5.9 Noise

5.9.1 INTRODUCTION

This Supplemental EIR section evaluates the potential noise and vibration impacts that could result from implementation of the proposed Project. It discusses the existing noise environment within and around the Project site, as well as the regulatory framework for regulation of noise. This section analyzes the effect of the proposed Project on the existing ambient noise environment during demolition, construction, and operational activities; and evaluates the proposed Project's noise effects for consistency with relevant local agency noise policies and regulations. The analysis in this section also addresses impacts related to groundborne vibration. Information in this section is based on the:

- *City of Santa Ana General Plan Update*
- *City of Santa Ana General Plan Update FEIR*
- *City of Santa Ana Municipal Code*
- *Acoustical Assessment, Appendix N*

Noise and Vibration Terminology

Various noise descriptors are utilized in this EIR analysis, and are summarized as follows:

dB: Decibel, the standard unit of measurement for sound pressure level.

dBA: A-weighted decibel, an overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.

Leq: The equivalent sound level, which is used to describe noise over a specified period of time, typically 1 hour, in terms of a single numerical value. The Leq of a time-varying signal and that of a steady signal are the same if they deliver the same acoustic energy over a given time. The Leq may also be referred to as the average sound level.

Lmax: The instantaneous maximum noise level experienced during a given period of time.

Lmin: The instantaneous minimum noise level experienced during a given period of time.

Lx: The sound level that is equaled or exceeded "x" percent of a specified time period. The "x" thus represents the percentage of time a noise level is exceeded. For instance, L50 and L90 represents the noise levels that are exceeded 50 percent and 90 percent of the time, respectively.

Ldn: Also termed the "day-night" average noise level (DNL), Ldn is a measure of the average of A-weighted sound levels occurring during a 24-hour period, accounting for the greater sensitivity of most people to nighttime noise by weighting noise levels at night (penalizing" nighttime noises). Noise between 10:00 p.m. and 7:00 a.m. is weighted by adding 10 dBA to take into account the greater annoyance of nighttime noises.

CNEL: The Community Noise Equivalent Level, which, similar to the Ldn, is the average A-weighted noise level during a 24-hour day that is obtained after an addition of 5 dBA to measured noise levels between the hours of 7:00 p.m. to 10:00 p.m. and after an addition of 10 dBA to noise levels between the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively.

The "ambient noise level" is the background noise level associated with a given environment at a specified time and is usually a composite of sound from many sources from many directions.

Effects of Noise

Noise is generally loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity that is a nuisance or disruptive. The effects of noise on people can be placed into four general categories:

- Subjective effects (e.g., dissatisfaction, annoyance)
- Interference effects (e.g., communication, sleep, and learning interference)
- Physiological effects (e.g., startle response)
- Physical effects (e.g., hearing loss)

Although exposure to high noise levels has been demonstrated to cause physical and physiological effects, the principal human responses to typical environmental noise exposure are related to subjective effects and interference with activities. Interference effects refer to interruption of daily activities and include interference with human communication activities, such as normal conversations, watching television, telephone conversations, and interference with sleep. Sleep interference effects can include both awakening and arousal to a lesser state of sleep. With regard to the subjective effects, the responses of individuals to similar noise events are diverse and are influenced by many factors, including the type of noise, the perceived importance of the noise, the appropriateness of the noise to the setting, the duration of the noise, the time of day and the type of activity during which the noise occurs, and individual noise sensitivity.

In general, the more a new noise level exceeds the previously existing ambient noise level, the less acceptable the new noise level will be by those hearing it. With regard to increases in A-weighted noise levels, the following relationships generally occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived.
- Outside of the laboratory, a 3-dBA change in noise levels is considered to be a barely perceivable difference.
- A change in noise levels of 5 dBA is considered to be a readily perceivable difference.
- A change in noise levels of 10 dBA is subjectively heard as doubling of the perceived loudness.

Noise Attenuation

Stationary point sources of noise, including mobile sources such as idling vehicles, attenuate (lessen) at a rate of 6 dBA per doubling of distance from the source over hard surfaces to 7.5 dBA per doubling of distance from the source over hard surfaces, depending on the topography of the area and environmental conditions (e.g., atmospheric conditions, noise barriers [either vegetative or manufactured]). Thus, a noise measured at 90 dBA 50 feet from the source would attenuate to about 84 dBA at 100 feet, 78 dBA at 200 feet, 72 dBA at 400 feet, and so forth. Widely distributed noise, such as a large industrial facility spread over many acres or a street with moving vehicles, would typically attenuate at a lower rate, approximately 4 to 6 dBA per doubling of distance from the source.

Hard sites are those with a reflective surface between the source and the receiver, such as asphalt or concrete surfaces or smooth bodies of water. No excess ground attenuation is assumed for hard sites and the changes in noise levels with distance (drop-off rate) is simply the geometric spreading of the noise from the source. Soft sites have an absorptive ground surface such as soft dirt, grass, or scattered bushes and trees. In addition to geometric spreading, an excess ground attenuation value of 1.5 dBA (per doubling distance) is normally assumed for soft sites. Line sources (such as traffic noise from vehicles) attenuate at a rate between 3 dBA for hard sites and 4.5 dBA for soft sites for each doubling of distance from the reference measurement.

Fundamentals of Vibration

Vibration is energy transmitted in waves through the ground or man-made structures. These energy waves generally dissipate with distance from the vibration source. There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings but is not always suitable for evaluating human response (annoyance) because it takes some time for the human body to respond to vibration signals. Instead, the human body responds to average vibration amplitude often described as the root mean square (RMS). The RMS amplitude is defined as the average of the squared amplitude of the signal and is most frequently used to describe the effect of vibration on the human body. Decibel notation (VdB) is commonly used to measure RMS. VdB serves to reduce the range of numbers used to describe human response to vibration. Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receivers for vibration include structures (especially older masonry structures), people (especially residents, the elderly, and sick), and vibration-sensitive equipment.

The background vibration-velocity level in residential areas is generally 50 VdB. Ground-borne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground-borne vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings.

5.9.2 REGULATORY SETTING

Caltrans Vibration Guidance Manual

There are no vibration standards that are specifically applicable to the proposed Project, hence, California Department of Transportation's (Caltrans) Transportation and Construction Vibration Guidance Manual guidelines are used as a screening tool for assessing the potential for adverse vibration effects related to human perception, which are listed in Table 5.9-1. It should be noted that the human annoyance threshold of 0.04 is less (more conservative) than the Federal Transit Administration (FTA) building damage threshold for a reinforced concrete building.

Table 5.9-1: Vibration Screening Standards

Caltrans Guidelines	Peak Particle Velocity for Continuous Sources (PPV) (in/sec)
Human Annoyance	
Barely Perceptible	0.01
Distinctly Perceptible	0.04
Strongly Perceptible	0.10
Severe	0.40

Source: Caltrans Transportation and Construction Vibration Guidance Manual, September 2013, Tables 19 & 20.

Title 24, California Building Code

State regulations related to noise include requirements for the construction of new hotels, motels, apartment houses, and dwellings other than detached single-family dwellings that are intended to limit the extent of noise transmitted into habitable spaces. These requirements are collectively known as the California Noise Insulation Standards and are found in California Code of Regulations, Title 24 (known as the Building Standards Administrative Code), Part 2 (known as the California Building Code), Appendix Chapters 12 and 12A. For limiting noise transmitted between adjacent dwelling units, the noise insulation standards specify the extent to which walls, doors, and floor ceiling assemblies must block or absorb sound. For limiting noise from exterior sources, the noise insulation standards set forth an interior standard of DNL 45 dBA in any habitable room and, where such units are proposed in areas subject to noise levels greater than DNL 60 dBA require an acoustical analysis demonstrating how dwelling units have been designed to meet this interior standard. If the interior noise level depends upon windows being closed, the design for the structure must also specify a ventilation or air conditioning system to provide a habitable interior environment.

The mandatory measures for non-residential buildings states that new construction shall provide an interior noise level that does not exceed an hourly equivalent level of 50 dBA Leq in occupied areas during any hour of operation. Title 24 standards are enforced through the building permit application process in the City.

County of Orange General Aviation Noise Ordinance

To reduce noise from operation of SNA the General Aviation Noise Ordinance was adopted by the County to regulate the hours of operation and the maximum permitted noise levels associated with general aviation operations. The General Aviation Noise Ordinance specifies noise limits at each noise monitoring station that vary by time of day. The Ordinance also prohibits commercial aircraft departures between the hours of 10:00 p.m. and 7:00 a.m. and arrivals between the hours of 11:00 p.m. and 7:00 a.m.

City of Santa Ana General Plan Noise Element

The City's GPU Noise Element includes the following goals and policies that are relevant to the proposed Project:

GOAL N-1:	Ensure that existing and future land uses are compatible with current and projected local and regional noise conditions.
POLICY N-1.1:	Utilize established Citywide Noise Standards and guidelines to inform land use decisions and guide noise management strategies.
POLICY N-1.2:	Encourage functional and attractive designs to mitigate excessive noise levels.
POLICY N-1.4:	Protect noise sensitive land uses from excessive, unsafe, or otherwise disruptive noise levels.
GOAL N-2:	Reduce the impact of known sources of noise and vibration.
POLICY N-2.1:	Reduce noise generated from traffic, railroads, transit, and airports to the extent feasible.
POLICY N-2.2:	Minimize noise impacts from commercial and industrial facilities adjacent to residential uses or zones where residential uses are permitted.

POLICY N-2.3: Minimize the effects of intermittent, short-term, or other nuisance noise sources.

GOAL N-3: Protect sensitive land uses from airport related noise impacts.

POLICY N-3.1: Residential development within the John Wayne Airport (SNA) 65 dB(A) CNEL Noise Contour or greater is not supported.

POLICY N-3.2: Advocate that future flight path selection be directed away from existing noise sensitive land uses.

POLICY N-3.3: Require all residential land uses in 60 dB(A) CNEL or 65 dB(A) CNEL Noise Contours to be sufficiently mitigated so as not to exceed an interior standard of 45 dB(A) CNEL.

The City's Noise Element also includes standards related to excessive noise levels. The City's General Plan noise standards for noise-sensitive land uses are provided in Table 5.9-2.

Table 5.9-2: City of Santa Ana General Plan Noise Element Standards

Land Use Category	Sensitive Land Use	Noise Level (dBA CNEL)	
		Interior	Exterior
Residential	Single-family, duplex, multi family	45	65
Institutional	Hospital, school classroom/playgrounds, church, library	45	65
Open Space	Parks	--	65

Source: City of Santa Ana Noise Element

City of Santa Ana Municipal Code

Pursuant to the City's Municipal Code Section 18-313, noise levels at residential properties are restricted from exceeding certain noise levels for extended periods of time. Table 5.9-3 provides the Municipal Code exterior noise standards that are applied to residential properties.

Table 5.9-3: City of Santa Ana Municipal Code Residential Noise Standards

Time	Permissible Noise Levels (dBA)
10:00 p.m. to 7:00 a.m.	55 dB(A)
7:00 a.m. to 10:00 p.m.	50 dB(A)

Source: City of Santa Ana Municipal Code, Article VI, Section 18-312.

With respect to construction-related noise, Section 18-314 (Special Provisions) of the City's Municipal Code specifies that noise sources associated with construction activities are exempt from the City's established noise standards as long as the activities do not take place between the hours of 8:00 p.m. and 7:00 a.m. on weekdays, including Saturday, or any time on Sunday or a federal holiday.

5.9.3 ENVIRONMENTAL SETTING

Existing Noise Levels

To assess the existing noise level environment, short-term noise measurements were taken at 6 locations and 24-hour noise level measurements were taken at 4 locations, which are shown in Figure 5.9-1. A description of these locations and the existing noise levels are provided below and listed in Table 5.9-4.

Table 5.9-4: Existing Noise Measurements

Site	Location	Measurement Period	Duration	L_{eq} (dBA)
Short-Term Noise Measurements				
ST-1	1101 West Stevens Ave, near the southeast corner of the Project site	1:56 – 2:06 p.m.	10 Minutes	58.4
ST-2	3333 Bristol Street, near the southeast corner of the Project site	2:20 – 2:30 p.m.	10 Minutes	58.8
ST-3	South Coast Metro, near the southwest corner of the Project site	2:37 – 2:47 p.m.	10 Minutes	59.5
ST-4	3772 South Plaza Drive, west of the Project site	2:59 – 3:09 p.m.	10 Minutes	60.9
ST-5	3400 South Plaza Drive, near the northwest corner of the Project site	3:18 – 3:28 p.m.	10 Minutes	62.6
ST-6	1200 West MacArthur Blvd, near northeast corner of the Project site	3:38 – 3:48 p.m.	10 Minutes	71.0
Long-Term Noise Measurements				
LT-1	Northeast corner of Callen's Common and South Plaza Drive	1/18/23 to 1/19/23	24 hours	61.6 / 55.9
LT-2	Southeast corner of MacArthur Boulevard and South Plaza Drive	1/23/23 to 1/24/23	24 hours	68.0 / 63.2
LT-3	Along the west side of Bristol Street, approximately 300 feet south of MacArthur Boulevard	1/24/23 to 1/25/23	24 hours	68.2 / 65.4
LT-4	Along the west side of Bristol Street, approximately 130 feet north of Callen's Common	2/1/23 to 2/2/23	24 hours	62.2 / 59.1

Source: Acoustical Assessment, Appendix N.

In addition, existing roadway noise levels were calculated for the roadway segments in the Project vicinity. This task was accomplished using the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108) and existing traffic volumes from the proposed Project traffic analysis. The average daily noise levels along roadway segments proximate to the Project site are included in Table 5.9-5. As shown, the existing traffic-generated noise levels on Project-vicinity roadways currently range from 53.9 dBA CNEL to 69.5 dBA CNEL 100 feet from the centerline. As previously described, CNEL is 24-hour average noise level with a 5 dBA "weighting" during the hours of 7:00 p.m. to 10:00 p.m. and a 10 dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime hours.

Table 5.9-5: Existing Traffic Noise Levels

Roadway Segment	ADT	dBA CNEL
Fairview Street, between Segerstrom Avenue and MacArthur Boulevard (Santa Ana)	56,973	69.5
Fairview Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana)	54,025	64.7
Fairview Street, between Sunflower Avenue and S. Coast Drive (Costa Mesa)	48,087	67.8
Fairview Street, between S. Coast Drive and I-405 NB Ramps (Costa Mesa)	58,231	68.3
Fairview Street, between I-405 NB Ramps and I-405 SB Ramps (Costa Mesa/Caltrans)	43,770	67.1
Fairview Street, between I-405 SB Ramps and Baker Street (Costa Mesa)	48,390	67.7
Bear Street, between Segerstrom Avenue and MacArthur Boulevard (Santa Ana)	17,008	62.8
Bear Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana/Costa Mesa)	17,989	63.4
Bear Street, between Sunflower Avenue and S. Coast Drive (Costa Mesa)	29,134	65.7
Bear Street, between S. Coast Drive and Paularino Avenue (Costa Mesa)	30,398	65.7
Bear Street, between Paularino Avenue and Baker Street (Costa Mesa)	38,267	66.3
S. Plaza Drive, between MacArthur Boulevard and Callen's Common (Santa Ana)	5,308	54.3
S. Plaza Drive, between Callen's Common and Sunflower Avenue (Santa Ana)	4,843	53.9
Bristol Street, between Segerstrom Avenue and MacArthur Boulevard (Santa Ana)	44,293	67.4
Bristol Street, between MacArthur Boulevard and Callen's Common (Santa Ana)	46,145	67.7
Bristol Street, between Callen's Common and Sunflower Avenue (Santa Ana)	44,768	67.5
Bristol Street, between Sunflower Avenue and Anton Boulevard (Costa Mesa)	49,274	68.2
Bristol Street, between Anton Boulevard and I-405 NB Ramps (Costa Mesa)	56,559	69.5
Bristol Street, between I-405 NB Ramps and I-405 SB Ramps (Costa Mesa/Caltrans)	58,259	68.7
Bristol Street, between I-405 SB Ramps and Paularino Avenue (Costa Mesa)	39,269	66.7
Bristol Street, between Paularino Avenue and Baker Street (Costa Mesa)	40,662	67.1
Flower Street, between Dyer Road and MacArthur Boulevard (Santa Ana)	15,150	61.1
Flower Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana)	9,338	59.0
Main Street, between Dyer Road and MacArthur Boulevard (Santa Ana)	30,688	66.9
Main Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana)	23,929	65.8
Main Street, between Sunflower Avenue and Red Hill Avenue (Santa Ana/Irvine)	23,638	65.9
Segerstrom Avenue, between Fairview Street and Bear Street (Santa Ana)	21,253	63.9
Segerstrom Avenue, between Bear Street and Bristol Street (Santa Ana)	28,544	65.1
Segerstrom Avenue, between Bristol Street and Flower Street (Santa Ana)	23,189	64.2
Dyer Road, between Flower Street and Main Street (Santa Ana)	29,175	65.3
MacArthur Boulevard, between Fairview Street and Bear Street (Santa Ana)	31,076	65.8
MacArthur Boulevard, between Bear Street and S. Plaza Drive (Santa Ana)	37,959	66.7
MacArthur Boulevard, between S. Plaza Drive and Bristol Street (Santa Ana)	34,622	66.3
MacArthur Boulevard, between Bristol Street and Flower Street (Santa Ana)	37,835	66.6
MacArthur Boulevard, between Flower Street and Main Street (Santa Ana)	38,325	66.7
MacArthur Boulevard, between Main Street and SR-55 SB Ramps (Santa Ana)	48,923	67.8
MacArthur Boulevard, between SR-55 SB Ramps and SR-55 NB Ramps (Santa Ana/Irvine/Caltrans)	50,476	67.7
Sunflower Avenue, between Fairview Street and Bear Street (Santa Ana/Costa Mesa)	16,071	62.6
Sunflower Avenue, between Bear Street and S. Plaza Drive (Santa Ana/Costa Mesa)	28,528	65.6
Sunflower Avenue, between S. Plaza Drive and Bristol Street (Santa Ana/Costa Mesa)	27,615	65.3
Sunflower Avenue, between Bristol Street and Flower Street (Santa Ana/Costa Mesa)	21,571	65.4

Roadway Segment	**ADT**	**dBA CNEL**
Bristol Street, south of Baker Street (Santa Ana)	27,756	65.3

Source: Acoustical Assessment, Appendix N.

Noise Measurement Locations

This page intentionally left blank.

Sensitive Receptors

Sensitive receptors are generally defined as locations where people reside or where the presence of unwanted sound could otherwise adversely affect the use of the land. Noise-sensitive land uses are generally considered to include: residences, schools, hospitals, and recreation areas. Existing offsite sensitive noise receptors where someone can remain for 24-hours in the vicinity of the Project site consists of residences. The closest offsite residences are located 130 feet (40 meters) to the west of the site as listed in Table 5.9-6.

Table 5.9-6: Closest Sensitive Receptors to the Project Site

Receptor Description	Distance and Direction from the Project Site
Multi-family Residences	130 feet to the west
Multi-family Residences	292 feet to the northwest
Multi-family Residences	460 feet to the east
Bomo Koral Park	1,580 feet to the east

Source: Acoustical Assessment, Appendix N

John Wayne Airport

John Wayne Airport (SNA) is located approximately 1.4 miles southeast of the Project site, which is to the west of the primary aircraft approach corridor. The Project site is located outside of both the airport's planned and actual (2019) 60 CNEL contours (Section 5.6, *Hazards and Hazardous Materials*, Figures 5.6-2 and 5.6-3). In addition, the General Aviation Noise Ordinance restricts airport operations between 11:00 p.m. and 7:00 a.m., to limit the hours of noise generated by SNA.

5.9.4 THRESHOLDS OF SIGNIFICANCE

Appendix G of State CEQA Guidelines indicates that a project could have a significant effect if it were to result in:

NOI-1 Generation of a substantial temporary or permanent increase in ambient noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;

NOI-2 Generate excessive groundborne vibration or groundborne noise levels;

NOI-3 For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.

Construction Noise and Vibration

- The proposed Project may result in a potentially significant impact related to construction noise if Project-related construction activities:
    - Occur between the hours of 8:00 p.m. and 7:00 a.m. on weekdays, including Saturday, or any time on Sunday or a federal holiday (City of Santa Ana Municipal Code, Section 18-314(e); or
    - Create noise levels which exceeds the Federal Transit Administration (FTA) threshold of 80 dBA (8-hour Leq) for residential uses and 85 dBA (8-hour Leq) for non-residential uses to evaluate construction noise impacts. FTA's nighttime construction noise threshold (potentially needed for

Project concrete pours only) are 70 dBA (8-hour Leq) for residential uses and 85 dBA (8-hour Leq) for commercial non-residential uses.,

- The proposed Project may result in a potentially significant impact related to vibration if Project-related construction activities generate vibration levels which exceed the Caltrans building damage vibration level threshold for older residential structures of 0.2 in/sec PPV, or the distinctly perceptible human annoyance vibration level threshold of 0.04 in/sec PPV at nearby sensitive receiver locations (Caltrans Transportation and Construction Vibration Guidance Manual, Tables 19 and 20).

Offsite Traffic Noise

- The proposed Project may result in a potentially significant impact related to offsite traffic noise if the noise levels at existing and future noise-sensitive land uses (e.g., residential, etc.):
    - Are less than 60 dBA CNEL and the project creates a *readily perceptible* 5 dBA CNEL or greater project-related noise level increase; or
    - Range from 60 to 64 dBA CNEL and the project creates a *barely perceptible* 3 dBA CNEL or greater project-related noise level increase; or
    - Already exceeds 65 dBA CNEL, and the project creates a community noise level impact of greater than 1.5 dBA CNEL.

Operational Noise

- The proposed Project may result in a potentially significant operational noise impact if Project-related operational (stationary source) noise levels exceed the exterior 55 dBA daytime (7:00 a.m. to 10:00 p.m.) or 50 dBA nighttime (10:00 p.m. to 7:00 a.m.) noise level standards for sensitive residential land uses.

5.9.5 METHODOLOGY

Construction Noise

To identify the temporary construction noise contribution to the existing ambient noise environment, the construction noise levels anticipated from usage of construction equipment needed to implement the proposed Project were combined with the existing ambient noise level measurements at the sensitive receiver locations. The construction noise levels are compared against the thresholds listed previously to assess the level of significance associated with temporary construction noise level impacts.

Operational Noise

The primary source of noise associated with the operation of the proposed Project would be from vehicular trips. The expected roadway noise level increases from vehicular traffic were calculated using the Federal Highway Administration (FHWA) traffic noise prediction model and the average daily traffic volumes from the Traffic Impact Analysis prepared for the proposed Project. As detailed in Section 5.13, *Transportation,* the proposed Project is anticipated to generate a net increase of approximately 7,328 daily trips, 1,219 AM peak hour trips and 688 PM peak hour trips. The increase in noise levels generated by the vehicular trips have been quantitatively estimated and compared to the applicable noise standards and thresholds of significance listed previously.

Secondary sources of noise would include new stationary sources (such as heating, ventilation, and air conditioning units) associated with the new buildings on the Project site. The increase in noise levels generated

by these activities has been quantitatively estimated and compared to the applicable noise standards listed previously.

Vibration

Aside from noise levels, groundborne vibration would also be generated during construction of the proposed Project by various construction-related activities and equipment; and could be generated by truck traffic traveling to and from the Project site. The potential ground-borne vibration levels resulting from construction activities occurring from the proposed Project were estimated by data published by the Federal Transit Administration (FTA). Thus, the groundborne vibration levels generated by these sources have also been quantitatively estimated and compared to the applicable thresholds of significance listed previously.

5.9.6 ENVIRONMENTAL IMPACTS

Summary of Impacts Identified in the GPU FEIR

The GPU FEIR addressed impacts related to noise in Chapter 5.12. Temporary construction is expected to generate high levels of noise, ranging from maximums of 71 to 101 dBA. The City of Santa Ana noise ordinance, which restricts construction from 7:00 AM to 8:00 PM Monday through Saturday, would help limit noise disturbance. Mitigation measures listed in N-1 address construction noise related impacts. However, because construction may occur near noise-sensitive sites and may occur for prolonged periods of time, construction noise impacts would remain significant and unavoidable.

The GPU FEIR also determined that buildout of the GPU would increase local traffic, which in turn may increase noise levels past established standards. The GPU FEIR determined that there are no feasible mitigation measures to reduce project-generated traffic noise; therefore, noise impacts due to traffic are significant and unavoidable.

In addition, the GPU FEIR determined that impacts related to groundborne vibration would be less than significant with implementation of Mitigation Measures N-2 to N-4. Regarding airport noise, the GPU EIR determined that impacts would be less than significant with compliance with applicable Noise Element policies.

Proposed Specific Plan Project

IMPACT NOI-1: THE PROJECT WOULD NOT GENERATE A SUBSTANTIAL TEMPORARY OR PERMANENT INCREASE IN AMBIENT NOISE LEVELS IN THE VICINITY OF THE PROJECT IN EXCESS OF STANDARDS ESTABLISHED IN THE LOCAL GENERAL PLAN OR NOISE ORDINANCE, OR APPLICABLE STANDARDS OF OTHER AGENCIES.

Less than Significant Impact with Mitigation Incorporated.

Construction

Noise generated by construction equipment would include a combination of trucks, power tools, concrete mixers, and portable generators that when combined can reach high levels. For each Project phase, construction is expected to occur in the following stages: demolition, excavation and grading, building construction, architectural coating, paving. Project construction would not include pile driving. Buildings would use a mat foundation and any piles would be drilled and cast-in-place (i.e., not driven). Noise levels generated by heavy construction equipment can range from approximately 76 dBA to 88 dBA when measured at 50 feet, and between 67.7 dBA and 79.7 at 130 feet from the noise source, as shown on Table 5.9-7.

Table 5.9-7: Typical Construction Noise Levels

Equipment	Typical Noise Level (dBA) at 50 feet from Source	Typical Noise Level (dBA) at 130 feet from Source
Air Compressor	80	71.7
Backhoe	80	71.7
Compactor	82	73.7
Concrete Mixer	85	76.7
Concrete Pump	82	73.7
Concrete Vibrator	76	67.7
Crane, Mobile	83	74.7
Dozer	85	76.7
Generator	82	73.7
Grader	85	76.7
Impact Wrench	85	76.7
Jack Hammer	88	79.7
Loader	80	71.7
Paver	85	76.7
Pneumatic Tool	85	76.7
Pump	77	68.7
Roller	85	76.7
Saw	76	67.7
Scraper	85	76.7
Shovel	82	73.7
Truck	84	75.7

Source: Acoustical Assessment, Appendix N

However, per Section 18-314 (Special Provisions) of the City's Municipal Code, noise sources associated with construction activities are exempt from the City's established noise standards as long as the activities do not take place between the hours of 8:00 p.m. and 7:00 a.m. on weekdays, including Saturday, or any time on Sunday or a federal holiday. The proposed Project's construction activities would occur pursuant to these regulations. Thus, the proposed Project would be in compliance with the City's construction-related noise standards.

Construction noise would be temporary in nature as the operation of each piece of construction equipment would not be constant throughout the construction day, and equipment would be turned off when not in use. The typical operating cycle for a piece of construction equipment involves one or two minutes of full power operation followed by three or four minutes at lower power settings. The construction equipment would include a combination of trucks, power tools, concrete mixers, and portable generators. Also, the location of construction equipment would vary throughout the site and would not occur at a fixed location for extended periods of time. To provide a conservative evaluation, the construction noise analysis assumed simultaneous operation of the two loudest pieces of equipment closest to sensitive receptors and the remaining equipment mix at an average distance. However, construction activities would occur throughout the Project site and would not be concentrated at a single point near sensitive receptors. Further, it is unlikely that multiple pieces of equipment would operate within the same area closest to sensitive receptors during Project construction. The nature of construction is such that all equipment is not used simultaneously and not used at the same location (because equipment serves different purposes) and equipment is spread across the construction area. Because the analysis assumes that the noisiest equipment would operate concurrently at the construction boundary closest to the nearest sensitive receptor, it provides represents a conservative analysis of potential

impacts. Construction noise levels drop off at a rate of about 6 dBA per doubling of distance between the noise source and receptor.

Phase 1. Construction activity for Phase 1 would be as close as 130 feet from the closest offsite residences, and noise from Phase 1 construction at the closest nearby receiver location would range from 65.4 to 75.7 dBA Leq (as shown on Table 5.9-8), which would not exceed the 80 dba L_{eq} daytime construction noise level threshold. Therefore, construction noise impacts related to Phase 1 would be less than significant.

Table 5.9-8: Phase 1 Construction Noise Levels at Closest Offsite Sensitive Receptor

Construction Phase	Worst Case Modeled Exterior Noise Level (dBA L_{eq})	Noise Threshold (dBA L_{eq})	Exceeded?
Demolition	75.7	80	No
Site Preparation	74.2	80	No
Grading	75.4	80	No
Building Construction	73.0	80	No
Paving	74.9	80	No
Architectural Coating	65.4	80	No

Source: Acoustical Assessment, Appendix N

Phase 2. Construction activity for Phase 2 would be as close as 410 feet from the closest offsite residences. As shown on Table 5.9-9, noise from Phase 2 construction at the closest nearby receiver locations would range from 55.4 to 68.0 dBA Leq. This would not exceed the 80 dba Leq daytime construction noise level threshold. Therefore, construction noise impacts to offsite sensitive receptors related to Phase 2 would be less than significant.

Table 5.9-9: Phase 2 Construction Noise Levels at Closest Offsite Sensitive Receptor

Construction Phase	Worst Case Modeled Exterior Noise Level (dBA L_{eq})	Noise Threshold (dBA L_{eq})	Exceeded?
Demolition	67.0	80	No
Site Preparation	67.2	80	No
Grading	68.0	80	No
Building Construction	66.3	80	No
Paving	66.7	80	No
Architectural Coating	55.4	80	No

Source: Acoustical Assessment, Appendix N

In addition, Phase 2 construction would occur after Phase 1 is occupied. The onsite receptors in Phase 1 would be located as close as 130 feet away from the Phase 2 construction activity area where heavy equipment would be located. The loudest Phase 2 noise level would occur during grading and would be 75.6 dBA at the Phase 1 residences located 130 feet away, which would not exceed the 80 dBA Leq daytime construction noise level threshold at residential receiver locations. Therefore, construction noise impacts related to Phase 2 would be less than significant.

Phase 3. As shown on Table 5.9-10, construction activity for Phase 3 would be as close as 130 feet from the closest offsite residences, and noise from Phase 3 construction at the nearby receiver locations would

range from 65.4 to 75.9 dBA Leq. This would not exceed the 80 dBA Leq daytime construction noise level threshold. Therefore, construction noise impacts to offsite sensitive receptors related to Phase 3 would be less than significant.

Table 5.9-10: Phase 3 Construction Noise Levels at Closest Offsite Sensitive Receptor

Construction Phase	Worst Case Modeled Exterior Noise Level (dBA L_{eq})	Noise Threshold (dBA L_{eq})	Exceeded?
Demolition	75.9	80	No
Site Preparation	74.8	80	No
Grading	75.9	80	No
Building Construction	73.7	80	No
Paving	75.2	80	No
Architectural Coating	65.4	80	No

Source: Acoustical Assessment, Appendix N

In addition, Phase 3 construction would occur after Phase 1 and Phase 2 are occupied. The onsite receptors in Phases 1 and 2 would be located as close as 130 feet away from the Phase 3 construction activity. The loudest Phase 3 noise level would occur during demolition and grading and would be 76.5 dBA at the closest Phase 1 and Phase 2 residences located 130 feet away. Therefore, Phase 3 construction would not exceed the 80 dBA Leq daytime construction noise level threshold at residential receiver locations. Therefore, construction noise impacts related to Phase 3 would be less than significant.

Although noise generated from construction of Phases 1, 2, and 3 would be less than significant, the proposed Project would still be required to implement GPU FEIR Mitigation Measure N-1, which includes construction requirements to limit noise. Implementation of these measures would further reduce noise generated from Project construction at sensitive receptor locations.

The proposed Project would result in less impacts than the construction noise impacts that were identified in the GPU FEIR, which were identified as potentially significant. Therefore, construction noise impacts related to the proposed Project would not exceed those previously identified.

Offsite Construction Noise. During Phase 1 construction, offsite improvements would also occur in the rights-of-way adjacent to the Project site. The offsite improvements include the installation and upgrade of water, stormwater, and sewer utilities, as well as roadway improvements that include sidewalks, bicycle facilities, landscaping, intersection improvements, median reconstruction, etc. The offsite improvements would include excavators, loaders, and trucks during pavement demolition and trenching activities and pavers, rollers, and loaders for paving activities.

Because offsite construction would occur within roadways, equipment would move linearly and would not operate in a fixed location for extended durations. The distance assumptions for offsite construction noise represent the worst-case noise scenario because construction activities would typically not be located near a sensitive receptor for the entire construction period. In addition, construction noise levels are not constant, and in fact, construction activities and associated noise levels would fluctuate and generally be brief and sporadic, depending on the type, intensity, and location of construction activities. Construction noise would also be acoustically dispersed and would be masked by surrounding roadway noise. Table 5.9-11 shows that the proposed Project's offsite construction noise would not exceed the FTA's standard. Additionally, when the worst-case offsite noise level (77.4 dBA during demolition) is combined with the worst-case onsite construction noise level (75.7 dBA during Phase 1 demolition), noise levels would be 79.6 dBA, which is below

the FTA's 80 dBA standard. Therefore, construction noise impacts from offsite improvements would be less than significant. In addition, GPU FEIR Mitigation Measure N-1, which includes construction requirements to limit noise would be required to be implemented, which would further reduce noise generated from proposed Project construction at sensitive receptor locations.

Table 5.9-11: Offsite Project Improvements Construction Noise Levels

Construction Phase	Offsite Receptor Location		Worst Case Modeled Exterior Noise Level (dBA L_{eq})	Noise Threshold (dBA L_{eq})	Exceeded?
	Direction	Distance (feet)			
Demolition	Northwest	75	77.4	80	No
Trenching	Northwest	75	76.4	80	No
Paving	Northwest	75	75.4	80	No

Source: Acoustical Assessment, Appendix N

Actual construction-related noise activities would be lower than the conservative levels described above and would cease upon completion of construction. Due to the variability of construction activities and equipment for the proposed Project, overall construction noise levels would be intermittent and would fluctuate over time. In addition, the noise modeling assumes that construction noise is constant, when, in fact, construction activities and associated noise levels would fluctuate and generally be brief and sporadic, depending on the type, intensity, and location of construction activities.

Nighttime Concrete Pour Construction Noise. The proposed Project could include nighttime concrete pour activities. The nighttime concrete pours would use the following construction equipment: concrete mixer trucks, concrete pump truck, concrete vibrator, generator, trucks, and air compressors. Table 5.9-12 shows that construction noise associated with nighttime concrete pours would be up to 71.0 dBA at the closest offsite sensitive receptors. Therefore, nighttime construction noise would exceed FTA's nighttime threshold of 70 dBA at offsite sensitive receptors and Project Mitigation Measure NOI-1 has been included to require enclosures for stationary (e.g., generators, air compressors, etc.) concrete pour equipment and buffer distances for mobile equipment (including concrete trucks) to minimize nighttime construction noise. Enclosures would muffle noise from stationary equipment and minimum buffer distances would ensure mobile equipment operates at a sufficient distance to attenuate noise levels. Table 5.9-12 shows that with implementation of GPU FEIR Mitigation Measure N-1 and Project Mitigation Measure NOI-1, impacts related to nighttime concrete pour activities at offsite sensitive receptors would be less than significant.

Table 5.9-12: Nighttime Concrete Pour Construction Noise Levels

Construction Phase	Closest Receptor Location		Worst-Case Modeled Exterior Noise Level (dBA L_{eq})		Noise Threshold (dBA L_{eq})	Exceeded with Mitigation?
	Direction	Distance (feet)	Unmitigated	Mitigated		
Phase 1 Offsite	Northwest	130	70.3	69.5	70	No
Phase 2 Offsite	West	410	63.9	N/A	70	No
Phase 3 Offsite	West	130	71.0	69.7	70	No
Phase 2 (Phase 1 Onsite Receptors)	South	130	70.6	69.8	70	No
Phase 3 (Phase 1 Onsite Receptors)	West	130	71.9	69.8	70	No

Source: Acoustical Assessment, Appendix N

As noted above, subsequent phase construction would occur while completed phases are occupied. Future onsite receptors would be located as close as 130 feet away from subsequent phase construction. The loudest nighttime concrete pour noise levels at the closest onsite sensitive receptors would potentially be 70.6 dBA during Phase 2 and 71.9 dBA during Phase 3. Nighttime construction would be limited to brief periods when nighttime concrete pours would be necessary. As shown in Table 5.9-12 with implementation of GPU FEIR Mitigation Measure N-1 and Project Mitigation Measure NOI-1, impacts to onsite sensitive receptors related to nighttime concrete pour construction activities would be less than significant. Therefore, impacts would be less than significant with mitigation incorporated.

Construction Traffic Noise. Construction noise would be generated by large trucks moving materials to and from the Project site. The proposed Project would include demolition of existing buildings. Grading would require approximately 640,550 cubic yards of export for Phase 1; approximately 214,906 cubic yards of export for Phase 2; and approximately 484,869 cubic yards of export for Phase 3, which would result in approximately 80,069, 26,863, and 60,609 roundtrip truck hauling trips, respectively. Building construction would result in approximately 2,019 worker trips per day in Phase 1, 961 worker trips per day in Phase 2, and 1,649 worker trips per day in Phase 3 during the building construction stage of each phase.

Noise generated from construction traffic would increase short-term noise; however, these noise levels are temporary and would cease once construction is complete. The trucks associated with construction would occur during the allowable hours for construction specified in the Municipal Code (7:00 a.m. to 8:00 p.m. on weekdays and Saturdays). Trucks (including trucks hauling excavated material) would also occur during the allowable daytime hours only. Delivery trucks, haul trucks, and worker vehicles associated with the construction of the proposed Project would vary from day to day, with the highest volumes generally occurring during construction initiation. The proposed Project's offsite construction traffic noise impact was analyzed by using the FHWA RD-77-108 model to quantify noise from the proposed Project's construction trips with existing traffic noise levels along the potential haul routes (i.e., Bristol Street, MacArthur Boulevard, and Sunflower Avenue) and the location of sensitive receptors. Table 5.9-13 lists the predicted noise levels at nearby roadway segments near the Project site. Table 5.9-13 shows that construction traffic noise levels would not exceed the 85 dBA construction thresholds for commercial uses (soil hauling would not occur along residential streets) and roadway noise levels would not increase ambient noise levels above the perceptible range (3.0 dBA) for any of the construction phases. Therefore, a less than significant impact would occur. Additionally, the GPU FEIR Mitigation Measure N-1 requires construction traffic use City approved haul routes to the extent feasible. Thus, ensuring that construction traffic would not use residential roadways.

Table 5.9-13: Construction Traffic Noise Levels

Roadway Segment	Without Construction		With Construction		Change	Threshold	Significant Impact?
	ADT	dBA CNEL	ADT	dBA CNEL			
Phase 1							
Bristol Street, between MacArthur Boulevard and Callen's Common (Santa Ana)	46,145	67.7	49,074	69.3	1.6	85	No
Bristol Street, between Callen's Common and Sunflower Avenue (Santa Ana)	44,768	67.5	47,697	69.1	1.7	85	No
Bristol Street, between Sunflower Avenue and Anton Boulevard (Costa Mesa)	49,274	68.2	52,203	69.7	1.5	85	No
Bristol Street, between Anton Boulevard and I-405 NB Ramps (Costa Mesa)	56,559	69.5	59,488	70.9	1.4	85	No
Bristol Street, between I-405 NB Ramps and I-405 SB Ramps (Costa Mesa/Caltrans)	58,259	68.7	61,188	70.1	1.3	85	No

Roadway Segment	Without Construction		With Construction		Change	Threshold	Significant Impact?
	ADT	dBA CNEL	ADT	dBA CNEL			
MacArthur Boulevard, between S. Plaza Drive and Bristol Street (Santa Ana)	34,622	66.3	37,551	68.3	2.1	85	No
Sunflower Avenue, between S. Plaza Drive and Bristol Street (Santa Ana/Costa Mesa)	27,615	65.3	30,544	67.8	2.5	85	No
Phase 2							
Bristol Street, between MacArthur Boulevard and Callen's Common (Santa Ana)	51,586	68	52,954	68.9	0.7	85	No
Bristol Street, between Callen's Common and Sunflower Avenue (Santa Ana)	50,098	68	51,466	68.7	0.8	85	No
Bristol Street, between Sunflower Avenue and Anton Boulevard (Costa Mesa)	55,366	69	56,734	69.4	0.7	85	No
Bristol Street, between Anton Boulevard and I-405 NB Ramps (Costa Mesa)	66,204	70	67,572	70.8	0.6	85	No
Bristol Street, between I-405 NB Ramps and I-405 SB Ramps (Costa Mesa/Caltrans)	66,353	69	67,721	69.9	0.6	85	No
MacArthur Boulevard, between S. Plaza Drive and Bristol Street (Santa Ana)	38,095	67	39,463	67.6	1.0	85	No
Sunflower Avenue, between S. Plaza Drive and Bristol Street (Santa Ana/Costa Mesa)	31,199	66	32,567	67.0	1.1	85	No
Phase 3							
Bristol Street, between MacArthur Boulevard and Callen's Common (Santa Ana)	52,509	68.2	55,076	69.7	1.5	85	No
Bristol Street, between Callen's Common and Sunflower Avenue (Santa Ana)	50,994	68.0	53,561	69.5	1.5	85	No
Bristol Street, between Sunflower Avenue and Anton Boulevard (Costa Mesa)	56,351	68.7	58,918	70.1	1.4	85	No
Bristol Street, between Anton Boulevard and I-405 NB Ramps (Costa Mesa)	67,335	70.2	69,902	71.4	1.2	85	No
Bristol Street, between I-405 NB Ramps and I-405 SB Ramps (Costa Mesa/Caltrans)	67,518	69.4	70,085	70.6	1.2	85	No
MacArthur Boulevard, between S. Plaza Drive and Bristol Street (Santa Ana)	38,787	66.7	41,354	68.6	1.9	85	No
Sunflower Avenue, between S. Plaza Drive and Bristol Street (Santa Ana/Costa Mesa)	31,752	65.9	34,319	68.1	2.2	85	No

Source: Acoustical Assessment, Appendix N
ADT = average daily traffic; dBA = A-weighted decibels; CNEL = community noise equivalent level

Operation

Onsite Operational Noise Sources

Once the proposed Project is operational, noise levels generated at the Project site would occur from stationary equipment such as heating, ventilation, and air conditioning (HVAC) units that would be installed for the new development, use of parking facilities, trash removal activity, and activity at outdoor gathering areas, landscape maintenance activities, and parking lot activities. As described previously, there are residences in the vicinity of the Project site and the proposed Project would develop onsite residences, which would be sensitive receivers.

Mechanical Equipment. The Project site is located near residential properties to the west, northwest, and east, while properties to the southwest, south, and southeast are primarily commercial. The nearest sensitive receptors to the Project site are residences approximately 130 feet west of the proposed Project's western

boundary. Potential stationary noise sources related to long-term operation of the Project site would include mechanical equipment. Mechanical equipment (e.g., heating ventilation and air conditioning [HVAC] equipment) typically generates noise levels of approximately 52 dBA at 50 feet. At the closest sensitive receptor, approximately 130 feet away, mechanical equipment noise levels would attenuate to 43.7 dBA, which is below the City's ambient noise standards of 55 dBA for residential receptors and below the measured ambient levels ranging from 58.4 to 71.0 dBA (refer to Table 5.9-4). Operation of mechanical equipment would not increase ambient noise levels beyond the acceptable compatible land use noise levels. Therefore, the proposed Project would result in a less than significant impact related to stationary noise levels.

Open Spaces and Plazas. The proposed Project includes open spaces and plazas that could generate noise from people gathering (i.e., crowds) or from amplified music. Crowd noise from special events at the Project site could be audible at the nearest noise-sensitive receptors (i.e., residences approximately 130 feet to the west). The plazas and open spaces would be located at the proposed Project's interior of the site approximately 350 feet from sensitive receptors, and surrounded by proposed buildings that would shield sound from traveling offsite and provide at least 15 dBA of noise attenuation.

Crowd noise is dependent on various factors including vocal effort, impulsiveness, and the random orientation of the crowd members. Crowd noise is estimated at 60 dBA at one meter (3.28 feet) away for raised normal speaking. This noise level would have a +5 dBA adjustment for the impulsiveness of the noise source, and a -3 dBA adjustment for the random orientation of the crowd members. Therefore, crowd noise would be approximately 62 dBA at one meter from the source. Crowd noise at the nearest noise-sensitive receptors (residences to the west) would be approximately 18 dBA, without including attenuation from surrounding buildings.

Special events at the plazas/open spaces could involve amplified live or recorded music. Amplified music is typically 88 dBA at 20 feet. Noise levels from amplified music at the nearest noise-sensitive receptors (residences approximately 350 feet west of the plazas) would be 63 dBA. With inclusion of the noise reduction from shielding of the surrounding Project buildings, the noise would attenuate to 48 dBA. As such, crowd and music would not exceed the City's 55 dBA noise standard and would be below the measured ambient levels ranging from 58.4 to 71.0 dBA (refer to Table 5.9-4). Therefore, noise impacts from crowds/amplified music would be less than significant.

Landscape Maintenance Activities. Operation of the proposed Project includes maintenance of the landscaping that would be onsite and adjacent to the site in the roadway rights-of-way. Noise generated by a gasoline-powered lawnmower is estimated to be approximately 64.4 dBA at 50 feet. Maintenance activities would operate during daytime hours for brief periods of time as allowed by the City of Santa Ana Municipal Code and would not permanently increase ambient noise levels in the area and would be consistent with activities that currently occur at the surrounding uses as well as landscape maintenance associated with the existing onsite shopping center.

The closest sensitive receptor to the Project site is residences located approximately 130 feet to the west. At this distance, a gasoline-powered lawnmower noise level would be attenuated to 56.1 dBA. The minimum ambient noise level is 58.4 dBA; therefore, a gasoline-powered lawnmower noise level of 56.1 dBA is less than the ambient noise levels and would not represent a noticeable noise level increase. Furthermore, it should be noted that Mitigation Measure AQ-5 in Section 5.1, *Air Quality*, requires electric landscape equipment. Electric landscape equipment is approximately 10 to 20 dBA quieter than gasoline-powered equipment. Therefore, the landscape maintenance noise levels discussed above are conservative and the proposed Project would result in a less than significant impact related to landscape maintenance noise levels.

Parking Noise. The proposed Project would provide onsite parking in subterranean and at-grade/above-grade parking garages. There would be up to two levels of subterranean parking in Phase 1 and one level of subterranean parking in Phase 2 and Phase 3. Additionally, there would be some on-street parking throughout the Project site.

Traffic associated with parking lots is typically not of sufficient volume to exceed community noise standards, which are based on a time-averaged scale such as the CNEL scale. The instantaneous maximum sound levels generated by a car door slamming, engine starting up, and car pass-bys range from 53 to 61 dBA. Conversations in parking areas may also be an annoyance to adjacent sensitive receptors. Sound levels of speech typically range from 33 dBA at 50 feet for normal speech to 50 dBA at 50 feet for very loud speech. Parking lot noises are instantaneous noise levels compared to noise standards in the hourly Leq metric, which are averaged over the entire duration of a time period. As a result, actual noise levels from parking lot activities would be far lower than the reference levels identified herein.

Based on the peak hour trip generation rates in Section 5.13, *Transportation*, for Phase 1, Phase 2, and Phase 3 combined, using the FTA's reference noise level of 92 dBA SEL at 50 feet from the noise source, the Project's highest peak hour vehicle trips would generate noise levels of approximately 59 dBA Leq at 50 feet from the parking lot. The nearest offsite residential property is 130 feet west of the Project site. Based strictly on distance attenuation and not including sound reduction from intervening structures, parking lot noise at the nearest receptor would be 50.7 dBA which is below the City's residential and non-residential noise standards of 55 dBA and below the measured ambient levels ranging from 58.4 to 71.0 dBA (refer to Table 5.9-4). Therefore, noise impacts from parking lot activities would be less than significant.

Offsite Traffic Operational Noise

The proposed Project would generate traffic-related noise from operation. As described previously, the proposed Project would provide vehicular access to the site from the adjacent roadways through new driveways that would include: four unsignalized right-turn only driveways and one unsignalized full-access driveway along South Plaza Drive, two unsignalized right-turn only driveways along MacArthur Boulevard, three unsignalized right-turn only driveways along Bristol Street (one of which would be truck driveway), two signalized driveways on Bristol Street, and two unsignalized right-turn only driveways and one signalized driveway along Sunflower Avenue. To identify the potential of traffic from the proposed Project to generate noise impacts, modeling of vehicular noise on area roadways was conducted by the Acoustical Assessment (Appendix N). The following discussion provides a summary of the traffic noise levels for the study area roadway segments in the without and with proposed Project conditions.

Phase 1 Traffic Noise. As shown in Table 5.9-14, roadway noise levels without the proposed Project would range from 54.2 dBA CNEL to 70.2 dBA CNEL and with the Project between 54.5 dBA CNEL and 70.3 dBA CNEL. Therefore, Project-generated traffic would result in a maximum increase of 0.4 dBA. In general, a 3-dBA increase in traffic noise is barely perceptible to people, while a 5-dBA increase is readily noticeable. Table 5.9-14 shows that none of the roadway segments would exceed both 3.0 dBA and the applicable normally acceptable land use compatibility standard for increases in traffic noise (greater than 1.5 dBA increase for ambient noise environments of 65 dBA CNEL and higher; greater than 3 dBA increase for ambient noise environments of 60 to 64 CNEL; and greater than 5 dBA increase for ambient noise environments of less than 60 dBA CNEL). Therefore, Phase 1 traffic noise would result in a less than significant impact.

Table 5.9-14: Phase 1 Operational Traffic Noise Levels

Roadway Segment	2030 Without Project		2030 With Project		Change	Normally Acceptable Standard	Significant Impact?
	ADT	dBA CNEL	ADT	dBA CNEL			
Fairview Street, between Segerstrom Avenue and MacArthur Boulevard (Santa Ana)	62,900	69.9	62,925	69.9	0.0	65	No
Fairview Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana)	59,954	65.2	59,979	65.2	0.0	65	No
Fairview Street, between Sunflower Avenue and S. Coast Drive (Costa Mesa)	53,444	68.3	53,475	68.3	0.0	60	No
Fairview Street, between S. Coast Drive and I-405 NB Ramps (Costa Mesa)	63,912	68.7	63,952	68.7	0.0	60	No
Fairview Street, between I-405 NB Ramps and I-405 SB Ramps (Costa Mesa/Caltrans)	48,214	67.5	48,254	67.5	0.0	60	No
Fairview Street, between I-405 SB Ramps and Baker Street (Costa Mesa)	53,203	68.1	53,243	68.1	0.0	60	No
Bear Street, between Segerstrom Avenue and MacArthur Boulevard (Santa Ana)	18,369	63.2	18,433	63.2	0.0	65	No
Bear Street, between MacArthur Blvd and Sunflower Avenue (Santa Ana/Costa Mesa)	19,428	63.7	19,453	63.8	0.0	60	No
Bear Street, between Sunflower Avenue and S. Coast Drive (Costa Mesa)	31,465	66.0	31,963	66.1	0.1	67.5	No
Bear Street, between S. Coast Drive and Paularino Avenue (Costa Mesa)	33,197	66.0	33,688	66.1	0.1	60	No
Bear Street, between Paularino Avenue and Baker Street (Costa Mesa)	41,750	66.7	41,997	66.7	0.0	60	No
S. Plaza Drive, between MacArthur Boulevard and Callen's Common (Santa Ana)	5,733	54.6	6,267	55.0	0.4	65	No
S. Plaza Drive, between Callen's Common and Sunflower Avenue (Santa Ana)	5,230	54.2	5,559	54.5	0.3	65	No
Bristol Street, between Segerstrom Avenue and MacArthur Boulevard (Santa Ana)	49,501	67.8	49,980	67.9	0.0	65	No
Bristol Street, between MacArthur Boulevard and Callen's Common (Santa Ana)	51,586	68.1	53,000	68.3	0.1	65	No
Bristol Street, between Callen's Common and Sunflower Avenue (Santa Ana)	50,098	67.9	51,128	68.0	0.1	65	No
Bristol Street, between Sunflower Avenue and Anton Boulevard (Costa Mesa)	55,366	68.7	57,176	68.8	0.1	67.5	No
Bristol Street, between Anton Boulevard and I-405 NB Ramps (Costa Mesa)	66,204	70.2	68,014	70.3	0.1	67.5	No
Bristol Street, between I-405 NB Ramps and I-405 SB Ramps (Costa Mesa/Caltrans)	66,353	69.3	67,767	69.4	0.1	67.5	No
Bristol Street, between I-405 SB Ramps and Paularino Avenue (Costa Mesa)	43,442	67.1	43,669	67.1	0.0	67.5	No
Bristol Street, between Paularino Avenue and Baker Street (Costa Mesa)	44,946	67.5	45,173	67.6	0.0	67.5	No
Flower Street, between Dyer Road and MacArthur Boulevard (Santa Ana)	16,661	61.5	16,724	61.5	0.0	65	No
Flower Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana)	10,384	59.5	10,409	59.5	0.0	65	No
Main Street, between Dyer Road and MacArthur Boulevard (Santa Ana)	34,075	67.3	34,100	67.3	0.0	65	No

Roadway Segment	2030 Without Project		2030 With Project		Change	Normally Acceptable Standard	Significant Impact?
	ADT	dBA CNEL	ADT	dBA CNEL			
Main Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana)	26,921	66.3	26,946	66.3	0.0	65	No
Main Street, between Sunflower Avenue and Red Hill Avenue (Santa Ana/Irvine)	26,725	66.5	26,919	66.5	0.0	60	No
Segerstrom Avenue, between Fairview Street and Bear Street (Santa Ana)	23,274	64.3	23,363	64.3	0.0	65	No
Segerstrom Avenue, between Bear Street and Bristol Street (Santa Ana)	31,149	65.5	31,174	65.5	0.0	65	No
Segerstrom Avenue, between Bristol Street and Flower Street (Santa Ana)	25,316	64.6	25,422	64.6	0.0	65	No
Dyer Road, between Flower Street and Main Street (Santa Ana)	31,781	65.6	31,887	65.6	0.0	65	No
MacArthur Boulevard, between Fairview Street and Bear Street (Santa Ana)	34,265	66.2	34,376	66.2	0.0	65	No
MacArthur Boulevard, between Bear Street and S. Plaza Drive (Santa Ana)	41,699	67.1	41,821	67.1	0.0	65	No
MacArthur Boulevard, between S. Plaza Drive and Bristol Street (Santa Ana)	38,095	66.7	38,140	66.7	0.0	65	No
MacArthur Boulevard, between Bristol Street and Flower Street (Santa Ana)	41,462	67.0	42,441	67.1	0.1	65	No
MacArthur Boulevard, between Flower Street and Main Street (Santa Ana)	41,852	67.1	42,768	67.2	0.1	65	No
MacArthur Boulevard, between Main Street and SR-55 SB Ramps (Santa Ana)	54,572	68.3	55,488	68.4	0.1	65	No
MacArthur Boulevard, between SR-55 SB Ramps and SR-55 NB Ramps (Santa Ana/ Irvine/ Caltrans)	55,605	68.1	56,159	68.2	0.0	60	No
Sunflower Avenue, between Fairview Street and Bear Street (Santa Ana/Costa Mesa)	18,732	63.3	18,991	63.4	0.1	60	No
Sunflower Avenue, between Bear Street and S. Plaza Drive (Santa Ana/Costa Mesa)	32,185	66.1	32,716	66.2	0.1	65	No
Sunflower Avenue, between S. Plaza Drive and Bristol Street (Santa Ana/Costa Mesa)	31,199	65.8	32,428	66.0	0.2	65	No
Sunflower Avenue, between Bristol Street and Flower Street (Santa Ana/Costa Mesa)	25,581	66.1	25,775	66.1	0.0	65	No
Bristol Street, south of Baker Street (Santa Ana)	30,901	65.8	31,128	65.8	0.0	65	No

Source: Acoustical Assessment, Appendix N
ADT = average daily traffic; dBA = A-weighted decibels; CNEL = community noise equivalent level

Phase 2 Traffic Noise. As shown in Table 5.9-15, roadway noise levels without the proposed Project would range from 54.3 dBA CNEL to 70.2 dBA CNEL and with Phase 2 of the proposed Project would range between 54.6 dBA CNEL and 70.4 dBA CNEL. Thus, Project-generated traffic would result in a maximum increase of 0.5 dBA. Table 4.9-15 shows that none of the roadway segments would exceed the City's standards for increases in traffic noise (greater than 1.5 dBA increase for ambient noise environments of 65 dBA CNEL and higher; greater than 3 dBA increase for ambient noise environments of 60 to 64 CNEL; and greater than 5 dBA increase for ambient noise environments of less than 60 dBA CNEL). Therefore, Phase 2 traffic noise would result in a less than significant impact.

Table 5.9-15: Phase 2 Operational Traffic Noise Levels

Roadway Segment	2032 Without Project		2032 With Project		Change	Normally Acceptable Standard	Significant Impact?
	ADT	dBA CNEL	ADT	dBA CNEL			
Fairview Street, between Segerstrom Avenue and MacArthur Boulevard (Santa Ana)	64,039	70.0	64,064	70.0	0.0	65	No
Fairview Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana)	61,035	65.3	61,060	65.3	0.0	65	No
Fairview Street, between Sunflower Avenue and S. Coast Drive (Costa Mesa)	54,406	68.4	54,470	68.4	0.0	60	No
Fairview Street, between S. Coast Drive and I-405 NB Ramps (Costa Mesa)	65,077	68.8	65,184	68.8	0.0	60	No
Fairview Street, between I-405 NB Ramps and I-405 SB Ramps (Costa Mesa/Caltrans)	49,089	67.6	49,196	67.6	0.0	60	No
Fairview Street, between I-405 SB Ramps and Baker Street (Costa Mesa)	54,171	68.2	54,278	68.2	0.0	60	No
Bear Street, between Segerstrom Avenue and MacArthur Boulevard (Santa Ana)	18,709	63.2	18,876	63.3	0.0	65	No
Bear Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana/Costa Mesa)	19,788	63.8	19,813	63.8	0.0	60	No
Bear Street, between Sunflower Avenue and S. Coast Drive (Costa Mesa)	32,047	66.1	32,615	66.1	0.1	67.5	No
Bear Street, between S. Coast Drive and Paularino Avenue (Costa Mesa)	33,805	66.1	34,332	66.2	0.1	60	No
Bear Street, between Paularino Avenue and Baker Street (Costa Mesa)	42,516	66.8	42,799	66.8	0.0	60	No
S. Plaza Drive, between MacArthur Boulevard and Callen's Common (Santa Ana)	5,839	54.7	6,522	55.2	0.5	65	No
S. Plaza Drive, between Callen's Common and Sunflower Avenue (Santa Ana)	5,327	54.3	5,761	54.6	0.3	65	No
Bristol Street, between Segerstrom Avenue and MacArthur Boulevard (Santa Ana)	50,387	67.9	51,395	68.0	0.1	65	No
Bristol Street, between MacArthur Boulevard and Callen's Common (Santa Ana)	52,509	68.2	55,126	68.4	0.2	65	No
Bristol Street, between Callen's Common and Sunflower Avenue (Santa Ana)	50,994	68.0	53,300	68.2	0.2	65	No
Bristol Street, between Sunflower Avenue and Anton Boulevard (Costa Mesa)	56,351	68.7	59,268	69.0	0.2	67.5	No
Bristol Street, between Anton Boulevard and I-405 NB Ramps (Costa Mesa)	67,335	70.2	70,252	70.4	0.2	67.5	No
Bristol Street, between I-405 NB Ramps and I-405 SB Ramps (Costa Mesa/Caltrans)	67,518	69.4	69,802	69.5	0.1	67.5	No
Bristol Street, between I-405 SB Ramps and Paularino Avenue (Costa Mesa)	44,227	67.2	44,616	67.2	0.0	67.5	No
Bristol Street, between Paularino Avenue and Baker Street (Costa Mesa)	45,759	67.6	46,148	67.7	0.0	67.5	No
Flower Street, between Dyer Road and MacArthur Boulevard (Santa Ana)	16,964	61.6	17,130	61.6	0.0	65	No
Flower Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana)	10,571	59.5	10,596	59.5	0.0	65	No
Main Street, between Dyer Road and MacArthur Boulevard (Santa Ana)	34,689	67.4	34,714	67.4	0.0	65	No

Roadway Segment	2032 Without Project		2032 With Project		Change	Normally Acceptable Standard	Significant Impact?
	ADT	dBA CNEL	ADT	dBA CNEL			
Main Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana)	27,400	66.4	27,425	66.4	0.0	65	No
Main Street, between Sunflower Avenue and Red Hill Avenue (Santa Ana/Irvine)	27,198	66.6	27,554	66.6	0.1	60	No
Segerstrom Avenue, between Fairview Street and Bear Street (Santa Ana)	23,699	64.3	23,994	64.4	0.1	65	No
Segerstrom Avenue, between Bear Street and Bristol Street (Santa Ana)	31,719	65.6	31,847	65.6	0.0	65	No
Segerstrom Avenue, between Bristol Street and Flower Street (Santa Ana)	25,780	64.7	25,989	64.7	0.0	65	No
Dyer Road, between Flower Street and Main Street (Santa Ana)	32,365	65.7	32,574	65.7	0.0	65	No
MacArthur Boulevard, between Fairview Street and Bear Street (Santa Ana)	34,887	66.3	35,174	66.3	0.0	65	No
MacArthur Boulevard, between Bear Street and S. Plaza Drive (Santa Ana)	42,458	67.1	42,859	67.2	0.0	65	No
MacArthur Boulevard, between S. Plaza Drive and Bristol Street (Santa Ana)	38,787	66.7	39,373	66.8	0.1	65	No
MacArthur Boulevard, between Bristol Street and Flower Street (Santa Ana)	42,219	67.1	44,259	67.3	0.2	65	No
MacArthur Boulevard, between Flower Street and Main Street (Santa Ana)	42,619	67.2	44,494	67.3	0.2	65	No
MacArthur Boulevard, between Main Street and SR-55 SB Ramps (Santa Ana)	55,550	68.4	57,425	68.5	0.1	65	No
MacArthur Boulevard, between SR-55 SB Ramps and SR-55 NB Ramps (Santa Ana/Irvine/Caltrans)	56,615	68.2	57,729	68.3	0.1	60	No
Sunflower Avenue, between Fairview Street and Bear Street (Santa Ana/Costa Mesa)	19,053	63.4	19,345	63.4	0.1	60	No
Sunflower Avenue, between Bear Street and S. Plaza Drive (Santa Ana/Costa Mesa)	32,756	66.2	33,390	66.3	0.1	65	No
Sunflower Avenue, between S. Plaza Drive and Bristol Street (Santa Ana/Costa Mesa)	31,752	65.9	32,979	66.1	0.2	65	No
Sunflower Avenue, between Bristol Street and Flower Street (Santa Ana/Costa Mesa)	26,012	66.2	26,368	66.2	0.1	65	No
Bristol Street, south of Baker Street (Santa Ana)	31,457	65.9	31,846	65.9	0.1	65	No

Source: Acoustical Assessment, Appendix N
ADT = average daily traffic; dBA = A-weighted decibels; CNEL = community noise equivalent level

Phase 3 Traffic Noise. As shown in Table 5.9-16, roadway noise levels without the proposed Project would range from 54.6 dBA CNEL to 70.4 dBA CNEL and with Phase 3 of the proposed Project would range between 55.0 dBA CNEL and 70.6 dBA CNEL. Project generated traffic would result in a maximum increase of 0.4 dBA, which is less than the 3-dBA increase that is barely perceptible to people. Table 5.9-16 also shows that none of the roadway segments would exceed the City's standards for increases in traffic noise (greater than 1.5 dBA increase for ambient noise environments of 65 dBA CNEL and higher; greater than 3 dBA increase for ambient noise environments of 60 to 64 CNEL; and greater than 5 dBA increase for ambient noise environments of less than 60 dBA CNEL). Therefore, Phase 3 traffic noise would result in a less than significant impact.

Table 5.9-16: Phase 3 Operational Traffic Noise Levels

Roadway Segment	2036 Without Project		2036 With Project		Change	Normally Acceptable Standard	Significant Impact?
	ADT	dBA CNEL	ADT	dBA CNEL			
Fairview Street, between Segerstrom Avenue and MacArthur Boulevard (Santa Ana)	66,318	70.2	66,343	70.2	0.0	65	No
Fairview Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana)	63,196	65.4	63,221	65.4	0.0	65	No
Fairview Street, between Sunflower Avenue and S. Coast Drive (Costa Mesa)	56,339	68.5	56,403	68.5	0.0	60	No
Fairview Street, between S. Coast Drive and I-405 NB Ramps (Costa Mesa)	67,391	69.0	67,443	69.0	0.0	60	No
Fairview Street, between I-405 NB Ramps and I-405 SB Ramps (Costa Mesa/Caltrans)	50,825	67.8	50,877	67.8	0.0	60	No
Fairview Street, between I-405 SB Ramps and Baker Street (Costa Mesa)	56,092	68.3	56,144	68.3	0.0	60	No
Bear Street, between Segerstrom Avenue and MacArthur Boulevard (Santa Ana)	19,327	63.4	19,352	63.4	0.0	65	No
Bear Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana/Costa Mesa)	20,320	63.9	20,345	63.9	0.0	60	No
Bear Street, between Sunflower Avenue and S. Coast Drive (Costa Mesa)	33,258	66.2	33,718	66.3	0.1	67.5	No
Bear Street, between S. Coast Drive and Paularino Avenue (Costa Mesa)	35,091	66.3	35,564	66.3	0.1	60	No
Bear Street, between Paularino Avenue and Baker Street (Costa Mesa)	44,069	66.9	44,298	67.0	0.0	60	No
S. Plaza Drive, between MacArthur Boulevard and Callen's Common (Santa Ana)	6,314	55.0	6,742	55.3	0.3	65	No
S. Plaza Drive, between Callen's Common and Sunflower Avenue (Santa Ana)	5,744	54.6	6,242	55.0	0.4	65	No
Bristol Street, between Segerstrom Avenue and MacArthur Boulevard (Santa Ana)	52,195	68.1	53,086	68.1	0.1	65	No
Bristol Street, between MacArthur Boulevard and Callen's Common (Santa Ana)	54,449	68.4	57,194	68.6	0.2	65	No
Bristol Street, between Callen's Common and Sunflower Avenue (Santa Ana)	52,880	68.2	55,336	68.4	0.2	65	No
Bristol Street, between Sunflower Avenue and Anton Boulevard (Costa Mesa)	59,000	68.9	62,422	69.2	0.2	67.5	No
Bristol Street, between Anton Boulevard and I-405 NB Ramps (Costa Mesa)	70,275	70.4	73,697	70.6	0.2	67.5	No
Bristol Street, between I-405 NB Ramps and I-405 SB Ramps (Costa Mesa/Caltrans)	70,211	69.5	72,873	69.7	0.2	67.5	No
Bristol Street, between I-405 SB Ramps and Paularino Avenue (Costa Mesa)	45,846	67.3	46,231	67.4	0.0	67.5	No
Bristol Street, between Paularino Avenue and Baker Street (Costa Mesa)	47,434	67.8	47,819	67.8	0.0	67.5	No
Flower Street, between Dyer Road and MacArthur Boulevard (Santa Ana)	17,530	61.7	17,587	61.7	0.0	65	No
Flower Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana)	10,944	59.7	10,969	59.7	0.0	65	No
Main Street, between Dyer Road and MacArthur Boulevard (Santa Ana)	35,916	67.5	35,941	67.5	0.0	65	No

Roadway Segment	2036 Without Project		2036 With Project		Change	Normally Acceptable Standard	Significant Impact?
	ADT	dBA CNEL	ADT	dBA CNEL			
Main Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana)	28,357	66.5	28,382	66.5	0.0	65	No
Main Street, between Sunflower Avenue and Red Hill Avenue (Santa Ana/Irvine)	28,191	66.7	28,543	66.8	0.1	60	No
Segerstrom Avenue, between Fairview Street and Bear Street (Santa Ana)	24,468	64.5	24,545	64.5	0.0	65	No
Segerstrom Avenue, between Bear Street and Bristol Street (Santa Ana)	32,880	65.8	33,008	65.8	0.0	65	No
Segerstrom Avenue, between Bristol Street and Flower Street (Santa Ana)	26,667	64.9	26,767	64.9	0.0	65	No
Dyer Road, between Flower Street and Main Street (Santa Ana)	33,492	65.9	33,592	65.9	0.0	65	No
MacArthur Boulevard, between Fairview Street and Bear Street (Santa Ana)	36,005	66.4	36,030	66.4	0.0	65	No
MacArthur Boulevard, between Bear Street and S. Plaza Drive (Santa Ana)	43,976	67.3	44,001	67.3	0.0	65	No
MacArthur Boulevard, between S. Plaza Drive and Bristol Street (Santa Ana)	40,435	66.9	40,737	67.0	0.0	65	No
MacArthur Boulevard, between Bristol Street and Flower Street (Santa Ana)	44,014	67.3	46,188	67.5	0.2	65	No
MacArthur Boulevard, between Flower Street and Main Street (Santa Ana)	44,515	67.3	46,632	67.5	0.2	65	No
MacArthur Boulevard, between Main Street and SR-55 SB Ramps (Santa Ana)	57,870	68.5	59,987	68.7	0.2	65	No
MacArthur Boulevard, between SR-55 SB Ramps and SR-55 NB Ramps (Santa Ana/Irvine/Caltrans)	58,839	68.4	60,072	68.5	0.1	60	No
Sunflower Avenue, between Fairview Street and Bear Street (Santa Ana/ Costa Mesa)	19,706	63.5	19,998	63.6	0.1	60	No
Sunflower Avenue, between Bear Street and S. Plaza Drive (Santa Ana/ Costa Mesa)	34,478	66.4	35,003	66.5	0.1	65	No
Sunflower Avenue, between S. Plaza Drive and Bristol Street (Santa Ana/ Costa Mesa)	33,676	66.2	35,255	66.4	0.2	65	No
Sunflower Avenue, between Bristol Street and Flower Street (Santa Ana/ Costa Mesa)	26,923	66.3	27,275	66.4	0.1	65	No
Bristol Street, south of Baker Street (Santa Ana)	32,615	66.0	33,000	66.1	0.1	65	No

Source: Acoustical Assessment, Appendix N
ADT = average daily traffic; dBA = A-weighted decibels; CNEL = community noise equivalent level

Traffic Noise at Project Buildout. As shown in Table 5.9-17, roadway noise levels without the proposed Project would range between 54.6 dBA CNEL and 70.6 dBA CNEL at 100 feet from the centerline without the proposed Project and between 55.0 dBA CNEL and 70.8 dBA CNEL with the proposed Project. Thus, the proposed Project would result in a maximum increase of 0.4 dBA, which is less than the 3 dBA increase that is barely perceptible to people and would not exceed the City's standards for increases in traffic noise. Therefore, buildout of the proposed Project in year 2045 would result in less than significant traffic noise impacts.

Table 5.9-17: Operational Traffic Noise Levels With Project Buildout

Roadway Segment	2045 Without Project		2045 With Project		Change	Normally Acceptable Standard	Significant Impact?
	ADT	dBA CNEL	ADT	dBA CNEL			
Fairview Street, between Segerstrom Avenue and MacArthur Boulevard (Santa Ana)	69,634	70.4	69,659	70.4	0.0	65	No
Fairview Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana)	66,356	65.6	66,381	65.6	0.0	65	No
Fairview Street, between Sunflower Avenue and S. Coast Drive (Costa Mesa)	59,156	68.7	59,220	68.7	0.0	60	No
Fairview Street, between S. Coast Drive and I-405 NB Ramps (Costa Mesa)	70,761	69.2	70,813	69.2	0.0	60	No
Fairview Street, between I-405 NB Ramps and I-405 SB Ramps (Costa Mesa/Caltrans)	53,366	68.0	53,418	68.0	0.0	60	No
Fairview Street, between I-405 SB Ramps and Baker Street (Costa Mesa)	58,897	68.5	58,949	68.5	0.0	60	No
Bear Street, between Segerstrom Avenue and MacArthur Boulevard (Santa Ana)	20,293	63.6	20,318	63.6	0.0	65	No
Bear Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana/Costa Mesa)	21,336	64.2	21,361	64.2	0.0	60	No
Bear Street, between Sunflower Avenue and S. Coast Drive (Costa Mesa)	34,921	66.4	35,381	66.5	0.1	67.5	No
Bear Street, between S. Coast Drive and Paularino Avenue (Costa Mesa)	36,846	66.5	37,319	66.6	0.1	60	No
Bear Street, between Paularino Avenue and Baker Street (Costa Mesa)	46,272	67.1	46,501	67.2	0.0	60	No
S. Plaza Drive, between MacArthur Boulevard and Callen's Common (Santa Ana)	6,630	55.2	7,058	55.5	0.3	65	No
S. Plaza Drive, between Callen's Common and Sunflower Avenue (Santa Ana)	5,780	54.6	6,278	55.0	0.4	65	No
Bristol Street, between Segerstrom Avenue and MacArthur Boulevard (Santa Ana)	54,805	68.3	55,696	68.3	0.1	65	No
Bristol Street, between MacArthur Boulevard and Callen's Common (Santa Ana)	57,171	68.6	59,916	68.8	0.2	65	No
Bristol Street, between Callen's Common and Sunflower Avenue (Santa Ana)	55,524	68.4	57,980	68.6	0.2	65	No
Bristol Street, between Sunflower Avenue and Anton Boulevard (Costa Mesa)	61,950	69.2	65,372	69.4	0.2	67.5	No
Bristol Street, between Anton Boulevard and I-405 NB Ramps (Costa Mesa)	73,789	70.6	77,211	70.8	0.2	67.5	No
Bristol Street, between I-405 NB Ramps and I-405 SB Ramps (Costa Mesa/Caltrans)	73,722	69.8	76,384	69.9	0.2	67.5	No
Bristol Street, between I-405 SB Ramps and Paularino Avenue (Costa Mesa)	48,138	67.6	48,523	67.6	0.0	67.5	No
Bristol Street, between Paularino Avenue and Baker Street (Costa Mesa)	49,806	68.0	50,191	68.0	0.0	67.5	No
Flower Street, between Dyer Road and MacArthur Boulevard (Santa Ana)	18,407	61.9	18,464	62.0	0.0	65	No
Flower Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana)	11,491	59.9	11,516	59.9	0.0	65	No
Main Street, between Dyer Road and MacArthur Boulevard (Santa Ana)	37,712	67.7	37,737	67.7	0.0	65	No

Roadway Segment	2045 Without Project		2045 With Project		Change	Normally Acceptable Standard	Significant Impact?
	ADT	dBA CNEL	ADT	dBA CNEL			
Main Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana)	29,775	66.7	29,800	66.8	0.0	65	No
Main Street, between Sunflower Avenue and Red Hill Avenue (Santa Ana/Irvine)	29,601	66.9	29,953	67.0	0.1	60	No
Segerstrom Avenue, between Fairview Street and Bear Street (Santa Ana)	24,629	64.5	24,706	64.5	0.0	65	No
Segerstrom Avenue, between Bear Street and Bristol Street (Santa Ana)	34,524	66.0	34,652	66.0	0.0	65	No
Segerstrom Avenue, between Bristol Street and Flower Street (Santa Ana)	27,540	65.0	27,640	65.0	0.0	65	No
Dyer Road, between Flower Street and Main Street (Santa Ana)	34,666	66.0	34,766	66.0	0.0	65	No
MacArthur Boulevard, between Fairview Street and Bear Street (Santa Ana)	37,805	66.6	37,830	66.6	0.0	65	No
MacArthur Boulevard, between Bear Street and S. Plaza Drive (Santa Ana)	46,175	67.5	46,200	67.5	0.0	65	No
MacArthur Boulevard, between S. Plaza Drive and Bristol Street (Santa Ana)	42,457	67.1	42,759	67.2	0.0	65	No
MacArthur Boulevard, between Bristol Street and Flower Street (Santa Ana)	46,215	67.5	48,389	67.7	0.2	65	No
MacArthur Boulevard, between Flower Street and Main Street (Santa Ana)	46,741	67.6	48,858	67.8	0.2	65	No
MacArthur Boulevard, between Main Street and SR-55 SB Ramps (Santa Ana)	60,764	68.8	62,881	68.9	0.1	65	No
MacArthur Boulevard, between SR-55 SB Ramps and SR-55 NB Ramps (Santa Ana/Irvine/Caltrans)	71,625	69.2	72,858	69.3	0.1	60	No
Sunflower Avenue, between Fairview Street and Bear Street (Santa Ana/Costa Mesa)	20,691	63.7	20,983	63.8	0.1	60	No
Sunflower Avenue, between Bear Street and S. Plaza Drive (Santa Ana/Costa Mesa)	36,202	66.6	36,727	66.7	0.1	65	No
Sunflower Avenue, between S. Plaza Drive and Bristol Street (Santa Ana/Costa Mesa)	35,360	66.4	36,939	66.6	0.2	65	No
Sunflower Avenue, between Bristol Street and Flower Street (Santa Ana/Costa Mesa)	28,269	66.5	28,621	66.6	0.1	65	No
Bristol Street, south of Baker Street (Santa Ana)	34,246	66.2	34,631	66.3	0.0	65	No

Source: Acoustical Assessment, Appendix N
ADT = average daily traffic; dBA = A-weighted decibels; CNEL = community noise equivalent level

The traffic noise impacts that would be generated by the proposed Project would be less than those identified by the GPU FEIR, which were determined to be significant and unavoidable. Therefore, traffic noise impacts related to the proposed Project would not exceed those previously identified.

Onsite Traffic Operational Noise

The California Supreme Court in a December 2015 opinion (*California Building Industry Association v. Bay Area Air Quality Management District*, 62 Cal. 4th 369 [No. S 213478]) confirmed that CEQA, with several specific exceptions, is concerned with the impacts of a project on the environment, not the effects the existing environment may have on a project. Therefore, this section is not required under CEQA and is included to describe compliance with City and State Building Code noise standards.

Future residents at the Project site would be exposed to mobile traffic noise along Bristol Street, MacArthur Boulevard, Sunflower Avenue, and Plaza Drive. Table 5.9-17 shows that noise levels along these roadways would be up to 68.8 dBA (along Bristol Street from MacArthur Boulevard to Callen's Common) at 100 feet from the roadway centerline. At 70 feet, traffic noise would be approximately 71 dBA. However, this does not account for intervening structures and changes in altitude, as residences would be above commercial and retail uses. Therefore, the potential for the proposed Project to exceed the City's 65 dBA exterior and 45 dBA interior General Plan noise standards (based on an outdoor to indoor attenuation rate of 25 dB) cannot be excluded, and noise-reduction features, acoustical designs for the proposed residential buildings, and enforcement of the California Uniform Building Code would be required. However, Condition of Approval NOI-1 is included to require a detailed acoustical study demonstrating that all residential units would meet the City's General Plan 65 dBA exterior and 45 dBA interior noise standards by incorporating applicable noise reduction features. Compliance with Condition of Approval NOI-1 would ensure that the proposed Project meets the applicable City and state standards.

IMPACT NOI-2: THE PROJECT WOULD NOT GENERATE EXCESSIVE GROUND-BORNE VIBRATION OR GROUNDBORNE NOISE LEVELS.

Construction

Less than Significant Impact. Construction activities for the proposed Project would include demolition, excavation, and grading activities, which have the potential to generate low levels of groundborne vibration. People living and working in close proximity to the Project site could be exposed to the generation of excessive groundborne vibration or groundborne noise levels related to construction activities. The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibrations at moderate levels, to slight structural damage at the highest levels. Site ground vibrations from construction activities very rarely reach the levels that can damage structures, but they can be perceived in the audible range and be felt in buildings very close to a construction site.

Demolition, excavation, and grading activities are required for the proposed Project and can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. For example, for a building that is constructed with reinforced concrete with no plaster, the FTA guidelines show that a vibration level of up to 0.20 in/sec is considered safe and would not result in any construction vibration damage. In addition, Transportation and Construction Vibration Guidance Manual prepared by California Department of Transportation (Caltrans), has identified vibration at the level of 0.04 in/sec PPV is barely perceptible and is considered the annoyance threshold. Groundborne vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance.

Based on the reference vibration levels provided by the FTA, a large bulldozer represents the peak source of vibration with a reference velocity of 0.089 in/sec PPV at 25 feet. As indicated in Table 5.9-18, based on FTA data, vibration velocities from typical heavy construction equipment operations that would be used during Project construction range from 0.003 to 0.089 in/sec PPV at 25 feet from the source of activity; and would range from 0.0011 to 0.0315 in/sec PPV at 50 feet from the source of activity. All of the onsite and offsite receptors are farther than 25 feet from construction areas; and therefore, actual vibrations at sensitive receptors would be less.

Table 5.9-18: Construction Equipment Vibration Levels

Equipment	Peak Particle Velocity at 25 Feet (in/sec)	Peak Particle Velocity at 50 Feet (in/sec)	Peak Particle Velocity at 100 Feet (in/sec)
Large Bulldozer	0.089	0.0315	0.011
Caisson Drilling	0.089	0.0315	0.011
Loaded Trucks	0.076	0.0269	0.010
Jackhammer	0.035	0.0124	0.004
Small Bulldozer/Tractors	0.003	0.0011	0.0001

Source: Acoustical Assessment, Appendix N

These vibration levels would not be sustained during the entire construction period but would occur only during the times that heavy construction equipment is operating in the vicinity of the sensitive receivers. This level of vibration would be below the FTA building damage threshold of 0.2 in/sec PPV and the Caltrans vibration standard of 0.04 in/sec PPV for human annoyance at all receiver locations. Therefore, vibration impacts from Project construction would be less than significant.

The construction vibration impacts that would be generated by the proposed Project would be less than those identified by the GPU FEIR, which were determined to be significant and unavoidable. Therefore, construction vibration impacts related to the proposed Project would not exceed those previously identified.

Operation

Less than Significant Impact. Operation of the proposed commercial and multi-family uses would include heavy trucks for residents moving in and out of the rental units, product deliveries to retail and restaurant uses, and garbage trucks for solid waste disposal. Truck vibration levels are dependent on vehicle characteristics, load, speed, and pavement conditions. However, typical vibration levels for heavy truck activity at normal traffic speeds would be approximately 0.006 in/sec PPV, based on the FTA Transit Noise Impact and Vibration Assessment. Truck movements on site would be travelling at very low speed, so it is expected that truck vibration at nearby sensitive receivers would be less than the vibration threshold of 0.08 in/sec PPV for fragile historic buildings and 0.04 in/sec PPV for human annoyance, and therefore, would be less than significant.

The operational vibration impacts that would be generated by the proposed Project would be less than those identified by the GPU FEIR, which were determined to be significant and unavoidable. Therefore, operational vibration impacts related to the proposed Project would not exceed those previously identified.

IMPACT NOI-3: THE PROJECT WOULD NOT EXPOSE PEOPLE RESIDING AND WORKING IN THE PROJECT AREA TO EXCESSIVE NOISE LEVELS RELATED TO A PUBLIC AIRPORT.

Less than Significant Impact. As described previously, SNA is located approximately 1.4 miles southeast of the Project site and under the primary aircraft approach corridor. The AELUP prepared by the Orange County Airport Land Use Commission (ALUC) identifies noise compatibility policies *to safeguard the general welfare of the inhabitants within the vicinity of the airport and to ensure the continued operation of the airport. Specifically, the AELUP plan seeks to protect the public from the adverse effects of aircraft noise, to ensure that people and facilities are not concentrated in areas susceptible to aircraft accidents, and to ensure that no structures or activities adversely affect navigable airspace.*

The basic function of the AELUP is to promote compatibility between the airport and the land uses that surround it. The AELUP establishes aircraft noise exposure exterior noise level compatibility thresholds for new developments by land use category. According to the exterior noise thresholds outlined in the AELUP, multi-family residential development is considered *normally consistent* with exterior noise levels of less than

60 dBA CNEL, *conditionally consistent* with exterior noise levels between 60 and 65 dBA CNEL and *normally inconsistent* with exterior noise level above 65 dBA CNEL. For commercial retail land use, exterior noise levels are considered *normally consistent* with exterior noise levels of less than 65 dBA CNEL and *conditionally consistent* with exterior noise level above 65 dBA CNEL.

As shown on Figures 5.6-2 and 5.6-3, the Project site is located outside of both the airport's planned and actual (2019) 60 CNEL contours of SNA. Therefore, according to the AELUP, the Project residential, open space, and commercial retail land uses are *normally consistent* with SNA aircraft noise exposure exterior noise level compatibility thresholds. Also, the airport related noise at the Project site does not exceed the City's municipal code permissible noise levels. Additionally, the County's General Aviation Noise Ordinance prohibits commercial aircraft departures between the hours of 10:00 p.m. and 7:00 a.m. and arrivals between the hours of 11:00 p.m. and 7:00 a.m. These restrictions substantially limit the aircraft noise during the noise sensitive nighttime hours for residential use. Therefore, noise impacts related to SNA would be less than significant.

5.9.7 CUMULATIVE IMPACTS

Cumulative noise assessment considers development of the proposed Project in combination with ambient growth and other development projects within the vicinity of the proposed Project. As noise is a localized phenomenon, and drastically reduces in magnitude as distance from the source increases, only projects and ambient growth in the nearby area could combine with the proposed Project to result in cumulative noise impacts.

Development of the proposed Project in combination with the related projects would result in an increase in construction-related and traffic-related noise. However, each of the related projects would be subject to the operational noise standards established in Section 18-313 of the City's Municipal Code, which establishes the allowable exterior noise standards for various types of land uses in the City. In addition, Section 18-314 of the City's Municipal Code allows for construction activities to be exempt from the noise standards set forth in Sections 18-312 and 18-313 of the City's Municipal Code as long as these activities do not take place between the hours of 8:00 p.m. and 7:00 a.m. on weekdays, including Saturday, or anytime on Sunday or a federal holiday. In addition, the City of Tustin has a similar municipal code requirement related to construction noise.

Construction noise is localized in nature and decreases substantially with distance. Consequently, in order to achieve a substantial cumulative increase in construction noise levels, more than one source emitting high levels of construction noise would need to be in close proximity to the proposed Project. The nearest development projects to the Project site include the South Coast Village Mixed-Use project that is adjacent to the southwest of the Project site and the Chick-Fil-A expansion project that is across Bristol Street to the northeast of the Project site. The Chick-Fil-A expansion project is currently in plan check and completion of construction of that project would likely be completed by the time construction of Phase 1 of the proposed Project commences. The South Coast Village Mixed-Use project is still in the early stages of entitlement. Therefore, there is potential that construction of the South Coast Village Mixed-Use project overlaps with construction of Phase 1 of the proposed Project. However, due to the size of the Project site, varying locations onsite where construction would occur, and the limited offsite construction noise levels that would be generated from the proposed Project, it would not combine to become cumulatively considerable, and cumulative noise impacts associated with construction activities would be less than significant.

Cumulative construction could also result in the exposure of people to or the generation of excessive groundborne vibration. As described above, the proposed Project would result in limited vibration at 25 and 50 feet from construction activities. Due the rapid attenuation of groundborne vibration, the size of the Project site, and the location of the nearest project and limited potential for overlapping construction, the proposed Project would not result in vibration that could combine with other development projects. Thus, the

proposed Project would not contribute to cumulative vibration impacts and impacts would be less than significant.

As described previously, stationary noise sources that would be generated by the proposed Project would result in noise levels that would be below the existing City noise standards. Because the Project site is surrounded by roadways and proposed buildings and parking structures are setback from roadways, noise from the site would attenuate to diminish, and would not combine with other stationary sources of adjacent uses. Thus, stationary noise sources from the proposed Project would result in impacts that are less than cumulatively significant.

Cumulative mobile source noise impacts would occur primarily as a result of increased traffic on local roadways due to the proposed Project and related projects within the study area. Therefore, cumulative traffic-generated noise impacts have been assessed based on the contribution of the proposed Project in the Project buildout condition. Cumulative increases in traffic noise levels were estimated by comparing the existing and Project buildout without and with Project scenarios. As shown in Table 5.9-19, the volume of traffic generated by the proposed Project on MacArthur Boulevard, between SR-55 SB Ramps and SR-55 NB Ramps, would exceed 1.5 dBA for an ambient noise environment of 65 dBA and higher when comparing Year 2045 With proposed Project conditions to existing conditions. However, the proposed Project's incremental contribution would be 0.1 dBA (i.e., far below a 3.0 barely perceptible increase and below the City's 1.5 dBA increase). Therefore, although related cumulative projects and growth would increase traffic noise levels along this segment, the proposed Project's incremental effects would be less than cumulatively significant.

Table 5.9-19: Year 2045 Cumulative Operational Traffic Noise Levels

Roadway Segment	Existing dBA CNEL	Year 2045 Without Project dBA CNEL	Year 2045 With Project dBA CNEL	Difference In dBA Between Existing and Year 2045 With Project	Difference In dBA Between Year 2045 Without Project and Year 2045 With Project	Land Use Threshold dBA CNEL	Cumulatively Significant Impact?
Fairview Street, between Segerstrom Avenue and MacArthur Boulevard (Santa Ana)	69.5	70.4	70.4	0.9	0.0	65	No
Fairview Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana)	64.7	65.6	65.6	0.9	0.0	65	No
Fairview Street, between Sunflower Avenue and S. Coast Drive (Costa Mesa)	67.8	68.7	68.7	0.9	0.0	60	No
Fairview Street, between S. Coast Drive and I-405 NB Ramps (Costa Mesa)	68.3	69.2	69.2	0.8	0.0	60	No
Fairview Street, between I-405 NB Ramps and I-405 SB Ramps (Costa Mesa/Caltrans)	67.1	68.0	68.0	0.9	0.0	60	No
Fairview Street, between I-405 SB Ramps and Baker Street (Costa Mesa)	67.7	68.5	68.5	0.9	0.0	60	No
Bear Street, between Segerstrom Avenue and MacArthur Boulevard (Santa Ana)	62.8	63.6	63.6	0.8	0.0	65	No

Roadway Segment	Existing dBA CNEL	Year 2045 Without Project dBA CNEL	Year 2045 With Project dBA CNEL	Difference In dBA Between Existing and Year 2045 With Project	Difference In dBA Between Year 2045 Without Project and Year 2045 With Project	Land Use Threshold dBA CNEL	Cumulatively Significant Impact?
Bear Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana/Costa Mesa)	63.4	64.2	64.2	0.7	0.0	60	No
Bear Street, between Sunflower Avenue and S. Coast Drive (Costa Mesa)	65.7	66.4	66.5	0.8	0.1	67.5	No
Bear Street, between S. Coast Drive and Paularino Avenue (Costa Mesa)	65.7	66.5	66.6	0.9	0.1	60	No
Bear Street, between Paularino Avenue and Baker Street (Costa Mesa)	66.3	67.1	67.2	0.8	0.0	60	No
S. Plaza Drive, between MacArthur Boulevard and Callen's Common (Santa Ana)	54.3	55.2	55.5	1.2	0.3	65	No
S. Plaza Drive, between Callen's Common and Sunflower Avenue (Santa Ana)	53.9	54.6	55.0	1.1	0.4	65	No
Bristol Street, between Segerstrom Avenue and MacArthur Boulevard (Santa Ana)	67.4	68.3	68.3	1.0	0.0	65	No
Bristol Street, between MacArthur Boulevard and Callen's Common (Santa Ana)	67.7	68.6	68.8	1.1	0.2	65	No
Bristol Street, between Callen's Common and Sunflower Avenue (Santa Ana)	67.5	68.4	68.6	1.1	0.2	65	No
Bristol Street, between Sunflower Avenue and Anton Boulevard (Costa Mesa)	68.2	69.2	69.4	1.2	0.2	67.5	No
Bristol Street, between Anton Boulevard and I-405 NB Ramps (Costa Mesa)	69.5	70.6	70.8	1.4	0.2	67.5	No
Bristol Street, between I-405 NB Ramps and I-405 SB Ramps (Costa Mesa/Caltrans)	68.7	69.8	69.9	1.2	0.2	67.5	No
Bristol Street, between I-405 SB Ramps and Paularino Avenue (Costa Mesa)	66.7	67.6	67.6	0.9	0.0	67.5	No
Bristol Street, between Paularino Avenue and Baker Street (Costa Mesa)	67.1	68.0	68.0	0.9	0.0	67.5	No

Roadway Segment	Existing dBA CNEL	Year 2045 Without Project dBA CNEL	Year 2045 With Project dBA CNEL	Difference In dBA Between Existing and Year 2045 With Project	Difference In dBA Between Year 2045 Without Project and Year 2045 With Project	Land Use Threshold dBA CNEL	Cumulatively Significant Impact?
Flower Street, between Dyer Road and MacArthur Boulevard (Santa Ana)	61.1	61.9	62.0	0.9	0.0	65	No
Flower Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana)	59.0	59.9	59.9	0.9	0.0	65	No
Main Street, between Dyer Road and MacArthur Boulevard (Santa Ana)	66.9	67.7	67.7	0.9	0.0	65	No
Main Street, between MacArthur Boulevard and Sunflower Avenue (Santa Ana)	65.8	66.7	66.8	1.0	0.0	65	No
Main Street, between Sunflower Avenue and Red Hill Avenue (Santa Ana/Irvine)	65.9	66.9	67.0	1.0	0.1	60	No
Segerstrom Avenue, between Fairview Street and Bear Street (Santa Ana)	63.9	64.5	64.5	0.7	0.0	65	No
Segerstrom Avenue, between Bear Street and Bristol Street (Santa Ana)	65.1	66.0	66.0	0.8	0.0	65	No
Segerstrom Avenue, between Bristol Street and Flower Street (Santa Ana)	64.2	65.0	65.0	0.8	0.0	65	No
Dyer Road, between Flower Street and Main Street (Santa Ana)	65.3	66.0	66.0	0.8	0.0	65	No
MacArthur Boulevard, between Fairview Street and Bear Street (Santa Ana)	65.8	66.6	66.6	0.9	0.0	65	No
MacArthur Boulevard, between Bear Street and S. Plaza Drive (Santa Ana)	66.7	67.5	67.5	0.9	0.0	65	No
MacArthur Boulevard, between S. Plaza Drive and Bristol Street (Santa Ana)	66.3	67.1	67.2	0.9	0.0	65	No
MacArthur Boulevard, between Bristol Street and Flower Street (Santa Ana)	66.6	67.5	67.7	1.1	0.2	65	No
MacArthur Boulevard, between Flower Street and Main Street (Santa Ana)	66.7	67.6	67.8	1.1	0.2	65	No
MacArthur Boulevard, between Main Street and SR-55 SB Ramps (Santa Ana)	67.8	68.8	68.9	1.1	0.1	65	No
MacArthur Boulevard, between SR-55 SB Ramps	67.7	69.2	69.3	1.6	0.1	60	No

Roadway Segment	Existing dBA CNEL	Year 2045 Without Project dBA CNEL	Year 2045 With Project dBA CNEL	Difference In dBA Between Existing and Year 2045 With Project	Difference In dBA Between Year 2045 Without Project and Year 2045 With Project	Land Use Threshold dBA CNEL	Cumulatively Significant Impact?
and SR-55 NB Ramps (Santa Ana/Irvine/Caltrans)							
Sunflower Avenue, between Fairview Street and Bear Street (Santa Ana/Costa Mesa)	62.6	63.7	63.8	1.2	0.1	60	No
Sunflower Avenue, between Bear Street and S. Plaza Drive (Santa Ana/ Costa Mesa)	65.6	66.6	66.7	1.1	0.1	65	No
Sunflower Avenue, between S. Plaza Drive and Bristol Street (Santa Ana/ Costa Mesa)	65.3	66.4	66.6	1.3	0.2	65	No
Sunflower Avenue, between Bristol Street and Flower Street (Santa Ana/ Costa Mesa)	65.4	66.5	66.6	1.2	0.1	65	No
Bristol Street, south of Baker Street (Santa Ana)	65.3	66.2	66.3	1.0	0.0	65	No

Source: Acoustical Assessment, Appendix N

The GPU FEIR identified significant and unavoidable impacts for traffic noise; but did not analyze this segment of MacArthur Boulevard. However, GPU FEIR Figure 5.12-5 and Figure 5.12-10 show that this segment of MacArthur Boulevard (between SR-55 SB Ramps and SR-55 NB Ramps) is also within the 70+ dBA contour of SR-55). Therefore, the year 2045 noise level of 69.3 dBA would be lower than the SR-55 traffic noise in this area. Overall, cumulative operational noise impacts from related projects, in conjunction with noise from the proposed Project would not be cumulatively considerable and cumulative traffic noise impacts would be less than significant.

5.9.8 EXISTING STANDARD CONDITIONS AND PLANS, PROGRAMS, OR POLICIES

- California Building Code: The California Building Code (CBC), Title 24, Part 2, Volume 1, Chapter 12, Interior Environment, Section 1207.11.2, Allowable Interior Noise Levels, requires that interior noise levels attributable to exterior sources shall not exceed 45 dB in any habitable room.
- Section 18.312 of the Santa Ana Municipal Code provides standards for stationary noise sources.
- Section 18-314 (Special Provisions) of the City's Municipal Code does not allow construction activities to occur between the hours of 8:00 p.m. and 7:00 a.m. on weekdays, including Saturday, or any time on Sunday or a federal holiday.

5.9.9 CONDITION OF APPROVAL

Proposed Specific Plan Project Condition of Approval

COA N-1: Onsite Traffic Noise. Prior to issuance of building permits for Phase 1, Phase 2, and Phase 3, a detailed acoustical study based on architectural plans shall be prepared by a qualified acoustical consultant to demonstrate compliance with General Plan Noise Element Standards. The acoustical study shall be submitted to the City's Planning and Building Agency to demonstrate that all residential units would meet the City's 65 dBA exterior noise standard and 45 dBA interior noise standard to the satisfaction of the Planning and Building Agency Executive Director. This complies with the applicable sections of the California Building Code (Title 24 of the California Code of Regulations). The necessary noise reductions may be achieved by implementing noise control measures at the receiver locations. The required noise attenuation measures shall be incorporated into the applicable building plans and specifications.

5.9.10 LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Impact NOI-1 would be potentially significant.

Upon implementation of regulatory requirements, Impacts NOI-2 and NOI-3 would be less than significant.

5.9.11 MITIGATION MEASURES

GPU FEIR Mitigation Measures

GPU FEIR MM N-1: Construction contractors shall implement the following measures for construction activities conducted in the City of Santa Ana. Construction plans submitted to the City shall identify these measures on demolition, grading, and construction plans submitted to the City: The City of Santa Ana Planning and Building Agency shall verify that grading, demolition, and/or construction plans submitted to the City include these notations prior to issuance of demolition, grading and/or building permits.

- Construction activity is limited to the hours: Between 7:00 a.m. to 8:00 p.m. Monday through Saturday, as prescribed in Municipal Code Section 18-314(e). Construction is prohibited on Sundays.
- During the entire active construction period, equipment and trucks used for project construction shall use the best-available noise control techniques (e.g., improved mufflers, equipment re-design, use of intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds), wherever feasible.
- Impact tools (e.g., jack hammers and hoe rams) shall be hydraulically or electrically powered wherever possible. Where the use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used along with external noise jackets on the tools.
- Stationary equipment such as generators and air compressors shall be located as far as feasible from nearby noise-sensitive uses.
- Stockpiling shall be located as far as feasible from nearby noise-sensitive receptors.
- Construction traffic shall be limited to approved haul routes established by the City Public Works Agency. Exceptions to approved routes must be granted by the Public Works Agency before any modification to approved haul routes.
- At least 10 days prior to the start of construction activities, a sign shall be posted at the entrance(s) to the job site, clearly visible to the public, that includes permitted construction days and hours, as well as the telephone numbers of the City's and contractor's authorized representatives that are assigned to respond in the event of a noise or vibration complaint. If the authorized contractor's representative

receives a complaint, he/she shall investigate, take appropriate corrective action, and report the action to the City.

- Signs shall be posted at the job site entrance(s), within the onsite construction zones, and along queueing lanes (if any) to reinforce the prohibition of unnecessary engine idling. All other equipment shall be turned off if not in use for more than 5 minutes.
- During the entire active construction period and to the extent feasible, the use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only. The construction manager shall use smart back-up alarms, which automatically adjust the alarm level based on the background noise level, or switch off back-up alarms and replace with human spotters in compliance with all safety requirements and laws.
- Erect temporary noise barriers (at least as high as the exhaust of equipment and breaking line-of-sight between noise sources and sensitive receptors), as necessary and feasible, to maintain construction noise levels at or below the performance standard of 80 dBA Leq. Barriers shall be constructed with a solid material that has a density of at least 4 pounds per square foot with no gaps from the ground to the top of the barrier.

Proposed Project Applicability: GPU FEIR Mitigation Measure N-1 is applicable to the proposed Project and will be included in the Project MMRP.

GPU FEIR MM N-2: Prior to issuance of a building permit for a project requiring pile driving during construction within 135 feet of fragile structures, such as historical resources, 100 feet of non-engineered timber and masonry buildings (e.g., most residential buildings), or within 75 feet of engineered concrete and masonry (no plaster); or a vibratory roller within 25 feet of any structure, the project applicant shall prepare a noise and vibration analysis to assess and mitigate potential noise and vibration impacts related to these activities. This noise and vibration analysis shall be conducted by a qualified and experienced acoustical consultant or engineer. The vibration levels shall not exceed Federal Transit Administration (FTA) architectural damage thresholds (e.g., 0.12 inches per second [in/sec] peak particle velocity [PPV] for fragile or historical resources, 0.2 in/sec PPV for non- engineered timber and masonry buildings, and 0.3 in/sec PPV for engineered concrete and masonry). If vibration levels would exceed this threshold, alternative uses such as drilling piles as opposed to pile driving and static rollers as opposed to vibratory rollers shall be used. If necessary, construction vibration monitoring shall be conducted to ensure vibration thresholds are not exceeded.

Proposed Project Applicability: GPU FEIR Mitigation Measure N-2 is not applicable to the proposed Project because it does not include pile driving.

GPU FEIR MM N-3: New residential projects (or other noise sensitive uses) located within 200 feet of existing railroad lines shall be required to conduct a groundborne vibration and noise evaluation consistent with Federal Transit Administration (FTA) approved methodologies.

Proposed Project Applicability: GPU FEIR Mitigation Measure N-3 is not applicable to the proposed Project because the Project site is not located within 200 feet of a railroad line.

GPU FEIR MM N-4: During the project-level California Environmental Quality Act (CEQA) process for industrial developments under the General Plan Update or other projects that could generate substantial vibration levels near sensitive uses, a noise and vibration analysis shall be conducted to assess and mitigate potential noise and vibration impacts related to the operations of that individual development. This noise and vibration analysis shall be conducted by a qualified and experienced acoustical consultant or engineer and shall follow the latest CEQA guidelines, practices, and precedents.

Proposed Project Applicability: GPU FEIR Mitigation Measure N-4 has been completed for the proposed Project through preparation of the Acoustical Assessment that is included in Appendix N.

Proposed Specific Plan Project Mitigation Measures

Mitigation Measure NOI-1: Prior to the issuance of construction/grading permits, the Project Applicant shall obtain a permit from the City's Building and Safety Division to complete work outside the standard construction hours outlined in Santa Ana Municipal Code Section 18-314(e). In addition, the Project Applicant and/or contractor(s) shall develop a nighttime construction noise control plan that requires the following:

Stationary equipment such as generators and air compressors shall adhere to the following:

- Stationary equipment (e.g., generators, air compressors, etc.) shall be located 300 feet or more away from residences.
- Stationary equipment shall be surrounded with noise barriers to achieve a minimum 10 dBA reduction. Alternatively, a temporary noise barrier may be used along the property line.

Mobile equipment such as concrete mixer trucks, pump trucks shall adhere to the following:

- The nighttime noise control plan shall prohibit mobile equipment and trucks from operating within the following distances to offsite sensitive receptors:
    - **Phase 1**: Trucks and equipment shall be 140 feet or more away from the Versailles residences along Plaza Drive.
    - **Phase 2**: No minimum distance required (Phase 2 is 410 feet from sensitive receptors and would not exceed thresholds).
    - **Phase 3**: Trucks and equipment shall be 150 feet or more away from the Versailles residences along Plaza Drive.
- The nighttime noise control plan shall prohibit mobile equipment and trucks from operating within the following distances to onsite sensitive receptors:
    - **Phase 1**: No minimum distance is required because no onsite receptors would be constructed prior to Phase 1.
    - **Phase 2**: Trucks and equipment shall be 150 feet or more away from Phase 1 onsite residences.
    - **Phase 3:** Trucks and equipment shall be 170 feet or more away from Phase 1 and Phase 2 onsite residences.

5.9.12 LEVEL OF SIGNIFICANCE AFTER MITIGATION

The GPU FEIR and Project specific mitigation measures and the existing regulatory programs described previously would ensure that potential impacts associated with noise and vibration would be less than significant. Therefore, no significant unavoidable adverse impacts related to noise or vibration would occur.

REFERENCES

City of Santa Ana General Plan Update. April 2022. Accessed: https://www.santa-ana.org/general-plan-documents/

City of Santa Ana General Plan Update Final Recirculated Program Environmental Impact Report. October 2021. Accessed: https://www.santa-ana.org/general-plan-environmental-documents/

City of Santa Ana Municipal Code. Accessed: https://library.municode.com/ca/santa_ana

Acoustical Assessment. June 2023. Prepared by Kimley-Horn. (Appendix N)