

5.10 Noise

5.10.1 INTRODUCTION

This EIR section evaluates the potential noise impacts that would 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 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 Noise Impact Analysis prepared by Urban Crossroads (NOI 2019), which is included as Appendix I.

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.

5.10.2 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 structural damage and human perception, which are listed in Table 5.10-1, Vibration Standards.

Table 5.10-1: Vibration Screening Standards

Caltrans Guidelines	Peak Particle Velocity for Continuous Sources (PPV) (in/sec)
Building Damage	
Extremely Fragile Historic Buildings	0.08
Fragile Buildings	0.10
Historic Buildings	0.25
Older Residential Structures	0.30
New Residential Structures	0.50
Modern Industrial/Commercial Buildings	0.50
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 JWA 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. JWA maintains 10 permanent noise monitoring stations. 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 is currently undergoing a comprehensive update to the General Plan. The City's Noise Element includes standards related to excessive noise levels. The following existing goal and policies in the Noise Element are relevant to the proposed Project:

Goal 1: Prevent significant increases in noise levels in the community and minimize the adverse effects of currently existing noise sources.

Policies:

- Require consideration of noise generation potential and susceptibility to noise impacts in the siting, design and construction of new developments.
- Require mitigating site and building design features, traffic circulation alternatives, insulation, and other noise prevention measures of those new developments which generate high noise levels.
- Sound insulate and/or buffer sensitive land uses such as housing from adverse noise impacts in noise-prone areas.

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 5.10-2.

Table 5.10-2: City of Santa Ana 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 5.10-3 provides the Municipal Code exterior noise standards that are applied to residential properties.

Table 5.10-3: City of Santa Ana Municipal Code Residential Noise Standards

Time	Permissible Noise Levels (dBA)				
	L ₅₀	L ₂₅	L ₈	L ₂	L _{max}
10:00 p.m. to 7:00 a.m.	50	55	60	65	70
7:00 a.m. to 10:00 p.m.	55	60	65	70	75

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.

5.10.3 ENVIRONMENTAL SETTING

Existing Noise Levels

To assess the existing noise level environment, 24-hour noise level measurements were taken at 6 locations, which are shown in Figure 5.10-1. A description of these locations and the existing noise levels are provided below and listed in Table 5.10-4.

- Location L1 represents the noise levels on Warner Avenue near the existing business complex, across from northeast boundary of the Project site. The noise levels at this location consist primarily of traffic noise from Warner Avenue and commercial parking lot vehicle movements. The noise level measurements collected show an overall 24-hour exterior noise level of 65.1 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 62.9 dBA L_{eq} with an average nighttime noise level of 56.7 dBA L_{eq} .
- Location L2 represents the noise levels Warner Avenue near Tustin Legacy development, southeast of the Project site. Ambient noise levels at this location account for the daytime operations at the U.S. Armed Forces Reserve Center in addition to traffic noise from Warner Avenue. The noise level measurements collected show an overall 24-hour exterior noise level of 62.9 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 61.0 dBA L_{eq} with an average nighttime noise level of 54.2 dBA L_{eq} .
- Location L3 represents the noise levels on Red Hill Avenue near the southeast border of the Project site. The noise levels at this location consist primarily of traffic noise from Red Hill Avenue and vehicle movement into business complex parking lot. The noise level measurements collected show an overall

24-hour exterior noise level of 64.3 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 61.6 dBA L_{eq} with an average nighttime noise level of dBA L_{eq} .

- Location L4 represents the noise levels south on Red Hill Avenue, across from southeastern boundary of the Project site, near the Tustin Legacy development. The noise level measurements collected show an overall 24-hour exterior noise level of 62.3 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 60.9 dBA L_{eq} with an average nighttime noise level of 53.2 dBA L_{eq} . The noise levels at this location consist primarily of traffic noise from Red Hill Avenue.
- Location L5 represents the noise levels within Project site boundaries, adjacent to southwestern border of the Project site, near light industrial area. The 24-hour CNEL indicates that the overall exterior noise level is 58.9 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 58.0 dBA L_{eq} with an average nighttime noise level of 47.6 dBA L_{eq} . Background industrial activity represents the primary noise source at this location.
- Location L6 represents the noise levels northwest of the Project site, adjacent to existing industrial use. The 24-hour CNEL indicates that the overall exterior noise level is 63.8 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 63.7 dBA L_{eq} with an average nighttime noise level of 51.9 dBA L_{eq} . Parking lot vehicle movements and background industrial activity represents the primary source of noise at this location.

Table 5.10-4: Summary of 24-Hour Ambient Noise Level Measurements

Location	Description	Energy Average Noise Level (dBA L_{eq})		CNEL
		Daytime	Nighttime	
L1	Located on Warner Avenue near the existing business complex, across from northeast boundary of the Project site.	62.9	56.7	65.1
L2	Located on Warner Avenue near in the Tustin Legacy, southeast of the Project site.	61.0	54.2	62.9
L3	Located on Red Hill Avenue near the southeast border of the Project site.	61.6	56.4	64.3
L4	Located on Red Hill Avenue, across from southeastern boundary of the Project site, near the Tustin Legacy.	60.9	53.2	62.3
L5	Located within Project site, adjacent to the southwestern border, near the light industrial area and railroad tracks.	58.0	47.6	58.9
L6	Located northwest of the Project site, adjacent to existing business commercial area.	63.7	51.9	63.8

Source: Urban Crossroads, 2019.

"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

Noise Measurement Locations



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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. The Project site is not surrounded by sensitive receptors. The non-sensitive receptors that are in the vicinity of the Project site include office and business park uses. The surrounding uses are described below.

- R1: Located about 220 feet northeast of the Project site, R1 represents Harvest Time Ministries north of Warner Avenue. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.
- R2: Location R2 represents the U.S. Armed Forces Reserve Center on the north side of Warner Avenue at approximately 667 feet east of the Project site. A 24-hour noise measurement near this location, L2, is used to describe the existing ambient noise environment.
- R3: Location R3 represents existing offices for OnTrac and Brasstech northeast of Carnegie Avenue at approximately 85 feet from the Project site. A 24-hour noise measurement near this location, L5, is used to describe the existing ambient noise environment.
- R4: Location R4 represents existing offices for in Carnegie Square Business Park north of Carnegie Avenue at approximately 118 feet from the Project site. A 24-hour noise measurement near this location, L5, is used to describe the existing ambient noise environment.
- R5: Location R5 represents offices in Sirco Irvine Business Park at approximately 64 feet from the Project site. A 24-hour noise measurement near this location, L6, is used to describe the existing ambient noise environment.

John Wayne Airport

John Wayne Airport (JWA) is located approximately 2.2 miles southwest of the Project site and under the primary aircraft approach corridor and within the Airport Environs Land Use Plan (AELUP) notification area for JWA. As shown on Figure 5.10-2, the Project site is located outside the 55 dBA CNEL aircraft noise level contour boundaries of JWA. In addition, the County of Orange has adopted the General Aviation Noise Ordinance that prohibits commercial aircraft departures from JWA 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.

5.10.4 THRESHOLDS OF SIGNIFICANCE

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

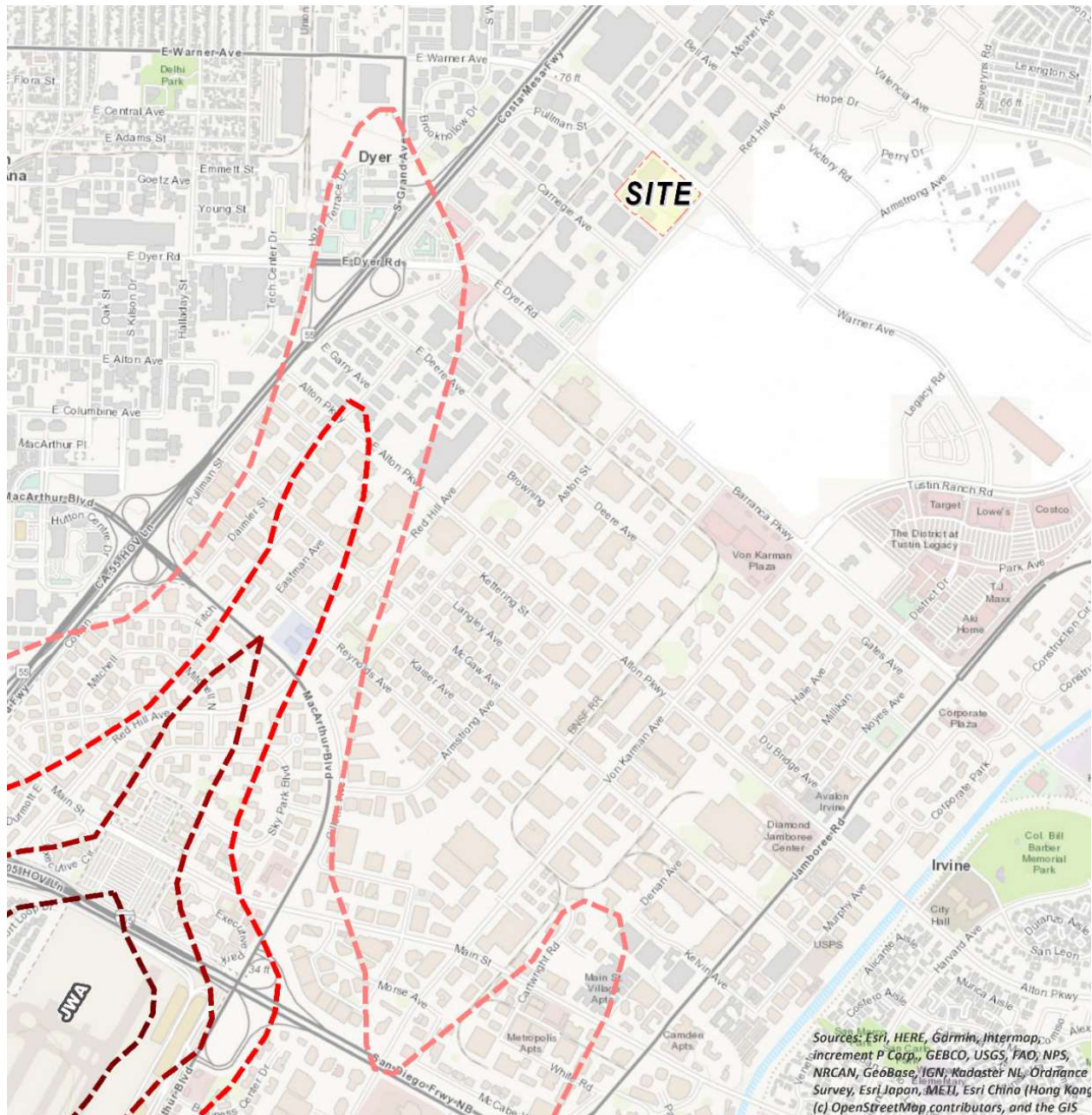
- NOI-1 Generation of a substantial temporary or permanent increase in ambient noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- NOI-2 Generate excessive groundborne vibration or groundborne noise levels;
- NOI-3 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

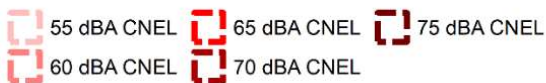
- If project-related construction activities:
 - Occur between the hours of 8:00 p.m. and 7:00 a.m. on weekdays, including Saturday, or any

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John Wayne Airport Noise Level Contours



LEGEND:



Source: Land Use Plan for John Wayne Airport (John Wayne Airport Impact Zones)
Amended: April 17, 2008.

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- time on Sunday or a federal holiday (City of Santa Ana Municipal Code, Section 18-314(e);
 - Create noise levels which exceed the 85 dBA Leq acceptable noise level threshold at the nearby sensitive receiver locations (NIOSH, Criteria for Recommended Standard: Occupational Noise Exposure); or
 - Generate temporary Project construction-related noise level increases which exceed the 10 dBA Leq noise level increase threshold at residential noise-sensitive receiver locations.
- If Project-related construction activities generate vibration levels which exceed the Caltrans building damage vibration level threshold for older residential structures of 0.3 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 & 20).

Off-Site Traffic Noise

- When 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 65 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.
- When the noise levels at existing and future non-noise-sensitive land uses (e.g. office, commercial, etc.):
 - are less than the OPR General Plan Guidelines, Figure 2, *normally acceptable* 70 dBA CNEL and the Project creates a *readily perceptible* 5 dBA CNEL or greater Project-related noise level increase; or
 - are greater than the OPR General Plan Guidelines, Figure 2, *normally acceptable* 70 dBA CNEL and the Project creates a *barely perceptible* 3 dBA CNEL or greater Project-related noise level increase.

On-Site Traffic Noise

- If the on-site noise levels:
 - exceed the exterior noise level standard of 65 dBA CNEL for outdoor areas (e.g., outdoor courtyards); or
 - exceed an interior noise level of 45 dBA CNEL for residential uses (City of Santa Ana General Plan Noise Element, Table 1); or
 - exceed an interior noise level of 50 dBA Leq for non-residential buildings (CALGreen Section 5.507 Environmental Comfort).

Operational Noise

- If project-related operational (stationary source) noise levels exceed the exterior 55 dBA L₅₀ daytime or 50 dBA L₅₀ nighttime noise level standards for sensitive residential land uses, or 60 dBA L₅₀ for community support uses. These standards shall not be exceeded for a cumulative period of 30 minutes (L₅₀), or plus 5 dBA cannot be exceeded for a cumulative period of more than 15 minutes (L₂₅) in any hour, or the standard plus 10 dBA for a cumulative period of more than 5 minutes (L₈) in

any hour, or the standard plus 15 dBA for a cumulative period of more than 1 minute (L_2) in any hour, or the standard plus 20 dBA at any time (L_{max}) per Municipal Code, Section 18-312); or

- If the existing ambient noise levels at the nearby noise-sensitive receivers near the Project site:
 - are less than 60 dBA L_{50} and the project creates a *readily perceptible* 5 dBA L_{50} or greater project-related noise level increase; or
 - range from 60 to 65 dBA L_{50} and the project creates a *barely perceptible* 3 dBA L_{50} or greater project-related noise level increase; or
 - already exceed 65 dBA L_{50} , and the project creates a community noise level impact of greater than 1.5 dBA L_{50} .

5.10.1 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 5.14, *Transportation*, the proposed Project is anticipated to generate a net increase of approximately 11,546 daily trips, 534 a.m. peak hour trips and 604 p.m. 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 have 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 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.

5.10.2 ENVIRONMENTAL IMPACTS

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.

Construction

Less than Significant. 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. Construction is expected to occur in the following stages: demolition, excavation and grading, building construction, architectural coating, paving. Noise levels generated by heavy construction equipment can range from approximately 59.2 dBA to 73.5 dBA when measured at 50 feet, as shown on Table 5.10-5.

Table 5.10-5: Construction Reference Noise Levels

ID	Noise Source	Reference Distance From Source	Reference Noise Levels @ Reference Distance (dBA Leq)	Reference Noise Levels @ 50 Feet (dBA Leq)
1	Truck Pass-Bys & Dozer Activity	30'	63.6	59.2
2	Dozer Activity	30'	68.6	64.2
3	Construction Vehicle Maintenance Activities	30'	71.9	67.5
4	Foundation Trenching	30'	72.6	68.2
5	Rough Grading Activities	30'	77.9	73.5
6	Framing	30'	66.7	62.3
7	Concrete Mixer Truck Movements	50'	71.2	71.2
8	Concrete Paver Activities	30'	70.0	65.6
9	Concrete Mixer Pour & Paving Activities	30'	70.3	65.9
10	Concrete Mixer Backup Alarms & Air Brakes	50'	71.6	71.6
11	Concrete Mixer Pour Activities	50'	67.7	67.7

Source: Urban Crossroads, 2019.

Noise levels are calculated at 50 feet using a drop off rate of 6 dBA per doubling of distance (point source).

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.

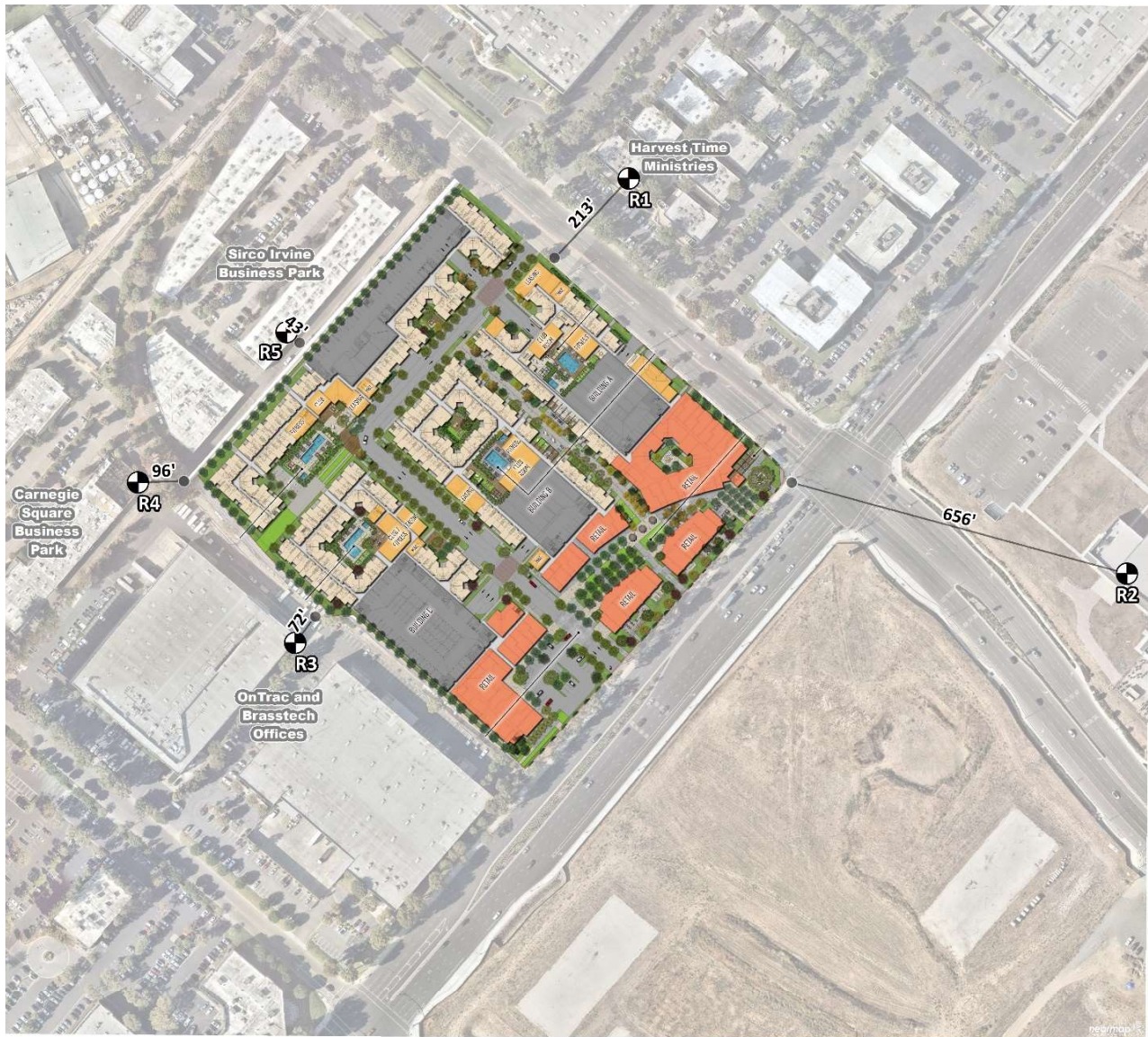
Construction noise would be temporary in nature as the operation of each piece of construction equipment would not be constant throughout the construction day, and equipment would be turned off when not in use. The typical operating cycle for a piece of construction equipment involves one or two minutes 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. As shown on Table 5.10-6, construction noise at the nearby receiver locations shown on Figure 5.10-3 would range from 51.0 to 71.4 dBA Leq, which would not exceed the 85 dBA Leq daytime construction noise level threshold at nearby non-residential non-sensitive receiver locations. Therefore, construction impacts would be less than significant.

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Construction Activity and Receiver Locations

The Bowery Noise Impact Analysis

EXHIBIT 10-A: CONSTRUCTION ACTIVITY AND RECEIVER LOCATIONS



LEGEND:



Receiver Locations



Distance from receiver to Project site boundary (in feet)

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Table 5.10-6: Project Construction Noise

Receiver Location	Construction Noise Levels by Stage (dBA L _{eq})					Highest Construction Noise Level
	Demolition	Grading	Building Construction	Architectural Coating	Paving	
R1	51.3	60.6	55.3	55.3	58.7	60.6
R2	41.7	51.0	45.7	45.7	49.1	51.0
R3	59.6	68.9	63.6	63.6	67.0	68.9
R4	56.7	66.0	60.7	60.7	64.1	66.0
R5	62.1	71.4	66.1	66.1	69.5	71.4

Source: Urban Crossroads, 2019.

To identify the increase in temporary noise from Project construction, the construction noise levels were combined with the existing ambient noise levels measurements at the off-site receiver locations. The difference between the combined project-construction and ambient noise levels are used to describe the construction noise level contributions. This analysis provides a conservative approach with the highest noise-level-producing equipment for each stage of demolition and construction operating at the closest point from construction activity to the closest receiver locations. This construction activity scenario is limited in time and duration and unlikely to occur during typical daily construction activities and provides the maximum anticipated construction noise levels at the receiver locations. As indicated in Table 5.10-7, the Project would result in construction noise level increases that would not exceed the 12 dBA L_{eq} significance threshold. Therefore, impacts related to substantial increases in ambient noise related to construction activity would be less than significant.

Table 5.10-7: Construction Noise Related Ambient Noise Level Increases (dBA L_{eq})

Receiver Location	Project Construction Noise Level	Measurement Location	Reference Ambient Noise Levels	Combined Project and Ambient	Temporary Worst-Case Project Contribution	Threshold Exceeded?
R1	60.6	L1	62.9	64.9	2.0	No
R2	51.0	L2	61.0	61.4	0.4	No
R3	68.9	L5	58.0	69.2	11.2	No
R4	66.0	L5	58.0	66.6	8.6	No
R5	71.4	L6	63.7	72.0	8.3	No

Source: Urban Crossroads, 2019.

Operation

On-Site Operational Noise Sources

Less than Significant. 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. As described previously, there are no off-site sensitive receiver locations in the vicinity of the Project site. However, the Project would develop onsite residences, which would be sensitive receivers. Typical noise levels from onsite operations at 50 feet from the noise source include the following:

- Roof-Top Air Conditioning Unit: 54.4 dBA L₅₀
- Trash Enclosure Activity: 49.0 dBA L₅₀
- Parking Lot Vehicle Movements: 33.5 dBA L₅₀
- Outdoor Activity from Pool and Spa: 48.7 dBA L₅₀

Typically, rooftop air conditioning units are located away from sensitive receivers and shielded to ensure that noise from operation of the units does not have the potential to result in an impact. Based on these typical noise levels, operation of the Project would not result in an exceedance of the City's Municipal Code Section 18-313 noise standards. To ensure compliance with municipal code standards, the City's building and plan check permitting process includes verification that the location of operational noise sources would not result in an exceedance of the municipal code standards. Thus, the City's standards development permitting process would ensure that the proposed Project would not generate on-site operational noise that would exceed noise standards. Therefore, impacts would be less than significant.

On-Site Exterior Traffic Noise

Less than Significant. As shown in Figure 3-5 in Section 3.0, *Project Description*, the Project's outdoor common areas would be located on the rooftops of Building A and Building B and in the courtyard areas by Building C and Building D. The location and design of the multi-family residential outdoor common areas substantially limits their potential exposure to traffic noise from Warner Avenue and Red Hill Avenue. The roof-deck representing the outdoor common areas for Building A, is located on the top of the 6-story building and is screened from both Warner Avenue and Red Hill Avenue by the structure itself including the fitness and clubroom buildings.

As shown on Table 5.10-8, the exterior noise levels at the multi-family residential outdoor common areas would range from 45.1 to 57.7 dBA CNEL, which is below the General Plan Noise Element 65 dBA CNEL exterior noise level standard for outdoor common areas. Therefore, the on-site traffic noise impacts at the multi-family residential outdoor common areas would be less than significant.

Table 5.10-8: Traffic Noise Levels at Residential Exterior Common Areas

Outdoor Common Area	Location	Roadway	Exterior Noise Level (dBA CNEL)	Threshold (dBA CNEL)	Threshold Exceeded?
Bldg. A	6-Story Building Rooftop	Warner Ave.	49.7	65	No
Bldg. B	6-Story Building Rooftop	Red Hill Ave.	46.1	65	No
Bldg. C	Street Level	Red Hill Ave.	45.1	65	No
Bldg. D	Street Level	Warner Ave.	57.7	65	No

Source: Urban Crossroads, 2019.

Off-Site Traffic Noise

Less than Significant

The proposed Project would generate traffic related noise from operation. As described in Section 3.0, *Project Description*, the proposed Project provides access from Red Hill Avenue and Warner 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 Noise Impact Analysis (Appendix I). The tables below provide a summary of the exterior traffic noise levels for the 24 study area roadway segments in the without and with Project conditions.

Existing with Project Conditions. In the existing with Project conditions (Table 5.10-9) noise would range from 66.8 to 75.8 dBA CNEL. Implementation of the proposed Project A would generate a noise level increase of up to 0.5 dBA CNEL on the study area roadway segments, which is less than the 1.5 dBA CNEL threshold for areas above 65 dBA CNEL. Thus, off-site traffic noise impacts in the existing plus Project condition would be less than significant.

Table 5.10-9: Existing with Project Off-Site Traffic Noise

ID	Road	Segment	CNEL at Adjacent Land Use (dBA)			Noise-Sensitive Land Use?	Off-Site Traffic Noise Threshold	Threshold Exceeded?
			No Project	With Project	Project Addition			
1	Grand Ave.	s/o Warner Ave.	70.9	70.9	0.0	No	3.0	No
2	Newport Ave.	n/o Valencia Ave.	66.7	66.8	0.1	No	5.0	No
3	Red Hill Ave.	n/o Walnut Ave.	70.3	70.3	0.0	Yes	1.5	No
4	Red Hill Ave.	s/o Walnut Ave.	70.5	70.5	0.0	Yes	1.5	No
5	Red Hill Ave.	n/o Valencia Ave.	71.6	71.6	0.0	No	3.0	No
6	Red Hill Ave.	s/o Valencia Ave.	73.3	73.4	0.1	No	3.0	No
7	Red Hill Ave.	s/o Warner Ave.	74.1	74.3	0.2	No	3.0	No
8	Red Hill Ave.	n/o Carnegie Ave.	74.1	74.5	0.4	No	3.0	No
9	Red Hill Ave.	s/o Carnegie Ave.	74.0	74.4	0.4	No	3.0	No
10	Red Hill Ave.	n/o Barranca Pkwy.	73.3	73.7	0.4	No	3.0	No
11	Red Hill Ave.	s/o Barranca Pkwy.	73.3	73.5	0.2	No	3.0	No
12	Red Hill Ave.	n/o MacArthur Blvd.	75.7	75.8	0.1	No	3.0	No
13	Red Hill Ave.	s/o MacArthur Blvd.	73.1	73.2	0.1	No	3.0	No
14	Valencia Ave.	w/o Red Hill Ave.	67.5	67.7	0.2	No	5.0	No
15	Valencia Ave.	e/o Red Hill Ave.	68.4	68.5	0.1	No	5.0	No
16	Warner Ave.	w/o Grand Ave.	72.5	72.5	0.0	No	3.0	No
17	Warner Ave.	e/o Grand Ave.	72.2	72.4	0.2	No	3.0	No
18	Warner Ave.	w/o Red Hill Ave.	71.4	71.9	0.5	No	3.0	No
19	Warner Ave.	e/o Red Hill Ave.	70.7	71.1	0.4	No	3.0	No
20	Dyer Rd.	w/o Red Hill Ave.	70.6	70.7	0.1	No	3.0	No
21	Barranca Pkwy.	e/o Red Hill Ave.	73.0	73.1	0.1	No	3.0	No
22	Barranca Pkwy.	w/o Tustin Ranch Rd.	73.5	73.6	0.1	No	3.0	No
23	MacArthur Blvd.	w/o Red Hill Ave.	73.2	73.2	0.0	No	3.0	No
24	MacArthur Blvd.	e/o Red Hill Ave.	72.3	72.3	0.0	No	3.0	No

Source: Urban Crossroads, 2019.

Opening Year (2022) with Project Conditions. In the opening year (2022) with Project conditions (Table 5.10-10) noise would range from 67.4 to 76.2 dBA CNEL. Implementation of the proposed Project would generate a noise level increase of up to 0.5 dBA CNEL on the study area roadway segments, which is less than the 1.5 dBA CNEL threshold for areas above 65 CNEL. Thus, off-site traffic noise impacts in the opening year plus Project condition would be less than significant.

Table 5.10-10: Opening Year (2022) with Project Off-Site Traffic Noise

ID	Road	Segment	CNEL at Adjacent Land Use (dBA)			Noise-Sensitive Land Use?	Off-Site Traffic Noise Threshold	Threshold Exceeded?
			No Project	With Project	Project Addition			
1	Grand Ave.	s/o Warner Ave.	71.1	71.1	0.0	No	3.0	No
2	Newport Ave.	n/o Valencia Ave.	67.3	67.4	0.1	No	5.0	No
3	Red Hill Ave.	n/o Walnut Ave.	70.7	70.7	0.0	Yes	1.5	No
4	Red Hill Ave.	s/o Walnut Ave.	70.8	70.8	0.0	Yes	1.5	No
5	Red Hill Ave.	n/o Valencia Ave.	72.0	72.0	0.0	No	3.0	No
6	Red Hill Ave.	s/o Valencia Ave.	73.5	73.6	0.1	No	3.0	No
7	Red Hill Ave.	s/o Warner Ave.	74.3	74.5	0.2	No	3.0	No
8	Red Hill Ave.	n/o Carnegie Ave.	74.3	74.6	0.3	No	3.0	No
9	Red Hill Ave.	s/o Carnegie Ave.	74.1	74.5	0.4	No	3.0	No
10	Red Hill Ave.	n/o Barranca Pkwy.	73.8	74.2	0.4	No	3.0	No

ID	Road	Segment	CNEL at Adjacent Land Use (dBA)			Noise-Sensitive Land Use?	Off-Site Traffic Noise Threshold	Threshold Exceeded?
			No Project	With Project	Project Addition			
11	Red Hill Ave.	s/o Barranca Pkwy.	73.9	74.1	0.2	No	3.0	No
12	Red Hill Ave.	n/o MacArthur Blvd.	76.1	76.2	0.1	No	3.0	No
13	Red Hill Ave.	s/o MacArthur Blvd.	73.2	73.3	0.1	No	3.0	No
14	Valencia Ave.	w/o Red Hill Ave.	68.2	68.3	0.1	No	5.0	No
15	Valencia Ave.	e/o Red Hill Ave.	69.4	69.5	0.1	No	5.0	No
16	Warner Ave.	w/o Grand Ave.	72.8	72.8	0.0	No	3.0	No
17	Warner Ave.	e/o Grand Ave.	72.5	72.6	0.1	No	3.0	No
18	Warner Ave.	w/o Red Hill Ave.	71.6	72.1	0.5	No	3.0	No
19	Warner Ave.	e/o Red Hill Ave.	71.0	71.4	0.4	No	3.0	No
20	Dyer Rd.	w/o Red Hill Ave.	71.2	71.2	0.0	No	3.0	No
21	Barranca Pkwy.	e/o Red Hill Ave.	73.7	73.9	0.2	No	3.0	No
22	Barranca Pkwy.	w/o Tustin Ranch Rd.	74.0	74.1	0.1	No	3.0	No
23	MacArthur Blvd.	w/o Red Hill Ave.	73.4	73.4	0.0	No	3.0	No
24	MacArthur Blvd.	e/o Red Hill Ave.	72.8	72.9	0.1	No	3.0	No

Source: Urban Crossroads, 2019.

Year 2040 with Project Conditions. In 2040 with Project conditions (Table 5.10-11) noise would range from 69.7 to 76.6 dBA CNEL. Implementation of the proposed Project would generate a noise level increase of up to 0.4 dBA CNEL on the study area roadway segments, which is less than the 1.5 dBA CNEL threshold for areas above 65 CNEL. Thus, off-site traffic noise impacts in the 2040 plus Project condition would be less than significant.

Table 5.10-11: Year 2040 with Project Off-Site Traffic Noise Impacts

ID	Road	Segment	CNEL at Adjacent Land Use (dBA)			Noise-Sensitive Land Use?	Off-Site Traffic Noise Threshold	Threshold Exceeded?
			No Project	With Project	Project Addition			
1	Grand Ave.	s/o Warner Ave.	70.8	70.8	0.0	No	3.0	No
2	Newport Ave.	n/o Valencia Ave.	69.7	69.7	0.0	No	5.0	No
3	Red Hill Ave.	n/o Walnut Ave.	71.2	71.2	0.0	Yes	1.5	No
4	Red Hill Ave.	s/o Walnut Ave.	71.5	71.5	0.0	Yes	1.5	No
5	Red Hill Ave.	n/o Valencia Ave.	72.8	72.9	0.1	No	3.0	No
6	Red Hill Ave.	s/o Valencia Ave.	73.8	73.9	0.1	No	3.0	No
7	Red Hill Ave.	s/o Warner Ave.	74.8	75.0	0.2	No	3.0	No
8	Red Hill Ave.	n/o Carnegie Ave.	74.6	75.0	0.4	No	3.0	No
9	Red Hill Ave.	s/o Carnegie Ave.	74.7	75.0	0.3	No	3.0	No
10	Red Hill Ave.	n/o Barranca Pkwy.	74.3	74.6	0.3	No	3.0	No
11	Red Hill Ave.	s/o Barranca Pkwy.	74.3	74.5	0.2	No	3.0	No
12	Red Hill Ave.	n/o MacArthur Blvd.	76.6	76.7	0.1	No	3.0	No
13	Red Hill Ave.	s/o MacArthur Blvd.	73.6	73.7	0.1	No	3.0	No
14	Valencia Ave.	w/o Red Hill Ave.	70.5	70.6	0.1	No	3.0	No
15	Valencia Ave.	e/o Red Hill Ave.	72.0	72.0	0.0	No	3.0	No
16	Warner Ave.	w/o Grand Ave.	73.0	73.1	0.1	No	3.0	No
17	Warner Ave.	e/o Grand Ave.	73.7	73.8	0.1	No	3.0	No
18	Warner Ave.	w/o Red Hill Ave.	73.4	73.8	0.4	No	3.0	No
19	Warner Ave.	e/o Red Hill Ave.	73.9	74.1	0.2	No	3.0	No
20	Dyer Rd.	w/o Red Hill Ave.	71.9	72.0	0.1	No	3.0	No
21	Barranca Pkwy.	e/o Red Hill Ave.	74.1	74.2	0.1	No	3.0	No
22	Barranca Pkwy.	w/o Tustin Ranch Rd.	74.4	74.5	0.1	No	3.0	No
23	MacArthur Blvd.	w/o Red Hill Ave.	74.1	74.1	0.0	No	3.0	No

ID	Road	Segment	CNEL at Adjacent Land Use (dBA)			Noise-Sensitive Land Use?	Off-Site Traffic Noise Threshold	Threshold Exceeded?
			No Project	With Project	Project Addition			
24	MacArthur Blvd.	e/o Red Hill Ave.	73.1	73.2	0.1	No	3.0	No

Source: Urban Crossroads, 2019.

Interior Noise

Less than Significant. As described previously, traffic along the roadways near the Project site would generate noise. Thus, the interior noise levels were analyzed by the Noise Impact Analysis to identify the interior noise reduction measures needed to satisfy the General Plan Noise Element 45 dBA CNEL interior noise level standard for units facing Warner Avenue and Red Hill Avenue. Tables 5.10-12 through 5.10-15 show that based with a “windows closed” condition with standard windows with a minimum Sound Transmission Class (STC) of 27, the interior noise levels of the residential units would be below the 45 dBA CNEL interior noise standard. Therefore, impacts related to interior noise would be less than significant.

Table 5.10-12: First Floor Residential Interior Noise Levels (CNEL)

Receiver Location	Unit Plan	Noise Level at Façade	Required Interior NR	Minimum Calculated Interior NR	Upgraded Windows	Interior Noise Level	Threshold	Threshold Exceeded?
Bldg. A Warner Ave.	A1	73.2	28.2	30.7	No	42.5	45	No
	A3	73.2	28.2	30.6	No	42.6	45	No
	B2	73.2	28.2	31.3	No	41.9	45	No
	B5	73.2	28.2	30.5	No	42.7	45	No
	S1	73.2	28.2	30.4	No	42.8	45	No
	S2	73.2	28.2	29.7	No	43.5	45	No
Bldg. D Warner Ave.	A1	73.2	28.2	30.7	No	42.5	45	No
	A3	73.2	28.2	30.6	No	42.6	45	No
	B2	73.2	28.2	31.3	No	41.9	45	No
	B5	73.2	28.2	30.5	No	42.7	45	No
	S1	73.2	28.2	30.4	No	42.8	45	No
	S2	73.2	28.2	29.7	No	43.5	45	No
Retail-Warner Ave.		73.1	23.1	25.0	No	48.1	50	No
Retail-Red Hill Ave.		72.7	22.7	25.0	No	47.7	50	No

Source: Urban Crossroads, 2019. NR = Noise Reduction

Table 5.10-13: Second Floor Residential Interior Noise Levels (CNEL)

Receiver Location	Unit Plan	Noise Level at Façade	Required Interior NR	Minimum Calculated Interior NR	Upgraded Windows	Interior Noise Level	Threshold	Threshold Exceeded?
Bldg. A Warner Ave.	A1	73.1	28.1	30.7	No	42.4	45	No
	A3	73.1	28.1	30.6	No	42.5	45	No
	B2	73.1	28.1	31.3	No	41.8	45	No
	B5	73.1	28.1	30.5	No	42.6	45	No
	S1	73.1	28.1	30.4	No	42.7	45	No
	S2	73.1	28.1	29.7	No	43.4	45	No
Bldg. A Red Hill Ave.	A1	70.7	25.7	30.7	No	40.0	45	No
	A3	70.7	25.7	30.6	No	40.1	45	No
	B2	70.7	25.7	31.3	No	39.4	45	No
	B5	70.7	25.7	30.5	No	40.2	45	No

Receiver Location	Unit Plan	Noise Level at Façade	Required Interior NR	Minimum Calculated Interior NR	Upgraded Windows	Interior Noise Level	Threshold	Threshold Exceeded?
	S1	70.7	25.7	30.4	No	40.3	45	No
	S2	70.7	25.7	29.7	No	41.0	45	No
Bldg. B Red Hill Ave.	A1	68.6	23.6	30.7	No	37.9	45	No
	A3	68.6	23.6	30.6	No	38.0	45	No
	B2	68.6	23.6	31.3	No	37.3	45	No
	B5	68.6	23.6	30.5	No	38.1	45	No
	S1	68.6	23.6	30.4	No	38.2	45	No
	S2	68.6	23.6	29.7	No	38.9	45	No
	A1	72.2	27.2	30.7	No	41.5	45	No
	A3	72.2	27.2	30.6	No	41.6	45	No
Bldg. C Red Hill Ave.	B2	72.2	27.2	31.3	No	40.9	45	No
	B5	72.2	27.2	30.5	No	41.7	45	No
	S1	72.2	27.2	30.4	No	41.8	45	No
	S2	72.2	27.2	29.7	No	42.5	45	No
	A1	73.1	28.1	30.7	No	42.4	45	No
	A3	73.1	28.1	30.6	No	42.5	45	No
Bldg. D Warner Ave.	B2	73.1	28.1	31.3	No	41.8	45	No
	B5	73.1	28.1	30.5	No	42.6	45	No
	S1	73.1	28.1	30.4	No	42.7	45	No
	S2	73.1	28.1	29.7	No	43.4	45	No

Source: Urban Crossroads, 2019. NR = Noise Reduction

Table 5.10-14: Third Floor Residential Interior Noise Levels (CNEL)

Receiver Location	Unit Plan	Noise Level at Façade	Required Interior NR	Minimum Calculated Interior NR	Upgraded Windows	Interior Noise Level	Threshold	Threshold Exceeded?
Bldg. A Warner Ave.	A1	72.9	27.9	30.7	No	42.2	45	No
	A3	72.9	27.9	30.6	No	42.3	45	No
	B2	72.9	27.9	31.3	No	41.6	45	No
	B5	72.9	27.9	30.5	No	42.4	45	No
	S1	72.9	27.9	30.4	No	42.5	45	No
	S2	72.9	27.9	29.7	No	43.2	45	No
	A1	70.7	25.7	30.7	No	40.0	45	No
Bldg. A Red Hill Ave.	A3	70.7	25.7	30.6	No	40.1	45	No
	B2	70.7	25.7	31.3	No	39.4	45	No
	B5	70.7	25.7	30.5	No	40.2	45	No
	S1	70.7	25.7	30.4	No	40.3	45	No
	S2	70.7	25.7	29.7	No	41.0	45	No
	A1	68.6	23.6	30.7	No	37.9	45	No
Bldg. B Red Hill Ave.	A3	68.6	23.6	30.6	No	38.0	45	No
	B2	68.6	23.6	31.3	No	37.3	45	No
	B5	68.6	23.6	30.5	No	38.1	45	No
	S1	68.6	23.6	30.4	No	38.2	45	No
	S2	68.6	23.6	29.7	No	38.9	45	No
	A1	72.1	27.1	30.7	No	41.4	45	No
Bldg. C Red Hill Ave.	A3	72.1	27.1	30.6	No	41.5	45	No
	B2	72.1	27.1	31.3	No	40.8	45	No
	B5	72.1	27.1	30.5	No	41.6	45	No
	S1	72.1	27.1	30.4	No	41.7	45	No
	S2	72.1	27.1	29.7	No	42.4	45	No
	A1	72.9	27.9	30.7	No	42.2	45	No

Receiver Location	Unit Plan	Noise Level at Façade	Required Interior NR	Minimum Calculated Interior NR	Upgraded Windows	Interior Noise Level	Threshold	Threshold Exceeded?
Bldg. D Warner Ave.	A3	72.9	27.9	30.6	No	42.3	45	No
	B2	72.9	27.9	31.3	No	41.6	45	No
	B5	72.9	27.9	30.5	No	42.4	45	No
	S1	72.9	27.9	30.4	No	42.5	45	No
	S2	72.9	27.9	29.7	No	43.2	45	No

Source: Urban Crossroads, 2019. NR = Noise Reduction

Table 5.10-15: Fourth through Sixth Floors Residential Interior Noise Levels (CNEL)

Receiver Location	Unit Plan	Noise Level at Façade	Required Interior NR	Minimum Calculated Interior NR	Upgraded Windows	Interior Noise Level	Threshold	Threshold Exceeded?
Bldg. A Warner Ave.	A1	72.6	27.6	30.7	No	41.9	45	No
	A3	72.6	27.6	30.6	No	42.0	45	No
	B2	72.6	27.6	31.3	No	41.3	45	No
	B5	72.6	27.6	30.5	No	42.1	45	No
	S1	72.6	27.6	30.4	No	42.2	45	No
	S2	72.6	27.6	29.7	No	42.9	45	No
Bldg. A Red Hill Ave.	A1	70.6	25.6	30.7	No	39.9	45	No
	A3	70.6	25.6	30.6	No	40.0	45	No
	B2	70.6	25.6	31.3	No	39.3	45	No
	B5	70.6	25.6	30.5	No	40.1	45	No
	S1	70.6	25.6	30.4	No	40.2	45	No
	S2	70.6	25.6	29.7	No	40.9	45	No
Bldg. B Red Hill Ave.	A1	68.5	23.5	30.7	No	37.8	45	No
	A3	68.5	23.5	30.6	No	37.9	45	No
	B2	68.5	23.5	31.3	No	37.2	45	No
	B5	68.5	23.5	30.5	No	38.0	45	No
	S1	68.5	23.5	30.4	No	38.1	45	No
	S2	68.5	23.5	29.7	No	38.8	45	No
Bldg. C Red Hill Ave.	A1	72.0	27.0	30.7	No	41.3	45	No
	A3	72.0	27.0	30.6	No	41.4	45	No
	B2	72.0	27.0	31.3	No	40.7	45	No
	B5	72.0	27.0	30.5	No	41.5	45	No
	S1	72.0	27.0	30.4	No	41.6	45	No
	S2	72.0	27.0	29.7	No	42.3	45	No
Bldg. D Warner Ave.	A1	72.6	27.6	30.7	No	41.9	45	No
	A3	72.6	27.6	30.6	No	42.0	45	No
	B2	72.6	27.6	31.3	No	41.3	45	No
	B5	72.6	27.6	30.5	No	42.1	45	No
	S1	72.6	27.6	30.4	No	42.2	45	No
	S2	72.6	27.6	29.7	No	42.9	45	No

Source: Urban Crossroads, 2019. NR = Noise Reduction

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

Construction

Less than Significant. 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 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 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. 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. At distances ranging from 85 to 667 feet from construction, vibration levels are anticipated to range from 0.001 to 0.014 in/sec PPV, as shown on Table 5.10-16. 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 Caltrans building damage threshold of 0.3 in/sec PPV and vibration standard of 0.04 in/sec PPV for human annoyance at all receiver locations. Therefore, vibration impacts would be less than significant.

Table 5.10-16: Construction Equipment Vibration Levels

Receiver	Distance to Const. Activity (Feet)	Receiver Levels (in/sec) PPV					Thresholds (in/sec) PPV		Threshold Exceeded?	
		Small Bulldozer (< 80k lbs)	Jack-hammer	Loaded Trucks	Large Bulldozer (> 80k lbs)	Highest Vibration Level	Human Annoyance	Building Damage	Human Annoyance	Building Damage
R1	220'	0.000	0.001	0.003	0.003	0.003	0.04	0.3	No	No
R2	667'	0.000	0.000	0.001	0.001	0.001	0.04	0.3	No	No
R3	85'	0.000	0.006	0.012	0.014	0.014	0.04	0.3	No	No
R4	118'	0.000	0.003	0.007	0.009	0.009	0.04	0.3	No	No
R5	64'	0.001	0.009	0.019	0.022	0.022	0.04	0.3	No	No

Source: Urban Crossroads, 2019.

Operation

Less than Significant. 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 the 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.

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 with Mitigation Incorporated. As described previously, JWA is located approximately 2.2 miles southwest 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 Figure 5.10-2, the Project site is located outside the 55 dBA CNEL aircraft noise level contour boundaries of JWA. Therefore, according to the AELUP, the Project residential and commercial retail land use is considered *normally consistent* with JWA 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 that 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.

However, since the Project site is located within the JWA influence area, all future residents shall be notified of potential aircraft overflight consistent with the requirements of the AELUP, which is included as Mitigation Measure LU-1 follows:

"The property is presently located in the vicinity of an airport, within what is known as an airport influence area. For that reason, the property may be subject to some of the annoyances or inconveniences associated with proximity to airport operations (for example: noise, vibration or odors). Individual sensitives to those annoyances, if any are associated with the property before you complete your purchase and determine where they are acceptable to you."

5.10.7 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 Heritage Village Residential project and the Flight at Tustin Legacy project, which are both currently under construction; and would be operational and no longer under construction during construction of the proposed Project. Thus, construction noise levels from the projects 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 nearest related projects to the proposed Project are currently under construction, and no overlap of construction activities would occur. In addition, due to this distance to other projects that are farther from the site, and the rapid attenuation of groundborne vibration, the proposed Project would not result in vibration that could combine with other development projects. Thus, the Project would not contribute to cumulative vibration impacts and impacts would be less than 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 opening year (2022) and the year 2040 cumulative traffic volumes on the roadways in the Project vicinity. The noise levels associated with these traffic volumes with the proposed Project were identified previously in Tables 5.10-10 and 5.10-11. As shown, cumulative development along with the proposed Project would increase local noise levels by a maximum of 0.5 dBA CNEL. As the increase is much lower than 1.5 dBA threshold for areas above 65 dBA CNEL, cumulative impacts associated with traffic noise would be less than significant.

5.10.8 EXISTING STANDARD CONDITIONS AND PLANS, PROGRAMS, OR POLICIES

- 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.

5.10.3 LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Without mitigation, Impact NOI-3 would be **potentially significant**:

Upon implementation of regulatory requirements Impacts NOI-1 and NOI-2 would be less than significant.

5.10.10 MITIGATION MEASURES

Mitigation Measure LU-1: The Development Agreement that is required for implementation of the proposed Project shall include a clause requiring that all prospective residents of the Project site shall be notified of airport related noise. Notification shall be included in lease/rental agreements and shall state the following:

“Notice of Airport in Vicinity. This property is presently located in the vicinity of an airport, within what is known as an airport influence area. For that reason, the property may be subject to some of the annoyances or inconveniences associated with proximity to airport operations related to noise. Individual sensitivities to noise annoyances can vary from person to person. You may wish to consider what airport annoyances, if any, are associated with the property and determine whether they are acceptable to you.”

5.10.11 LEVEL OF SIGNIFICANCE AFTER MITIGATION

The mitigation measure and existing regulatory programs described previously would reduce potential impacts associated with noise to a level that is less than significant. Therefore, no significant unavoidable adverse impacts related to noise would occur.

REFERENCES

City of Santa Ana General Plan Noise Element. Accessed: www.santa-ana.org/generalplan/documents/Noise.pdf

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

Environmental Protection Agency Office of Noise Abatement and Control. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. March 1974. EPA/ONAC 550/9/74-004. Accessed: <https://nepis.epa.gov/Exe/ZyPDF.cgi/2000L3LN.PDF?Dockey=2000L3LN.PDF>

Noise Impact Analysis. Prepared by Urban Crossroads.

United States Department of Housing and Urban Development (HUD), The Noise Guidebook, February 2009. Accessed at: <https://www.hudexchange.info/resource/313/hud-noise-guidebook/>

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