3.8 NOISE

This section describes the existing noise environment and evaluates the potential noise and vibration impacts that could result from the proposed Fountain Valley Crossings Specific Plan (FVCSP) Project (Project) as defined by the California Environmental Quality Act (CEQA), as well as by the City's regulations, policies, and design guidelines. Data for this section was taken from the City of Fountain Valley General Plan Noise Element (1995), Land Use Element (1995), and the Fountain Valley Municipal Code (2016). This analysis addresses both short-term construction-related impacts as well as long-term operational noise impacts of land use changes that would occur as a result of implementing the Project.

This section of the Partial Recirculated Draft EIR has been revised to reflect changes in the Fountain Valley Crossings Specific Plan Transportation Impact Analysis (TIA) prepared by Fehr & Peers (Appendix E) in April 2017 and amended in September 2017. The updated TIA has been provided to include analysis of additional cumulatively considered approved, pending, or recently completed projects that have been identified after release of the pre-recirculation Final EIR in April 2017. Revisions provided in section of the Partial Recirculated Draft EIR include expanded analysis of cumulative Project noise impacts to account for an updated list of cumulative projects, as well as provide revisions and clarification in the text of section to address public comments and concerns that were raised following release of the draft pre-recirculated Final EIR. Revisions to the TIA in December 2017 to account for revised plans for improvement to the Ellis Avenue/Euclid Street & Southbound I-405 Ramp (see Section 8.0, *Response to Comments)* have not resulted in the need for revised analysis of Project-related traffic noise, as revised intersection improvements have not affected assumptions regarding the volume or distribution of Project-generated or cumulative traffic.

3.8.1 Environmental Setting

3.8.1.1 Fundamentals of Sound and Environmental Noise

Sound is technically described in terms of the loudness (amplitude) and frequency (pitch) of the sound. The standard unit of measurement of the loudness of sound is the decibel (dB). Since the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear.

Noise is generally defined as unwanted sound that is heard by people or wildlife and that interferes with normal activities or otherwise diminishes the quality of the environment. Prolonged exposure to high levels of noise is known to have several adverse effects on people, including hearing loss, communication interference, sleep interference, physiological responses, and annoyance. The noise environment typically includes background noise generated from both near and distant noise sources as well as the sound from individual local sources. These

can vary from an occasional aircraft or train passing by to continuous noise from sources such as traffic on a major road.

Decibels are based on the logarithmic scale. The logarithmic scale compresses the wide range in sound pressure levels to a more useable range of numbers in a manner similar to the way that the Richter scale is used to measure earthquakes. In terms of human response to noise, studies have indicated that a noise level increase of 3 dBA is barely perceptible to most people, a 5 dBA increase is readily noticeable, and a difference of 10 dBA would be perceived as a doubling of loudness (Harris Miller Miller & Hanson Inc. 2006). Everyday sounds normally range from 30 dBA (very quiet) to 100 dBA (very loud). Examples of various sound levels in different environments are shown in Table 3.8-1.

Table 3.8-1. Representative Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Power Saw	—110—	Rock Band
Jet Fly-over at 100 feet		Crying Baby
Subway	—100—	
Gas Lawnmower at 3 feet		
Rail Transit Horn/ Tractor	—90—	
Jack Hammer		Food Blender at 3 feet
Rail Transit At-grade (50 mph)	—80—	Garbage Disposal at 3 feet
Noisy Urban Area during Daytime		
Gas Lawnmower at 100 feet	—70—	Vacuum Cleaner at 10 feet
Rail Transit in Station/ Commercial Area		Normal Speech at 3 feet
Heavy Traffic at 300 feet	—60—	Sewing Machine
Air Conditioner		Large Business Office
Quiet Urban Area during Daytime	—50—	Dishwasher in Next Room
		Refrigerator
Quiet Urban Area during Nighttime	—40—	Theater, Large Conference Room (background)
Quiet Suburban Area during Nighttime		
	—30—	Library
Quiet Rural Area during Nighttime		Bedroom at Night, Concert Hall (background)
	—20—	
		Broadcast/Recording Studio
	—10—	
Lowest Threshold of Human Hearing	—0—	Lowest Threshold of Human Hearing

Source: California Department of Transportation (Caltrans) 1998.

Several noise metrics have been developed to analyze the adverse effect of community noise on people. Because environmental noise fluctuates over time, these scales consider that the effect of noise upon people is largely dependent upon the total acoustical energy content of the noise, as well as the time of day when the noise occurs. The equivalent energy noise level (L_{eq}) is a measure of ambient noise, while the Community Noise Equivalent Level (CNEL) is a measure of community noise. Each noise rating scale applicable to this analysis is defined as follows:

- *L_{eq} (equivalent energy noise level)* is the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.

- *CNEL (Community Noise Equivalent Level)* is a 24-hour average L_{eq} with a 5 dBA "weighting" during the hours of 7:00 PM to 10:00 PM and a 10 dBA "weighting" added to noise during the hours of 10:00 PM to 7:00 AM to account for noise sensitivity in the evening and nighttime, respectively. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.7 dBA CNEL. CNEL is often used due to its utility in identifying noise related sleep disturbance effects, often a key community concern for increases in noise levels.

- *L_{dn} (day-night average noise level)* is a 24-hour average L_{eq} with a 10 dBA "weighting" added to noise during the hours of 10:00 PM to 7:00 AM to account for noise sensitivity in the nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.4 dBA L_{dn}.

- *L_{min} (minimum instantaneous noise level)* is the minimum instantaneous noise level experienced during a given period of time.

- *L_{max} (maximum instantaneous noise level)* is the maximum instantaneous noise level experienced during a given period of time.

Noise levels from a particular source decline (attenuate) as distance to the receptor increases. Other factors, such as the weather and reflecting or shielding by buildings or other structures, also intensify or reduce the noise level at a location. A common method for estimating roadway noise is that for every doubling of distance from the source, the noise level is reduced by about 3 dBA at acoustically "hard" locations (i.e., the area between the noise source and the receptor is nearly complete asphalt, concrete, hard-packed soil, or other solid materials) and 4.5 dBA at acoustically "soft" locations (i.e., the area between the source and receptor is normal earth or has vegetation, such as grass).

Noise from stationary or point sources (including construction noise) is reduced by about 6 to 7.5 dBA for every doubling of distance at acoustically hard and soft locations, respectively. Noise levels may also be reduced by intervening structures; generally, a single row of buildings

between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm can reduce noise levels by up to 5 to 10 dBA. The manner in which older homes in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows. The exterior-to-interior reduction of newer residential units is generally 30 dBA or more (Harris Miller Miller & Hanson Inc. 2006).

3.8.1.2 Vibration

Vibration is sound radiated through the ground. Most perceptible indoor vibration is caused by sources within buildings, such as operation of mechanical equipment, movement of people, or slamming of doors. 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 from traffic is rarely perceptible. The vibration of floors and walls may cause perceptible vibration, rattling of items such as windows or dishes on shelves, or a rumble noise. The rumble is the noise radiated from the motion of the room surfaces. In essence, the room surfaces act like a giant loudspeaker causing what is called ground-borne noise. Ground-borne vibration is almost never annoying to people who are outdoors. Although the motion of the ground may be perceived, without the effects associated with the shaking of a building, the motion does not provoke the same adverse human reaction. In addition, the rumble noise that usually accompanies the building vibration is perceptible only inside buildings. Typically, ground-borne vibration generated by manmade activities attenuates rapidly with distance from the source of the vibration. Man-made vibration issues are therefore usually confined to short distances from the source.

The ground motion caused by vibration can be measured as particle velocity in inches per second (in/sec); in the U.S., this is referenced as vibration decibels (VdB) (Caltrans 2013; Harris Miller Miller & Hanson Inc. 2006). The vibration level at which continuous vibration is strongly perceptible is 0.1 in/sec. For incidental ground-borne vibration, 0.035 in/sec is barely perceptible while 2.0 in/sec is felt severely (Caltrans 2013). General human response to different levels of ground-borne vibration velocity levels are described in Table 3.8-2 and guidelines for the effect of vibration levels in structures described in Table 3.8-3.

Table 3.8-2. Human Response to Different Levels of Ground-borne Vibration

Human Response	Transient (in/sec)	Continuous (in/sec)
Barely perceptible	0.035	0.012
Distinctly perceptible	0.24	0.035
Strongly perceptible	0.9	0.1
Severe/Disturbing	2	0.4

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.
Source: Caltrans 2013.

Table 3.8-3. Vibration Thresholds for Potential Structural Damage

Structure and Condition	Transient (in/sec)	Continuous (in/sec)
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1	0.5
Modern industrial/commercial buildings	2	0.5

Source: Caltrans 2013.

3.8.1.3 Existing Noise Environment

Existing major noise sources in the Project vicinity include roadway noise generated by approximately 350,000 vehicle trips per day on I-405, and between 20,000 and 30,000 vehicle trips per day each on Euclid Street and Ellis Avenue, as well as other typical urban noise sources. Pictured: I-405 bisecting the Project area.

Land uses within the City of Fountain Valley (City) include a range of residential, commercial, institutional, and recreational open space areas. The primary source of ambient noise in the Project vicinity is associated with roadway traffic noise. Motor vehicle noise generated by automobiles, buses, motorcycles, and trucks on streets is the most common source of sustained noise levels. The main source of traffic noise comes from the Interstate 405 (I-405) freeway, which receives approximately 350,000 vehicle trips per day (see Section 3.11, *Transportation, Circulation, and Traffic*) and bisects the Project area. Traffic noise is also generated on major streets within the Project area vicinity, particularly along Euclid Street and Ellis Avenue, which receive between 20,000 and 30,000 vehicle trips per day. Noise in the Project vicinity also occurs from various stationary sources, especially urban-related activities (e.g., mechanical equipment, parking areas, conversations, etc.) that may represent a single event or a continuous occurrence.

The Project is located in the light industrial/commercial district in the southeastern portion of the City. It is bounded by Talbert Avenue to the north, Ward Street to the west, Ellis Avenue to the south, the Santa Ana River to the east, and is bisected by the I-405 freeway, which runs southeast to northwest diagonally through the Project area. Euclid Street is a six-lane divided roadway with no curbside parking. Talbert Avenue is a six-lane divided roadway with no curbside parking and single-family residences beyond to the north. Ward Street is an undivided four-lane facility and an undivided two-lane facility from Talbert Avenue to Lawson River Avenue with a Class II bike line in each direction and no curbside parking and single-family residences beyond to the west. Ellis Avenue is an undivided four-lane facility with no curbside parking. The

segment of I-405 traversing through the Project area has 12 lanes, including a high occupancy lane in each direction, with north and south on- and off-ramps within the Project area. Bus trips consistently run through the Project area creating additional traffic noise, with multiple stops along Ellis Avenue, Euclid Street, and Talbert Avenue and peak-hour weekday headways of 30 to 60 minutes.

In order to identify representative existing noise levels in the Project area vicinity, noise data was gathered from the Hyundai Motor America North American Corporate Campus Project (Hyundai Project). On February 15, 2011, RBF Consulting conducted noise measurements for the Hyundai Project at four unique locations around their project site, which coincides with the northwestern-most corner of the Project area (see Table 3.8-4). Site numbers 1 and 4 are expected to be representative of noise levels in other parts of the Project area not in close proximity to I-405, while site numbers 2 and 3 are representative of noise levels in areas near I-405. The noise measurements were taken at 10-minute intervals between 9:45 and 11:00 AM. The predominant source of noise in the Hyundai Project's study area was traffic along I-405. While noise measurements were completed in 2011, traffic volume have decreased by 2.1 percent along I-405 to the present year 2015 (Caltrans 2011; Caltrans 2015). This 2.1 percent decrease in traffic volume would result in a 0.09 dBA decrease to noise measurement values from 2011 to 2015 where I-405 was the dominant noise source (i.e., sites 2 and 3); however, given the negligible decrease, the noise measurements completed in 2011 would be applicable to 2015. These measurements are conservative for 2015 given that traffic counts along I-405, the dominant noise source in the area, at Euclid have decreased from the year 2011 to 2015.

Table 3.8-4. Hyundai Project Noise Measurements

Site #	Location	L_{eq} (dBA)	L_{min} (dBA)	L_{max} (dBA)	Peak (dBA)	Time
1	La Perla Avenue, within residential uses to the north of the site	53.9	45.8	76.1	92.5	9:47 AM
2	Southern portion of the site near a parking lot adjacent to I-405	70.8	66.2	74.8	100.4	10:11 AM
3	Southern portion of the site in a parking lot adjacent to I-405	69.7	64.5	83.7	97.8	10:25 AM
4	Northern portion of the site in a parking lot adjacent to Talbert Avenue	59.1	51.1	75.3	95.3	10:40 AM

Source: City of Fountain Valley 2012.

3.8.1.4 Noise Sensitive Receptors

Noise sensitive receptors are populations that are more susceptible to the effects of noise than the population at large. Land uses identified by the City's General Plan *Noise Element* as noise sensitive uses include residential areas, schools, parks, hospitals, rest homes, medical or mental care facilities, and churches. Such uses can be sensitive to increases in both short-term and long-term noise due to a range of issues, such as sleep disturbance and disruption of conversations, lectures or sermons, or decreased attractiveness of exterior use areas, such as patios, backyards, or parks. Of particular concern is exposure of sensitive receptors to long-term

elevated interior noise levels and sleep disturbance, which can be associated with health concerns. The sensitive receptors nearest to the Project area are listed below in Table 3.8-5.

Table 3.8-5. Noise Sensitive Receptors in Project Vicinity

Type	Name	Distance from Project Area (feet)	Direction from Project Area
Residential	Green Valley Neighborhood	90	North
	Los Alamos Park Neighborhood	150	North West
	Adobe River Avenue Neighborhood	75	West
	R. Gisler School Neighborhood	130	South West
Schools	James H. Cox School	1900	North
	Elite Educational Center	2070	North West
	Fountain Valley Montessori	2100	West
	Shoreline Christian School	875	South West
	Robert Gisler Elementary School	1400	South West
	Diane's Day Care	620	North West
	Kazuo Masuda Middle School	3000	North
Libraries	Fountain Valley Library	2600	North West
Parks	Moon Park	520	South East
	Ellis Park	1015	West
	Suburbia Park	845	East
	Los Alamos Park	1742	North West
Places of Worship	Holy Spirit Catholic Church	3700	North
	Shoreline Baptist Church	1140	South West

3.8.2 Regulatory Setting

Various standards have been developed to address the compatibility of land uses and noise levels. The applicable standards to the Project are presented in the following discussion. Special emphasis is placed on land uses that are considered to be noise sensitive, as previously discussed.

3.8.2.1 Federal Policies and Regulations

Occupational Safety and Health Act

Under the Occupational Safety and Health Act of 1970 (29 USC Section 651 et seq.), the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) adopted regulations (29 CFR Section 1910.95) designed to protect workers against the effects of occupational noise exposure. These regulations list limits on noise exposure levels as a function of the amount of time during which the worker is exposed. The regulations further specify requirements for a hearing conservation program (Section 1910.95(c)), a monitoring program (Section 1910.95(d)), an audiometric testing program (Section 1910.95(g)), and hearing protection (Section 1910.95(i)). There are no federal laws governing community noise.

Federal Highway Administration

Proposed federal or federal-aid highway construction projects at a new location, or the physical alteration of an existing highway that significantly changes either the horizontal or vertical alignment, or increases the number of through-traffic lanes, requires an assessment of noise and consideration of noise abatement per Title 23 of the Code of Federal Regulations, Part 772 (23 CFR Part 772), Procedures for Abatement of Highway Traffic Noise and Construction Noise. The Federal Highway Administration (FHWA) has adopted Noise Abatement Criteria (NAC) for sensitive receivers such as picnic areas, recreation areas, playgrounds, active sport areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals when "worst-hour" noise levels approach or exceed 67 dBA L_{eq}. The California Department of Transportation (Caltrans) has further defined approaching the NAC to be 1 dBA below the NAC for noise-sensitive receivers identified as Category B activity areas (e.g., 66 dBA L_{eq} is considered approaching the NAC).

Federal Noise Control Act (1972)

Public Law 92-574 regulates noise emissions from operation of all construction equipment and facilities; establishes noise emission standards for construction equipment and other categories of equipment; and provides standards for the testing, inspection, and monitoring of such equipment. This Act gives states and municipalities primary responsibility for noise control.

3.8.2.2 State Policies and Regulations

State Department of Health Services

The California State Office of Noise Control in the State Department of Health Services has established guidelines to provide a community with a noise environment that it deems to be generally acceptable. Specifically, ranges of noise exposure levels have been developed for different land uses to serve as the primary tool a city uses to assess the compatibility between land uses and outdoor noise (see Table 3.8-6). To achieve a clearly compatible land use/noise zone, a noise level standard of 60 dBA L_{dn} is used for the exterior living areas of new single-family, duplex, and mobile home residential land uses. A 45 to 65 dBA L_{dn} noise level standard is used for the interior and exterior of all new multi-family residential uses. Where a land use is denoted as "normally acceptable" for the given L_{dn} noise environment, the highest noise level in that range should be considered the maximum desirable for conventional construction which does not incorporate any special acoustic treatment. The acceptability of noise environments classified as "conditionally acceptable" or "normally unacceptable" depends on the anticipated amount of time that will normally be spent outside the structure and the acoustic treatment to be incorporated in the structure's design.

Table 3.8-6. Land Use/Noise Compatibility Matrix

Proposed Land Use Categories		Compatible Land Use Zones (in CNEL)					
Categories	**Uses**	**<60**	**60-65**	**65-70**	**70-75**	**75-80**	**>80**
RESIDENTIAL	Single-family, Duplex, Multiple-family	A	B	C	C	D	D
COMMERCIAL Regional, District	Hotel, Motel, Transient Lodging	A	B	B	C	C	D
COMMERCIAL Regional, Village, District, Special	Commercial Retail, Bank, Restaurant, Movie Theater	A	A	A	B	B	C
COMMERCIAL INDUSTRIAL INSTITUTIONAL	Office Building, Research and Development, Professional Offices, City Office Building	A	B	B	B	C	D
COMMERCIAL General, Special INDUSTRIAL, INSTITUTIONAL	Automobile Service Station, Auto Dealership, Manufacturing, Warehousing, Wholesale, Utilities	A	A	B	B	C	D
ZONE A – Clearly Compatible: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements. ZONE B – Normally Compatible: New construction or development should be undertaken only after detailed analysis of the noise reduction requirements are made and needed noise insulation features in the design are determined. Conventional construction, with closed windows and fresh air supply systems or air conditioning, will normally suffice. ZONE C – Normally Incompatible: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in the design. ZONE D – Clearly Incompatible: New construction or development should generally not be undertaken.							

Source: City of Fountain Valley 1995.

California Building Standards Code (Title 24)

Title 24 of the California Code of Regulations includes Sound Transmission Control requirements that establish uniform minimum noise insulation performance standards for new hotels, motels, dormitories, apartment houses, and dwellings other than detached single-family units. Specifically, Title 24 states that interior noise levels attributable to exterior sources shall not exceed 45 dBA CNEL in any habitable room of new dwellings. Dwellings are to be designed so that interior noise levels would meet this standard for at least 10 years from the time of building permit application.

3.8.2.3 Local Policies and Regulations

City of Fountain Valley General Plan – Noise Element

The *Noise Element* of the City of Fountain Valley General Plan provides guidance about acceptable noise levels based on the proposed land use. Based on these standards, which follow the state guidelines outlined in Table 3.8-6, exterior noise levels of 60 dBA CNEL and lower are “clearly compatible” for residential and commercial uses. “Clearly compatible” is defined as the highest noise level that should be considered for the construction of new

buildings that incorporate conventional construction techniques, but without any special noise insulation requirements. "Normally compatible" includes the highest noise levels that should be considered only after detailed analysis of the noise reduction requirements are made and needed noise insulation features are determined.

The *Noise Element* also addresses the issue of noise by identifying sources of noise in the City and providing objectives and policies that ensure that noise from various sources would not create an unacceptable noise environment. Table 3.8-7 identifies the City-adopted interior and exterior noise standards in relation to specific land uses. The Noise Ordinance places limitations on noise produced by equipment operation, human activities, and construction. The *Noise Element* goals and policies that are relevant to the Project are identified below.

Table 3.8-7. Fountain Valley Exterior and Interior Noise Standards

Land Use Categories		Energy Average (CNEL)	
Categories	**Uses**	**Interior[1]**	**Exterior[2]**
Residential	Single-Family, Duplex, Multi-Family	45[3]	60
Commercial Industrial Institutional	Hotel, Motel, Transient Lodging	45	60[4]
	Commercial Retail, Bank, Restaurant	55	--
	Office Building, Research and Development, Professional Offices, City Office Building	45	--
	Manufacturing, Warehousing, Wholesale, Utilities	65	--
Institutional	Hospital, Schools' classroom	45	65
	Church, Library	45	--
Open Space	Parks	--	65

[1] Indoor environment excluding: Bathrooms, toilets, closets, corridors.
[2] Outdoor environment limited to: Private yard of single-family, multi-family private patio or balcony which is served by a means of exit from inside, mobile home park, hospital patio, office patio, park's picnic area, school's playground, hotel and motel recreation area.
[3] Noise level requirement with closed windows. Mechanical ventilation system or other means of natural ventilation shall be provided as of Chapter 12, Section 1205 of the Uniform Building Code.
[4] Except those areas affected by aircraft noise.
Source: City of Fountain Valley 1995.

Goal 7.1 Protect public health and welfare by eliminating existing noise problems and preventing significant degradation of the future acoustic environment.

Policy 7.1.1 Incorporate noise considerations into land use planning decisions.

a) Establish acceptable limits of noise for various land uses throughout the community. The City adopts the noise standards presented in Table 3.8-6 which identify interior and exterior noise standards in relation to specific land uses; particularly residential areas, schools, hospitals, open space preserves and parks. The standards specify the maximum noise levels allowable for new developments impacted by noise sources operating in public or quasi-public property.

b) The City may require an environmental and noise impact evaluation for projects if

determined necessary by the Environmental Review Committee. Should noise abatement be necessary, the City shall require the implementation of mitigation measures based on a detailed technical study prepared by a qualified acoustical engineer.

c) The City shall consider establishing a periodic noise monitoring program to identify progress in achieving noise abatement and to perform necessary updating of the noise element and community noise standards.

d) The City shall minimize potential transportation through proper design of street circulation, coordination of routing, and other traffic control measures.

Policy 7.1.2 Establish measures to reduce noise impacts from traffic noise sources.

a) The City may require the construction of barriers to mitigate sound emissions where necessary or where feasible. Barriers shall not have gaps or openings. Wherever possible, freeway walls shall not stop short of bridge overcrossings but shall continue until meeting with the walls supporting the bridges. Without prevention, openings or gaps could render the sound walls ineffective.

b) The City shall insure the effective enforcement of City, state and federal noise levels by all appropriate City divisions.

c) The City shall actively advocate noise control requirements for all new motor vehicles.

Policy 7.1.3 Establish measures to control non-transportation noise impacts.

a) The City shall enforce the Fountain Valley Noise Ordinance to mitigate noise conflicts between adjacent land uses. The Noise Ordinance establishes noise limits that cannot be exceeded at the property line. The Noise Ordinance, because it is a City statute, can only control noise generated on private property. Therefore, the primary function of the Noise Ordinance is to control stationary noise sources and construction noise.

b) The City shall evaluate noise generated by construction activities, and subject them to the requirements of the Noise Ordinance.

c) The City shall establish and maintain coordination among the City agencies involved in noise abatement.

d) The City shall insure the effective enforcement of City, state and federal noise levels by all appropriate City divisions. The City shall provide quick response to complaints and rapid abatement of noise nuisances within the scope of the City's police powers.

e) The City shall coordinate with the California Occupational Safety and Health Administration (Cal/OSHA) to provide information on and enforcement of occupational noise requirements within the City.

f) The City shall coordinate with the County of Orange to ensure that special events in Mile Square Park adhere to adopted noise standards and ordinances to minimize noise impacts surrounding neighborhoods.

City of Fountain Valley Municipal Code

Fountain Valley Municipal Code Chapter 6.28 (Noise) includes limitations on unnecessary, excessive, and annoying noises within the City. Section 6.28.040 designates residential districts as Noise Zone I.

Noise Zone I. All properties located in residential zone districts.

Section 6.28.050 outlines the exterior noise standards for Noise Zone I (Table 3.8-8).

Table 3.8-8. Exterior Noise Standards in the City of Fountain Valley

Noise Zone	Time Interval	L_{eq} for 30 cumulative minutes or more in any hour	L_{eq} for 15 cumulative minutes or more in any hour	L_{eq} for 5 cumulative minutes or more in any hour	L_{eq} for 1 cumulative minute or more in any hour	L_{eq} for any period of time
I	7 AM – 10 PM	55 dBA	60 dBA	65 dBA	70 dBA	75 dBA
	10 PM – 7 AM	50 dBA	55 dBA	60 dBA	65 dBA	70 dBA

Note: In the event the alleged offensive noise consists entirely of impact noise, simple tone noise, speech, music, or any combination thereof, each of the above noise levels shall be reduced by 5 dBA.
Source: City of Fountain Valley 2016.

Section 6.28.060 outlines the interior noise standards for Noise Zone I (Table 3.8-9).

Table 3.8-9. Interior Noise Standards in the City of Fountain Valley

Noise Zone	Time Interval	L_{eq} for 5 cumulative minutes or more in any hour	L_{eq} for 1 cumulative minutes or more in any hour	L_{eq} for any period of time
I	7 AM – 10 PM	55 dBA	60 dBA	65 dBA
	10 PM – 7 AM	45 dBA	50 dBA	55 dBA

Note: In the event the alleged offensive noise consists entirely of impact noise, simple tone noise, speech, music, or any combination thereof, each of the above noise levels shall be reduced by 5 dBA.
Source: City of Fountain Valley 2016.

Subsection (c) of Section 6.28.050 and Section 6.28.060 (Exterior and Interior Noise Standards) of the Noise Ordinance also states in the event the ambient noise level exceeds any of the noise limit categories set forth in Tables 3.8-8 and 3.8-9, the cumulative period applicable to said category shall be increased to reflect said ambient noise level. In the event the ambient

noise level exceeds the fifth noise limit category, the maximum allowable noise level under said category shall be increased to reflect the maximum ambient noise level.

Section 6.28.070 (Special Provisions) of the Noise Ordinance exempts noise sources associated with the construction, repair, remodeling or grading of any real property, provided said activities take place between the hours of 7:00 AM and 8:00 PM Monday through Friday, 9:00 AM through 8:00 PM on Saturday and at no time on Sunday or any legal holiday. For purposes of this exception the use of saws, buffers, sanders, drills, and sprayers shall be included, as shall similar activity. Section 6.28.070 also exempts noise sources associated with the landscape maintenance of real property, provided said activities take place between the hours of 7:00 AM and 8:00 PM Monday through Friday, 9:00 AM through 8:00 PM on Saturday, or 9:00 AM through 6:00 PM on Sunday or legal holidays. For purposes of this exception, the phrase "landscape maintenance of real property" shall include, but not be limited to, the use of power mowers, edgers, chain saws, trimmers, hedgecutters, and other devices that are not hand-powered. Leaf blowers shall not be included in said exception and shall be regulated as provided in Chapter 6.10 of this code, which states that leaf blowers shall not operate between the hours of 6:00 PM and 8:00 AM Monday through Friday, 6:00 PM and 9:00 AM Saturday, and no time on Sunday.

3.8.3 Impact Assessment and Methodology

3.8.3.1 Thresholds of Significance

Appendix G of the 2016 California Environmental Quality Act (CEQA) Guidelines provides a set of screening questions that address impacts related to noise. Specifically, the Guidelines state that a proposed project may have a significant adverse noise or vibration impact if:

a) The project would increase exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

b) The project would increase exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

c) The project would result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

d) The project would result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

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

f) For a project within the vicinity of a private airstrip, the project would expose people residing or working in the project area to excessive noise levels.

Non-applicable Threshold(s):

Thresholds (e) and (f) *Public Airport* and *Private Airstrip*: The Project area is not located within or in the vicinity of a public airport land use plan or a private airstrip. As such, Threshold (e) and Threshold (f), regarding the potential noise impacts of aviation uses on people residing or working nearby, requires no analysis or mitigation of impacts and is not discussed in the analysis below.

3.8.3.2 Construction Noise Levels

The timing of construction noise impacts is an important factor in determining significance. In any urban area, residents expect to periodically be exposed to construction noise during normal working hours on weekdays and for more abbreviated periods on Saturdays (and sometimes Sundays). As set forth in the previous discussion of the City's Noise Ordinance, noise sources associated with construction activities are generally permissible only between 7:00 AM and 8:00 PM on weekdays, and between 9:00 AM and 8:00 PM on Saturdays. Given the fact that residents of urban areas are used to such temporary construction noise from time to time, the City does not consider construction activities consistent with these timing limits to constitute significant environmental effects.

3.8.3.3 Operational Noise Levels

The CEQA Guidelines do not define the levels at which temporary and permanent increases in ambient noise are considered "substantial." A noise level increase of 3 dBA is barely perceptible to most people, a 5 dBA increase is readily noticeable, and a difference of 10 dBA would be perceived as a doubling of loudness. However, as the existing level of ambient noise increases, the allowable level of project-generated noise increases, but the total amount that community noise exposure is allowed to increase is reduced. This accounts for the unexpected circumstance wherein project noise exposure which is less than the existing noise exposure can still cause an impact. As a result, the following noise thresholds are used with respect to assessing operational roadway noise (Table 3.8-10).

Table 3.8-10. ~~Interior and~~ Exterior Noise Thresholds

Ambient Noise Levels Without Project (L_{dn} or CNEL)	Threshold (L_{dn} or CNEL)
< 60 dB	+ 5.0 dB or more
60–65 dB	+ 3.0 dB or more
> 65 dB	+ 1.5 dB or more

Source: Harris Miller Miller & Hanson Inc. 2006.

The justification for the above thresholds is that people already exposed to high noise levels would notice and be annoyed by a small increase in the amount of noise in their community. In contrast, if the existing noise levels are already low, a greater change in community noise would be required for the equivalent level of annoyance (Harris Miller Miller & Hanson Inc. 2006).

3.8.3.4 Vibration

The CEQA Guidelines also do not define the levels at which ground-borne vibration or ground-borne noise is considered "excessive." For the purpose of this analysis, ground-borne vibration impacts associated with human annoyance would be significant if the Project exceeds the threshold of 0.1 in/sec within 25 feet of any building. Per Caltrans, this threshold corresponds to the levels at which vibration can cause a "strongly perceptible" degree of human annoyance and has the potential to cause structural damage in fragile buildings as shown in Table 3.8-2 and Table 3.8-3.

3.8.3.5 Methodology

The analysis of potential noise impacts includes an assessment of existing noise conditions and the Project's potential to increase noise levels in the City. Data for this section was based on a review of current noise standards and noise assessment methodologies, including the City of Fountain Valley *Noise Element* and Noise Ordinance, and the Federal Transit Administration's Transit Noise and Impact Assessment document. The methodology and assumptions used for the analysis of noise impacts that could result from implementation of the Project are detailed below.

Construction Noise Levels

Construction-related noise levels are estimated based on the Project's anticipated construction equipment inventory, estimated duration of construction, and distance between the Project construction site and sensitive receptors.

Construction noise levels were estimated using data published by the U.S. Department of Transportation (U.S. DOT). The U.S. DOT has compiled data regarding the noise-generating characteristics of typical construction activities (see Table 3.8-11).

These noise levels would diminish rapidly with distance from the construction site, at a rate of approximately 6 dBA per doubling of distance as equipment is generally stationary or confined to specific areas during construction. For example, a noise level of 86 dBA measured at 50 feet from the noise source to the receptor would reduce to 80 dBA at 100 feet from the source to the receptor, and reduce by another 6 dBA to 74 dBA at 200 feet from the source to the receptor. The noise levels from construction at the offsite sensitive uses can be determined with the following equation from the Harris Miller Miller & Hanson Inc. Transit Noise and Vibration Impact Assessment, Final Report:

$$L_{eq} = L_{eq} \text{ at 50 feet} - 20 \text{ Log}(D/50)$$

Where: L_{eq} = noise level of noise source, D = distance from the noise source to the receptor, L_{eq} at 50 feet = noise level of source at 50 feet.

Table 3.8-11. Noise Ranges of Typical Construction Equipment

Construction Equipment	Noise Levels in dBA L_{eq} at 50 Feet
Pile Driver	95-101
Auger Drill Rig	80-85
Front Loader	73–86
Trucks	82–95
Cranes (moveable)	75–88
Cranes (derrick)	86–89
Vibrator	68–82
Saws	72–82
Pneumatic Impact Equipment	83–88
Jackhammers	81–98
Pumps	68–72
Generators	71–83
Compressors	75–87
Concrete Mixers	75–88
Concrete Pumps	81–85
Back Hoe	73–95
Tractor	77–98
Scraper/Grader	80–93
Paver	85–88

Note: Machinery equipped with noise control devices or other noise-reducing design features does not generate the same level of noise emissions as that shown in this table.
Source: Harris Miller Miller & Hanson Inc. 2006.

Operational Noise Levels

Because traffic is the primary component of the noise environment in the City and in the vicinity of the Project area, operational noise levels due to roadway noise were considered in terms of traffic impacts related to the Project. The change in peak roadway noise levels in and adjacent to the Project area were calculated using maximum peak hour trip volumes projected for primary roadway corridors within the Project vicinity. These volumes were based upon the Traffic Impact Analysis (TIA) prepared for the Project (see Section 3.11, *Transportation, Circulation, and Traffic* and Appendix E). The resulting changes in roadway noise levels were then compared to applicable CEQA and City thresholds to assess noise impacts related to traffic volumes. Noise projections are derived based on the percentage change in traffic volume; where fleet mix, roadway configuration, and speed limit remained constant. Noise generated from Project stationary sources is estimated based on the typical dBA levels generated from urban uses, such as heating, ventilation, and air conditioning (HVAC) equipment, delivery trucks, and other common uses (see Table 3.8-1).

Vibration Levels Associated with Construction Equipment

Ground-borne vibration levels resulting from construction activities occurring within the City were estimated using the 2013 Caltrans *Transportation and Construction Vibration Guidance Manual*. Potential vibration levels are identified for onsite and offsite locations that are sensitive to vibration, including nearby residences. Caltrans provides thresholds of significance for vibration and methodology for calculating vibration levels at distances from generation. Vibration levels at the offsite sensitive uses were determined with the following equation: [1]

$$PPV_{Projected} = PPV_{Ref} (25/D)^n$$

Where: PPV_{Ref} = reference PPV at 25 feet; D = distance from equipment to the receiver in feet; n = 1.1 (a recommended conservative value pertaining to attenuation rate of vibration through ground).

3.8.4 Project Impacts and Mitigation Measures

Impact N-1 Description

N-1 Construction of the Project could result in significant temporary noise impacts to nearby noise-sensitive receptors (*Less than Significant with Mitigation*).

Construction activities would produce increased noise levels that would impact surrounding noise-sensitive uses. The precise construction timeline for the Project depends on the timing of entitlements and permit processing. For the purposes of this Environmental Impact Report (EIR), construction activity for the Project is assumed to begin in early 2018 with an estimated completion in early 2035. The Project's construction activities and estimated durations are as follows:

- Demolition – 257 days
- Site Preparation – 180 days
- Grading – 400 days
- Building Construction – 4,077 days
- Architectural Coating – 409 days

All phases of construction would involve the use of heavy equipment. Construction activities would also involve the use of smaller power tools, generators, and other equipment that are sources of noise. Haul trucks using the local roadways would generate noise as they move along the road. Table 3.8-11 indicates the anticipated noise levels of construction equipment noise levels. Each stage of construction would involve a different mix of operating equipment,

[1] Caltrans 2013, *Transportation and Construction Vibration Guidance Manual*, Equation 12.

and noise levels would vary based on the amount and types of equipment in operation and the location of the activity.

Existing noise-sensitive uses in close proximity to the Project area include the surrounding residential uses, the closest being the Green Valley Neighborhood to the north, Los Alamos Park Neighborhood to the northwest, Adobe River Avenue Neighborhood to the west, and the R. Gisler School Neighborhood to the southwest. Approximate noise levels anticipated to occur at these nearby sensitive uses due to Project construction activities are shown in Table 3.8-12.

Table 3.8-12. Estimated Outdoor Construction Peak Noise Levels

Noise-Sensitive Receptor	Distance from Project Area (feet)	Peak Noise Level from Construction (dBA L_{eq})
Green Valley Neighborhood	90	92.9
Los Alamos Park Neighborhood	150	88.5
Adobe River Avenue Neighborhood	75	94.5
R. Gisler School Neighborhood	130	89.7
James H. Cox School	1900	66.4
Elite Educational Center	2070	65.7
Fountain Valley Montessori	2100	65.5
Shoreline Christian School	875	73.1
Robert Gisler Elementary School	1400	69.1
Diane's Day Care	620	76.1
Kazuo Masuda Middle School	3000	62.4
Fountain Valley Library	2600	63.7
Moon Park	520	77.7
Ellis Park	1015	71.9
Suburbia Park	845	73.4
Los Alamos Park	1742	67.2
Holy Spirit Catholic Church	3700	60.6
Shoreline Baptist Church	1140	70.8

Note: Noise levels at offsite sensitive uses were determined with the following equation from the Harris Miller Miller & Hanson Inc. 2006 Transit Noise and Vibration Impact Assessment, Final Report: L_{eq} = L_{eq} at 50 feet – 20 Log(D/50), where L_{eq} = noise level of noise source, D = distance from the noise source to the receiver, L_{eq} at 50 feet = noise level of source at 50 feet. Noise levels have been rounded up to the nearest whole number. Peak noise levels calculated from Table 3.8-1, Noise Ranges of Typical Construction Equipment.
Source: U.S. Environmental Protection Agency 1971.

Maximum noise levels could reach as high as 94.5 dBA at the exterior of noise-sensitive receptors in proximity to the Project area during construction activities. According to the City's Municipal Code, Section 6.28.050, exterior noise standards for residential zones can reach up to 75 dBA from 7:00 AM to 10:00 PM, and up to 70 dBA from 10:00 PM to 7:00 AM for any period of time (see Table 3.8-8). Because maximum noise levels could exceed maximum allowable levels, increased noise levels

during construction would be considered a potential adverse impact for neighboring sensitive residential uses.

However, pursuant to the City's Municipal Code Section 6.28.070 (Special Provisions), noise due to construction activities would be exempt from the Noise Ordinance between the hours of 7:00 AM and 8:00 PM on weekdays and 9:00 AM and 8:00 PM on Saturdays, with no construction activities permitted on Sundays or legal holidays.

Adherence to the Municipal Code Section 6.28.070 and compliance with the mitigation below would reduce short-term construction noise impacts by requiring mobile equipment to be muffled and requiring best management practices for hauling activities. In addition, Project construction is temporary and sensitive receptors would not be exposed to significant construction noise levels over an extended period of time. Therefore, impacts would be *less than significant with mitigation*.

Mitigation Measures

To further reduce the noise levels resulting from construction of the Project for offsite noise-sensitive uses, the following mitigation measures shall be implemented:[2]

MM N-1 ***Construction Noise Management Plan****. A Construction Noise Management Plan shall be prepared by the Applicant and approved by the City prior to Grading Permit issuance. The Plan would address noise and vibration impacts and outline measures that would be used to reduce impacts. Measures would include but not be limited to:*

- *To the extent that they exceed the applicable construction noise limits, excavation, foundation-laying, and conditioning activities shall be restricted to between the hours of 7:00 AM and ~~10:00~~ 8:00 PM Monday through Friday, and 9:00 AM and 8:00 PM Saturdays, in accordance with Section 6.28.070 of the Fountain Valley Municipal Code.*
- *The Applicant's construction contracts shall require implementation of the following construction best management practices (BMPs) by all construction contractors and subcontractors working in or around the Project area to reduce construction noise levels from all construction projects occurring under the Specific Plan:*
    - *The Applicant and its contractors and subcontractors shall ensure that all construction equipment, fixed or mobile, is properly muffled according to manufacturer's specifications or as required by the City's Building and Safety Division, whichever is the more stringent.*
    - *The Applicant and its contractors and subcontractors shall place noise-generating construction equipment and locate construction staging areas away from sensitive uses, where feasible, to the satisfaction of the Building and Safety Division.*

[2] The text of MM N-1 has been revised since release of the pre-recirculation Final EIR to provide consistency in proposed noise mitigation and the noise regulations provided in Section 6.28.070 of the Fountain Valley Municipal Code.

- *The Applicant and its contractors and subcontractors shall implement noise attenuation measures which may include, but are not limited to, noise barriers or noise blankets to the satisfaction of the City's Building and Safety Division.*
  - *The Applicant's contracts with its construction contractors and subcontractors shall include the requirement that construction staging areas, construction worker parking and the operation of earthmoving equipment within the Project area, are located as far away from vibration- and noise-sensitive sites as possible. Contract provisions incorporating the above requirements shall be included as part of the Project's construction documents, which shall be reviewed and approved by the City.*
  - *The Applicant shall require by contract specifications that heavily loaded trucks used during construction shall be routed away from residential streets to the extent possible. Contract specifications shall be included in the proposed Project's construction documents, which shall be reviewed by the City prior to issuance of a grading permit.*
  - *Meetings shall be coordinated with the management of neighboring residential areas such as Green Valley Neighborhood, Los Alamos Park Neighborhood, Adobe River Avenue Neighborhood, and R. Gisler School Neighborhood to seek solutions to minimize noise impacts. Additionally, neighboring residents would be notified of the construction schedule and upcoming high level noise events.*
  - *Property owners and occupants located within 500 feet of the boundary of a construction project occurring under the Specific Plan shall be sent a notice, at least 15 days prior to commencement of construction of each phase, regarding the construction schedule of the Project. A sign, legible at a distance of 50 feet, shall also be posted at the construction site. All notices and signs shall be reviewed and approved by the City prior to mailing or posting and shall indicate the dates and duration of construction activities, as well as provide a contact name and a telephone number where residents can inquire about the construction process and register complaints.*

Residual Impact

Although construction of the Project would generate noise levels that exceed the established exterior noise limits for the City, MM N-1 would require that construction activities be consistent with Section 6.28.070 of the City's Municipal Code. Further, construction-related noise is intermittent in nature and would not generate continuous noise levels above the Municipal Code standards. Under mitigation measure MM N-1, the implementation of noise attenuation measures may include the use of noise barriers (e.g., sound walls) or noise blankets. As a general rule, a sound wall is able to reduce noise by 5 dBA. In addition, the requirement that construction staging areas and earthmoving equipment be located as far away from noise and vibration-sensitive land uses as possible would also reduce construction-related noise levels. Further, MM N-1 would ensure that haul trucks associated with construction activities are routed away from residences as feasible. Implementation of mitigation measure MM N-1 would reduce noise impacts associated with construction activities resulting from implementation of the Project to *less than significant*.

Impact N-2 Description

N-2 Construction of the Project would require the use of equipment that would potentially result in exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels (*Less than Significant*).

Construction of the Project would occur in phases that would include demolition, site preparation, grading, building construction, and architectural coating. During construction, ground-borne vibration would be generated from various types of construction equipment such as loaded trucks, jack hammers, and bulldozers.

Periods of high vibration levels would occur primarily during demolition and construction of foundation. Vibration levels would decrease as the distance between the vibration source and the receptor increases, and would vary depending on the soil type, ground strata, and construction characteristics of the sensitive receptor buildings.

There are no fragile historic structures in close proximity to the Project area that could be affected by construction vibration. Ground-borne vibration from construction activities could potentially be felt by surrounding sensitive uses such as the nearby residential neighborhoods. However, vibration levels at the closest sensitive receptors would not exceed the threshold of 0.1 in/sec (see Table 3.8-13). Therefore, ground-borne vibration impacts would be *less than significant*.

Table 3.8-13. Estimated Peak Construction Vibration Levels at Sensitive Receptors

Construction Activity	Reference Vibration Level at 25 feet; in/sec	Vibration Level at 75 Feet; in/sec	Vibration Level at 90 Feet; in/sec
Large Bulldozer	0.089	0.027	0.022
Loaded Trucks	0.076	0.022	0.019
Jackhammer	0.035	0.010	0.009
Small Bulldozer	0.003	0.001	0.001

Source: Caltrans 2013.

Mitigation Measures

No mitigation required.

Impact N-3 Description

N-3 Operation of the Project would potentially result in a significant increase in ambient noise levels due to increased traffic and associated noise (*Less than Significant*).

The Project would increase traffic in the area, contributing to the area's noise levels. According to the updated 2017 TIA (see Appendix E), the Project is expected to generate 907 net new trips in the AM peak hour, and 849 net new trips in the PM peak hour. Intersection traffic volumes were analyzed in the TIA to determine Project impacts on a number of local

intersections. Based on the percent change in traffic volumes resulting from Project conditions, the change in traffic noise levels on nearby streets would range from 0.04 dB (1 percent increase) to a maximum increase of 0.88 dB (22.5 percent increase) as shown in Tables 3.8-14 and 3.8-15.

Table 3.8-14. Noise Impacts from Project-related Traffic AM Peak Hour

Intersection	Existing Traffic Counts (2015)	Existing + Project Traffic Counts (2015)	% Change with Project	Change with Project in dB
1. Brookhurst St/Warner Ave	6774	6845	1	0.04
2. Euclid St/Warner Ave	6287	6405	1.9	0.08
3. Ward St/Slater St	2926	3046	4.1	0.17
4. Euclid St/Slater St	4377	4452	1.7	0.07
5. Newhope St/Slater St	2684	2738	2	0.09
6. Bushard St/Talbert Ave	3581	3636	1.5	0.06
7. Brookhurst St/Talbert Ave	5491	5545	1	0.04
8. Ward St/Talbert Ave	2975	3223	8.3	0.35
9. Hyundai Way/Talbert Ave	2394	2498	4.3	0.18
10. Euclid St/Talbert Ave	4577	4767	4.2	0.18
11. Newhope St/Talbert Ave	3921	4145	5.7	0.24
12. Mount Washington St/Talbert Ave	3613	3762	4.1	0.17
13. Harbor Blvd/MacArthur Blvd	6256	6387	2	0.09
14: Fairview St/MacArthur Blvd	5636	5746	2	0.09
15. Euclid St/I-405 NB Ramps/Newhope St	3329	3881	16.6	0.67
16. Euclid St/Condor Ave	2737	3307	20.8	0.82
17. Brookhurst St/Ellis Ave	4509	4650	3.1	0.13
18. Ward St/Ellis Ave	3352	3850	14.9	0.60
19. I-405 SB Ramps/Ellis Ave/Euclid St	3492	4279	22.5	0.88
20. Brookhurst St/Garfield Ave	3731	3806	2	0.09

Source: Fehr and Peers 2017.

The values in Tables 3.8-14 and 3.8-15 represent changes to ambient noise levels attributable to the Project. Comparing changes attributable to the Project, differences in ambient noise would constitute an imperceptible difference in the noise environment. The maximum noise level increase would be less than 1 dB in any location, which would not trigger any level of significance. Therefore, noise impacts from vehicle trips generated by the Project would be *less than significant*.

Mitigation Measures

No mitigation required.

Table 3.8-15. Noise Impacts from Project-related Traffic PM Peak Hour

Intersection	Existing Traffic Counts (2015)	Existing + Project Traffic Counts (2015)	% Change with Project	Change with Project in dB
1. Brookhurst St/Warner Ave	7281	7373	1.2	0.05
2. Euclid St/Warner Ave	6414	6570	2.4	0.10
3. Ward St/Slater St	3126	3237	3.6	0.15
4. Euclid St/Slater St	4509	4627	2.6	0.11
5. Newhope St/Slater St	3617	3680	1.8	0.08
6. Bushard St/Talbert Ave	3727	3791	1.8	0.08
7. Brookhurst St/Talbert Ave	6544	6608	1	0.04
8. Ward St/Talbert Ave	3759	4092	8.9	0.37
9. Hyundai Way/Talbert Ave	3046	3249	6.7	0.28
10. Euclid St/Talbert Ave	5260	5587	6.2	0.26
11. Newhope St/Talbert Ave	4904	5195	5.9	0.25
12. Mount Washington St/Talbert Ave	4660	4866	4.4	0.19
13. Harbor Blvd/MacArthur Blvd	6879	7034	2.3	0.10
14: Fairview St/MacArthur Blvd	6272	6408	2.2	0.09
15. Euclid St/I-405 NB Ramps/Newhope St	3672	4292	16.9	0.68
16. Euclid St/Condor Ave	2924	3538	21	0.83
17. Brookhurst St/Ellis Ave	5172	5336	3.2	0.14
18. Ward St/Ellis Ave	3226	3629	12.5	0.51
19. I-405 SB Ramps/Ellis Ave/Euclid St	3357	4114	22.5	0.88
20. Brookhurst St/Garfield Ave	4377	4463	1.9	0.08

Source: Fehr and Peers 2017.

Impact N-4 Description

N-4 Operation of the Project could result in exposure of persons to excessive ground-borne vibration or noise levels (*Less than Significant*).

Operation of the Project would incrementally contribute new noise sources that would incrementally increase noise levels. The noise sources that may be present during operation of the Project include delivery and trash trucks, mechanical equipment, and typical parking lot activities, as discussed below.

Truck Deliveries and Trash Hauling

During operation of the Project, the onsite retail, commercial, industrial and residential uses would involve the delivery of goods and trash hauling. Two noise sources would be identified with delivery and trash hauling operations: the noise of the diesel engines of the semi-trailer trucks and the backup beeper alarm that sounds when a truck is put in reverse, as is required and regulated by Cal/OSHA. The noise generated by idling diesel engines typically ranges between 64 and 66 dBA L_{eq} at 75 feet. This noise would be temporary in nature, typically lasting no more than 5 minutes. Backup beepers are required by Cal/OSHA to be at least 5 dBA above

ambient noise levels. These devices are highly directional in nature, and when in reverse, the trucks and the beeper alarm would be directed towards the structure the truck would be serving. Thus, sensitive receptors surrounding the Project area would not be directly exposed to noise from onsite delivery operations created by the Project. Further, loading noise would occur occasionally and blend with the noise environment from existing activity, including truck loading and unloading, vehicles entering and exiting the Project area, and garbage collection. Given the existing noise environment, noise impacts related to deliveries and trash hauling would be *less than significant*.

Daily operations of the Project are not anticipated to generate excessive levels of ground-borne vibration. Occasionally, vibration could occur as a result of truck travel to and from the Project area for periodic deliveries. However, such incidences would be temporary in nature and would not be expected to exceed 0.1 in/sec, which is below the level for potential damage to fragile structures. No substantial sources of ground-borne vibration would be introduced as part of the Project; therefore, operation of the Project would not expose sensitive receptors onsite or offsite to excessive ground-borne vibration or ground-borne noise levels, and this impact would be *less than significant*.

Mechanical Equipment

The Project would require the use of HVAC units. Large HVAC systems associated with the Project could result in noise levels that average between 50 and 65 dBA L_{eq} at 50 feet from the equipment. However, noise from mechanical equipment associated with operation of the Project would be required to comply with the state Building Code requirements pertaining to noise attenuation. Mechanical equipment would not be located on the side of any building which is adjacent to a residential building on the adjoining lot unless it can be shown that the noise would comply with the City's exterior noise standards. Therefore, mechanical equipment noise associated with operation of the Project would be below the established standards and would be *less than significant*.

Parking Areas

Parking lots and garages can be a source of annoyance to neighboring uses due to the instantaneous maximum sound levels generated by a car door slamming, automobile engine start-ups and acceleration, and the potential activation of car alarms. Parking garages can generate L_{eq} noise levels of between 49 dBA L_{eq} (tire squeals) to 74 dBA L_{eq} (car alarms) at 50 feet. Due to the relatively high level of traffic noise along streets surrounding the Project area, normal daytime parking area noise would not likely be audible due to the masking of noise by traffic on nearby roadways. Therefore, noise impacts relating to parking operations of the Project would be *less than significant*.

Mitigation Measures

No mitigation required.

3.8.4.1 Cumulative Impacts

Development of the Project in conjunction with future cumulative projects would potentially result in an increase in construction-related and traffic-related noise, as well as onsite stationary noise sources in the City.

Construction-Related Cumulative Impacts

Construction of the Project would potentially overlap with other future projects in the immediate vicinity. It should be noted that the Applicant has no control over the timing or sequencing of future development projects that may occur within the immediate vicinity of the Project area. Therefore, any quantitative analysis that assumes multiple, concurrent construction projects would be entirely speculative. Construction-period noise and ground-borne vibration for the Project and each future development project (that has not yet been approved or built) would be localized.

Based on a September 2017~~June 2016~~ review of the City's current projects, Table 3.0-2, *Cumulative and Concurrent Project List,* there are three projects approved or pending in close proximity to or within the Project area, as well as potential for development of the 1,017,000-sf Southpark Specific Plan Sakioka Site, that could result in temporary cumulative increases in noise levels and ground-borne vibration levels at the same sensitive receptors as the Project. These projects are located at 17900 Newhope Street (Costco Expansion), 10955 Ellis Avenue (Electronic Message Center Sign), I-405 from State Route 73 (SR-73) to I-605 (Orange County Transportation Authority [OCTA]/ Caltrans I-405 Improvement Project), and 11049 Southpark Street (Southpark Specific Plan Sakioka Site). It is reasonably foreseeable that construction projects in the Project vicinity could occur proximate to one another with sometimes concurrent or overlapping schedules, temporarily elevating noise levels in the immediate area. During the time that these cumulative projects are being constructed, the Project vicinity could experience substantial increases in daytime noise levels, resulting in potentially significant cumulative noise impacts. However, noise is not strictly additive, and a doubling of noise sources would not cause a doubling of noise levels, but rather could result in a perceptible noise increase over a single source. Further, such increases in noise levels would be temporary due to the nature of construction. It is assumed that construction of these cumulative projects would be limited to daytime hours, consistent with the City's Municipal Code restrictions.

The cumulative contribution of construction of the Project to this noise and vibration environment would be less than significant after mitigation. Most noise generation from the Project would occur during demolition and foundation construction and would occur in temporary construction phases. With the implementation of mitigation measure MM N-1, cumulative construction impacts would be *less than significant*.

Operational Cumulative Impacts

Cumulative operational noise impacts could occur primarily as a result of increased traffic on local roadways due to the Project and related projects within the area. It is anticipated that additional proposed projects, including development of the Sakioka Site, would add an

approximately 11 to 13 percent increase in vehicle trips to existing traffic volumes on local roadways (Fehr and Peers 2017). Using a 13.0 percentage increase in traffic from Existing without Project to Cumulative without Project, the resulting noise level increase would be 0.53 dBA for all streets. When comparing Existing without Project to Cumulative with Project and assessing only the largest vehicle trip increase (+35.5 percent at Ellis Avenue/Euclid Street & Southbound I-405 Ramps), the noise level increase would be 1.3 dBA. This level is less than any perceptible level to the human ear and does not exceed noise level criteria (an increase of 1.5 dB above existing noise level of 65 CNEL) established for the area, and would therefore not result in the generation of a cumulatively significant increase in noise levels. The I-405 Improvement Project would be the largest contributor due to increased roadway capacity and subsequent increased traffic noise. However, as discussed in Impact N-3, the Project itself would result in an incremental increase in traffic-related noise levels in the area. Cumulative projects in the area would contribute to increased traffic and related noise levels, primarily on arterials and major roadways; however, future development would require City planning review to ensure compliance with City noise policies and regulations. Thus, the Project's contribution to cumulative impacts would be *less than significant*.

The Project would result in minimal operational noise associated with delivery and truck trips, mechanical equipment, and parking areas as discussed in Impact N-4. It is expected that at least the nearby Costco Expansion project would also generate noise from these types of sources. However, each cumulative project that would include these noise sources would require separate discretionary approval and CEQA assessment, which would address potential noise impacts and identify necessary attenuation measures, where appropriate. Therefore, this cumulative impact would be *less than significant*.

Overall, the Project's contribution to cumulative noise levels would be maintained at acceptable levels and impacts would be *less than significant.*