3.13 Noise

3.13.1 Regulatory Setting

The National Environmental Policy Act (NEPA) of 1969 and the California Environmental Quality Act (CEQA) provide the broad basis for analyzing and abating highway traffic noise effects. The intent of these laws is to promote the general welfare and to foster a healthy environment. The requirements for noise analysis and consideration of noise abatement and/or mitigation, however, differ between NEPA and CEQA.

3.13.1.1 California Environmental Quality Act

The California Environmental Quality Act 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 4 of this document for further information on noise analysis under CEQA.

3.13.1.2 National Environmental Policy Act and 23 CFR 772

For highway transportation projects with FHWA (and the Department, 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 dBA) is lower than the NAC for commercial areas (72 dBA). The following Table 3.13.1 lists the noise abatement criteria for use in the NEPA 23 CFR 772 analysis.

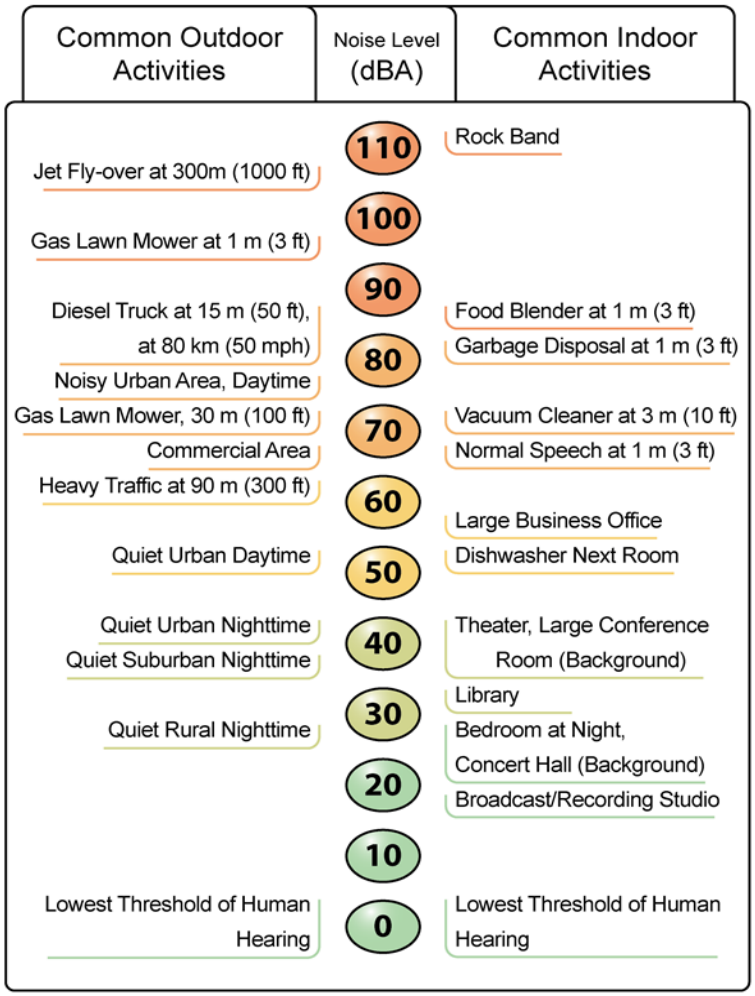
Table 3.13.2 lists the noise levels of common activities to enable readers to compare the actual and predicted highway noise levels discussed in this section with common activities.

Table 3.13.1 Noise Abatement Criteria

Activity Category	NAC, Hourly A- Weighted Noise Level, dBA $L_{eq}(h)$	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[1]	67 (Exterior)	Residential.
C[1]	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] Includes undeveloped lands permitted for this activity category.

Table 3.13.2 Noise Levels of Common Activities



According to the Department's *Traffic Noise Analysis Protocol for Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects* (May 2011), a noise impact occurs when the predicted future noise level with the project substantially exceeds the existing noise level (defined as a 12 dBA or more increase) or when the future noise level with the project approaches or exceeds the NAC. Approaching the NAC is defined as coming within 1 dBA of the NAC.

If it is determined that the project will have noise impacts, the potential abatement measures must be considered. Noise abatement measures that are determined to be reasonable and feasible at the time of final design are incorporated into the project plans and specifications. This document discusses noise abatement measures that would likely be incorporated into the project.

The Department's *Traffic Noise Analysis Protocol* sets forth the criteria for determining when an abatement measure is reasonable and feasible. Feasibility of noise abatement is basically an engineering concern. A minimum 5 dBA reduction 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. A minimum 7 dBA reduction must be achieved at one or more benefited receptor to meet the acoustical design goal. 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.

3.13.2 Affected Environment

This section is based on the *Noise Study Report* (NSR) (August 2015) and the *Noise Study Report Errata* (August 2016) prepared for the Proposed Project. The NSR followed Caltrans Protocol.

3.13.2.1 Surrounding Land Uses and Sensitive Receptors

The Study Area includes land uses with receptor locations adjacent to the proposed express lanes connector. Existing land uses in the Study Area include Canyon RV Park, Featherly Regional Park, and Chino Hills State Park. The Santa Ana River also parallels SR-91. Residential uses in the vicinity include the Summit at Anaheim Hills and the Archstone at Yorba Linda communities. Undeveloped lands include Chino Hills State Park and the former Mountain Park Specific Plan areas.

Study Area land uses were grouped into a series of Common Noise Environments (CNE 1-3 to CNE 3-3) as shown in Figure 3.13.1. CNEs were established to aide in the identification of representative receptor locations in the Study Area. The CNEs are representative of land uses, receptors, and noise sources in the Study Area.

CNE 1-3, west of SR-241, encompasses the Summit at Anaheim Hills subdivision. The homes are approximately 385 feet (ft) from the SR-241 mainline and approximately 100 ft above it. As shown in Figure 3.13.2, a total of 20 modeling receptors were established in CNE 1-3, all representing single-family residences.

CNE 2-3 is north of the SR-241/SR-91 interchange, east and west of Gypsum Canyon Road. This area includes Canyon RV Park, the only developed portion of Featherly Regional Park. Canyon RV Park contains 140 recreational vehicle sites and ten cabins. The Santa Ana River Bike Trail runs through this park site.

FIGURE 3.13.1

N

SR 241/SR 91 Express Lanes Connector

Common Noise Environments (CNE)

SOURCE: CH2M HILL

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FIGURE 3.13.2

N

0 200 400
FEET

SOURCE: CH2MHILL

SR-241/SR-91 Express Lanes Connector

Receptors within CNE 1-3

I:\RBF1101\G\Receptors within CNE 1-3.cdr (7/22/2016)

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As shown in Figure 3.13.3, a total of 22 modeled receptors were established in CNE 2-3. These receptors represent all of the over 100 recreational-vehicle sites and the additional noise-sensitive land uses in the vicinity of the SR-241/SR-91 interchange. Noise barriers already exist along the mainline of SR-91, adjacent to Canyon RV Park.

CNE 3-3 is east of the SR-241/SR-91 interchange. Featherly Regional Park Archstone at Yorba Linda residential community is in CNE 3-3. Featherly Regional Park and Archstone at Yorba Linda are approximately 680 ft and 1,000 ft from the SR-91 mainline, respectively. As shown in Figure 3.13.4, a total of 13 modeled receptors were established in CNE 3-3. These receptors represent the frequent human uses in the recreational areas and the single/multifamily residences.

As shown later in this report, the receptors in the Study Area fall into two activity categories with specific NAC. Single-family residences and multifamily residences in the Study Area are considered Activity Category B land uses, which have an exterior NAC of 67 A-weighted decibel (dBA) L_{eq}. In addition, some of the recreational areas within CNEs 2-3 and 3-3 are considered Activity Category C land uses, which have an exterior NAC of 67 dBA L_{eq}.

3.13.2.2 Existing Noise Levels

The primary source of existing noise in the Study Area is traffic on SR-241 and SR-91. Short-term measurement locations were selected to represent the major developed areas within the Study Area. The measurement locations were selected to serve as representative modeling locations for the Study Area. Short-term monitoring was conducted at six locations on September 10, 2014. Measurements were taken over a 15-minute period at each site. The short-term measurement locations are shown in Figure 3.13.2. Table 3.13.3 contains the results of the short-term noise level measurements.

The Federal Highway Administration (FHWA) Traffic Noise Model Version 2.5 (TNM 2.5) was used to compare measured traffic noise levels to modeled noise levels at the short-term measurement locations. Table 3.13.4 compares the measured and modeled (predicted) noise levels at each measurement location. The predicted sound levels are within 3 decibels (dB) of the measured sound levels and are, therefore, considered to be in reasonable agreement with the measured sound levels.

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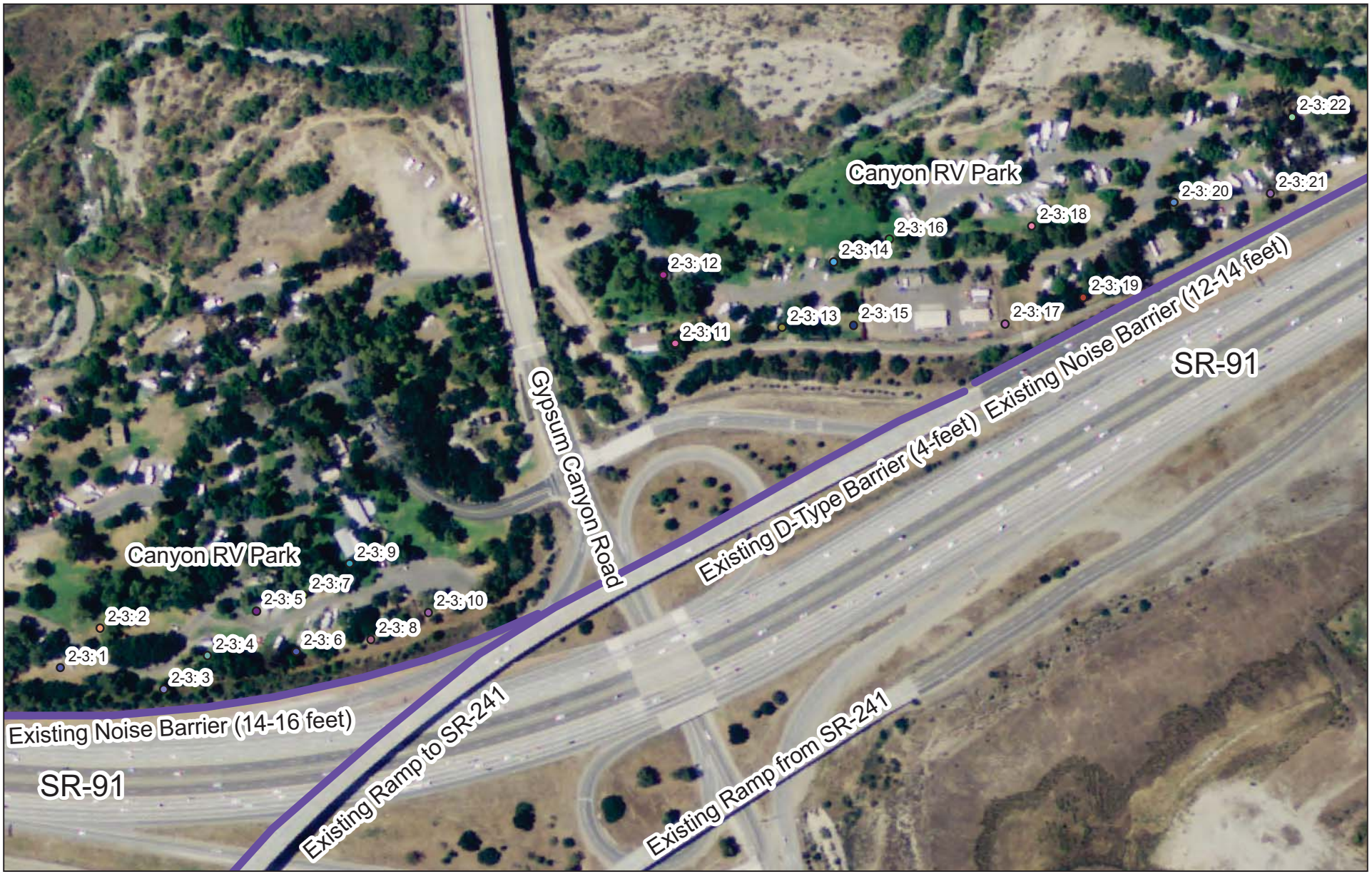

FIGURE 3.13.3

N

0 150 300
FEET

SOURCE: CH2MHILL

SR-241/SR-91 Express Lanes Connector

Receptors within CNE 2-3

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FIGURE 3.13.4

N

0 200 400
FEET

SOURCE: CH2MHILL

SR-241/SR-91 Express Lanes Connector

Receptors within CNE 3-3

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Table 3.13.3 Summary of Short-Term Measurements

Position	Address	CNE	Land Use	Start Time	Duration (minutes)	Measured L_{eq}
M1	Canyon RV Park	2-3	Recreation	9:00 AM	15	69.1
M2	Featherly Regional Park	2-3	Recreation	9:30 AM	15	69.0
M3	25580 Aragon Way	3-3	Residential	10:15 AM	15	49.3
M4	Beneath SR-91 EB off Ramp	2-3	Vacant	10:35 AM	15	76.0
M5	Oak Canyon Road	1-3	Residential	11:15 AM	15	50.7
M6	Garden View Drive	1-3	Residential	12:20 PM	15	52.0

Source: *Noise Study Report* (August 2015).
EB = eastbound
L_{eq} = equivalent continuous sound level
SR-91 = State Route 91

Table 3.13.4 Comparison of Measured to Predicted Sound Levels in the TNM Model

Measurement Position	Measured Sound Level (dBA)	Predicted Sound Level (dBA)	Measured minus Predicted (dBA)	K-Factor	K-Factor Receptors
M1	69.1	66.5	-2.6	2.6	2-3:11 through 2-3:22
M2	69.0	68.2	-0.8	0.8	2-3:1 through 2-3:10
M3	49.3	51.8	2.5	-2.5	3-3:1 through 3-3:11
M4	76.0	78.4	2.4	-2.4	1-3:18 through 1-3:20
M5	50.7	49.1	-1.6	1.6	1-3:1 through 1-3:7
M6	52.0	54.9	2.9	-2.9	1-3:8 through 1-3:17

Source: *Noise Study Report* (August 2015).
dBA = A-weighted decibels
TNM = Traffic Noise Model

Correction factors, known as K-factors, were applied to each of the modeled receptor locations so that the monitored and modeled noise levels were the same. Table 3.13.4 shows the K-factors at each of the monitoring locations and respective receptors.

Traffic modeling projections were used to predict existing baseline noise levels using TNM 2.5. Based on coordination with Caltrans and the Noise Study Report Work Plan, the 2017 No Build Condition was agreed to be the best approximation of existing conditions and was recommended for use in the noise analysis as the baseline for comparison purposes. Due to congestion on the SR-91 corridor throughout the day, traffic volumes/vehicle throughput are projected to remain fairly consistent between 2013 and 2017 since there is no capacity to accommodate a higher traffic

demand. Use of the 2017 predictions allowed for the use of a more accurate depiction of volumes throughout the corridor because the 2017 demand and resulting traffic volumes/vehicle throughput were derived from travel demand modeling completed as part of the *Traffic Analysis Report* (July 2015). Noise levels were predicted at the 55 receptors in the Study Area shown earlier on Figures 3.13.2 through 3.13.4. Table 3.13.5 contains the traffic noise modeling results for existing condition.

CNE 1-3

In CNE 1-3, existing noise levels range between 47 and 60 dBA. As shown in Table 3.13.5, the existing noise levels do not approach or exceed the NAC at any of the 20 receptors located at the Summit at Anaheim Hills neighborhood.

CNE 2-3

In CNE 2-3, existing noise levels range between 64 and 77 dBA. As shown in Table 3.13.5, existing noise levels at 17 of the 22 receptors approach or exceed the NAC. The 22 receptors that are located at camp sites were treated the same as residential dwellings (NAC B/C).

CNE 3-3

In CNE 3-3, existing noise levels are range between 54 and 63 dBA. As shown in Table 3.13.5, existing noise levels do not approach or exceed the NAC at any of the 13 receptors within CNE 3-3.

3.13.3 Environmental Consequences

3.13.3.1 Temporary Impacts

Build Alternative (*Two-Lane Express Lanes Connector*) (*Preferred Alternative*)

Noise from construction activities associated with the Build Alternative may intermittently dominate the noise environment in the immediate area of construction. Table 3.13.6 summarizes noise levels produced by construction equipment that is commonly used on roadway construction projects. As shown, construction equipment is expected to generate noise levels ranging from 70 to 90 dB at a distance of 50 ft from the piece of equipment, and noise produced by construction equipment would be reduced over distance at a rate of about 6 dB per doubling of distance from the piece of equipment.

As described later in Measure N-1, noise control during construction will conform to the provisions in Section 14-8.02 of Caltrans “Noise Control Requirements.” No adverse noise impacts from the construction of the Build Alternative are anticipated

Table 3.13.5 No Build Noise Levels (2017 data[1])

Receptor I.D.	Land Use	Number of Dwelling Units	Address	Noise Activity Category	No Build Noise Level (dBA)
CNE 1-3					
1	Single-Family Residential	5	Heatherwood Road	B/C (67)	53.1
2	Single-Family Residential	5	Heatherwood Road	B/C (67)	54.7
3	Single-Family Residential	6	Cloudview Way	B/C (67)	54.4
4	Single-Family Residential	4	Cloudview Way	B/C (67)	54.3
5	Single-Family Residential	6	Cloudview Way	B/C (67)	57.7
6	Single-Family Residential	4	Cloudview Way	B/C (67)	47.7
7	Single-Family Residential	5	Cloudview Way	B/C (67)	60.2
8	Single-Family Residential	6	Banner Ridge Drive	B/C (67)	56.0
9	Single-Family Residential	6	Banner Ridge Drive	B/C (67)	57.3
10	Single-Family Residential	7	Banner Ridge Drive	B/C (67)	57.0
11	Single-Family Residential	6	Banner Ridge Drive	B/C (67)	56.5
12	Single-Family Residential	5	Banner Ridge Drive	B/C (67)	52.5
13	Single-Family Residential	4	Grand View Drive	B/C (67)	51.2
14	Single-Family Residential	4	Grand View Drive	B/C (67)	53.9
15	Single-Family Residential	4	Grand View Drive	B/C (67)	55.5
16	Single-Family Residential	4	Fox Hollow Drive	B/C (67)	47.2
17	Single-Family Residential	4	Fox Hollow Drive	B/C (67)	54.6
18	Single-Family Residential	4	Fox Hollow Drive	B/C (67)	53.3
19	Single-Family Residential	4	Fox Hollow Drive	B/C (67)	49.5
20	Single-Family Residential	4	Fox Hollow Drive	B/C (67)	50.0
CNE 2-3					
1	Recreational	6	Canyon RV Park - West	B/C (67)	68.8
2	Recreational	4	Canyon RV Park - West	B/C (67)	64.5
3	Recreational	5	Canyon RV Park - West	B/C (67)	68.3
4	Recreational	2	Canyon RV Park - West	B/C (67)	64.3
5	Recreational	6	Canyon RV Park - West	B/C (67)	64.1
6	Recreational	6	Canyon RV Park - West	B/C (67)	67.4
7	Recreational	8	Canyon RV Park - West	B/C (67)	65.5
8	Recreational	7	Canyon RV Park - West	B/C (67)	68.0
9	Recreational	6	Canyon RV Park - West	B/C (67)	66.3
10	Recreational	0	Canyon RV Park - West	B/C (67)	71.3
11	Recreational	2	Canyon RV Park - East	B/C (67)	67.4

Table 3.13.5 No Build Noise Levels (2017 data[1])

Receptor I.D.	Land Use	Number of Dwelling Units	Address	Noise Activity Category	No Build Noise Level (dBA)
12	Recreational	2	Canyon RV Park - East	B/C (67)	65.6
13	Recreational	2	Canyon RV Park - East	B/C (67)	69.3
14	Recreational	3	Canyon RV Park - East	B/C (67)	67.5
15	Recreational	0	Canyon RV Park - East	B/C (67)	73.7
16	Recreational	11	Canyon RV Park - East	B/C (67)	70.1
17	Recreational	3	Canyon RV Park - East	B/C (67)	77.0
18	Recreational	8	Canyon RV Park - East	B/C (67)	72.8
19	Recreational	3	Canyon RV Park - East	B/C (67)	71.0
20	Recreational	6	Canyon RV Park - East	B/C (67)	68.6
21	Recreational	5	Canyon RV Park - East	B/C (67)	69.1
22	Recreational	6	Canyon RV Park - East	B/C (67)	67.8
CNE 3-3					
1	Single-Family Residential	6	Corsica Road	B (67)	53.9
2	Single-Family Residential	7	Corsica Road	B (67)	54.2
3	Recreational	0	Featherly Regional Park	B (67)	59.9
4	Single-Family Residential	7	Corsica Road	B (67)	54.2
5	Recreational	0	Featherly Regional Park	C (67)	62.5
6	Recreational	0	Featherly Regional Park	C (67)	60.6
7	Single-Family Residential	5	Corsica Road	B (67)	55.4
8	Multi-Family Residential	8	Corsica Road	B (67)	59.2
8a	Multi-Family Residential	8	Corsica Road	B (67)	61
9	Multi-Family Residential	8	Corsica Road	B (67)	56.5
9a	Multi-Family Residential	8	Corsica Road	B (67)	60.6
10	Recreational	0	Featherly Regional Park	C (67)	59.4
11	Recreational	0	Featherly Regional Park	C (67)	61.3

Source: *Noise Study Report* (August 2015).
Note: Shaded cells signify that noise levels approach or exceed the NAC.
[1] The revised planned opening year is 2020. The difference in traffic operations between 2017 and 2020 would be nominal. Although the revised opening year is 2020, all of the tables still refer to 2017 as this is the year for which the modeling was completed.
CNE = Common Noise Environment
dBA = A-weighted decibels
NAC = Noise Abatement Criteria

Table 3.13.6 Construction Equipment Noise

Equipment	Maximum Noise Level (dBA at 50 ft)
Scrapers	89
Bulldozers	85
Heavy Trucks	88
Backhoe	80
Pneumatic Tools	85
Concrete Pump	82

Source: *Noise Study Report* (August 2015).
dBA = A-weighted decibels
ft = foot/feet

because construction would be conducted in accordance with Caltrans Standard Specifications Section 14.8-02. Construction noise would be short-term, intermittent, and overshadowed by local traffic noise.

No Build Alternative

The No Build Alternative would not result in the construction of improvements in the Study Area and, therefore, would not result in temporary noise effects.

3.13.3.2 Permanent Impacts

Build Alternative (Two-Lane Express Lanes Connector) (Preferred Alternative)

The FHWA defines a Type I project as a proposed federal or federal-aid highway project for the construction of a highway on a new location or the physical alteration of an existing highway that significantly changes either the horizontal or vertical alignment of the highway. The Proposed Project is considered a Type 1 project. Consideration of noise abatement is required for all Type 1 projects.

TNM 2.5 was used to predict noise levels for the future (2040) Build Alternative. The 2040 noise levels for the Build Alternative are shown in Tables 3.13.7 through 3.13.9. K-factors were applied to the output data in these tables.

The proposed express lanes connector would start on SR-241 in the vicinity of CNE 1-3. As shown in Table 3.13.7, in CNE 1-3, 2040 noise levels for the Build Alternative would not approach or exceed the NAC at any of the receptor locations. As shown in Table 3.13.7, the noise levels for the Build Alternative at the receptors in CNE 1-3 would be a maximum of 3 dBA higher than the No Build Alternative, which is barely perceptible to the human ear. Because a substantial noise increase would not occur at the receptor locations in CNE 1-3, noise abatement is not required.

Table 3.13.7 2040 Noise Levels for CNE 1-3 (west side of SR-241 [Summit at Anaheim Hills])

Receptor I.D	K-Factor	Land Use	Number of Dwelling Units	Address	Activity Category (NAC)	2017 No Build Noise Level $L_{eq}(h)$, dBA	2040 Noise Level without Project $L_{eq}(h)$, dBA	2040 Noise Level with Project $L_{eq}(h)$, dBA	2040 Noise Level with Project minus 2017 No Build Conditions $L_{eq}(h)$, dBA	2040 Noise Level with Project minus 2040 No Build Conditions $L_{eq}(h)$, dBA
1	1.6	Single-Family Residential	5	Heatherwood Road	B (67)	53.1	53.8	54.3	1.2	0.5
2	1.6	Single-Family Residential	5	Heatherwood Road	B (67)	54.7	55.4	56.2	1.5	0.8
3	1.6	Single-Family Residential	6	Cloudview Way	B (67)	54.4	55.0	56.0	1.6	1.0
4	1.6	Single-Family Residential	4	Cloudview Way	B (67)	54.3	54.9	56.2	1.9	1.3
5	1.6	Single-Family Residential	6	Cloudview Way	B (67)	57.7	58.5	59.9	2.2	1.4
6	1.6	Single-Family Residential	4	Cloudview Way	B (67)	47.7	47.8	48.3	0.6	0.5
7	1.6	Single-Family Residential	5	Cloudview Way	B (67)	60.2	60.8	62.1	1.9	1.3
8	-2.9	Single-Family Residential	6	Banner Ridge Drive	B (67)	56.0	56.5	58.8	2.8	2.3
9	-2.9	Single-Family Residential	6	Banner Ridge Drive	B (67)	57.3	57.8	59.5	2.2	1.7
10	-2.9	Single-Family Residential	7	Banner Ridge Drive	B (67)	57.0	57.4	58.4	1.4	1.0
11	-2.9	Single-Family Residential	6	Banner Ridge Drive	B (67)	56.5	57.0	58.5	2.0	1.5
12	-2.9	Single-Family Residential	5	Banner Ridge Drive	B (67)	52.5	52.7	53.9	1.4	1.2
13	-2.9	Single-Family Residential	4	Grand View Drive	B (67)	51.2	51.3	53.4	2.2	2.1
14	-2.9	Single-Family Residential	4	Grand View Drive	B (67)	53.9	54.5	56.7	2.8	2.2
15	-2.9	Single-Family Residential	4	Grand View Drive	B (67)	55.5	56.0	58.0	2.5	2.0
16	-2.9	Single-Family Residential	4	Fox Hollow Drive	B (67)	47.2	46.8	47.5	0.3	0.7
17	-2.9	Single-Family Residential	4	Fox Hollow Drive	B (67)	54.6	54.9	56.8	2.2	1.9
18	-2.4	Single-Family Residential	4	Fox Hollow Drive	B (67)	53.3	53.5	55.3	2.0	1.8
19	-2.4	Single-Family Residential	4	Fox Hollow Drive	B (67)	49.5	49.2	50.0	0.5	0.8
20	-2.4	Single-Family Residential	4	Fox Hollow Drive	B (67)	50.0	49.7	50.5	0.5	0.8

Source: *Noise Study Report* (August 2015).
CNE = Common Noise Environments
dBA = A-weighted decibels
$L_{eq}(h)$ = one-hour A-weighted equivalent continuous sound level
NAC = Noise Abatement Criteria
SR-241 = State Route 241

Table 3.13.8 2040 Noise Levels and Barrier Analysis for CNE 2-3 (north side of SR-91 at Gypsum Canyon Road) Noise Barrier on Express Lanes

Receptor I.D	K-Factor	Land Use	Number of Dwelling Units	Address	Activity Category (NAC)	2017 No Build Noise Level $L_{eq}(h)$, dBA	2040 Noise Level without Project $L_{eq}(h)$, dBA	2040 Noise Level with Project $L_{eq}(h)$, dBA	2040 Noise Level with Project minus 2017 No Build Conditions $L_{eq}(h)$, dBA	2040 Noise Level with Project minus 2040 No Build Conditions $L_{eq}(h)$, dBA
1	0.8	Recreational	6	Canyon RV Park- West	B/C (67)	68.8	67.7	68.7	-0.1	1
2	0.8	Recreational	4	Canyon RV Park -West	B/C (67)	64.5	63.9	64.8	0.3	0.9
3	0.8	Recreational	5	Canyon RV Park -West	B/C (67)	68.3	67.2	68.2	-0.1	1
4	0.8	Recreational	2	Canyon RV Park -West	B/C (67)	64.3	63.7	64.7	0.4	1
5	0.8	Recreational	6	Canyon RV Park -West	B/C (67)	64.1	63.7	64.7	0.6	1
6	0.8	Recreational	6	Canyon RV Park -West	B/C (67)	67.4	66.7	67.7	0.3	1
7	0.8	Recreational	8	Canyon RV Park -West	B/C (67)	65.5	65.3	66.2	0.7	0.9
8	0.8	Recreational	7	Canyon RV Park -West	B/C (67)	68.0	67.7	68.6	0.6	0.9
9	0.8	Recreational	6	Canyon RV Park -West	B/C (67)	66.3	66.2	67.1	0.8	0.9
10	0.8	Recreational	0	Canyon RV Park -West	B/C (67)	71.3	71.0	71.7	0.4	0.7
11	2.6	Recreational	2	Canyon RV Park -East	B/C (67)	67.4	67.9	68.2	0.8	0.3
12	2.6	Recreational	2	Canyon RV Park -East	B/C (67)	65.6	66.1	66.5	0.9	0.4
13	2.6	Recreational	2	Canyon RV Park -East	B/C (67)	69.3	69.8	69.7	0.4	-0.1
14	2.6	Recreational	3	Canyon RV Park -East	B/C (67)	67.5	68.0	68.0	0.5	0
15	2.6	Recreational	0	Canyon RV Park -East	B/C (67)	73.7	74.1	73.8	0.1	-0.3
16	2.6	Recreational	11	Canyon RV Park -East	B/C (67)	70.1	70.6	70.2	0.1	-0.4
17	2.6	Recreational	3	Canyon RV Park -East	B/C (67)	77.0	77.4	76.5	-0.5	-0.9
18	2.6	Recreational	8	Canyon RV Park -East	B/C (67)	72.8	73.3	72.3	-0.5	-1
19	2.6	Recreational	3	Canyon RV Park -East	B/C (67)	71.0	71.3	71.0	0	-0.3
20	2.6	Recreational	6	Canyon RV Park -East	B/C (67)	68.6	69.0	69.0	0.4	0

Table 3.13.8 2040 Noise Levels and Barrier Analysis for CNE 2-3 (north side of SR-91 at Gypsum Canyon Road) Noise Barrier on Express Lanes

Receptor I.D	K-Factor	Land Use	Number of Dwelling Units	Address	Activity Category (NAC)	2017 No Build Noise Level $L_{eq}(h)$, dBA	2040 Noise Level without Project $L_{eq}(h)$, dBA	2040 Noise Level with Project $L_{eq}(h)$, dBA	2040 Noise Level with Project minus 2017 No Build Conditions $L_{eq}(h)$, dBA	2040 Noise Level with Project minus 2040 No Build Conditions $L_{eq}(h)$, dBA
21	2.6	Recreational	5	Canyon RV Park -East	B/C (67)	69.1	69.4	68.4	-0.7	-1
22	2.6	Recreational	6	Canyon RV Park -East	B/C (67)	67.8	68.2	68.4	0.6	0.2

Source: *Noise Study Report* (August 2015).
Note: Shaded cells signify that noise levels approach or exceed the NAC.
CNE = Common Noise Environment
dBA = A-weighted decibels
$L_{eq}(h)$ = one-hour A-weighted equivalent continuous sound level
NAC = Noise Abatement Criteria
SR-91 = State Route 91

Table 3.13.9 2040 Noise Levels for CNE 3-3 (north side of SR-91 [Archstone at Yorba Linda and Sycamore Park])

Receptor I.D	K-Factor	Land Use	Number of Dwelling Units	Address	Activity Category (NAC)	2017 No Build Noise Level $L_{eq}(h)$, dBA	2040 Noise Level without Project $L_{eq}(h)$, dBA	2040 Noise Level with Project $L_{eq}(h)$, dBA	2040 Noise Level with Project minus 2017 No Build Conditions $L_{eq}(h)$, dBA	2040 Noise Level with Project minus 2040 No Build Conditions $L_{eq}(h)$, dBA
1	-2.5	Single-Family Residential	6	Corsica Road	B (67)	53.9	54	54.1	0.2	0.1
2	-2.5	Single-Family Residential	7	Corsica Road	B (67)	54.2	54.2	54.4	0.2	0.2
3	-2.5	Recreational	0	Featherly Regional Park	B (67)	59.9	59.9	60.2	0.3	0.3
4	-2.5	Single-Family Residential	7	Corsica Road	B (67)	54.2	54.2	54.3	0.1	0.1
5	-2.5	Recreational	0	Featherly Regional Park	C (67)	62.5	62.4	62.7	0.2	0.3
6	-2.5	Recreational	0	Featherly Regional Park	C (67)	60.6	60.5	60.8	0.2	0.3
7	-2.5	Single-Family Residential	5	Corsica Road	B (67)	55.4	55.3	55.5	0.1	0.2
8	-2.5	Multi-Family Residential	8	Corsica Road	B (67)	59.2	59	59.3	0.1	0.3
8a	-2.5	Multi-Family Residential	8	Corsica Road	B (67)	61	60.8	61.1	0.1	0.3
9	-2.5	Multi-Family Residential	8	Corsica Road	B (67)	56.5	56.4	56.6	0.1	0.2
9a	-2.5	Multi-Family Residential	8	Corsica Road	B (67)	60.6	60.4	60.7	0.1	0.3
10	-2.5	Recreational	0	Featherly Regional Park	C (67)	59.4	59.2	59.5	0.1	0.3
11	-2.5	Recreational	0	Featherly Regional Park	C (67)	61.3	61.2	61.4	0.1	0.2

Source: *Noise Study Report* (August 2015).
CNE = Common Noise Environment
dBA = A-weighted decibels
$L_{eq}(h)$ = one-hour A-weighted equivalent continuous sound level
NAC = Noise Abatement Criteria
SR-91 = State Route 91

The proposed express lanes connector would be at its highest in the vicinity of CNE 2-3. As shown in Table 3.13.8, in CNE 2-3, 2040 noise levels for the Build Alternative are expected to approach or exceed the NAC at 19 of the 22 modeled receptor locations at the Canyon RV Park. As shown in Table 3.13.8, the traffic level increases associated with the Build Alternative are very low (1 dBA or less) compared to the No Build Alternative and are not perceptible to the human ear. In addition, Measure N-2 would ensure noise levels are minimized by requiring quieter deck texture specifications for the ramps. Because noise levels are predicted to approach or exceed the NAC, evaluation of noise abatement was conducted and barriers were evaluated to determine the level of noise reduction that was possible. The evaluation of noise abatement is discussed in Section 3.13.4, below.

The proposed express lanes connector would end on SR-91 in the vicinity of CNE 3-3. As shown in Table 3.13.9, in CNE 3-3, 2040 noise levels for the Build Alternative would not approach the NAC at any of the receptor locations. In addition, as shown in Table 3.13.9, the traffic level increases associated with the Build Alternative are very low (1 dBA or less) compared to the No Build Alternative and are not perceptible to the human ear. Because a substantial noise increase would not occur at the receptor locations in CNE 3-3, noise abatement is not required.

No Build Alternative

The traffic noise model (TNM 2.5) was used to predict 2040 noise levels for the future (2040) No Build condition. The 2040 noise levels for the No Build Alternative are shown in Tables 3.13.7 to 3.13.9.

In CNE 1-3, future 2040 noise levels are predicted to range between 47 and 61 dBA. As shown in Table 3.13.7, noise levels within CNE 1-3 are not predicted to approach or exceed the NAC at any of the 20 receptors within the Summit at Anaheim Hills neighborhood.

In CNE 2-3, future 2040 noise levels are predicted to range between 64 and 77 dBA. As shown in Table 3.13.8, noise levels at 18 of the 22 receptors are predicted to approach or exceed the NAC in 2040.

In CNE 3-3, future 2040 noise levels are predicted to range between 54 and 62 dBA. As shown in Table 3.13.9, noise levels are not predicted to approach or exceed the NAC in 2040.

3.13.4 Avoidance, Minimization, and/or Mitigation Measures

3.13.4.1 Construction Measures

Measure N-1 would avoid and/or minimize effects related to construction noise.

Measure N-1 **Control of Construction Noise Levels.** The control of noise from construction activities will conform to the California Department of Transportation (Caltrans) Standard Specifications, Section 14-8.02, "Noise Control." The nighttime noise level from the contractor's operations, between the hours of 9:00 p.m. and 6:00 a.m., will not exceed 86 A-weighted decibels (dBA) one-hour A weighted equivalent continuous sound level (Leq(h)) at a distance of 50 feet.

3.13.4.2 Operational Measures

Measure N-2 would minimize effects related to operational noise.

Measure N-2 **Deck Specifications.** To ensure that noise impacts are minimized, the deck texture on the direct connector ramps will be constructed using the new quieter longitudinally-tined Groove and Grind deck specification, instead of a transversely-tined texture.

3.13.4.3 Consideration of Noise Abatement

Two scenarios for noise abatement within CNE 2-3 were evaluated. These include a new noise barrier along the proposed express lanes connector and improvements to the existing noise barriers along SR-91.

For the noise barrier along the proposed express lanes connector, a 4 ft D Type barrier was assumed. The modeling examined barriers up to 16 ft tall. Table 3.13.10 summarizes these traffic noise modeling results for the barrier at the proposed express lanes connector. Even at a maximum height, an express lanes connector noise barrier would fail to discernibly reduce noise at any of the receptors. No receptor would experience an insertion loss of over 1 dBA. As a result, an express lanes connector noise barrier is not feasible. The primary reason for this is the low number of vehicles using the express ramps per the *Traffic Analysis Report* (July 2015), which was 1,876 vehicles in the peak noise hour (6:00 AM to 7:00 AM).

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Table 3.13.10 Sound Barrier Analysis at CNE 2-3 (north side of SR-91 at Gypsum Canyon Road) Noise Barrier on Express Lanes

Receptor I.D.	Land Use	Number of Dwelling Units	Address	Activity Category	2017 No Build Noise Level $L_{eq}(h)$, dBA	Future Worst Hour Noise Levels - $L_{eq}(h)$, dBA																						
						2040 Noise Level without Project $L_{eq}(h)$, dBA	2040 Noise 2040 Noise Level with Project $L_{eq}(h)$, dBA Level with Project $L_{eq}(h)$, dBA	2040 Noise Level with Project minus 2017 No Build Conditions $L_{eq}(h)$, dBA	2040 Noise Level with Project minus 2040 No Build Conditions $L_{eq}(h)$, dBA	Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR) Noise Barrier on Express Lanes																	
										6 ft			8 ft			10 ft			12 ft			14 ft			16 ft		
										$L_{eq}(h)$	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
1	Recreational	6	Canyon RV Park - West	B/C (67)	68.8	67.7	68.7	-0.1	1	68.7	0.0	0	68.7	0.0	0	68.7	0.0	0	68.7	0.0	0	68.7	0.0	0	68.6	0.1	0
2	Recreational	4	Canyon RV Park - West	B/C (67)	64.5	63.9	64.8	0.3	0.9	64.8	0.0	0	64.7	0.1	0	64.7	0.1	0	64.7	0.1	0	64.7	0.1	0	64.7	0.1	0
3	Recreational	5	Canyon RV Park - West	B/C (67)	68.3	67.2	68.2	-0.1	1	68.2	0.0	0	68.1	0.1	0	68.1	0.1	0	68.1	0.1	0	68.1	0.1	0	68.1	0.1	0
4	Recreational	2	Canyon RV Park - West	B/C (67)	64.3	63.7	64.7	0.4	1	64.6	0.1	0	64.6	0.1	0	64.6	0.1	0	64.5	0.2	0	64.5	0.2	0	64.5	0.2	0
5	Recreational	6	Canyon RV Park - West	B/C (67)	64.1	63.7	64.7	0.6	1	64.6	0.1	0	64.5	0.2	0	64.5	0.2	0	64.5	0.2	0	64.5	0.2	0	64.5	0.2	0
6	Recreational	6	Canyon RV Park - West	B/C (67)	67.4	66.7	67.7	0.3	1	67.7	0.0	0	67.5	0.2	0	67.5	0.2	0	67.5	0.2	0	67.5	0.2	0	67.5	0.2	0
7	Recreational	8	Canyon RV Park - West	B/C (67)	65.5	65.3	66.2	0.7	0.9	66.2	0.0	0	66.1	0.1	0	66.1	0.1	0	66.1	0.1	0	66.0	0.2	0	66.0	0.2	0
8	Recreational	7	Canyon RV Park - West	B/C (67)	68.0	67.7	68.6	0.6	0.9	68.6	0.0	0	68.5	0.1	0	68.5	0.1	0	68.5	0.1	0	68.5	0.1	0	68.5	0.1	0
9	Recreational	6	Canyon RV Park - West	B/C (67)	66.3	66.2	67.1	0.8	0.9	67.1	0.0	0	67.0	0.1	0	67.0	0.1	0	67.0	0.1	0	67.0	0.1	0	67.0	0.1	0
10	Recreational	0	Canyon RV Park - West	B/C (67)	71.3	71.0	71.7	0.4	0.7	71.7	0.0	0	71.7	0.0	0	71.7	0.0	0	71.7	0.0	0	71.7	0.0	0	71.7	0.0	0
11	Recreational	2	Canyon RV Park - East	B/C (67)	67.4	67.9	68.2	0.8	0.3	68.2	0.0	0	68.3	-0.1	0	68.3	-0.1	0	68.3	-0.1	0	68.3	-0.1	0	68.3	-0.1	0
12	Recreational	2	Canyon RV Park - East	B/C (67)	65.6	66.1	66.5	0.9	0.4	66.5	0.0	0	66.5	0.0	0	66.5	0.0	0	66.5	0.0	0	66.5	0.0	0	66.5	0.0	0
13	Recreational	2	Canyon RV Park - East	B/C (67)	69.3	69.8	69.7	0.4	-0.1	69.7	0.0	0	69.7	0.0	0	69.7	0.0	0	69.7	0.0	0	69.7	0.0	0	69.7	0.0	0
14	Recreational	3	Canyon RV Park - East	B/C (67)	67.5	68.0	68.0	0.5	0	68.0	0.0	0	68.1	-0.1	0	68.1	-0.1	0	68.1	-0.1	0	68.1	-0.1	0	68.1	-0.1	0
15	Recreational	0	Canyon RV Park - East	B/C (67)	73.7	74.1	73.8	0.1	-0.3	73.8	0.0	0	73.8	0.0	0	73.8	0.0	0	73.8	0.0	0	73.8	0.0	0	73.8	0.0	0
16	Recreational	11	Canyon RV Park - East	B/C (67)	70.1	70.6	70.2	0.1	-0.4	70.2	0.0	0	70.2	0.0	0	70.2	0.0	0	70.2	0.0	0	70.2	0.0	0	70.2	0.0	0
17	Recreational	3	Canyon RV Park - East	B/C (67)	77.0	77.4	76.5	-0.5	-0.9	76.5	0.0	0	76.5	0.0	0	76.5	0.0	0	76.5	0.0	0	76.5	0.0	0	76.5	0.0	0
18	Recreational	8	Canyon RV Park - East	B/C (67)	72.8	73.3	72.3	-0.5	-1	72.3	0.0	0	72.3	0.0	0	72.3	0.0	0	72.3	0.0	0	72.3	0.0	1	72.3	0.0	1
19	Recreational	3	Canyon RV Park - East	B/C (67)	71.0	71.3	71.0	0	-0.3	71.0	0.0	0	71.0	0.0	0	71.0	0.0	0	71.0	0.0	0	71.0	0.0	0	71.0	0.0	0
20	Recreational	6	Canyon RV Park - East	B/C (67)	68.6	69.0	69.0	0.4	0	69.0	0.0	0	69.0	0.0	0	69.0	0.0	0	69.0	0.0	0	69.0	0.0	0	69.0	0.0	0
21	Recreational	5	Canyon RV Park - East	B/C (67)	69.1	69.4	68.4	-0.7	-1	68.4	0.0	0	68.4	0.0	0	68.4	0.0	0	68.4	0.0	0	68.4	0.0	0	68.4	0.0	0
22	Recreational	6	Canyon RV Park - East	B/C (67)	67.8	68.2	68.4	0.6	0.2	68.4	0.0	0	68.4	0.0	0	68.4	0.0	0	68.4	0.0	0	68.4	0.0	0	68.4	0.0	0

Source: *Noise Study Report* (August 2015).
Note: Shaded cells signify that noise levels approach or exceed the NAC.
CNE = Common Noise Environments
dBA = A-weighted decibels
ft = foot/feet
$L_{eq}(h)$ = one-hour A-weighted equivalent continuous sound level
NAC = Noise Abatement Criteria

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The second scenario examined increasing the height of the existing noise barrier along SR-91. The existing SR-91 barrier segments examined for modification include the portion west of Gypsum Canyon (currently 14 to 16 ft tall) and the portion east of Gypsum Canyon (currently 12 to 14 ft tall). The existing ramp from SR-91 to SR-241 was also analyzed. Currently, there is a 4 ft Jersey barrier (a concrete or plastic barrier employed to separate traffic lanes and also to prevent a crossover case of a head-on collision) on that ramp. Noise barriers were modeled starting with the existing height in 2 ft increments up to an additional 8 ft.

Table 3.13.11 summarizes the traffic noise modeling results for increasing the height of the existing noise barriers along SR-91. The existing barriers are effective in reducing noise levels and adding height to the existing barriers would provide limited benefits. Table 3.13.12 summarizes the average noise levels and reductions associated with CNE 2-3 and alternations to the existing SR-91 noise barriers. An addition of 8 ft to the existing barrier height would provide between 0 and 3 dBA in additional insertion loss. The receptors with the greatest benefits (2 to 3 dBA) are located nearest to the termini of the SR-91 noise barriers. The benefits of altering the existing barriers would be below the typical threshold of perception; therefore, this approach is not considered feasible.

In summary, with respect to CNE 2-3:

- Noise levels in the Canyon RV Park exceed the Noise Abatement Criteria. This applies to No Build (2017), Build (2040), and Future No Build (2040) conditions.
- The noise levels under the No Build (2017), Build (2040), and Future No Build (2040) conditions are virtually identical.
- The additional traffic noise associated with the Proposed Project is minimal.
- Noise barriers to reduce the noise associated with the Proposed Project have very limited effectiveness.
- The existing barriers along SR-91 are effective at reducing traffic noise.
- Increasing the size of the existing barriers along SR-91 would provide limited additional benefits.

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Table 3.13.11 Sound Barrier Analysis at CNE 2-3 (north side of SR-91 at Gypsum Canyon Road) Noise Barrier along SR-91 (above existing)

Receptor I.D.	Land Use	Number of Dwelling Units	Address	Activity Category	2017 No Build Noise Level $L_{eq}(h)$, dBA	Future Worst Hour Noise Levels - $L_{eq}(h)$, dBA																			
						2040 Noise Level without Project $L_{eq}(h)$, dBA	2040 Noise Level with Project $L_{eq}(h)$, dBA	2040 Noise Level with Project minus 2017 No Build Conditions $L_{eq}(h)$, dBA	2040 Noise Level with Project minus 2040 No Build Conditions $L_{eq}(h)$, dBA	Noise Prediction with Barrier, Barrier Insertion Loss (I.L.), and Number of Benefited Receptors (NBR) Noise Barrier along SR-91 (above existing)															
										Existing			+2 ft			+4 ft			+6 ft			+8 ft		
										$L_{eq}(h)$	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
1	Recreational	6	Canyon RV Park - West	B/C (67)	68.8	67.7	68.7	-0.1	1	68.7	0.0	0	67.6	1.1	0	66.7	2.0	0	66.0	2.7	0	65.4	3.3	0
2	Recreational	4	Canyon RV Park - West	B/C (67)	64.5	63.9	64.8	0.3	0.9	64.8	0.0	0	64.2	0.6	0	63.8	1.0	0	63.4	1.4	0	63.0	1.8	0
3	Recreational	5	Canyon RV Park - West	B/C (67)	68.3	67.2	68.2	-0.1	1	68.2	0.0	0	67.2	1.0	0	66.4	1.8	0	65.7	2.5	0	65.1	3.1	0
4	Recreational	2	Canyon RV Park - West	B/C (67)	64.3	63.7	64.7	0.4	1	64.7	0.0	0	64.1	0.6	0	63.7	1.0	0	63.3	1.4	0	63.0	1.7	0
5	Recreational	6	Canyon RV Park - West	B/C (67)	64.1	63.7	64.7	0.6	1	64.7	0.0	0	64.2	0.5	0	63.9	0.8	0	63.6	1.1	0	63.4	1.3	0
6	Recreational	6	Canyon RV Park - West	B/C (67)	67.4	66.7	67.7	0.3	1	67.7	0.0	0	67.1	0.6	0	66.6	1.1	0	66.0	1.7	0	65.4	2.3	0
7	Recreational	8	Canyon RV Park - West	B/C (67)	65.5	65.3	66.2	0.7	0.9	66.2	0.0	0	65.9	0.3	0	65.6	0.6	0	65.4	0.8	0	65.2	1.0	0
8	Recreational	7	Canyon RV Park - West	B/C (67)	68.0	67.7	68.6	0.6	0.9	68.6	0.0	0	68.3	0.3	0	68.0	0.6	0	67.7	0.9	0	67.4	1.2	0
9	Recreational	6	Canyon RV Park - West	B/C (67)	66.3	66.2	67.1	0.8	0.9	67.1	0.0	0	66.9	0.2	0	66.7	0.4	0	66.5	0.6	0	66.4	0.7	0
10	Recreational	0	Canyon RV Park - West	B/C (67)	71.3	71.0	71.7	0.4	0.7	71.7	0.0	0	71.7	0.0	0	71.6	0.1	0	71.6	0.1	0	71.6	0.1	0
11	Recreational	2	Canyon RV Park - East	B/C (67)	67.4	67.9	68.2	0.8	0.3	68.2	0.0	0	68.2	0.0	0	68.1	0.1	0	68.1	0.1	0	68.0	0.2	0
12	Recreational	2	Canyon RV Park - East	B/C (67)	65.6	66.1	66.5	0.9	0.4	66.5	0.0	0	66.4	0.1	0	66.4	0.1	0	66.3	0.2	0	66.3	0.2	0
13	Recreational	2	Canyon RV Park - East	B/C (67)	69.3	69.8	69.7	0.4	-0.1	69.7	0.0	0	69.7	0.0	0	69.6	0.1	0	69.6	0.1	0	69.6	0.1	0
14	Recreational	3	Canyon RV Park - East	B/C (67)	67.5	68.0	68.0	0.5	0	68.0	0.0	0	68.0	0.0	0	68.0	0.0	0	67.9	0.1	0	67.9	0.1	0
15	Recreational	0	Canyon RV Park - East	B/C (67)	73.7	74.1	73.8	0.1	-0.3	73.8	0.0	0	73.8	0.0	0	73.8	0.0	0	73.8	0.0	0	73.8	0.0	0
16	Recreational	11	Canyon RV Park - East	B/C (67)	70.1	70.6	70.2	0.1	-0.4	70.2	0.0	0	70.2	0.0	0	70.2	0.0	0	70.1	0.1	0	70.1	0.1	0
17	Recreational	3	Canyon RV Park - East	B/C (67)	77.0	77.4	76.5	-0.5	-0.9	76.5	0.0	0	76.5	0.0	0	76.5	0.0	0	76.5	0.0	0	76.5	0.0	0
18	Recreational	8	Canyon RV Park - East	B/C (67)	72.8	73.3	72.3	-0.5	-1	72.3	0.0	0	72.2	0.1	0	72.2	0.1	0	72.1	0.2	0	72.1	0.2	1
19	Recreational	3	Canyon RV Park - East	B/C (67)	71.0	71.3	71.0	0	-0.3	71.0	0.0	0	71.0	0.0	0	70.9	0.1	0	70.8	0.2	0	70.7	0.3	0
20	Recreational	6	Canyon RV Park - East	B/C (67)	68.6	69.0	69.0	0.4	0	69.0	0.0	0	68.1	0.9	0	67.2	1.8	0	66.5	2.5	0	66.3	2.7	0
21	Recreational	5	Canyon RV Park - East	B/C (67)	69.1	69.4	68.4	-0.7	-1	68.4	0.0	0	67.4	1.0	0	66.6	1.8	0	65.9	2.5	0	65.3	3.1	0
22	Recreational	6	Canyon RV Park - East	B/C (67)	67.8	68.2	68.4	0.6	0.2	68.4	0.0	0	67.2	1.2	0	66.2	2.2	0	65.5	2.9	0	65.1	3.3	0

Source: *Noise Study Report* (August 2015).
Note: Shaded cells signify that noise levels approach or exceed the NAC.
CNE = Common Noise Environment
dBA = A-weighted decibels
$L_{eq}(h)$ = one-hour A-weighted equivalent continuous sound level
NAC = Noise Abatement Criteria

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Table 3.13.12 Average Noise Levels at CNE 2-3 Receptors (dBA)

No Build Condition (2017)	No Build Alternative (2040)	Build Alternative (2040)	Build Alternative (2040) with Additional 8 ft Barrier Height to Existing Barrier	Build Alternative (2040) without Existing Barriers	Abatement from Existing Barriers	Additional Abatement from Improved Barriers
66.78	66.77	67.05	65.84	71.16	4.11	1.21

Source: *Noise Study Report* (August 2015).
Note: Average TNM results of the 22 receptors in CNE 2-3.
CNE = Common Noise Environment
dBA = A-weighted decibels
ft = foot/feet
TNM = Traffic Noise Model

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