2 Judge John Aiso St., #231 — Gabrielino
Los Angeles, CA, 90012
Phone: (951)807-0479
sgoad@gabrielino-tongva.com

Gabrielino Tongva Indians of California Tribal Council
Robert Dorame, Chairperson
P.O. Box 490 — Gabrielino
Bellflower, CA, 90707
Phone: (562) 761 - 6417
Fax: (562) 761-6417
gtongva@gmail.com

Gabrielino-Tongva Tribe
Linda Candelaria, Co-Chairperson
23453 Vanowen Street — Gabrielino
West Hills, CA, 91307
Phone: (626) 676 - 1184
palmsprings9@yahoo.com

Juaneno Band of Mission Indians Acjachemen Nation - Belardes
Joyce Perry, Tribal Manager
4955 Paseo Segovia — Juaneno
Irvine, CA, 92603
Phone: (949) 293 - 8522
kaamalam@gmail.com

Juaneno Band of Mission Indians Acjachemen Nation - Belardes
Matias Belardes, Chairperson
32161 Avenida Los Amigos — Juaneno
San Juan Capisttrano, CA, 92675
Phone: (949)293-8522

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Westbound SR-91 Improvements Project, Los Angeles County.

LSA

BERKELEY
CARLSBAD
FRESNO
IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

May 24, 2017

Gabrieleno Band of Mission Indians—Kizh Nation
Andrew Salas, Chairperson
P.O. Box 393
Covina, CA 91723

Subject: Section 106 Consultation for the Westbound State Route 91 Improvement Project, Cities of Artesia and Cerritos, County of Los Angeles, California

Dear Mr. Salas:

The Los Angeles County Metropolitan Transportation Authority and the California Department of Transportation District 7, in collaboration with the Gateway Cities Council of Governments, and the Cities of Artesia and Cerritos, propose to widen and improve approximately 3 miles of westbound State Route 91 (SR-91), also known as the Artesia Freeway, between approximately Shoemaker Avenue and the Interstate 605 (I-605) northbound off-ramp to Alondra Boulevard.

The purpose of the project is to reduce congestion and improve freeway operations (both mainline and ramps), improve safety, and improve local and system interchange operations. Proposed improvements include the following:

- Additional freeway mainline capacity leading to the westbound SR-91 connector ramp to northbound and southbound I-605
- Improvements to freeway entrance and exit ramps on westbound SR-91
- Operational improvements to northbound I-605 at the Alondra Boulevard off-ramp

Associated improvements are also anticipated on the arterial streets near the freeway ramp intersections.

The project location is shown on Figure 1: Project Location (attached). Because all cultural resource efforts will be completed in compliance with Section 106 of the National Historic Preservation Act, you are being contacted per the Native American consultation guidelines of Section 106.

As part of the cultural resources studies, a records search for the project area was completed at the South Central Coastal Information Center of the California Historical Resources Information System at California State University, Fullerton. The records search indicated there are no known prehistoric sites within the project area. One prehistoric site is located within a half-mile of the project area. A Sacred Lands File search requested from the Native American Heritage Commission was also negative for the project area.

If you know of any cultural resources of religious and/or cultural significance to your community that may be affected, or if you would like more information, please do not hesitate to contact me at (949) 553-0666 or at kerrie.collison@lsa.net. If I do not receive a response from you, I will contact you again in the near future to discuss any comments or concerns you may have. Also, please feel free to forward this to others in your group whom you believe may have information that would be helpful in identifying cultural resources that could be affected by the project.

Thank you for your involvement in this process. Your comments are important, and I look forward to hearing from you.

Respectfully,

LSA Associates, Inc.

Kerrie N Collison

Kerrie Collison, M.A., RPA
Cultural Resources Analyst

Attachment: Figure 1: Project Location

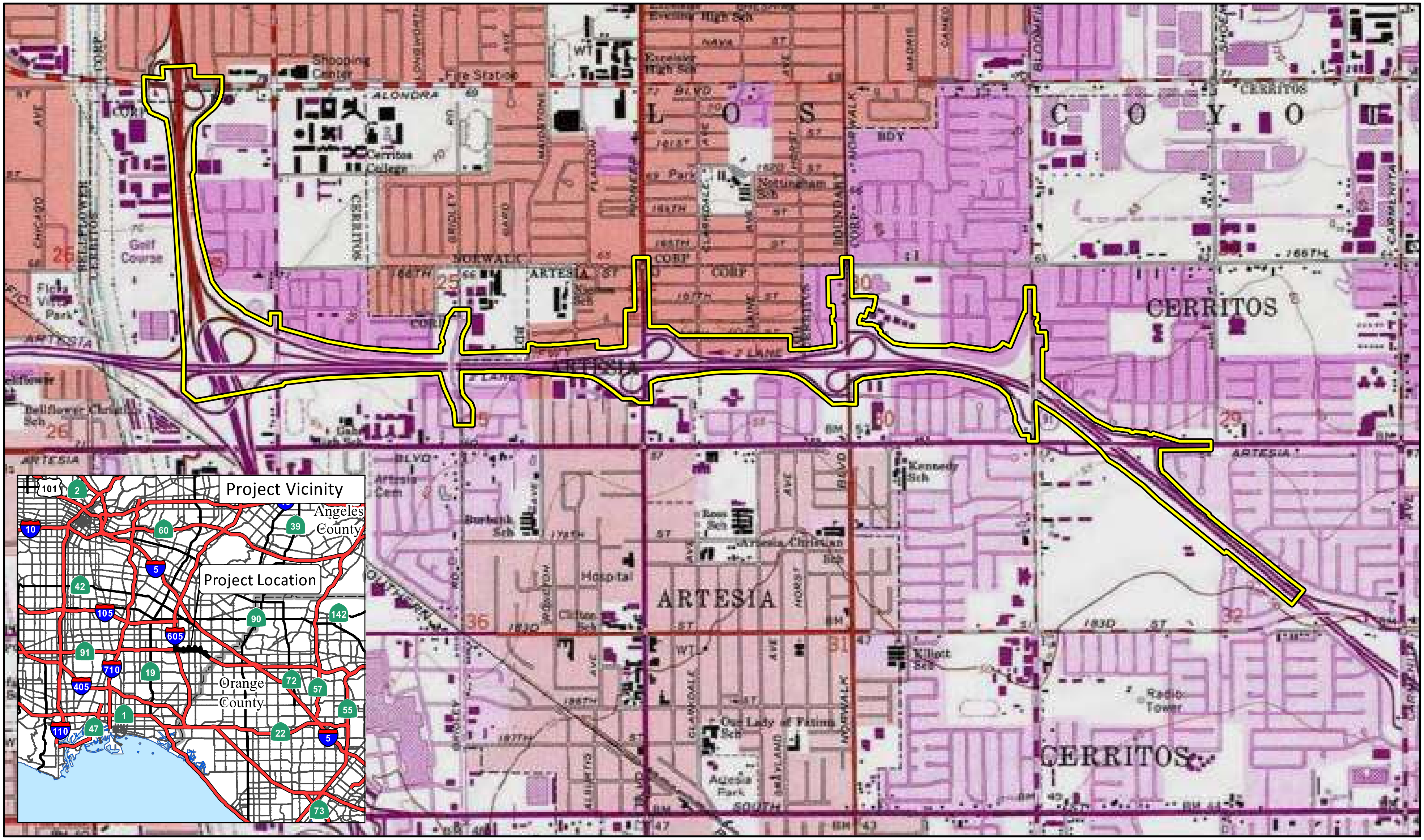

FIGURE 1

LEGEND

Study Area Limits

N

0 1000 2000

FEET

SOURCE: USGS 7.5' Quad - Whittier (1981) and Los Alamitos (1981); Michael Baker (3/2017)

Westbound SR-91 Improvement Project

Project Location

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0716000284; EA 07-29811

I:\RBF1601\GIS\MXD\ProjectLocation_USGS.mxd (3/29/2017)

Kerrie Collison

From: Kerrie Collison
Sent: Monday, June 12, 2017 11:32 AM
To: Andrew Salas (gabrielenoindians@yahoo.com)
Subject: Section 106 Consultation for the Proposed WB-91 Improvement Project, County of Los Angeles
Attachments: Andrew Salas.pdf

Good afternoon, Mr. Salas.

I sent a project notification letter to you dated May 24, 2017, for the proposed WB-91 Improvement Project in Los Angeles County. I have attached a copy of the letter for your reference. Please let me know at your earliest convenience if you have concerns about this project and the potential to impact cultural resources. Thank you for your input.

Best,
Kerrie

Kerrie Collison, M.A., RPA | Cultural Resources Analyst
LSA | 20 Executive Park, Suite 200
Irvine, CA 92614
_ _ _ _ _ _ _ _ _ _ _ _ -
949-553-0666 ext. 312 Tel
949-413-2134 Mobile
Website

Kerrie Collison

From: Kerrie Collison
Sent: Monday, June 12, 2017 11:34 AM
To: Anthony Morales (GTTribalcouncil@aol.com)
Subject: Section 106 Consultation for the Proposed WB-91 Improvement Project, County of Los Angeles
Attachments: Anthony Morales.pdf

Good morning, Mr. Morales.

I sent a project notification letter to you dated May 24, 2017, for the proposed WB-91 Improvement Project in Los Angeles County. I have attached a copy of the letter for your reference. Please let me know at your earliest convenience if you have concerns about this project and the potential to impact cultural resources. Thank you for your input.

Best,
Kerrie

Kerrie Collison, M.A., RPA | Cultural Resources Analyst
LSA | 20 Executive Park, Suite 200
Irvine, CA 92614
_ _ _ _ _ _ _ _ _ _ _ _ -
949-553-0666 ext. 312 Tel
949-413-2134 Mobile
Website

Kerrie Collison

From: Kerrie Collison
Sent: Monday, June 12, 2017 11:36 AM
To: Joyce Perry (kaamalam@gmail.com)
Subject: Section 106 Consultation for the Proposed WB-91 Improvement Project, County of Los Angeles
Attachments: Joyce Perry.pdf

Good morning, Ms. Perry.

I sent a project notification letter to you dated May 24, 2017, for the proposed WB-91 Improvement Project in Los Angeles County. I have attached a copy of the letter for your reference. Please let me know at your earliest convenience if you have concerns about this project and the potential to impact cultural resources. Thank you for your input.

Best,
Kerrie Collison

Kerrie Collison, M.A., RPA | Cultural Resources Analyst
LSA | 20 Executive Park, Suite 200
Irvine, CA 92614
– – – – – – – – – – – – -
949-553-0666 ext. 312 Tel
949-413-2134 Mobile
Website

Kerrie Collison

From:	Kerrie Collison
Sent:	Monday, June 12, 2017 11:38 AM
To:	'palmsprings9@yahoo.com'
Subject:	Section 106 Consultation for the Proposed WB-91 Improvement Project, County of Los Angeles
Attachments:	Linda Candelaria.pdf

Good morning, Ms. Candelaria.

I sent a project notification letter to you dated May 24, 2017, for the proposed WB-91 Improvement Project in Los Angeles County. I have attached a copy of the letter for your reference. Please let me know at your earliest convenience if you have concerns about this project and the potential to impact cultural resources. Thank you for your input.

Best,
Kerrie Collison

Kerrie Collison, M.A., RPA | Cultural Resources Analyst
LSA | 20 Executive Park, Suite 200
Irvine, CA 92614
– – – – – – – – – – – – -
949-553-0666 ext. 312 Tel
949-413-2134 Mobile
Website

Kerrie Collison

From: Kerrie Collison
Sent: Monday, June 19, 2017 11:19 AM
To: Robert Dorame (gtongva@gmail.com)
Subject: RE: Section 106 Consultation for the Proposed WB-91 Improvement Project, County of Los Angeles
Attachments: Robert Dorame.pdf

Good morning, Mr. Dorame.

I called your cell phone earlier this morning to follow up with you regarding this project, and was asked to call back later. I just tried calling again, and got an automated message saying that your voice mailbox is not set up, so I wanted to follow up with you via email.

I wanted to check in one more time regarding this project (I have attached the initial consultation letter). If you have any concerns or comments about this project, please let me know. Thank you!

Best,
Kerrie Collison

Kerrie Collison, M.A., RPA | Cultural Resources Analyst
LSA | 20 Executive Park, Suite 200
Irvine, CA 92614
– – – – – – – – – – – – -
949-553-0666 ext. 312 Tel
949-413-2134 Mobile
Website

From: Kerrie Collison
Sent: Monday, June 12, 2017 11:40 AM
To: Robert Dorame (gtongva@gmail.com)
Subject: Section 106 Consultation for the Proposed WB-91 Improvement Project, County of Los Angeles

Good morning, Mr. Dorame.

I sent a project notification letter to you dated May 24, 2017, for the proposed WB-91 Improvement Project in Los Angeles County. I have attached a copy of the letter for your reference. Please let me know at your earliest convenience if you have concerns about this project and the potential to impact cultural resources. Thank you for your input.

Best,
Kerrie Collison

Kerrie Collison, M.A., RPA | Cultural Resources Analyst
LSA | 20 Executive Park, Suite 200
Irvine, CA 92614
– – – – – – – – – – – – -
949-553-0666 ext. 312 Tel
949-413-2134 Mobile
Website

Kerrie Collison

From: Kerrie Collison
Sent: Monday, June 12, 2017 11:42 AM
To: Sandonne Goad (sgoad@gabrielino-tongva.com)
Subject: Section 106 Consultation for the Proposed WB-91 Improvement Project, County of Los Angeles
Attachments: Sandonne Goad.pdf

Good morning, Ms. Goad.

I sent a project notification letter to you dated May 24, 2017, for the proposed WB-91 Improvement Project in Los Angeles County. I have attached a copy of the letter for your reference. Please let me know at your earliest convenience if you have concerns about this project and the potential to impact cultural resources. Thank you for your input.

Best,
Kerrie Collison

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RTIP ID# TBD (TIP submission is in progress)

TCWG Consideration Date June 27, 2017

Project Description *(clearly describe project)*
Proposed improvements include: (1) additional freeway mainline capacity leading to the westbound SR-91 connector ramp to the northbound and southbound I-605, (2) improvements to freeway entrance and exit ramps in the westbound direction on SR-91, and (3) operational improvements for the northbound I-605 at the Alondra Boulevard off-ramp. Associated improvements are also anticipated on the arterial streets in the vicinity of the freeway ramp intersections.

ALTERNATIVES

The proposed alternatives include the No Build Alternative, a Build Alternative and a Design Option at the SR-91/Pioneer Boulevard and SR-91/Norwalk Boulevard interchanges for the Build Alternative. These alternatives are each discussed below.

No Build Alternative

The No Build Alternative does not include any planned improvements to the westbound SR-91 corridor. Under this alternative, there would be no reconstruction or improvements to the SR-91 corridor. Within the Project limits, SR-91 would continue to have four mixed flow lanes that are 11 feet wide, with a 2-foot-wide median shoulder, plus one 11-foot-wide HOV lane and a 1-foot-wide HOV buffer.

Build Alternative

The Build Alternative adds one new mixed-flow lane in the westbound direction for SR-91 from approximately Shoemaker Avenue to I-605, joining at the point where the westbound SR-91 to the northbound I-605 connector ramp flares from one to two lanes (also known as the gore point). In addition, the new mixed-flow lane would create a three-lane exit movement on the westbound SR-91 to both the northbound and southbound I-605 connector ramps where only a two-lane exit movement exists now.

The project will also propose to add auxiliary lanes between Bloomfield Avenue and Norwalk Boulevard; Norwalk Boulevard and Pioneer Boulevard; and Pioneer Boulevard and the westbound SR-91 to the northbound and southbound I-605 connector ramps.

Interchange modifications at Pioneer Boulevard and Norwalk Boulevard are proposed. These modifications include reconstructing Type L-9 cloverleaf interchanges into Type L-7 cloverleaf interchange configurations. Typical Type L-7 and Type L-9 local street interchanges are shown in Figure 1. These new configurations will eliminate loop on-ramp free right-turn and direct on-ramp movements and increase the vehicular weaving and merging distances on westbound SR-91 mainline between these two interchanges, as well as the I-605 northbound/southbound connector ramp. These modifications will alter the arterial street operations as a result of the changed interchange access point for the arterial street to westbound SR-91. To compare overall freeway, ramp, and arterial street operations, Design Options will be evaluated to consider diamond ramp configurations at Pioneer Boulevard and Norwalk Boulevard, in lieu of Type L-7 cloverleaf interchange configurations.

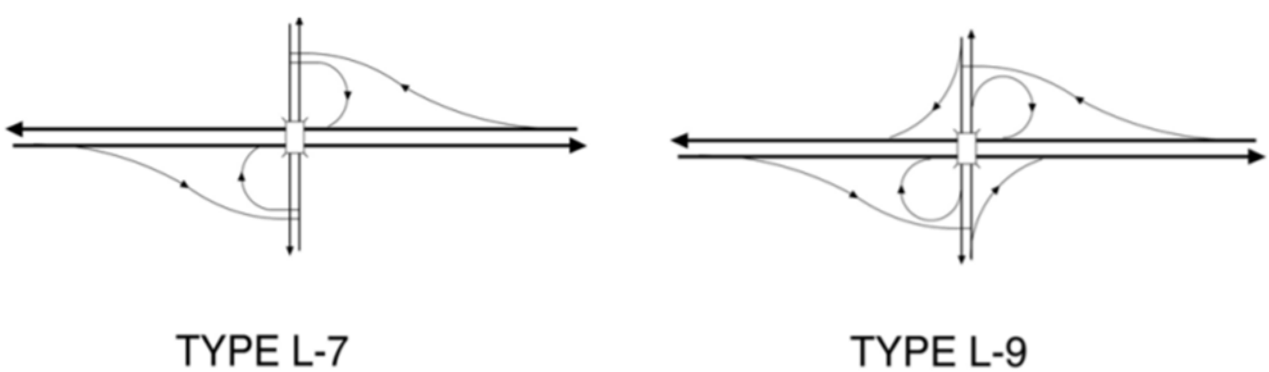
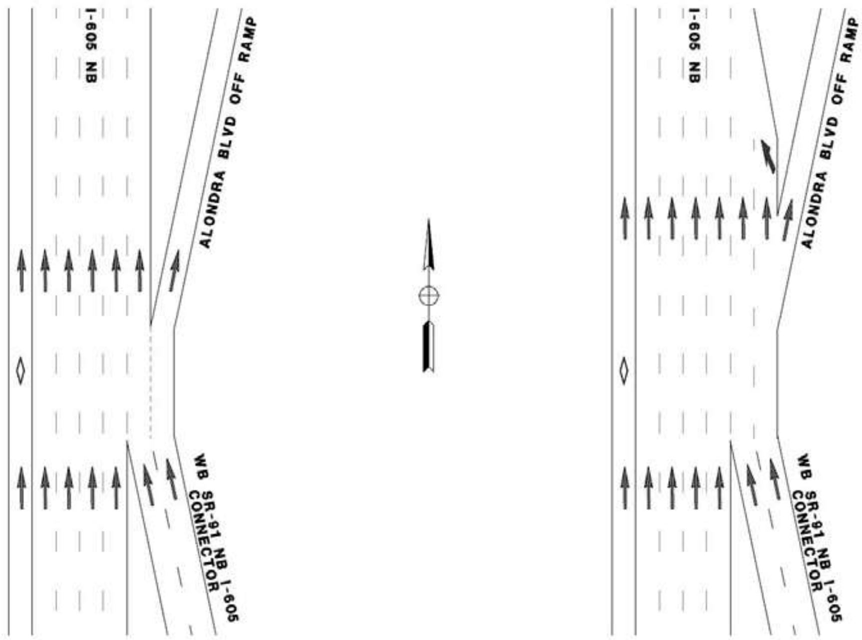


Figure 1. Typical Type L-7 and L-9 Local Street Interchanges

The existing outside lane of the westbound SR-91 to the northbound I-605 two-lane connector ramp terminates at Alondra Boulevard; the outside lane forces the driver to exit at Alondra Boulevard. Modifications are proposed at the Alondra Boulevard exit point to provide a single lane exit movement and carry the outside lane past the exit point and merge with the northbound I-605 mainline prior to the Alondra Boulevard undercrossing. No Build and Build configurations for the I-605 northbound Alondra Blvd off-ramp are shown in Figure 2.



No Build Alternative **Build Alternative**

Figure 2. I-605 NB Alondra Off-Ramp

Transportation system management (TSM) provides cost-effective improvements that increase transportation system performance without the major expense of capital expansion projects. These programs include minor geometric improvements, bicycle and pedestrian improvements, and other measures such as signal synchronization, motorist information, bus signal priority, and freeway ramp metering. Transportation demand management (TDM) provides cost-effective improvements that reduce system demand by eliminating trips or shifting trips out of the peak periods to other less congested time periods during the day and thus increase transportation system performance without implementing travel restrictions. Transportation demand management programs include rideshare programs, employer flex-time, parking pricing, and intermodal improvements that support TDM programs and transfers between modes at key locations. TDM programs are devised to change the behavior of travelers. Some TDM approaches are voluntary, and they motivate participants with incentives. Other TDM approaches apply disincentives to drive single-occupancy vehicles (SOVs), such as fees and constraints.

A TSM/TDM alternative is not considered a viable stand-alone option because it does not fulfill the project purpose. A TSM/TDM alternative on its own would:

- Provide minimal congestion reduction
- Provide minimal enhancement of operations and improvement in trip reliability
- Not increase mobility significantly because it would have limited effect on congestion
- Not maximize throughput because no additional through lanes are provided.

TSM and TDM are similar in a number of ways, because they may:

- Lessen the number of trips
- Lessen peak hour travel
- Conserve energy

- Reduce emissions
- Provide more travel alternatives.

Although TSM and TDM measures alone do not satisfy the purpose and need of the project, the following TSM and TDM measures are beneficial and may be incorporated into the Build alternative for the proposed project.

- Improved ramp metering hardware and software and closed-circuit television system for viewing ramps and nearby arterials
- Upgraded traffic signals interconnected and coordinated with adjacent signals and ramp meters at locations of interchange improvements
- Additional way-finding signs on freeways and arterials
- On- and off-ramps designed to limit impacts to non-motorized travel and preserve access to bike lanes and trails
- ITS elements including fiber-optic and other communication systems for improved connectivity and remote management; changeable message signs, closed-circuit television coverage of the entire freeway mainline, ramps, and adjacent arterials, video detection systems, and vehicle detection systems for volume, speed, and vehicle classification
- Advanced traffic management system improvements to the hardware and software systems at the Caltrans District 7 Traffic Management Center
- Traveler information management system improvements to enhance dissemination of real-time information on roadway conditions.

Type of Project *(use Table 1 on instruction sheet)*
Change to existing state highway

County Los Angeles	**Narrative Location/Route & Postmiles:** **Caltrans Projects – EA#** 07-29811	SR-91 PM 16.9-19.8 I-605 PM 5.0-5.8

Lead Agency: Caltrans District 7

Contact Person	**Phone#**	**Fax#**	**Email**
Andrew Yoon	213-897-6117	213-897-1634	andrew_yoon@dot.ca.gov

Hot Spot Pollutant of Concern *(check one or both)* **PM2.5 X** **PM10 X**

Federal Action for which Project-Level PM Conformity is Needed *(check appropriate box)*

	Categorical Exclusion (NEPA)	X	**EA or Draft EIS**	**FONSI or Final EIS**	**PS&E or Construction**	**Other**

Scheduled Date of Federal Action: 2017

NEPA Assignment – Project Type *(check appropriate box)*

Exempt		**Section 326 – Categorical Exemption**	X	**Section 327 – Non-Categorical Exemption**

Current Programming Dates *(as appropriate)*

	PE/Environmental	**ENG**	**ROW**	**CON**
Start	2016	2019	June 2020	May 2021
End	2019	2021	May 2021	June 2024

Project Purpose and Need (Summary): *(attach additional sheets as necessary)*
Purpose:

The purpose of the project is to reduce congestion and improve freeway operations (both mainline and ramps), improve safety and improve local and system interchange operations.

Need:

The westbound SR-91 approaching the connector ramp for both the northbound and southbound I-605 currently experiences substantial congestion, which will continue in the future No Build condition. Congestion is a result of inadequate capacity of the existing two-lane connector for the westbound SR-91 to northbound and southbound I-605, as well as the closely spaced freeway entrance and exit ramps resulting in a high concentration of accidents.

Capacity and Transportation Demand

The need for the Project is based on an assessment of the existing and future transportation demand in the Study Area compared to the available capacity. Based on the examination of existing travel conditions and projected future traffic (2044), the SR91 currently experiences, and will continue to experience, capacity and operational problems due to a number of interrelated factors. The existing westbound SR-91 mainline and connector ramp to the northbound and southbound I-605 has insufficient capacity for the existing traffic volumes, resulting in deficient levels of service. No major improvements have been undertaken on SR-91 in the Study Area since it was built in 1968, except for pavement rehabilitation and re-striping in 1994 to provide for an HOV lane in each direction. Extensive population growth occurred both before and after SR-91 was built. The increase in regional traffic during that time has contributed to traffic volumes that exceed the existing design capacity of the SR-91, particularly at the I-605 interchange. Table A below shows the average daily weekday automobile and heavy-duty truck volumes on SR-91. The SR-91 westbound traffic volumes range from lower volumes on the eastern end near Shoemaker Avenue and higher volumes on the western end near I-605.

Table A. SR-91 Corridor Average Daily (24-hour) Weekday Traffic Volumes.

	General Purpose Lanes		HOV Lanes
Route	**Automobiles**	**Trucks**	**Automobiles**
SR-91 Westbound (east of connector ramp)	90,630 – 118,050	7,000 – 7,500	15,800 – 19,600
I-605 Northbound	140,700	8,700	6,200

Sources: SR-91 Automobile counts were based on PeMS data from spring and fall 2016; SR-91 truck counts were based on WILTEC video counts conducted in 2016; I-605 automobile counts were based on PeMS data from spring and fall 2013; and I-605 truck counts were calculated based on the 2013 Caltrans reported truck percentages.

Social Demand and Economic Development

Regional population is forecast to grow by 18 percent, and the Study Area population is forecast to grow by 12 percent from 2016 to 2044. Employment is anticipated to follow a different pattern, with regional growth of 23 percent and Study Area employment growth of 27 percent. Population growth is projected to be lower in the Study Area than in the Southern California Association of Governments (SCAG) region because the Study Area is almost completely developed. New growth will be limited to smaller, infill-type developments. For historical context, the regional population was approximately eight million in 1960. The 2016 population of nearly nineteen million for the region represents a 135 percent increase since 1960. The 2016 Regional Transportation Plan (RTP) growth forecast was the basis for the regional traffic modeling that was conducted for the SR-91 Project.

Surrounding Land Use/Traffic Generators *(especially effect on diesel traffic)*
Existing land uses in the project area include single- and multifamily residences, churches, schools, an institution, a community center, a day-care center, an after-school facility, a park, a golf course, recreational areas, hotels, restaurants, vacant land, retail, office, commercial, and light industrial uses. The majority of the sensitive receptors within or adjacent to the project area are residential uses.

Opening Year: Build and No Build LOS, AADT, % and # trucks, truck AADT of proposed facility
2024

See attached analysis

RTP Horizon Year / Design Year: Build and No Build LOS, AADT, % and # trucks, truck AADT of proposed facility
2044

See attached analysis
Opening Year: If facility is an interchange(s) or intersection(s), Build and No Build cross-street AADT, % and # trucks, truck AADT N/A **RTP Horizon Year / Design Year: If facility is an interchange (s) or intersection(s), Build and No Build cross-street AADT, % and # trucks, truck AADT** N/A
Describe potential traffic redistribution effects of congestion relief *(impact on other facilities)* See attached analysis
Comments/Explanation/Details *(attach additional sheets as necessary)* See attached analysis

$PM_{2.5}$/PM_{10} Hot-Spot Analysis

The proposed project is located within a nonattainment area for federal PM2.5 and PM10 standards. Therefore, per 40 CFR Part 93 hot-spot analyses are required for conformity purposes. However, the EPA does not require hot-spot analyses, qualitative or quantitative, for projects that are not listed in section 93.123(b)(1) as an air quality concern. The project does not qualify as a project of air quality concern (POAQC) because of the following reasons:

i. The proposed project would improve SR-91 by changing the existing highway. As shown in Tables 1 and 2, while traffic volumes along SR-91 would exceed the 125,000 average daily trips criteria for a POAQC and the truck percentage exceeds 8 percent, the truck traffic volumes and percentages would not change significantly with the project. The two highlighted roadway segments in each table are between two existing on-ramps. The build alternative would combine the southbound on-ramp with the northbound on-ramp, thus putting the combined traffic volumes onto these segments. Thus, while the project will result in shifting some traffic (both truck and auto) from other routes to SR-91 westbound as a result of the increased capacity of the roadway and enhanced operating conditions, it will not result in a higher proportion of trucks overall. While some segments could experience a very small increase in truck percentage (one tenth of one percent), other segments will experience a decrease in truck percentage due to a proportionally larger increase in shifted auto volumes as compared to truck volumes. Finally, the trucks that will operate on the improved corridor under the build condition would experience much less congestion, higher speeds, less delay and lower travel times in the corridor.

ii. The proposed project does not affect intersections that are at LOS D, E, or F that have a significant number of diesel vehicles. Based on the Transportation Analysis Report (Michael Baker International, May 2017), the proposed project would reduce the delay and improve the LOS at intersections within the project vicinity. The LOS conditions in the project vicinity with and without the proposed project are shown in Tables 3 through 10. While some of the road segments shown show a worsening of LOS, all of the segments where the LOS worsens are located outside of the area where the project results in physical changes (improvements) to the roadway network. These locations are either to the east of west of the area of improvement. The improvements themselves, by adding capacity (due to the new freeway lane and other measures which improve operating conditions), attract traffic to the westbound corridor. The attraction of trips extends beyond the limits of the physical improvements themselves because these improvements alleviate a major bottleneck in the corridor. Each of the segments which show a degradation in service levels are forecast to experience an increase in travel demand of approximately 5 percent to 7.5 percent. In these segments, without a physical or operational improvement to go along with the increase in traffic flow, the Highway Capacity Manual (HCM) analysis will result in a degraded service level (higher traffic flow, but the same capacity). However, it is also important to note that HCM does not account for upstream or downstream improvements which will occur as a result of the project. The traffic microsimulation model that was developed to assess the project area showed significant improvements in traffic flow, increased speeds and decreased delay in the study area and outside of the study area, which is not captured by the HCM results. Thus, while the HCM shows a slight worsening of LOS for these segments, the microsimulation model demonstrates that they will likely improve in operation conditions in the future.

iii. The proposed project does not include the construction of a new bus or rail terminal that would have a significant number of diesel vehicles congregating at a single location.

iv. The proposed project does not expand an existing bus or rail terminal that would significantly increase the number of diesel vehicles congregating at a single location.

v. The proposed project is not in or affecting locations, areas, or categories of sites that are identified in the $PM_{2.5}$ and PM_{10} applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

Therefore, the proposed project meets the Clean Air Act requirements and 40 CFR 93.116 without any explicit hot-spot analysis. The proposed project would not create a new, or worsen an existing, PM_{10} or $PM_{2.5}$ violation.

Table 1: Opening Year (2024) Traffic Volumes

Roadway Segment	No Build (2024)			Build (2024) Both Without and With Design Option			Project Percent Increase	
	Total ADT	Truck ADT	Truck %	Total ADT	Truck ADT	Truck %	Total ADT	Truck ADT
WESTBOUND SR-91								
East of Studebaker Rd	106,700	11,240	10.5%	109,700	11,590	10.6%	2.8%	3.1%
West of Pioneer Blvd	136,400	13,570	9.9%	149,000	13,590	9.1%	9.2%	0.1%
East of Pioneer Blvd	132,400	13,120	9.9%	139,300	13,880	10.0%	5.2%	5.8%
West of Norwalk Blvd	131,100	12,980	9.9%	144,400	13,120	9.1%	10%	1.1%
East of Norwalk Blvd	128,500	12,820	10.0%	135,200	12,340	9.1%	5.2%	-3.7%
West of Bloomfield Ave	124,800	12,410	9.9%	130,200	13,020	10.0%	4.3%	4.9%
East of Artesia Blvd	116,800	11,530	9.9%	119,500	11,840	9.9%	2.3%	2.7%
West of 183rd St	126,400	12,580	10.0%	128,400	12,830	10.0%	1.6%	2.0%
NORTHBOUND I-605								
North of Westbound SR-91 On-Ramp	153,900	11,790	7.7%	155,200	11,880	7.7%	0.8%	0.8%

Source: Cambridge Systematics, Inc., June 2017.

Table 2: Future Year (2044) Traffic Volumes

Roadway Segment	No Build (2044)			Build (2044) Both Without and With Design Option			Project Percent Increase	
	Total ADT	Truck ADT	Truck %	Total ADT	Truck ADT	Truck %	Total ADT	Truck ADT
WESTBOUND SR-91								
East of Studebaker Rd	108,500	14,960	13.8%	111,200	15,250	13.7%	2.5%	1.9%
West of Pioneer Blvd	137,700	17,320	12.6%	150,600	17,960	11.9%	9.4%	3.7%
East of Pioneer Blvd	133,600	17,140	12.8%	140,300	17,570	12.5%	5.0%	2.5%
West of Norwalk Blvd	132,100	16,950	12.8%	145,300	17,780	12.2%	10%	4.9%
East of Norwalk Blvd	129,400	17,390	13.4%	135,900	18,390	13.5%	5.0%	5.8%
West of Bloomfield Ave	125,200	15,990	12.8%	130,400	16,330	12.5%	4.2%	2.1%
East of Artesia Blvd	116,400	15,580	13.4%	119,000	15,840	13.3%	2.2%	1.7%
West of 183rd St	126,700	16,040	12.7%	128,800	16,310	12.7%	1.7%	1.7%
NORTHBOUND I-605								
North of Westbound SR-91 On-Ramp	155,700	14,800	9.5%	157,200	16,450	10.5%	1.0%	11%

Source: Cambridge Systematics, Inc., June 2017.

Table 3: Opening Year (2024) Freeway Mainline Level of Service

Roadway Segment	No Build (2024)		Build (2024)		Build Alternative with Design Option (Diamond Ramps)	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Carmenita Rd Off-Ramp to 183rd St On-Ramp	C	C	C	D	C	D
Artesia Blvd Off-Ramp to Artesia Blvd On-Ramp	C	C	C	D	C	D
Artesia Blvd On-Ramp to Bloomfield Ave On-Ramp	C	D	C	C	C	C
Norwalk Blvd Off-Ramp to Norwalk Blvd Loop On-Ramp	C	D	C	C	C	C
Pioneer Blvd Off-Ramp to Pioneer Blvd Loop On-Ramp	D	D	C	D	C	D
I-605 Off-Ramp (NB & SB) to Studebaker Rd Off-Ramp	C	D	C	C	C	C
Studebaker Rd Off-Ramp to I-605 NB/WB SR-91 Loop On- Ramp	C	C	B	C	B	C
I-605 NB/WB SR-91 Loop On-Ramp to I-605 SB/WB SR-91 On-Ramp	C	C	C	D	C	D

Source: Transportation Analysis Report (Michael Baker International, May 2017),

Table 4: Opening Year 2024 Freeway Weaving Analysis

Roadway Segment	No Build (2024)		Build (2024)		Build Alternative with Design Option (Diamond Ramps)	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
183rd St On-Ramp to Artesia Blvd Off-Ramp	C	C	D	D	D	D
Bloomfield Ave On-Ramp to Norwalk Blvd Off-Ramp	C	D	C	D	C	D
Norwalk Blvd Direct On-Ramp to Pioneer Blvd Off-Ramp	D	D	D	D	D	D
Pioneer Blvd Direct On-Ramp to I-605 Off-Ramp (NB & SB)	F	F	F	F	F	F
SR-91 WB On-Ramp to Alondra Blvd Off-Ramp	F	F	F	F	F	F

Source: Transportation Analysis Report (Michael Baker International, May 2017),

Table 5: Opening Year 2024 Freeway Merge and Diverge Analysis

Roadway Segment	Merge/ Diverge	No Build (2024)		Build (2024)		Build Alternative with Design Option (Diamond Ramps)	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Artesia Blvd On-Ramp	Merge	C	C	C	D	C	D
Studebaker Rd Off-Ramp	Diverge	C	D	C	C	C	C
I-605 NB On-Ramp	Merge	C	D	C	D	C	D

Source: Transportation Analysis Report (Michael Baker International, May 2017),

Table 6: Opening Year 2024 Intersection Level of Service Analysis

Roadway Segment	No Build (2024)		Build (2024)		Build Alternative with Design Option (Diamond Ramps)	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
WB SR-91 Off-Ramp/Artesia Blvd	B	B	B	B	B	B
Norwalk Blvd/WB SR-91 Off-Ramp	A	A	C	B	A	A
Pioneer Blvd/WB SR-91 Off-Ramp	A	A	E	C	B	A
Studebaker Rd/WB SR-91 Off-Ramp	B	A	C	B	C	B
NB I-605 Off-Ramp/Alondra Blvd	B	F	B	F	B	F

Source: Transportation Analysis Report (Michael Baker International, May 2017),

Table 7: Future Year (2044) Freeway Mainline Level of Service

Roadway Segment	No Build (2044)		Build (2044)		Build Alternative with Design Option (Diamond Ramps)	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Carmenita Rd Off-Ramp to 183rd St On-Ramp	C	C	C	D	C	D
Artesia Blvd Off-Ramp to Artesia Blvd On-Ramp	C	C	C	D	C	D
Artesia Blvd On-Ramp to Bloomfield Ave On-Ramp	C	D	C	C	C	C
Norwalk Blvd Off-Ramp to Norwalk Blvd Loop On-Ramp	D	D	C	D	C	D
Pioneer Blvd Off-Ramp to Pioneer Blvd Loop On-Ramp	D	D	C	D	C	D
I-605 Off-Ramp (NB & SB) to Studebaker Rd Off-Ramp	C	D	C	C	C	C
Studebaker Rd Off-Ramp to I-605 NB/WB SR-91 Loop On- Ramp	C	C	C	C	C	C
I-605 NB/WB SR-91 Loop On-Ramp to I-605 SB/WB SR-91 On-Ramp	C	C	C	D	C	D

Source: Transportation Analysis Report (Michael Baker International, May 2017),

Table 8: Future Year 2044 Freeway Weaving Analysis

Roadway Segment	No Build (2044)		Build (2044)		Build Alternative with Design Option (Diamond Ramps)	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
183rd St On-Ramp to Artesia Blvd Off-Ramp	C	D	D	D	D	D
Bloomfield Ave On-Ramp to Norwalk Blvd Off-Ramp	D	D	C	D	C	D
Norwalk Blvd Direct On-Ramp to Pioneer Blvd Off-Ramp	D	D	D	D	D	D
Pioneer Blvd Direct On-Ramp to I-605 Off-Ramp (NB & SB)	F	F	F	F	F	F
SR-91 WB On-Ramp to Alondra Blvd Off-Ramp	F	F	F	F	F	F

Source: Transportation Analysis Report (Michael Baker International, May 2017),

Table 9: Future Year 2044 Freeway Merge and Diverge Analysis

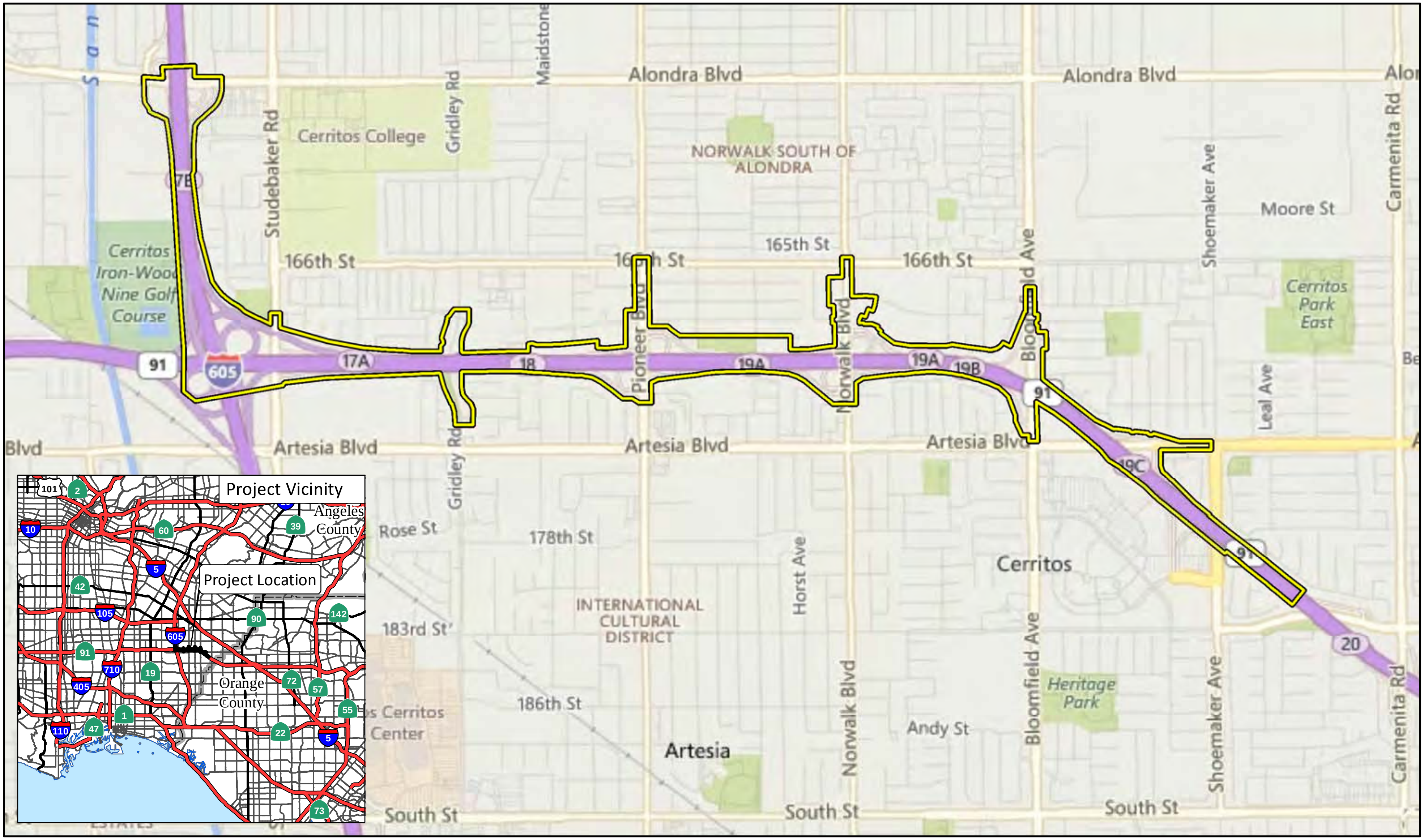
Roadway Segment	Merge/ Diverge	No Build (2044)		Build (2044)		Build Alternative with Design Option (Diamond Ramps)	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Artesia Blvd On-Ramp	Merge	C	C	C	D	C	D
Studebaker Rd Off-Ramp	Diverge	C	D	C	C	C	C
I-605 NB On-Ramp	Merge	C	D	C	D	C	D

Source: Transportation Analysis Report (Michael Baker International, May 2017),

Table 10: Future Year 2044 Intersection Level of Service Analysis

Roadway Segment	No Build (2044)		Build (2044)		Build Alternative with Design Option (Diamond Ramps)	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
WB SR-91 Off-Ramp/Artesia Blvd	B	B	B	B	B	B
Norwalk Blvd/WB SR-91 Off-Ramp	A	A	C	B	A	A
Pioneer Blvd/WB SR-91 Off-Ramp	A	A	E	C	B	A
Studebaker Rd/WB SR-91 Off-Ramp	B	A	C	B	C	B
NB I-605 Off-Ramp/Alondra Blvd	B	F	B	F	B	F

Source: Transportation Analysis Report (Michael Baker International, May 2017),



LEGEND

Study Area Limits

FIGURE 1

0 1000 2000

FEET

SOURCE: Bing Maps (2014); Michael Baker (3/2017)

Westbound SR-91 Improvement Project

Project Location

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0716000284; EA 07-29811

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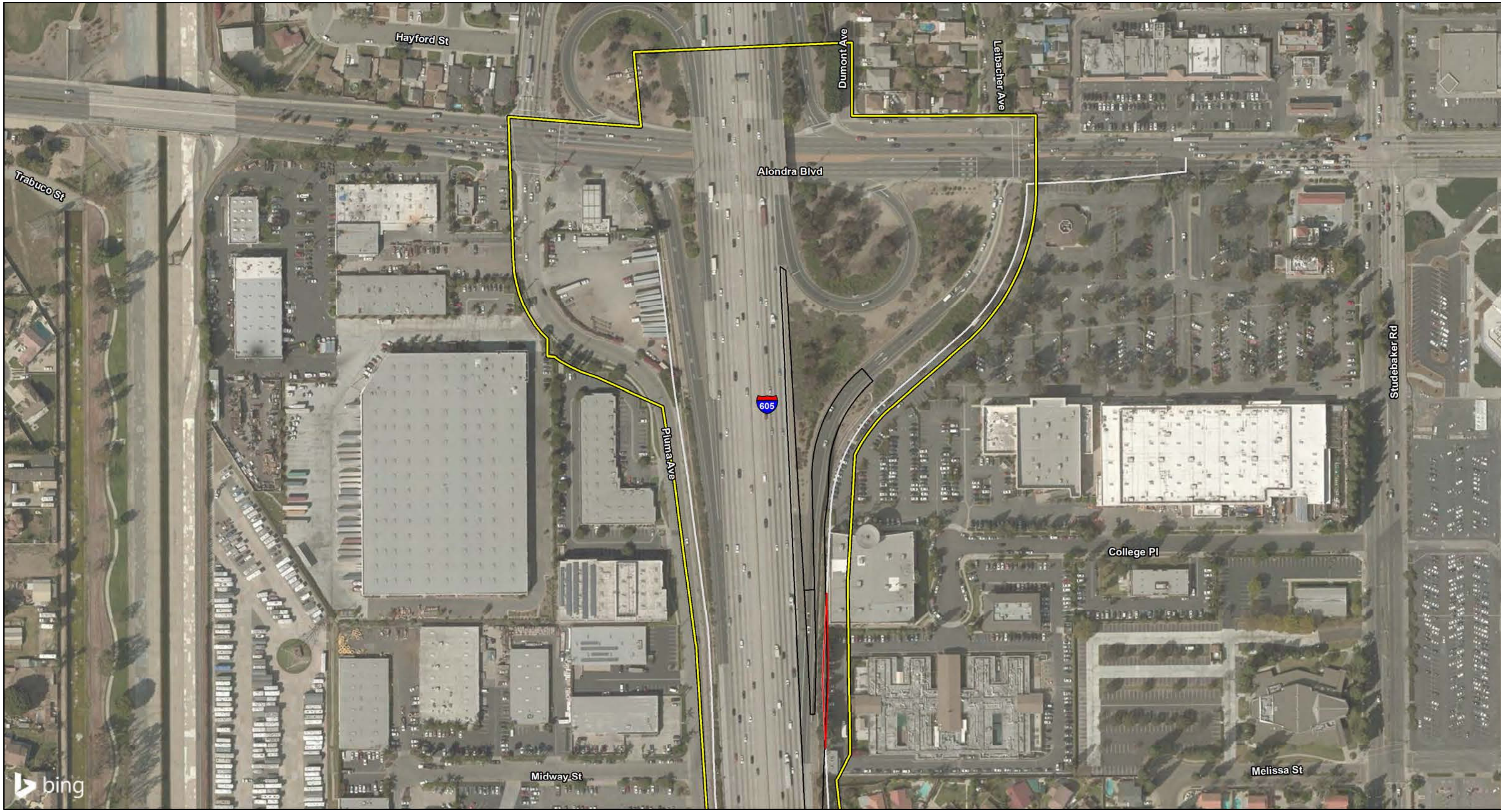


LEGEND

Study Area Limits

Existing Right of Way

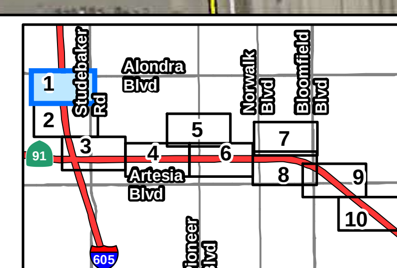
Project Features

Proposed Improvements

Proposed Right Of Way

Proposed Striping

Potential Acquisition



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SOURCE: Bing Maps (2015); Michael Baker (3/2017)

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FIGURE 2

Sheet 1 of 10

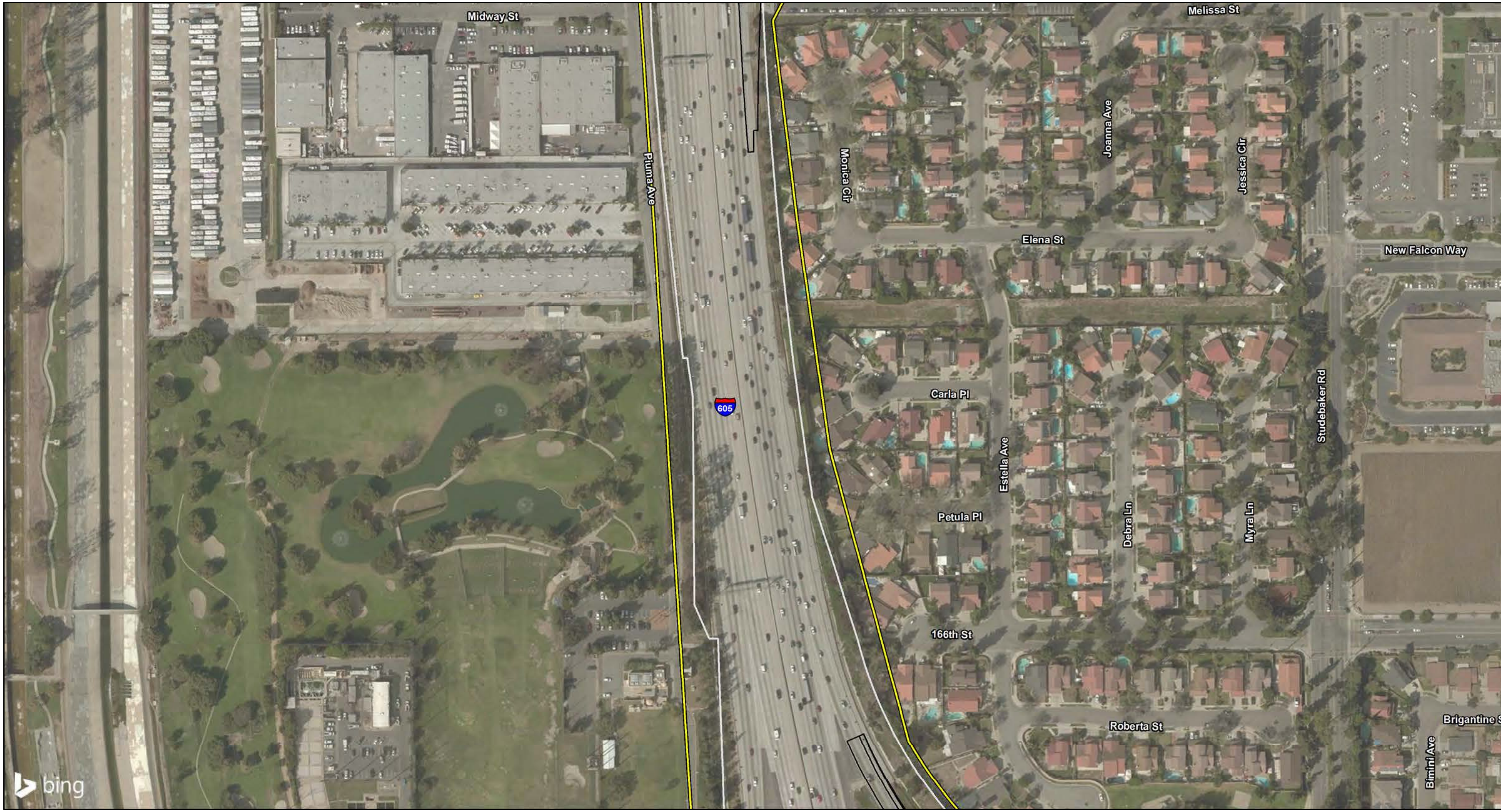
Westbound SR-91 Improvement Project

Study Area Limits

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0716000284; EA 07-29811



LEGEND

Study Area Limits

Existing Right of Way

Project Features

Proposed Improvements

Proposed Right Of Way

Proposed Striping

Potential Acquisition

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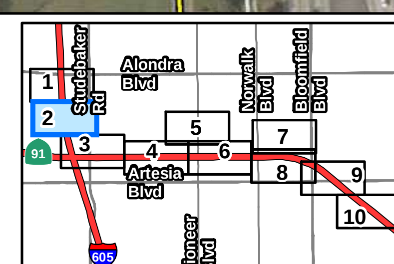


FIGURE 2

Sheet 2 of 10

Westbound SR-91 Improvement Project

Study Area Limits

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0716000284; EA 07-29811

SOURCE: Bing Maps (2015); Michael Baker (3/2017)

I:\RBF1601\GIS\MXD\AQ\AQ_StudyArea.mxd (5/17/2017)

LEGEND

Study Area Limits

Existing Right of Way

Project Features

Proposed Improvements

Proposed Right Of Way

Proposed Striping

Potential Acquisition

0 100 200
FEET

SOURCE: Bing Maps (2015); Michael Baker (3/2017)

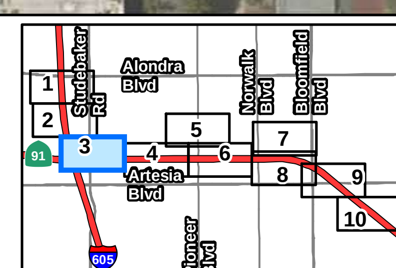


FIGURE 2

Sheet 3 of 10

Westbound SR-91 Improvement Project

Study Area Limits

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0716000284; EA 07-29811

I:\RBF1601\GIS\MXD\AQ\AQ_StudyArea.mxd (5/17/2017)

LEGEND

Study Area Limits

Existing Right of Way

Project Features

Proposed Improvements

Proposed Right Of Way

Proposed Striping

Potential Acquisition

N

0 100 200

FEET

SOURCE: Bing Maps (2015); Michael Baker (3/2017)

I:\RBF1601\GIS\MXD\AQ\AQ_StudyArea.mxd (5/17/2017)

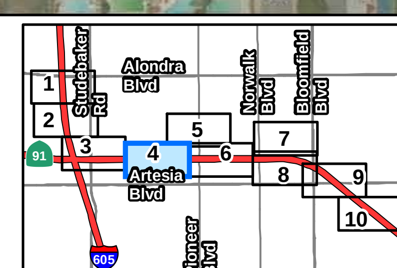


FIGURE 2

Sheet 4 of 10

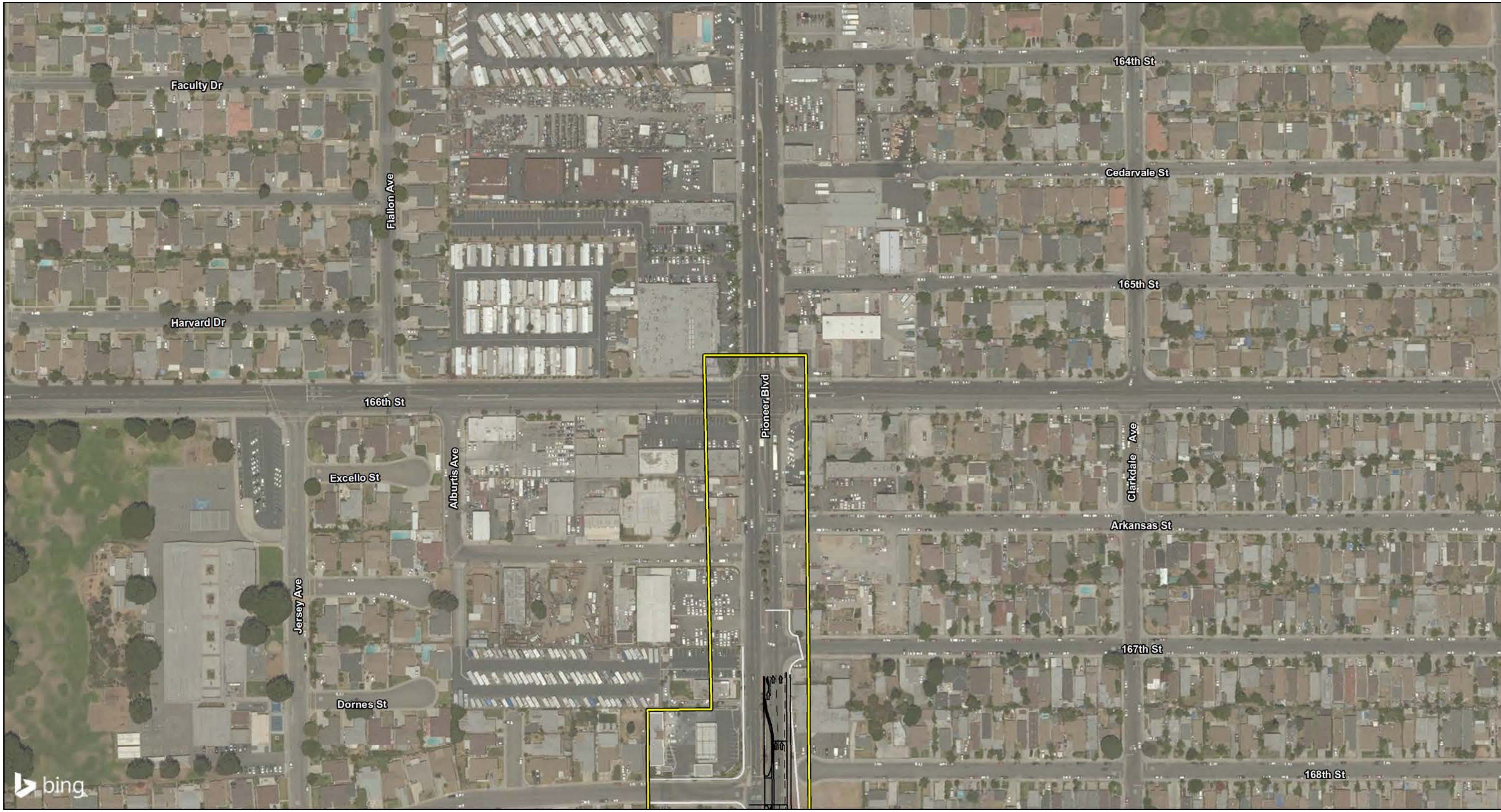
Westbound SR-91 Improvement Project

Study Area Limits

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0716000284; EA 07-29811



LEGEND

Study Area Limits

Existing Right of Way

Project Features

Proposed Improvements

Proposed Right Of Way

Proposed Striping

Potential Acquisition

N

0 100 200

FEET

SOURCE: Bing Maps (2015); Michael Baker (3/2017)

I:\RBF1601\GIS\MXD\AQ\AQ_StudyArea.mxd (5/17/2017)

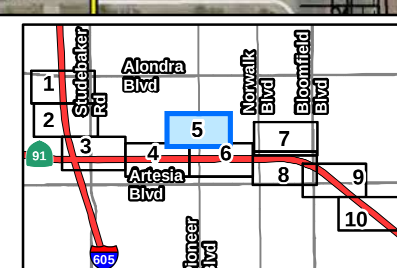


FIGURE 2

Sheet 5 of 10

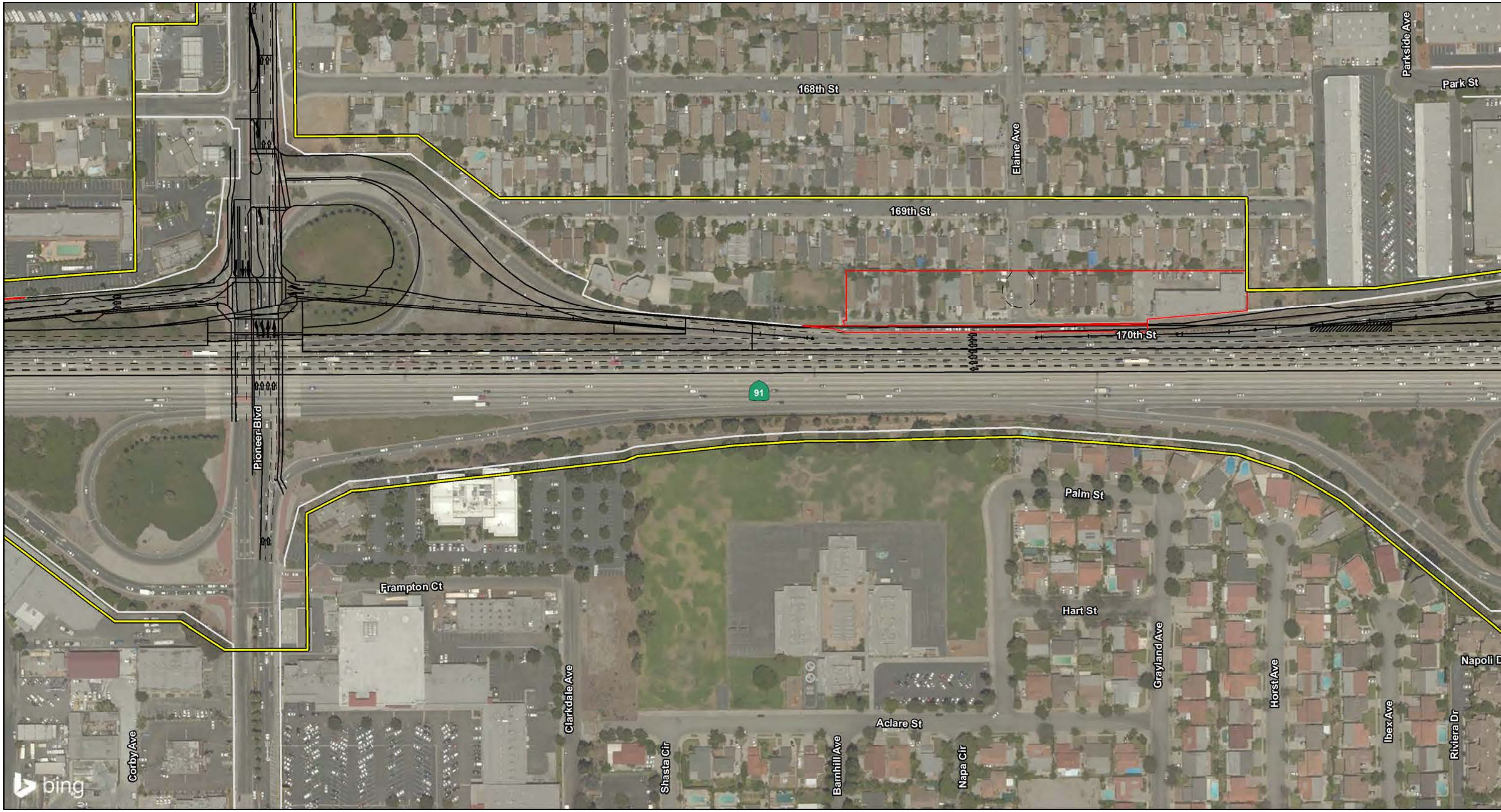
Westbound SR-91 Improvement Project

Study Area Limits

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0716000284; EA 07-29811



LEGEND

Study Area Limits

Existing Right of Way

Project Features

Proposed Improvements

Proposed Right Of Way

Proposed Striping

Potential Acquisition

N

0 100 200

FEET

SOURCE: Bing Maps (2015); Michael Baker (3/2017)

I:\RBF1601\GIS\MXD\AQ\AQ_StudyArea.mxd (5/17/2017)

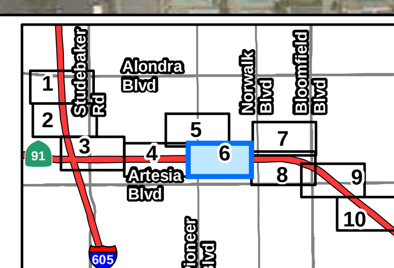


FIGURE 2

Sheet 6 of 10

Westbound SR-91 Improvement Project

Study Area Limits

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0716000284; EA 07-29811

LEGEND

Study Area Limits

Existing Right of Way

Project Features

Proposed Improvements

Proposed Right Of Way

Proposed Striping

Potential Acquisition

N

0 100 200

FEET

SOURCE: Bing Maps (2015); Michael Baker (3/2017)

I:\RBF1601\GIS\MXD\AQ\AQ_StudyArea.mxd (5/17/2017)

FIGURE 2

Sheet 7 of 10

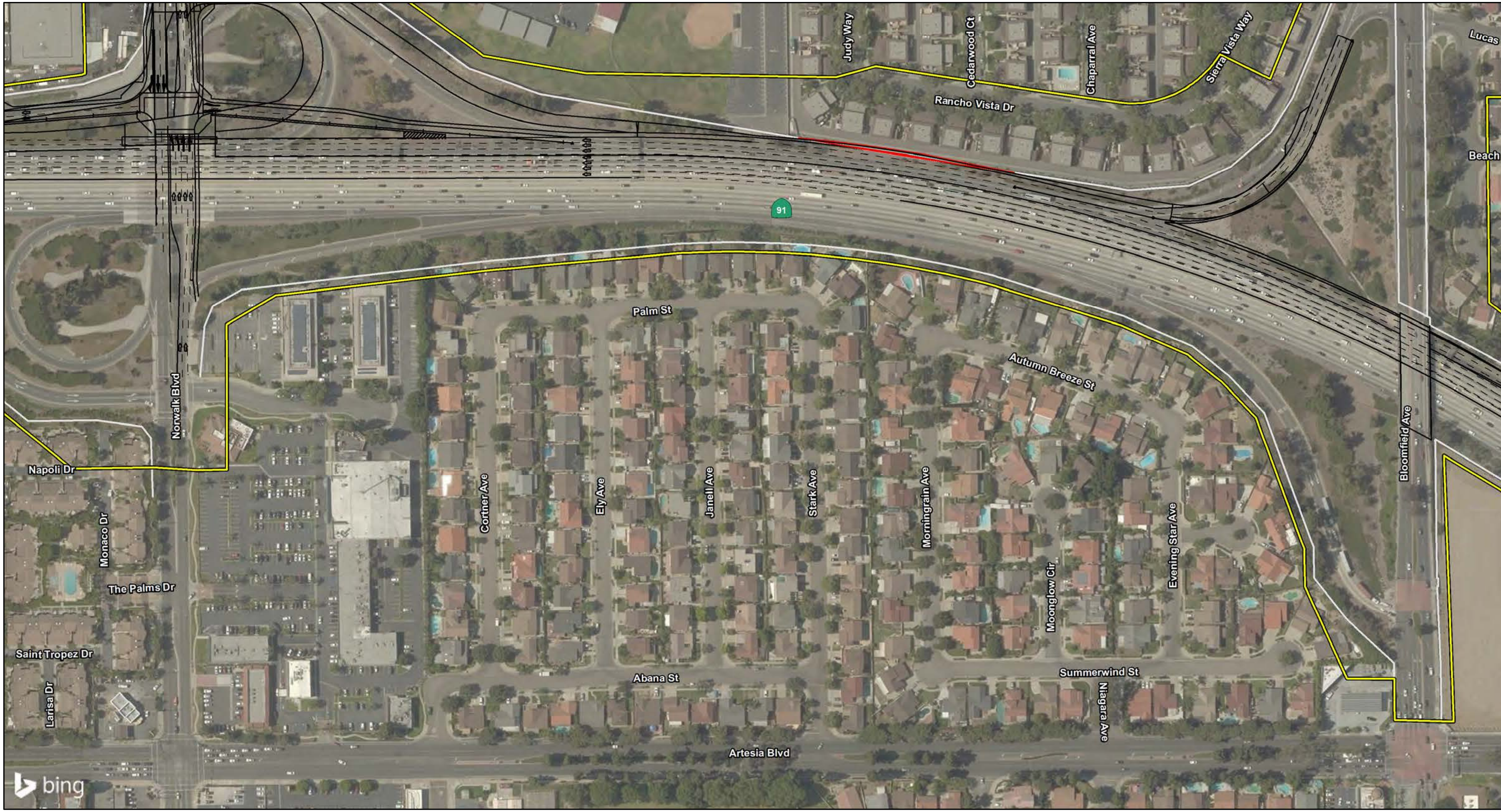
Westbound SR-91 Improvement Project

Study Area Limits

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0716000284; EA 07-29811



LEGEND

Study Area Limits

Existing Right of Way

Project Features

Proposed Improvements

Proposed Right Of Way

Proposed Striping

Potential Acquisition

N

0 100 200

FEET

SOURCE: Bing Maps (2015); Michael Baker (3/2017)

I:\RBF1601\GIS\MXD\AQ\AQ_StudyArea.mxd (5/17/2017)

FIGURE 2

Sheet 8 of 10

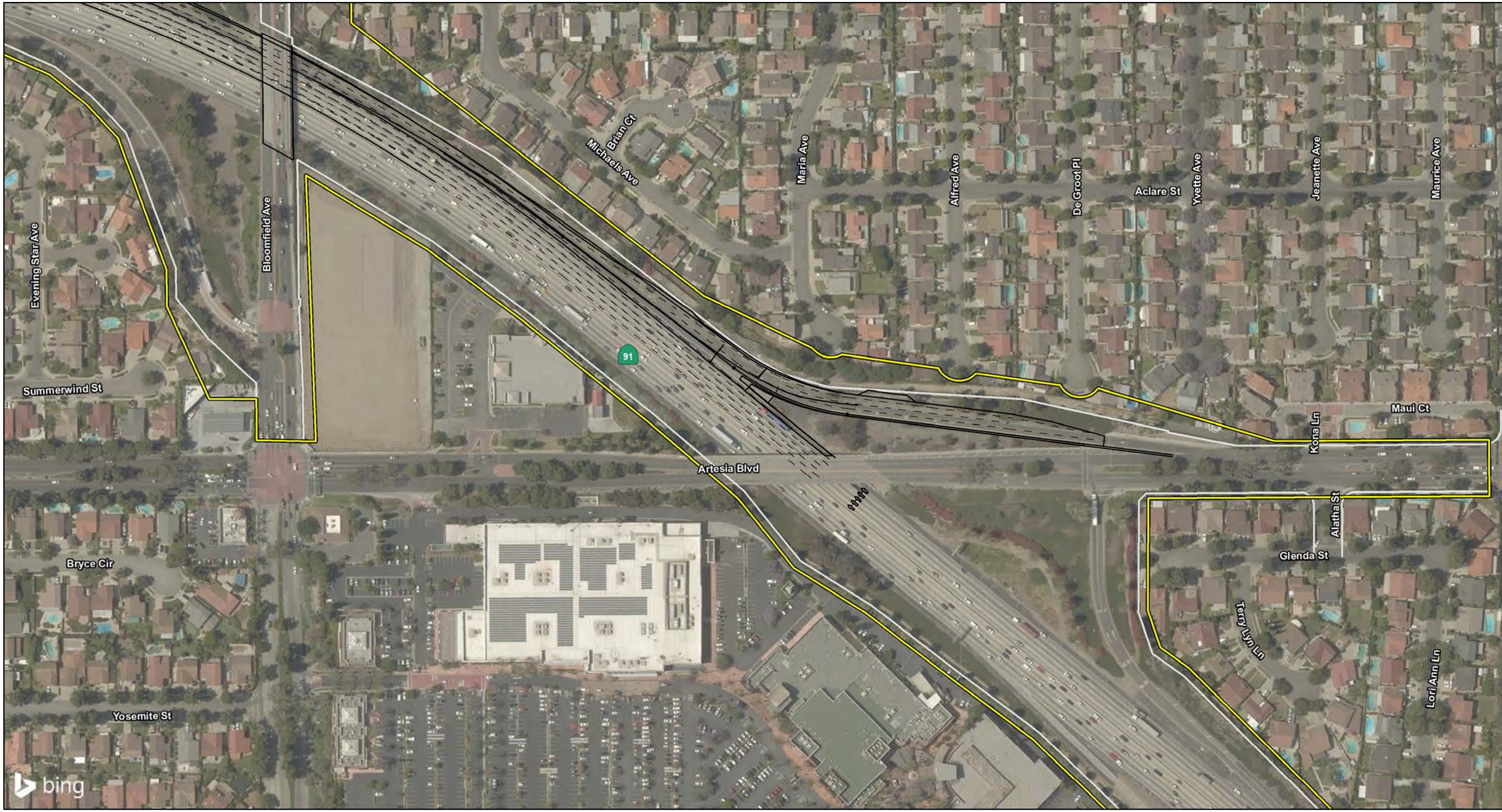
Westbound SR-91 Improvement Project

Study Area Limits

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0716000284; EA 07-29811



LEGEND

Study Area Limits

Existing Right of Way

Project Features

Proposed Improvements

Proposed Right Of Way

Proposed Striping

Potential Acquisition

N

0 100 200

FEET

SOURCE: Bing Maps (2015); Michael Baker (3/2017)

I:\RBF1601\GIS\MXD\AQ\AQ_StudyArea.mxd (5/17/2017)

FIGURE 2

Sheet 9 of 10

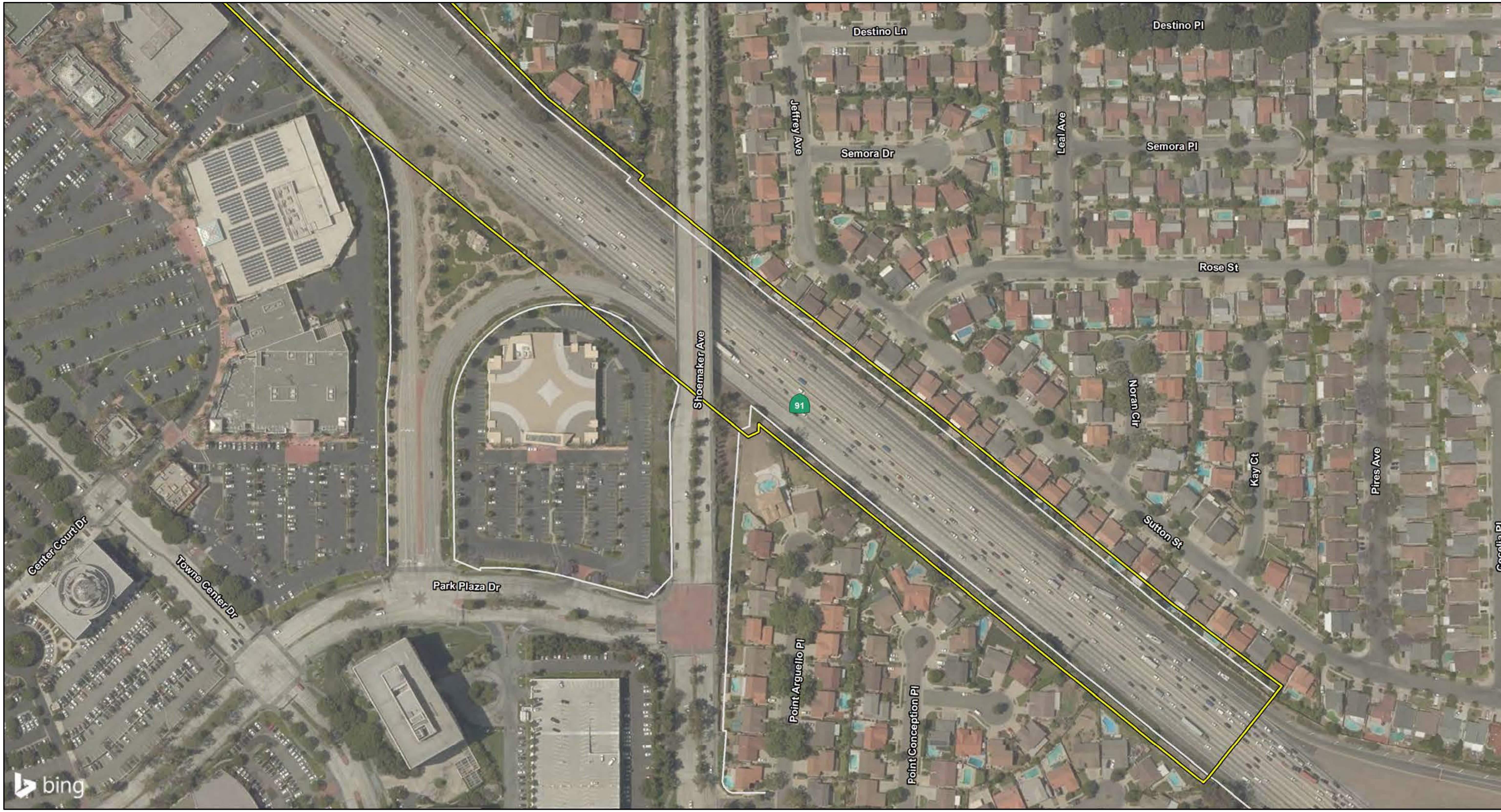
Westbound SR-91 Improvement Project

Study Area Limits

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0716000284; EA 07-29811



LEGEND

Study Area Limits

Existing Right of Way

Project Features

Proposed Improvements

Proposed Right Of Way

Proposed Striping

Potential Acquisition

N

0 100 200

FEET

SOURCE: Bing Maps (2015); Michael Baker (3/2017)

FIGURE 2

Sheet 10 of 10

Westbound SR-91 Improvement Project

Study Area Limits

07-LA-91

SR-91 PM 16.9-19.8; I-605 PM 5.0-5.8

EFIS 0716000284; EA 07-29811

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Carlsbad Fish And Wildlife Office
2177 Salk Avenue - Suite 250
Carlsbad, CA 92008-7385
Phone: (760) 431-9440 Fax: (760) 431-5901
http://www.fws.gov/carlsbad/

In Reply Refer To: March 19, 2018
Consultation Code: 08ECAR00-2018-SLI-0707
Event Code: 08ECAR00-2018-E-01594
Project Name: Westbound State Route 91 Improvement Project (EA 29811)

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, and proposed species, designated critical habitat, and candidate species that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Carlsbad Fish And Wildlife Office
2177 Salk Avenue - Suite 250
Carlsbad, CA 92008-7385
(760) 431-9440

Project Summary

Consultation Code: 08ECAR00-2018-SLI-0707

Event Code: 08ECAR00-2018-E-01594

Project Name: Westbound State Route 91 Improvement Project (EA 29811)

Project Type: TRANSPORTATION

Project Description: The California Department of Transportation (Caltrans) District 7 and the Los Angeles County Metropolitan Transportation Authority (Metro), in collaboration with the Gateway Cities Council of Governments (GCCOG) and the Cities of Cerritos and Artesia, propose to widen and improve approximately 3 miles (mi) of freeway along westbound State Route 91 (SR-91) between approximately Shoemaker Avenue and the Interstate 605 (I-605) interchange. The study area includes westbound SR-91 (Post Miles [PM] 16.9–19.8) and northbound I-605 (PM 5.0–5.8) and traverses the cities of Cerritos and Artesia.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/33.87722020350006N118.08322091323316W

Counties: Los Angeles, CA

Endangered Species Act Species

There is a total of 7 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Pacific Pocket Mouse *Perognathus longimembris pacificus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8080	Endangered

Birds

NAME	STATUS
California Least Tern *Sterna antillarum browni* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8104	Endangered
Coastal California Gnatcatcher *Polioptila californica californica* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8178	Threatened
Least Bell's Vireo *Vireo bellii pusillus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5945	Endangered
Western Snowy Plover *Charadrius alexandrinus nivosus* Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8035	Threatened

Flowering Plants

NAME	STATUS
Salt Marsh Bird's-beak *Cordylanthus maritimus ssp. maritimus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6447	Endangered
Ventura Marsh Milk-vetch *Astragalus pycnostachyus var. lanosissimus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1160	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Chapter 5 List of Preparers

The following persons were primarily responsible for preparation of this Draft Initial Study/Environmental Assessment and supporting technical studies.

5.1 Public Agencies

5.1.1 California Department of Transportation, District 7

Ronald Kosinski, Deputy District Director. B.A. Geography, California State University, Long Beach; Masters in Urban Planning, California State Polytechnic University, Pomona. Forty-three years of environmental planing experience. Contribution: Management, including analysis, document editing, and approval.

Samer Momani, Associate Environmental Planner; Division of Environmental Planning, District 7; Master of Science, Environmental Studies, California State University, Fullerton. Ten years of experience in environmental planning. Contribution: Environmental Document Oversight.

Jinous Saleh, Branch Chief and Senior Environmental Planner. Masters of Urban and Regional Planning, University of Southern California, Los Angeles. Thirty-four years of experience (i.e., 8 years in Housing and County Community Development and 26 years of environmental planning experience with Caltrans). Contribution: Management and document editing.

5.1.2 Los Angeles County Metropolitan Transportation Authority

Carlos Montez, Project Manager. B.S. in Chemistry/Natural Science, California State University, Los Angeles. Twenty years of experience in project management, environmental planning and analysis. Contribution: Project Management.

Ayda Safaei, B.A. in Communication Studies, California State University, Northridge. Community Relations Manager, Los Angeles County Metropolitan Transportation Authority. Fifteen years of experience in community engagement and external affairs.

5.2 Consultant Team

5.2.1 Michael Baker International

Steve Huff, Vice President. B.S. in Civil Engineering, California State Polytechnic University, Pomona. Experience: 34 years in civil engineering and highway design. Contribution: Quality control and quality assurance review of the Highway Geometric Design and Draft Project Report.

Eric Spangler, Senior Project Manager. B.S. in Civil Engineering, California Polytechnic State University, San Luis Obispo. Experience: 18 years in civil engineering and highway design. Contribution: Oversaw preparation of the Highway Geometric Design and Draft Project Report.

Mo Ghonim, Civil Designer. B.S. in Civil Engineering, California State Polytechnic University, Pomona. Experience: 7 years in geometric highway design, civil engineering, and traffic engineering. Contribution: Prepared the Highway Geometric Design and assisted in preparing Draft Project Report.

Da-Cheng Lee, Civil Engineer. B.S. in Civil Engineering, National Taiwan University. M.B.A. in Business, University of Arizona. M.E. in Construction Management, State University of New York at Buffalo. M.S. in Geotechnical Engineering, National Taiwan University of Science and Technology. Experience: 16 years in highway and roadway project design. Contribution: Prepared the Highway Geometric Design and prepared Draft Project Report.

Gary Warkentin, Vice President. Certificate, Traffic Engineering, University of California, Irvine. Experience: 46 years in geometric highway design. Contribution: Oversaw preparation of the Highway Geometric Design.

5.2.2 LSA Associates, Inc.

Rob McCann, Principal. B.A. in Geography, California State University, Fullerton. Experience: 35 years in environmental planning and analysis. Contribution: Quality control and quality assurance review of the IS/EA.

King Thomas, Associate Environmental Planner. B.A. in Social Ecology, Specialization in Environmental Health and Planning, University of California, Irvine. Experience: 28 years in environmental planning and analysis. Contribution: Quality control and quality assurance review of the IS/EA.

Janet Danker, Environmental Planner. B.A. in Urban Studies, University of California, Irvine. Master in Urban and Regional Planning, University of California, Irvine. Experience: 4 years in environmental planning and analysis. Contribution: Assistant Project Manager and preparer of the Growth, Traffic and Transportation/Pedestrian and Bicycle Facilities, Cultural Resources, and Paleontology sections of the IS/EA.

David Atwater, Senior Environmental Planner. B.S. in Urban and Regional Planning with an Interdisciplinary Minor in Geographic Information Systems Applications, California State Polytechnic University, Pomona. Experience: 12 years in environmental planning and analysis. Contribution: Preparer of the Land Use, Community Impacts, Visual/Aesthetics, and Noise sections of the IS/EA.

Ron Brugger, Senior Air Quality Specialist. B.S. Mechanical Engineering, University of Wisconsin, Madison. Experience: 26 years in environmental studies, specializing in air quality analysis. Contribution: Preparer of the Air Quality Study.

Meredith Canterbury, Senior GIS Specialist. B.A. in Geography with Emphasis in Environmental Analysis, California State University, Fullerton. Experience: 10 years in the GIS field. Contribution: GIS graphics preparation and generation of technical data from GIS files for the technical reports and the IS/EA.

Jill Carpenter, Senior Biologist/Bat Specialist. B.S. in Biological Sciences, specialization in ecology. Experience: 9 years participating in a wide range of field surveys, monitoring, and environmental assessment activities. Contribution: Preparer of the Daytime Bat Habitat Suitability Assessment.

Charity Girard-Sanders, Environmental Planner. B.A. in Psychology, Minor in Chemistry, Gallaudet University, Washington, D.C. Master of Urban Planning, City University of New York, Hunter College. Experience: 5 years in environmental planning and analysis. Contribution: Preparer of the Utilities/Emergency Services section of the IS/EA.

Christina Hirt, Environmental Planner. B.A. in Environmental Studies, University of San Diego. Experience: 3 years in environmental planning and analysis. Contribution: Preparer of the Geology/Soils/Seismic/Topography section of the IS/EA.

Beverly Inloes, Associate and Senior Technical Editor/Word Processor. Experience: 49 years editing and formatting scientific/technical documentation. Contribution: Technical editing, word processing, and formatting.

Amanda Johnson, Senior Environmental Planner. B.A. in Geography, California State University, Long Beach. Experience: 17 years in environmental planning and analysis. Contribution: Preparer of the Wetlands and Other Waters, Plant Species, Animal Species, Invasive Species, and Cumulative Impacts sections of the IS/EA.

Daniel Kaufman, Noise Analyst. B.A. in Environmental Studies, University of California, Santa Barbara. Experience: 2 years in environmental studies, specializing in noise analysis. Contribution: Preparer of *Noise Study Report*.

Patrick Kallas Assistant Environmental Planner. B.S. in Environmental Management and Protection, Minor in Water Science, California Polytechnic State University, San Luis Obispo. Experience: 1 year conducting research and preparing technical sections of environmental documents. Contribution: Preparer of Chapter 4 and Chapter 6 of the IS/EA.

Maebeth Lopez, Senior Greenhouse Gas/Climate Change Specialist. B.S. in Environmental Toxicology, University of California, Davis. Experience: 11 years in greenhouse gas/climate change analysis. Contribution: Preparer of the Climate Change section in Chapter 3 of the IS/EA.

Jason Lui, Senior Noise Specialist. B.A. in Environmental Analysis and Design, University of California, Irvine. M.S. in Environmental Studies, California State University, Fullerton. Experience: 11 years in environmental studies, specializing in noise and air quality analysis. Contribution: Preparer of the *Noise Study Report*.

Erin Martinelli, Senior Biologist. B.A. in Environmental Studies, University of California, Santa Barbara. M.S. in Environmental Studies, California State University, Fullerton. Experience: 14 years in biological analysis. Contribution: Preparer of the NES (MI).

Rod McLean, Associate Archaeologist. B.A. in Anthropology/Archaeology, University of California, Los Angeles. M.A. in Anthropology/Archaeology, California State University, Fullerton. Experience: 32 years in the archaeological field. Contribution: Preparer of the *Archaeological Survey Report*.

Allison Morrow, Senior Environmental Planner. B.A. in Environmental Analysis and Design, University of California, Irvine. M.B.A., California State University, Long Beach. Experience: 10 years preparing CEQA/NEPA technical studies and environmental documents. Contribution: Preparer of the Water Quality section of the IS/EA and CEQA Checklist in Chapter 3.

Akshay Newgi, Air Quality Specialist. B.S. in Civil Engineering, University of Mumbai, India. M.S. in Environmental Engineering, Old Dominion University. Experience: 5 years in environmental studies, specializing in air quality analysis. Contribution: Preparer of the Air Quality section of the IS/EA.

Sarah Rieboldt, Paleontologist. B.A. in Biology, University of Colorado, Boulder, magna cum laude. Ph.D. in Paleontology, University of California, Berkeley. Experience: 15 years in the paleontology and geology fields. Contribution: Preparer of the *Paleontological Identification Report and Paleontological Evaluation Report*.

Joe Simmons, Editor. B.A. in Communications, California State University, Fullerton. Experience: 10 years as an editor. Contribution: Editing the IS/EA for grammar and consistency.

Ivan Strudwick, Associate/Archaeologist. B.A., Anthropology, California State University, Long Beach. M.A. in Anthropology with specialization in Archaeology, California State University, Long Beach, magna cum laude. Experience: 34 years in the archaeology field. Contribution: Preparer of the *Archaeological Survey Report*.

5.2.3 GPA Consulting

Laura Comstock, Associate Environmental Planner. Master of Urban and Regional Planning, University of Hawaii at Manoa. Experience: 5 years in environmental planning and permitting. Contribution: Author of the Section 4(f) and *Community Impact Assessment* reports; technical editor of the Cumulative Impacts Analysis.

Alen Estrada-Rodas, Environmental Planner. B.A. in Urban Studies and Planning, California State University, Northridge. Master of Urban Planning, California State University, Northridge. Experience: 8 months in environmental planning and analysis. Contribution: Preparer of the *Community Impact Assessment.*

Nicole Greenfield, Environmental Planner. B.A. in Integrative Biology, University of California, Berkeley. Experience: 1.5 years in environmental planning and analysis. Contribution: Preparer of the *Cumulative Impact Assessment.*

Jeanne Ogar, Senior Environmental Planner. M.S. in Environmental Science and Management, University of California, Santa Barbara. Experience: 10 years in environmental planning and permitting. Contribution: Preparer of the *Community Impact Assessment* and *Energy Technical Report* and review of the *Draft Relocation Impact Report.*

Laura O'Neill, Senior Architectural Historian. B.A. in Political Science, Lehigh University. Master of Architecture, California State Polytechnic University, Pomona. Experience: 12 years in historic preservation and architectural history. Contribution: Project manager and preparer for the *Historical Resources Evaluation Report* and *Historic Properties Survey Report.*

Sylvia Vega, Principal Environmental Planner. B.S. in Natural Resources Management, California State University, San Luis Obispo. Experience: 34 years in environmental planning and analysis. Contribution: Quality control and quality assurance review of the *Community Impact Assessment,* Cumulative Impact Analysis, and Section 4(f).

5.2.4 Cambridge Systematics

Gary Hamrick, Principal. M.A. in Transportation Planning, UCLA, 34 years of experience in transportation planning and analysis. Contribution: Managed development of traffic analysis, travel demand modeling, traffic microsimulation and completion of Traffic Operations Analysis Report (TOAR).

Alice Chu, Transportation Analyst. B.S. in Computer Science, University of California, San Diego. M.S. in Transportation Engineering, University of Texas at Austin. Two years of experience in transportation operations analysis. Contribution: Traffic analysis and co-author of draft and final Traffic Operations Analysis Report (TOAR).

5.2.5 WKE, Inc.

Joseph Carbajal, B.A. in Civil Engineering, University of California, Irvine, P.E. (C) 81202. 10 years of experience in roadway, drainage, and utility design and analysis. Contribution: Utility Relocation and Impacts Report, Project Cost Estimate, Pavement Life Cycle Cost Analysis.

Tyler Lim, B.A. in Civil Engineering, California State University, Long Beach. 3 years of experience in roadway and utility design. Contribution: Utility Relocation and Impacts Report, Project Cost Estimate, Pavement Life Cycle Cost Analysis.

5.2.6 Sanberg

Dale Schneeberger, Managing Professional Geologist (P.G.). M.S. in Geology, California State University, Long Beach. 29 years of experience in environmental assessment and analysis. Contribution: Principal author for the ISA.

Ray Rothwell, GIS Manager/Environmental Scientist. B.A. in Environmental Studies, California State University, San Francisco. 8 years of experience in environmental analysis and data management. Contribution: Data management and evaluation, and preparation of GIS-based maps and figures for the IS/EA.

Taylor Ambriz, Staff Environmental Scientist. B.S. in Environmental Science & Biological Science, BIOLA University, La Mirada, California. 1 year of experience in environmental studies. Contribution: Summary and tabulation of environmental database and internal QA of information for the IS/EA.

Chapter 6 Distribution List

The Draft Initial Study/Environmental Assessment (IS/EA) and/or Notice of Availability (NOA) was distributed to federal, State, regional, and local agencies and elected officials, as well as Native American representatives, utility providers, and other interested parties listed on the following pages. In addition to the list provided below, all property owners/occupants within a 500-foot radius of the Westbound State Route 91 (SR-91) Improvement Project and interested public members on the Westbound SR-91 Improvement Project public mailing list were mailed a postcard informing them of the availability of the IS/EA.

6.1 Federal Agencies

United States Environmental Protection Agency, Region IX
Federal Activities Office, CMD-2
75 Hawthorne Street
San Francisco, CA 94105-3901

Federal Highway Administration
1200 New Jersey Avenue, SE
Washington, D.C. 20590

Federal Transit Administration, Region IX
201 Mission Street, Suite 1650
San Francisco, CA 94105-1839

Office of Environmental Policy and Compliance
Department of the Interior
Main Interior Building, MS 2462
1849 C Street, NW
Washington, D.C. 20240

Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
Carlsbad, California 92008

United States Army Corps of Engineers
Los Angeles District
Attention: CESPL-CO-R
911 Wilshire Boulevard, Suite 1101
P.O. Box 532711
Los Angeles, CA 90053-2325

Regional Director
Federal Emergency Management Agency
1111 Broadway, Suite 1200
Oakland, CA 94607-4052

6.2 State Agencies

California Department of Fish and Wildlife
Ed Pert, Regional Manager
3883 Ruffin Road
San Diego, CA 92123

California Transportation Commission
Commission Chair
1120 N Street
Room 2221 (MS-52)
Sacramento, CA 95814

Native American Heritage Commission
Cynthia Gomez, Executive Secretary
1550 Harbor Boulevard, Suite 100
West Sacramento, CA 95691

California Highway Patrol
411 North Central Avenue
Glendale, CA 91203

California Air Resources Board
Mary D. Nichols, Chair
1001 I Street
Sacramento, CA 95814

California Department of Conservation
David Bunn, Director
801 K Street, MS 24-01
Sacramento, CA 95814

State Office of Historic Preservation
Julianne Polanco, Preservation Officer
1725 23rd Street, Suite 100
Sacramento, CA 95816

State Water Resources Control Board
Felicia Marcus, Board Chair
1001 I Street
Sacramento, CA 95814

State Clearinghouse
Ken Alex, Director
1400 Tenth Street
Sacramento, CA 95814

California Natural Resources Agency
John Laird, California Secretary for Natural Resources
1416 Ninth Street, Suite 1311
Sacramento, CA 95814

California Department of Toxic Substances Control
Barbara Lee, Director
1001 I Street
Sacramento, CA 95814-2828

Governor's Office of Emergency Services
Mark Ghilarducci, Director
3650 Schriever Avenue
Mather, CA 95655-4203

California Public Utilities Commission
Michael Picker, President
505 Van Ness Avenue
San Francisco, CA 94102

California Department of Water Resources
Grant Davis, Director
1416 9th Street, Room 1115-1
Sacramento, CA 95814

California Native Plant Society
2707 K Street, Suite 1
Sacramento, CA 95816-5113

California Wildlife Federation
1012 J Street
Sacramento, CA 95814

6.3 Regional/County Agencies

Los Angeles County Clerk
2400 Imperial Highway
Norwalk, CA 90650

Southern California Association of Governments Media & Public Affairs
Jeff Liu, Manager
900 Wilshire Boulevard, Suite 1700
Los Angeles, CA 90017

Los Angeles Regional Water Quality Control Board – Region 4
Irma Muñoz, Chair
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Metropolitan Water District of Southern California
Randy A. Record, Chairman
1121 L Street, Suite 900
Sacramento, CA 95814

Los Angeles County Metropolitan Transportation Authority
Phillip A. Washington, Chief Executive Officer
One Gateway Plaza
Los Angeles, CA 90012-2952

South Coast Air Quality Management District
Dr. William A. Burke, Chairman
21865 Copley Drive
Diamond Bar, CA 91765

Los Angeles County Sheriff's Department
Sheriff Jim McDonnell
211 West Temple Street
Los Angeles, CA 90012

Los Angeles Department of Water and Power
David H. Wright, General Manager
111 North Hope Street, #1221
Los Angeles, CA 90012

Los Angeles County Department of Public Works
James Yang, Manager
900 South Freemont
Alhambra, CA 91803

Los Angeles County Fire Department
Environmental Review Unit
12605 Osborne Street
Pacoima, CA 91331-2129

County of Los Angeles Department of Parks and Recreation
John Wicker, Director
433 South Vermont Avenue
Los Angeles, CA 90020

Gateway Cities Council of Governments
Nancy Pfeffer
Executive Director
16401 Paramount Boulevard
Paramount, CA 90723

Los Angeles County Department of Regional Planning
Richard Bruckner, Director of Planning
320 West Temple Street, 13th Floor
Los Angeles, CA 90012

6.4 Local Agencies

Los Angeles County Fire Department Station 30
19030 Pioneer Boulevard
Cerritos, CA 90703

City of Cerritos
Public Works Department
18125 Bloomfield Avenue
Cerritos, CA 90703

Cerritos Sheriff Station
18135 Bloomfield Avenue
Cerritos, CA 90703

City of Artesia
Public Works Department
18747 Clarkdale Avenue
Artesia, CA 90701

City of Norwalk Public Services Department Administrative Offices
12650 East Imperial Highway
Norwalk, CA 90650

Jim Parker, City of Norwalk Interim City Manager
12700 Norwalk Boulevard, Room 3
Norwalk, CA 90650

Art Gallucci, City of Cerritos City Manager
18125 Bloomfield Avenue
Cerritos, CA 90703

William Rawlings, City of Artesia City Manager
18747 Clarkdale Avenue
Artesia, CA 90701

6.5 Elected Officials/Federal

The Honorable Dianne Feinstein
United State Senator
11111 Santa Monica Boulevard, Suite 915
Los Angeles, CA 90025

The Honorable Kamala Harris
United State Senator
312 North Spring Street, Suite 1748
Los Angeles, CA 90012

The Honorable Linda Sanchez
United States Congress 38th District
12440 East Imperial Highway, Suite 140
Norwalk, CA 90650

6.6 Elected Officials/State

The Honorable Tony Mendoza
State Senate 32nd District
17315 Studebaker Road, Suite 332
Cerritos, CA 90703

The Honorable Ian Calderon
State Assembly 57th District
13181 Crossroads Parkway, Suite 160
City of Industry, CA 91746-3497

The Honorable Cristina Garcia
State Assembly 58th District
8255 Firestone Boulevard, Suite 203
Downey, CA 90241

6.7 Elected Officials/County

The Honorable Janice Hahn
Board of Supervisors, 4th District
Norwalk Field Office
12720 Norwalk Boulevard, Room 704
Norwalk, CA 90650

6.8 Elected Officials/Norwalk

The Honorable Luigi Vernola, Mayor
12700 Norwalk Boulevard
Norwalk, CA 90650

The Honorable Leonard Shryock, Vice Mayor
12700 Norwalk Boulevard
Norwalk, CA 90650

The Honorable Tony Ayala, Councilmember
12700 Norwalk Boulevard
Norwalk, CA 90650

The Honorable Jennifer Perez, Councilmember
12700 Norwalk Boulevard
Norwalk, CA 90650

The Honorable Margarita L. Rios, Councilmember
12700 Norwalk Boulevard
Norwalk, CA 90650

6.9 Elected Officials/Artesia

The Honorable Sally Flowers, Mayor
18747 Clarkdale Avenue
Artesia, CA 90701

The Honorable Tony Lima, Mayor Pro Tem
18747 Clarkdale Avenue
Artesia, CA 90701

The Honorable Miguel Canales, Councilmember
18747 Clarkdale Avenue
Artesia, CA 90701

The Honorable Victor Manalo, Councilmember
18747 Clarkdale Avenue
Artesia, CA 90701

The Honorable Ali Sajjad Taj, Councilmember
18747 Clarkdale Avenue
Artesia, CA 90701

Okina Dor, Planning Director
18747 Clarkdale Avenue
Artesia, CA 90701

6.10 City Officials/Cerritos

The Honorable Grace Hu, Mayor
18125 Bloomfield Avenue
Cerritos, CA 90703

The Honorable Mark E. Pulido, Mayor Po Tem
18125 Bloomfield Avenue
Cerritos, CA 90703

The Honorable Jim Edwards, Councilmember
18125 Bloomfield Avenue
Cerritos, CA 90703

The Honorable Naresh Solanki, Councilmember
18125 Bloomfield Avenue
Cerritos, CA 90703

The Honorable Frank Aurelio Yokoyama, Councilmember
18125 Bloomfield Avenue
Cerritos, CA 90703

6.11 Native American Tribal Representatives

Gabrieleño Band of Mission Indians – Kizh Nation
Andrew Salas, Chairperson
P.O. Box 393
Covina, CA 91723

Gabrieleno/Tongva San Gabriel Band of Mission Indians
Anthony Morales, Chairperson
P.O. Box 693
San Gabriel, CA 91778

Gabrielino/Tongva Nation
Sandonne Goad, Chairperson
106 ½ Judge John Aiso Street #231
Los Angeles, CA 90012

Gabrielino Tongva Indians of
California Tribal Council
Robert Dorame, Chairperson
P.O. Box 490
Bellflower, CA 90707

Gabrielino-Tongva Tribe
Linda Candelaria, Co-Chairperson
23453 Vanwen Street
West Hills, CA 91307

Juaneno Band of Mission Indians
Acjachemen Nation – Belardes
Joyce Perry, Tribal Manager
4955 Paseo Segovia
Irvine, CA 92603

Juaneno Band of Mission Indians
Acjachemen Nation – Belardes
Matias Belardes, Chairperson
32161 Avenida Los Amigos
San Juan Capistrano, CA 92675

6.12 Libraries

Cerritos Library
18025 Bloomfield Avenue
Cerritos, CA 90703

Artesia Library
18801 Elaine Avenue
Artesia, CA 90701

La Palma Branch Library
7842 Walker Street
La Palma, CA 90623

Alondra Library
11949 Alondra Boulevard
Norwalk, CA 90650

Buena Park Library District
7150 La Palma Avenue
Buena Park, CA 90620

6.13 Utility Providers

Time Warner Cable
14328-14338 Lakewood Blvd
Bellflower, CA 90706

Southern California Edison
1325 S Grand Avenue
Santa Ana, CA 92705

City of Cerritos Water and Power
PO Box 3130
Cerritos, CA 90703

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