



## 5.11 Noise

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## 5.11 NOISE

The purpose of this section is to evaluate noise source impacts on-site and to surrounding land uses as a result of implementation of the Project. This section evaluates short-term construction-related impacts, as well as future buildout conditions. Mitigation measures are also recommended to avoid or lessen the Project's noise impacts. Information in this section is based on the *City of Azusa General Plan* (General Plan) and the *City of Azusa Municipal and Development Code* (Municipal Code).

For the purposes of mobile source noise modeling and contour distribution, traffic information contained in the *Azusa Business Center Traffic Impact Analysis* (Traffic Impact Analysis), and *Azusa Business Center Supplemental Traffic Assessment* (Supplemental Traffic Assessment), both prepared by Urban Crossroads and dated January 29, 2018, were used; refer to [Appendix 11.7, \*Traffic Impact Analysis\*](#).

Noise measurement and traffic noise modeling data can be found in the *Azusa Business Center Noise Impact Analysis* (Noise Study), and *Azusa Business Center Off-site Traffic Noise Analysis Memo* (Supplemental Noise Study) both prepared by Urban Crossroads, dated January 15, 2018 and February 1, 2018, respectively; refer to [Appendix 11.9, \*Noise Study\*](#).

### 5.11.1 EXISTING SETTING

#### NOISE SCALES AND DEFINITIONS

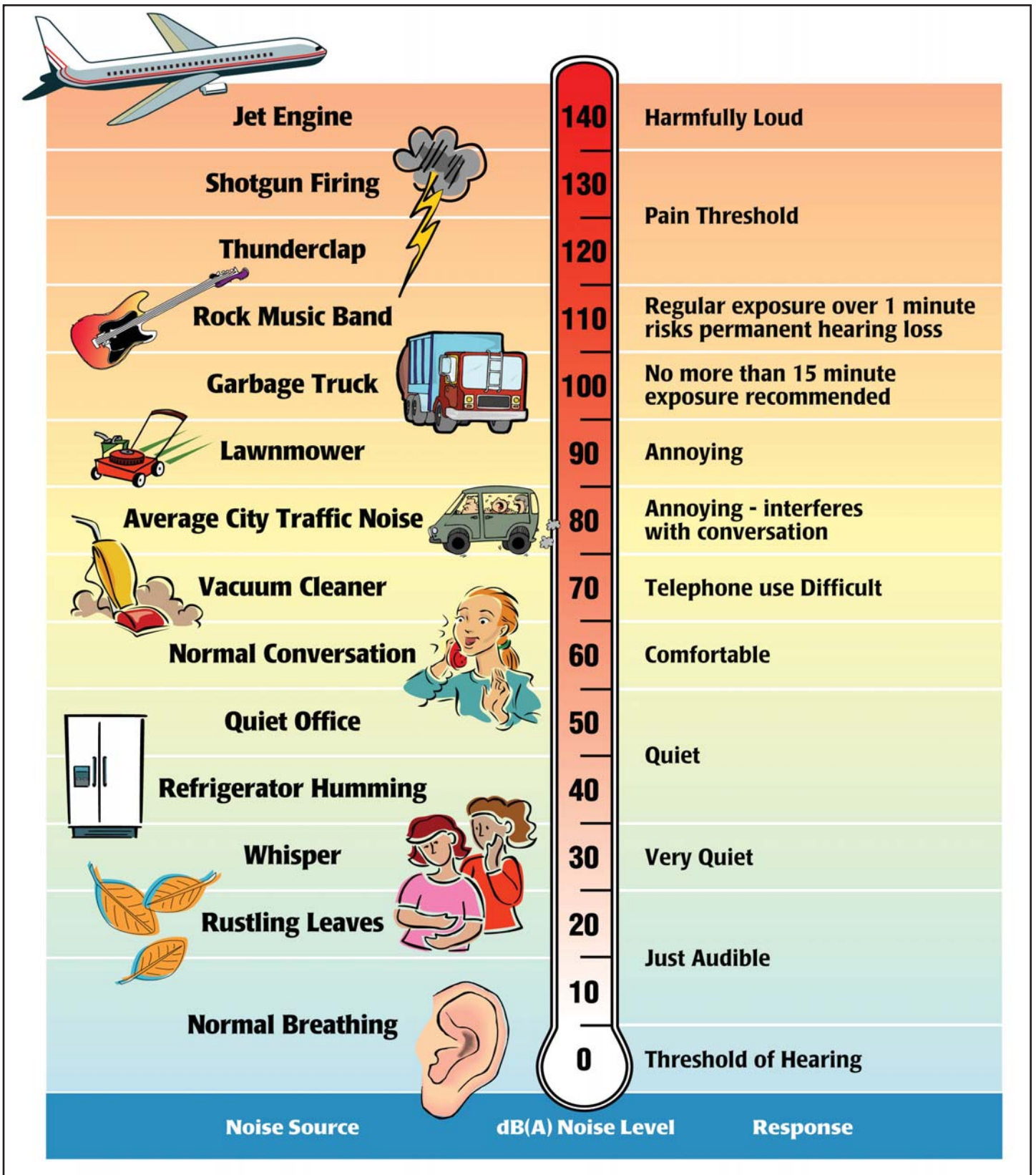
Sound is described in terms of the loudness (amplitude) of the sound and frequency (pitch) of the sound. The standard unit of measurement of the loudness of sound is the decibel (dB). Since the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale 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.

Decibels are based on the logarithmic scale. The logarithmic scale compresses the wide range in sound pressure levels to a more usable range of numbers in a manner similar to the Richter scale used to measure earthquakes. In terms of human response to noise, a sound 10 dBA higher than another is judged to be twice as loud, and 20 dBA higher four times as loud, and so forth. Everyday sounds normally range from 30 dBA (very quiet) to 100 dBA (very loud). Examples of various sound levels in different environments are illustrated on [Exhibit 5.11-1, \*Sound Levels and Human Response\*](#).

Many methods have been developed for evaluating community noise to account for, among other things:

- The variation of noise levels over time;
- The influence of periodic individual loud events; and
- The community response to changes in the community noise environment.

Numerous methods have been developed to measure sound over a period of time; refer to [Table 5.11-1, \*Noise Descriptors\*](#).



Source: Environmental Protection Agency, *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* (EPA/ONAC 550/9-74-004), March 1974.



**Table 5.11-1  
Noise Descriptors**

Term	Definition
Decibel (dB)	The unit for measuring the volume of sound equal to 10 times the logarithm (base 10) of the ratio of the pressure of a measured sound to a reference pressure (20 micropascals).
A-Weighted Decibel (dBA)	A sound measurement scale that adjusts the pressure of individual frequencies according to human sensitivities. The scale accounts for the fact that the region of highest sensitivity for the human ear is between 2,000 and 4,000 cycles per second (hertz).
Equivalent Sound Level ( $L_{eq}$ )	The sound level containing the same total energy as a time varying signal over a given time period. The $L_{eq}$ is the value that expresses the time averaged total energy of a fluctuating sound level.
Maximum Sound Level ( $L_{max}$ )	The highest individual sound level (dBA) occurring over a given time period.
Minimum Sound Level ( $L_{min}$ )	The lowest individual sound level (dBA) occurring over a given time period.
Community Noise Equivalent Level (CNEL)	A rating of community noise exposure to all sources of sound that differentiates between daytime, evening, and nighttime noise exposure. These adjustments are +5 dBA for the evening, 7:00 p.m. to 10:00 p.m., and +10 dBA for the night, 10:00 p.m. to 7:00 a.m.
Day/Night Average ( $L_{dn}$ )	The $L_{dn}$ is a measure of the 24-hour average noise level at a given location. It was adopted by the U.S. Environmental Protection Agency (EPA) for developing criteria for the evaluation of community noise exposure. It is based on a measure of the average noise level over a given time period called the $L_{eq}$ . The $L_{dn}$ is calculated by averaging the $L_{eq}$ 's for each hour of the day at a given location after penalizing the "sleeping hours" (defined as 10:00 p.m. to 7:00 a.m.) by 10 dBA to account for the increased sensitivity of people to noises that occur at night.
Exceedance Level ( $L_n$ )	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% ( $L_{01}$ , $L_{10}$ , $L_{50}$ , $L_{90}$ , respectively) of the time during the measurement period.

Source: Cyril M. Harris, Handbook of Noise Control, 1979.

## HEALTH EFFECTS OF NOISE

Human response to sound is highly individualized. Annoyance is the most common issue regarding community noise. However, many factors influence people's response to noise. The factors can include the character of the noise, the variability of the sound level, the presence of tones or impulses, and the time of day of the occurrence. Additionally, non-acoustical factors, such as the person's opinion of the noise source, the ability to adapt to the noise, the attitude towards the source and those associated with it, and the predictability of the noise, all influence people's response. As such, response to noise varies widely from one person to another and with any particular noise, individual responses range from "not annoyed" to "highly annoyed."



The effects of noise are often only transitory, but adverse effects can be cumulative with prolonged or repeated exposure. The effects of noise on the community can be organized into six broad categories:

- Noise-Induced Hearing Loss;
- Interference with Communication;
- Effects of Noise on Sleep;
- Effects on Performance and Behavior;
- Extra-Auditory Health Effects; and
- Annoyance.

According to the United States Public Health Service, nearly ten million of the estimated 21 million Americans with hearing impairments owe their losses to noise exposure. Noise can mask important sounds and disrupt communication between individuals in a variety of settings. This process can cause anything from a slight irritation to a serious safety hazard, depending on the circumstance. Noise can disrupt face-to-face communication and telephone communication, and the enjoyment of music and television in the home. It can also disrupt effective communication between teachers and pupils in schools, and can cause fatigue and vocal strain in those who need to communicate in spite of the noise.

Interference with communication has proved to be one of the most important components of noise-related annoyance. Noise-induced sleep interference is one of the critical components of community annoyance. Sound level, frequency distribution, duration, repetition, and variability can make it difficult to fall asleep and may cause momentary shifts in the natural sleep pattern, or level of sleep. It can produce short-term adverse effects on mood changes and job performance, with the possibility of more serious effects on health if it continues over long periods. Noise can cause adverse effects on task performance and behavior at work, and non-occupational and social settings. These effects are the subject of some controversy, since the presence and degree of effects depends on a variety of intervening variables. Most research in this area has focused mainly on occupational settings, where noise levels must be sufficiently high and the task sufficiently complex for effects on performance to occur.

Annoyance can be viewed as the expression of negative feelings resulting from interference with activities, as well as the disruption of one's peace of mind and the enjoyment of one's environment. Field evaluations of community annoyance are useful for predicting the consequences of planned actions involving highways, airports, road traffic, railroads, or other noise sources. The consequences of noise-induced annoyance are privately held dissatisfaction, publicly expressed complaints to authorities, and potential adverse health effects, as discussed above. In a study conducted by the United States Department of Transportation, the effects of annoyance to the community were quantified. In areas where noise levels were consistently above 60 dBA CNEL, approximately nine percent of the community is highly annoyed. When levels exceed 65 dBA CNEL, that percentage rises to 15 percent. Although evidence for the various effects of noise have differing levels of certainty, it is clear that noise can affect human health. Most of the effects are, to a varying degree, stress related.



## GROUND-BORNE VIBRATION

Vibration is an oscillatory motion through a solid medium in which the motion’s amplitude can be described in terms of displacement, velocity, or acceleration. The peak particle velocity (PPV) or the root mean square (RMS) velocity is usually used to describe vibration amplitudes. PPV is defined as the maximum instantaneous peak or vibration signal, while RMS is defined as the square root of the average of the squared amplitude of the signal. PPV is typically used for evaluating potential building damage, whereas RMS is typically more suitable for evaluating human response. Typically, ground-borne vibration, generated by man-made activities, attenuates rapidly with distance from the source of vibration. Man-made vibration issues are therefore usually confined to short distances (i.e., 500 feet or less) from the source.

Both construction and operation of development projects can generate ground-borne vibration. In general, demolition of structures preceding construction generates the highest vibrations. Construction equipment such as vibratory compactors or rollers, pile drivers, and pavement breakers can generate perceptible vibration during construction activities. Heavy trucks can also generate ground-borne vibrations that vary depending on vehicle type, weight, and pavement conditions.

## SENSITIVE RECEPTORS

Human response to noise varies widely depending on the type of noise, time of day, and sensitivity of the receptor. The effects of noise on humans can range from temporary or permanent hearing loss to mild stress and annoyance due to such things as speech interference and sleep deprivation. Prolonged stress, regardless of the cause, is known to contribute to a variety of health disorders. Noise, or the lack thereof, is a factor in the aesthetic perception of some settings, particularly those with religious or cultural significance. Certain land uses are particularly sensitive to noise, including schools, hospitals, rest homes, long-term medical and mental care facilities, and parks and recreation areas. Residential areas are also considered noise sensitive, especially during the nighttime hours. The Site vicinity is predominantly an industrial/business park area. The closest sensitive uses within the immediate Site vicinity are residential uses to the northeast across North Todd Avenue and West Sierra Madre Avenue, the Azusa Greens Golf Course to the east, and the San Gabriel River Trail to the west; refer to Table 5.11-2, Sensitive Receptors.

**Table 5.11-2**  
**Sensitive Receptors**

Type	Name	Distance from Site (feet)	Orientation from Site
Residential	Residential Uses	375	Northeast
Recreation/ Open Space	Azusa Greens Golf Course	100	East
	San Gabriel River Trail	216	West
Note: 1. Distances are measured from the exterior Site boundary only and not from individual construction projects/areas within the interior of the Site.			
Source: Google Earth, 2018.			



## AMBIENT NOISE MEASUREMENTS

To quantify existing ambient noise levels in the Site vicinity, Urban Crossroads conducted noise measurements on June 27, 2017; refer to [Exhibit 5.11-2, \*Noise Measurement Locations\*](#), and [Table 5.11-3, \*24-Hour Ambient Noise Level Measurements\*](#). The noise measurement sites were representative of typical existing noise exposure within and immediately adjacent to the Site. Each site was positioned as close to the nearest sensitive receiver locations to assess the existing ambient hourly noise levels surrounding the Site. Four long-term measurements were taken on June 27, 2017 for a 24-hour period.

**Table 5.11-3  
24-Hour Ambient Noise Level Measurements**

Location Number <sup>1</sup>	Distance to Site Boundary (feet)	Description	Leq (dBA)		CNEL
			Daytime <sup>2</sup>	Nighttime <sup>2</sup>	
LT-1	1,427	Located on Encanto Parkway west of the Site near existing residential homes and Encanto Park in the City of Duarte.	54.2	48.8	57.2
LT-2	0	Located on Sierra Madre Avenue north of the Site near existing office buildings and the Army National Guard.	57.3	55.2	62.1
LT-3	620	Located on Sierra Madre Avenue east of the Site near existing residential homes (Rancho Azusa).	68.2	63.8	71.8
LT-4	1,970	Unmitigated exterior conditions on 10th Street, east of the Site near existing residential homes (Sierra Village) and industrial uses.	70.9	66.3	74.0

Notes:  
 1 See [Exhibit 5.11-2](#) for the noise level measurement locations.  
 2 Daytime = 7:00 a.m. to 10:00 p.m.; Nighttime = 10:00 p.m. to 7:00 a.m.

Source: Urban Crossroads, *Azusa Business Center Noise Impact Analysis*, January 15, 2018; refer to [Appendix 11.9](#).

## MOBILE SOURCES

In order to assess the potential for mobile source noise impacts, it is necessary to determine the noise currently generated by vehicles traveling through the Site vicinity. The existing roadway noise levels in the vicinity of the Site were projected. Noise models were run using the Federal Highway Administration's Highway Noise Prediction Model (FHWA RD-77-108) together with several roadway and site parameters. These parameters determine the projected impact of vehicular traffic noise and include the following considerations:

- Roadway classification (e.g., collector, secondary, major or arterial);
- Roadway active width (i.e., the distance between the center of the outermost travel lanes on each side of the roadway);
- Total average daily traffic (ADT);
- Travel speed;
- Percentages of automobiles, medium trucks, and heavy trucks in the traffic volume;





Source: Urban Crossroads; dated January 31, 2018.

NOT TO SCALE

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INTERNATIONAL



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ENVIRONMENTAL IMPACT REPORT

# Noise Measurement Locations

Exhibit 5.11-2



- Roadway grade;
- Angle of view (e.g., whether the roadway view is blocked), the site conditions (“hard” or “soft” relates to the absorption of the ground, pavement, or landscaping); and
- Percentage of total ADT which flows each hour throughout a 24-hour period.

The model does not account for ambient noise levels (i.e., noise from adjacent land uses) or topographical differences between the roadway and adjacent land uses. Noise projections are based on modeled vehicular traffic as derived from the Traffic Impact Analysis. Existing modeled traffic noise levels are detailed in Table 5.11-4, *Existing Traffic Noise Levels*.

## **STATIONARY NOISE SOURCES**

The Site vicinity consists of industrial, residential, recreational, and open space uses. The primary sources of stationary noise in the Site vicinity are urban-related activities (e.g., heating, ventilation, and air conditioning units, parking areas, and conversations). The noise associated with these sources may represent a single-event or a continuous occurrence.

### **5.11.2 REGULATORY SETTING**

This section summarizes the laws, ordinances, regulations, and standards that are applicable to the Project. Regulatory requirements related to environmental noise are typically promulgated at the local level. However, Federal and State agencies provide standards and guidelines to the local jurisdictions.

#### **FEDERAL LEVEL**

##### **Federal Transit Administration**

The cities of Azusa, Irwindale, and Duarte do not identify specific vibration standards for temporary construction, and therefore, the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Standards* are utilized in this analysis. The *Transit Noise and Vibration Impact Assessment* identifies the vibration level thresholds for potential building damage due to construction activities. The lowest threshold identified in the FTA criteria is a PPV of 0.12 inch/second for historic, sensitive buildings.

#### **STATE LEVEL**

##### **California Government Code**

California Government Code Section 65302(f) mandates that the legislative body of each county, town, and city adopt a noise element as part of their comprehensive general plan. The local noise element must recognize the land use compatibility guidelines established by the State Department of Health Services, as shown in Table 5.11-5, *Land Use Compatibility for Community Noise Environments*. The guidelines rank noise land use compatibility in terms of “normally acceptable,” “conditionally acceptable,” “normally unacceptable,” and “clearly unacceptable” noise levels for various land use



**Table 5.11-4  
Existing Traffic Noise Levels**

ID	Road	Segment	ADT	Adjacent Planned/ Existing Land Use	CNEL at Nearest Adjacent Land Use (dBA) <sup>1</sup>	Distance to Contour from Centerline (feet)		
						70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Interstate 605 (I-605) Ramps	South of Huntington Drive	28,449	Residential	72.2	63	135	291
2	Irwindale Avenue	South of Foothill Boulevard	36,498	Industrial/ Business Park	73.6	86	186	400
3	Irwindale Avenue	South of I-210 Freeway	31,161	Industrial/ Business Park	72.9	78	167	360
4	Todd Avenue	North of 10th Street	11,821	Light Industrial	69.8	RW	84	181
5	Todd Avenue	North of Foothill Boulevard	14,533	Light Industrial (Residential)	70.7	45	96	208
6	San Gabriel Avenue	North of Sierra Madre Avenue	3,316	Residential	64.2	RW	RW	57
7	San Gabriel Avenue	South of Foothill Boulevard	12,156	Residential	69.8	RW	63	136
8	Azusa Avenue	North of Sierra Madre Avenue	4,926	Residential	64.7	RW	RW	82
9	Azusa Avenue	South of Foothill Boulevard	7,633	Mixed-Use	66.6	RW	51	110
10	Azusa Avenue	South of 1st Street	27,846	Commercial Mixed-Use	72.2	56	121	260
11	Alameda Avenue	North of 1st Street	3,701	Residential	61.4	RW	RW	37
12	Sierra Madre Avenue	East of Todd Avenue	11,012	Residential	69.5	RW	80	173
13	Sierra Madre Avenue	West of San Gabriel Avenue	13,169	Residential	70.3	42	90	194
14	10th Street	East of Todd Avenue	1,799	Light Industrial/ Open Space	58.2	RW	RW	RW
15	Huntington Drive	West of I-605 Ramps	28,103	Residential	72.8	83	179	387
16	Huntington Drive	East of I-605 Ramps	26,522	Residential	72.6	80	173	372
17	Foothill Boulevard	West of Irwindale Avenue	28,526	Recreation (Residential)	75.1	109	234	505
18	Foothill Boulevard	East of Irwindale Avenue	41,017	Industrial/ Business Park	76.6	139	299	643
19	Foothill Boulevard	East of Todd Avenue	25,455	Light Industrial	72.0	68	146	315
20	Foothill Boulevard	West of San Gabriel Avenue	22,473	Residential	71.4	62	135	290

Notes: ADT = average daily trips; I-605 = Interstate 605; I-210 = Interstate 210; RW = Location of the respective noise contour falls within the right-of-way of the road; dBA = A-weighted decibel scale; CNEL = Community Noise Equivalent Level  
<sup>1</sup> The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.  
Source: Urban Crossroads, *Azusa Business Center Noise Impact Analysis*, January 15, 2018; refer to Appendix 11.9.



types. Single-family homes are “normally acceptable” in exterior noise environments up to 60 CNEL and “conditionally acceptable” up to 70 CNEL. Multiple-family residential uses are “normally acceptable” up to 65 CNEL and “conditionally acceptable” up to 70 CNEL. Schools, libraries, and churches are “normally acceptable” up to 70 CNEL, as are office buildings and business, commercial, and professional uses.

## Green Building Standards Code

The State’s 2014 Green Building Standards Code contains mandatory measures for non-residential building construction in Section 5.507 on Environmental Comfort. These noise standards are applied to new construction in California for controlling interior noise levels resulting from exterior noise sources. The regulations specify that acoustical studies must be prepared when non-residential structures are developed in areas where the exterior noise levels exceed 65 dBA CNEL, such as within a noise contour of an airport, freeway, railroad, and other areas where noise contours are not readily available. If the development falls within the 65 dBA CNEL noise contour of an airport or freeway, the combined sound transmission class (STC) rating of the wall and roof-ceiling assemblies must be at least 50. For those developments in areas where noise contours are not readily available and the noise level exceeds 65 dBA  $L_{eq}$  for any hour of operation, a wall and roof-ceiling combined STC rating of 45, and exterior windows with a minimum STC rating of 40 are required.

**Table 5.11-5  
Land Use Compatibility for Community Noise Environments**

Land Use Category	Community Noise Exposure ( $L_{dn}$ or CNEL, dBA)			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential – Low Density, Single-Family, Duplex, Mobile Homes	50 – 60	55 – 70	70 – 75	75 – 85
Residential – Multiple Family	50 – 65	60 – 70	70 – 75	70 – 85
Transient Lodging - Motel, Hotels	50 – 65	60 – 70	70 – 80	80 – 85
Schools, Libraries, Churches, Hospitals, Nursing Homes	50 – 70	60 – 70	70 – 80	80 – 85
Auditoriums, Concert Halls, Amphitheaters	NA	50 – 70	NA	65 – 85
Sports Arenas, Outdoor Spectator Sports	NA	50 – 75	NA	70 – 85
Playgrounds, Neighborhood Parks	50 – 70	NA	67.5 – 75	72.5 – 85
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50 – 70	NA	70 – 80	80 – 85
Office Buildings, Business Commercial and Professional	50 – 70	67.5 – 77.5	75 – 85	NA
Industrial, Manufacturing, Utilities, Agriculture	50 – 75	70 – 80	75 – 85	NA

Notes: NA = Not Applicable;  $L_{dn}$  = Day/Night Average; CNEL = community noise equivalent level; dBA = A-weighted decibels

Normally Acceptable - Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

Conditionally Acceptable - New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

Normally Unacceptable - New Construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Clearly Unacceptable – New construction or development should generally not be undertaken.

Source: Office of Planning and Research, California, *General Plan Guidelines*, October 2003.



## LOCAL LEVEL

### City of Azusa

#### AZUSA GENERAL PLAN NOISE CRITERIA

General Plan Chapter 5, *Natural Environment*, includes a Noise Section which identifies noise compatibility criteria consistent with the Governor's Office of Planning and Research. The goal of the Noise Section is to maintain community noise levels that meet health guidelines and allow for a high quality of life. The guidelines included in the Noise Section consider land use compatibility and identify exterior noise level compatibility criteria for transportation related noise. General Plan Table N-1, *Land Use Compatibility for Community Noise Environments*, which is detailed in [Table 5.11-4](#), provides the City with a planning tool to gauge the compatibility of land uses relative to existing and future exterior noise levels.

The City's Land Use Compatibility for Community Noise Environments criteria are detailed above in [Table 5.11-5](#). As shown, noise-sensitive land uses such as residential uses are normally acceptable with exterior noise levels below 60 dBA CNEL and conditionally acceptable with noise levels approaching 70 dBA CNEL. Industrial uses, such as the Project, are conditionally acceptable with exterior noise levels between 67 to 78 dBA CNEL and normally unacceptable with exterior noise levels above 75 dBA CNEL. For the purposes of this analysis, industrial land uses are considered normally acceptable land use with exterior noise levels below 70 dBA CNEL, consistent with the adjacent jurisdictional compatibility criteria of the City of Duarte and City of Irwindale General Plans (described below).

#### AZUSA MUNICIPAL CODE

Municipal Code Section 88.31.020 Table 3-4, *Noise Standards for Short-Duration Events Near Residential Areas*, identifies the exterior noise level standards for noise-sensitive receiving land uses in the City. For noise-sensitive residential uses, the daytime (7:00 a.m. to 10:00 p.m.) exterior noise level limit is 50 dBA  $L_{eq}$  and 70 dBA  $L_{max}$ , and 45 dBA  $L_{eq}$  and 65 dBA  $L_{max}$  during the nighttime hours (10:00 p.m. to 7:00 p.m.).

### City of Duarte

#### DUARTE GENERAL PLAN NOISE CRITERIA

The *City of Duarte Comprehensive General Plan 2005-2020* (Duarte General Plan) Noise Element provides a framework to limit noise exposure in Duarte. The land use compatibility noise guidelines provided by the State Department of Health Services shown in [Table 5.11-5](#) are also utilized in Duarte. The Duarte Noise Ordinance establishes acceptable noise levels generated on private property in residential neighborhoods and is designed to control unnecessary, excessive, and annoying sounds. Section 9.68 of the *City of Duarte Municipal Code* (Duarte Municipal Code) is referenced as the City's Noise Ordinance and Duarte General Plan Table N-2, *City of Duarte Noise*



*Ordinance Standards*, provides the current noise regulations. As shown, maximum noise levels for Duarte's industrial zones are 70 dBA for daytime and nighttime hours.<sup>1</sup>

## DUARTE MUNICIPAL CODE

Duarte Municipal Code, Section 9.68.050, identifies the exterior noise level standards at land uses in Duarte. For lower density residential uses (R-1 and R-2 designated), the daytime (7:00 a.m. to 10:00 p.m.) exterior noise level limit is 55 dBA  $L_{eq}$ , and 45 dBA  $L_{eq}$  during the nighttime hours (10:00 p.m. to 7:00 p.m.). For higher density residential uses (R-3 and R-4 designated), the daytime (7:00 a.m. to 10:00 p.m.) exterior noise level limit is 55 dBA  $L_{eq}$ , and 50 dBA  $L_{eq}$  during the nighttime hours (10:00 p.m. to 7:00 p.m.). Exterior noise levels at commercial uses shall not exceed 60 dBA  $L_{eq}$  daytime and 55 dBA  $L_{eq}$  nighttime, and at industrial uses, 70 dBA  $L_{eq}$  during the daytime and nighttime hours.

## City of Irwindale

### IRWINDALE GENERAL PLAN NOISE CRITERIA

The *City of Irwindale General Plan Update* (Irwindale General Plan) Public Safety Element includes a Noise and Land Use Compatibility section. Irwindale General Plan Table 6-2, *Traffic Noise Levels Along Major Arterial Roadways Serving the City*, and Table 6-3, *Noise Measurement Survey Results*, identify ambient noise levels within Irwindale.<sup>2</sup> Irwindale relies on existing Federal and State noise criteria guidelines to gauge the compatibility of land uses relative to existing the future noise levels, including the EPA, FHWA, and the State Department of Health Services.

### Irwindale Municipal Code

The *City of Irwindale Municipal Code* (Irwindale Municipal Code), Section 9.28.030, identifies the exterior noise level standards for receiving land uses in Irwindale. For residential uses, the daytime (7:00 a.m. to 10:00 p.m.) exterior noise level limit is 50 dBA  $L_{eq}$ , and 45 dBA  $L_{eq}$  during the nighttime hours (10:00 p.m. to 7:00 p.m.). Exterior noise levels at commercial uses shall not exceed 55 dBA  $L_{eq}$  daytime and 50 dBA  $L_{eq}$  nighttime, and at industrial uses, 70 dBA  $L_{eq}$  daytime and 60 dBA  $L_{eq}$  nighttime. Irwindale Municipal Code, Section 9.28.040, indicates that Project construction noise levels shall not exceed the base exterior noise level standard or the ambient noise level by more than 5 dBA  $L_{eq}$  at sensitive receiver locations.

## 5.11.3 IMPACT THRESHOLDS AND SIGNIFICANCE CRITERIA

Appendix G, of the *CEQA Guidelines* contains analysis guidelines related to the assessment of noise impacts. These guidelines have been utilized as thresholds of significance for this analysis. As stated in Appendix G, a project would create a significant environmental impact if it would:

<sup>1</sup> City of Duarte, *City of Duarte Comprehensive General Plan 2005-2020 Noise Element*, <http://www.accessduarte.com/civicax/filebank/blobdload.aspx?BlobID=22817>, accessed on March 21, 2018.

<sup>2</sup> City of Irwindale, *City of Irwindale General Plan Update*, June 2008, <http://www.ci.irwindale.ca.us/DocumentCenter/View/38>, accessed on March 21, 2018.



- a) Expose persons to, or generate, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies (refer to Impact Statement N-1);
- b) Expose persons to or generate excessive ground borne vibration or ground borne noise levels (refer to Impact Statement N-2);
- c) Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project (refer to Impact Statements N-3 and N-4);
- d) Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project (refer to Impact Statement N-1);
- 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, expose people residing or working in the project area to excessive noise levels (refer to Section 8.0, *Effects Found Not To Be Significant*); and/or
- f) For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels (refer to Section 8.0).

Based on these standards, the effects of the Project have been categorized as either a “less than significant impact” or a “potentially significant impact.” Mitigation measures are recommended for potentially significant impacts. If a potentially significant impact cannot be reduced to a less than significant level through the application of mitigation, it is categorized as a significant and unavoidable impact.

## **OPERATIONAL NOISE STANDARDS**

Although the Site is located within the City, nearby sensitive receiver locations are potentially located within the adjacent jurisdictions of the City of Irwindale and City of Duarte. Therefore, to accurately evaluate the Project’s potential operational noise levels, the appropriate operational noise standards for the City of Irwindale and Duarte are provided below the City of Azusa’s operational noise standards. Table 5.11-6, *Operational Noise Standards*, shows the operational noise level limits by jurisdiction used in this analysis.

## **CONSTRUCTION NOISE STANDARDS**

To analyze noise impacts originating from Project construction, construction noise is typically evaluated against standards established under a city’s municipal code. The construction noise standards for the cities of Azusa, Irwindale, and Duarte are described below and summarized in Table 5.11-7, *Construction Noise Standards*. While both Azusa and Duarte establish limits to construction hours, neither of the cities’ general plans or municipal codes establish numeric maximum acceptable construction source noise levels at potentially affected receivers. Therefore, the adjacent City of Irwindale construction noise standards are used in this analysis to assess potential impacts at study area receiver locations as shown below in Table 5.11-7.



**Table 5.11-6  
Operational Noise Standards**

Jurisdiction	Land Use	Time Period	Exterior Noise Levels (dBA)	
			L <sub>eq</sub>	L <sub>max</sub>
City of Azusa	Residential	Daytime	50	70
		Nighttime	45	65
City of Irwindale	Residential	Daytime	50	—
		Nighttime	45	—
	Commercial	Daytime	55	—
		Nighttime	50	—
	Industrial	Daytime	70	—
		Nighttime	60	—
City of Duarte	Residential (R-1 and R-2)	Daytime	55	—
		Nighttime	45	—
	Residential (R-3 and R-4)	Daytime	55	—
		Nighttime	50	—
	Commercial	Daytime	60	—
		Nighttime	55	—
	Industrial	Day/Night	70	—

Notes: dBA = A-weighted decibel; L<sub>eq</sub> = equivalent noise level; L<sub>max</sub> = maximum noise level  
 Daytime and Nighttime Hours by Jurisdiction:  
 Irwindale and Azusa: Daytime = 7:00 a.m. to 10:00 p.m.; Nighttime = 10:00 p.m. to 7:00 a.m.  
 Duarte: Daytime = 7:00 a.m. to 9:00 p.m.; Nighttime = 9:00 p.m. to 7:00 a.m.  
 Source: Urban Crossroads, *Azusa Business Center Noise Impact Analysis*, January 15, 2018; refer to [Appendix 11.9](#).

**Table 5.11-7  
Construction Noise Standards**

Jurisdiction	Permitted Hours of Construction Activity	Construction Noise Level Standards (dBA L <sub>eq</sub> )
City of Azusa	7:00 a.m. to 6:00 p.m. Monday through Saturday; unless otherwise allowed through conditions of approval	—
City of Irwindale	—	Base Standard or Ambient Noise Level + 5 dBA
City of Duarte	—	—
Acceptable threshold for determining the relative significance of project construction levels:		Base Standard or Ambient Noise Level + 5 dBA

Notes: dBA = A-weighted decibel; L<sub>eq</sub> = equivalent noise level  
 Source: Urban Crossroads, *Azusa Business Center Noise Impact Analysis*, January 15, 2018; refer to [Appendix 11.9](#).





## VIBRATION STANDARDS

As stated above, the cities of Azusa, Irwindale, and Duarte do not identify specific vibration standards for temporary construction, and therefore, the FTA’s *Transit Noise and Vibration Impact Assessment Standards* are utilized in this analysis. The lowest threshold identified in the FTA criteria is a PPV of 0.12 inch/second for historic, sensitive buildings. For the purposes of this analysis, the building damage threshold of 0.12 inch/second shall be used to assess the potential impacts due to Project construction at surrounding uses.

## NOISE IMPACT CRITERIA

Table 5.11-8, *Significance Criteria Summary*, shows the significance criteria for noise impacts as a direct result of the proposed development.

Table 5.11-8  
Significance Criteria Summary

Analysis	Receiving Land Use	Jurisdiction	Condition(s)	Significance Criteria	
				Daytime	Nighttime
Off-Site	Noise-Sensitive	All	If ambient is < 60 dBA CNEL	≥ 5 dBA CNEL project increase	
			If ambient is 60 – 65 dBA CNEL	≥ 3 dBA CNEL project increase	
			If ambient is > 65 dBA CNEL	≥ 1.5 dBA CNEL project increase	
	Non-Noise-Sensitive		If ambient is < 70 dBA CNEL	≥ 5 dBA CNEL project increase	
			If ambient is > 70 dBA CNEL	≥ 3 dBA CNEL project increase	
Operational	Noise-Sensitive	Azusa	See Table 5.11-6 for Operational Noise Level Standard by Jurisdiction and Land Use		
		Irwindale			
		Duarte			
		All	If ambient is < 60 dBA Leq	≥ 5 dBA Leq project increase	
			If ambient is 60 – 65 dBA Leq	≥ 3 dBA Leq project increase	
			If ambient is > 65 dBA Leq	≥ 1.5 dBA Leq project increase	
		All	Vibration Level Threshold	0.12 inch/second PPV	N/A
Construction	Noise-Sensitive	Azusa	Permitted between 7:00 a.m. to 6:00 p.m. Monday through Saturday; unless otherwise allowed through conditions of approval. <sup>1</sup>		
		All	Noise Level Threshold <sup>2</sup>	5 dBA Leq Increase Above Ambient	
		All	Vibration Level Threshold	0.12 inch/second PPV	N/A
Notes: N/A = Not applicable; no nighttime construction activity is permitted, so no nighttime construction noise level limits are identified; PPV = peak particle velocity <sup>1</sup> City of Azusa Municipal Code, Section 88.31.020(C)(3) (Appendix 3.1) <sup>2</sup> Construction noise level thresholds based on the Irwindale Municipal Code Section 9.28.110 and Los Angeles Municipal Code Section 112.02. Daytime and Nighttime Hours by Jurisdiction: Irwindale and Azusa: Daytime = 7:00 a.m. to 10:00 p.m.; Nighttime = 10:00 p.m. to 7:00 a.m. Duarte: Daytime = 7:00 a.m. to 9:00 p.m.; Nighttime = 9:00 p.m. to 7:00 a.m. Source: Urban Crossroads, <i>Azusa Business Center Noise Impact Analysis</i> , January 15, 2018; refer to Appendix 11.9.					



## 5.11.4 IMPACTS AND MITIGATION MEASURES

### SHORT-TERM CONSTRUCTION NOISE IMPACTS

N-1 Would Project construction result in significant temporary noise impacts to nearby noise sensitive receivers?

#### Impact Analysis:

#### WAREHOUSE ONLY OPTION

Construction activities associated with the Warehouse Only Option would generate perceptible noise levels during the demolition, site preparation, grading, building construction, paving, and architectural coating phases. High groundborne noise levels and other miscellaneous noise levels can be created by the operation of heavy-duty trucks, backhoes, bulldozers, excavators, front-end loaders, scrapers, and other heavy-duty construction equipment.

Table 5.11-9, *Construction Reference Noise Levels*, indicates the anticipated noise levels of construction equipment at various distances. Noise levels generated by heavy construction equipment can range from approximately 68 dBA to more than 80 dBA when measured at 50 feet. However, these noise levels diminish with distance from the construction site at a rate of 6 dBA per doubling of distance. For example, a noise level of 80 dBA measured at 50 feet from the noise source to the receiver would be reduced to 74 dBA at 100 feet from the source to the receiver, and would be further reduced to 68 dBA at 200 feet from the source to the receiver.

Table 5.11-9  
Construction Reference Noise Levels

ID	Noise Source	Reference Distance From Source (Feet)	Reference Noise Levels @ Reference Distance (dBA L <sub>eq</sub> )	Reference Noise Levels @ 50 Feet (dBA L <sub>eq</sub> ) <sup>1</sup>
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	Water Truck Pass-By & Backup Alarm	30	76.3	71.9
8	Dozer Pass-By	30	84.0	79.6
9	Two Scrapers & Water Truck Pass-By	30	83.4	79.0
10	Two Scrapers Pass-By	30	83.7	79.3
11	Scraper, Water Truck, & Dozer Activity	30	79.7	75.3
12	Concrete Mixer Truck Movements	50	71.2	71.2
13	Concrete Paver Activities	30	70.0	65.6
14	Concrete Mixer Pour & Paving Activities	30	70.3	65.9
15	Concrete Mixer Backup Alarms & Air Brakes	50	71.6	71.6
16	Concrete Mixer Pour Activities	50	67.7	67.7
17	Forklift, Jackhammer, & Metal Truck Bed Loading	50	67.9	67.9
Notes:				
1 Reference noise levels are calculated at 50 feet using a drop off rate of 6 dBA per doubling of distance (point source).				
Source: Urban Crossroads, Azusa Business Center Noise Impact Analysis, January 15, 2018; refer to Appendix 11.9.				



Using the reference construction equipment noise levels in [Table 5.11-9](#), calculations of the Project construction noise level impacts at the nearby sensitive receiver locations were completed. [Table 5.11-10](#), *Construction Equipment Noise Level Summary*, provides a summary of the construction noise levels by stage at the nearby noise-sensitive receiver locations. As shown on [Table 5.11-10](#), construction noise levels are expected to range from 44.9 to 60.1 dBA  $L_{eq}$  at the nearby receiver locations.

**Table 5.11-10  
Construction Equipment Noise Level Summary**

Receiver Location <sup>1</sup>	Construction Noise Levels by Stage (dBA $L_{eq}$ )						
	Demolition	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Construction Noise Level <sup>2</sup>
R1	44.9	44.9	44.9	33.5	36.9	32.8	44.9
R2	60.1	60.1	60.1	48.7	52.2	48.0	60.1
R3	44.9	44.9	44.9	33.5	36.9	32.8	44.9
R4	47.1	47.1	47.1	35.7	39.1	35.0	47.1

Notes:  
 1 Noise receiver locations are the same as the noise measurement locations shown on [Exhibit 5.11-2](#).  
 2 Estimated construction noise levels during peak operating conditions.  
 Source: Urban Crossroads, *Azusa Business Center Noise Impact Analysis*, January 15, 2018; refer to [Appendix 11.9](#).

To evaluate whether the Warehouse Only Option would generate potentially significant short-term noise levels at off-site sensitive receiver locations, a construction-related noise level increase threshold of 5 dBA  $L_{eq}$  over ambient conditions is used as an acceptable threshold for construction noise at the nearby sensitive receiver locations. [Table 5.11-11](#), *Construction Equipment Noise Level Compliance*, shows the highest construction noise levels at the potentially impacted receiver locations are expected to generate temporary, short-term noise level increases above ambient conditions of up to 0.6 dBA  $L_{eq}$ . Per [Table 5.11-11](#), the construction noise level increase significance threshold would not be exceeded. Thus, Warehouse Only Option-generated construction noise would result in a less than significant impact at all nearby sensitive receiver locations.

**Table 5.11-11  
Construction Equipment Noise Level Compliance**

Receiver Location <sup>1</sup>	Highest Project Construction Noise Level <sup>2</sup>	Measurement Location <sup>1</sup>	Reference Ambient Noise Levels <sup>3</sup>	Combined Project and Ambient	Temporary Worst-Case Project Contribution	Threshold Exceeded? <sup>4</sup>
R1	44.9	L1	54.2	54.7	0.5	No
R2	60.1	L3	68.2	68.8	0.6	No
R3	44.9	L4	70.9	70.9	0.0	No
R4	47.1	L4	70.9	70.9	0.0	No

Notes:  
 1 Noise receiver locations are the same as the noise measurement locations shown on [Exhibit 5.11-2](#).  
 2 Project construction noise levels as shown on [Table 5.11-10](#).  
 3 Observed daytime ambient noise levels as shown on [Table 5.11-3](#).  
 4 Significance thresholds are based on those detailed in [Table 5.11-8](#).  
 Source: Urban Crossroads, *Azusa Business Center Noise Impact Analysis*, January 15, 2018; refer to [Appendix 11.9](#).



As shown, short-term construction noise impacts generated by the Warehouse Only Option would be less than significant. Additionally, best management practices related to construction noise reduction would be implemented as detailed in SCA NOI-1 through SCA NOI-3, which would further reduce Project-related construction noise levels. Overall, compliance with Municipal Code Section 88.31.020(C)(3) and SCA NOI-1 through SCA NOI-3, short-term construction impacts are less than significant for the Warehouse Only Option.

## WAREHOUSE AND MANUFACTURING OPTION

Given that both the Warehouse Only Option and Warehouse and Manufacturing Option would require similar construction equipment and generate similar construction noise impacts, the analysis above is also applicable to the Warehouse and Manufacturing Option. Short-term construction noise impacts would be less than significant with implementation of applicable local, State, and Federal regulations and SCA NOI-1 through SCA NOI-3.

### Standard Conditions of Approval:

- SCA NOI-1 Prior to approval of grading plans and/or issuance of building permits, plans shall include a note indicating that noise-generating Project construction activities shall only occur between the hours of 7:00 a.m. to 6:00 p.m. Monday through Saturday, unless otherwise allowed through conditions of approval (City of Azusa Municipal Code Section 88.31.020(C)(3)). The Project construction supervisor shall ensure compliance with the note and the City shall conduct periodic inspection at its discretion.
- SCA NOI-2 During all Site construction, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the Site.
- SCA NOI-3 The construction contractor shall locate equipment staging in areas that would create the greatest distance between construction-related noise sources and noise-sensitive receivers nearest the Site during all Project construction (i.e., to the center).

**Mitigation Measures:** No mitigation measures are required.

**Level of Significance:** Less Than Significant Impact.

## VIBRATION IMPACTS

- N-2 Would Project implementation result in significant vibration impacts to nearby sensitive receptors?

### Impact Analysis:

#### WAREHOUSE ONLY OPTION

Construction of the Warehouse Only Option can generate varying degrees of groundborne vibration, depending on the construction procedure and the construction equipment used.



Operation of construction equipment generates vibrations that spread through the ground and diminish in amplitude with distance from the source. The effect on buildings located in the vicinity of the Site often varies depending on soil type, ground strata, and construction characteristics of the receiver building(s). The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibration at moderate levels, to slight damage at the highest levels. Groundborne vibrations from construction activities rarely reach levels that damage structures.

The Federal Transit Administration (FTA) has published standard vibration velocities for construction equipment operations. In general, the FTA architectural damage criterion for continuous vibrations (i.e., 0.2 inch/second) appears to be conservative even for sustained pile driving. Pile driving levels often exceed 0.2 inch/second at distances of 50 feet, and 0.5 inch/second at 25 feet without any apparent damage to buildings.

Construction vibration impacts include human annoyance and building damage. Human annoyance occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time. Building damage can be cosmetic or structural. Ordinary buildings that are not particularly fragile would not experience any cosmetic damage (e.g., plaster cracks) at distances beyond 30 feet. This distance can vary substantially depending on the soil composition and underground geological layer between vibration source and receiver. In addition, not all buildings respond similarly to vibration generated by construction equipment. Ground vibration levels associated with various types of construction equipment are summarized in Table 5.11-12, Typical Vibration Levels for Construction Equipment. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the human response (annoyance) using the following vibration assessment methods defined by the FTA.

**Table 5.11-12  
Vibration Source Levels for Construction Equipment**

Equipment	PPV (inch/second) at 25 feet
Small bulldozer	0.003
Jackhammer	0.035
Loaded Trucks	0.076
Large bulldozer	0.089
Notes: PPV = peak particle velocity	
Source: Urban Crossroads, Azusa Business Center Noise Impact Analysis, January 15, 2018; refer to <u>Appendix 11.9</u> .	

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from the Warehouse Only Option construction activities would cause only intermittent, localized intrusion. The Warehouse Only Option’s construction activities most likely to cause vibration impacts are:

- Heavy Construction Equipment: Although all heavy mobile construction equipment has the potential of causing at least some perceptible vibration while operating close to building, the vibration is usually short-term and is not of sufficient magnitude to cause building damage.



It is not expected that heavy equipment such as large bulldozers would operate close enough to any residences to cause a vibration impact.

- Trucks: Trucks hauling building materials to construction sites can be sources of vibration intrusion if the haul routes pass through residential neighborhoods on streets with bumps or potholes. Repairing the bumps and potholes generally eliminates the problem.

Ground-borne vibration levels resulting from construction activities occurring within the Site were estimated by data published by the FTA. Construction activities that would have the potential to generate low levels of ground-borne vibration within the Site include grading. Table 5.11-13, Construction Equipment Vibration Levels, presents the expected Project-related vibration levels at the nearby receiver locations.

**Table 5.11-13  
Construction Equipment Vibration Levels**

Receiver <sup>1</sup>	Distance to Const. Activity (Feet)	Receiver PPV Levels (inch/second) <sup>2</sup>					Vibration Level Threshold	Exceeded?
		Small Bulldozer	Jack-hammer	Loaded Trucks	Large Bulldozer	Highest Vibration Level		
R1	1,526	0.0000	0.0001	0.0002	0.0002	0.0002	0.12	No
R2	468	0.0000	0.0004	0.0009	0.0011	0.0011	0.12	No
R3	1,521	0.0000	0.0001	0.0002	0.0002	0.0002	0.12	No
R4	2,100	0.0000	0.0000	0.0001	0.0001	0.0001	0.12	No

Notes: PPV = peak particle velocity  
<sup>1</sup> Noise receiver locations and noise measurement locations are the same and are shown on Exhibit 5.11-2.  
 Source: Urban Crossroads, *Azusa Business Center Noise Impact Analysis*, January 15, 2018; refer to Appendix 11.9.

Based on the reference vibration levels provided by the FTA (see Table 5.11-12), a large bulldozer represents the peak source of vibration with a reference velocity of 0.089 inch/second PPV at 25 feet. At distances ranging from 468 to 2,100 feet from Warehouse Only Option construction activities, construction vibration velocity levels are expected to approach 0.001 inch/second PPV, which is below the FTA vibration standard of 0.12 inch/second PPV at all receiver locations. Therefore, the Warehouse Only Option-related vibration impacts are considered less than significant during the construction activities at the Site.

Further, the impacts at the site of the closest sensitive receivers are unlikely to be sustained during the entire construction period, but would occur rather only during the times that heavy construction equipment is operating adjacent to the Site perimeter. Construction at the Site would be restricted to daytime hours consistent with Municipal Code Section 88.31.020(C)(3) (7:00 a.m. to 6:00 p.m. Monday through Saturday; unless otherwise allowed through conditions of approval), thereby eliminating potential vibration impact during the sensitive nighttime hours.

Therefore, proposed construction activities associated with the Warehouse Only Option would not expose sensitive receptors to excessive groundborne vibration levels. Vibration impacts associated with construction would be less than significant and no mitigation measures are required.



## WAREHOUSE AND MANUFACTURING OPTION

Given that both the Warehouse Only Option and Warehouse and Manufacturing Option would require similar construction equipment and generate similar construction vibration impacts, the analysis above is also applicable to the Warehouse and Manufacturing Option. Short-term construction vibration impacts would be less than significant.

**Standard Conditions of Approval:** No standard conditions of approval are applicable.

**Mitigation Measures:** No mitigation measures are required.

**Level of Significance:** Less Than Significant Impact.

## LONG-TERM (MOBILE) NOISE IMPACTS

N-3        **Would traffic generated by the Project significantly contribute to existing traffic noise in the area or exceed established noise standards?**

### **Impact Analysis:**

#### WAREHOUSE ONLY OPTION

The “Future Without Project” and “Future With Project” scenarios at an assumed opening year of 2019 were compared for long-term conditions. Table 5.11-14, *Future Traffic Noise Levels – Warehouse Only Option*, presents a summary of the exterior traffic noise levels, without barrier attenuation, for the 20 study area roadway segments for the “Future Without Project” and “Future With Project” scenarios.

As indicated in Table 5.11-14, under the “Future Without Project” scenario, noise levels at the nearest adjacent land use would range from approximately 58.9 dBA to 77.1 dBA. The highest noise levels under “Future Without Project” conditions would occur along Foothill Boulevard, east of Irwindale Avenue. Under the “Future With Project” scenario, noise levels at the nearest adjacent land use would range from approximately 60.0 dBA to 77.3 dBA. The highest noise levels occurring under these conditions would also occur along Foothill Boulevard, east of Irwindale Avenue. Table 5.11-14 also compares the “Future Without Project” scenario to the “Future With Project” scenario. The Warehouse Only Option would increase noise levels on the surrounding roadways by a maximum of 0.8 dBA along Todd Avenue, north of Foothill Boulevard. Therefore, noise levels resulting from the Project would be less than significant under the Warehouse Only Option.



**Table 5.11-14  
Future Traffic Noise Levels – Warehouse Only Option**

ID	Road	Segment	Adjacent Land Use	CNEL at Adjacent Land Use (dBA) <sup>1</sup>			Noise-Sensitive Land Use?	Threshold Exceeded? <sup>2</sup>
				Without Project	With Project	Incremental Change		
1	I-605 Ramps	South of Huntington Drive	Residential	72.6	72.7	0.1	Yes	No
2	Irwindale Avenue	South of Foothill Boulevard	Industrial/ Business Park	74.5	74.7	0.2	No	No
3	Irwindale Avenue	South of I-210 Freeway	Industrial/ Business Park	73.6	73.6	0.0	No	No
4	Todd Avenue	North of 10th Street	Light Industrial	70.3	71.4	1.1	No	No
5	Todd Avenue	North of Foothill Boulevard	Light Industrial (Residential)	71.4	72.2	0.8	Yes	No
6	San Gabriel Avenue	North of Sierra Madre Avenue	Residential	64.8	65.0	0.2	Yes	No
7	San Gabriel Avenue	South of Foothill Boulevard	Residential	70.4	70.7	0.3	Yes	No
8	Azusa Avenue	North of Sierra Madre Avenue	Residential	65.1	65.3	0.2	Yes	No
9	Azusa Avenue	South of Foothill Boulevard	Mixed-Use	67.4	67.4	0.0	Yes	No
10	Azusa Avenue	South of 1st Street	Commercial Mixed-Use	72.7	72.7	0.1	Yes	No
11	Alameda Avenue	North of 1st Street	Residential	61.5	61.5	0.0	Yes	No
12	Sierra Madre Avenue	East of Todd Avenue	Residential	69.9	70.0	0.2	Yes	No
13	Sierra Madre Avenue	West of San Gabriel Avenue	Residential	70.7	70.9	0.1	Yes	No
14	10th Street	East of Todd Avenue	Light Industrial/ Open Space	58.9	60.0	1.1	No	No
15	Huntington Drive	West of I-605 Ramps	Residential	73.1	73.1	0.1	Yes	No
16	Huntington Drive	East of I-605 Ramps	Residential	73.1	73.3	0.1	Yes	No
17	Foothill Boulevard	West of Irwindale Avenue	Recreation (Residential)	76.1	76.2	0.1	Yes	No
18	Foothill Boulevard	East of Irwindale Avenue	Industrial/ Business Park	77.1	77.3	0.2	No	No
19	Foothill Boulevard	East of Todd Avenue	Light Industrial	72.4	72.5	0.1	No	No
20	Foothill Boulevard	West of San Gabriel Avenue	Residential	71.9	72.1	0.2	Yes	No

Notes: I-605 = Interstate 605; I-210 = Interstate 210; dBA = A-weighted decibel scale; CNEL = Community Noise Equivalent Level  
 1 The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.  
 2 Significance thresholds are based on those detailed in [Table 5.11-8](#).

Source: Urban Crossroads, *Azusa Business Center Noise Impact Analysis*, January 15, 2018; refer to [Appendix 11.9](#).





## WAREHOUSE AND MANUFACTURING OPTION

Similar to the Warehouse Only Option, “Future Without Project” and “Future With Project” scenarios for the Warehouse and Manufacturing Option were compared for operational conditions. Table 5.11-15, Future Traffic Noise Levels – Warehouse and Manufacturing Option, presents a summary of the exterior traffic noise levels, without barrier attenuation, for the 20 study area roadway segments for the “Future Without Project” and “Future With Project” scenarios.

**Table 5.11-15  
Future Traffic Noise Levels – Warehouse and Manufacturing Option**

ID	Road	Segment	Adjacent Land Use	CNEL at Adjacent Land Use (dBA) <sup>1</sup>			Noise-Sensitive Land Use?	Threshold Exceeded? <sup>2</sup>
				Without Project	With Project	Incremental Change		
1	I-605 Ramps	South of Huntington Drive	Residential	72.6	72.7	0.1	Yes	No
2	Irwindale Avenue	South of Foothill Boulevard	Industrial/ Business Park	74.5	74.7	0.3	No	No
3	Irwindale Avenue	South of I-210 Freeway	Industrial/ Business Park	73.6	73.6	0.0	No	No
4	Todd Avenue	North of 10th Street	Light Industrial	70.3	71.7	1.5	No	No
5	Todd Avenue	North of Foothill Boulevard	Light Industrial (Residential)	71.4	72.5	1.1	Yes	No
6	San Gabriel Avenue	North of Sierra Madre Avenue	Residential	64.8	65.1	0.3	Yes	No
7	San Gabriel Avenue	South of Foothill Boulevard	Residential	70.4	70.8	0.4	Yes	No
8	Azusa Avenue	North of Sierra Madre Avenue	Residential	65.1	65.4	0.2	Yes	No
9	Azusa Avenue	South of Foothill Boulevard	Mixed-Use	67.4	67.4	0.0	Yes	No
10	Azusa Avenue	South of 1st Street	Commercial Mixed-Use	72.7	72.8	0.1	Yes	No
11	Alameda Avenue	North of 1st Street	Residential	61.5	61.5	0.0	Yes	No
12	Sierra Madre Avenue	East of Todd Avenue	Residential	69.9	70.1	0.2	Yes	No
13	Sierra Madre Avenue	West of San Gabriel Avenue	Residential	70.7	70.9	0.2	Yes	No
14	10th Street	East of Todd Avenue	Light Industrial/ Open Space	58.9	60.4	1.4	No	No
15	Huntington Drive	West of I-605 Ramps	Residential	73.1	73.2	0.1	Yes	No
16	Huntington Drive	East of I-605 Ramps	Residential	73.1	73.3	0.2	Yes	No
17	Foothill Boulevard	West of Irwindale Avenue	Recreation (Residential)	76.1	76.2	0.1	Yes	No
18	Foothill Boulevard	East of Irwindale Avenue	Industrial/ Business Park	77.1	77.4	0.3	No	No
19	Foothill Boulevard	East of Todd Avenue	Light Industrial	72.4	72.6	0.1	No	No
20	Foothill Boulevard	West of San Gabriel Avenue	Residential	71.9	72.2	0.3	Yes	No

Notes: I-605 = Interstate 605; I-210 = Interstate 210; dBA = A-weighted decibel scale; CNEL = Community Noise Equivalent Level  
 1 The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.  
 2 Significance thresholds are based on those detailed in Table 5.11-8.

Source: Urban Crossroads, *Azusa Business Center Off-site Traffic Noise Analysis Memo*, February 1, 2018; refer to Appendix 11.9.



As indicated in [Table 5.11-15](#), under the “Future Without Project” scenario, noise levels at the nearest adjacent land use would range from approximately 58.9 dBA to 77.4 dBA. The highest noise levels under “Future Without Project” conditions would occur along Foothill Boulevard, east of Irwindale Avenue. Under the “Future With Project” scenario, noise levels at the nearest adjacent land use would range from approximately 60.4 dBA to 77.4 dBA. The highest noise levels occurring under these conditions would also occur along Foothill Boulevard, east of Irwindale Avenue. [Table 5.11-15](#) also compares the “Future Without Project” scenario to the “Future With Project” scenario. The Warehousing and Manufacturing Option would increase noise levels on the surrounding roadways by a maximum of 1.5 dBA along Todd Avenue, north of 10th Street. Therefore, noise levels resulting from the Project would be less than significant under the Warehousing and Manufacturing Option.

**Standard Conditions of Approval:** No standard conditions of approval are applicable.

**Mitigation Measures:** No mitigation measures are required.

**Level of Significance:** Less Than Significant Impact.

## LONG-TERM (STATIONARY) NOISE IMPACTS

N-4 Would the Project result in a significant increase in long-term operational stationary ambient noise levels?

### Impact Analysis:

#### WAREHOUSE ONLY OPTION

Under the Warehouse Only Option, the Project would allow development of a 463,316-square foot industrial business park with warehousing uses. On-site Project-related noise sources are expected to include: idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, truck trailer storage activity, roof-top air conditioning units, and parking lot vehicle movements. Since the future tenants of the Warehouse Only Option are not yet known, the Project’s operational noise levels were estimated based on reference noise level measurements of similar operational activities, as shown on [Table 5.11-16](#), *Reference Noise Level Measurements*.

**Table 5.11-16**  
**Reference Noise Level Measurements**

Noise Source	Duration (hh:mm:ss)	Reference Distance (Feet)	Noise Source Height (Feet)	Reference Noise Level (dBA L <sub>eq</sub> )	
				@ Reference Distance	@ 50 Feet
Truck Idle/Reefer Activity	0:14:00	30	8	70.1	65.7
Entry Gate Activity	0:10:00	20	8	69.2	61.2
Entry Gate Activity	0:15:00	20	8	64.0	56.0
Unloading/Docking Activity	0:15:00	30	8	67.2	62.8
Distribution/Warehouse Activity	24:00:00	25	8	69.1	63.1
Roof-Top Air Conditioning Units	96:00:00	5	5	77.2	57.2
Parking Lot Vehicle Movements	01:00:00	10	5	52.2	41.7
Notes: dBA = A-weighted decibel scale; L <sub>eq</sub> = equivalent sound level; hh = hours; mm = minutes; ss = seconds					
Source: Urban Crossroads, Azusa Business Center Noise Impact Analysis, January 15, 2018; refer to <a href="#">Appendix 11.9</a> .					



### Project Operational Noise Levels

The Warehouse Only Option’s operational source noise impacts were calculated based on the reference noise levels. Table 5.11-17, Operational Noise Levels, presents a summary of the combined total Project-generated operational noise impacts at nearby sensitive receiver locations compared to local jurisdiction exterior noise level standards. As indicated on Table 5.11-17, the Warehouse Only Option’s operational noise levels at the nearby sensitive receiver locations would range from 33.5 to 37.9 dBA  $L_{eq}$  and 44.3 to 46.8 dBA  $L_{max}$ .

**Table 5.11-17  
Operational Noise Levels**

Receiver Location <sup>1</sup>	Jurisdiction	Land Use	Noise Level at Receiver Locations (dBA)		Thresholds <sup>2</sup>				Threshold Exceeded?	
					Daytime		Nighttime			
			$L_{eq}$	$L_{max}$	$L_{eq}$	$L_{max}$	$L_{eq}$	$L_{max}$	Daytime	Nighttime
R1	Duarte	Residential	35.7	46.5	55.0	n/a	45.0	n/a	No	No
R2	Azusa	Residential	37.9	46.8	50.0	70.0	45.0	65.0	No	No
R3	Azusa	Residential	36.0	46.7	50.0	70.0	45.0	65.0	No	No
R4	Azusa	Residential	33.5	44.3	50.0	70.0	45.0	65.0	No	No

Notes: dBA = A-weighted decibel scale;  $L_{eq}$  = equivalent sound level;  $L_{max}$  = maximum sound level  
 1 Noise receiver locations and noise measurement locations are the same and are shown on Exhibit 5.11-2.  
 2 Operational noise level significance thresholds are detailed on Table 5.11-6.  
Daytime and Nighttime Hours by Jurisdiction:  
 Irwindale and Azusa: Daytime = 7:00 a.m. to 10:00 p.m.; Nighttime = 10:00 p.m. to 7:00 a.m.  
 Duarte: Daytime = 7:00 a.m. to 9:00 p.m.; Nighttime = 9:00 p.m. to 7:00 a.m.  
 Source: Urban Crossroads, Azusa Business Center Noise Impact Analysis, January 15, 2018; refer to Appendix 11.9.

As shown in Table 5.11-17, the operational noise levels associated with the Warehouse Only Option would not exceed the operational exterior daytime and nighttime noise level standards at all nearby sensitive receiver locations. Thus, long-term operational noise impacts under the Warehouse Only Option would have less than significant impacts, and no mitigation is required.

### Project Operational Noise Level Contributions

To describe the Warehouse Only Option operational noise level contributions, the Project operational noise levels are combined with the existing ambient noise levels measurements for the nearby receiver locations potentially impacted by Project operational noise sources.

As indicated on Table 5.11-18, Project Daytime Noise Level Contributions, and Table 5.11-19, Project Nighttime Noise Level Contributions, the Warehouse Only Option would generate a daytime operational noise level increase of up to 0.1 dBA  $L_{eq}$  and a nighttime operational noise level increase of up to 0.2 dBA  $L_{eq}$  at the nearby receiver locations. Since the Project-related operational noise level contributions would not exceed the significance criteria thresholds, the increases at the sensitive receiver locations would be less than significant under the Warehouse Only Option.



**Table 5.11-18  
Project Daytime Noise Level Contributions**

Receiver Location <sup>1</sup>	Total Project Operational Noise Level <sup>2</sup>	Measurement Location <sup>1</sup>	Reference Ambient Noise Levels	Combined Project and Ambient	Project Contribution	Threshold Exceeded? <sup>3</sup>
R1	35.7	L1	54.2	54.3	0.1	No
R2	37.9	L3	68.2	68.2	0.0	No
R3	36.0	L4	70.9	70.9	0.0	No
R4	33.5	L4	70.9	70.9	0.0	No

Notes:  
 1 Noise receiver locations and noise measurement locations are the same and are shown on [Exhibit 5.11-2](#).  
 2 Total Project operational noise levels as shown on [Table 5.11-17](#).  
 3 Operational noise level significance thresholds are detailed on [Table 5.11-6](#).

Source: Urban Crossroads, *Azusa Business Center Noise Impact Analysis*, January 15, 2018; refer to [Appendix 11.9](#).

**Table 5.11-19  
Project Nighttime Noise Level Contributions**

Receiver Location <sup>1</sup>	Total Project Operational Noise Level <sup>2</sup>	Measurement Location <sup>1</sup>	Reference Ambient Noise Levels	Combined Project and Ambient	Project Contribution	Threshold Exceeded? <sup>3</sup>
R1	35.7	L1	48.8	49.0	0.2	No
R2	37.9	L3	63.8	63.8	0.0	No
R3	36.0	L4	66.3	66.3	0.0	No
R4	33.5	L4	66.3	66.3	0.0	No

Notes:  
 1 Noise receiver locations and noise measurement locations are the same and are shown on [Exhibit 5.11-2](#).  
 2 Total Project operational noise levels as shown on [Table 5.11-17](#).  
 3 Operational noise level significance thresholds are detailed on [Table 5.11-6](#).

Source: Urban Crossroads, *Azusa Business Center Noise Impact Analysis*, January 15, 2018; refer to [Appendix 11.9](#).

## WAREHOUSE AND MANUFACTURING OPTION

The Warehouse and Manufacturing Option would similarly allow development of a 463,316-square foot industrial business park but would include warehouse and manufacturing uses. While manufacturing is a new use included under this development option, on-site Project-related noise sources are expected to be similar: idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, truck trailer storage activity, roof-top air conditioning units, and parking lot vehicle movements. Thus, long-term operational noise impacts under the Warehouse and Manufacturing Option would be similar to the Warehouse Only Option and a less than significant impact would result in this regard.



**Standard Conditions of Approval:** No standard conditions of approval are applicable.

**Mitigation Measures:** No mitigation measures are required.

**Level of Significance:** Less Than Significant Impact.

## 5.11.5 CUMULATIVE IMPACTS

Table 4-1, *Cumulative Projects List*, identifies the related projects and other possible development in the area determined as having the potential to interact with the Project to the extent that a significant cumulative effect may occur. The following discussions are included per topic area to determine whether a significant cumulative effect would occur.

### SHORT-TERM CONSTRUCTION NOISE IMPACTS

- Would Project construction result in cumulatively significant short-term noise impacts to nearby noise sensitive receivers?

#### Impact Analysis:

##### WAREHOUSE ONLY OPTION

Construction activities associated with the Warehouse Only Option and cumulative projects may overlap, resulting in construction noise in the area. However, cumulative construction noise impacts would affect only the areas immediately adjacent to the Site. The closest cumulative project is the senior living facility project (California Grand Villages), located east of the Site across North Todd Avenue. The next closest cumulative project is the 10th Street Center Industrial Business Park, located directly south of the Site on 1001 North Todd Avenue.

Construction of the two cumulative related projects (California Grand Villages and 10th Street Center Industrial Business Park) may occur at the same time as the Warehouse Only Option. However, cumulatively significant noise would generally only occur when construction activities on either related project site occurs in close vicinity of the Site (e.g., closest to North Todd Avenue on either side of the roadway for the California Grand Villages project or closest to the Site's southern boundary for the 10th Street Center Industrial Business Park) in a way that concentrates the noise. The further construction activities occur from one another on each respective project site, the quicker the noise dissipates by the time it reaches a sensitive receptor. As such, cumulative noise impacts would not occur due to site distance. Both cumulative related projects would be required to comply with the Municipal Code limitations on allowable hours of construction and mitigate their respective construction noise impacts, as required. The Warehouse Only Option would also implement SCA NOI-1 through SCA NOI-3 that would further reduce construction noise impacts. Therefore, the Warehouse Only Option's contribution to cumulative noise impacts would not be cumulatively considerable.

##### WAREHOUSE AND MANUFACTURING OPTION

Given that both the Warehouse Only Option and Warehouse and Manufacturing Option would require similar construction equipment and generate similar construction noise impacts, the analysis



above is also applicable to the Warehouse and Manufacturing Option. Cumulative short-term construction noise impacts would be less than significant.

**Standard Conditions of Approval:** Refer to SCA NOI-1 through SCA NOI-3.

**Mitigation Measures:** No mitigation measures are required.

**Level of Significance:** Less Than Significant Impact.

## VIBRATION IMPACTS

- Would Project implementation result in cumulatively significant vibration impacts to nearby sensitive receptors?

### Impact Analysis:

#### WAREHOUSE ONLY OPTION

As stated above, construction activities associated with the Warehouse Only Option and cumulative projects may overlap. Despite the potential for overlap, groundborne vibration generated at the Site during construction would not be in exceedance of the FTA threshold of 0.12 inch/second PPV. In addition, there would be no vibration impacts associated with operations at the Site. The closest cumulative projects to the Site are the California Grand Villages, located east of the Site across North Todd Avenue and the 10th Street Center Industrial Business Park, located directly south of the Site on 1001 North Todd Avenue.

Although construction of the two related projects (California Grand Villages and 10th Street Center Industrial Business Park) may occur at the same time as the Warehouse Only Option, cumulatively significant construction vibration would generally only occur when construction activities on the sites occur in close vicinity of one another in a way that concentrates the vibration. The further construction activities occur from one another on each respective project site, the quicker the vibration dissipates by the time it reaches a sensitive receptor. Additionally, because heavy construction equipment moves around a project site and would only occur for limited durations, average vibration levels at the nearest structures would diminish with increasing distance between structures. As such, cumulative construction vibration impacts would not occur. Both cumulative related projects would be required to comply with the Municipal Code limitations on allowable hours of construction and mitigate their respective construction vibration impacts, as required. Therefore, the Warehouse Only Option's contribution to cumulative vibration impacts would not be cumulatively considerable.

#### WAREHOUSE AND MANUFACTURING OPTION

Given that both the Warehouse Only Option and Warehouse and Manufacturing Option would require similar construction equipment and generate similar construction vibration impacts, the analysis above is also applicable to the Warehouse and Manufacturing Option. Cumulative short-term construction vibration impacts would not be cumulatively considerable.



**Standard Conditions of Approval:** No standard conditions of approval are applicable.

**Mitigation Measures:** No mitigation measures are required.

**Level of Significance:** Less Than Significant Impact.

## **LONG-TERM (MOBILE) NOISE IMPACTS**

- Would traffic generated by the Project cause cumulatively considerable traffic noise in the area or exceed established noise standards?

### **Impact Analysis:**

#### **WAREHOUSE ONLY OPTION**

The cumulative mobile noise analysis is conducted in a two-step process. First, the combined effects from both the Warehouse Only Option and other projects are compared. Second, for combined effects that are determined to be cumulatively significant, the Warehouse Only Option's incremental effects then are analyzed. The Warehouse Only Option's contribution to a cumulative traffic noise increase would be considered significant when the combined effect exceeds perception level (i.e., auditory level increase) threshold. The combined effect compares the "Cumulative with Project" condition to "Existing" conditions. This comparison accounts for the traffic noise increase from the Warehouse Only Option generated in combination with traffic generated by projects in the cumulative projects list.

As summarized in [Table 5.11-14](#), the incremental change in noise level between the "Future Without Project" and "Future With Project" scenarios would not exceed the significance threshold and long-term mobile noise impacts would be less than significant. Given that the combined effects of both the Warehouse Only Option and future cumulative projects would not result in significant impacts, the Warehouse Only Option-generated mobile noise impacts would not be significantly cumulatively considerable. Overall, the Warehouse Only Option, in combination with cumulative background mobile noise levels, would result in a less than significant cumulative impact.

#### **WAREHOUSE AND MANUFACTURING OPTION**

Similar to the Warehouse Only Option, the Warehouse and Manufacturing Option would not result in long-term mobile noise impacts as detailed in [Table 5.11-15](#). The incremental change in noise level between the "Future Without Project" and "Future With Project" scenarios would not exceed the significance threshold. Thus, given that the combined effects of both the Warehousing and Manufacturing Option and future cumulative projects would not result in significant impacts, the Warehousing and Manufacturing Option-generated mobile noise impacts would not be significantly cumulatively considerable and impacts would be less than significant.

**Standard Conditions of Approval:** No standard conditions of approval are applicable.

**Mitigation Measures:** No mitigation measures are required.

**Level of Significance:** Less Than Significant Impact.



## LONG-TERM (STATIONARY) NOISE IMPACTS

- Would the Project cause a cumulatively considerable increase in long-term operational stationary ambient noise levels?

### Impact Analysis:

#### WAREHOUSE ONLY OPTION

Although related cumulative projects have been identified within the Site area, the noise generated by stationary equipment on-site cannot be quantified due to the speculative nature of conceptual nature of each development. However, each cumulative project would require separate discretionary approval and CEQA assessment, which would address potential noise impacts and identify necessary attenuation measures, where appropriate. Additionally, as noise dissipates as it travels away from its source, noise impacts from stationary sources would be limited to each of the respective sites and their vicinities. The closest related project to the Site would be a senior living facility project (California Grand Villages) east of the Site, across North Todd Avenue. Given its residential nature, the California Grand Villages would not contribute to a considerably cumulative operational noise impact. The two projects are also separated by North Todd Avenue; therefore, any noise generated by on-site stationary noise equipment would dissipate as distance grows. The next closest cumulative project is the 10th Street Center Industrial Business Park, located directly south of the Site on 1001 North Todd Avenue. This project is partially operational with the Lagunitas Brewing Company; thus, ambient noise measurements in the Site vicinity already include stationary noise generated at that site. As such, significant cumulative operational noise impacts would not occur from the 10th Street Center Industrial Business Park site. As noted above, the Warehouse Only Option would not result in significant long-term operational noise impacts. Thus, the Warehouse Only Option and identified cumulative projects are not anticipated to result in cumulatively considerable impacts and the Warehouse Only Option would not cumulatively contribute to significant long-term operational noise impacts.

#### WAREHOUSE AND MANUFACTURING OPTION

The Warehouse and Manufacturing Option would have similar on-site Project-related noise sources as the Warehouse Only Option: idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, truck trailer storage activity, roof-top air conditioning units, and parking lot vehicle movements. Thus, the cumulative long-term operational noise impacts analysis for the Warehouse Only Option would also be applicable to the Warehouse and Manufacturing Option, and the cumulative operational noise impacts would not be cumulatively considerable.

**Standard Conditions of Approval:** No standard conditions of approval are applicable.

**Mitigation Measures:** No mitigation measures are required.

**Level of Significance:** Less Than Significant Impact.





### **5.11.6 SIGNIFICANT UNAVOIDABLE IMPACTS**

No unavoidable significant impacts related to noise have been identified following compliance with the applicable Federal, State, and local regulatory requirements and standard conditions of approval.



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