2.2.7 Noise and Vibration

This section addresses potential noise impacts on nearby noise-sensitive areas along the project corridor resulting from the proposed project. For detailed analysis, please refer to the *Noise Study Report* (NSR) (December 2017).

2.2.7.1 Regulatory Setting

NEPA and 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.

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 those measures are not feasible. The rest of this section will focus on the NEPA 23 CFR 772 noise analysis; please see Chapter 3 of this document for further information on noise analysis under CEQA.

Pursuant to Caltrans Traffic Noise Analysis Protocol (dated May 2011), Section 7, CEQA and NEPA Considerations, a 12-decibel (dB) increase between existing and design-year with-project conditions is considered a significant impact. If a proposed project is determined to have a significant noise impact under CEQA, then abatement measures must be incorporated into the project unless those measures are not feasible.

National Environmental Policy Act and 23 CFR 772

For highway transportation projects with FHWA (and Caltrans, as assigned) involvement, the federal-Aid Highway Act of 1970 and the associated 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 A-weighted decibels [dBA]) is lower than the NAC for commercial areas (72 dBA). Table 2.2.7-1 lists the NAC for use in the NEPA 23 CFR 772 analysis.

Table 2.2.7-1. Noise Abatement Criteria

Activity Category	NAC, Hourly A-Weighted Noise Level, $L_{eq}(h)$[1]	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.
B[2]	67 (Exterior)	Residential.
C[2]	67 (Exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care 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, day care 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] The $L_{eq}(h)$ activity criteria values are for impact determination only and are not design standards for noise abatement measures.
All values are A-weighted decibels (dBA).
[2] Includes undeveloped lands permitted for this activity category.

Figure 2.2.7-1 shows a range of noise levels for common activities so that a comparison can be made between the predicted traffic noise levels discussed in this section with common activities.

According to Caltrans' *Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier 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, then 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 in the project.

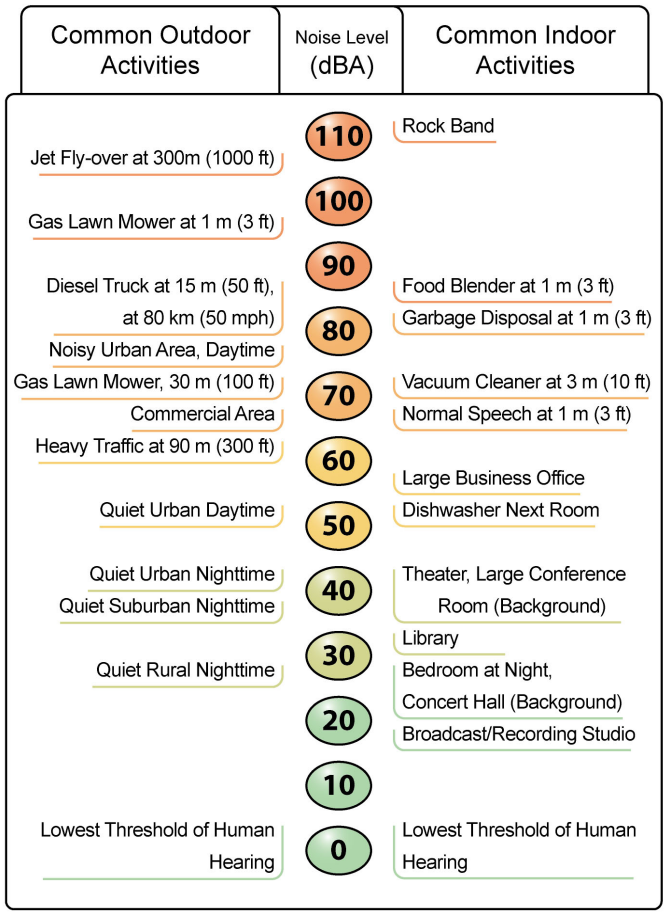

Figure 2.2.7-1. Noise Levels of Common Activities

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 7-dBA reduction in the future noise level must be achieved for an abatement measure to be considered feasible. Other considerations include topography, access requirements, other noise sources, and safety considerations. 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.

2.2.7.2 Affected Environment

Information in this section is from the NSR (December 2017) and the *Noise Abatement Decision Report* (December 2017).

Developed and undeveloped land uses in the project vicinity were identified through inspection of aerial photography and a detailed field investigation.

Existing land uses in the project area are described below and in further detail starting at 4th Street (the northern terminus of the project area) and continuing south along Grove Avenue to E. State Street/E. Airport Drive (the southern terminus of the project area).

Grove Avenue between 4th Street and I Street: This is the northernmost area in the project corridor and consists of recreational parks on the east and west sides of Grove Avenue.

Grove Avenue between I Street and G Street: This area consists of single-family residences west of Grove Avenue and single-family residences approximately 150 feet east of Grove Avenue.

Grove Avenue between G Street and Nocta Street: This area consists of single- and multi-family residences, west and east of Grove Avenue. There is also a place of worship, the Sovereign Grace Baptist Church, at the southwest corner of Grove Avenue and G Street.

Grove Avenue between Nocta Street and E. State Street/E. Airport Drive: This area consists of several single-family residences (permanent and mobile homes) that are located approximately 100 feet or more from Grove Avenue. There are several hotels along Holt Boulevard. In addition, an outdoor waiting area for the Car Wash El Chavo was identified. Furthermore, there are several parcels of undeveloped land in this area.

The generalized land use data and location of particular noise-sensitive receivers were the basis for the selection of representative analysis sites. A total of 97 receiver locations were modeled to represent existing uses in the project vicinity. Figures 2.2.7-2 through 2.2.7-4 show the locations that were analyzed, as well as receiver and soundwall locations. The following land uses occur along the Grove Avenue Corridor:

- Category B – Single-family and multi-family residences
- Category C – Sovereign Grace Baptist Church, walking trail benches, John Galvin Park, and Jay Littleton Ballpark
- Category E – Knights Inn Ontario, Capri Motel, Pepper Tree Motel, and Car Wash El Chavo
- Category G – Undeveloped lands

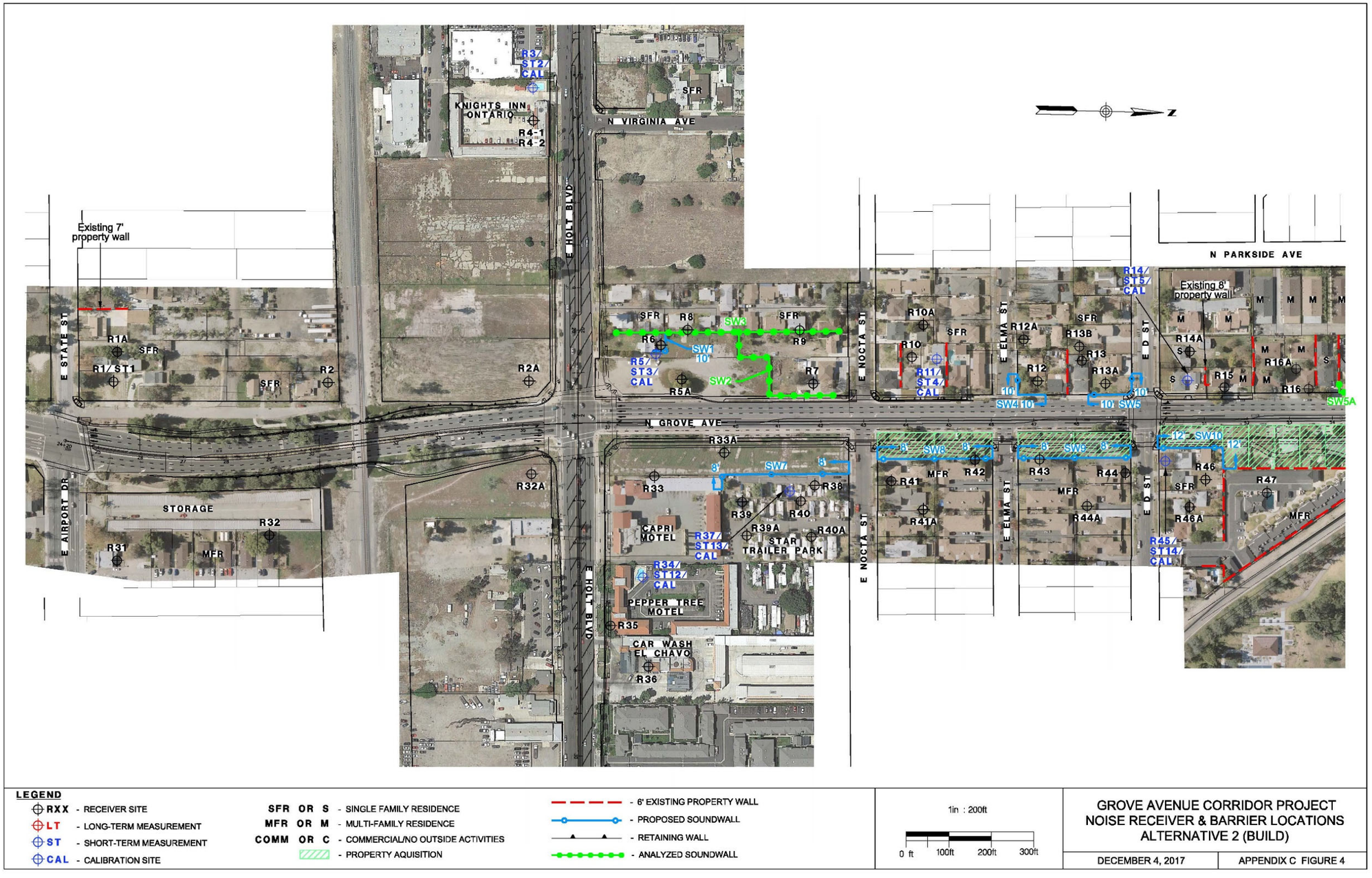

Figure 2.2.7-2. Noise Receiver and Barrier Locations (Build Alternative)

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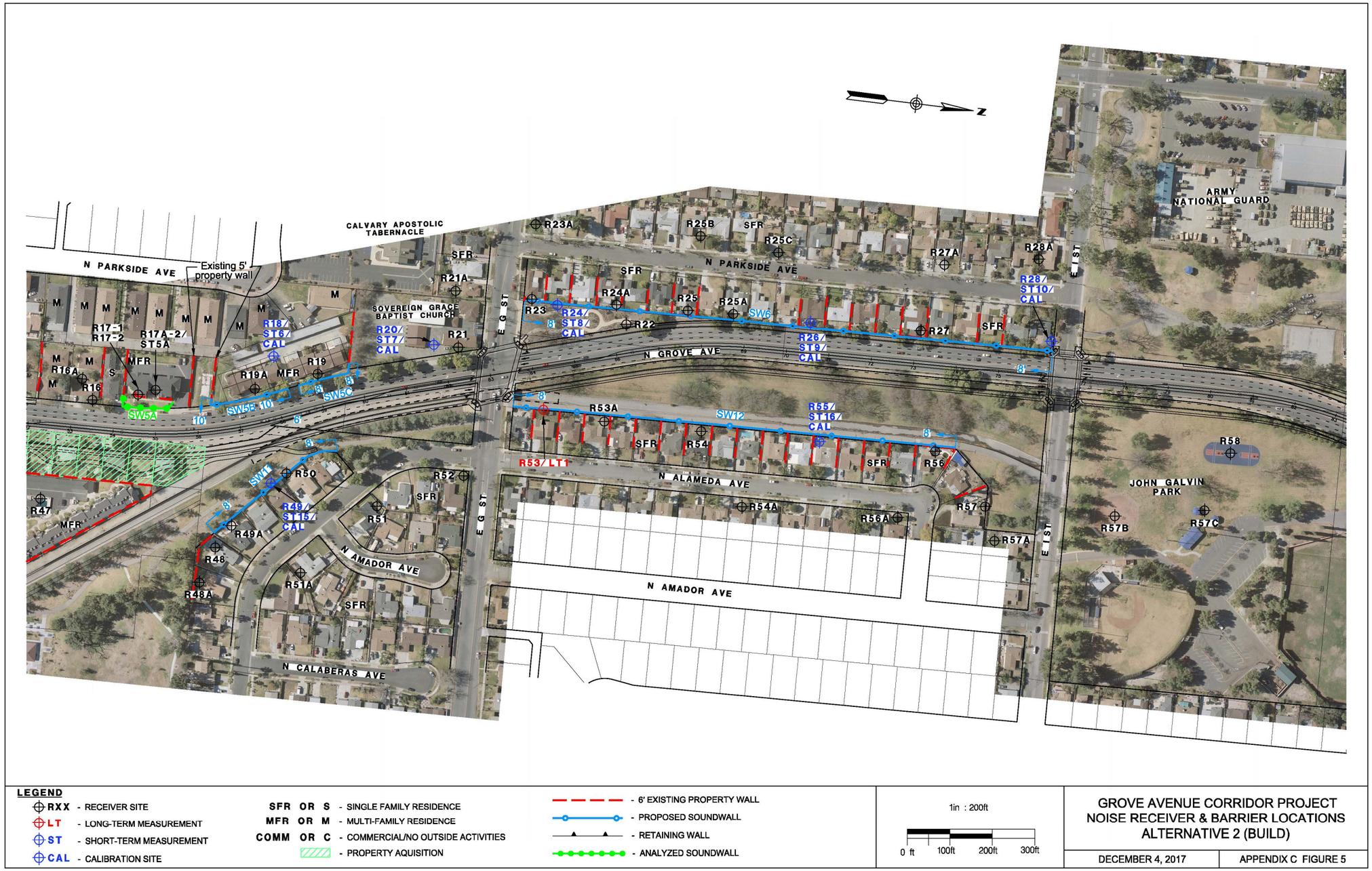

Figure 2.2.7-3. Noise Receiver and Barrier Locations (Build Alternative)

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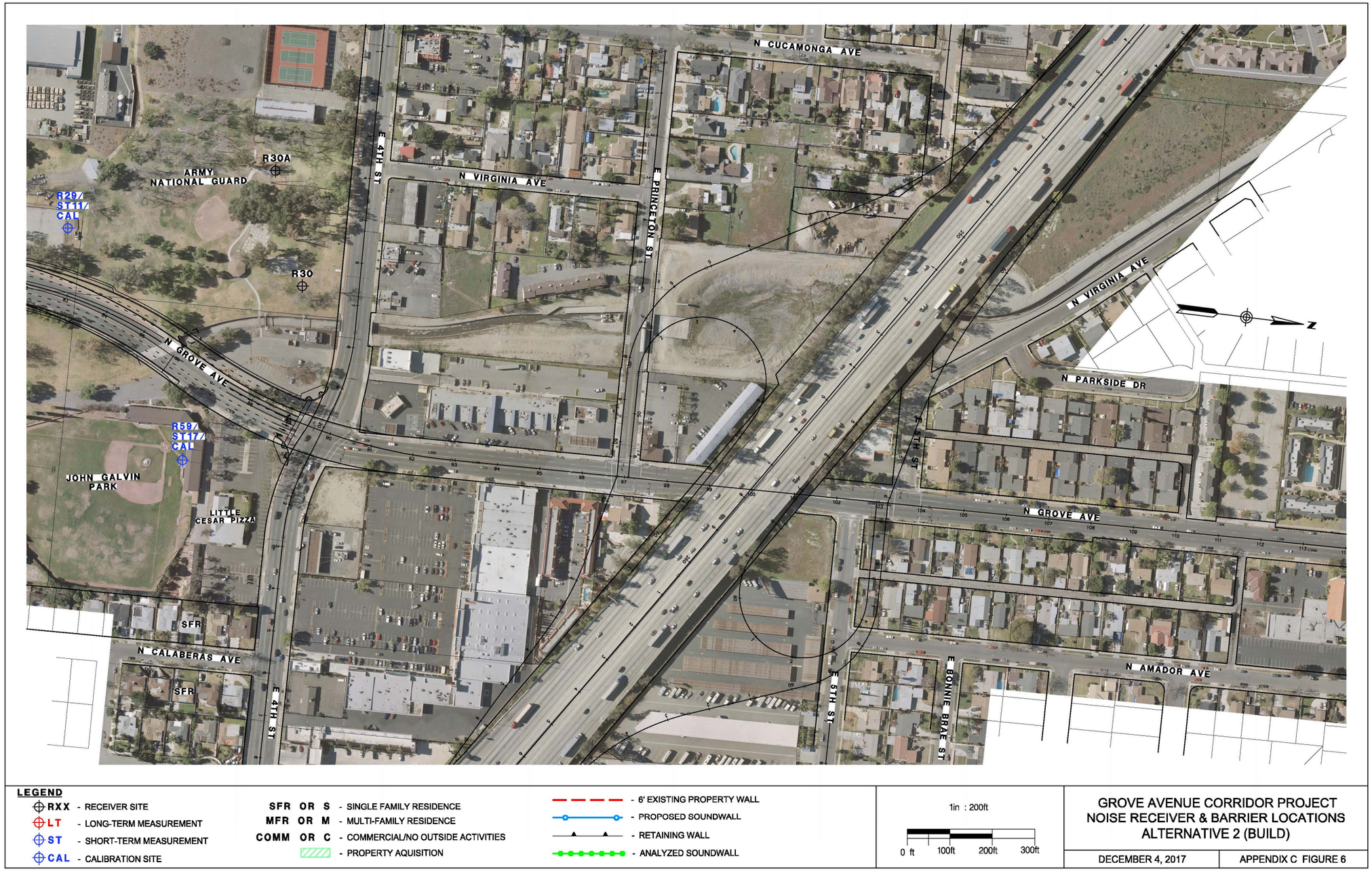

Figure 2.2.7-4. Noise Receiver and Barrier Locations (Build Alternative)

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2.2.7.3 Environmental Consequences

The project is considered a Type I project by 23 CFR 772 because the proposed construction that would widen Grove Avenue would add lanes and shift traffic closer to adjacent receivers.

The following paragraphs explain the steps in predicting traffic noise levels along the project corridor as a result of the proposed project.

Existing Noise Level Measurements

The existing noise environment in the project area is characterized below based on short-term (20-minute) noise level measurements (and traffic counts) completed at 17 locations in May 2015 and at 1 additional location in February 2017, and subsequent modeling of traffic noise levels at 97 representative receiver locations. Table 2.2.7-2 summarizes the results of the short-term noise measurement conducted in the project area.

Table 2.2.7-2. Summary of Short-Term Measurements

Receiver	Address	Land Uses	Start Time	Duration (minutes)	Measured L_{eq}
ST1	1197 E. State Street	Residential	10:20 a.m.	20	61.9
ST2	1120 E. Holt Boulevard	Residential	3:00 p.m.	20	66.6
ST3	1179 E. Holt Boulevard	Residential	10:50 a.m.	20	64.7
ST4	213 N. Grove Avenue	Recreation	11:20 a.m.	20	56.5
ST5	1195 E. D Street	Recreation	1:20 p.m.	20	60.7
ST5A	501 N. Grove Avenue #203	Residential	2:00 p.m.	20	66.9
ST6	533 N. Grove Avenue	Residential	1:00 p.m.	20	59.0
ST7	1168 E. G Street	Residential	12:20 p.m.	20	63.4
ST8	710 N. Parkside Drive	Residential	9:40 a.m.	20	60.2
ST9	804 N. Parkside Drive	Recreation	4:15 p.m.	20	62.0
ST10	1156 E. I Street	Residential	3:20 p.m.	20	67.8
ST11	John Galvin Park	Park	2:20 p.m.	20	58.9
ST12	1241 E. Holt Boulevard	Recreation	11:00 a.m.	20	59.4
ST13	1230 E. Nocta Street	Residential	12:20 p.m.	20	57.9
ST14	1213 E. D Street	Residential	10:40 a.m.	20	61.6
ST15	1210 E. Flora Street	Recreation	4:25 p.m.	20	63.7
ST16	809 N. Alameda Avenue	Residential	11:25 a.m.	20	58.7
ST17	John Galvin Park	Park	2:30 p.m.	20	57.8

Source: Noise Study Report, Grove Avenue Corridor Project (December 2017).

Future Noise-Level Modeling

Traffic noise levels were predicted using the FHWA Traffic Noise Model Version 2.5 (TNM 2.5). Key inputs to the traffic noise model were the locations of roadways, shielding features, existing soundwalls, ground types, and receiver locations. Receivers, defined as single points, were at frequent outdoor use areas such as residences, schools, and recreational areas.

A comparison of existing noise levels to the projected noise levels in 2045 under the No Build Alternative and the Build Alternative is provided. Comparison to existing conditions indicates traffic noise impacts to the receptors; comparison of the build and no-build conditions indicates the direct effect of the project.

Where noise levels met the NAC, soundwalls were evaluated to determine if they were reasonable and feasible. The criteria for determining when an abatement measure is reasonable and feasible are provided above in the Regulatory Setting.

Reasonableness of noise abatement (for each noise barrier found to be acoustically feasible) must then be determined based on the cost allowance calculation procedure identified in the *Caltrans Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects*. A soundwall is considered reasonable if it costs less than the reasonable allowance for that barrier (described in more detail in the December 2017 *Noise Abatement Decision Report*), meets the design goal, and the viewpoints of benefited receivers have been taken into consideration. The preliminary determination of reasonableness is discussed later in this section.

Thresholds of Significance

An evaluation of potential noise impacts associated with each alternative is presented below.

No Build Alternative

Table 2.2.7-3 shows the results of the traffic noise modeling for the design-year No Build Alternative range from 49 to 74 dBA L_{eq}(h). Noise levels for design-year no-build conditions are expected to increase up to 3 dB over existing noise levels due to projected traffic volume increases over existing conditions. Estimated no-build traffic noise levels were found to approach or exceed the applicable NAC at representative land use locations.

Table 2.2.7-3. Traffic Noise Impact Analysis

Receiver	Existing Noise Level (dBA)	Predicted Noise Level without Project (dBA)	Predicted Noise Level with Project (dBA)	Noise Impact Requiring Abatement Consideration	Predicted Noise Level with Abatement (dBA)						Reasonable and Feasible
					6-foot Wall	8-foot Wall	10-foot Wall	12-foot Wall	14-foot Wall	16-foot Wall	
R1/ST1	68	70	70	No	--	--	--	--	--	--	--
R1A	62	64	65	No	--	--	--	--	--	--	--
R2	61	62	63	No	--	--	--	--	--	--	--
R2A	72	74	74	No	--	--	--	--	--	--	--
R3/ST2	66	68	68	No	--	--	--	--	--	--	--
R4-1	59	61	61	No	--	--	--	--	--	--	--
R4-2	60	62	62	No	--	--	--	--	--	--	--
R5/ST3	68	70	70	No	--	--	--	--	--	--	--
R5A	70	72	72	No	--	--	--	--	--	--	--
R6	67	68	69	Yes	64	63	62	61	61	61	Yes
R7	67	68	68	Yes	67	65	65	64	64	63	No
R8	65	67	67	Yes	64	64	64	63	63	63	No
R9	60	62	63	No	--	--	--	--	--	--	--
R10	62	63	65	No	--	--	--	--	--	--	--
R10A	55	56	57	No	--	--	--	--	--	--	--
R11/ST4	59	61	62	No	--	--	--	--	--	--	--
R12	69	70	71	Yes	65	64	63	63	63	62	Yes
R12A	62	64	64	No	63	63	62	62	62	62	No
R13	61	62	62	No	60	60	60	60	59	--	No
R13A	71	73	73	Yes	67	65	64	64	63	--	Yes
R13B	59	61	61	No	58	57	56	56	56	--	Yes
R14/ST5	67	68	68	Yes	--	--	--	--	--	--	--
R14A	59	61	61	No	--	--	--	--	--	--	--

Table 2.2.7-3. Traffic Noise Impact Analysis

Receiver	Existing Noise Level (dBA)	Predicted Noise Level without Project (dBA)	Predicted Noise Level with Project (dBA)	Noise Impact Requiring Abatement Consideration	Predicted Noise Level with Abatement (dBA)						Reasonable and Feasible
					6-foot Wall	8-foot Wall	10-foot Wall	12-foot Wall	14-foot Wall	16-foot Wall	
R15	72	73	73	Yes	--	--	--	--	--	--	--
R16	72	74	74	Yes	--	--	--	--	--	--	--
R16A	61	62	62	No	--	--	--	--	--	--	--
R17-1	62	64	64	No	63	60	59	59	59	59	No
R17-2	71	72	72	Yes	72	72	72	70	68	66	No
R17A/ST5A	70	72	72	Yes	72	71	70	68	67	66	No
R18/ST6	61	62	63	No	--	--	--	--	--	--	--
R19	71	73	73	Yes	66	64	62	61	60	60	Yes
R19A	71	73	73	Yes	66	64	63	62	61	61	No
R20/ST7	71	72	72	No	--	--	--	--	--	--	--
R21	47	49	49	No	--	--	--	--	--	--	--
R21A	54	56	56	No	--	--	--	--	--	--	--
R22	72	74	74	Yes	--	--	--	--	--	--	--
R23	61	64	64	No	64	62	61	60	60	--	No
R23A	60	62	62	No	62	62	62	62	61	--	No
R24/ST8	68	70	70	No	--	--	--	--	--	--	--
R24A	68	69	70	Yes	64	61	59	57	56	--	Yes
R25	62	64	64	No	64	61	60	58	57	--	No
R25A	71	72	73	Yes	67	64	62	60	59	--	Yes
R25B	56	57	59	No	57	56	55	55	54	--	No
R25C	57	58	60	No	58	57	56	55	54	--	No
R26/ST9	64	65	66	Yes	66	64	62	60	59	--	No
R27	63	65	69	Yes	67	64	62	61	59	--	Yes

Table 2.2.7-3. Traffic Noise Impact Analysis

Receiver	Existing Noise Level (dBA)	Predicted Noise Level without Project (dBA)	Predicted Noise Level with Project (dBA)	Noise Impact Requiring Abatement Consideration	Predicted Noise Level with Abatement (dBA)						Reasonable and Feasible
					6-foot Wall	8-foot Wall	10-foot Wall	12-foot Wall	14-foot Wall	16-foot Wall	
R27A	58	59	60	No	59	59	58	57	57	--	No
R28/ST10	70	72	74	Yes	71	71	71	71	71	--	No
R28A	62	63	64	No	63	63	63	63	63	--	No
R29/ST11	66	68	69	Yes	--	--	--	--	--	--	--
R30	66	68	68	Yes	--	--	--	--	--	--	--
R30A	61	63	63	No	--	--	--	--	--	--	--
R31	53	54	54	No	--	--	--	--	--	--	--
R32	49	51	51	No	--	--	--	--	--	--	--
R32A	72	73	75	No	--	--	--	--	--	--	--
R33	69	70	72	No	--	--	--	--	--	--	--
R33A	70	71	74	No	--	--	--	--	--	--	--
R34/ST12	67	68	68	No	--	--	--	--	--	--	--
R35	71	72	72	No	--	--	--	--	--	--	--
R36	66	67	68	No	--	--	--	--	--	--	--
R37/ST13	65	67	69	Yes	62	61	60	59	58	58	Yes
R38	66	67	70	Yes	64	62	61	60	59	58	Yes
R39	57	58	61	No	59	58	58	57	57	56	No
R39A	57	58	61	No	57	57	56	56	55	55	No
R40	64	65	67	Yes	62	61	60	60	59	59	Yes
R40A	55	56	58	No	56	56	56	56	56	56	No
R41	58	59	62	No	62	62	62	61	61	--	No
R41A	55	57	61	No	59	59	58	58	58	--	No
R42	64	65	72	Yes	67	62	59	58	57	--	Yes

Table 2.2.7-3. Traffic Noise Impact Analysis

Receiver	Existing Noise Level (dBA)	Predicted Noise Level without Project (dBA)	Predicted Noise Level with Project (dBA)	Noise Impact Requiring Abatement Consideration	Predicted Noise Level with Abatement (dBA)						Reasonable and Feasible
					6-foot Wall	8-foot Wall	10-foot Wall	12-foot Wall	14-foot Wall	16-foot Wall	
R43	64	65	73	Yes	67	62	60	58	57	--	Yes
R44	67	68	72	Yes	69	69	68	68	68	--	No
R44A	53	54	57	No	56	56	56	56	56	--	No
R45/ST14	67	69	72	Yes	70	70	70	70	70	--	No
R46	62	64	69	Yes	64	63	63	62	62	--	No
R46A	56	57	60	No	57	56	56	55	55	--	No
R47	57	58	63	No	--	--	--	--	--	--	--
R48	54	56	58	No	--	--	--	--	--	--	--
R48A	51	52	54	No	--	--	--	--	--	--	--
R49/ST15	67	68	70	No	--	--	--	--	--	--	--
R49A	63	65	66	Yes	61	59	57	57	56	56	Yes
R50	67	68	70	Yes	61	59	58	57	57	56	Yes
R51	62	64	65	No	--	--	--	--	--	--	--
R51A	58	59	61	No	--	--	--	--	--	--	--
R52	66	68	69	No	--	--	--	--	--	--	--
R53/LT1	69	71	73	Yes	69	63	61	60	59	59	No
R53A	66	67	69	Yes	64	61	60	59	58	57	No
R54	64	66	67	Yes	60	59	57	56	55	54	No
R54A	57	59	61	No	56	57	56	56	55	55	No
R55/ST16	64	65	67	Yes	61	59	57	56	54	54	No
R56	58	60	61	No	61	59	57	56	55	54	No
R56A	57	59	60	No	58	59	58	58	58	58	No
R57	61	62	64	No	--	--	--	--	--	--	--

Table 2.2.7-3. Traffic Noise Impact Analysis

Receiver	Existing Noise Level (dBA)	Predicted Noise Level without Project (dBA)	Predicted Noise Level with Project (dBA)	Noise Impact Requiring Abatement Consideration	Predicted Noise Level with Abatement (dBA)						Reasonable and Feasible
					6-foot Wall	8-foot Wall	10-foot Wall	12-foot Wall	14-foot Wall	16-foot Wall	
R57A	60	61	62	No	--	--	--	--	--	--	--
R57B	61	63	64	No	--	--	--	--	--	--	--
R57C	62	63	64	No	--	--	--	--	--	--	--
R58	67	69	70	Yes	--	--	--	--	--	--	--
R59/ST17	62	63	63	No	--	--	--	--	--	--	--

dBA: A-weighted decibels.

--: Not Evaluated

1 - Receivers that are noise measurement sites that are not located at an outdoor use area, or those subject to acquisitions, are not listed in this table because they do not represent a future outdoor use area and do not qualify for noise abatement.

Source: Developed from the Noise Study Report, 2017.

Build Alternative (Proposed Project)

Under the Build Alternative, traffic noise modeling results range from 49 to 75 dBA L_{eq}(h). Noise levels for the design-year 2045 Build Alternative are expected to increase by up to 8 dB over design-year no-build noise levels. Under future design-year 2045 build conditions, most of the receiver locations have traffic noise levels that were found to approach or exceed the applicable NAC. Where possible, noise abatement was considered at these receiver locations. Figures 2.2.7-2 through 2.2.7-4 show the locations that were analyzed, as well as receiver and soundwall locations.

Implementation of Caltrans Standard Special Provisions for vibration would ensure that the project has none to very little potential for ground-borne vibration or ground-borne noise levels during construction or operation of the project. The project is located near the Ontario International Airport but would not change the exposure of residents or other persons in the area to airport noise nor conflict with an airport land use plan; therefore, no airport-associated noise impacts would occur.

Future Noise-Level Modeling

Traffic noise impacts would occur along the various roadways even without project implementation, as shown in Table 2.2.7-4, because traffic noise levels would approach or exceed NAC; however, no noise abatement would be considered without the project.

Short-Term Construction Impacts

No Build Alternative

No project improvements are proposed under the No Build Alternative; therefore, no construction impacts were analyzed for the No Build Alternative.

Build Alternative (Proposed Project)

During construction of the project, noise from construction activities may intermittently dominate the noise environment in the immediate area of construction. Noise associated with construction is controlled by Caltrans Standard Specification Section 14-8.02, “Noise Control.”

No adverse noise impacts from construction are anticipated because construction would be conducted in accordance with Standard Specification 14-8.02, SSP 14-8.02, and applicable local noise standards.

Table 2.2.7-4. Predicted Future Traffic Noise and Soundwall Analysis – Alternative 2 (Build Alternative)

Receiver I.D.	Barrier I.D. and Location	Land Use[2]	Number of Dwelling Units	Existing Noise Level $L_{eq}(h)$, dBA[1]	I-10 Grove Avenue Project Future Worst Hour Noise Levels - $L_{eq}(h)$, dBA[1]						Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and Number of Benefitted Receivers (NBR)																	
					Design Year No-Build Noise Level $L_{eq}(h)$, dBA[1]	Design Year Build Noise Level $L_{eq}(h)$, dBA[1]	Design Year No-Build Noise Level Minus Existing Conditions, dB	Design Year Build Noise Level Minus No-Build Conditions, dB	Activity Category (NAC)	Impact Type[3]	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*
R1/ST1 [4]	No Barrier	UND	--	68	70	70	2	0	G (--)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R1A		SFR	1	62	64	65	2	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R2		SFR	2	61	62	63	1	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R2A		UND	--	72	74	74	2	0	G (--)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R3/ST2		HOT	1	66	68	68	2	0	E (72)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R4-1		HOT	--	59	61	61	2	0	E (72)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R4-2		HOT	--	60	62	62	2	0	E (72)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R5/ST3 [4]		--	--	68	70	70	2	0	--	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R5A		UND	--	70	72	72	2	0	G (--)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R6	SW1	SFR	1	67	68	69	1	1	B (67)	A/E	64 [T]	5	*1*	63	6	*1*	**62 [R]**	**7**	*1*	61	8	*1*	61	8	*1*	61	8	*1*
R7	SW2	SFR	2	67	68	68	1	0	B (67)	A/E	67	1	*0*	65	3	*0*	65 [T]	3	*0*	64	4	*0*	64	4	*0*	63	5	*2*
R8	SW3	SFR	6	65	67	67	2	0	B (67)	A/E	64	3	*0*	64 [T]	3	*0*	64	3	*0*	63	4	*0*	63	4	*0*	63	4	*0*
R9	No Barrier	SFR	4	60	62	63	2	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R10		SFR	2	62	63	65	1	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R10A		SFR	2	55	56	57	1	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R11/ST4		SFR	3	59	61	62	2	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R12	SW4	SFR	1	69	70	71	1	1	B (67)	A/E	65	6	*1*	64	7	*1*	**63 [R,T]**	**8**	*1*	63	8	*1*	63	8	*1*	62	9	*1*
R12A		SFR	1	62	64	64	2	0	B (67)	NONE	63	1	*0*	63	1	*0*	62	2	*0*	62	2	*0*	62	2	*0*	62	2	*0*
R13	SW5	SFR	2	61	62	62	1	0	B (67)	NONE	60	2	*0*	60	2	*0*	60	2	*0*	60	2	*0*	59	3	*0*	-- [5]	--	--
R13A		SFR	1	71	73	73	2	0	B (67)	A/E	67	6	*1*	65	8	*1*	**64 [R,T]**	**9**	*1*	64	9	*1*	63	10	*1*	-- [5]	--	--
R13B		SFR	1	59	61	61	2	0	B (67)	NONE	58	3	*0*	57	4	*0*	56	5	*1*	56	5	*1*	56	5	*1*	-- [5]	--	--

Notes:

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Table 2.2.7-4. Predicted Future Traffic Noise and Soundwall Analysis – Alternative 2 (Build Alternative)

Receiver I.D.	Barrier I.D. and Location	Land Use[2]	Number of Dwelling Units	Existing Noise Level Leq(h), dBA[1]	I-10 Grove Avenue Project Future Worst Hour Noise Levels - L_{eq}(h), dBA[1]						Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and Number of Benefitted Receivers (NBR)																	
					Design Year No-Build Noise Level Leq(h), dBA[1]	Design Year Build Noise Level Leq(h), dBA[1]	Design Year No-Build Noise Level Minus Existing Conditions, dB	Design Year Build Noise Level Minus No-Build Conditions, dB	Activity Category (NAC)	Impact Type[3]	6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
											Leq(h)	I.L.	*NBR*	Leq(h)	I.L.	*NBR*	Leq(h)	I.L.	*NBR*	Leq(h)	I.L.	*NBR*	Leq(h)	I.L.	*NBR*	Leq(h)	I.L.	*NBR*
R14/ST5	No Barrier	SFR	1	67	68	68	1	0	B (67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R14A		SFR	1	59	61	61	2	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R15		MFR	2	72	73	73	1	0	B (67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R16		MFR	2	72	74	74	2	0	B (67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R16A		MFR	1	61	62	62	1	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R17-1	SW5A	MFR	2	62	64	64	2	0	B (67)	NONE	63	1	*0*	60	4	*0*	59	5	2	59	5	2	59	5	2	59	5	2
R17-2		MFR	2	71	72	72	1	0	B (67)	A/E	72	0	*0*	72	0	*0*	72	0	*0*	70	2	*0*	68	4	*0*	66 [T]	6	2
R17A/ST5A		MFR	2	70	72	72	2	0	B (67)	A/E	72	0	*0*	71	1	*0*	70	2	*0*	68	4	*0*	67	5	2	66 [T]	6	2
R18/ST6	No Barrier	MFR	8	61	62	63	1	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R19	SW5C	MFR	1	71	73	73	2	0	B (67)	A/E	66 [R]	7	*1*	**64** [R,T]	9	*1*	62	11	*1*	61	12	*1*	60	13	*1*	60	13	*1*
R19A	SW5B	MFR	1	71	73	73	2	0	B (67)	A/E	66 [R]	7	*1*	64	9	*1*	**63** [R,T]	**10**	*1*	62	11	*1*	61	12	*1*	61	12	*1*
R20 [4]	No Barrier	--	--	71	72	72	1	0	--	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R21 Ext		POW	--	72	74	74	2	0	--	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R21 Int		POW	1	47	49	49	2	0	D (52)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R21A		SFR	1	54	56	56	2	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R22	No Barrier[6]	REC	1	72	74	74	2	0	C (67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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Table 2.2.7-4. Predicted Future Traffic Noise and Soundwall Analysis – Alternative 2 (Build Alternative)

Receiver I.D.	Barrier I.D. and Location	Land Use[2]	Number of Dwelling Units	Existing Noise Level Leq(h), dBA[1]	I-10 Grove Avenue Project Future Worst Hour Noise Levels - L_{eq}(h), dBA[1]						Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and Number of Benefitted Receivers (NBR)																	
					Design Year No-Build Noise Level Leq(h), dBA[1]	Design Year Build Noise Level Leq(h), dBA[1]	Design Year No-Build Noise Level Minus Existing Conditions, dB	Design Year Build Noise Level Minus No-Build Conditions, dB	Activity Category (NAC)	Impact Type[3]	6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
											Leq(h)	I.L.	*NBR*	Leq(h)	I.L.	*NBR*	Leq(h)	I.L.	*NBR*	Leq(h)	I.L.	*NBR*	Leq(h)	I.L.	*NBR*	Leq(h)	I.L.	*NBR*
R23 W	SW6	SFR	1	61	64	64	3	0	B (67)	NONE	64	0	*0*	62	2	*0*	61	3	*0*	60	4	*0*	60	4	*0*	-- [5]	--	--
R23A		SFR	1	60	62	62	2	0	B (67)	NONE	62	0	*0*	62	0	*0*	62	0	*0*	62	0	*0*	61	1	*0*	-- [5]	--	--
R24/ST8[4]		--	--	68	70	70	2	0	--	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	-- [5]	--	--
R24A		SFR	2	68	69	70	1	1	B (67)	A/E	64	6	*2*	**61** [R,T]	**9**	*2*	59	11	*2*	57	13	*2*	56	14	*2*	-- [5]	--	--
R25		SFR	4	62	64	64	2	0	B (67)	NONE	64	0	*0*	61	3	*0*	60	4	*0*	58	6	*4*	57	7	*4*	-- [5]	--	--
R25A		SFR	4	71	72	73	1	1	B (67)	A/E	67	6	*4*	**64** [R,T]	**9**	*4*	62	11	*4*	60	13	*4*	59	14	*4*	-- [5]	--	--
R25B		SFR	1	56	57	59	1	2	B (67)	NONE	57	2	*0*	56	3	*0*	55	4	*0*	55	4	*0*	54	5	*1*	-- [5]	--	--
R25C		SFR	1	57	58	60	1	2	B (67)	NONE	58	2	*0*	57	3	*0*	56	4	*0*	55	5	*1*	54	6	*1*	-- [5]	--	--
R26/ST9		SFR	4	64	65	66	1	1	B (67)	A/E	66	0	*0*	64 [T]	2	*0*	62	4	*0*	60 [R]	6	*4*	59	7	*4*	-- [5]	--	--
R27		SFR	5	63	65	69	2	4	B (67)	A/E	67	2	*0*	**64** [R,T]	**5**	*5*	62	7	*5*	61	8	*5*	59	10	*5*	-- [5]	--	--
R27A		SFR	1	58	59	60	1	1	B (67)	NONE	59	1	*0*	59	1	*0*	58	2	*0*	57	3	*0*	57	3	*0*	-- [5]	--	--
R28/ST10		SFR	1	70	72	74	2	2	B (67)	A/E	71	3	*0*	71	3	*0*	71	3	*0*	71	3	*0*	71	3	*0*	-- [5]	--	--
R28A		SFR	1	62	63	64	1	1	B (67)	NONE	63	1	*0*	63	1	*0*	63	1	*0*	63	1	*0*	63	1	*0*	-- [5]	--	--
R29/ST11	No Barrier[6]	REC	1	66	68	69	2	1	C (67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R30		REC	1	66	68	68	2	0	C (67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R30A		REC	1	61	63	63	2	0	C (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R31	No Barrier	SFR	3	53	54	54	1	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R32		SFR	4	49	51	51	2	0	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R32A		UND	--	72	73	75	1	2	G (--)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R33		--	--	69	70	72	1	2	--	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R33A		UND	--	70	71	74	1	3	G (--)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R34/ST12		HOT	1	67	68	68	1	0	E (72)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R35		--	--	71	72	72	1	0	--	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R36		COM	1	66	67	68	1	1	E (72)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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					Design Year No-Build Noise Level Leq(h), dBA[1]	Design Year Build Noise Level Leq(h), dBA[1]	Design Year No-Build Noise Level Minus Existing Conditions, dB	Design Year Build Noise Level Minus No-Build Conditions, dB	Activity Category (NAC)	Impact Type[3]	6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
											Leq(h)	I.L.	*NBR*	Leq(h)	I.L.	*NBR*	Leq(h)	I.L.	*NBR*	Leq(h)	I.L.	*NBR*	Leq(h)	I.L.	*NBR*	Leq(h)	I.L.	*NBR*
R37/ST13	SW7	MH	4	65	67	69	2	2	B (67)	A/E	62	7	*4*	**61** [R,T]	**8**	*4*	60	9	*4*	59	10	*4*	58	11	*4*	58	11	*4*
R38		MH	4	66	67	70	1	3	B (67)	A/E	64	6	*4*	**62** [R,T]	**8**	*4*	61	9	*4*	60	10	*4*	59	11	*4*	58	12	*4*
R39		MH	5	57	58	61	1	3	B (67)	NONE	59	2	*0*	58	3	*0*	58	3	*0*	57	4	*0*	57	4	*0*	56	5	*5*
R39A		MH	4	57	58	61	1	3	B (67)	NONE	57	4	*0*	57	4	*0*	56	5	*4*	56	5	*4*	55	6	*4*	55	6	*4*
R40		MH	4	64	65	67	1	2	B (67)	A/E	62	5	*4*	**61** [R,T]	**6**	*4*	60	7	*4*	60	7	*4*	59	8	*4*	59	8	*4*
R40A		MH	3	55	56	58	1	2	B (67)	NONE	56	2	*0*	56	2	*0*	56	2	*0*	56	2	*0*	56	2	*0*	56	2	*0*
R41	SW8	MFR	2	58	59	62	1	3	B (67)	NONE	62	0	*0*	62	0	*0*	62	0	*0*	61	1	*0*	61	1	*0*	-- [5]	--	--
R41A		MFR	3	55	57	61	2	4	B (67)	NONE	59	2	*0*	59	2	*0*	58	3	*0*	58	3	*0*	58	3	*0*	-- [5]	--	--
R42		MFR	3	64	65	72	1	7	B (67)	A/E	67	5	*3*	**62** [R,T]	**10**	*3*	59	13	*3*	58	14	*3*	57	15	*3*	-- [5]	--	--
R43	SW9	MFR	3	64	65	73	1	8	B (67)	A/E	67	6	*3*	**62** [R,T]	**11**	*3*	60	13	*3*	58	15	*3*	57	16	*3*	-- [5]	--	--
R44		MFR	3	67	68	72	1	4	B (67)	A/E	69	3	*0*	69 [T]	3	*0*	68	4	*0*	68	4	*0*	68	4	*0*	-- [5]	--	--
R44A		MFR	1	53	54	57	1	3	B (67)	NONE	56	1	*0*	56	1	*0*	56	1	*0*	56	1	*0*	56	1	*0*	-- [5]	--	--
R45/ST14	SW10	SFR	1	67	69	72	2	3	B (67)	A/E	70	2	*0*	70	2	*0*	70 [T]	2	*0*	70	2	*0*	70	2	*0*	-- [5]	--	--
R46		SFR	1	62	64	69	2	5	B (67)	A/E	64	5	*1*	63	6	*1*	63 [T]	6	*1*	**62** [R]	**7**	*1*	62	7	*1*	-- [5]	--	--
R46A		SFR	1	56	57	60	1	3	B (67)	NONE	57	3	*0*	56	4	*0*	56	4	*0*	55	5	*1*	55	5	*1*	-- [5]	--	--

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					Design Year No-Build Noise Level Leq(h), dBA[1]	Design Year Build Noise Level Leq(h), dBA[1]	Design Year No-Build Noise Level Minus Existing Conditions, dB	Design Year Build Noise Level Minus No-Build Conditions, dB	Activity Category (NAC)	Impact Type[3]	6 feet			8 feet			10 feet			12 feet			14 feet			16 feet		
											Leq(h)	I.L.	*NBR*	Leq(h)	I.L.	*NBR*	Leq(h)	I.L.	*NBR*	Leq(h)	I.L.	*NBR*	Leq(h)	I.L.	*NBR*	Leq(h)	I.L.	*NBR*
R47	No Barrier	MFR	1	57	58	63	1	5	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R48		SFR	1	54	56	58	2	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R48A		SFR	1	51	52	54	1	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R49/ST15		--	--	67	68	70	1	2	--	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R49A	SW11	SFR	2	63	65	66	2	1	B (67)	A/E	61	5	*2*	**59** [R,T]	**7**	*2*	57	9	*2*	57	9	*2*	56	10	*2*	56	10	*2*
R50		SFR	3	67	68	70	1	2	B (67)	A/E	61 [T]	9	*3*	**59** [R]	**11**	*3*	58	12	*3*	57	13	*3*	57	13	*3*	56	14	*3*
R51	No Barrier	SFR	6	62	64	65	2	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R51A		SFR	2	58	59	61	1	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R52		SFR	--	66	68	69	2	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R53/LT1	SW12	SFR	1	69	71	73	2	2	B (67)	A/E	69	4	*0*	**63** [R,T]	**10**	*1*	61	12	*1*	60	13	*1*	59	14	*1*	59	14	*1*
R53A		SFR	4	66	67	69	1	2	B (67)	A/E	64	5	*4*	**61** [R,T]	**8**	*4*	60	9	*4*	59	10	*4*	58	11	*4*	57	12	*4*
R54		SFR	5	64	66	67	2	1	B (67)	A/E	60	7	*5*	**59** [R,T]	**8**	*5*	57	10	*5*	56	11	*5*	55	12	*5*	54	13	*5*
R54A		SFR	1	57	59	61	2	2	B (67)	NONE	56	5	*1*	57	4	*0*	56	5	*1*	56	5	*1*	55	6	*1*	55	6	*1*
R55/ST16		SFR	5	64	65	67	1	2	B (67)	A/E	61 [T]	6	*5*	**59** [R]	**8**	*5*	57	10	*5*	56	11	*5*	54	13	*5*	54	13	*5*
R56		SFR	2	58	60	61	2	1	B (67)	NONE	61	0	*0*	59	2	*0*	57	4	*0*	56	5	*2*	55	6	*2*	54	7	*2*
R56A		SFR	2	57	59	60	2	1	B (67)	NONE	58	2	*0*	59	1	*0*	58	2	*0*	58	2	*0*	58	2	*0*	58	2	*0*
R57	No Barrier	SFR	1	61	62	64	1	2	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R57A		SFR	1	60	61	62	1	1	B (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R57B	No Barrier[6]	REC	1	61	63	64	2	1	C (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R57C		REC	1	62	63	64	1	1	C (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R58		REC	1	67	69	70	2	1	C (67)	A/E	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R59/ST17		REC	1	62	63	63	1	0	C (67)	NONE	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

1 - Leq(h) are A-weighted, peak hour noise levels in decibels. Noise levels are calculated using PM peak hour traffic volumes, based on the results of long-term measurement site LT1 and the project traffic study.

2 - Land Use: SFR - single-family residence; MFR - multi-family residence; UND - undeveloped; SCH - educational center; COM- commercial; REC - recreational; HOT - hotel/motel; POW - place of worship; MH - mobile home.

3 - S = Substantial Increase (12 dBA or more); A/E = Approach or exceed NAC.

4 - This noise measurement site was chosen for monitoring purposes and was not located at an outdoor use area; however, this site is acoustically representative of nearby outdoor use areas.

5 - Per the Highway Design Manual, the maximum height of a noise barrier should not exceed 14 feet in height when located 15 feet or less from the edge of traveled way.

6 - Soundwalls were not analyzed at public parks maintained by the City of Ontario.

W - Includes the benfit of an existing soundwall or property wall.

T - Minimum height required to block the line-of-sight from the receiver to truck exhaust stacks.

R - Minimum height required to meet feasibility requirements and design goal.

STxx - Short-term measurement / model calibration site.

LTxx - Long-term measurement site.

Int - Interior noise level determined using a building structure noise reduction of 25 dB, based on visual inspection of building and FHWA *Highway Traffic Noise: Analysis and Abatement Guidance* Table 6.

-- - A soundwall was not evaluated for this receiver.

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However, construction noise can vary greatly depending on the construction process, type and condition of equipment used, and layout of the construction site. Many of these factors are traditionally left to the contractor's discretion, which makes it difficult to accurately estimate levels of construction noise. Construction noise estimates are approximate because of the lack of specific information available at the time of the assessment. Temporary construction noise impacts would be unavoidable at areas located immediately adjacent to the proposed project alignment.

2.2.7.4 Avoidance, Minimization, and/or Mitigation Measures

Based on the studies completed to date, Caltrans intends to incorporate noise abatement minimization measures in the form of barriers at:

- Soundwall SW-1 would be approximately 73 feet in length and 10 feet in height and would be located within the private property of the single-family residence located at 1179 East Holt Boulevard, along the side and back yard. Calculations based on preliminary design data show that Soundwall SW-1 would reduce noise levels by 7 dBA for 1 receptor and is estimated to cost $43,900.
- Soundwall SW-5C would be approximately 145 feet in length and 8 feet in height and would be located along the property line of the multi-family residence located at 549 Grove Avenue. Calculations based on preliminary design data show that Soundwall SW-5C would reduce noise levels by 9 dBA for 1 receptor and is estimated to cost $65,200.
- Soundwall SW-6 on the eastern property line between the residences on Parkside Avenue and Grove Avenue, with length and average height of 1,243 and 12 feet, respectively. Calculations based on preliminary design data show that the barriers would reduce noise levels by up to 9 dBA for 20 residences at a cost of $722,400.
- Soundwall SW-7 on the western and southern property lines between the mobile homes at the Star Trailer Park community at 1212 East Nocta Street and Grove Avenue, with length and average height of 332 and 8 feet, respectively. Calculations based on preliminary design data show that the barriers would reduce noise levels by up to 8 dBA for 12 receptors at a cost of $148,600.
- Soundwall SW-8 on the western property line between the residences at 250 North Grove Avenue along the east side of Grove Avenue, with length and average height of 270 and 8 feet, respectively. Calculations based on preliminary design data show that the barriers would reduce noise levels by 10 dBA for 3 receptors at a cost of $125,000.
- Soundwall SW-9 on the western property line between the residences and Grove Avenue, with length and average height of 264 and 8 feet, respectively.

Calculations based on preliminary design data show that the barriers would reduce noise levels by up to 11 dBA for 3 receptors at a cost of $110,400.

- Soundwall SW-11 on the western property line between the residences on Flora Street and east of Grove Avenue, with length and average height of 356 and 8 feet, respectively. Calculations based on preliminary design data show that the barriers would reduce noise levels by up to 11 dBA for 5 receptors at a cost of $159,200.
- Soundwall SW-12 on the western property lines between the residences on the west side of Alameda Avenue and east of Grove Avenue, with length and average height of 1,042 and 8 feet, respectively. Calculations based on preliminary design data show that the barriers would reduce noise levels by up to 10 dBA for 15 receptors at a cost of $484,400.

Minimization Measure N-1, which is related to soundwall construction, may change based on input received from the public. If, during final design, conditions have substantially changed, noise abatement may not be necessary. The final decision on noise abatement will be made upon completion of the project design.

For the Build Alternative, Soundwalls SW-1 through SW-12 (including SW-5A, SW-5B, and SW-5C) were evaluated on private property lines in the proposed project corridor, which was the optimum location for breaking the line of site between Grove Avenue and impacted receiver locations. All 15 soundwalls were evaluated in 2-foot increments ranging in height from 6 to 16 feet for feasibility. The results of the soundwall analysis are provided below.

Soundwall SW-1

The future build noise level at Receiver R6, representing a single-family residence, is predicted to be 69 dBA L_{eq}(h). This receiver would experience an estimated 1-dB increase from existing to no-build conditions and a 1-dB increase in noise levels from no-build to build conditions; however, because the predicted build noise level in the design year exceeds 67 dBA L_{eq}(h) for NAC Activity Category B, noise abatement was evaluated.

Soundwall SW-1 was evaluated for Receiver R6, representing one single-family residence. This residence has driveway access via E. Holt Boulevard; therefore, Soundwall SW-1 was placed on the eastern and northern property lines between the residence and Grove Avenue. Soundwall SW-1 was found to be feasible and break the line of sight of an 11.5-foot-high truck exhaust stack at a minimum height of 10 feet. The total cost allowance for this soundwall, calculated in accordance with the Caltrans

Traffic Noise Analysis Protocol, is $92,000. The current estimated cost is $43,900; therefore, the soundwall would be reasonable.

Soundwall SW-2

The estimated future build noise level for Receiver R7 is expected to be 68 dBA L_{eq}(h) in the design-year. There is a 1-dB increase from existing to no-build conditions and no estimated increase in noise levels from no-build to build conditions; however, because the predicted noise level in the design-year exceeds 67 dBA L_{eq}(h) for NAC Activity Category B, traffic noise impacts are predicted at this receiver, and noise abatement was evaluated.

Soundwall SW-2 was evaluated for Receiver R7, representing two single-family residences. These residences have driveway access via E. Nocta Street; therefore, Soundwall SW-2 was placed on the eastern and southern property lines between the residences and Grove Avenue. At a maximum height of 16 feet, Soundwall SW-2 provides feasible noise reduction of 5 dB, but it would not achieve the Caltrans acoustical design goal of 7-dB noise reduction for at least one benefited receptor; therefore, the soundwall would not be feasible.

Soundwall SW-3

Build noise levels at Receiver R8 are predicted to be 67 dBA L_{eq}(h). Build noise levels are expected to increase by 2 dB from existing conditions and no increase in noise levels from no-build to build conditions. Predicted noise levels in the design-year meets the 67 dBA L_{eq}(h) for NAC Activity Category B; therefore, noise abatement was evaluated.

Soundwall SW-3 was evaluated for Receiver R8, representing seven single-family residences. Soundwall SW-3 was placed on the eastern property lines between the residential homes and Grove Avenue. Soundwall SW-3 would not provide feasible noise reduction of at least 5 dB at any evaluated height; therefore, the soundwall would not be feasible.

Soundwall SW-4

Noise modeling results indicate that future build noise levels experienced at Receiver R12 are predicted to be 71 dBA L_{eq}(h). No-build noise levels are expected to increase by 1 dB from existing conditions and a 1-dB increase in noise levels from no-build to build conditions. The predicted noise level in the design-year build condition exceeds 67 dBA L_{eq}(h) for NAC Activity Category B; therefore, noise abatement was evaluated.

Soundwall SW-4 was evaluated for Receiver R12, representing a single-family residence. Soundwall SW-4 was placed to the maximum extent of the eastern and southern property lines without restricting driveway access. Soundwall SW-4 was found to be feasible at a minimum height of 6 feet. To meet the Caltrans acoustical design goal of a 7-dB reduction to break the line of sight of an 11.5-foot-high truck exhaust stack, Soundwall SW-4 is required to be at a minimum height of 10 feet. The total cost allowance for this soundwall, calculated in accordance with the Caltrans Traffic Noise Analysis Protocol, is $92,000. The current estimated cost is $71,300; therefore, the soundwall would be reasonable. However, Soundwall SW-4 was found to be infeasible due to nonacoustical factors related to the City of Ontario Development and Subdivision Regulations. These regulations state that the maximum height of a fence on a front property line is 3 feet, and a 6-foot-tall fence may be constructed, provided it is set back 5 feet from the property line and at least 90 percent of the vertical surface above 3 feet is non-view-obstructing.

Soundwall SW-5

The traffic noise modeling results indicate that build noise levels at Receivers R13, R13A, and R13B are predicted to range from 61 dBA to 73 dBA L_{eq}(h). Noise levels from existing to no-build conditions would increase by a maximum of 2 dB, and noise levels from no-build to build conditions would not increase. The predicted noise level at Receiver R13A during the design-year exceeds 67 dBA L_{eq}(h) for NAC Activity Category B; therefore, noise abatement was evaluated.

Soundwall SW-5 was evaluated for Receiver R13A, representing one of the single-family residences. Soundwall SW-5 was placed on the northern and eastern property lines of two residential properties at Receivers R13A and R13B. Soundwall SW-5 was found to be feasible at a minimum height of 6 feet. To meet the Caltrans acoustical design goal of a 7-dB reduction at one or more benefited receptors and to break the line of sight of an 11.5-foot-high truck exhaust stack, Soundwall SW-5 is required to be at a minimum height of 10 feet. The total cost allowance for this soundwall, calculated in accordance with the Caltrans Traffic Noise Analysis Protocol, is $184,000. The current estimated cost is $95,700; therefore, the soundwall would be reasonable. However, Soundwall SW-5 was found to be infeasible due to nonacoustical factors related to the City of Ontario Development and Subdivision Regulations. These state that the maximum height of a fence on a front property line is 3 feet, and a 6-foot-tall fence may be constructed, provided it is set back 5 feet from the property line and at least 90 percent of the vertical surface above 3 feet is non-view-obstructing.

Soundwall SW-5A

Noise modeling results indicate that design-year build noise levels at Receivers R17-1, R17-2, and R17A are predicted to range from 64 to 72 dBA L_{eq}(h). Noise levels from existing to no-build conditions are predicted to increase by a maximum of 2 dB, while noise levels from no-build to build conditions are not expected to increase. The predicted noise levels for the design-year with-project conditions exceed the 67 dBA L_{eq}(h) NAC for Activity Category B at Receivers R17-2 and R17A; therefore, noise abatement must be evaluated.

Soundwall SW-5A was evaluated along the property line of the six multi-family residences represented by Receivers R17-1, R17-2, and R17A and would be located west of Grove Avenue. This soundwall would provide feasible noise reduction for the frequent outdoor human use areas represented by Receivers R17-2 and R17A at minimum heights of 16 and 14 feet, respectively. However, Soundwall SW-5A would not achieve the Caltrans acoustical design goal of at least 7 dB of noise reduction for at least one benefited receptor; therefore, the soundwall would not be feasible.

Soundwall SW-5B

Noise modeling results indicate the future build noise level at Receiver R19A, which represents one multi-family residence, is predicted to be 73 dBA L_{eq}(h). The noise level from existing to no-build conditions is predicted to increase by 2 dB at Receiver R19A; however, there is no difference in predicted noise level between the no-build and build conditions. Because the predicted worst-hour traffic noise level exceeds the 67-dBA L_{eq}(h) NAC for this Activity Category B land use, consideration of noise abatement is required.

Soundwall SW-5B would provide feasible noise reduction for the multi-family residence represented by Receiver R19A. This soundwall would be placed at the eastern property line of the property. Soundwall SW-5B would provide feasible noise reduction and achieve the Caltrans acoustical design goal of at least 7 dB of noise reduction at a minimum height of 6 feet; however, to break the line-of-sight to an 11.5-foot-high truck exhaust stack, the height of Soundwall SW-5B would need to be increased to 10 feet. The total cost allowance for this soundwall, calculated in accordance with the Caltrans Traffic Noise Analysis Protocol, is $92,000. The current estimated cost is $97,600. Therefore, the soundwall would not be reasonable.

Soundwall SW-5C

The design-year build traffic noise level at Receiver R19 is predicted to be 73 dBA L_{eq}(h). The worst-hour exterior noise level from existing to no-build conditions is

predicted to increase by 2 dB, and the noise level from no-build to build conditions is predicted not to increase. Predicted traffic noise levels exceed the 67-dBA L_{eq}(h) NAC at Receiver R19, which is an Activity Category B land use; therefore, noise abatement must be considered.

Soundwall SW-5C would provide feasible noise reduction for the formalized outdoor activity area of the multi-family residence represented by Receiver R19. This soundwall would be located on the eastern property line of the property at Receiver R19. Soundwall SW-5C would provide feasible noise reduction and achieve the Caltrans acoustical design goal of at least 7 dB of noise reduction at a minimum height of 6 feet. However, to break the line-of-sight to an 11.5-foot-high truck exhaust stack, the height of Soundwall SW-5C would need to be increased to 8 feet. The total cost allowance for this soundwall, calculated in accordance with the Caltrans Traffic Noise Analysis Protocol, is $92,000. The current estimated cost is $65,200; therefore, the soundwall would be reasonable.

Soundwall SW-6

Noise modeling results indicate that design-year build noise levels at Receivers R23 through R28A are predicted to range from 59 dBA to 74 dBA L_{eq}(h). Noise levels from existing to no-build conditions would increase by up to 3 dB, and noise levels from no-build to build conditions would increase by 2 dB. The predicted noise level in the design-year approaches or exceeds 67 dBA L_{eq}(h) for NAC Activity Category B; therefore, noise abatement was evaluated.

Soundwall SW-6 was evaluated for Receivers R23 to R28, representing 25 single-family residences. Soundwall SW-6 was placed on the eastern property lines between the residences and Grove Avenue. Soundwall SW-6 was found to be feasible and break the line of sight of an 11.5-foot-high truck exhaust stack at a minimum height of 8 feet. To meet the Caltrans acoustical design goal of a 7-dB reduction, Soundwall SW-6 is required to be at a minimum height of 12 feet in front of the residences represented by Receivers R26 and R27. It is not possible to provide feasible noise reduction for the single-family residence represented by Receiver R28 at any height analyzed. The total cost allowance for this soundwall, calculated in accordance with the Caltrans Traffic Noise Analysis Protocol, is $1,840,000. The current estimated cost of a 12-foot-tall wall is $722,400; therefore, the soundwall would be reasonable.

Soundwall SW-7

Noise modeling results indicate that design-year build noise levels at Receivers R37 and R40A are predicted to range from 58 dBA to 70 dBA L_{eq}(h). Noise levels from

existing to no-build conditions would increase by up to 4 dB, and noise levels from no-build to build conditions would increase by up to 2 dB. Predicted noise levels in the design-year exceed 67 dBA L_{eq}(h) for NAC Activity Category B; therefore, noise abatement was evaluated.

Soundwall SW-7 was evaluated for Receivers R37, R38, and R40, representing 12 mobile homes within the Star Trailer Park community. Soundwall SW-7 was placed on the western and southern property lines between the mobile homes and Grove Avenue. To meet the Caltrans acoustical design goal of a 7-dB reduction and to break the line of sight of an 11.5-foot-high truck exhaust stack, Soundwall SW-7 is required to be at a minimum height of 8 feet. The total cost allowance for this soundwall, calculated in accordance with the Caltrans Traffic Noise Analysis Protocol, is $1,104,000. The current estimated cost is $148,600; therefore, the soundwall would be reasonable.

Soundwall SW-8

Noise modeling results indicate that design-year build noise levels at Receiver R42 are predicted to be 72 dBA L_{eq}(h). No-build noise levels are expected to increase by 1 dB from existing conditions. There is an estimated 7-dB increase in noise levels from no-build to build conditions. The predicted noise level in the design year exceeds 67 dBA L_{eq}(h) for NAC Activity Category B; therefore, noise abatement was evaluated.

Soundwall SW-8 was evaluated for Receiver R42, representing three multi-family residences. The soundwall would also provide some benefit to Receiver R41. Soundwall SW-8 was placed on the western property line between the residences and Grove Avenue. Soundwall SW-8 was found to be feasible at a minimum height of 6 feet. To meet the Caltrans acoustical design goal of a 7-dB reduction, Soundwall SW-8 is required to be at a minimum height of 8 feet. The total cost allowance for this soundwall, calculated in accordance with the Caltrans Traffic Noise Analysis Protocol, is $276,000. The current estimated cost is $125,000; therefore, the soundwall would be reasonable.

Soundwall SW-9

The traffic noise modeling results indicate that design-year build noise levels at Receivers R43 and R44A are predicted to range from 57 dBA to 73 dBA L_{eq}(h). Noise levels from existing to no-build conditions would increase up to 1 dB, and noise levels from no-build to build conditions would increase up to 8 dB. Predicted noise levels in the design year exceed 67 dBA L_{eq}(h) for NAC Activity Category B; therefore, noise abatement was evaluated.

Soundwall SW-9 was evaluated for Receiver R43, representing three multi-family residences. Soundwall SW-9 was placed on the western property line between the residences and Grove Avenue. Soundwall SW-9 was found to be feasible at a minimum height of 6 feet. To meet the Caltrans acoustical design goal of a 7-dB reduction, Soundwall SW-9 is required to be at a minimum height of 8 feet. Analysis results indicate that Soundwall SW-9 would not provide feasible noise reduction at impacted Receiver R44, even at the maximum height of 14 feet. The total cost allowance for this soundwall, calculated in accordance with the Caltrans Traffic Noise Analysis Protocol, is $276,000. The current estimated cost is $110,400; therefore, the soundwall would be reasonable.

Soundwall SW-10

The traffic noise modeling results indicate that design-year build noise levels at Receivers R45 through R46A are predicted to range from 60 dBA to 72 dBA L_{eq}(h). Noise levels from existing to no-build conditions would increase up to 2 dB, and noise levels from no-build to build conditions would increase up to 5 dB. Predicted noise levels in the design year exceed 67 dBA $L_{eq(h)}$ for NAC Activity Category B; therefore, noise abatement was evaluated.

Soundwall SW-10 was evaluated for Receiver R46, representing a single-family residence. Soundwall SW-10 was placed on the western and northern property lines between the residence and Grove Avenue. Although Soundwall SW-10 would provide feasible noise reduction at a minimum height of 6 feet, a height of 12 feet is needed for Soundwall SW-10 to meet the Caltrans acoustical design goal of a 7-dB reduction. The analysis results indicate that Soundwall SW-10 would not provide feasible noise reduction at impacted Receiver R45, even at the maximum height of 14 feet. The total cost allowance for this soundwall, calculated in accordance with the Caltrans Traffic Noise Analysis Protocol, is $92,000. The current estimated cost is $119,700; therefore, the soundwall would not be reasonable.

Soundwall SW-11

Noise modeling results indicate that design-year noise levels at Receivers R49A and R50 are predicted to be 61 and 70 dBA L_{eq}(h), respectively. No-build noise levels are expected to increase by 3 dB from existing to no-build conditions, and there is an estimated 2-dB increase in noise levels from no-build to build conditions. The predicted noise level in the design year exceeds 67 dBA L_{eq}(h) for NAC Activity Category B; therefore, noise abatement was evaluated.

Soundwall SW-11 was evaluated for Receivers R49A and R50, representing five single-family residences. Soundwall SW-11 was placed on the western property line between the residences and Grove Avenue. Soundwall SW-11 was found to be feasible and meet the Caltrans acoustical design goal of a 7-dB reduction at a minimum height of 6 feet. Soundwall SW-11 breaks the line of sight of an 11.5-foot-high truck exhaust stack at a minimum height of 8 feet. The total cost allowance for this soundwall, calculated in accordance with the Caltrans Traffic Noise Analysis Protocol, is $460,000. The current estimated cost is $159,200; therefore, the soundwall would be reasonable.

Soundwall SW-12

Noise modeling results indicate that design-year build noise levels at Receivers R53 through R56A are predicted to range from 60 dBA to 73 dBA L_{eq}(h). Noise levels from existing to no-build conditions would increase up to 2 dB, and noise levels from no-build to build conditions would increase up to 2 dB. Predicted noise levels in the design year meet or exceed 67 dBA L_{eq}(h) for NAC Activity Category B; therefore, noise abatement was evaluated.

Soundwall SW-12 was evaluated for Receivers R53, R53A, R54, and R55, representing 15 single-family residences. Soundwall SW-12 was placed on the western property lines between the residences and Grove Avenue. Soundwall SW-12 was found to be feasible and meet the Caltrans acoustical design goal of a 7-dB reduction at a minimum height of 8 feet. The total cost allowance for this soundwall, calculated in accordance with the Caltrans Traffic Noise Analysis Protocol, is $1,472,000. The current estimated cost is $484,400. Therefore, the soundwall would be reasonable.

The noise abatement evaluation indicates that feasible soundwalls placed at the modeled locations in the Grove Avenue corridor require heights ranging from 6 to 16 feet. Soundwalls SW-1, SW-4, SW-5, SW-5B, and SW-5C through SW-12 were found to be feasible and meet the Caltrans design criteria at heights ranging from 6 to 16 feet. Soundwalls SW-2, SW-3, and SW-5A do not meet the Caltrans acoustical design goal at any evaluated height. Soundwalls SW-1, SW-5C, SW-6, SW-7, SW-8, SW-9, SW-11, and SW-12 were found to be both feasible and reasonable.

The design of the feasible soundwalls presented in the NSR that meet the Caltrans design goal are preliminary and have been conducted at a level appropriate for environmental review and not for the final design of the project. Preliminary information on the physical location, length, and height of soundwalls is provided in the NSR. If pertinent parameters change substantially during the final design,

preliminary soundwall designs may be modified or eliminated from the final project. A final decision on the construction of noise abatement will be made upon completion of the project design.

The following noise abatement minimization measure would apply to the project:

N-1: Based on the studies completed, Caltrans and the City will incorporate noise abatement in the form of soundwalls that meet the criteria for reasonableness and feasibility. The recommended soundwalls would reduce the traffic noise by at least 5 dB at the impacted receivers, would meet the design goal by providing a 7-dB reduction for at least one receiver, and would cost less than the reasonable cost allowance. If, during final design, conditions have substantially changed, noise abatement may change or not be necessary, depending on the results of the updated noise analysis using final design information. The final decision of the noise abatement will be made upon completion of the project design and the public involvement process.

During circulation of the draft environmental document, soundwall surveys will be conducted with all property owners and residents of benefited receptors located with the footprint of the Build Alternative. If more than 50 percent of the responding benefited receptors oppose the soundwall, then the soundwall will not be constructed.

Construction Noise Abatement

There are many measures that can be taken to minimize noise intrusion without placing unreasonable constraints on the construction process or substantially increasing costs. The following are possible control measures that can be implemented under standard condition SC-CI-23 to minimize noise disturbances at sensitive areas during construction:

- All equipment shall have sound-control devices no less effective than those provided on the original equipment. Each internal combustion engine used for any purpose on the job or related to the job shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the jobsite without an appropriate muffler.
- Construction methods or equipment that will provide the lowest level of noise impact (e.g., avoid impact pile driving near residences and consider alternative methods that are also suitable for the soil condition) shall be used.

- Idling equipment shall be turned off.
- Truck loading, unloading, and hauling operations shall be restricted so that noise and vibration are kept to a minimum through residential neighborhoods to the greatest possible extent.
- Construction activities shall be coordinated to build recommended permanent soundwalls during the first phase of construction to protect sensitive receivers from subsequent construction noise, dust, light, glare, and other impacts, to the extent feasible.
- Temporary noise barriers shall be used and relocated, as needed, to protect sensitive receivers against excessive noise from construction activities involving large equipment and by small items such as compressors, generators, pneumatic tools, and jackhammers. Noise barriers can be made of heavy plywood, moveable insulated sound blankets, or other best available control techniques.
- Newer equipment with improved noise muffling shall be used, and all equipment items shall have the manufacturers' recommended noise abatement measures (e.g., mufflers, engine covers, and engine vibration isolators) intact and operational. Newer equipment will generally be quieter in operation than older equipment. All construction equipment shall be inspected at periodic intervals to ensure proper maintenance and presence of noise-control devices (e.g., mufflers and shrouding).
- Construction activities shall be minimized in residential areas during evening, nighttime, weekend, and holiday periods. Noise impacts are typically minimized when construction activities are performed during daytime hours; however, nighttime construction may be desirable (e.g., in commercial areas where businesses may be disrupted during daytime hours) or necessary to avoid major traffic disruption. Coordination with the City shall occur before construction can be performed in noise-sensitive areas.
- Construction laydown or staging areas shall be selected in industrially zoned districts. If industrially zoned areas are not available, commercially zoned areas may be used, or locations that are at least 100 feet from any noise-sensitive land use (e.g., residences).
- Contractor shall prepare a Noise and Vibration Monitoring and Mitigation Plan by a qualified Acoustical Engineer and submit it for approval. The Plan must outline noise and vibration monitoring procedures at predetermined noise- and vibration-sensitive sites, as well as historic properties. The Plan also must

include calculated noise and vibration levels for various construction phases and mitigation measures that may be needed to meet the project specifications. The Contractor shall not start any construction work or operate any noise-generating construction equipment at the construction site before approval of the Plan. The Plan must be updated every 3 months or sooner if there are any changes to the construction activities.

Certain construction activities could cause intermittent localized concern from vibration in the project area. Processes such as earth moving with bulldozers, the use of vibratory compaction rollers, impact pile driving, demolitions, or pavement braking may cause construction-related vibration impacts such as human annoyance or, in some cases, building damage. There are cases where it may be necessary to use this type of equipment near residential buildings. The following are procedures that can be used to minimize the potential impacts from construction vibration:

- Restrict the hours of vibration-intensive equipment or activities, such as vibratory rollers, so that impacts to residents are minimal (e.g., weekdays during daytime hours only when as many residents as possible are away from home).
- The owner of a building close enough to a construction vibration source that damage to that structure due to vibration is possible would be entitled to a preconstruction building inspection to document the preconstruction condition of that structure.
- Conduct vibration monitoring during vibration-intensive activities.

A combination of the mitigation techniques for equipment vibration control, as well as administrative measures, when properly implemented, can be selected to provide the most effective means to minimize the effects of construction activity. Application of these measures as standard condition SC-CI-24 will reduce the construction impacts; however, temporary increases in vibration may occur at some locations.

2.2.8 Energy

Energy is consumed during construction and operation of transportation projects. This section provides an assessment of the potential impacts of the proposed project on transportation-related energy consumption in the study corridor. The analysis considers direct (operational) and indirect (construction and maintenance) energy requirements.

2.2.8.1 Regulatory Setting

NEPA (42 U.S.C. Part 4332) requires the identification of all potentially significant impacts to the environment, including energy impacts.

CEQA Guidelines, Appendix F, Energy Conservation, state that EIRs are required to include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy.

2.2.8.2 Affected Environment

The California Energy Commission (CEC) is California's primary energy policy and planning agency. SCAG's responsibilities include tracking and forecasting energy use in southern California. An Energy Working Group, as part of SCAG's Energy Planning Program, assists in developing energy policies consistent with the adopted plans, such as the RTP and the RCP and Guide. Over the past 50 years, energy supplies in southern California have sufficiently served the rapid growth in population and development (SCAG, 2008).

Energy resources for transportation include petroleum, natural gas, liquefied petroleum gas electricity, hydrogen, and biofuel. Transportation is the single largest contributor to California's GHG emissions, producing approximately 39 percent of the state's total emissions in 2009. In addition, Californians consumed more than 18 billion gallons of gasoline and diesel fuel in 2010, resulting in the estimated emission of more than 200 million metric tons of GHG equivalence. California has long been regulating the criteria pollutants from automobiles. The State adopted stringent tailpipe emission standards as early as 1996 and in 1971 adopted nitrogen oxides (NO_X) standards, both the first such standards in the nation. The California Smog Check Program, which assured the effectiveness of vehicle emission control systems, went into effect in 1984. In 1992, California began the first phase of reformulated clean-burning gasoline, and in 1993, the State enacted new standards for cleaner diesel fuel. However, reducing GHG emissions is a new, more difficult challenge for a state so heavily dependent on automobiles.

Currently, California's gas and diesel markets are characterized by increasing demands, tight supplies, and volatile supplies. California imports more than 50 percent of its crude oil and more than 15 percent of its refined products. Demand for gasoline and diesel is projected to increase in California by 1 to 2 percent each year as a growing population registers more vehicles and drives more miles. California is the third largest consumer of transportation fuels in the world (behind the United States as a whole and China); almost 16 billion gallons of gasoline and more than 4 billion gallons of diesel fuels are consumed each year. California would like to improve efficiency of the transportation fuel; however, federal law has prohibited states from setting the minimum number of miles per gallon (mpg) that new cars and light trucks must achieve. In 2003, the CEC and ARB reviewed the technical and economic aspects of a major reduction in the petroleum dependence of California's transportation sector. Based on this research, in 2005, Governor Schwarzenegger appealed to the United States House of Representatives "to establish new fuel economy standards that double the fuel efficiency of new cars, light trucks and SUVs." In June 2007, the United States Senate voted to raise the fuel efficiency standards for cars to 35 mpg by 2020. The proposed 35-mpg standard pales in comparison with Japan's current standard of 45 mpg and Europe's more than 50 mpg standard by 2012.

California's population is estimated to exceed 44 million by 2020, which would result in substantial increases in transportation fuel demand for the State. Table 2.2.8-1 indicates a projected 149 million-barrel increase in transportation fuel demand from 2005 by the year 2020.

Table 2.2.8-1. California Transportation Fuel Demand

Year	Demand Level Range (Million Barrels per Year)	Daily Energy Consumption (Billions BTU)
2005	553	8,787
2010	580-617	9,804
2015	608-661	10,504
2020	638-702	11,155
Values derived from Figure 7-5 in 2007 IEPR (CEC, 2007).		

Source: CEC, 2007.

The CEC-proposed energy needs are measured in petroleum and equivalent British Thermal Units (BTU). A BTU is the quantity of heat required to raise the temperature of water 1 degree Fahrenheit (°F) at sea level. Other units of energy can be converted into equivalent BTU units, and BTU is used as the basis for comparing energy consumption associated with different resources. Table 2.2.8-2 shows comparisons of types of energy and their equivalent BTU units.

Table 2.2.8-2. Energy Value (BTU) of Various Energy Sources

Energy Source	Measurement Unit	Equivalent BTU[a]
Electricals	Kilowatt-hour	3,412
Natural Gas	Cubic Feet	1,034
Petroleum (Crude Oil)	Barrel (42 Gallons)	5,800,000
Gasoline	Gallon	125,000
[a] One BTU is the quantity of energy necessary to raise the temperature of one pound of water by 1 °F		

Source: CEC, 2007.

Transportation sector energy consumption reflects the types and numbers of vehicles, the extent of their use (i.e., VMT), and their fuel economy (i.e., mpg). Implementation of the proposed project would allow capacity in the project corridor, thereby facilitating improved efficiency in energy use. Changes in VMT would affect traffic fuel and energy consumption. VMT and vehicle hours traveled (VHT) are also important in determining the demand for infrastructure improvements. Urban growth patterns have caused California's VMT to increase at a rate of more than 3 percent per year between 1975 and 2004. In 2005, SCAG data showed automobile VMT in California at 372 million, which is equivalent to 2.14 trillion BTUs or approximately 369,000 barrels of oil.

2.2.8.3 Environmental Consequences

Based on CEQA Guidelines, Appendix F, energy impacts would be considered significant if implementation of the proposed project would result in:

- Wasteful, inefficient, and unnecessary usage of energy; or
- Placing a significant demand on regional energy supply or requirement for substantial additional capacity.

Energy consumption includes direct and indirect energy use. Direct use is the energy consumed in the actual propulsion of the vehicles traveling within the project corridor. Indirect use includes the energy consumed for project construction and maintenance activities. The impact of the proposed project in context of the countywide travel is too small to demonstrate energy impacts quantitatively; therefore, a qualitative energy analysis was conducted.

No Build Alternative

Under the No Build Alternative, fuel consumption by motor vehicle traffic would change as vehicle traffic volumes, driving speed, and the vehicle type changes year by year. Fuel efficiency would decrease due to projected future growth as more vehicles

would be traveling with reduced average speeds on an increasingly congested roadway. There would be no construction activities except for regular maintenance operations.

Build Alternative (Proposed Project)

The proposed project would not affect traffic volume or traffic mix, and it would not affect the diesel truck percentage along the project corridor. The project traffic study indicates that currently the project corridor traffic is not significantly affected by the delays at the intersections (see Table 2.2.8-3); however, traffic flow would continue deteriorating in the future with the No Build Alternative. The proposed addition of a new traffic lane on each side of Grove Avenue, within the proposed limits, would relieve traffic congestion along the project corridor. Furthermore, as a result of the project, LOS at intersections would improve, and delay due to traffic congestions at the project intersections would be greatly reduced. The effects would translate into more efficient energy consumption for the proposed Build Alternative compared to the No Build Alternative.

Table 2.2.8-3. Comparison of Traffic LOS for Existing and Future Build Years 2025 and 2045

Grove Avenue Segments and Intersections	Peak Hour LOS (AM/PM)		
	Existing	2025	2045
No Build			
Grove Avenue/4th Street	D/C	D/E	D/F
Grove Avenue/I Street	A/A	A/A	A/A
Grove Avenue/G Street	A/A	A/A	B/C
Grove Avenue/D Street	A/A	A/A	B/B
Grove Avenue/Holt Boulevard	C/C	F/F	F/F
Grove Avenue/State Street-Airport Drive	C/C	C/C	F/F
Build Alternative			
Grove Avenue/4th Street	--	D/**D**	D/**D**
Grove Avenue/I Street	--	A/A	A/A
Grove Avenue/G Street	--	A/A	B/**B**
Grove Avenue/D Street	--	A/A	**A/A**
Grove Avenue/Holt Boulevard	--	**D/D**	**E/E**
Grove Avenue/State Street-Airport Drive	--	C/C	**D/E**
Improved LOS is shown in **bold**.			

Source: Iteris, 2015.

Maintenance of the Build Alternative can potentially generate indirect energy impacts within the proposed project corridor; however, operation of the Build Alternative

would translate into more efficient energy consumption and higher energy savings for the project corridor. These high energy savings from operation of the Build Alternative would offset the potential indirect energy impacts generated from maintenance of the improved facility.

Furthermore, it should be noted that while the No Build Alternative does not require immediate consumption of energy for construction activities, it may use larger quantities of energy in the future as traffic worsens; as such, savings in operational energy requirements would more than offset construction energy requirements, and thus, in the long term, result in a new savings in energy usage.

When balancing energy used during construction and operation against energy saved by relieving congestion and other transportation efficiencies, the project would not have substantial energy impacts.

2.2.8.4 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, or mitigation measures are required; however, as discussed in Section 3.5.1.6, GHG Reduction Strategies, several measures will be included in the proposed project to reduce GHG emissions. A few of these GHG measures will also aid in reducing energy consumption for the Build Alternative. These measures include the following:

1. **Use of Reclaimed Water:** Use of reclaimed water helps conserve energy, which reduces GHG emissions from electricity production.
2. **Lighting:** Use of energy-efficient lighting, such as light-emitting diode (LED) traffic signals.
3. **Idling Restrictions:** Turning off the engines of trucks and construction equipment when not in use will assist in conserving energy during construction.

In addition to the measures listed above, the following measure will also be included to further conserve energy usage from the proposed project:

- The solicitation for construction bids shall include language requiring the use of energy and fuel-efficient fleets and zero-emission technologies for vehicles where possible.

2.3 Biological Environment

The analysis of potential impacts of the Grove Avenue Corridor Project on the biological environment is based on the *Natural Environment Study (Minimal Impacts)* (September 2016) prepared for this project.

2.3.1 Natural Communities

This section of the document discusses natural communities of concern. The focus of this section is on biological communities, not individual plant or animal species. This section also includes information on wildlife corridors and habitat fragmentation. Wildlife corridors are areas of habitat used by wildlife for seasonal or daily migration. Habitat fragmentation involves the potential for dividing sensitive habitat and thereby lessening its biological value.

Habitat areas that have been designated as critical habitat under the Federal Endangered Species Act (FESA) are discussed below in Section 2.3.5, Threatened and Endangered Species. Wetlands and other waters are also discussed below in Section 2.3.2, Wetlands and Other Waters.

2.3.1.1 Affected Environment

Biological Study Area

The Biological Study Area (BSA) for the project is located along an approximately 116.27-acre study area along Grove Avenue in Ontario. The BSA consists of Caltrans ROW, anticipated TCEs, proposed construction staging areas (CSAs), and areas within a 50-foot-wide buffer immediately adjacent to the ROW and CSAs. The BSA includes all areas anticipated to be disturbed during construction of the proposed project.

The BSA consists of entirely developed land. Vegetation within the BSA is limited to non-native ornamental landscaping for existing roads, homes, and parks, in addition to non-native ruderal (weedy) elements within vacant locks. Surveyed trees within the BSA that overlap with the parkway are, at a minimum, 10 feet tall; therefore, these trees qualify as parkway trees under the City's Municipal Code Sections 10-2 *et seq*. A total of 484 trees occur within the BSA. All trees with a minimum trunk diameter of 4 inches were surveyed within the BSA permanent impact area. All trees were noted for their species, size (trunk diameter at breast height in inches), crown radius (in feet), and general health and vigor.

Natural Communities of Special Concern

As identified in the California Natural Diversity Database (CNDDB) and summarized in Table 2.3.1-1, no sensitive natural communities, one special-status plant species, and three special-status animal species have been reported within 1.0 mile of the BSA between the years 1905 and 2001. Based on the current developed condition and lack of suitable habitat within the BSA, regional species of concern are not likely to occur within the BSA.

Table 2.3.1-1. Regional Species of Concern

Scientific Name	Common Name	Status	Species Present/ Absent
Plants			
Uneatekelia cuneata var. puberula	Mesa Horkelia	--/-- CRPR 1B.1	Absent
Wildlife			
Rhaphiomidas terminates abdominalis	Delhi Sands Flower-loving Fly	FE/--	Absent
Anniella pulchra pulchra	Silvery Legless Lizard	--/SSC	Absent
Antrozous pallidus	Pallid bat	--/SSC	Absent

FE: Federally Endangered
CRPR 1B.1: California Rare Plant Rank listing designates plants that are rare, with most of them endemic to California, that present populations throughout their range, are seriously threatened in California (more than 80 percent of occurrences threatened/high degree and immediacy of threat).
SSC: Species of Special Concern
These designations are to be considered during the State and federal environmental review process, as applicable (e.g., CEQA [PRC Section 21000 *et seq*.] and NEPA [50 CFR 402.12]).

Habitat Connectivity

Habitat connectivity is established when there is a wildlife movement corridor that connects two blocks of native habitat. A wildlife corridor between such habitats functions to allow genetic interchange between populations. Movement corridors allow dispersal of young and allow animals to flee one patch of habitat in the event of a fire or other large-scale disturbance. Viable connections between habitat areas act as a linkage between those habitats contained in each connected habitat, effectively expanding the usable areas for wildlife that use both the habitats and the corridors connecting them. Wildlife movement connections between these features are generally limited by urbanization.

With that being considered, it should be mentioned that there are some wildlife species that are well adapted to urban environments and will thrive among residential and

commercial developments. Most of the species that are commonly observed in urban environments do not have specific movement corridor requirements, instead using nonspecific movement patterns across these urban areas.

The BSA is situated within a transportation corridor and highly urbanized area that provides no connectivity of habitat in the region.

2.3.1.2 Environmental Consequences

The City has not established significance thresholds for use in evaluating the proposed project's natural community impacts; therefore, the thresholds presented in Appendix G of the CEQA Guidelines are used. The guidelines suggest that a project-related significant impact would occur if the project would:

- 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 CDFW or United States Fish and Wildlife Service (USFWS).
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by CDFW or USFWS.
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

An evaluation of potential impacts to natural communities associated with each alternative is presented below.

No Build Alternative

The No Build Alternative does not propose any construction or other disturbance in the BSA; therefore, this alternative would not result in permanent impacts to natural communities.

Build Alternative (Proposed Project)

Project implementation would result in no impacts to sensitive habitats or natural communities.

The project would result in permanent unavoidable impacts to approximately 174 trees. Permanent impacts were determined if at least 50 percent of the tree occurred within

the permanent impact area. This number includes tree trimming, as well as tree removals.

No special-status plants or wildlife have potential to occur within the BSA due to lack of suitable habitat.

Implementation of the Build Alternative would not conflict with the provisions of any habitat conservation plan or local biological resource protection ordinances.

Given the high level of existing development within the BSA and minimal opportunity for regional wildlife movement, no permanent impacts to wildlife movement are anticipated to result.

2.3.1.3 Avoidance, Minimization, and/or Mitigation Measures

Although avoidance, minimization, or compensatory mitigation is not required, the following minimization measure is proposed to reduce impacts:

NC-1: The project shall preserve as many mature trees as practicable. Although there is no City or County ordinance for tree removal, the project's landscape plan will incorporate a tree replacement plan with a replacement ratio of 2:1 – for every mature tree removed, two trees will be planted to be consistent with Measure VA-2. Mature trees (larger than 20 feet high) that are to be removed shall be replaced with two 24-inch box trees. Design plans shall indicate locations of existing mature trees (larger than 20 feet high) to be preserved in place. Tree replacement shall meet all Caltrans and City standards and policies, and near John Galvin Park, the replacement tree species will incorporate species that have been identified as those of the original planting of John Galvin Park in the 1930s.

2.3.2 Wetlands and Other Waters

2.3.2.1 Regulatory Setting

Clean Water Act: Section 404

Wetlands and other waters are protected under several laws and regulations. At the federal level, the Federal Water Pollution Control Act, more commonly referred to as the CWA (33 U.S.C. 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. 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 USACE with oversight by EPA.

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 EPA's Section 404(b)(1) Guidelines (40 CFR Part 230), and whether permit approval is in the public interest. The Section 404 (b)(1) Guidelines (Guidelines) were developed by EPA in conjunction with 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 USACE may not issue a permit if there is an 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 Alternative Finding must be made.

At the State level, wetlands and waters are regulated primarily by the SWRCB, the RWQCBs, and 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 CFG 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 USACE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from 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 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 2.2.2, Water Quality and Stormwater Runoff, for more details

California Fish and Game Code: Section 1602

CFG Code Section 1602 requires any person, state, or local government agency, or public utility proposing a project that may affect a river, stream, or lake to notify CDFW before beginning the project. If activities will result in the diversion or obstruction of the natural flow of a stream; substantially alter its bed, channel, or bank; impact riparian vegetation; or adversely affect existing fish and wildlife resources, then a Streambed Alteration Agreement is required.

A Streambed Alteration Agreement lists the CDFW conditions of approval relative to the project, and it serves as an agreement between an applicant and CDFW for a term

of not more than 5 years for the performance of activities subject to this section. A CDFW Streambed Alteration Notification is required for all activities potentially affecting streambeds and/or their associated riparian habitats. Subsequently, implementation of the project may require a 1602 Streambed Alteration Agreement if these areas are determined to be jurisdictional by CDFW. A Streambed Alteration Agreement will be required for potential impacts to drainages within the study area.

2.3.2.2 Affected Environment

This section discusses wetlands and other waters and summarizes the *Jurisdictional Delineation Letter Report* completed in September 2016 and the *Natural Environment Study (Minimal Impacts)* completed in September 2016.

A delineation of jurisdictional waters and wetlands within the BSA was conducted in accordance with regulation set forth in 33 CFR Part 328 and the USACE guidance documents as referenced in the *Jurisdictional Delineation Letter Report* (September 2016) and *Natural Environment Study (Minimal Impacts)* (September 2016).

Jurisdictional Delineation Methodology

Prior to conducting the field delineation for potential jurisdictional Waters of the U.S. (including wetlands), all available biological reports, historical land use of the property, local and regional climactic data, and areas with topographical configurations and vegetative signatures occurring within the survey area that may suggest the potential or presence of jurisdictional Waters of the U.S at the time of the field survey were reviewed. The National Hydrography Dataset (USGS, 2015), National Wetlands Inventory (NWI) Interactive Wetlands Mapper (USFWS, 2015), NRCS (2015a, 2015b), Office of Water Programs, Water Quality Planning Tool (CSUS, 2015), and SBCFCD System Facilities (SBCFCD, 2014) were consulted.

A field survey and formal jurisdictional delineation of potentially regulated waters of the U.S and State, including wetlands, within the project study area were conducted on March 26, 2015. All acquired field data were obtained by recording the presence, including extents, types, and boundaries, of potential jurisdictional waters using a handheld global positioning system (GPS) unit. Geographic Information System (GIS) post-processing of the data was conducted for further analysis.

The survey and field reconnaissance determined that the study area did not have potential for the presence of wetlands as defined in 33 CFR 328.3[b], 40 CFR 230.3[t] and USACE guidance documents.

The formal field delineation for field indicators of all potential nonwetland waters of the U.S and the identification of the jurisdictional lateral extent of the ordinary high water mark (OHWM) utilized all relevant guidance, methodologies, and procedural documents. OHWM indicators were used to delineate the lateral jurisdictional extent of potential nonwetland waters of the U.S.

The formal field delineation for field indicators of all potential nonwetland waters of the U.S. yielded approximately 1.76 acres of jurisdictional waters of the U.S. and State in the form of a concrete-lined ephemeral channel for the West Cucamonga Channel, which is a previously permitted and serviceable facility owned and operated by SBCFCD (Table 2.3.2-1).

Table 2.3.2-1. Potential Waters of the U.S. and State occurring within the Study Area

Geomorphic Feature	Type of Habitat	Regulatory Authority	USACE Jurisdiction		
			Non-wetland Waters (acres)	Non-wetland Waters (linear feet)	Wetland Waters Acres (linear feet)
West Cucamonga Channel	Riverine; Intermittent Stream Bed, Temporarily Flooded, Artificial Substrate, Fresh	USACE, CDFW, and RWQCB	1.76	2,031	0.00 (0)
Total			1.76	2,031	0.00 (0)

The West Cucamonga Channel is still representative of riverine features that present a hydrologic regime and have the potential to support aquatic-dependent life and/or aquatic functions in semi-arid environments, albeit related to downstream receiving waters (namely the Prado Flood Control Basin and the Santa Ana River). Therefore, the West Cucamonga Channel is a valuable cement-lined channel with regard to flood control protection. As an abiotic feature that presents no hydroperiod or biological activity, it can be considered to provide low ecological functions. However, the West Cucamonga Channel conveys stormwater into the Prado Flood Control Basin and, in turn, the Santa Ana River. The Prado Flood Control Basin, as a receiving waterbody, supports extensive and important aquatic habitats.

2.3.2.3 Environmental Consequences

The City has not established significance thresholds for use in evaluating the proposed project's wetland impacts; therefore, the thresholds presented in Appendix G of the CEQA Guidelines are used. The guidelines suggest that a project-related significant impact would occur if the project would:

- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (e.g., marsh, vernal pool, coastal) through direct removal, filling, hydrological interruption, or other means.

An evaluation of potential impacts to wetlands associated with each alternative is presented below.

Permanent Impacts

No Build Alternative

The No Build Alternative does not propose any construction or other disturbance in the BSA; therefore, this alternative would not result in permanent impacts to wetlands or other jurisdictional waters.

Build Alternative (Proposed Project)

The Build Alternative would result in no permanent impacts to wetlands or nonwetland waters of the U.S.

Temporary/Construction Impacts

No Build Alternative

The No Build Alternative does not propose any construction or other disturbance in the BSA; therefore, this alternative would not result in temporary impacts to wetlands or other jurisdictional waters.

Build Alternative (Proposed Project)

The Build Alternative would result in approximately 0.46 acre (795 linear feet) of temporary impacts to nonwetland waters of the U.S. as a result of improvements to existing, enclosed box culverts for Grove Avenue (Table 2.3.2-2). Temporary impacts would not result in the permanent loss of jurisdictional acreage or permanent loss of function or value of these areas. The affected jurisdictional features would be restored to their approximate original contours and conditions.

Table 2.3.2-2. Impacts to Nonwetland Waters of the U.S.

Geomorphic Feature Number	Impact Acres (Linear Feet)	
	Temporary	Permanent
West Cucamonga Channel	0.46 (795)	0.00 (0)

2.3.2.4 Avoidance, Minimization, and/or Mitigation Measures

The project has been designed to avoid and minimize impacts to waters of the U.S. and State as practicable. Complete avoidance is not possible due to the need to widen Grove Avenue at the existing West Cucamonga Channel crossing locations. The project would minimize impacts by maintaining the existing drainage course and channel width through culverts. The project would implement BMPs to prevent stormwater runoff, sedimentation, and pollutants from entering the channel during construction. Temporary impact areas would be restored to preconstruction contours and conditions.

The project proposes no permanent impacts to waters of the U.S. or waters of the State. No permanent fill would be placed within the channel (concrete would be removed and replaced resulting in no net import of fill), channel elevation would not be altered, and drainage functions would be conserved and returned to pre-project conditions. The effects of shading the channel would be negligible because it is an abiotic feature and resources are not present that could be adversely affected by shading; therefore, compensatory mitigation is not required.

During construction, the following minimization measure will be implemented to avoid and minimize potential project impacts:

WET-1: Construction activities within the West Cucamonga Channel and Princeton Basin will be designed and conducted to maintain downstream flow conditions. All construction activities will be effectively isolated from water flows to the greatest extent feasible. This may be accomplished by working in the dry season or dewatering the work area in the wet season. When work in standing or flowing water is required, structures for isolating the in-water work area and/or diverting the water flow must not be removed until all disturbed areas are cleaned and stabilized. The diverted water flow must not be contaminated by construction activities. Structures used to isolate the in-water work area and/or diverting the water flow (e.g., coffer dam, geotextile silt curtain) must not be removed until all disturbed areas are stabilized.

2.3.3 Plant Species

2.3.3.1 Regulatory Setting

USFWS and 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 FESA and/or the California Endangered Species Act (CESA). Please see Section 2.3.5, Threatened and Endangered Species, for detailed information about these species.

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 U.S.C., Section 1531, *et seq.* See also 50 CFR Part 402. The regulatory requirements for CESA can be found at CFG Code, Section 2050, *et seq.* Caltrans projects are also subject to the Native Plant Protection Act, found at CFG Code, Section 1900-1913, and CEQA, CA PRC, Sections 2100-21177.

2.3.3.2 Affected Environment

The analysis of potential for the Grove Avenue Corridor Project to result in adverse impacts on special-status plant species is described in the *Natural Environment Study (Minimal Impacts)* (September 2016).

In developing the *Natural Environment Study (Minimal Impacts)*, the BSA was surveyed by biologists in June 2013 and March 2015 to determine the extent of plant communities and assess the presence of suitable habitat for sensitive plant species. Plant identifications were made in the field or in the lab through comparison with voucher specimens or photographs. Data from the field maps were digitized into GIS using ArcGIS 9.2. In addition to conducting biological surveys, a review of existing literature and biological databases was conducted to identify the existence or potential occurrence of special-status species plants and vegetation communities in or within the vicinity of the BSA. Primary databases consulted included the CNDDB information (version 5), which is administered by CDFW, and CNPS' On-line Inventory of Rare and Endangered Plants of California (Version 8-02, CNPS Inventory [2016]). Additionally, USFWS's Information, Planning, and Conservation (IPaC) System was used to generate a list of species to be considered in the effects analysis for the project.

The general biological surveys confirmed that the entirety of the BSA is developed. Vegetation within the BSA is limited to non-native ornamental landscaping for existing roads, homes, and parks, in addition to non-native ruderal (weedy) elements within vacant lots.

According to the CNDDB, two special-status plant species have been reported within 1.0 mile of the BSA between 1905 and 1917. Based on the current developed condition and lack of suitable habitat within the BSA, regional species of concern are not likely to occur within the BSA (Table 2.3.3-1).

Table 2.3.3-1. Special-Status Plant Species

Scientific Name/ Common Name	Status	General Habitat Description	Species Present/ Absent	Rationale
Dodecahema leptoceras Slender-horned Spineflower	FE/SE CRPR 1B.1	**Distribution:** Riverside Los Angeles, and San Bernardino counties. **Habitat:** Chaparral, cismontane woodland, coastal scrub on alluvial fans.	Absent	No suitable habitat occurs within the BSA. Most recent report to the CNDDB of this species within 1 mile of the BSA was 1905.
Uneatekelia cuneata var. puberula Mesa Horkelia	--/-- CRPR 1B.1	**Distribution: Coastal southern California from San Luis Obispo County south.** **Habitat:** Sandy or gravelly soils in maritime chaparral, cismontane woodland, or coastal scrub.	Absent	No suitable habitat occurs within the BSA. Most recent report to the CNDDB of this species within 1 mile of the BSA was in 1917.

FE: Federally Endangered
SE: State Endangered
CRPR 1B.1: California Rare Plant Rank listing designates plants that are rare, with most of them endemic to California, that present populations throughout their range, are seriously threatened in California (more than 80 percent of occurrences threatened/high degree and immediacy of threat).
These designations are to be considered during the State and federal environmental review process, as applicable (e.g., CEQA [PRC Section 21000 *et seq*.] and NEPA [50 CFR 402.12]).

2.3.3.3 Environmental Consequences

Permanent Impacts

No Build Alternative

The No Build Alternative does not propose any construction or other disturbance in the BSA; therefore, this alternative would not result in permanent impacts to special-status plant species.

Build Alternative (Proposed Project)

Botanical surveys conducted in June 2013 and March 2015 confirmed that the entirety of the BSA is developed and has been determined as not suitable for special-status plant species. None of the two special-status plant species were observed during the surveys; therefore, no permanent impacts to these special-status plants would occur as a result of the project.

Temporary/Construction Impacts

No Build Alternative

The No Build Alternative does not propose any construction or other disturbance in the BSA; therefore, this alternative would not result in temporary impacts to special-status plant species.

Build Alternative (Proposed Project)

None of the two special-status plant species were observed during the surveys; therefore, no temporary impacts to these special-status plants would occur as a result of the project.

2.3.3.4 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, or mitigation measures are warranted because no special-status plant species occur in the BSA.

2.3.4 Animal Species

2.3.4.1 Regulatory Setting

Many State and federal laws regulate impacts to wildlife. USFWS, National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries Service), and 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 FESA or CESA. Species listed or proposed for listing as threatened or endangered are discussed in Section 2.3.5, Threatened and Endangered Species. 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:

- NEPA
- Migratory Bird Treaty Act (MBTA)
- Fish and Wildlife Coordination Act

State laws and regulations relevant to wildlife include the following:

- CEQA
- Sections 1600–1603 of the CFG Code
- Sections 4150 and 4152 of the CFG Code

2.3.4.2 Affected Environment

The BSA is situated within a transportation corridor and highly urbanized area. According to the CNDDB (CDFW, 2015), three special-status animal species have been reported within 1.0 mile of the BSA between the dates of 1951 and 1997. Based on the current developed condition and lack of suitable habitat within the BSA, special-status wildlife species are not likely to occur within the BSA (Table 2.3.4-1).

Although not specifically listed in Table 2.3.4-1, the project site contains trees, shrubs, and other vegetation that provide suitable nesting habitat for common birds, including raptors, protected under the MBTA and CFG Code.

Table 2.3.4-1. Special-Status Wildlife Species

Scientific Name/ Common Name	Status	General Habitat Description	Species Present/ Absent	Rationale
Invertebrates				
Rhaphiomidas terminates abdominalis Delhi Sands Flower-loving Fly	FE/--	**Distribution:** Endemic to the Colton Dunes of southwestern San Bernardino and northwestern Riverside counties. **Habitat:** Sandy substrates (Delhi soil series) with sparse cover (less than 50 percent, usually 10 to 20 percent) of perennial shrubs and other vegetation. Three indicator plant species are usually present in occupied habitat: California buckwheat, telegraph weed, and croton; only a few individuals of telegraph weed occur in the BSA.	Absent	No suitable habitat occurs within the BSA. The soils within the BSA are not associated with this species. Most recent report to the CNDDB of this species within 1 mile of the BSA was in 2001. The Ontario Recovery Unit occurs approximately 3 miles east of the BSA (USFWS, 1997).
Reptiles				
Anniella pulchra pulchra Silvery Legless Lizard	--/SSC	**Distribution:** Occurs from the Bay Area south through the Coast and Peninsular Ranges to northern Baja California. Occurrences scattered through the San Joaquin Valley and southern Sierra Nevada. **Habitats:** Loose soil, particularly in sand dunes or otherwise sandy soil. Generally found in leaf litter, under rocks, logs, or driftwood in oak woodland, chaparral, and desert scrub.	Absent	No suitable habitat occurs within the BSA. Most recent report to the CNDDB of this species within 1 mile of the BSA was 1993.
Mammals				
Antrozous pallidus Pallid bat	--/SSC	**Distribution:** Mexico and extreme southwestern U.S. north through Oregon, Washington, and western Canada. **Habitats:** Deserts and canyons with daytime roosts in buildings, crevices; less often in caves, mines, hollow trees, and other shelters.	Absent	No suitable habitat occurs within the BSA. The existing railroad bridge overcrossing in the southern portion of the BSA does not provide suitable roosting habitat. Most recent report to the CNDDB of this species within 1 mile of the BSA was in 1951.

FE: Federally Endangered
SSC: Species of Special Concern
These designations are to be considered during the State and federal environmental review process, as applicable (e.g., CEQA [PRC Section 21000 *et seq*.] and NEPA [50 CFR 402.12]).

2.3.4.3 Environmental Consequences

The City has not established significance thresholds for use in evaluating the proposed project's impacts to animal species; therefore, the thresholds presented in Appendix G of the CEQA Guidelines are used. The guidelines suggest that a project-related significant impact would occur if the project would:

- 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.

An evaluation of potential impacts to animal species associated with each alternative is presented below.

Permanent Impacts

No Build Alternative

The No Build Alternative does not propose any construction or other disturbance in the BSA; therefore, this alternative would not result in permanent impacts to special-status animal species.

Build Alternative (Proposed Project)

The June 2013 and March 2015 general biological surveys confirmed that the entirety of the BSA is developed and is not suitable for special-status wildlife species. As such, project implementation would result in no impacts on special-status wildlife species.

Raptors and migratory birds potentially using shrubs within the BSA could be affected by their removal and/or proximity to construction activities. Construction of the proposed project could result in the removal or trimming of trees during the general bird nesting season (i.e., February 15 through August 31); therefore, it could result in impacts to nesting birds in violation of the MBTA and CFG Code. Direct impacts could occur as a result of removal of vegetation supporting an active nest. Impacts would be considered significant. Implementation of Mitigation Measure AS-1 would reduce potentially significant impacts on nesting birds and raptors to less than significant levels.

Temporary/Construction Impacts

No Build Alternative

The No Build Alternative does not propose any construction or other disturbance in the BSA; therefore, this alternative would not result in temporary impacts to special-status animal species.

Build Alternative (Proposed Project)

None of the three special-status animal species were observed during the surveys; therefore, no temporary impacts to these special-status animals would occur as a result of the project.

Raptors and migratory birds potentially using shrubs within the BSA could be affected by their removal and/or proximity to construction activities. Temporary effects include increased noise and vibration that may result in an alteration in bird behavior and the potential to abandon nests and/or alter nesting locations. In addition, increased dust on vegetation from construction may alter bird behavior for preferred nest sites.

2.3.4.4 Avoidance, Minimization, and/or Mitigation Measures

The following mitigation measure will be implemented prior to construction to avoid and reduce potential impacts related to special-status animal species:

Mitigation Measure AS-1: To avoid effects to nesting birds, the Project Engineer will require the contractor to conduct vegetation removal or tree-trimming activities outside of the nesting bird season (i.e., February 15 through August 31).

If vegetation clearing is necessary during the nesting season, the Project Engineer will require the contractor to have a qualified biologist conduct a preconstruction survey within 150 feet of construction areas no more than 10 days prior to construction at the location to identify the location of nests, if any. A qualified biologist is one that has previously surveyed for nesting bird species within Southern California.

Should nesting birds be found, an exclusionary buffer will be established by the qualified biologist around each nest site. The buffer will be clearly marked in the field by construction personnel under guidance of the contractor's qualified biologist, and construction or clearing will not be conducted within this zone until the qualified biologist determines that the young have fledged or the nest is no longer active.

The qualified biologist will monitor the nests on a weekly basis to ensure that construction activities do not disturb or disrupt nesting activities.

If the qualified biologist determines that construction activities are disturbing or disrupting nesting activities, then the biologist will notify the Project Engineer, who has the authority to stop or modify construction to reduce the noise and/or disturbance to the nests. Responses may include, but are not limited to, increasing the size of the exclusionary buffer, curtailing nearby work activities, turning off vehicle engines and other equipment wherever possible to reduce noise, installing a protective noise barrier between the nest and the construction activities, and/or working in other areas until the young have fledged.

2.3.5 Threatened and Endangered Species

2.3.5.1 Regulatory Setting

The primary federal law protecting threatened and endangered species is the FESA: 16 U.S.C., Section 1531, *et seq.* See also 50 CFR Part 402. This act and later amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Under Section 7 of this act, federal agencies, such as FHWA, are required to consult with USFWS and NOAA Fisheries Service to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 may include a Biological Opinion with an Incidental Take statement, a Letter of Concurrence, and/or documentation of a No Effect finding. Section 3 of FESA defines take as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct.”

California has enacted a similar law at the state level, the CESA, CFG Code, Section 2050, *et seq.* CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate planning to offset project-caused losses of listed species populations and their essential habitats. CDFW is the agency responsible for implementing CESA. Section 2081 of the CFG Code prohibits "take" of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the CFG Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.” CESA allows for take incidental to otherwise lawful development projects; for these actions an incidental take permit is issued by CDFW. For species listed under both FESA and CESA requiring a Biological Opinion under Section 7 of FESA, CDFW may also authorize impacts to CESA species by issuing a Consistency Determination under Section 2080.1 of the CFG Code.

Another federal law, the Magnuson-Stevens Fishery Conservation and Management Act of 1976, was established to conserve and manage fishery resources found off the coast, as well as anadromous species and Continental Shelf fishery resources of the United States, by exercising (A) sovereign rights for the purposes of exploring, exploiting, conserving, and managing all fish within the exclusive economic zone established by Presidential Proclamation 5030, dated March 10, 1983, and (B) exclusive fishery management authority beyond the exclusive economic zone over such

anadromous species, Continental Shelf fishery resources, and fishery resources in special areas.

2.3.5.2 Affected Environment

The analysis of the project's potential effects on threatened and endangered species is based on the *Natural Environment Study (Minimal Impacts)* (September 2016). The findings of the *Natural Environment Study (Minimal Impacts)* related to threatened and endangered species are summarized in this section.

Prior to performing field surveys for threatened and endangered species, existing documentation relevant to the BSA was reviewed. The most recent records of the CNDDB (CDFW, 2015) and the CNPS' Electronic Inventory of Rare and Endangered Vascular Plants of California were reviewed for the United States Geological Survey (USGS) quadrangles containing these resources surrounding the BSA. Two special-status plant species and three special-status animal species have been reported within 1.0 mile of the BSA between the dates of 1905 and 2001 (Tables 2.3.3-1 and 2.3.4-1). Based on the current developed conditions and lack of suitable habitat within the BSA, threatened or endangered species are not likely to occur within the BSA.

2.3.5.3 Environmental Consequences

Permanent Impacts

No Build Alternative

The No Build Alternative does not propose any construction or other disturbance in the BSA; therefore, this alternative would not result in permanent impacts to threatened or endangered species.

Build Alternative (Proposed Project)

The June 2013 and March 2015 general biological surveys confirmed that the entirety of the BSA is developed and has been determined as not suitable for threatened or endangered species. As such, no threatened or endangered species have potential to occur within the BSA due to lack of suitable habitat. Project implementation would result in no permanent impacts on threatened or endangered species.

Temporary Impacts

No Build Alternative

The No Build Alternative does not propose any construction or other disturbance in the BSA; therefore, this alternative would not result in temporary effects to threatened or endangered species.

Build Alternative (Proposed Project)

Because the BSA is in an urbanized setting, any potential indirect effects/impacts of construction would be no greater than they would be under existing conditions. As such, no temporary effects to threatened or endangered species would occur as a result of the Build Alternative.

2.3.5.4 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, and/or mitigation measures are required because no threatened or endangered species have the potential to occur in the project area.

2.3.6 Invasive Species

2.3.6.1 Regulatory Setting

On February 3, 1999, President William J. Clinton signed 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." FHWA guidance issued August 10, 1999, directs the use of the State's invasive species list, maintained by the California Invasive Plant Council (Cal-IPC) to define the invasive plants that must be considered as part of NEPA analysis for a proposed project.

2.3.6.2 Affected Environment

This section discusses invasive species with the potential to occur within the BSA as discussed in the *Natural Environment Study (Minimal Impacts)* (September 2016). The *Natural Environment Study (Minimal Impacts)* determined that the study area is dominated by non-native species, most of which are non-native plants that occur within portions of the Grove Avenue corridor, adjacent developments, and basin bottoms. Ornamental vegetation is also present for aesthetic reasons.

Highway corridors provide opportunities for the movement of invasive species through the landscape. Invasive species can move on vehicles and in the loads they carry. Invasive plants can be moved from site to site during spraying and mowing operations. Weed seed can be inadvertently introduced into the corridor on equipment during construction and through the use of mulch, imported soil or gravel, and sod. In erosion control, landscape, or wildflower projects, some invasive plant species might be planted deliberately. Transportation corridor ROWs provide ample opportunity for weeds in adjacent lands to spread along corridors that span, on a national scale, millions of miles along highways.

The Cal-IPC Invasive Plant Inventory is based on information submitted by members, land managers, botanists, and researchers throughout California, as well as published sources. The 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 lands). The Invasive Plant Inventory categorizes plants as High, Moderate, or Limited based on the 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.

2.3.6.3 Environmental Consequences

No Build Alternative

The No Build Alternative does not propose any construction or other disturbance in the BSA; therefore, this alternative would not result in long-term impacts related to the introduction or spread of invasive species to or from the BSA and would not cause permanent direct or indirect adverse impacts regarding invasive species.

Build Alternative (Proposed Project)

Implementation of the Build Alternative would have the potential to spread invasive species by the entering and exiting of construction equipment contaminated by invasives, the inclusion of invasive species in seed mixtures and mulch, and the improper removal and disposal of invasive species so that seed is spread along the highway. The plant palette used for revegetation would not include invasive species; therefore, the Build Alternative for the proposed project would not have a substantial effect on invasive species. With implementation of Avoidance Measure IS-1, temporary invasive species impacts are not anticipated.

2.3.6.4 Avoidance, Minimization, and/or Mitigation Measures

The following avoidance measure will avoid potential temporary and permanent impacts related to invasive species:

IS-1: In compliance with the Executive Order on Invasive Species (EO 13112), and guidance from FHWA, the landscaping and erosion control included in the project will not use species listed as invasive. In areas of particular sensitivity (i.e., near or adjacent to drainages), extra precautions will be taken if invasive species are found in or next to the construction areas. This includes the inspection and cleaning of construction equipment and eradication strategies, as required by the Caltrans Biological Monitor, to be implemented should an invasion occur. Any cleaning of equipment or site watering will be conducted in adherence to any applicable drought conditions and related regulations. A Caltrans biologist or landscape Architect will approve any seed lists (for planting).

2.4 Cumulative Impacts

2.4.1 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.

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 NEPA can be found in 40 CFR Section 1508.7 of the CEQ Regulations.

2.4.2 Environmental Consequences

This section discusses potential impacts to various resources that could occur as a result of the Grove Avenue Corridor Project.

Cumulative Impacts

Land Use

Cumulative projects and planned growth in Ontario will lead to changes in land use and an increase in development intensity of the area. With this growth, there would be pressure for urbanized areas to expand to vacant lands and agricultural lands next to existing urban development. Historically, this has happened in the Ontario area, but future development would be managed to be consistent with adopted general plans.

The proposed project, which is widening an existing road, would provide support to the existing and planned developments. Therefore, the project would not cumulatively contribute to considerable cumulative land use impacts.

Farmlands

No farmlands occur within or immediately adjacent to the proposed improvements along the Grove Avenue corridor; therefore, there would be no cumulative effect to farmlands as a result of this project.

Growth

Given the existing level of growth to Ontario and the continuing traffic congestion in the project area, construction of the proposed project is judged unlikely to have a substantial effect on residential or commercial growth in the area. The project would not contribute to growth or expansion but would instead alleviate existing and future traffic congestion.

Parks and Recreational Facilities

The Build Alternative is not expected to have an adverse cumulative impact on parks when considered with any transportation, commercial, industrial, or residential projects because the overall parkland acquisition area would only minimally reduce the overall size of Grove Memorial Park and John Galvin Park and would not inhibit existing recreational facilities within the parks.

Community Character and Cohesion

As previously discussed in Section 2.1.4.1, the Build Alternative would result in the acquisition and removal of several residential properties requiring the displacement of residents. Some of the other projects considered in the cumulative impacts analysis, identified in Table 2.1.1-1, are also expected to result in the acquisition and removal of residential properties and the displacement of residents in the surrounding area. Although there would likely be some residential displacements throughout Ontario connected to the various projects, due to the dispersed locations of the projects and their associated displacements, there would not be an overall cumulative effect to one distinct neighborhood or localized community. Efforts would be made to relocate the displaced residents within the same general neighborhood or local vicinity as the affected property.

Relocation

The Build Alternative is not expected to have an adverse cumulative impact on relocations when considered with any transportation, commercial, industrial, or

residential projects because adequate replacement properties are available within close proximity.

Environmental Justice

Construction cumulative impacts on community disruption could occur if multiple projects in the same locality are scheduled to undergo construction at the same time. The City, through community outreach described earlier, would continue to work closely with the cities and communities within the project area to identify such potential consequences and adjust construction schedules to avoid construction, to the extent practicable, of multiple projects occurring simultaneously within the same locality.

Because implementation of the Build Alternative would not cause disproportionately high and adverse effects on minority or low-income populations, no permanent cumulative impacts are anticipated.

Utilities and Emergency Services

Utilities and emergency services are actively planned for and developed based on service needs of the area in which they are provided. Related transportation and public infrastructure project impacts would be beneficial because they normally improve circulation in their respective project areas. Emergency services would benefit from improved access and circulation. The Build Alternative is not expected to have an adverse cumulative impact on utilities when considered with any transportation, commercial, industrial, or residential projects.

Traffic

Implementation of the proposed project, together with the other transportation projects located within the cumulative projects study area, would accommodate future traffic demand during peak periods resulting in the reduction of traffic congestion conditions at various segments and interchanges. Other cumulative transportation projects would also provide alternative transportation modes and pedestrian connectivity, resulting in additional beneficial congestion impacts. The impacts to circulation and access systems are beneficial on a cumulative basis.

Visual/Aesthetics

Visual impacts during construction would be typical of roadway construction projects, including construction fencing, construction equipment, material stockpiles, and vegetation removal, which would collectively temporarily disturb the park's existing landscape aesthetic. Temporarily disturbed areas would be returned to pre-project

conditions once construction is completed; therefore, the minor visual changes associated with the Build Alternative would not be considered a cumulative effect.

Cultural Resources

The proposed project is not expected to affect any cultural resources in the project area; therefore, the project would not have an adverse cumulative impact on cultural resources.

Groundwater

The geographic context for the analysis of cumulative impacts associated with groundwater is the area underlain by the Chino Basin groundwater basin within the project corridor. The proposed project is not located within an identified recharge area. Construction activities, such as pile driving and dewatering, that would encounter groundwater could potentially occur and may reduce the storage capacity of groundwater. The displaced volume, however, would not be substantial relative to the volume of the basin. Likewise, the volume of water used during construction for dust control and other uses would be nominal; therefore, construction activities would not substantially deplete groundwater supplies nor interfere substantially with groundwater recharge. Thus, there would be no potential impacts to groundwater recharge in the area of the proposed project. Although implementation of the project would not have a cumulatively considerable contribution to the adverse effects on groundwater recharge in the basin, the overall development associated with transportation infrastructure projects that may be planned within the basin could directly and/or indirectly result in the loss of groundwater volume and recharge areas. This loss would be mitigated by groundwater recharge programs that have already been designed and implemented within the basin areas to ensure that groundwater will continue to be a viable water supply in the future. In addition, all of the projects would be required to implement BMP techniques to the MEP. BMP techniques, such as infiltration basins, augment groundwater by retaining stormwater runoff, which subsequently infiltrates into the groundwater regime.

Due to the volume of traffic and the nature of materials that are transported on roadways, sources of groundwater contamination would be associated with hazardous and nonhazardous materials that are transported through the area that could result in accidental spills, leaks, toxic releases, fire, or explosion. The transport of hazardous materials is regulated by the CHP. Hazardous materials and waste transporters are responsible for complying with all applicable packaging, labeling, and shipping regulations, which reduce the potential for a spill to impact water quality. The Office of Emergency Services also provides emergency response services involving

hazardous material incidents. The United States Federal Aviation Administration's Office of Hazardous Materials Safety prescribes strict regulations for the safe transportation of hazardous materials, as described in Title 49 of the CFR and implemented by Title 13 of the CCR. Appropriate documentation for all hazardous waste that is transported would be provided as required for compliance with existing hazardous materials regulations codified in Titles 8, 22, and 26 of the CCR, and their enabling legislation set forth in Chapter 6.95 of the California Health and Safety Code. Compliance with all applicable federal and State laws related to the transportation of hazardous materials would reduce the likelihood and severity of accidents during transit. Furthermore, any spill (i.e., hazardous and nonhazardous) would generate an immediate, local response to report, contain, and mitigate the incident.

Pollutants associated with roadway runoff that are considered treatable by BMP techniques include sediment, metals (i.e., total and dissolved fractions of zinc, Pb, and copper), nitrogen (e.g., ammonia), phosphorus, and general metals. Stormwater runoff from the project ROW would be conveyed to BMP facilities; therefore, roadway runoff conveyed to BMPs would be treated to the MEP and not create any groundwater quality impacts.

Furthermore, the City conducts roadway activities (i.e., sweeping operations and litter and debris removal) on a regular basis to correct situations that could cause water pollution; therefore, implementation of these nonstructural source control BMPs would reduce the discharge of potential pollutants to the stormwater drainage system and watercourses and not create any groundwater quality impacts.

Therefore, there would be no groundwater impacts associated with the Grove Avenue Corridor Project, and the proposed project would not have a cumulatively considerable contribution to the cumulative effects related to groundwater.

Water Quality

The geographic context for the analysis of cumulative impacts associated with water quality is the area covered by the HSA within the proposed project corridor. Development of the proposed project, in combination with all other development that would occur in the watershed area, would involve construction activities, increases in stormwater runoff from new impervious surface area, and possibly reduction in groundwater recharge areas. Construction of new development throughout the watershed area could result in the erosion of soil, thereby cumulatively degrading water quality. In addition, the increase in impervious surface area resulting from future development may also adversely affect water quality by increasing the amount of

stormwater runoff, transportation-related pollutants, and associated roadway runoff chemical pollutants entering the storm drain system. New development, however, would have to comply with existing regulations regarding construction practices that minimize risks of erosion and runoff. Among the various regulations are the applicable provisions of the County of San Bernardino MS4 NPDES Permit; municipal codes related to control of stormwater quality for transportation projects; municipal grading permits; and other NPDES permits. This would minimize degradation of water quality at individual project construction sites. Consequently, cumulative water quality impacts would be minimized during the construction and operational phases. Compliance with applicable SWRCB and Santa Ana RWQCB regulations would ensure that water quality is maintained to the MEP for potential development projects within the watershed areas. Therefore, there would be no water quality impacts associated with implementation of the project. The proposed project would not have a considerable contribution to the cumulative effects related to water quality.

Geology/Soils/Seismic/Topography

The project area generally has a low to negligible potential for geologic hazards such as landslides, expansive soil, collapsible soil, tsunamis, seismic slope instability, and subsidence. The proposed project would not increase the risk of exposing people or structures to potential adverse effects because of seismic activities or seismic-related ground failure beyond the existing level already present with the Grove Avenue configuration. Therefore, the proposed project is not expected to contribute to the cumulative effects related to geology, soils, seismic hazards, or topography.

Paleontology

While the Build Alternative does have the potential to affect paleontological resources during construction, the potential for such impacts is moderate undemonstrated to low. Appropriate monitoring in certain areas of the project would reduce the potential for any impacts to paleontological resources; therefore, there would be no cumulative effects related to paleontological resources.

Hazardous Waste/Materials

The proposed project would not create a significant hazard to the public or environment through transport, use, or disposal of hazardous materials because the project is not expected to produce a large amount of hazardous waste, and BMPs and industry standards would be utilized while handling and transporting any project-related hazardous materials; therefore, the project is not expected to contribute to the cumulative effects to hazardous wastes or materials.

Air Quality

Other individual projects in the Basin may be under construction simultaneously with the project. Depending on construction schedules and implementation of other projects in the region, fugitive dust and pollutant emissions generated during construction may result in substantial short-term increases in air pollutants. This would contribute to short-term cumulative air quality impacts; however, implementation of construction BACMs during site grading activities would reduce fugitive dust emissions to a level that is considered minor.

Noise

Under no-build conditions for the design year (2045), noise levels are expected to increase up to 2 dBA (all project noise levels include traffic projections from other regional projects). Under build conditions for the design year, traffic noise modeling results indicate that noise levels are expected to increase by up to 8 dB over design-year no-build noise levels. Increases in noise levels are due to the addition of two lanes (one in each direction) within the Grove Avenue corridor. The additional lanes would shift traffic closer to representative receivers within the proposed project area. Under future design-year 2045 build conditions, most of the receiver locations have traffic noise levels that were found to approach or exceed the applicable NAC. Where possible, noise abatement was considered at these receiver locations.

No exceedances of the applicable NAC were identified at any of the existing or planned commercial uses located within the project study area. Field monitoring confirmed that none of the existing commercial properties with outdoor areas of frequent human use within 500 feet of Grove Avenue would benefit from lower noise levels. As a result, consideration of noise abatement was not warranted for the commercial land uses located within the study area.

Energy

Maintenance of the Build Alternative can potentially generate indirect energy impacts within the proposed project corridor; however, operation of the Build Alternative would translate into more efficient energy consumption and higher energy savings for the project corridor. These high energy savings from operation of the Build Alternative would offset the potential indirect energy impacts generated from maintenance of the improved facility. Thus, the project is not expected to contribute to the cumulative effects to energy impacts.

Natural Communities

Project implementation would result in no impacts to sensitive habitats or natural communities. The project would result in permanent unavoidable impacts to

approximately 174 trees. Permanent impacts were determined if at least 50 percent of the tree occurred within the permanent impact area, which is not the case. This number includes tree trimming, as well as tree removals. No special-status plants or wildlife have potential to occur within the BSA due to lack of suitable habitat. Implementation of the Build Alternative would not conflict with the provisions of any habitat conservation plan or local biological resource protection ordinances. Given the high level of existing development within the BSA and minimal opportunity for regional wildlife movement, no permanent impacts to wildlife movement are anticipated to result. Given that the project impacts to natural communities are so small, it is doubtful that it would contribute to the cumulative effects to natural communities in the project area.

Wetlands and Other Waters

The Build Alternative would result in no permanent impacts to wetlands or nonwetland waters of the U.S. The Build Alternative would result in approximately 0.46 acre (795 linear feet) of temporary impacts to nonwetland waters of the U.S. as a result of improvements to existing, enclosed box culverts for Grove Avenue. Temporary impacts would not result in the permanent loss of jurisdictional acreage or permanent loss of function or value of these areas. The affected jurisdictional features would be restored to their approximate original contours and conditions. Thus, the proposed project would not contribute to cumulative impacts to wetlands and other waters.

Plant Species

Botanical surveys conducted in June 2013 and March 2015 confirmed that the entirety of the BSA is developed and has been determined as not suitable for special-status plant species; therefore, no cumulative impacts to special-status plants would occur as a result of the project.

Animal Species

The June 2013 and March 2015 general biological surveys confirmed that the entirety of the BSA is developed and is not suitable for special-status wildlife species. As such, project implementation would result in no impacts on special-status wildlife species. Raptors and migratory birds potentially using shrubs within the BSA could be affected by their removal and/or proximity to construction activities. Construction of the proposed project could result in the removal or trimming of trees during the general bird nesting season (i.e., February 15 through August 31); therefore, it could result in impacts to nesting birds in violation of the MBTA and CFG Code. Direct impacts could occur as a result of removal of vegetation supporting an active nest. If other projects in

the area also removed shrubs and trees during nesting season, then the proposed project could have a cumulative effect on animal species.

Threatened and Endangered Species

The June 2013 and March 2015 general biological surveys confirmed that the entirety of the BSA is developed and has been determined as not suitable for threatened or endangered species. As such, no threatened or endangered species have potential to occur within the BSA due to lack of suitable habitat. Project implementation would result in no permanent impacts on threatened or endangered species; therefore, the project has no potential to provide a cumulative effect on threatened or endangered species.

Invasive Species

Implementation of the Build Alternative would have the potential to spread invasive species by the entering and exiting of construction equipment contaminated by invasives, the inclusion of invasive species in seed mixtures and mulch, and the improper removal and disposal of invasive species so that seed is spread along the highway. Therefore, this project has the potential to contribute to a cumulative effect to invasive species.

2.4.3 Avoidance, Minimization, and/or Mitigation Measures

Avoidance, minimization, and/or mitigation measures identified in each topical section in this document would serve to minimize cumulative impacts to the extent feasible.

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