Appendix G

Acoustical Assessment;

Noise Memorandum - Mango Ave Replacement Site; and

Noise Memorandum - Palmetto Ave Replacement Site

Acoustical Assessment
Sierra Avenue and Casa Grande Warehouse Project
City of Fontana, California

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LIST OF ABBREVIATED TERMS

APN	Assessor's Parcel Number
ADT	average daily traffic
dBA	A-weighted sound level
CEQA	California Environmental Quality Act
CLSP	California Landings Specific Plan
CSMA	California Subdivision Map Act
CNEL	community equivalent noise level
L_{dn}	day-night noise level
dB	decibel
du/ac	dwelling units per acre
L_{eq}	equivalent noise level
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
HVAC	heating ventilation and air conditioning
Hz	hertz
HOA	homeowner's association
in/sec	inches per second
L_{max}	maximum noise level
µPa	micropascals
L_{min}	minimum noise level
PPV	peak particle velocity
RMS	root mean square
VdB	vibration velocity level

1 INTRODUCTION

This report documents the results of an Acoustical Assessment completed for the Sierra Avenue and Casa Grande Warehouse Project ("Project" or "Proposed Project"). The purpose of this Acoustical Assessment is to evaluate the potential construction and operational noise and vibration levels associated with the Project and determine the level of impact the Project would have on the environment.

1.1 Project Location and Setting

The propose warehouse site is located in the northeastern portion of the City of Fontana (City); approximately 330 feet west of the City border as shown in Exhibit 1: *Regional Vicinity*. The warehouse site consists of three connected parcels on the northeast corner of the Sierra Avenue and Casa Grande Drive intersection; refer to Exhibit 2: *Local Vicinity*. Regional access would be available to the site via transportation routes including State Route 210 and Interstate Highway I-15. The State Route 210 entrance and exit is located approximately 1.5 miles south of the proposed Project via Sierra Avenue. The Interstate Highway I-15 entrance and exit is located approximately 1.6 miles north of the proposed Project via Sierra Avenue.

The warehouse site is a rectangular lot, mostly vacant, and unimproved site on approximately 16.5-gross acres (15.34-net acres) or approximately 661,561-square feet; refer to Exhibit 2**.** The northwest corner of the property is occupied by a single-family residence, while the remaining portion of the property is undeveloped land covered with natural vegetation, including two trees on the west side of the site. A concrete foundation from a former house remains on the site. Additionally, there is debris consisting of mostly rocks, dirt, tires, and an old domestic sprinkler hose. The property is zoned R-5 and R-MU for single-family residential and regional-mixed use commercial development by the City of Fontana, respectively.

1.2 Project Description

The proposed Project involves the development of a 332,996-square feet distribution warehouse building within the approximate 16.5-gross acre (15.34-net acre) warehouse site. The warehouse would have associated facilities and improvements such as a guard booth, mezzanine (5,000-square feet), vehicle parking, loading dock doors, trailer parking, onsite and off-site landscaping, and onsite and off-site improvements; Refer to Exhibit 3**:** *Conceptual Site Plan*.

Landscaping

Onsite landscaping would be provided on the Project site. Approximately twenty-five to sixty-foot-wide landscaped buffers would be provided along the south and west boundaries and a thirty-foot-wide buffer along the northern boundary.

Project Circulation

Regional Project access would be from Interstate 215 (I-215) and State Route 210 (SR-210) via the officially designated local truck route[1] Sierra Avenue. Local access would be provided via Casa Grande Drive. Project site ingress and egress would be via four driveways; two approximately thirty-foot driveways on Sierra Avenue and two approximately forty-foot driveways on Casa Grande Drive.

Parking

The Project would provide 134 parking stalls, 67 trailers stalls, and 35 dock doors.

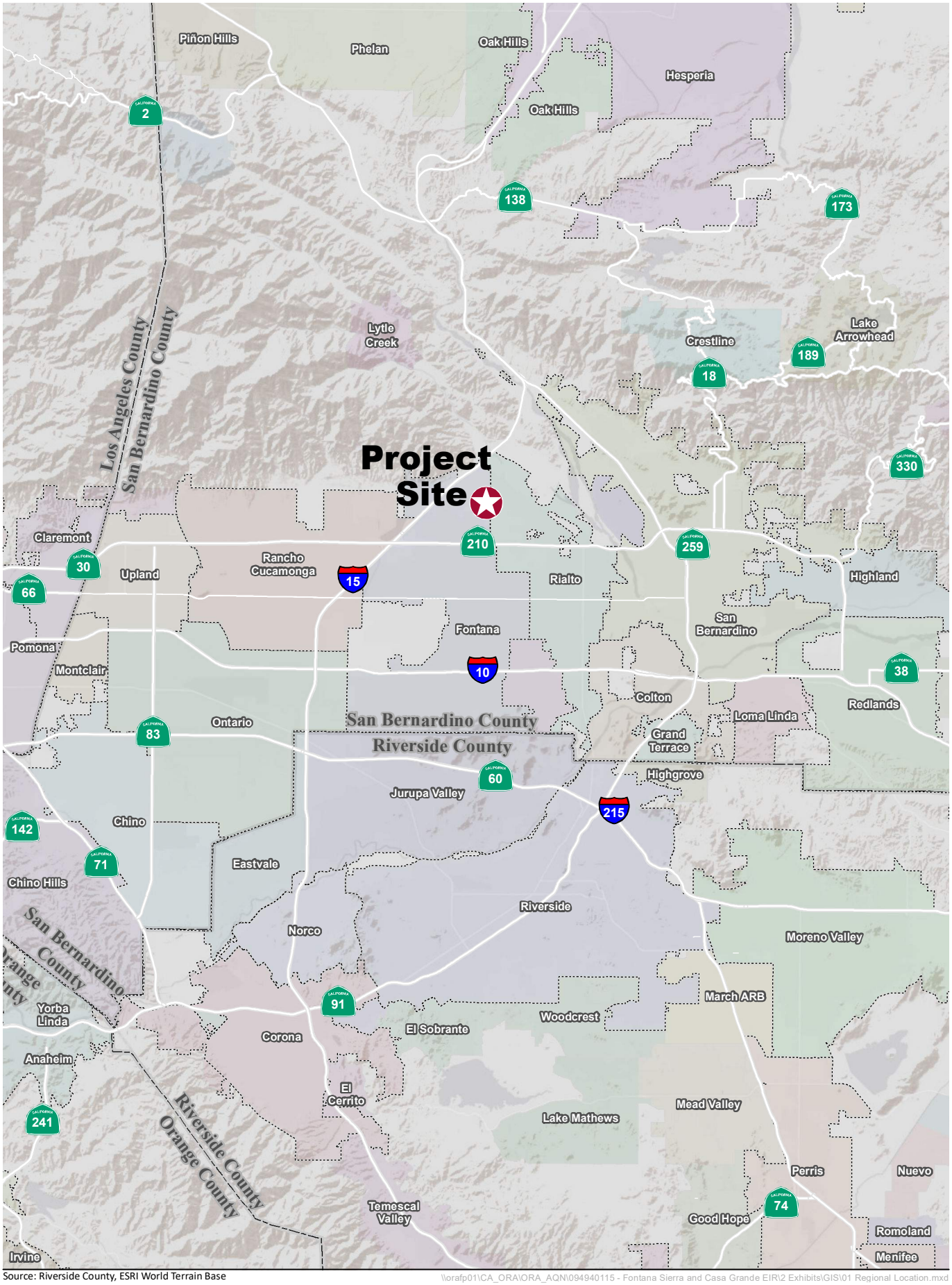
Project Phasing and Construction

The Project is anticipated to be developed in one phase. Should the Project be approved, construction is anticipated to occur over a duration of approximately 15 months, commencing in the second half of 2020; the facility would be operational in late 2021.

Offsite Improvements

The Project will be responsible for approximately eighteen feet beyond the property line on Casa Grande Drive. Additionally, the Project would improve Sierra Avenue and Casa Grande Drive with approved curb, gutter, and lighting.

[1] City of Fontana, *Local Truck Route – Ordinance No. 1273*, https://www.fontana.org/DocumentCenter/View/3971/Local-Truck-Routes-2017-11x17?bidId=, accessed March 11, 2020.



Source: Riverside County, ESRI World Terrain Base

\\orafp01\CA_ORA\ORA_AQN\094940115 - Fontana Sierra and Casa Grande EIR\2 Exhibits\GIS\01 Regional Location.mxd

EXHIBIT 1: Regional Vicinity

Sierra Avenue and Casa Grande Warehouse Project

0 2.5 5

Miles

Kimley»Horn

Source: ESRI World Imagery

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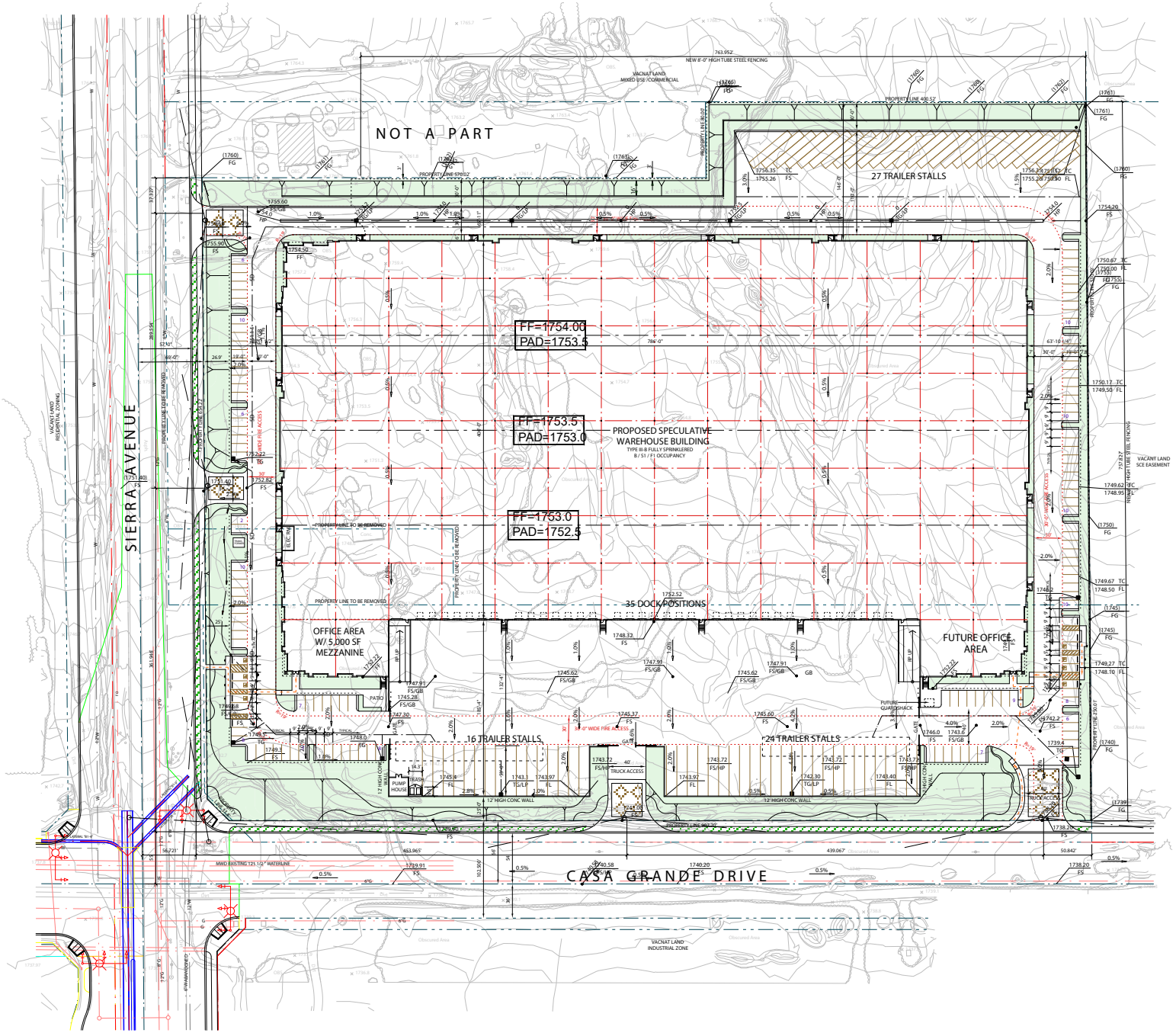
EXHIBIT 2: Site Vicinity

Sierra Avenue and Casa Grande Warehouse Project

0 250 500

Feet

Kimley»Horn



Source: RGA Office of Architectural Design

EXHIBIT 3: Conceptual Site Plan

Sierra Avenue and Casa Grande Warehouse Project

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Not to Scale

Kimley»Horn

2 ACOUSTIC FUNDAMENTALS

2.1 Sound and Environmental Noise

Acoustics is the science of sound. Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a medium (e.g. air) to human (or animal) ear. If the pressure variations occur frequently enough (at least 20 times per second), they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound and is expressed as cycles per second, or hertz (Hz).

Noise is defined as loud, unexpected, or annoying sound. In acoustics, the fundamental model consists of a noise source, a receptor, and the propagation path between the two. The loudness of the noise source, obstructions, or atmospheric factors affecting the propagation path, determine the perceived sound level and noise characteristics at the receptor. Acoustics deal primarily with the propagation and control of sound. A typical noise environment consists of a base of steady background noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this background noise is the sound from individual local sources. These sources can vary from an occasional aircraft or train passing by to continuous noise from traffic on a major highway. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a large range of numbers. To avoid this, the decibel (dB) scale was devised. The dB scale uses the hearing threshold of 20 micropascals (µPa) as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The dB scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels correspond closely to human perception of relative loudness. Table 1: Typical Noise Levels provides typical noise levels.

Table 1: Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	– 110 –	Rock Band
Jet fly-over at 1,000 feet		
	– 100 –	
Gas lawnmower at 3 feet		
	– 90 –	
Diesel truck at 50 feet at 50 miles per hour		Food blender at 3 feet
	– 80 –	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawnmower, 100 feet	**– 70 –**	Vacuum cleaner at 10 feet
Commercial area		Normal Speech at 3 feet
Heavy traffic at 300 feet	**– 60 –**	
		Large business office
Quiet urban daytime	**– 50 –**	Dishwasher in next room
Quiet urban nighttime	**– 40 –**	Theater, large conference room (background)
Quiet suburban nighttime		
	– 30 –	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	– 20 –	
		Broadcast/recording studio
	– 10 –	
Lowest threshold of human hearing	**– 0 –**	Lowest threshold of human hearing

Source: California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, September 2013.

Noise Descriptors

The dB scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Several rating scales have been developed to analyze the adverse effect of community noise on people. Because environmental noise fluctuates over time, these scales consider that the effect of noise on people is largely dependent on the total acoustical energy content of the noise, as well as the time of day when the noise occurs. The equivalent noise level (L_{eq}) is the average noise level averaged over the measurement period, while the day-night noise level (L_{dn}) and Community Equivalent Noise Level (CNEL) are measures of energy average during a 24-hour period, with dB weighted sound levels from 7:00 p.m. to 7:00 a.m. Most commonly, environmental sounds are described in terms of L_{eq} that has the same acoustical energy as the summation of all the time-varying events. Each is applicable to this analysis and defined in Table 2: Definitions of Acoustical Terms.

Table 2: Definitions of Acoustical Terms

Term	Definitions
Decibel (dB)	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in µPa (or 20 micronewtons per square meter), where 1 pascals is the pressure resulting from a force of 1 newton exerted over an area of 1 square meter. The sound pressure level is expressed in dB as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g. 20 µPa). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency (Hz)	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level (dBA)	The sound pressure level in dB as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level (L_{eq})	The average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.
Maximum Noise Level (L_{max}) Minimum Noise Level (L_{min})	The maximum and minimum dBA during the measurement period.
Exceeded Noise Levels (L_{01}, L_{10}, L_{50}, L_{90})	The dBA values that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day-Night Noise Level (L_{dn})	A 24-hour average L_{eq} with a 10 dBA weighting added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity at nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.4 dBA L_{dn}.
Community Noise Equivalent Level (CNEL)	A 24-hour average L_{eq} with a 5 dBA weighting during the hours of 7:00 a.m. to 10:00 a.m. and a 10 dBA weighting added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.7 dBA CNEL.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends on its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

The A-weighted decibel (dBA) sound level scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends on the distance between the receptor and the noise source.

A-Weighted Decibels

The perceived loudness of sounds is dependent on many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable and can be approximated by dBA values. There is a strong correlation between dBA and the way the human ear perceives sound. For this reason, the dBA has become the standard tool of environmental noise assessment. All noise levels reported in this document are in terms of dBA, but are expressed as dB, unless otherwise noted.

Addition of Decibels

The dB scale is logarithmic, not linear, and therefore sound levels cannot be added or subtracted through ordinary arithmetic. Two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic dB is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound and twice as loud as a 60-dBA sound. When two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dBA higher than one source under the same conditions. Under the dB scale, three sources of equal loudness together would produce an increase of 5 dBA.

Sound Propagation and Attenuation

Sound spreads (propagates) uniformly outward in a spherical pattern, and the sound level decreases (attenuates) at a rate of approximately 6 dB for each doubling of distance from a stationary or point source. Sound from a line source, such as a highway, propagates outward in a cylindrical pattern. Sound levels attenuate at a rate of approximately 3 dB for each doubling of distance from a line source, such as a roadway, depending on ground surface characteristics. No excess attenuation is assumed for hard surfaces like a parking lot or a body of water. Soft surfaces, such as soft dirt or grass, can absorb sound, so an excess ground-attenuation value of 1.5 dB per doubling of distance is normally assumed. For line sources, an overall attenuation rate of 3 dB per doubling of distance is assumed.

Noise levels may also be reduced by intervening structures; generally, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm reduces noise levels by 5 to 10 dBA. The way older homes in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows. The exterior-to-interior reduction of newer residential units is generally 30 dBA or more.

Human Response to Noise

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of actual physiological damage, such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities, including sleep, speech, recreation, and tasks that demand concentration or coordination. Hearing loss can occur at the highest noise intensity levels.

Noise environments and consequences of human activities are usually well represented by median noise levels during the day or night or over a 24-hour period. Environmental noise levels are generally considered low when the CNEL is below 60 dBA, moderate in the 60 to 70 dBA range, and high above 70 dBA. Examples of low daytime levels are isolated, natural settings with noise levels as low as 20 dBA and quiet, suburban, residential streets with noise levels around 40 dBA. Noise levels above 45 dBA at night can disrupt sleep. Examples of moderate-level noise environments are urban residential or semi-commercial areas (typically 55 to 60 dBA) and commercial locations (typically 60 dBA). People may consider louder environments adverse, but most will accept the higher levels associated with noisier urban residential or residential-commercial areas (60 to 75 dBA) or dense urban or industrial areas (65 to 80 dBA). Regarding increases in dBA, the following relationships should be noted:

- Except in carefully controlled laboratory experiments, a 1-dBA change cannot be perceived by humans.
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference.
- A minimum 5-dBA change is required before any noticeable change in community response would be expected. A 5-dBA increase is typically considered substantial.
- A 10-dBA change is subjectively heard as an approximate doubling in loudness and would almost certainly cause an adverse change in community response.

Effects of Noise on People

Hearing Loss

While physical damage to the ear from an intense noise impulse is rare, a degradation of auditory acuity can occur even within a community noise environment. Hearing loss occurs mainly due to chronic exposure to excessive noise but may be due to a single event such as an explosion. Natural hearing loss associated with aging may also be accelerated from chronic exposure to loud noise. The Occupational Safety and Health Administration has a noise exposure standard that is set at the noise threshold where hearing loss may occur from long-term exposures. The maximum allowable level is 90 dBA averaged over 8 hours. If the noise is above 90 dBA, the allowable exposure time is correspondingly shorter.

Annoyance

Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The L_{dn} as a measure of noise has been found to provide a valid correlation of noise level and the

percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. A noise level of about 55 dBA L_{dn} is the threshold at which a substantial percentage of people begin to report annoyance.[2]

2.2 Groundborne Vibration

Sources of groundborne vibrations include natural phenomena (earthquakes, volcanic eruptions, sea waves, landslides, etc.) or man-made causes (explosions, machinery, traffic, trains, construction equipment, etc.). Vibration sources may be continuous (e.g. factory machinery) or transient (e.g. explosions). Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One is the peak particle velocity (PPV); another is the root mean square (RMS) velocity. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. The RMS velocity is defined as the average of the squared amplitude of the signal. The PPV and RMS vibration velocity amplitudes are used to evaluate human response to vibration.

Table 3: Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibrations, displays the reactions of people and the effects on buildings produced by continuous vibration levels. The annoyance levels shown in the table should be interpreted with care since vibration may be found to be annoying at much lower levels than those listed, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. In high noise environments, which are more prevalent where groundborne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

Table 3: Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibrations

Peak Particle Velocity (in/sec)	Approximate Vibration Velocity Level (VdB)	Human Reaction	Effect on Buildings
0.006-0.019	64-74	Range of threshold of perception	Vibrations unlikely to cause damage of any type
0.08	87	Vibrations readily perceptible	Recommended upper level to which ruins and ancient monuments should be subjected
0.1	92	Level at which continuous vibrations may begin to annoy people, particularly those involved in vibration sensitive activities	Virtually no risk of architectural damage to normal buildings
0.2	94	Vibrations may begin to annoy people in buildings	Threshold at which there is a risk of architectural damage to normal dwellings
0.4-0.6	98-104	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Architectural damage and possibly minor structural damage

Source: California Department of Transportation, *Transportation and Construction Vibration Guidance Manual*, 2013.

[2] Federal Interagency Committee on Noise, *Federal Agency Review of Selected Airport Noise Analysis Issues*, August 1992.

Ground vibration can be a concern in instances where buildings shake, and substantial rumblings occur. However, it is unusual for vibration from typical urban sources such as buses and heavy trucks to be perceptible. Common sources for groundborne vibration are planes, trains, and construction activities such as earth-moving which requires the use of heavy-duty earth moving equipment. For the purposes of this analysis, a PPV descriptor with units of inches per second (in/sec) is used to evaluate construction-generated vibration for building damage and human complaints.

3 REGULATORY SETTING

To limit population exposure to physically or psychologically damaging as well as intrusive noise levels, the Federal government, the State of California, various county governments, and most municipalities in the state have established standards and ordinances to control noise.

3.1 State of California

California Government Code

California Government Code Section 65302(f) mandates that the legislative body of each county and city adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines established by the State Department of Health Services. 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 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.

Title 24 – Building Code

The State's noise insulation standards are codified in the California Code of Regulations, Title 24: Part 1, Building Standards Administrative Code, and Part 2, California Building Code. These noise standards are applied to new construction in California for interior noise compatibility from exterior noise sources. The regulations specify that acoustical studies must be prepared when noise-sensitive structures, such as residential buildings, schools, or hospitals, are located near major transportation noise sources, and where such noise sources create an exterior noise level of 65 dBA CNEL or higher. Acoustical studies that accompany building plans must demonstrate that the structure has been designed to limit interior noise in habitable rooms to acceptable noise levels. For new multi-family residential buildings, the acceptable interior noise limit for new construction is 45 dBA CNEL.

3.2 Local

City of Fontana General Plan

Adopted on November 13, 2018, the Fontana Forward General Plan Update 2015-2035 (Fontana General Plan) identifies noise standards that are used as guidelines to evaluate transportation noise level impacts. These standards are also used to assess the long-term traffic noise impacts on specific land uses. According to the Fontana General Plan, land uses such as residences have acceptable exterior noise levels of up to 65 dBA CNEL. Based on the guidelines in the Fontana General Plan, an exterior noise level of 65 dBA CNEL is generally considered the maximum exterior noise level for sensitive receptors.

Land uses near these significant noise-producers can incorporate buffers and noise control techniques including setbacks, landscaping, building transitions, site design, and building construction techniques to reduce the impact of excessive noise. Selection of the appropriate noise control technique would vary depending on the level of noise that needs to be reduced as well as the location and intended land use.

The City has adopted the Noise and Safety Element as a part of the updated Fontana General Plan. The Noise and Safety Element specifies the maximum allowable unmitigated exterior noise levels for new developments impacted by transportation noise sources. Additionally, the Noise and Safety Element identifies transportation noise policies designed to protect, create, and maintain an environment free of harmful noise that could impact the health and welfare of sensitive receptors. The following Fontana General Plan goals, policies, and actions for addressing noise are applicable to the Project:

Goal 8: The City of Fontana protects sensitive land uses from excessive noise by diligent planning through 2035.

Policy 8.2: Noise-tolerant land uses shall be guided into areas irrevocably committed to land uses that are noise-producing, such as transportation corridors.

Policy 8.4: Noise spillover or encroachment from commercial, industrial and educational land uses shall be minimized into adjoining residential neighborhoods or noise-sensitive uses.

Action C: The State of California Office of Planning and Research General Plan Guidelines shall be followed with respect to acoustical study requirements.

Goal 9: The City of Fontana provides a diverse and efficiently operated ground transportation system that generates the minimum feasible noise on its residents through 2035.

Policy 9.1: All noise sections of the State Motor Vehicle Code shall be enforced.

Policy 9.2: Roads shall be maintained such that the paving is in good condition and free of cracks, bumps, and potholes.

Action A: On-road trucking activities shall continue to be regulated in the City to ensure noise impacts are minimized, including the implementation of truck-routes based on traffic studies.

Action B: Development that generates increased traffic and subsequent increases in the ambient noise level adjacent to noise-sensitive land uses shall provide appropriate mitigation measures.

Action D: Explore the use of “quiet pavement” materials for street improvements.

Goal 10: Fontana’s residents are protected from the negative effects of “spillover” noise.

Policy 10.1: Residential land uses and areas identified as noise-sensitive shall be protected from excessive noise from non-transportation sources including industrial, commercial, and residential activities and equipment.

Action A: Projects located in commercial areas shall not exceed stationary-source noise standards at the property line of proximate residential or commercial uses.

Action B: Industrial uses shall not exceed commercial or residential stationary source noise standards at the most proximate land uses.

Action C: Non-transportation noise shall be considered in land use planning decisions.

Action D: Construction shall be performed as quietly as feasible when performed in proximity to residential or other noise sensitive land uses.

City of Fontana Municipal Code

Standards established under the City of Fontana Municipal Code (Municipal Code) are used to analyze noise impacts originating from the Project. Operational noise impacts are typically governed by Fontana Municipal Code Sections 18-61 through 18-67. However, the City currently relies on delineated general industrial areas. According to the General Plan Noise and Safety section, these areas are buffered from residential uses through land use zoning that places either light industrial or commercial uses between the major manufacturers involved in heavy industrial uses and local residents. This separation of land uses meaning noise intrusion on conforming land uses is not a problem at this time.

Guidelines for non-transportation and stationary noise source impacts from operations at private properties are found in the Zoning and Development Code in Chapter 30 of the Fontana Municipal Code. Applicable guidelines indicate that no person shall create or cause any sound exceeding the City's stated noise performance standards measured at the property line of any residentially zoned property. Per Fontana Municipal Code Section 30-543(A), the performance standards for exterior noise emanating from industrial uses are 65 dBA between the hours of 7:00 a.m. and 10:00 p.m. and 70 dBA during the noise-sensitive hours of 10:00 p.m. to 7:00 a.m. at residential uses. However, the nighttime performance standard in Section 30-543(A) should actually reference 65 dBA instead of the 70 dBA that is listed. For this analysis, a 65-dBA nighttime noise level standard is conservatively used to analyze potential noise impacts at off-site residential receptors within the City of Fontana.

The City has also set restrictions to control noise impacts from construction activities. Section 18-63(b)(7) states that the erection (including excavation), demolition, alteration, or repair of any structure shall only occur between the hours of 7:00 a.m. and 6:00 p.m. on weekdays and between the hours of 8:00 a.m. and 5:00 p.m. on Saturdays, except in the case of urgent necessity or otherwise approved by the City of Fontana. Although the Fontana Municipal Code limits the hours of construction, it does not provide specific noise level performance standards for construction.

4 EXISTING CONDITIONS

4.1 Existing Noise Sources

The City is impacted by various noise sources. Mobile sources of noise, especially cars, trucks, and trains are the most common and significant sources of noise. Other noise sources are the various land uses (i.e. residential, commercial, institutional, and recreational and parks activities) throughout the City that generate stationary-source noise.

Mobile Sources

Existing roadway noise levels were calculated for the roadway segments in the Project vicinity. This task was accomplished using the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108) and existing traffic volumes from the *Traffic Impact Study for the Proposed Sierra and Casa Grande Warehouse*, prepared by Kimley-Horn (December 2019) (Traffic Impact Study). The noise prediction model calculates the average noise level at specific locations based on traffic volumes, average speeds, roadway geometry, and site environmental conditions. The average vehicle noise rates (also referred to as energy rates) used in the FHWA model have been modified to reflect average vehicle noise rates identified for California by the California Department of Transportation (Caltrans). The Caltrans data indicates that California automobile noise is 0.8 to 1.0 dBA higher than national levels and that medium and heavy truck noise is 0.3 to 3.0 dBA lower than national levels. The average daily noise levels along roadway segments in proximity to the Project site are included in Table 4: Existing Traffic Noise Levels. As shown in Table 4, existing traffic noise levels in the Project vicinity range between 67.2 dBA CNEL and 72.2 dBA CNEL.

Table 4: Existing Traffic Noise Levels

Roadway Segment	ADT	dBA CNEL[1]
Sierra Avenue		
North of Casa Grande Avenue	9,756	67.2
Between Casa Grande Drive and SR-210 WB Ramps	21,528	71.0
Between SR-210 WB Ramps and EB Ramps	25,283	71.7
South of SR-210 Eastbound Ramps	28,770	72.2

ADT = average daily trips; dBA = A-weighted decibels; CNEL= Community Equivalent Noise Level
1. Traffic noise levels are at 100 feet from the roadway centerline.
Source: Based on traffic data provided by Kimley-Horn and Associates, Inc., May 2020. Refer to Appendix A for traffic noise modeling results.

Stationary Sources

The primary sources of stationary noise in the Project vicinity are those associated with the operations of adjacent warehouse uses to the south and southeast of the Project. The noise associated with these sources may represent a single-event noise occurrence or short-term noise. Other noises include mechanical equipment (e.g., heating ventilation and air conditioning [HVAC] equipment), dogs barking, idling vehicles, and residents talking.

4.2 Noise Measurements

The Project site is currently vacant and unoccupied. To quantify existing ambient noise levels in the Project area, Kimley-Horn conducted three short-term noise measurements on February 20, 2020; see Appendix A: Noise Data. The noise measurement sites were representative of typical existing noise exposure within and immediately adjacent to the Project site. The 10-minute measurements were taken between 12:30 p.m. and 2:00 p.m. near potential sensitive receptors. Short-term L_{eq} measurements are considered representative of the noise levels throughout the day. The average noise levels and sources of noise measured at each location are listed in Table 5: Existing Noise Measurements and shown on Exhibit 4: Noise Measurement Locations.

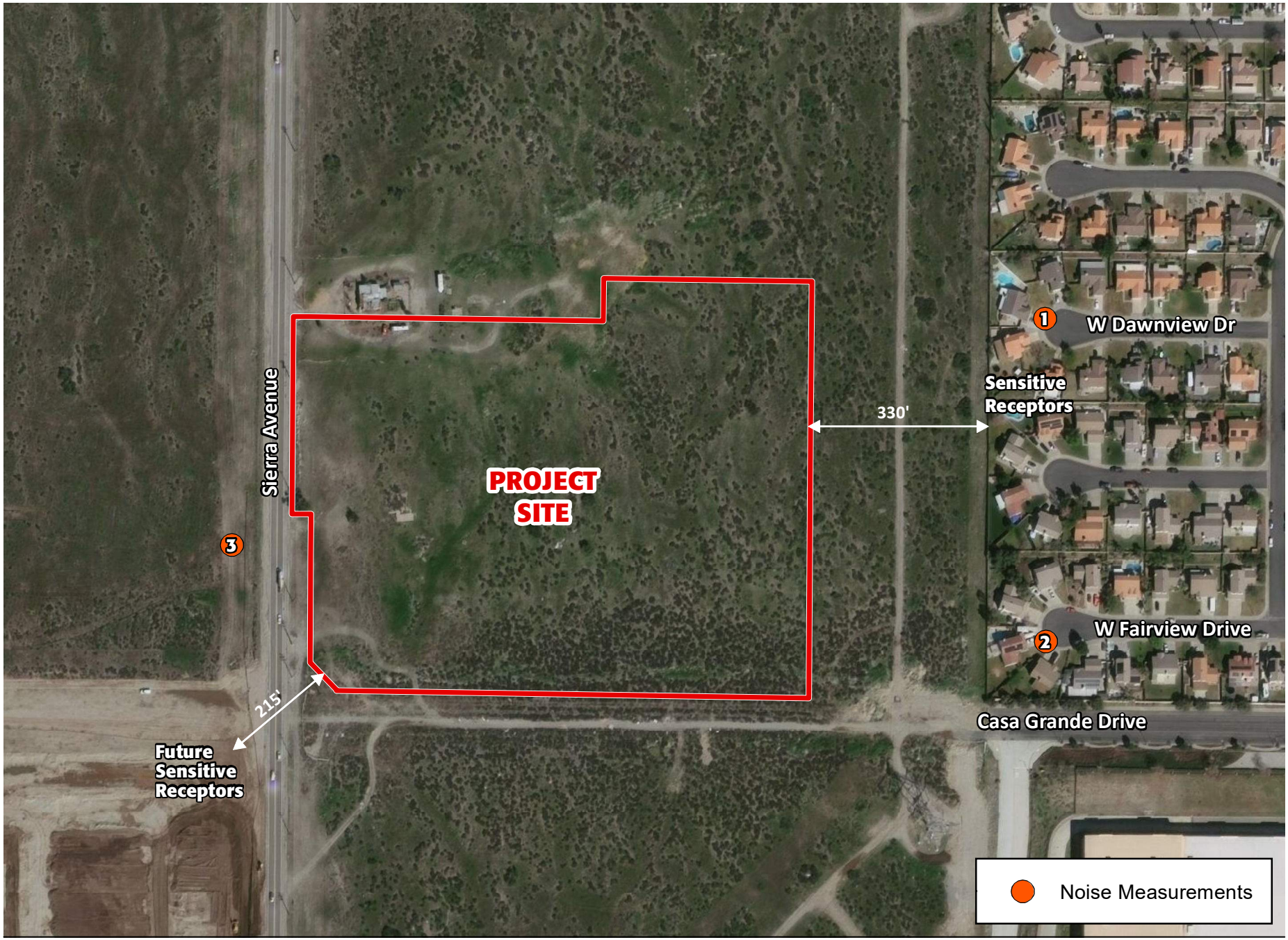
Table 5: Existing Noise Measurements

Site #	Location	L_{eq} (dBA)	L_{min} (dBA)	L_{max} (dBA)	Time
1	West Dawnview Drive cul-de-sac to the east of the Project site.	37.8	32.6	60.2	12:43 p.m.
2	West Fairview Drive cul-de-sac to the east of the Project site.	45.4	33.4	60.5	12:58 p.m.
3	To the west of the Project site along Sierra Avenue.	73.2	40.6	89.9	1:25 p.m.

Source: Noise measurements taken by Kimley-Horn, February 20, 2020. See Appendix A for noise measurement results.

4.3 Sensitive Receptors

Sensitive populations are more susceptible to the effects of air pollution than is the general population. Sensitive receptors that are in proximity to localized sources of toxics are of particular concern. Land uses considered sensitive receptors include residences, schools, playgrounds, childcare centers, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. Sensitive land uses surrounding the Project consist mostly of single-family residential communities. Sensitive land uses near the Project include the single-family residential communities 330 feet to the east and a future residential community currently under construction, located 215 feet to the southwest.



Source: Kimley-Horn, ESRI World Imagery

\\orafp01\CA_ORA\ORA_AQN\094940115 - Fontana Sierra and Casa Grande EIR\2 Exhibits\GIS\04 Noise Measurements.mxd

EXHIBIT 4: Noise Measurement Locations
Sierra Avenue and Casa Grande Warehouse Project

0 125 250
Feet

Kimley»Horn

5 SIGNIFICANCE CRITERIA AND METHODOLOGY

5.1 CEQA Thresholds

Appendix G of the California Environmental Quality Act (CEQA) Guidelines contains analysis guidelines related to noise impacts. These guidelines have been used by the City to develop thresholds of significance for this analysis. A project would create a significant environmental impact if it would:

- 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;
- Generate excessive groundborne vibration or groundborne noise levels; and
- 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, expose people residing or working in the Project area to excessive noise levels.

5.2 Methodology

This analysis of the Existing and With Project noise environments is based on noise prediction modeling and empirical observations. Construction noise levels were based on typical noise levels generated by construction equipment published by the Federal Transit Administration. Reference noise levels are used to estimate operational noise levels at nearby sensitive receptors based on a standard noise attenuation rate of 6 dB per doubling of distance (line-of-sight method of sound attenuation for point sources of noise). Noise level estimates do not account for the presence of intervening structures or topography, which may reduce noise levels at receptor locations. Therefore, the noise levels presented herein represent a conservative, reasonable worst-case estimate of actual temporary construction noise.

Groundborne vibration levels associated with construction-related activities for the Project were evaluated utilizing typical groundborne vibration levels associated with construction equipment, obtained from Federal Transit Administration (FTA) published data for construction equipment. Potential groundborne vibration impacts related to structural damage and human annoyance were evaluated, considering the distance from construction activities to nearby land uses and typically applied criteria for structural damage and human annoyance.

6 POTENTIAL IMPACTS AND MITIGATION

6.1 Acoustical Impacts

Threshold 6.1 Would the Project 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

Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g. land clearing, grading, excavation, paving). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. During construction, exterior noise levels could affect the residential neighborhoods surrounding the construction site. Project construction would occur adjacent to existing residential uses located approximately 330 feet to the east and 215 feet to the southwest from the Project construction area. However, it is acknowledged that construction activities would occur throughout the Project site and would not be concentrated at a single point near sensitive receptors.

Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g. land clearing, grading, excavation, paving). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. During construction, exterior noise levels could affect the residential neighborhoods surrounding the construction site. Project construction would occur adjacent to existing residential uses as close as 215 feet from potential construction. However, it is acknowledged that construction activities would occur throughout the Project site and would not be concentrated at a single point near sensitive receptors.

Construction activities would include demolition, site preparation, grading, building construction, paving, and architectural coating. Such activities would require concrete/industrial saws, excavators, and dozers during demolition; dozers and tractors during site preparation; excavators, graders, and dozers during grading; cranes, forklifts, generators, tractors, and welders during building construction; pavers, rollers, mixers, and paving equipment during paving; and air compressors during architectural coating. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full power operation followed by 3 to 4 minutes at lower power settings. Other primary sources of acoustical disturbance would be random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. Typical noise levels associated with individual construction equipment are listed in Table 6: Typical Construction Noise Levels.

Table 6: Typical Construction Noise Levels			
Equipment	**Typical Noise Level (dBA) at 50 feet from Source**	**Typical Noise Level (dBA) at 100 feet from Source[1]**	**Typical Noise Level (dBA) at 215 feet from Source[1]**
Air Compressor	80	74	67
Backhoe	80	74	67
Compactor	82	76	69
Concrete Mixer	85	77	72
Concrete Pump	82	76	69
Concrete Vibrator	76	79	63
Crane, Derrick	88	76	75
Crane, Mobile	83	70	70
Dozer	85	82	72
Generator	82	77	69
Grader	85	79	72
Impact Wrench	85	76	72
Jack Hammer	88	79	75
Loader	80	79	67
Paver	85	82	72
Pile-driver (Impact)	101	74	88
Pile-driver (Sonic)	95	79	82
Pneumatic Tool	85	95	72
Pump	77	89	64
Roller	85	79	72
Saw	76	71	63
Scraper	85	84	72
Shovel	82	89	69
Truck	84	79	71
Note: 1. Calculated using the inverse square law formula for sound attenuation: $dBA_2 = dBA_1+20Log(d_1/d_2)$ Where: dBA_2 = estimated noise level at receptor; dBA_1 = reference noise level; d_1 = reference distance; d_2 = receptor location distance			
Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.			

As shown in Table 6, exterior noise levels could affect the nearest existing sensitive receptors in the vicinity. Sensitive uses in the Project site vicinity include existing residential uses to the east and southwest. These sensitive receptors may be exposed to elevated noise levels during Project construction. However, construction noise would be acoustically dispersed throughout the Project site and not concentrated in one area near surrounding sensitive uses. The City's Municipal Code does not establish quantitative construction noise standards. Instead, the Municipal Code establishes limited hours of construction activities. Municipal Code Section 18-63 states that construction activities may only take place between the hours of 7:00 a.m. and 6:00 p.m. on weekdays and between the hours of 8:00 a.m. and 5:00 p.m. on Saturdays, except in the case of urgent necessity or otherwise approved by the City of Fontana. All motorized equipment used in such activity shall be equipped with functioning mufflers as mandated by the state.

Construction activities may also cause increased noise along site access routes due to movement of equipment and workers. Compliance with the Municipal Code would minimize impacts from construction noise, as construction would be limited to daytime hours on weekdays and Saturdays. By following

Municipal Code standards, Project construction activities would result in a less than significant noise impact.

Operations

Implementation of the proposed Project would create new sources of noise in the project vicinity. The major noise sources associated with the Project that would potentially impact existing and future nearby residences include stationary noise equipment (i.e. trash compactors, air conditioners, etc.); truck and loading dock (i.e. slow moving truck on the site, maneuvering and idling trucks, equipment noise); parking areas (i.e. car door slamming, car radios, engine start-up, and car pass-by); and off-site traffic noise.

Mechanical Equipment

The nearest sensitive receptors to the Project site are the residences 330 feet east and 215 feet southwest of the Project site. Potential stationary noise sources related to long-term operation of residential development in the Project site would include mechanical equipment. Mechanical equipment (e.g. heating ventilation and air conditioning [HVAC] equipment) typically generates noise levels of approximately 52 dBA at 50 feet.[3] HVAC noise levels would attenuate to approximately 39.3 dBA at the nearest residences located approximately 215 feet southwest of the Project site, which is well below he City's 65 dBA noise standard for residential uses. Operation of mechanical equipment would not increase ambient noise levels beyond the acceptable compatible land use noise levels. Further, it is noted that noise from stationary sources at the Project site would primarily occur during the daytime activity hours of 7:00 a.m. to 10:00 p.m. Therefore, the proposed project would result in a less than significant impact related to stationary noise levels.

Truck and Loading Dock Noise

During loading and unloading activities, noise would be generated by the trucks' diesel engines, exhaust systems, and brakes during low gear shifting' braking activities; backing up toward the docks; dropping down the dock ramps; and maneuvering away from the docks. Loading/unloading activities would occur on the southern portion of the proposed warehouse building in the southern portion of the Project site. Driveways and access to the site would occur along Almond Avenue. As noted above, Section 30-543(A) of the Municipal Code limits noise from industrial uses.

The proposed warehouse building includes dock-high doors for truck loading/unloading and manufacturing/light industrial operations. The dock-high doors are set back approximately 500 feet from the nearest residences to the east and southwest of the Project site. Loading dock noise is approximately 68 dB at 50 feet.[4] Loading dock noise levels would be approximately 48 dB at the nearest receptors conservatively assuming a clear line of sight and no attenuation from intervening walls or structures. Furthermore, loading dock doors would be surrounded with protective aprons, gaskets, or similar improvements that, when a trailer is docked, would serve as a noise barrier between the interior warehouse activities and the exterior loading area. This would attenuate noise emanating from interior activities, and as such, interior loading and associated activities would be permissible during all hours of

[3] Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, 2015.

[4] Charles M. Salter Associates, Inc., *Midpoint at 237 Loading Dock Noise Study,* March 27, 2014.

the day. Therefore, noise levels associated with truck loading/unloading activities would not exceed the City's noise standards of 65 dBA for residential uses.

Trucks at the Project site would also utilize backup alarms during loading/unloading activities. Backup alarms produce a typical noise level of 79 dB at 30 feet.[5] At 500 feet, backup alarm noise levels would be approximately 54.6 dB[6] and would be below the City's 65 dBA noise standard for residential uses. Therefore, noise levels from trucks and loading/unloading activities would not exceed any local noise standards and a less than significant impact would occur.

Parking Noise

The Project would provide 175 parking stalls, 45 trailers stalls, and 11 dock doors, and up to 136 parking stalls and 69 trailer stalls in the future (see Section 1.2, *Project Description*). Parking stalls would located on all sides of the proposed warehouse building near the site perimeter. Nominal parking noise would occur within the on-site parking facilities. Traffic associated with parking lots is typically not of sufficient volume to exceed community noise standards, which are based on a time-averaged scale such as the CNEL scale. The instantaneous maximum sound levels generated by a car door slamming, engine starting up, and car pass-bys range from 53 to 61 dBA[7] and may be an annoyance to adjacent noise-sensitive receptors. Conversations in parking areas may also be an annoyance to adjacent sensitive receptors. Sound levels of speech typically range from 33 dBA at 50 feet for normal speech to 50 dBA at 50 feet for very loud speech.[8] It should be noted that parking lot noises are instantaneous noise levels compared to noise standards in the hourly L_{eq} metric, which are averaged over the entire duration of a time period.

Additionally, parking noise also occurs at the adjacent properties to the east, southeast, and southwest under existing conditions. Parking and driveway noise would be consistent with existing noise in the vicinity and would be partially masked by background traffic noise from motor vehicles traveling along Sierra Avenue and Casa Grande Drive. Actual noise levels over time resulting from parking activities are anticipated to be far below the local noise standards. Therefore, noise impacts associated with parking would be less than significant.

Off-Site Traffic Noise

Implementation of the Project would generate increased traffic volumes along nearby roadway segments. According to the Traffic Impact Study, the proposed Project would generate 554 daily trips which would result in noise increases on Project area roadways. In general, a traffic noise increase of less than 3 dBA is barely perceptible to people, while a 5-dBA increase is readily noticeable.[9] Generally, traffic volumes on Project area roadways would have to approximately double for the resulting traffic noise levels to increase by 3 dBA. Therefore, permanent increases in ambient noise levels of less than 3 dBA are considered to be less than significant.

[5] Ibid.

[6] Based on the inverse square law for sound attenuation, and assuming a minimum of 5 dB noise reduction from the intervening warehouse building on the proposed Project site (FHWA, 2006).

[7] Kariel, H. G., *Noise in Rural Recreational Environments*, Canadian Acoustics 19(5), 3-10, 1991.

[8] Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, 2015.

[9] Federal Highway Administration, *Highway Traffic Noise Analysis and Abatement Policy and Guidance, Noise Fundamentals*, https://www.fhwa.dot.gov/environMent/noise/regulations_and_guidance/polguide/polguide02.cfm, accessed March 11, 2020.

Traffic noise levels for roadways primarily affected by the Project were calculated using the FHWA's Highway Noise Prediction Model (FHWA-RD-77-108). Traffic noise modeling was conducted for conditions with and without the Project, based on traffic volumes from the Traffic Impact Analysis. As indicated in Table 7: Existing and Project Traffic Noise Levels, Existing Plus Project traffic-generated noise levels on Project area roadways would range between 67.3 dBA CNEL and 72.3 dBA CNEL at 100 feet from the centerline, and the Project would result in a maximum increase of 0.1 dBA CNEL along Sierra Avenue. In addition, as shown in Table 8: Opening Year and Opening Year Plus Project Traffic Noise Levels, Opening Year Plus Project traffic noise levels on Project area roadways range between 68.3 dBA CNEL and 72.5 dBA CNEL at 100 feet from the centerline, and the Project would result in a maximum increase of 0.1 dBA CNEL along Sierra Avenue. As such, the Project would result in an increase of less than 3.0 dBA CNEL for the roadway segments analyzed and traffic noise. A less than significant impact would occur in this regard.

Table 7: Existing and Project Traffic Noise Levels

Roadway Segment	Existing		Existing Plus Project		Project Change from Existing Conditions	Significant Impact?
	ADT	dBA CNEL[1]	ADT	dBA CNEL[1]		
Sierra Avenue						
North of Casa Grande Avenue	9,756	67.2	9,895	67.3	0.1	No
Between Casa Grande Drive and SR-210 WB Ramps	21,528	71.0	22,179	71.1	0.1	No
Between SR-210 WB Ramps and EB Ramps	25,283	71.7	25,718	71.8	0.1	No
South of SR-210 Eastbound Ramps	28,770	72.2	28,987	72.3	0.0	No

ADT = average daily trips; dBA = A-weighted decibels; CNEL= Community Equivalent Noise Level
1. Traffic noise levels are at 100 feet from the roadway centerline.
Source: Based on traffic data provided by Kimley-Horn and Associates, Inc., March 2020. Refer to Appendix A for traffic noise modeling results.

Table 8: Opening Year and Opening Year Plus Project Traffic Noise Levels

Roadway Segment	Opening Year		Opening Year Plus Project		Project Change from Existing Conditions	Significant Impact?
	ADT	dBA CNEL[1]	ADT	dBA CNEL[1]		
Sierra Avenue						
North of Casa Grande Avenue	12,269	68.2	12,408	68.3	0.0	No
Between Casa Grande Drive and SR-210 WB Ramps	27,000	72.0	27,589	72.1	0.1	No
Between SR-210 WB Ramps and EB Ramps	29,061	72.3	29,337	72.4	0.0	No
South of SR-210 Eastbound Ramps	30,463	72.5	30,842	72.5	0.1	No

ADT = average daily trips; dBA = A-weighted decibels; CNEL= Community Equivalent Noise Level
1. Traffic noise levels are at 100 feet from the roadway centerline.
Source: Based on traffic data provided by Kimley-Horn and Associates, Inc., March 2020. Refer to Appendix A for traffic noise modeling results.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

Threshold 6.2 Would the Project generate excessive groundborne vibration or groundborne noise levels?

Increases in groundborne vibration levels attributable to the proposed Project would be primarily associated with short-term construction-related activities. The Federal Transit Administration (FTA) has published standard vibration velocities for construction equipment operations in their 2018 *Transit Noise and Vibration Impact Assessment Manual*. The types of construction vibration impacts include human annoyance and building damage.

Human annoyance is evaluated in vibration decibels (VdB) (the vibration velocity level in decibel scale) and occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time. The FTA Transit Noise and Vibration Impact Assessment Manual identifies 75 VdB as the approximate threshold for annoyance. Building damage can be cosmetic or structural. Ordinary buildings that are not particularly fragile would not experience cosmetic damage (e.g. plaster cracks) at distances beyond 30 feet. This distance can vary substantially depending on soil composition and underground geological layer between vibration source and receiver. In addition, not all buildings respond similarly to vibration generated by construction equipment. For example, for a building that is constructed with reinforced concrete with no plaster, the FTA guidelines show that a vibration level of up to 0.20 in/sec is considered safe and would not result in any vibration damage.

Table 9: Typical Construction Equipment Vibration Levels, lists vibration levels at 25 feet and 215 feet for typical construction equipment. Groundborne vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. As indicated in Table 9, based on FTA data, vibration velocities from typical heavy construction equipment operations that would be used during Project construction range from 0.003 to 0.089 in/sec PPV at 25 feet from the source of activity, which is below the FTA's 0.20 PPV threshold. The nearest sensitive receptors are the residential uses located approximately 215 feet to the southwest of the active construction zone.

Table 9: Typical Construction Equipment Vibration Levels

Equipment	Peak Particle Velocity at 25 Feet (in/sec)	Peak Particle Velocity at 100 Feet (in/sec)[1]	Approximate VdB at 25 Feet	Approximate VdB at 215 Feet[2]
Large Bulldozer	0.089	0.011	87	59
Caisson Drilling	0.089	0.011	87	59
Loaded Trucks	0.076	0.010	86	58
Jackhammer	0.035	0.004	79	51
Small Bulldozer/Tractors	0.003	0.000	58	30

Notes:
1. Calculated using the following formula: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$, where: PPV_{equip} = the peak particle velocity in in/sec of the equipment adjusted for the distance; PPV_{ref} = the reference vibration level in in/sec from Table 7-4 of the Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, 2018; D = the distance from the equipment to the receiver.
2. Calculated using the following formula: Lv(D) = Lv(25 feet) - (30 x log10(D/25 feet)) per the FTA Transit Noise and Vibration Impact Assessment Manual (2018).

Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, 2018.

As shown in Table 9, construction VdB levels would not exceed 59 VdB at 215 feet (i.e. below the 75 VdB annoyance threshold). It is also acknowledged that construction activities would occur throughout the

Project site and would not be concentrated at the point closest to the nearest residential structure(s). Therefore, vibration impacts associated with the Project construction would be less than significant.

Once operational, the Project would not be a significant source of groundborne vibration. Groundborne vibration surrounding the Project currently result from heavy-duty vehicular travel (e.g. refuse trucks, heavy duty trucks, delivery trucks, and transit buses) on the nearby local roadways. Operations of the proposed Project would include truck deliveries. Due to the rapid drop-off rate of ground-borne vibration and the short duration of the associated events, vehicular traffic-induced ground-borne vibration is rarely perceptible beyond the roadway right-of-way, and rarely results in vibration levels that cause damage to buildings in the vicinity. According to the FTA's Transit Noise and Vibration Impact Assessment, trucks rarely create vibration levels that exceed 70 VdB (equivalent to 0.012 inches per second PPV) when they are on roadways. Therefore, trucks operating at the Project site or along surrounding roadways would not exceed FTA thresholds for building damage or annoyance. Impacts would be less than significant in this regard.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

Threshold 6.3 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?

The nearest airport to the Project site is the Ontario International Airport located approximately 10.5 miles to the southwest. The Project is not within 2.0 miles of a public airport or within an airport land use plan. Additionally, there are no private airstrips located within the Project vicinity. Therefore, the Project would not expose people residing or working in the Project area to excessive airport- or airstrip-related noise levels and no mitigation is required.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

6.2 Cumulative Noise Impacts

The Project's construction activities would not result in a substantial temporary increase in ambient noise levels. The City permits construction activities between the hours of 7:00 a.m. and 6:00 p.m. on weekdays, between the hours of 8:00 a.m. and 5:00 p.m. on Saturdays (except in the case of urgent necessity or otherwise approved by the City of Fontana), and prohibited on Sundays and Federal holidays. There would be periodic, temporary, noise impacts that would cease upon completion of construction activities. The Project would contribute to other proximate construction project noise impacts if construction activities were conducted concurrently. However, based on the noise analysis above, the Project's construction-related noise impacts would be less than significant following compliance with the General Plan and the Municipal Code. Given that noise dissipates as it travels away from its source, operational noise impacts from on-site activities and other stationary sources would be limited to the Project site and vicinity. Thus, cumulative operational noise impacts from related projects, in conjunction with Project specific noise impacts, would not be cumulatively significant.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

7 REFERENCES

1. California Department of Transportation, *California Vehicle Noise Emission Levels*, 1987.
2. California Department of Transportation, *Traffic Noise Analysis Protocol*, 2011.
3. California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, 2013.
4. California Department of Transportation, *Transportation Related Earthborne Vibrations*, 2002.
5. California Department of Transportation, *Transportation and Construction Vibration Guidance Manual*, 2013.
6. City of Fontana, *General Plan*, 2018.
7. City of Fontana, *Municipal Code*, 2018.
8. Federal Highway Administration, *Roadway Construction Noise Model*, 2006.
9. Federal Highway Administration, *Roadway Construction Noise Model User's Guide Final Report*, 2006.
10. Federal Interagency Committee on Noise, *Federal Agency Review of Selected Airport Noise Analysis Issues*, 1992.
11. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, 2018.
12. United States Environmental Protection Agency, *Protective Noise Levels (EPA 550/9-79-100)*, 1979.

Appendix A

NOISE DATA

Noise Measurement Field Data

Project:	Fontana Sierra and Casa Grande	**Job Number:**	094940115
Site No.:	1	**Date:**	2/20/2020
Analyst:	Alex Howard	**Time:**	12:43 - 12:53 PM
Location:	2890 W Dawnview Dr, Rialto		
Noise Sources:	Road noise		
Comments:			

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
37.8	32.6	60.2	100.7

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	64
Wind (mph):	< 5
Sky:	Clear
Bar. Pressure:	30.04" Hg
Humidity:	39%

Photo:

Kimley»Horn

Measurement Report

Report Summary

Meter's File Name	FONT_.005	Computer's File Name	SLM_0005586_FONT__005.00.ldbin
Meter	LxT SE		
Firmware	2.402		
User	Alex Howard	Location	
Description	Fontana		
Note			
Start Time	2020-02-20 12:43:54	Duration	0:10:00.0
End Time	2020-02-20 12:53:54	Run Time	0:10:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	37.8 dB		
LAE	65.6 dB	SEA	--- dB
EA	0.4 µPa²h		
LZ_{peak}	100.7 dB	2020-02-20 12:44:03	
LAS_{max}	60.2 dB	2020-02-20 12:44:03	
LAS_{min}	32.6 dB	2020-02-20 12:50:41	
LA_{eq}	37.8 dB		
LC_{eq}	56.2 dB	LC_{eq} - LA_{eq}	18.3 dB
LAI_{eq}	46.8 dB	LAI_{eq} - LA_{eq}	9.0 dB

Exceedances

	Count	Duration
LAS > 85.0 dB	0	0:00:00.0
LAS > 115.0 dB	0	0:00:00.0
LZpeak > 135.0 dB	0	0:00:00.0
LZpeak > 137.0 dB	0	0:00:00.0
LZpeak > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight
37.8 dB	37.8 dB	0.0 dB

LDEN	LDay	LEve	LNight
37.8 dB	37.8 dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	37.8 dB		56.2 dB		--- dB	
$LS_{(max)}$	60.2 dB	2020-02-20 12:44:03	--- dB		--- dB	
$LS_{(min)}$	32.6 dB	2020-02-20 12:50:41	--- dB		--- dB	
$L_{Peak(max)}$	--- dB		--- dB		100.7 dB	2020-02-20 12:44:03

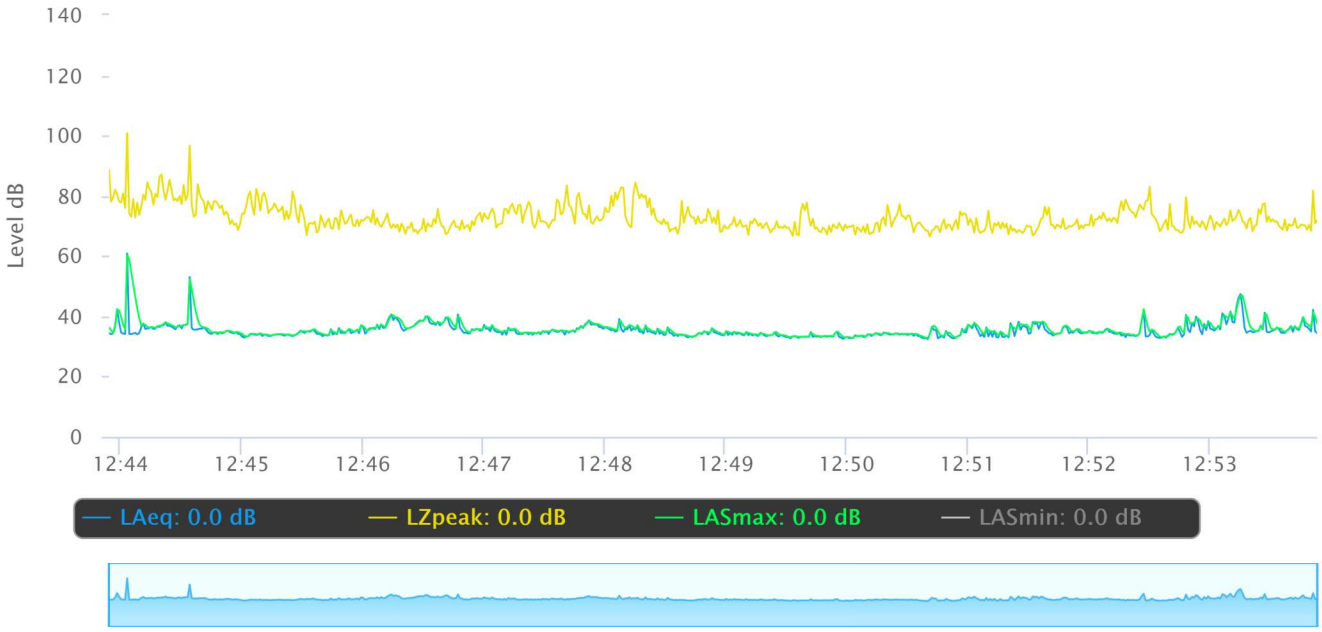
Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	39.2 dB
LAS 10.0	37.7 dB
LAS 33.3	35.7 dB
LAS 50.0	34.8 dB
LAS 66.6	34.3 dB
LAS 90.0	33.4 dB

Time History



Noise Measurement Field Data

Project:	Fontana Sierra and Casa	**Job Number:**	094940115
Site No.:	2	**Date:**	2/20/2020
Analyst:	Alex Howard	**Time:**	12:58 - 1:08 PM
Location:	2896 West Fairview Drive		
Noise Sources:	Road noise		
Comments:			

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
45.4	33.4	60.5	100.3

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	75
Wind (mph):	< 5
Sky:	Partly Cloudy
Bar. Pressure:	30.08" Hg
Humidity:	39%

Photo:

Kimley»Horn

Measurement Report

Report Summary

Meter's File Name	FONT_.006	Computer's File Name	SLM_0005586_FONT__006.00.ldbin
Meter	LxT SE		
Firmware	2.402		
User	Alex Howard	Location	
Description	Fontana		
Note			
Start Time	2020-02-20 12:58:26	Duration	0:10:00.0
End Time	2020-02-20 13:08:26	Run Time	0:10:00.0
		Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	45.4 dB		
LAE	73.2 dB	SEA	--- dB
EA	2.3 µPa²h		
LZ_{peak}	100.3 dB	2020-02-20 12:58:32	
LAS_{max}	60.5 dB	2020-02-20 13:07:28	
LAS_{min}	33.4 dB	2020-02-20 12:58:26	
LA_{eq}	45.4 dB		
LC_{eq}	57.8 dB	LC_{eq} - LA_{eq}	12.5 dB
LAI_{eq}	50.8 dB	LAI_{eq} - LA_{eq}	5.4 dB

Exceedances	Count	Duration
LAS > 85.0 dB	0	0:00:00.0
LAS > 115.0 dB	0	0:00:00.0
LZpeak > 135.0 dB	0	0:00:00.0
LZpeak > 137.0 dB	0	0:00:00.0
LZpeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight
	45.4 dB	45.4 dB	0.0 dB

	LDEN	LDay	LEve	LNight
	45.4 dB	45.4 dB	--- dB	--- dB

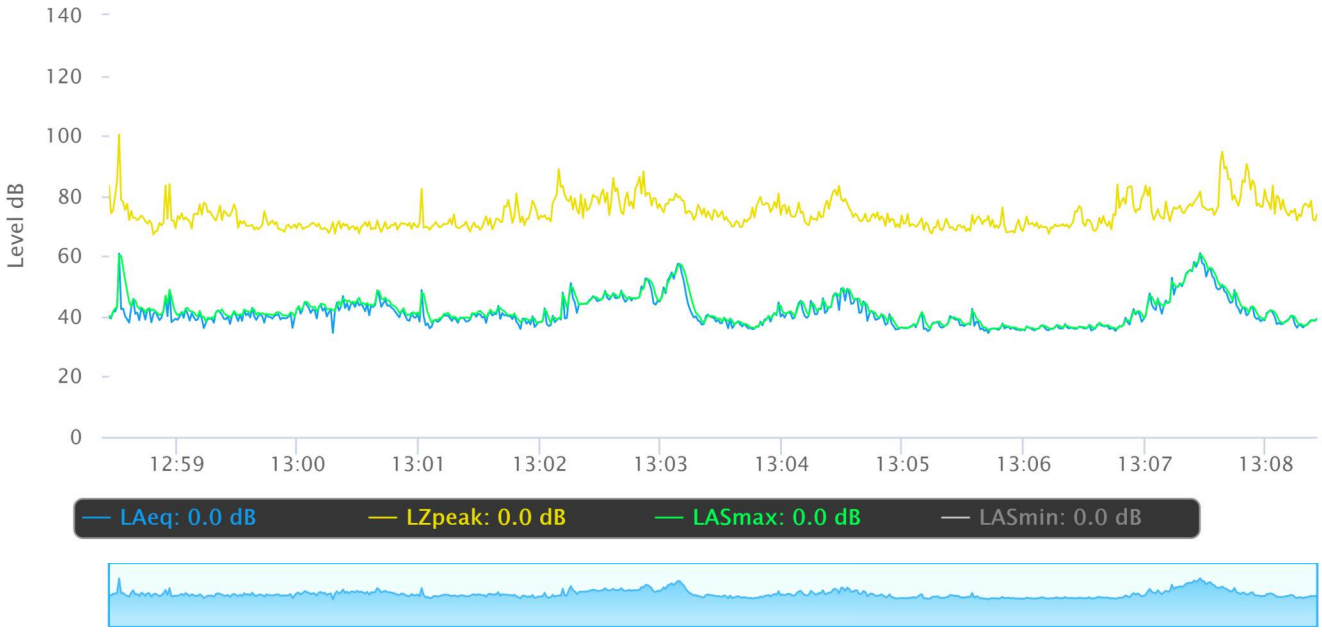
Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	45.4 dB		57.8 dB		--- dB	
$LS_{(max)}$	60.5 dB	2020-02-20 13:07:28	--- dB		--- dB	
$LS_{(min)}$	33.4 dB	2020-02-20 12:58:26	--- dB		--- dB	
$L_{Peak(max)}$	--- dB		--- dB		100.3 dB	2020-02-20 12:58:32

Overloads	Count	Duration	OBA Count	OBA Duration
	0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	51.2 dB
LAS 10.0	47.5 dB
LAS 33.3	42.1 dB
LAS 50.0	40.2 dB
LAS 66.6	38.9 dB
LAS 90.0	36.3 dB

Time History



Noise Measurement Field Data

Project:	Fontana Sierra and Casa	**Job Number:**	094940115
Site No.:	3	**Date:**	2/20/2020
Analyst:	Alex Howard	**Time:**	1:25 - 1:35 PM
Location:	4750 Sierra Ave.		
Noise Sources:	Road noise		
Comments:			

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
73.2	40.6	89.9	115.3

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	75
Wind (mph):	< 5
Sky:	Partly Cloudy
Bar. Pressure:	30.08" Hg
Humidity:	39%

Photo:

Kimley»Horn

Measurement Report

Report Summary

Meter's File Name	FONT_.007	Computer's File Name	SLM_0005586_FONT__007.00.ldbin
Meter	LxT SE		
Firmware	2.402		
User	Alex Howard	Location	
Description	Fontana		
Note			
Start Time	2020-02-20 13:25:45	Duration	0:10:00.0
End Time	2020-02-20 13:35:45	Run Time	0:10:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	73.2 dB		
LAE	101.0 dB	SEA	--- dB
EA	1.4 mPa²h		
LZ_{peak}	115.3 dB	2020-02-20 13:31:26	
LAS_{max}	89.9 dB	2020-02-20 13:26:48	
LAS_{min}	40.6 dB	2020-02-20 13:27:35	
LA_{eq}	73.2 dB		
LC_{eq}	79.4 dB	LC_{eq} - LA_{eq}	6.2 dB
LAI_{eq}	77.2 dB	LAI_{eq} - LA_{eq}	4.0 dB

Exceedances	Count	Duration
LAS > 85.0 dB	2	0:00:04.9
LAS > 115.0 dB	0	0:00:00.0
LZpeak > 135.0 dB	0	0:00:00.0
LZpeak > 137.0 dB	0	0:00:00.0
LZpeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight
	73.2 dB	73.2 dB	0.0 dB

	LDEN	LDay	LEve	LNight
	73.2 dB	73.2 dB	--- dB	--- dB

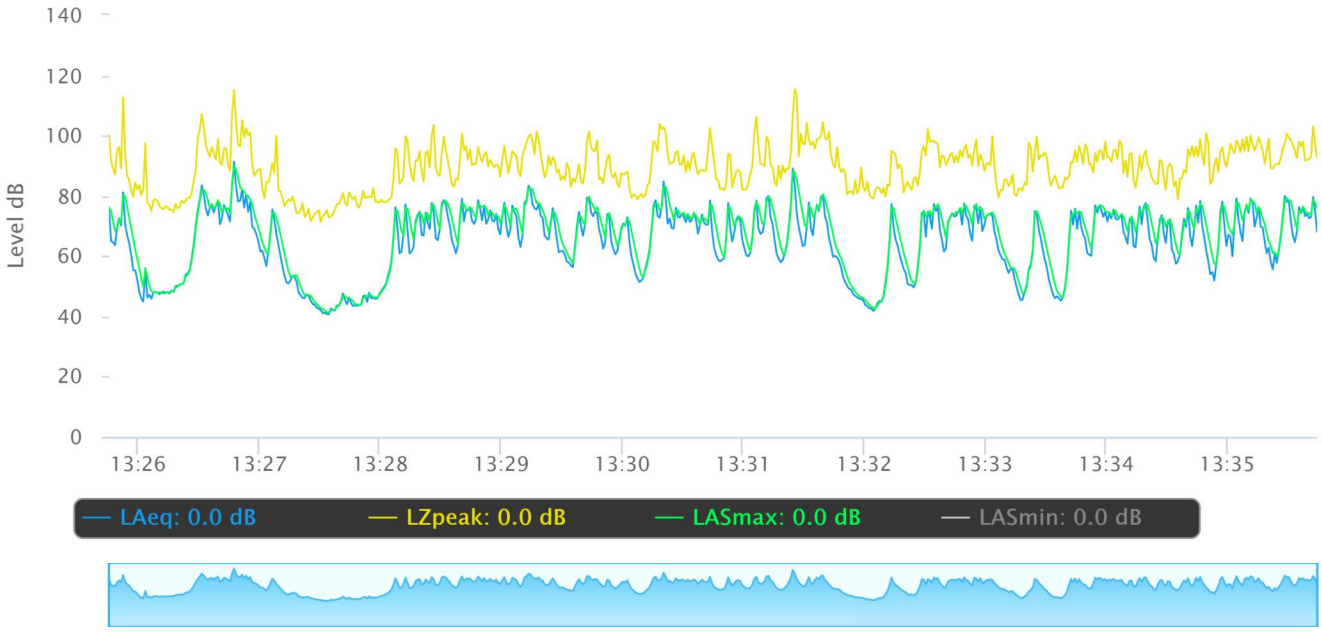
Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	73.2 dB		79.4 dB		--- dB	
$LS_{(max)}$	89.9 dB	2020-02-20 13:26:48	--- dB		--- dB	
$LS_{(min)}$	40.6 dB	2020-02-20 13:27:35	--- dB		--- dB	
$L_{Peak(max)}$	--- dB		--- dB		115.3 dB	2020-02-20 13:31:26

Overloads	Count	Duration	OBA Count	OBA Duration
	0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	78.0 dB
LAS 10.0	76.4 dB
LAS 33.3	72.7 dB
LAS 50.0	69.5 dB
LAS 66.6	63.4 dB
LAS 90.0	47.4 dB

Time History



FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels

Project Name: Sierra Casa Grande
Project Number: 94940115
Scenario: Existing
Ldn/CNEL: CNEL

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

								Vehicle Mix		Distance from Centerline of Roadway				
				Median	ADT	Speed	Alpha	Medium	Heavy	CNEL at	Distance to Contour			
#	Roadway	Segment	Lanes	Width	Volume	(mph)	Factor	Trucks	Trucks	100 Feet	70 CNEL	65 CNEL	60 CNEL	55 CNEL
1	Sierra Ave	North of Casa Grande Drive	2	0	9,756	30	0	4.6%	12.3%	67.2	53	166	526	1,663
2	Sierra Ave	Between Casa Grande Drive and SR-210 WB Ramp	6	20	21,528	30	0	4.6%	12.3%	71.0	126	400	1,264	3,997
3	Sierra Ave	Between SR-210 WB Ramp and SR-210 EB Ramp	6	20	25,283	30	0	4.6%	12.3%	71.7	148	469	1,484	4,694
4	Sierra Ave	South of SR-210 EB Ramp	6	15	28,770	30	0	4.6%	12.3%	72.2	167	528	1,670	5,281

[1] Distance is from the centerline of the roadway segment to the receptor location.
"-" = contour is located within the roadway right-of-way.

FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels

Project Name: Sierra Casa Grande
Project Number: 94940115
Scenario: Existing Plus Project
Ldn/CNEL: CNEL

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

								Vehicle Mix		Distance from Centerline of Roadway				
				Median	ADT	Speed	Alpha	Medium	Heavy	CNEL at	Distance to Contour			
#	Roadway	Segment	Lanes	Width	Volume	(mph)	Factor	Trucks	Trucks	100 Feet	70 CNEL	65 CNEL	60 CNEL	55 CNEL
1	Sierra Ave	North of Casa Grande Drive	2	0	9,895	30	0	4.6%	12.3%	67.3	53	169	533	1,687
2	Sierra Ave	Between Casa Grande Drive and SR-210 WB Ramp	6	20	22,179	30	0	4.6%	12.3%	71.1	130	412	1,302	4,118
3	Sierra Ave	Between SR-210 WB Ramp and SR-210 EB Ramp	6	20	25,718	30	0	4.6%	12.3%	71.8	151	477	1,510	4,775
4	Sierra Ave	South of SR-210 EB Ramp	6	15	28,987	30	0	4.6%	12.3%	72.3	168	532	1,682	5,320

[1] Distance is from the centerline of the roadway segment to the receptor location.
"-" = contour is located within the roadway right-of-way.

FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels

Project Name: Sierra Casa Grande
Project Number: 94940115
Scenario: Opening Year
Ldn/CNEL: CNEL

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

								Vehicle Mix		Distance from Centerline of Roadway				
				Median	ADT	Speed	Alpha	Medium	Heavy	CNEL at	Distance to Contour			
#	Roadway	Segment	Lanes	Width	Volume	(mph)	Factor	Trucks	Trucks	100 Feet	70 CNEL	65 CNEL	60 CNEL	55 CNEL
1	Sierra Ave	North of Casa Grande Drive	2	0	12,269	30	0	4.6%	12.3%	68.2	66	209	661	2,091
2	Sierra Ave	Between Casa Grande Drive and SR-210 WB Ramp	6	20	27,000	30	0	4.6%	12.3%	72.0	159	501	1,585	5,013
3	Sierra Ave	Between SR-210 WB Ramp and SR-210 EB Ramp	6	20	29,061	30	0	4.6%	12.3%	72.3	171	540	1,706	5,395
4	Sierra Ave	South of SR-210 EB Ramp	6	15	30,463	30	0	4.6%	12.3%	72.5	177	559	1,768	5,591

[1] Distance is from the centerline of the roadway segment to the receptor location.
"-" = contour is located within the roadway right-of-way.

FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels

Project Name: Sierra Casa Grande
Project Number: 94940115
Scenario: Opening Year Plus Project
Ldn/CNEL: CNEL

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

								Vehicle Mix		Distance from Centerline of Roadway				
#	Roadway	Segment	Lanes	Median Width	ADT Volume	Speed (mph)	Alpha Factor	Medium Trucks	Heavy Trucks	CNEL at 100 Feet	Distance to Contour 70 CNEL	65 CNEL	60 CNEL	55 CNEL
1	Sierra Ave	North of Casa Grande Drive	2	0	12,408	30	0	4.6%	12.3%	68.3	67	211	669	2,115
2	Sierra Ave	Between Casa Grande Drive and SR-210 WB Ramp	6	20	27,589	30	0	4.6%	12.3%	72.1	162	512	1,620	5,122
3	Sierra Ave	Between SR-210 WB Ramp and SR-210 EB Ramp	6	20	29,337	30	0	4.6%	12.3%	72.4	172	545	1,722	5,447
4	Sierra Ave	South of SR-210 EB Ramp	6	15	30,842	30	0	4.6%	12.3%	72.5	179	566	1,790	5,661

[1] Distance is from the centerline of the roadway segment to the receptor location.
"-" = contour is located within the roadway right-of-way.

Kimley»Horn

MEMORANDUM

To:	Kari Cano
From:	Alex Pohlman
	Kimley-Horn and Associates, Inc.
Date:	June 2, 2020
Subject:	Mango Replacement Site: Proposed Sierra Casa Grande Warehouse Residential Replacement Site – Noise Impacts

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Purpose

The purpose of this memorandum is to identify noise impacts associated with the proposed residential replacement site located on the northwest corner of Malaga Street and Mango Avenue (Mango Replacement Site) in the City of Fontana. Specifically, this analysis addresses the air quality impacts referenced in State CEQA Guidelines.

Project Description

The project is proposing residential replacement sites for the development of residential dwelling units at two project sites within the City of Fontana in efforts to account for the potential residential dwelling units lost with the development of the proposed Sierra Avenue at Casa Grande Drive Warehouse. The two replacement sites are proposed within the City of Fontana and are shown on Exhibit 1. One replacement site is located on the northwest corner of the intersection of Mango Avenue at Malaga Street. The site is currently 5.69 acres and occupied by 14 existing residential dwelling units. The second replacement site, located on the northeast corner of the intersection of Palmetto Avenue at Arrow Boulevard (Palmetto Replacement Site), is mentioned in this memorandum yet analyzed a separate document.

The replacement of residential land uses due to the development of the Sierra Avenue at Casa Grande Drive Warehouse would result in the development of a maximum of 219 new residential dwelling units, in addition to the existing units on each site. The 219 dwelling units would be split proportionally between the two replacement sites as follows:

- **Malaga Street/Mango Avenue Site**: 195 new dwelling units
  - 14 existing dwelling units
  - 209 onsite total dwelling units

  - Proposed Residential Designation: R-MF: Multi-Family Residential (12.1-24 du/ac) or WMXU-1: Walkable Mixed Use Corridor & Downtown (0.2-2 FAR, 3-39 du/ac)

- **Palmetto Avenue/Arrow Boulevard Site**: 24 new dwelling units
  - 8 existing dwelling units
  - 32 onsite total dwelling units
  - Proposed Residential Designation: R-MF: Multi-Family Residential (12.1-24 du/ac) or WMXU-1: Walkable Mixed Use Corridor & Downtown (0.2-2 FAR, 3-39 du/ac)

Noise Background

Sound is technically described in terms of amplitude (loudness) and frequency (pitch). The standard unit of sound amplitude measurement is the decibel (dB). The decibel scale is a logarithmic scale that describes the physical intensity of the pressure vibrations that make up any sound. The pitch of the sound is related to the frequency of the pressure vibration. Since the human ear is not equally sensitive to a given sound level at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) provides this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear.

Noise, on the other hand, is typically defined as unwanted sound. A typical noise environment consists of a base of steady ambient noise that is the sum of various distant and indistinguishable noise sources. Superimposed on this background noise is the sound from individual local sources. These can vary from an occasional aircraft or train passing by to virtually continuous noise from traffic on a major highway.

Several rating scales have been developed to analyze the adverse effect of community noise on people. Since environmental noise fluctuates over time, these scales consider that the effect of noise on people is largely dependent on the total acoustical energy content of the noise as well as the time of day when the noise occurs. For example, the equivalent continuous sound level (L_{eq}) is the average acoustic energy content of noise for a stated period of time; thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. The Day-Night Sound level (L_{dn}) is a 24-hour average L_{eq} with a 10 dBA "weighting" added to noise during the hours of 10:00 PM to 7:00 AM to account for noise sensitivity in the nighttime. The Community Noise Equivalent Level (CNEL) is a 24-hour average L_{eq} with a 10 dBA weighting added to noise during the hours of 10:00 PM to 7:00 AM and an additional 5 dBA weighting during the hours of 7:00 PM to 10:00 PM to account for noise sensitivity in the evening and nighttime.

Regulatory Setting

City of Fontana General Plan

The City of Fontana General Plan Noise and Safety Element (Noise Element) ensures that development accounts for physical constraints and the natural hazards of the land. The noise component of the General Plan identifies potential noise problems and exposure in the community and provides an integrated approach to regulating noise. The City currently regulates noise levels and exposure, consistent, consistent with this Plan, in the Zoning and Development Code.

Goal 8: The City of Fontana protects sensitive land uses from excessive noise by diligent planning through 2035.

Policy 8.1: New sensitive land uses shall be prohibited in incompatible areas.

Policy 8.2: Noise-tolerant land uses shall be guided into areas irrevocable committed to land uses that are noise-producing, such as transportation corridors.

Policy 8.3: Where sensitive uses are to be placed along transportation routes, mitigation shall be provided to ensure compliance with state-mandated noise levels.

Policy 8.4: Noise spillover or encroachment from commercial, industrial and educational land uses shall be minimized into adjoining residential neighborhoods or noise-sensitive users.

Goal 9: The City of Fontana provides a diverse and efficiently operated ground transportation system that generates the minimum feasible noise on its residents through 2035.

Policy 9.1: All noise sections of the State Motor Vehicle Code shall be enforced.

Policy 9.2: Roads shall be maintained such that paving is in good condition and free of cracks, bumps, and potholes.

Policy 9.3: Noise mitigation shall be included in the design of new roadway projects in the city.

Goal 10: Fontana's residents are protected from the negative effects of "spillover" noise.

Policy 10.1: Residential land uses and areas identified noise-sensitive shall be protected fro excessive noise from non-transportation sources including industrial, commercial, and residential activities and equipment.

City of Fontana Municipal Code

Chapter 18, Article II. Section 18-63. – Prohibited Noises

(b) The following acts, which create loud, excessive, impulsive or intrusive sound or noise that annoys or disturbs persons of ordinary sensibilities from a distance of 50 feet or more from the edge of the property, structure or unit in which the source is located, are declared to be in violation of this article.

Section 18-63(b)(6) Loading, unloading or opening boxes. The creation of load, excessive or intrusive and excessive noise in connection with loading or unloading of any vehicle or the opening and destruction of bales, boxes, crates and containers.

Section 18-63(b)(7) Construction or repairing of buildings or structures. The erection (including excavating), demolition, alteration or repair of any building or structure other than between the hours of 7:00 a.m. and 6:00 p.m. on weekdays and between the hours of 8:00 a.m. and 5:00 p.m. on Saturdays, except in case of urgent necessity in the interest of public health and safety, and then only with a permit from the building inspector, which permit may be granted for a period not to exceed three days or less while the emergency continues and which permit may be renewed for periods of three days or less while the emergency continues. If the building inspector should determine that the public health and safety will not be impaired by the erection, demolition, alteration or repair of any building or structure or the excavation of streets and highways within the hours of 6:00 p.m. and 7:00 a.m., and if he shall further determine that loss or inconvenience would result to any party in interest, he may grant permission for such work to be done on weekdays within the hours of 6:00 p.m. and 7:00 a.m., upon application being made at the time the permit for the work is awarded or during the progress of the work.

Section 18-63(b)(8) Noise near schools, courts, place of worship or hospitals. The creation of any loud, excessive, impulsive or intrusive noise on any street adjacent to any school, institution of learning, places of worship or court while the premises are in use, or adjacent to any hospital which unreasonably interferes with the workings of such institution or which disturbs or unduly annoys patients in the hospital; provided conspicuous signs are displayed in such streets indicating that the street is a school, hospital or court street.

Chapter 30, Article V. Division 6, Sec. 30-182. - Noise

(a) No use shall create or cause to be created any sound that exceeds the ambient noise standards outlined in Table 30-182.A (**Table 1, Noise Standards**)

(b) No use shall create or cause creation of noise from a portable electronic device such as a car stereo, portable radio and/or cassette/compact disc player or similar device which exceeds the ambient noise standards outlined in Table 30-182.A (**Table 1**)

Table 1: Noise Standards		
Location of Measurement	**Maximum Allowable**	
All Zoning Districts	**7:00 a.m. to 10:00 p.m.**	**10:00 p.m. to 7:00 a.m.**
Interior	45 db	45 db
Exterior	65 db	65 db
Source: Fontana Municipal Code, Chapter 30, Article V. Division 6, Sec. 30-182. – Noise, Table 30-469		

Chapter 30, Article V. Division 6, Sec. 30-183. - Vibration

No use shall create or cause to be created any activity that causes a vibration that can be felt beyond the property line with or without the aid of an instrument.

Chapter 30, Article VII. Division 6, Sec. 30-259. - Vibration
(a) Noise levels. No person shall create or cause to be created any sound which exceeds the noise levels in this section as measured at the property line of any residentially zoned property: (1) The noise level between 7:00 a.m. and 10:00 p.m. shall not exceed 70 db(A). (2) The noise level between 10:00 p.m. and 7:00 a.m. shall not exceed 65 db(A).

(b) Noise measurements. Noise shall be measured with a sound level meter that meets the standards of the American National Standards Institute (ANSI) Section SI4-1979, Type 1 or Type 2. Noise levels shall be measured using the "A" weighted sound pressure level scale in decibels (reference pressure = 20 micronewtons per meter squared).

(c) Vibration. No person shall create or cause to be created any activity which causes a vibration which can be felt beyond the property line of any residentially zoned property with or without the aid of an instrument.

Significance Criteria

Criteria for determining the significance of noise impacts were developed based on information contained in the Fontana General Plan and Fontana Municipal Code. A significant impact related to noise would occur if:

- Project construction activities occur outside the hours that construction noise is considered exempt as specified in the City of Fontana Municipal Code, Section 18-63(7), 7:00 a.m. to 6:00 p.m. on weekdays and between the hours of 8:00 a.m. to 5:00 p.m. on Saturdays
    - and Project construction noise levels would exceed the exterior 65 dBA noise level standard
    - and the Project creates a community noise level increase of greater than 3 dBA L_{eq}.

- Off-site traffic noise levels, without or with the Project at existing or future noise-sensitive land uses exceed the City of Fontana General Plan noise standard of 65 dBA CNEL and the Project creates a community noise level increase of greater than 3 dBA CNEL.

- Project construction vibration levels exceed the Caltrans human annoyance vibration threshold of 0.2 in/sec PPV at adjacent uses (Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual). The FTA threshold is used to quantify

potential impacts related to perception of short-term construction-related vibration levels.

Noise Impacts

Construction Noise

Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g., land clearing, grading, excavation, paving). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. During construction, exterior noise levels could affect the residential neighborhoods near the construction site.

Construction activities would include demolition, site preparation, grading, building construction, paving, and architectural coating. Such activities would require concrete/industrial saws, excavators, and dozers during demolition, tractors and dozers during site preparation; graders, dozers, excavators, and tractors during grading; cranes, forklifts, generators, tractors, and welders during building construction; pavers, rollers, mixers, and paving equipment during paving; and air compressors during architectural coating. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full power operation followed by 3 to 4 minutes at lower power settings. Other primary sources of acoustical disturbance would be random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. Typical noise levels associated with individual construction equipment are listed in **Table 2: Typical Construction Noise Levels**. It should be noted that the noise levels shown in **Table 2** are maximum noise levels (i.e., the equipment engine at maximum speed). However, equipment used on construction sites typically operates under less than full power conditions, or part power.

Noise-sensitive uses closest to the project site include residences to north located adjacent to the Project site. As shown in **Table 2**, construction noise levels would range from approximately 76 dBA to 85 dBA at a distance of 50 feet. As such, noise levels at the residences to the north of the project site could exceed ambient noise levels and may cause periodic disturbance during the construction period. However, Section 18-63(7) exempts construction noise between the hours of 7:00 a.m. to 6:00 p.m. on weekdays and between the hours of 8:00 a.m. to 5:00 p.m. on Saturdays. Construction activities for the proposed Project would only occur during the time period specified in the Municipal Code. Additionally, construction noise from the project would be acoustically dispersed throughout the project site (depending on what construction phase or activity is occurring) and not concentrated in one area near surrounding uses for an extended period of time. As such, construction-related noise impacts would be less than significant in this regard.

Table 2: Typical Construction Noise Levels	
Equipment	**Typical Noise Level (dBA L_{max}) at 50 feet from Source**
Air Compressor	80
Backhoe	80
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Mobile	83
Dozer	85
Generator	82
Grader	85
Impact Wrench	85
Jack Hammer	88
Loader	80
Paver	85
Pneumatic Tool	85
Pump	77
Roller	85
Saw	76
Scraper	85
Shovel	82
Truck	84
dBA = A-weighted decibel; L_{max} = maximum A-weighted sound level	
Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.	

Operational Noise

Implementation of the proposed project would result in noise sources typical of residential developments in the area. The major noise sources associated with the project would include off-site traffic noise. The closest sensitive receptors are located to the north, adjacent to the project site.

Project implementation would generate increased traffic volumes along Mango Avenue and Project area roadways. According to the trip generation analysis, the Project would result in an additional 820 average daily vehicle trips. The Project's increase in traffic would result in noise increases on Project area roadways. In general, a 3-dBA increase in traffic noise is barely perceptible to people, while a 5-dBA increase is readily noticeable. Traffic volumes on Project area roadways would have to approximately double for the resulting traffic noise levels to generate a 3-dBA increase[1]. According to the Background Report identified as Appendix 1 of the Fontana General Plan, the daily average daily traffic along Mango Avenue (between Foothill Boulevard and Miller Avenue) is 8,900 vehicles[2].

[1] According to the California Department of Transportation, *Technical Noise Supplement to Traffic Noise Analysis Protocol* (September 2013), it takes a doubling of traffic to create a noticeable (i.e., 3 dBA) noise increase

[2] City of Fontana, *Fontana General Plan Update: Background Report*, November 13, 2018

Therefore, because the increase of 820 daily trips generated by the proposed Project is not enough to double the number of trips along Mango Avenue, the Project would not generate sufficient traffic to result in a permanent 3-dBA increase in ambient noise levels. Noise impacts associated with traffic would be less than significant.

Vibration Impacts

Increases in groundborne vibration levels attributable to the project would be primarily associated with short-term construction-related activities. Project construction would have the potential to result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used and the operations involved.

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 in/sec) appears to be conservative. The types of 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. For example, for a building that is constructed with reinforced concrete with no plaster, the FTA guidelines show that a vibration level of up to 0.20 in/sec is considered safe and would not result in any construction vibration damage.

Table 3, Typical Construction Equipment Vibration Levels, lists vibration levels at 25 feet for typical construction equipment. Groundborne vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. As indicated in **Table 3**, based on FTA data, vibration velocities from typical heavy construction equipment operations that would be used during Project construction range from 0.003 to 0.089 in/sec PPV at 25 feet from the source of activity. The nearest sensitive receptors are the residential uses to the north, located adjacent to the Project site. As shown in **Table 3**, at 25 feet, construction equipment vibration velocities would not exceed 0.089 in/sec PPV, which is below the FTA's 0.20 PPV threshold. It is also acknowledged that construction activities would occur throughout the Project site and would not be concentrated at the point closest to the nearest residential structure. Therefore, vibration impacts associated with the proposed Project would be less than significant.

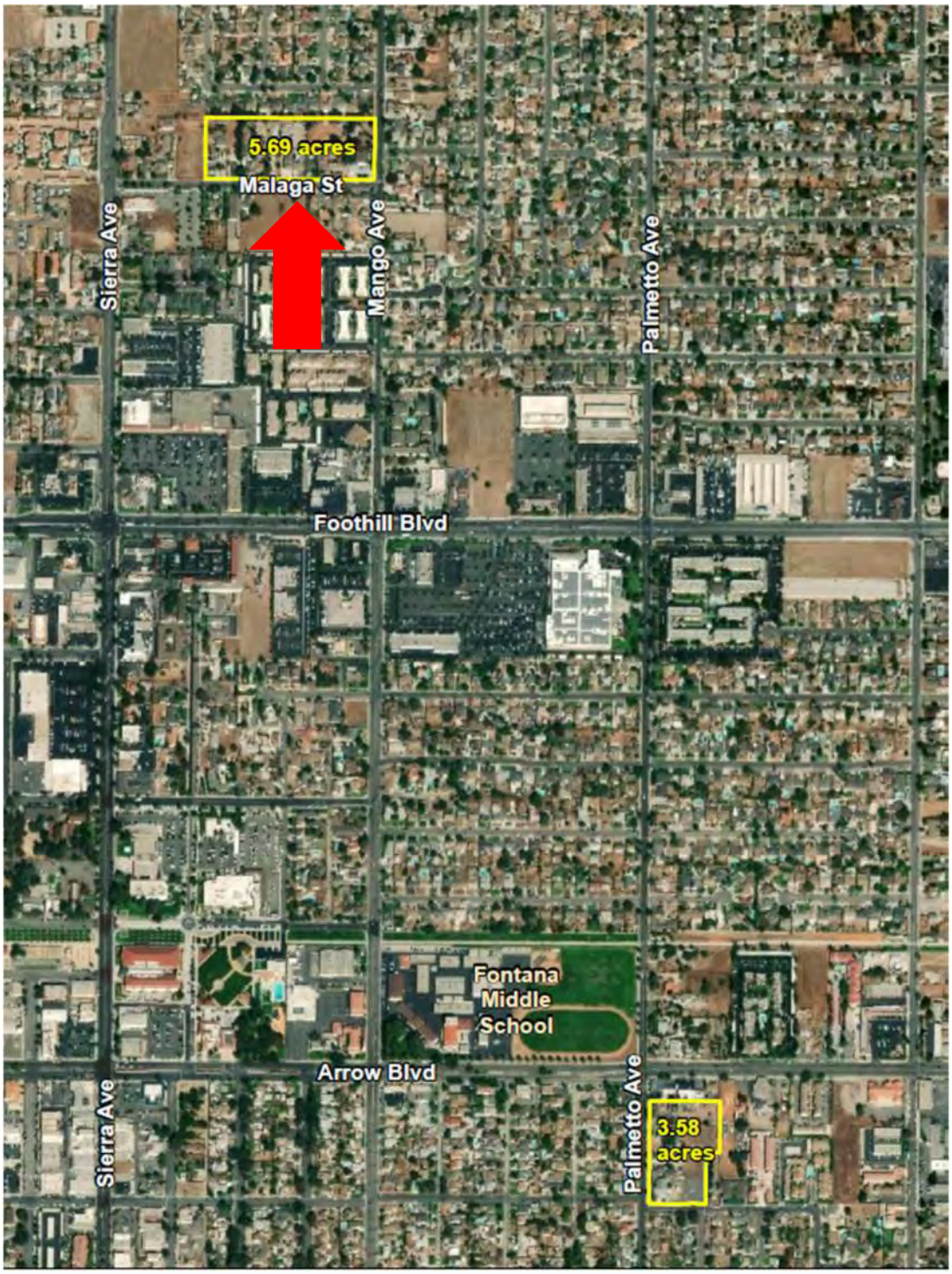
Table 3: Typical Construction Equipment Vibration Levels	
Equipment	**Peak Particle Velocity at 25 Feet (in/sec)**
Large Bulldozer	0.089
Caisson Drilling	0.089
Loaded Trucks	0.076
Rock Breaker	0.059
Jackhammer	0.035
Small Bulldozer/Tractors	0.003
Notes: 1. Calculated using the following formula: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$, where: PPV_{equip} = the peak particle velocity in in/sec of the equipment adjusted for the distance; PPV_{ref} = the reference vibration level in in/sec from Table 7-4 of the Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018; D = the distance from the equipment to the receiver.	
Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.	

Conclusion

Project implementation would result in less than significant short- and long-term noise impacts. No mitigation measures would be required. Therefore, the proposed project would not result in significant effects related to Section 15332(d) of the State CEQA Guidelines.

Kimley»Horn

Exhibit 1 - Project Location



Kimley»Horn

MEMORANDUM

To:	Kari Cano
From:	Alex Pohlman
	Kimley-Horn and Associates, Inc.
Date:	June 2, 2020
Subject:	Palmetto Replacement Site: Proposed Sierra Casa Grande Warehouse Residential Replacement Site – Noise Impacts

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Purpose

The purpose of this memorandum is to identify noise impacts associated with the proposed residential replacement site located on the northeast corner of Palmetto Avenue and Valencia Avenue (Palmetto Replacement Site) in the City of Fontana. Specifically, this analysis addresses the air quality impacts referenced in State CEQA Guidelines.

Project Description

The project is proposing residential replacement sites for the development of residential dwelling units at two project sites within the City of Fontana in efforts to account for the potential residential dwelling units lost with the development of the proposed Sierra Avenue at Casa Grande Drive Warehouse. The two replacement sites are proposed within the City of Fontana and are shown on Exhibit 1. One replacement site is located on the northeast corner of the intersection of Palmetto Avenue at Valencia Avenue. The site is currently 3.58 acres and occupied by 8 existing residential dwelling units and a church building. The other replacement site, located on the northwest corner of the intersection of Mango Avenue at Malaga Street (Mango Replacement site), is mentioned in this memorandum yet analyzed in a separate document.

The replacement of residential land uses due to the development of the Sierra Avenue at Casa Grande Drive Warehouse would result in the development of a maximum of 219 new residential dwelling units, in addition to the existing units on each site. The 219 dwelling units would be split proportionally between the two replacement sites as follows:

- **Palmetto Avenue/Arrow Boulevard Site**: 24 new dwelling units
  - 8 existing dwelling units
  - 32 onsite total dwelling units

  - Proposed Residential Designation: R-MF: Multi-Family Residential (12.1-24 du/ac) or WMXU-1: Walkable Mixed Use Corridor & Downtown (0.2-2 FAR, 3-39 du/ac)

- **Malaga Street/Mango Avenue Site**: 195 new dwelling units
  - 14 existing dwelling units
  - 209 onsite total dwelling units
  - Proposed Residential Designation: R-MF: Multi-Family Residential (12.1-24 du/ac) or WMXU-1: Walkable Mixed Use Corridor & Downtown (0.2-2 FAR, 3-39 du/ac)

Noise Background

Sound is technically described in terms of amplitude (loudness) and frequency (pitch). The standard unit of sound amplitude measurement is the decibel (dB). The decibel scale is a logarithmic scale that describes the physical intensity of the pressure vibrations that make up any sound. The pitch of the sound is related to the frequency of the pressure vibration. Since the human ear is not equally sensitive to a given sound level at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) provides this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear.

Noise, on the other hand, is typically defined as unwanted sound. A typical noise environment consists of a base of steady ambient noise that is the sum of various distant and indistinguishable noise sources. Superimposed on this background noise is the sound from individual local sources. These can vary from an occasional aircraft or train passing by to virtually continuous noise from traffic on a major highway.

Several rating scales have been developed to analyze the adverse effect of community noise on people. Since environmental noise fluctuates over time, these scales consider that the effect of noise on people is largely dependent on the total acoustical energy content of the noise as well as the time of day when the noise occurs. For example, the equivalent continuous sound level (L_{eq}) is the average acoustic energy content of noise for a stated period of time; thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. The Day-Night Sound level (L_{dn}) is a 24-hour average L_{eq} with a 10 dBA "weighting" added to noise during the hours of 10:00 PM to 7:00 AM to account for noise sensitivity in the nighttime. The Community Noise Equivalent Level (CNEL) is a 24-hour average L_{eq} with a 10 dBA weighting added to noise during the hours of 10:00 PM to 7:00 AM and an additional 5 dBA weighting during the hours of 7:00 PM to 10:00 PM to account for noise sensitivity in the evening and nighttime.

Regulatory Setting

City of Fontana General Plan

The City of Fontana General Plan Noise and Safety Element (Noise Element) ensures that development accounts for physical constraints and the natural hazards of the land. The noise component of the General Plan identifies potential noise problems and exposure in the community and provides an integrated approach to regulating noise. The City currently regulates noise levels and exposure, consistent, consistent with this Plan, in the Zoning and Development Code.

Goal 8: The City of Fontana protects sensitive land uses from excessive noise by diligent planning through 2035.

Policy 8.1: New sensitive land uses shall be prohibited in incompatible areas.

Policy 8.2: Noise-tolerant land uses shall be guided into areas irrevocable committed to land uses that are noise-producing, such as transportation corridors.

Policy 8.3: Where sensitive uses are to be placed along transportation routes, mitigation shall be provided to ensure compliance with state-mandated noise levels.

Policy 8.4: Noise spillover or encroachment from commercial, industrial and educational land uses shall be minimized into adjoining residential neighborhoods or noise-sensitive users.

Goal 9: The City of Fontana provides a diverse and efficiently operated ground transportation system that generates the minimum feasible noise on its residents through 2035.

Policy 9.1: All noise sections of the State Motor Vehicle Code shall be enforced.

Policy 9.2: Roads shall be maintained such that paving is in good condition and free of cracks, bumps, and potholes.

Policy 9.3: Noise mitigation shall be included in the design of new roadway projects in the city.

Goal 10: Fontana's residents are protected from the negative effects of "spillover" noise.

Policy 10.1: Residential land uses and areas identified noise-sensitive shall be protected fro excessive noise from non-transportation sources including industrial, commercial, and residential activities and equipment.

City of Fontana Municipal Code

Chapter 18, Article II. Section 18-63. – Prohibited Noises

(b) The following acts, which create loud, excessive, impulsive or intrusive sound or noise that annoys or disturbs persons of ordinary sensibilities from a distance of 50 feet or more from the edge of the property, structure or unit in which the source is located, are declared to be in violation of this article.

Section 18-63(b)(6) Loading, unloading or opening boxes. The creation of load, excessive or intrusive and excessive noise in connection with loading or unloading of any vehicle or the opening and destruction of bales, boxes, crates and containers.

Section 18-63(b)(7) Construction or repairing of buildings or structures. The erection (including excavating), demolition, alteration or repair of any building or structure other than between the hours of 7:00 a.m. and 6:00 p.m. on weekdays and between the hours of 8:00 a.m. and 5:00 p.m. on Saturdays, except in case of urgent necessity in the interest of public health and safety, and then only with a permit from the building inspector, which permit may be granted for a period not to exceed three days or less while the emergency continues and which permit may be renewed for periods of three days or less while the emergency continues. If the building inspector should determine that the public health and safety will not be impaired by the erection, demolition, alteration or repair of any building or structure or the excavation of streets and highways within the hours of 6:00 p.m. and 7:00 a.m., and if he shall further determine that loss or inconvenience would result to any party in interest, he may grant permission for such work to be done on weekdays within the hours of 6:00 p.m. and 7:00 a.m., upon application being made at the time the permit for the work is awarded or during the progress of the work.

Section 18-63(b)(8) Noise near schools, courts, place of worship or hospitals. The creation of any loud, excessive, impulsive or intrusive noise on any street adjacent to any school, institution of learning, places of worship or court while the premises are in use, or adjacent to any hospital which unreasonably interferes with the workings of such institution or which disturbs or unduly annoys patients in the hospital; provided conspicuous signs are displayed in such streets indicating that the street is a school, hospital or court street.

Chapter 30, Article V. Division 6, Sec. 30-182. - Noise

(a) No use shall create or cause to be created any sound that exceeds the ambient noise standards outlined in Table 30-182.A (**Table 1, Noise Standards**)

(b) No use shall create or cause creation of noise from a portable electronic device such as a car stereo, portable radio and/or cassette/compact disc player or similar device which exceeds the ambient noise standards outlined in Table 30-182.A (**Table 1**)

Table 1: Noise Standards		
Location of Measurement	**Maximum Allowable**	
All Zoning Districts	**7:00 a.m. to 10:00 p.m.**	**10:00 p.m. to 7:00 a.m.**
Interior	45 db	45 db
Exterior	65 db	65 db
Source: Fontana Municipal Code, Chapter 30, Article V. Division 6, Sec. 30-182. – Noise, Table 30-469		

Chapter 30, Article V. Division 6, Sec. 30-183. - Vibration

No use shall create or cause to be created any activity that causes a vibration that can be felt beyond the property line with or without the aid of an instrument.

Chapter 30, Article VII. Division 6, Sec. 30-259. - Vibration
(a) Noise levels. No person shall create or cause to be created any sound which exceeds the noise levels in this section as measured at the property line of any residentially zoned property: (1) The noise level between 7:00 a.m. and 10:00 p.m. shall not exceed 70 db(A). (2) The noise level between 10:00 p.m. and 7:00 a.m. shall not exceed 65 db(A).

(b) Noise measurements. Noise shall be measured with a sound level meter that meets the standards of the American National Standards Institute (ANSI) Section SI4-1979, Type 1 or Type 2. Noise levels shall be measured using the "A" weighted sound pressure level scale in decibels (reference pressure = 20 micronewtons per meter squared).

(c) Vibration. No person shall create or cause to be created any activity which causes a vibration which can be felt beyond the property line of any residentially zoned property with or without the aid of an instrument.

Significance Criteria

Criteria for determining the significance of noise impacts were developed based on information contained in the Fontana General Plan and Fontana Municipal Code. A significant impact related to noise would occur if:

- Project construction activities occur outside the hours that construction noise is considered exempt as specified in the City of Fontana Municipal Code, Section 18-63(7), 7:00 a.m. to 6:00 p.m. on weekdays and between the hours of 8:00 a.m. to 5:00 p.m. on Saturdays
    - and Project construction noise levels would exceed the exterior 65 dBA noise level standard
    - and the Project creates a community noise level increase of greater than 3 dBA L_{eq}.

- Off-site traffic noise levels, without or with the Project at existing or future noise-sensitive land uses exceed the City of Fontana General Plan noise standard of 65 dBA CNEL and the Project creates a community noise level increase of greater than 3 dBA CNEL.

- Project construction vibration levels exceed the Caltrans human annoyance vibration threshold of 0.2 in/sec PPV at adjacent uses (Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual). The FTA threshold is used to quantify

potential impacts related to perception of short-term construction-related vibration levels.

Noise Impacts

Construction Noise

Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g., land clearing, grading, excavation, paving). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. During construction, exterior noise levels could affect the residential neighborhoods near the construction site.

Construction activities would include demolition, site preparation, grading, building construction, paving, and architectural coating. Such activities would require concrete/industrial saws, excavators, and dozers during demolition, tractors and dozers during site preparation; graders, dozers, excavators, and tractors during grading; cranes, forklifts, generators, tractors, and welders during building construction; pavers, rollers, mixers, and paving equipment during paving; and air compressors during architectural coating. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full power operation followed by 3 to 4 minutes at lower power settings. Other primary sources of acoustical disturbance would be random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. Typical noise levels associated with individual construction equipment are listed in **Table 2: Typical Construction Noise Levels**. It should be noted that the noise levels shown in **Table 2** are maximum noise levels (i.e., the equipment engine at maximum speed). However, equipment used on construction sites typically operates under less than full power conditions, or part power.

Noise-sensitive uses closest to the project site include residences to west on the opposite side of Palmetto Avenue. As shown in **Table 2**, construction noise levels would range from approximately 76 dBA to 85 dBA at a distance of 50 feet. As such, noise levels at the residences to the west of the project site could exceed ambient noise levels and may cause periodic disturbance during the construction period. However, Section 18-63(7) exempts construction noise between the hours of 7:00 a.m. to 6:00 p.m. on weekdays and between the hours of 8:00 a.m. to 5:00 p.m. on Saturdays. Construction activities for the proposed Project would only occur during the time period specified in the Municipal Code. Additionally, construction noise from the project would be acoustically dispersed throughout the project site (depending on what construction phase or activity is occurring) and not concentrated in one area near surrounding uses for an extended period of time. As such, construction-related noise impacts would be less than significant in this regard.

Table 2: Typical Construction Noise Levels	
Equipment	**Typical Noise Level (dBA L_{max}) at 50 feet from Source**
Air Compressor	80
Backhoe	80
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Mobile	83
Dozer	85
Generator	82
Grader	85
Impact Wrench	85
Jack Hammer	88
Loader	80
Paver	85
Pneumatic Tool	85
Pump	77
Roller	85
Saw	76
Scraper	85
Shovel	82
Truck	84
dBA = A-weighted decibel; L_{max} = maximum A-weighted sound level	
Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.	

Operational Noise

Implementation of the proposed project would result in noise sources typical of residential developments in the area. The major noise sources associated with the project would include off-site traffic noise. The nearest sensitive receptors to the project site are the residences to west on the opposite side of Palmetto Avenue.

Project implementation would generate increased traffic volumes along Palmetto Avenue and Project area roadways. According to the trip generation analysis, the Project would result in an additional 520 average daily vehicle trips. The Project's increase in traffic would result in noise increases on Project area roadways. In general, a 3-dBA increase in traffic noise is barely perceptible to people, while a 5-dBA increase is readily noticeable. Traffic volumes on Project area roadways would have to approximately double for the resulting traffic noise levels to generate a 3-dBA increase[1]. According to the Background Report identified as Appendix 1 of the Fontana General Plan, the daily average daily

[1] According to the California Department of Transportation, *Technical Noise Supplement to Traffic Noise Analysis Protocol* (September 2013), it takes a doubling of traffic to create a noticeable (i.e., 3 dBA) noise increase

traffic along Palmetto Avenue (between Arrow Boulevard and Orange Way) is 8,500 vehicles[2]. Therefore, because the increase of 520 daily trips generated by the proposed Project is not enough to double the number of trips along Palmetto Avenue, the Project would not generate sufficient traffic to result in a permanent 3-dBA increase in ambient noise levels. Noise impacts associated with traffic would be less than significant.

Vibration Impacts

Increases in groundborne vibration levels attributable to the project would be primarily associated with short-term construction-related activities. Project construction would have the potential to result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used and the operations involved.

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 in/sec) appears to be conservative. The types of 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. For example, for a building that is constructed with reinforced concrete with no plaster, the FTA guidelines show that a vibration level of up to 0.20 in/sec is considered safe and would not result in any construction vibration damage.

Table 3, Typical Construction Equipment Vibration Levels, lists vibration levels at 25 feet for typical construction equipment. Groundborne vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. As indicated in **Table 3**, based on FTA data, vibration velocities from typical heavy construction equipment operations that would be used during Project construction range from 0.003 to 0.089 in/sec PPV at 25 feet from the source of activity. The nearest sensitive receptors are the residential uses to the west, located adjacent to the Project site. As shown in **Table 3**, at 25 feet, construction equipment vibration velocities would not exceed 0.089 in/sec PPV, which is below the FTA's 0.20 PPV threshold. It is also acknowledged that construction activities would occur throughout the Project site and would not be concentrated at the point closest to the nearest residential structure. Therefore, vibration impacts associated with the proposed Project would be less than significant.

[2] City of Fontana, *Fontana General Plan Update: Background Report*, November 13, 2018

Table 3: Typical Construction Equipment Vibration Levels	
Equipment	**Peak Particle Velocity at 25 Feet (in/sec)**
Large Bulldozer	0.089
Caisson Drilling	0.089
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Notes: 1. Calculated using the following formula: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$, where: PPV_{equip} = the peak particle velocity in in/sec of the equipment adjusted for the distance; PPV_{ref} = the reference vibration level in in/sec from Table 7-4 of the Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018; D = the distance from the equipment to the receiver.	
Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.	

Conclusion

Project implementation would result in less than significant short- and long-term noise impacts. No mitigation measures would be required. Therefore, the proposed project would not result in significant effects related to Section 15332(d) of the State CEQA Guidelines.

Kimley»Horn

Exhibit 1 - Project Location