

Noise Impact Assessment for the Walnut Property Project

City of Fontana, California

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LIST OF ACRONYMS AND ABBREVIATIONS

ALUCP	Airport Land Use Compatibility Plan
CalEEMod	California Emissions Estimator Model
Caltrans	California Department of Transportation
City	City of Fontana
CNEL	Community Noise Equivalent Level
County	San Bernardino County
dB	Decibel
dBA	Decibel is A-weighted
FHWA	Federal Highway Administration
FICON	Federal Interagency Commission on Noise
FTA	Federal Transit Administration
Hz	Hertz
I-210	Interstate 210
L_{dn}	Day-night average sound level
L_{eq}	Measure of ambient noise
L_{max}	The maximum A-weighted noise level during the measurement period.
L_{min}	The minimum A-weighted noise level during the measurement period.
NIOSH	National Institute for Occupational Safety and Health
OPR	Office of Planning and Research
OSHA	Federal Occupational Safety and Health Administration
PPV	Peak particle velocity
Project	Walnut Property Project
RCNM	Roadway Construction Noise Model
R-MF	Multi Family Residential
R-MFMH	Multi Family Medium/High Residential
RMS	Root mean square
STC	Sound Transmission Class
VdB	Vibration Velocity Level

1.0 INTRODUCTION

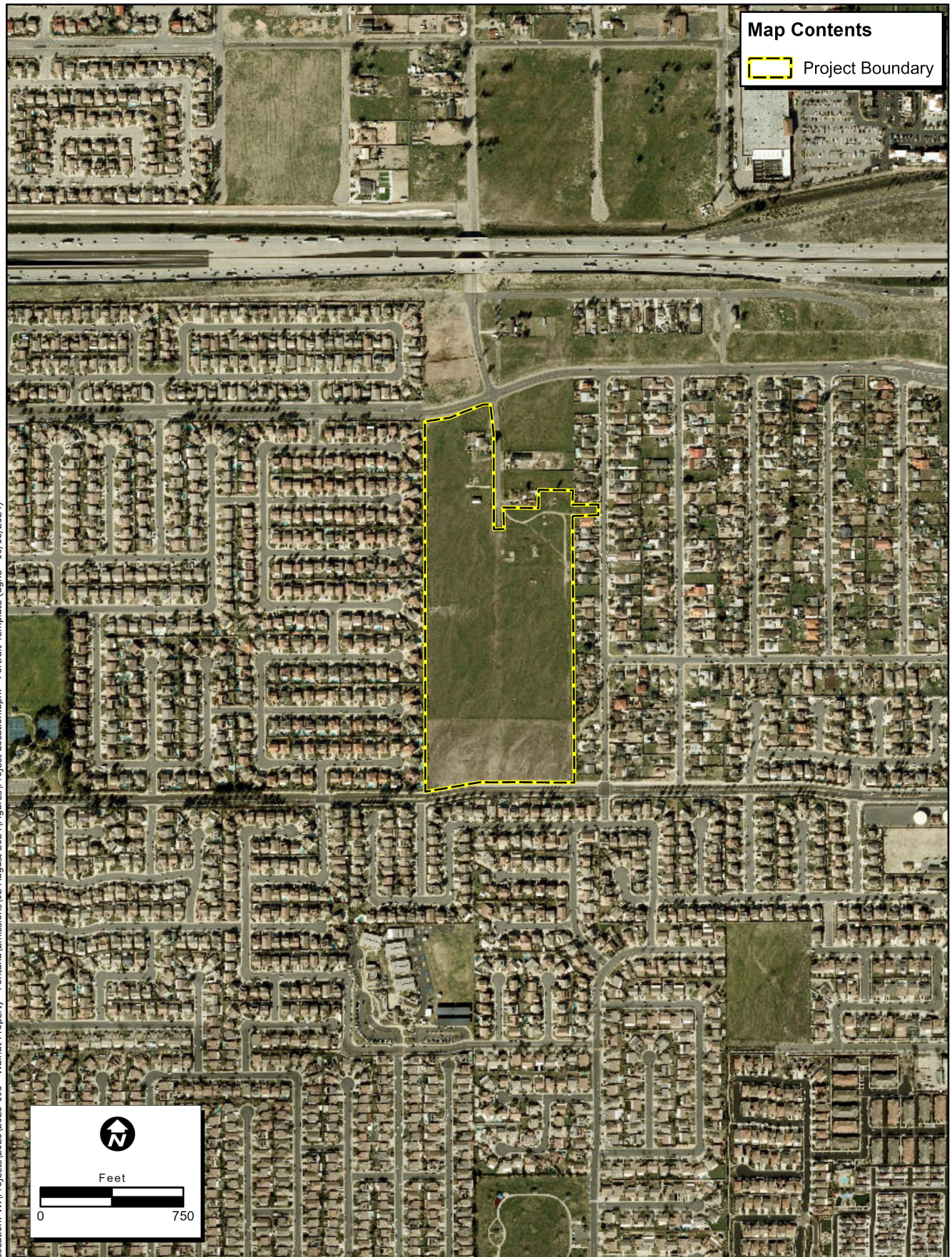
This report documents the results of a Noise Impact Assessment completed for the Walnut Property Project (Project), which proposes the construction of a 393-unit residential development in Fontana, California. The purpose of this report is to estimate Project-generated noise and to determine the level of impact the Project would have on the environment.

1.1 Project Location and Description

The Project Site is located in the City of Fontana in southwest San Bernardino County (County). The Project Site is currently undeveloped and surrounded by single-family residences and undeveloped plots of land to the north, and residences to the east, south, and west. The irregularly shaped Project Site is bordered by three single-family residential properties and S. Highland Avenue to the north, with vacant land, a single-family residence, and Interstate 210 (I-210) beyond; residences fronting Almeria Avenue to the east, with residences beyond; Walnut Street to the south, with residences beyond; and a residential community to the west (see Figure 1-1).

The Proposed Project would involve the construction of a residential community consisting of 393 dwelling units on a 30-acre plot of land. The property is currently designated Multi Family Medium/High Residential (R-MFMH) in the City's General Plan. The Project proposes to amend this General Plan land use designation to Multi Family Residential (R-MF). The Proposed Project would feature a combination of two-story cluster homes, two-story motor court, and two-story townhomes. The unit mix would consist of 103 detached cluster units in 6 and 8 pack configurations with sizing from 1,700 to 1,900 square feet. Additionally, 113 detached motor court units clustered in 6 and 8 pack configurations with sizing from 1,600 to 1,900 square feet are proposed. Lastly, 177 attached townhome units arranged in 5, 6, and 7 pack configurations are proposed, which would range from 1,100 to 1,700 square feet. Each house would include a garage fitting two cars. The Project would also accommodate street parking with 126 open-air parking spaces.

The Project is proposed to be a gated community with ingress and egress off Knox Avenue and Walnut Street. The entries would open up to the recreational and common areas located throughout the Project. The proposed amenities would include a recreational center with a pool, spa, BBQ's and lounging areas. The Project proposes a park on the northeastern edge of the Project Site, large open grass areas, including one such area adjacent to the northern boundary of the site, shaded sitting areas, play areas, and a paseo with playground equipment.



Location: W:\Projects\2023-193 - Walnut Property - Fontana\Emissions\02-August-2024\Figures\Project Location.aprx - Portrait Template (agne - 10/18/2024)

Figure 1-1. Project Location

2.0 ENVIRONMENTAL NOISE AND GROUNDBORNE VIBRATION ANALYSIS

2.1 Fundamentals of Noise and Environmental Sound

2.1.1 Addition of Decibels

The decibel (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 decibel is A-weighted (dBA), 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 three dB higher than one source under the same conditions (Federal Transit Administration [FTA] 2018). For example, a 65-dB source of sound, such as a truck, when joined by another 65 dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by three dB). Under the decibel scale, three sources of equal loudness together would produce an increase of five dB.

Typical noise levels associated with common noise sources are depicted in Figure 2-1. Common Noise Levels.

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Jet Fly-over at 300m (1000 ft)	110	Rock Band
Gas Lawn Mower at 1 m (3 ft)	100	
Diesel Truck at 15 m (50 ft), at 80 km (50 mph)	90	Food Blender at 1 m (3 ft)
Noisy Urban Area, Daytime	80	Garbage Disposal at 1 m (3 ft)
Gas Lawn Mower, 30 m (100 ft)	70	Vacuum Cleaner at 3 m (10 ft)
Commercial Area		Normal Speech at 1 m (3 ft)
Heavy Traffic at 90 m (300 ft)	60	Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	30	Library
Quiet Rural Nighttime	20	Bedroom at Night, Concert Hall (Background)
	10	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

Source: California Department of Transportation (Caltrans) 2020a



Figure 2-1. Common Noise Levels

2.1.2 Sound Propagation and Attenuation

Noise can be generated by a number of sources, including mobile sources such as automobiles, trucks and airplanes, and stationary sources such as construction sites, machinery, and industrial operations. Sound spreads (propagates) uniformly outward in a spherical pattern, and the sound level decreases (attenuates) at a rate of approximately 6 dB (dBA) for each doubling of distance from a stationary or point source (FHWA 2017). Sound from a line source, such as a highway, propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of approximately 3 dBA for each doubling of distance from a line source, such as a roadway, depending on ground surface characteristics (Federal Highway Administration [FHWA] 2017). 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 dBA per doubling of distance is normally assumed. For line sources, an overall attenuation rate of three dB per doubling of distance is assumed (FHWA 2011).

Noise levels may also be reduced by intervening structures; generally, a single row of detached buildings between the receptor and the noise source reduces the noise level by about five dBA (FHWA 2006), while a solid wall or berm generally reduces noise levels by 10 to 20 dBA (FHWA 2011). However, noise barriers or enclosures specifically designed to reduce site-specific construction noise can provide a sound reduction of 35 dBA or greater (Western Electro-Acoustic Laboratory, Inc. 2021). To achieve the most potent noise-reducing effect, a noise enclosure/barrier must physically fit in the available space, must completely break the "line of sight" between the noise source and the receptors, must be free of degrading holes or gaps, and must not be flanked by nearby reflective surfaces. Noise barriers must be sizable enough to cover the entire noise source and extend lengthwise and vertically as far as feasibly possible to be most effective. The limiting factor for a noise barrier is not the component of noise transmitted through the material, but rather the amount of noise flanking around and over the barrier. In general, barriers contribute to decreasing noise levels only when the structure breaks the "line of sight" between the source and the receiver.

The manner in which older homes in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows (California Department of Transportation [Caltrans] 2002). The exterior-to-interior reduction of newer residential units is generally 30 dBA or more (Harris Miller, Miller & Hanson Inc. 2006). Generally, in exterior noise environments ranging from 60 dBA Community Noise Equivalent Level (CNEL) to 65 dBA CNEL, interior noise levels can typically be maintained below 45 dBA, a typical residential interior noise standard, with the incorporation of an adequate forced air mechanical ventilation system in each residential building, and standard thermal-pane residential windows/doors with a minimum rating of Sound Transmission Class (STC) 28. (STC is an integer rating of how well a building partition attenuates airborne sound. In the U.S., it is widely used to rate interior partitions, ceilings, floors, doors, windows, and exterior wall configurations). In exterior noise environments of 65 dBA CNEL or greater, a combination of forced-air mechanical ventilation and sound-rated construction methods is often required to meet the interior noise level limit. Attaining the necessary noise reduction from exterior to interior spaces is readily achievable in noise environments less than 75 dBA CNEL with proper wall construction techniques following California Building Code methods, the selections of proper windows and doors, and the incorporation of forced-air mechanical ventilation systems.

2.1.3 Noise Descriptors

The decibel 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 noise descriptors most often encountered when dealing with traffic, community, and environmental noise include the average hourly noise level (in L_{eq}) and the average daily noise levels/community noise equivalent level (in L_{dn} /CNEL). The L_{eq} is a measure of ambient noise, while the L_{dn} and CNEL are measures of community noise. Each is applicable to this analysis and defined as follows:

- **Equivalent Noise 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. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.
- **Day-Night Average (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 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)** is a 24-hour average L_{eq} with a 5-dBA weighting during the hours of 7:00 pm to 10:00 pm and a 10-dBA weighting added to noise during the hours of 10:00 pm to 7:00 am to account for noise sensitivity in the evening and nighttime, respectively.

Table 2-1 provides a list of other common acoustical descriptors.

Table 2-1. Common Acoustical Descriptors	
Descriptor	Definition
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 micropascals (or 20 micronewtons per square meter), where 1 pascal 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 decibels 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 micropascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hertz (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 sounds are below 20 Hz and ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels 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.
L_{max} , L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01} , L_{10} , L_{50} , L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	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 in the nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.4 dBA L_{dn} .
Community Noise Equivalent Level, CNEL	A 24-hour average L_{eq} with a 5 dBA "weighting" during the hours of 7:00 p.m. to 10:00 p.m. and a 10 dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, 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.
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.

The A-weighted decibel 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 ± 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. Close to the noise source, the models are accurate to within about ± 1 to 2 dBA.

2.1.4 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 or L_{dn} 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 A-weighted noise levels (dBA), the following relationships should be noted in understanding this analysis:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived by humans.
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference.
- A change in level of at least 5 dBA is required before any noticeable change in community response would be expected. An increase of 5 dBA 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.

2.1.5 Effects of Noise on People

2.1.5.1 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 (OSHA) 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 eight hours. If the noise is above 90 dBA, the allowable exposure time is correspondingly shorter.

2.1.5.2 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.

2.2 Fundamentals of Environmental Groundborne Vibration

2.2.1 Vibration Sources and Characteristics

Sources of earthborne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or manmade 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.

PPV is generally accepted as the most appropriate descriptor for evaluating the potential for building damage. For human response, however, an average vibration amplitude is more appropriate because it takes time for the human body to respond to the excitation (the human body responds to an average vibration amplitude, not a peak amplitude). Because the average particle velocity over time is zero, the RMS amplitude is typically used to assess human response. The RMS value is the average of the amplitude squared over time, typically a 1- sec. period (FTA 2018).

Table 2-2 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.

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. For instance, heavy-duty trucks generally generate groundborne vibration velocity levels of 0.006 PPV at 50 feet under typical circumstances, which as identified in Table 2-2 is considered very unlikely to cause damage to buildings of any type. 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.

Table 2-2. Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibration Levels

Peak Particle Velocity (inches/second)	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	Threshold at which there is a risk of architectural damage to extremely fragile historic buildings, ruins, ancient monuments
0.1	92	Level at which continuous vibrations may begin to annoy people, particularly those involved in vibration sensitive activities	Threshold at which there is a risk of architectural damage to fragile buildings. Virtually no risk of architectural damage to normal buildings
0.25	94	Vibrations may begin to annoy people in buildings	Threshold at which there is a risk of architectural damage to historic and some old buildings
0.3	96	Vibrations may begin to feel severe to people in buildings	Threshold at which there is a risk of architectural damage to older residential structures
0.5	103	Vibrations considered unpleasant by people subjected to continuous vibrations	Threshold at which there is a risk of architectural damage to new residential structures and Modern industrial/commercial buildings

Source: Caltrans 2020b

3.0 EXISTING ENVIRONMENTAL NOISE SETTING

3.1 Noise Sensitive Land Uses

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. The City of Fontana identifies residential uses, hospitals, rest homes, long term care facilities, and mental care facilities as sensitive receptors. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Schools, libraries, places of worship, and passive recreation uses where low interior noise levels are essential are also considered noise-sensitive land uses by the City.

The Project Site is currently undeveloped and surrounded by residential land uses and undeveloped land. The nearest noise-sensitive receptors to the Project Site are private residences located on Knox Avenue, directly adjacent to the northern boundary of the Project Site, residences located across Walnut Street to the south, and residences bordering the Project Site to the east and west.

3.1.1 Existing Ambient Noise Environment

The Project Site is currently undeveloped with the exception of native vegetation and a modular building to be removed. The Project Site is surrounded by three single-family residential properties and S. Highland Avenue to the north, with vacant land, a single-family residence, and Interstate 210 (I-210) beyond; residences fronting Almeria Avenue to the east, with residences beyond; Walnut Street to the south, with residences beyond; and a residential community to the west. The most common and significant source of noise in the Project Area is traffic noise generated from vehicles traveling on I-210 approximately 960 feet north of the Project's northern boundary and S. Highland Avenue located just north of the site. Traffic noise generated on Walnut Street influences the noise environment experienced at the southern portion of the site. Noise generated by these traffic facilities is described in more detail in Section 3.1.3, *Existing Roadway Noise Levels*, below. Furthermore, Ontario International Airport (ONT) is the nearest airport to the Project Site located approximately 8.3 miles to the southwest.

3.1.2 Existing Ambient Noise Measurements

In order to quantify existing ambient noise levels in the Project Area, ECORP Consulting, Inc. conducted three short-term noise measurements on the morning of August 5th, 2024. The short-term measurements were taken between 10:30 a.m. and 11:15 a.m. These short-term noise measurements are representative of typical existing noise exposure within and immediately adjacent to the Project Site during the daytime (see Attachment A for a visual representation of the measurement locations). The average noise levels at each location are listed in Table 3-1.

Table 3-1. Existing Ambient Noise Measurements

Short-Term Noise Measurements					
Location Number	Location	L_{eq} dBA	L_{min} dBA	L_{max} dBA	Time
ST 1	South of Highland Avenue, Northwest Corner of Project Site	58.0	81.2	45.5	10:15 a.m. – 10:30 a.m.
ST 2	Southeast Corner of Property; North of Walnut Street and West of Almeria Avenue	53.9	72.6	42.3	10:33 a.m. - 10:51 a.m.
ST 3	Eastern End of Northstar Avenue	46.3	85.5	37.7	10:55 a.m. – 11:11 a.m.

Source: Measurements were taken by ECORP with a Larson Davis Spartan 821 sound level meter, which satisfies the American National Standards Institute for general environmental noise measurement instrumentation. Prior to the measurements, the Spartan 821 sound level meter was calibrated according to manufacturer specifications with a Larson Davis CAL200 Class I Calibrator. See Attachment A for noise measurement outputs.

Notes: 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. L_{min} is the minimum noise level during the measurement period and L_{max} is the maximum noise level during the measurement period.

As shown in Table 3-1, the ambient recorded noise levels range from 46.3 dBA to 58.0 dBA L_{eq} over the course of the three short-term noise measurements taken in the Project vicinity in August of 2024. The most common noise in the Project vicinity is produced by automotive vehicles (e.g., cars, trucks, buses, motorcycles) on I-210 and S. Highland Avenue.

3.1.3 Existing Roadway Noise Levels

Existing roadway noise levels were calculated for the roadway segments in the Project vicinity. This task was accomplished using the FHWA Highway Traffic Noise Prediction Model (FHWA-RD-77-108). The 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 (energy rates) used in the FHWA model have been modified to reflect average vehicle noise rates identified for California by Caltrans. The Caltrans data shows 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 Project Site is primarily affected by traffic noise generated on I-210 and S. Highland Avenue to the north, and Walnut Street to the south. For the purposes of this analysis, noise generation by I-210 and S. Highland Avenue was combined to accurately calculate the current traffic noise experienced on the northern end of the Project Site. According to the 2021 California Traffic Census (Caltrans 2022), I-210 between Citrus Avenue and Cherry Avenue currently experiences 164,000 average daily trips (ADT). Per the City of Fontana General Plan Noise Element (2023), the roadway segment on S. Highland Avenue that traverses just north of the Project Site accommodates an average of 5,150 ADT, and the roadway segment on Walnut Street between Beech Avenue and Citrus Avenue, which traverses adjacent to the southern boundary Project Site, accommodates an average of 2,400 vehicle trips daily. I-210 currently generates an ambient noise level of 64.8 dBA CNEL while S. Highland Avenue currently generates a noise level of 67.1 dBA CNEL on the northern portion of the Project Site (see Attachment B). These two sources of noise are the predominate sources of

noise affecting this portion of the site and combined, produce a level of approximately 69.1 dBA at the northern portion of the site. Traffic on Walnut Street currently generates an ambient noise level of 59.7 dBA CNEL on the southern portion of the Project Site (see Attachment B) and is the predominate source of noise affecting the southern portion of the site. Therefore, the southern portion of the Project Site generally experiences a noise level around 59.7 dBA CNEL. Vehicular noise varies with the volume, speed, and type of traffic. Slower traffic produces less noise than fast-moving traffic. Trucks typically generate more noise than cars. Infrequent or intermittent noise also is associated with vehicles including sirens, vehicle alarms, slamming of doors, garbage collection and construction vehicle activity, and honking of horns. These noises add to urban noise and are regulated by a variety of agencies.

As shown, the existing traffic-generated noise level on Project-vicinity roadways currently ranges from 59.7 dBA CNEL (at the southern portion of the site) to 69.1 dBA CNEL (at the northern portion of the site). As previously described, CNEL is 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.

4.0 REGULATORY FRAMEWORK

4.1 Federal

4.1.1 Occupational Safety and Health Act of 1970

OSHA regulates onsite noise levels and protects workers from occupational noise exposure. To protect hearing, worker noise exposure is limited to 90 decibels with A-weighting (dBA) over an eight-hour work shift (29 Code of Regulations 1910.95). Employers are required to develop a hearing conservation program when employees are exposed to noise levels exceeding 85 dBA. These programs include provision of hearing protection devices and testing employees for hearing loss on a periodic basis.

4.1.2 Federal Transit Administration

The FTA provides a guidance manual that contains procedures for predicting and assessing noise and vibration impacts of proposed transit projects. This manual acknowledges that noise and vibration are among the primary concerns of the surrounding communities. Project construction noise criteria should account for the existing noise environment, the absolute noise levels during construction activities, the duration of the construction, and the surrounding land use. Due to the lack of standardized construction noise thresholds, the FTA provides guidelines that are typically considered applicable criteria for construction noise assessments in a CEQA analysis. The FTA considers a daytime exterior construction noise level of 80 dBA L_{eq} as a reasonable threshold for noise sensitive residential land use with a nighttime exterior construction noise level of 70 dBA L_{eq} (FTA 2018).

4.1.3 Federal Interagency Commission on Noise

The 2000 Federal Interagency Commission on Noise (FICON) findings provide guidance as to the significance of changes in ambient noise levels due to transportation noise sources. FICON recommendations are based on studies that relate aircraft and traffic noise levels to the percentage of persons highly annoyed by the noise. FICON's measure of substantial increase for transportation noise exposure is as follows:

- If the existing ambient noise levels at existing noise-sensitive land uses (e.g. residential, etc.) are less than 60 dBA CNEL and the Project creates a readily perceptible 5 dBA CNEL or greater Project-related noise level increase and the resulting noise level would exceed acceptable exterior noise standards; or
- If the existing noise levels range from 60 to 65 dBA CNEL and the Project creates a barely perceptible 3 dBA CNEL or greater Project-related noise level increase and the resulting noise level would exceed acceptable exterior noise standards; or
- If the existing noise levels already exceed 65 dBA CNEL, and the Project creates a community noise level increase of greater than 1.5 dBA CNEL.

4.2 State

4.2.1 State of California General Plan Guidelines

The State of California regulates vehicular and freeway noise affecting classrooms, sets standards for sound transmission and occupational noise control, and identifies noise insulation standards and airport noise/land-use compatibility criteria. The State of California General Plan Guidelines (State of California 2003), published by the Governor's Office of Planning and Research (OPR), also provides guidance for the acceptability of projects within specific CNEL/L_{dn} contours. The guidelines also present adjustment factors that may be used in order to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

4.2.2 State Office of Planning and Research Noise Element Guidelines

The State OPR *Noise Element Guidelines* include recommended exterior and interior noise level standards for local jurisdictions to identify and prevent the creation of incompatible land uses due to noise. The Noise Element Guidelines contain a Land Use Compatibility table that describes the compatibility of various land uses with a range of environmental noise levels in terms of the CNEL.

4.2.3 California Department of Transportation

In 2020, Caltrans published the Transportation and Construction Vibration Manual (Caltrans 2020b). The manual provides general guidance on vibration issues associated with the construction and operation of projects concerning human perception and structural damage. Table 2-2 above presents recommendations for levels of vibration that could result in damage to structures exposed to continuous vibration.

4.3 Local

4.3.1 City of Fontana General Plan

The City of Fontana Noise Element of the General Plan establishes goals and policies addressing major noise sources within the community. The following provides the applicable goals, policies and criteria for evaluating the feasibility and potential noise impact associated with the Proposed Project:

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

- **Policy 1:** New sensitive land uses shall be prohibited in incompatible areas.
- **Policy 3:** Where sensitive uses are to be placed along transportation routes, mitigation shall be provided to ensure compliance with state- mandated noise levels.
- **Policy 5:** Noise spillover or encroachment from commercial, industrial and educational land uses shall be minimized into adjoining residential neighborhoods or noise-sensitive uses.

- **Action A:** The following uses shall be considered noise-sensitive and discouraged in areas in excess of 65 dBA CNEL (Community Noise Equivalent Level): Residential Uses; Hospitals; Rest Homes; Long Term Care Facilities; and Mental Care Facilities.
- **Action B:** The following uses shall be considered noise-sensitive and discouraged in areas in excess of 65 L_{eq} (Equivalent Continuous Sound Level): Schools; Libraries; Places of Worship; and Passive Recreation 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.

- **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.

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

- **Policy 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 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.

4.3.2 City of Fontana Municipal Code

The Fontana Municipal Code provides guidance on acceptable noise generation as well as noise standards to be used in the analysis of proposed projects. Chapter 18 Section 18-63, *Nuisances*, prohibits construction outside of the hours of 7:00 a.m. and 6:00 p.m. on weekdays and 8:00 a.m. and 5:00 p.m. on Saturdays. Construction in the City of Fontana must occur during those hours.

Chapter 30 Section 30-469, *Noise Standards*, specifies additional noise regulations pertaining to the allowable exterior noise levels based upon the time of day. The City's Noise Ordinance was established in order to control unnecessary, excessive and annoying noise while protecting public health, safety and welfare. These noise standards are presented in Table 4-1 below.

Table 4-1. Noise Standards		
All Zoning Districts	Time Period	Noise Level (Hourly L_{eq}/ dB)
Interior	10:00 p.m.- 7:00 a.m.	45
	7:00 a.m. to 10: 00 p.m.	45
Exterior	10:00 p.m.- 7:00 a.m.	65
	7:00 a.m. to 10: 00 p.m.	65

Source: City of Fontana 2024

5.0 Impact Assessment

5.1 Thresholds of Significance

The impact analysis provided below is based on the following California Environmental Quality Act Guidelines Appendix G thresholds of significance. The Project would result in a significant noise-related impact if it would result in the:

- 1) Generation of 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.
- 2) Generation of excessive groundborne vibration or groundborne noise levels.
- 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.

For the purposes of this analysis, Project construction noise is compared to the allowable hours of construction mandated by the City as well as the FTA standard of 80 dBA. The City does not regulate vibrations associated with construction or operations. However, a discussion of construction vibration is included for full disclosure purposes. For comparison purposes, the Caltrans (2020b) recommended standard of 0.3 inch per second PPV with respect to the prevention of structural damage for older residential buildings is used as a threshold. This is also the level at which vibrations may begin to annoy people in buildings. The Project would not be a source of groundborne vibration during operations. Transportation noise sources as a result of the Project and onsite noise sources produced by the Project are discussed qualitatively.

5.2 Methodology

This analysis of the existing and future noise environments is based on empirical observations and noise prediction modeling. Predicted construction noise levels were calculated utilizing the FHWA's Roadway Construction Noise Model (2006). The Caltrans traffic census (2022) was used for traffic levels on SR-210, and the General Plan was referenced for traffic levels on South Highland Avenue and Walnut Street. Groundborne vibration levels associated with construction-related activities for the Project have been evaluated utilizing typical groundborne vibration levels associated with construction equipment. Potential groundborne vibration impacts related to structural damage and human annoyance were evaluated, taking into account the distance from construction activities to nearby structures and typically applied criteria for structural damage and human annoyance.

Transportation-source noise levels and onsite operational noise levels associated with the Project are discussed qualitatively.

5.3 Impact Analysis

5.3.1 ***Would the Project Result in Short-Term Construction-Generated Noise in Excess of City Standards?***

Onsite Construction Noise

Construction noise associated with the Proposed Project would be temporary and would vary depending on the specific nature of the activities being performed. Noise generated would primarily be associated with the operation of off-road equipment for onsite construction activities as well as construction vehicle traffic on area roadways. Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g., site preparation, excavation, paving). Noise generated by construction equipment, including earth movers, pile drivers, and portable generators, can reach high levels. Typical operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four 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). During construction, exterior noise levels could negatively affect sensitive land uses in the vicinity of the construction site.

The nearest noise-sensitive receptors to the Project Site are residences located to directly adjacent to the Project Site to the north, east and west. The City does not promulgate a numeric threshold pertaining to the noise associated with construction. This is due to the fact that construction noise is temporary, short term, intermittent in nature, and would cease on completion of the Project. Instead, construction noise is regulated by allowable hours of construction. Section 18-63 of the City's Municipal Code prohibits construction between the hours of 10:00 p.m. and 7:00 a.m. The Project is required to adhere to the City Municipal Code and this construction timing limitation.

To estimate the worst-case onsite construction noise levels that may occur at the nearest noise-sensitive receptors and in order to evaluate the potential health-related effects (physical damage to the ear) from construction noise, the construction equipment noise levels were calculated using the Federal Highway Administration's Roadway Noise Construction Model and compared against the construction-related noise level threshold established in the FTA's Transit Noise and Vibration Impact Assessment Manual (2018). The FTA identifies a noise level threshold based on the loudness. The FTA construction-related noise level threshold is set at 80 dBA. For the purposes of this analysis, this threshold of 80 dBA L_{eq} is used as an acceptable threshold for construction noise at the nearby sensitive receptors.

It is acknowledged that the majority of construction equipment is not situated at any one location during construction activities, but rather spread throughout the Project Site and at various distances from sensitive receptors. Therefore, this analysis employs FTA guidance for calculating construction noise, which recommends measuring construction noise produced by all construction equipment simultaneously from the center of the Project Site (FTA 2018), which in this case is approximately 365 feet from the nearest single-family residences surround the Project Site. Construction equipment anticipated to be used for Project construction is provided by the California Emissions Estimator Model (CalEEMod 2022.1). CalEEMod is designed to calculate air pollutant emissions from construction activity and contains default construction

equipment and usage parameters for typical construction projects based on several construction surveys conducted in order to identify such parameters. The anticipated construction equipment for each specific construction activity (i.e., site preparation, grading, building construction, etc.) is then entered individually into the FHWA's Roadway Construction Model.

Recent case law has held that the use of an absolute noise threshold for evaluating all ambient noise impacts violated CEQA because it did not provide a "complete picture" of the noise impacts that may result from implementation of the ordinance. As such, the Proposed Project's construction noise is estimated and then added to the average daily ambient noise level in the Project Area as determined by the baseline noise survey conducted by ECORP Consulting (see Table 3-1). As previously described, the dB scale is logarithmic, not linear, and therefore sound levels cannot be added or subtracted through ordinary arithmetic. For example, a 65-dB source of sound, such as a truck, when joined by another 65 dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by three dB). Furthermore, when combining two separate sources where one of the noise sources is 10 dB or greater than the other noise source, the noise contribution of the quieter source is completely obscured by the louder source.

The anticipated short-term construction noise levels generated for the necessary equipment for each phase of construction are presented in Table 5-1.

Table 5-1. Construction Average (dBA) Noise Levels at Nearest Receptors

Construction Phase	Average Ambient Noise Level* (dBA L_{eq})	Existing Ambient Noise + Estimated Exterior Construction Noise Level @ Closest Receptor (dBA L_{eq})	FTA Construction Noise Standard (dBA L_{eq})	Exceeds Standard?
Site Preparation	52.7	67.0	80	No
Grading		69.8	80	No
Building Construction, Paving & Architectural Coating		56.4	80	No

Source: Construction noise levels were calculated by ECORP Consulting using the FHWA Roadway Noise Construction Model (FHWA 2006). Refer to Attachment C for Model Data Outputs.

Notes: *Average ambient noise levels of the Project Area were estimated using the average L_{eq} of the three short term noise measurement taken on August 5th, 2024, and identified in Table 3-1.

Construction equipment used during construction provided by the California Emissions Estimator Model (CalEEMod 2022.1.1.14). CalEEMod is designed to calculate air pollutant emissions from construction activity and contains default construction equipment and usage parameters for typical construction projects based on several construction surveys conducted in order to identify such parameters. Consistent with FTA recommendations for calculating construction noise, construction noise was measured to account for all pieces of construction equipment operating simultaneously from the center of the Project Site (FTA 2018), which is 365 feet from the nearest receptor. Building Construction, paving & architectural coating assumed to occur simultaneously.

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

As shown in Table 5-1, construction activities would not exceed the applicable noise limits. It is noted that construction noise was modeled on a worst-case basis. It is unlikely that all pieces of construction equipment would be operating at the same time for the various phases of Project construction. Nonetheless, it is acknowledged that the Project Site is surrounded by noise-sensitive residential receptors and that substantial construction would occur directly adjacent to these receptors. Therefore, the following noise-reducing best management practices are recommended.

Recommended Mitigation

NOI-1: Construction Noise-Reducing Best Management Practices

The Project improvement and building plans will include the following requirements for construction activities:

- Construction contracts must specify that all construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers and other state-required noise attenuation devices.

- A sign, legible at a distance of 50 feet, shall be posted at the Project construction site providing a contact name and a telephone number where residents can inquire about the construction process and register complaints. This sign shall indicate the dates and duration of construction activities. In conjunction with this required posting, a noise disturbance coordinator will be identified to address construction noise concerns received. The coordinator shall be responsible for responding to any local complaints about construction noise. When a complaint is received, the disturbance coordinator shall notify the City within 24 hours of the complaint and determine the cause of the noise complaint (starting too early, malfunctioning muffler, etc.) and shall implement reasonable measures to resolve the complaint, as deemed acceptable by the City. All signs posted at the construction site shall include the contact name and the telephone number for the noise disturbance coordinator.
- Identification of construction noise reduction methods. These reduction methods may include shutting off idling equipment (5 minutes), installing temporary acoustic barriers around stationary construction noise sources, maximizing the distance between construction equipment staging areas and occupied residential areas, and using electric air compressors and similar power tools.
- During construction, stationary construction equipment shall be placed such that emitted noise is directed away from sensitive noise receivers.
- Per Fontana Municipal Code Chapter 18 Section 18-63, *Nuisances*, construction shall be prohibited outside of the hours of 7:00 a.m. and 6:00 p.m. on weekdays and 8:00 a.m. and 5:00 p.m. on Saturdays.

Timing/Implementation: During Construction

Monitoring/Enforcement: City of Fontana Planning Department

Offsite Construction Worker Trips

Project construction would result in additional traffic on adjacent roadways over the period that construction occurs. According to CalEEMod, which is used to predict the number of construction-related automotive trips, the maximum number of Project construction trips traveling to and from the Project Site during a single construction phase would not be expected to exceed 397 daily trips in total (355 worker commute trips and 42 vendor truck trips). According to the Caltrans Technical Noise Supplement to the Traffic Noise Analysis Protocol (2013), a doubling of traffic on a roadway is required to result in an increase of 3 dB (outside of the laboratory, a 3-dBA change is considered a just-perceivable difference). Per the City of Fontana General Plan Noise Element (2023), the roadway segment on S. Highland Avenue that traverses parallel to the northern boundary of the Project Site accommodates an average of 5,150 vehicle trips daily, and the roadway segment on Walnut Street between Beech Avenue and Citrus Avenue, which traverses parallel to the southern boundary of the Project Site, accommodates an average of 2,400 vehicle trips daily. Thus, Project construction would not result in a doubling of traffic on this roadway.

The Project construction would not result in a doubling of traffic on the local transportation network, and therefore its contribution to existing traffic noise would not be perceptible.

5.3.2 Would the Project Result in a Substantial Permanent Increase in Ambient Noise Levels in Excess of City Standards During Operations?

As previously described, noise-sensitive land uses are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Residences, schools, hospitals, guest lodging, libraries, and some passive recreation areas would each be considered noise-sensitive and may warrant unique measures for protection from intruding noise. The nearest noise-sensitive receptors to the Project Site are residences located directly adjacent to the Project Site to the north, east, and west. Additionally, there are residences located south of the Project Site across Walnut Street.

Project Land Use Compatibility

As previously discussed, the Project is proposing the construction of a 393-unit residential development. As the Project is proposing the development of new noise-sensitive land uses within the existing noise environment, a discussion of land use compatibility is needed. The most basic planning strategy to minimize adverse impacts on new land uses due to noise is to avoid designating certain land uses at locations that would negatively affect noise-sensitive land uses. Uses such as schools, hospitals, childcare, senior care, congregate care, churches, and all types of residential use should be located outside of any area anticipated to exceed acceptable noise levels as defined by the General Plan Noise Element or should be protected from noise through sound attenuation measures such as site and architectural design and sound walls. As previously described in Section 3.1.3, *Existing Roadway Noise Levels*, the predominant source of noise affecting the Project Site is traffic noise generated on the I-210 Highway as well as traffic noise generated on S. Highland Avenue. As further described in Section 3.1.3, traffic on I-210 generates a noise level of approximately 64.8 dBA CNEL at the northern portion of the Project Site, while traffic on S. Highland Avenue currently generates a noise level of approximately 67.1 dBA CNEL at the northern portion of the Project Site. These two noise sources combined generate approximately 69.1 dBA CNEL at the northern boundary of the Project Site, along S. Highland Avenue.

The City General Plan Noise Element Goal 8, Action A states that noise-sensitive residential receptors shall be discouraged in areas experiencing noise levels in excess of 65 dBA CNEL. Goal 8, Action B states that noise-sensitive recreation uses shall be discouraged in areas experiencing noise levels in excess of 65 dBA L_{eq} (in addition to residences, the Project is also proposing a private park (large open grass area) adjacent to the northern boundary of the site, as described in Section 1.1, *Project Location and Description*). Thus, the noise levels currently experienced at the northern portion of the Project Site exceed that which is considered acceptable by the City General Plan Noise Element. It is noted that the Project Site is surrounded by existing residential neighborhoods and that the segments of I-210 traversing parallel to these existing neighborhoods are buffered by a 15-foot tall concrete soundwall atop a large earthen berm directly adjacent to the I-210 corridor and breaking the line-of-sight between I-210 and the residences. However, there is no soundwall flanking the segment of I-210 directly north of the Project Site. The potential construction of a future soundwall flanking the segment of I-210 directly north of the Project Site is the

decision of Caltrans yet would provide substantial noise reduction at the Project Site if constructed. Nonetheless, it is not known if such a soundwall would be constructed and therefore the following mitigation is recommended to reduce the traffic noise exposure at the northern portion of the Project Site:

Recommended Mitigation

NOI-2: Noise/Land Use Compatibility

The Project shall include the following requirements for operational activities prior to the occupancy permits:

- Consistent with the existing residential neighborhoods surrounding the Project Site, a soundwall at least 6-feet in height shall span the northern boundary of the Project Site from the Project northwest corner to Knox Avenue. The wall shall be constructed of CMU block, mortared masonry, stucco, gypsum board, or material of similar density, use or comparable acoustic ratings. All walls shall be sealed airtight, free of degrading holes or gaps, and must not be flanked by nearby reflective surfaces.
- The residential units built on Lots 374 – 386, at a minimum, shall be designed and built with the installation of standard thermal-pane residential windows and doors with a minimum rating of STC 35.
- The residential units built on Lots 374 – 386, at a minimum, shall have air conditioning units installed. This would allow occupants and business owners to close doors and windows as desired for additional acoustical isolation.

Timing/Implementation: Prior to the issuance of occupancy permits

Monitoring/Enforcement: City of Fontana Planning Department

Implementation of mitigation measure NOI-2 would require that a soundwall at least 6-feet in height separating the line-of-sight between S. Highland Avenue and the Proposed Project be constructed. As previously described in Section 2.1.2, *Sound Propagation and Attenuation*, a solid wall or berm generally reduces noise levels by 10 to 20 dBA (FHWA 2011), which would result in maximum noise levels ranging from 49.1 to 59.1 dBA CNEL at the northern portion of the Project Site, which is below the residential threshold of 65 dBA CNEL (Combined I-210 and S. Highland Avenue traffic noise levels of 69.1 dBA – 10 = 59.1 dBA CNEL. Combined I-210 and S. Highland Avenue traffic noise levels of 69.1 dBA – 20 = 49.1 dBA CNEL). Mitigation measure NOI-2 would also reduce noise at the proposed private park adjacent to the northern boundary of the site below the recreational use threshold of 65 dBA L_{eq} . Additionally, the installation of noise-reducing building materials in the northern-most Project residences would provide at least 7 dB of noise reduction within the building interior (High Speed Rail Authority 2022).

Operational Onsite Noise

The main noise source generated from the proposed residences on the Project Site would include mechanical equipment and other typical sources specific to residential neighborhoods, such as barking

dogs, internal traffic circulation, power tools and landscaping equipment, radios, and people talking. According to previous field noise measurements conducted by ECORP, mechanical heating, ventilation, and air conditioning equipment generates noise levels less than 45 dBA at 20 feet. This noise level is less than the City's daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) noise standard for residential land uses as presented in the City's Municipal Code (Table 4-1). Additionally, previous field measurements within six different residential neighborhoods, including two multi-family neighborhoods, two single-family neighborhoods, and two mixed density neighborhoods identify an average daytime noise environment of 51.9 dBA, which is under the City's daytime standard. It is further noted that the Project proposes to place residential uses adjacent to other residential uses. The most basic planning strategy to minimize adverse impacts on new land uses due to noise is to avoid designating certain land uses at locations within the community that would negatively affect noise sensitive land uses. The Project is consistent with the types, intensity, and patterns of land use existing in the Project Area.

Operational Offsite Traffic Noise

The Project is proposing the construction of a 393-unit residential development, a neighborhood park, internal streets, and associated features. According to the City of Fontana General Plan, Walnut Street and S. Highland Avenue, which both traverse parallel to the Project Site, have an annual average daily traffic count of 2,400 and 5,150 vehicles, respectively. The Project is expected to generate an average of 3,230 trips per day. Assuming that half of the traffic generated by the Proposed Project would exit the Project Site through the northern end, and half would exit through the southern end, traffic on each Walnut Street and S. Highland Avenue would increase by approximately 1,615 trips daily as a result of the Project. According to the Caltrans Technical Noise Supplement to the Traffic Noise Analysis Protocol (2013), a doubling of traffic on a roadway is required to result in an increase of 3 dB (outside of the laboratory, a 3-dBA change is considered a just-perceivable difference). The contribution of an additional 1,588 daily trips during Project operations would not result in a doubling of traffic on either of the Project vicinity roadways. Thus, Project operations would not result in a doubling of traffic, and therefore its contribution to existing traffic noise would not be perceptible.

5.3.3 Would the Project Expose Structures to Substantial Groundborne Vibration During Construction?

Excessive groundborne vibration impacts result from continuously occurring vibration levels. Increases in groundborne vibration levels attributable to the Project would be primarily associated with short-term construction-related activities. Construction on the Project Site would have the potential to result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used and the operations involved. Ground vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance.

Construction-related ground vibration is normally associated with impact equipment such as pile drivers, jackhammers, and the operation of some heavy-duty construction equipment, such as dozers and trucks. Vibration decreases rapidly with distance, and it is acknowledged that construction activities would occur throughout the Project Site and would not be concentrated at the point closest to sensitive receptors. Groundborne vibration levels associated with construction equipment are summarized in Table 5-2.

Table 5-2. Representative Vibration Source Levels for Construction Equipment	
Equipment Type	Peak Particle Velocity at 25 Feet (inches per second)
Vibratory Roller	0.210
Pile Driver	0.170
Large Bulldozer	0.089
Caisson Drilling	0.089
Hoe Ram	0.089
Loaded Trucks	0.076
Jackhammer	0.035
Small Bulldozer/Tractor	0.003

Source: FTA 2018; Caltrans 2020b

The City does not regulate or have a numeric threshold associated with construction vibrations. However, a discussion of construction vibration is included for full disclosure purposes. For comparison purposes, the Caltrans (2020b) recommended standard of 0.3 inches per second PPV with respect to the prevention of structural damage for older residential buildings is used as a threshold. This is also the level at which vibrations may begin to annoy people in buildings. It is acknowledged that construction activities would occur throughout the Project Site and would not be concentrated at the point closest to sensitive receptors. Therefore, consistent with FTA recommendations for calculating construction vibration, construction vibration was measured from the center of the Project Site (FTA 2018), which is approximately 365 feet from the nearest residential structures bordering the eastern and western sides of the Project Site.

Based on the representative vibration levels presented for various construction equipment types in Table 5-2 and the construction vibration assessment methodology published by the FTA (2018), it is possible to estimate the potential Project construction vibration levels. The FTA provides the following equation:

$$[PPV_{\text{equip}} = PPV_{\text{ref}} \times (25/D)^{1.5}]$$

Table 5-4 presents the expected Project related vibration levels at a distance of 365 feet.

Table 5-3. Construction Vibration Levels at 365 Feet

Receiver PPV Levels (in/sec) ¹					Peak Vibration	Threshold	Exceed Threshold?
Large Bulldozer, Caisson Drilling, & Hoe Ram	Loaded Trucks	Jackhammer	Pile Driver	Vibratory Roller			
0.0016	0.0014	0.0006	0.0030	0.0038	0.0038	0.3	No

As shown in Table 5-3, vibration as a result of onsite construction activities on the Project Site would not exceed 0.3 PPV at the nearest structure. Thus, onsite Project construction would not exceed the recommended threshold.

5.3.4 Would the Project Expose Structures to Substantial Groundborne Vibration During Operations?

Project operations would not include the use of any stationary equipment that would result in excessive vibration levels. Therefore, the Project would result in negligible groundborne vibration impacts during operations.

5.3.5 Would the Project Expose People Residing or Working in the Project area to Excessive Airport Noise?

The nearest airport to the Project Site is Ontario International Airport, located 8.3 miles southwest of the Project Site. This places the Project Site outside the Airport Influence Area according to Policy Map 2-1 of the Ontario International Airport Land Use Compatibility Plan (2011). Implementation of the Proposed Project would not affect airport operations nor result in increased exposure of people on the Project Site to aircraft noise.

6.0 REFERENCES

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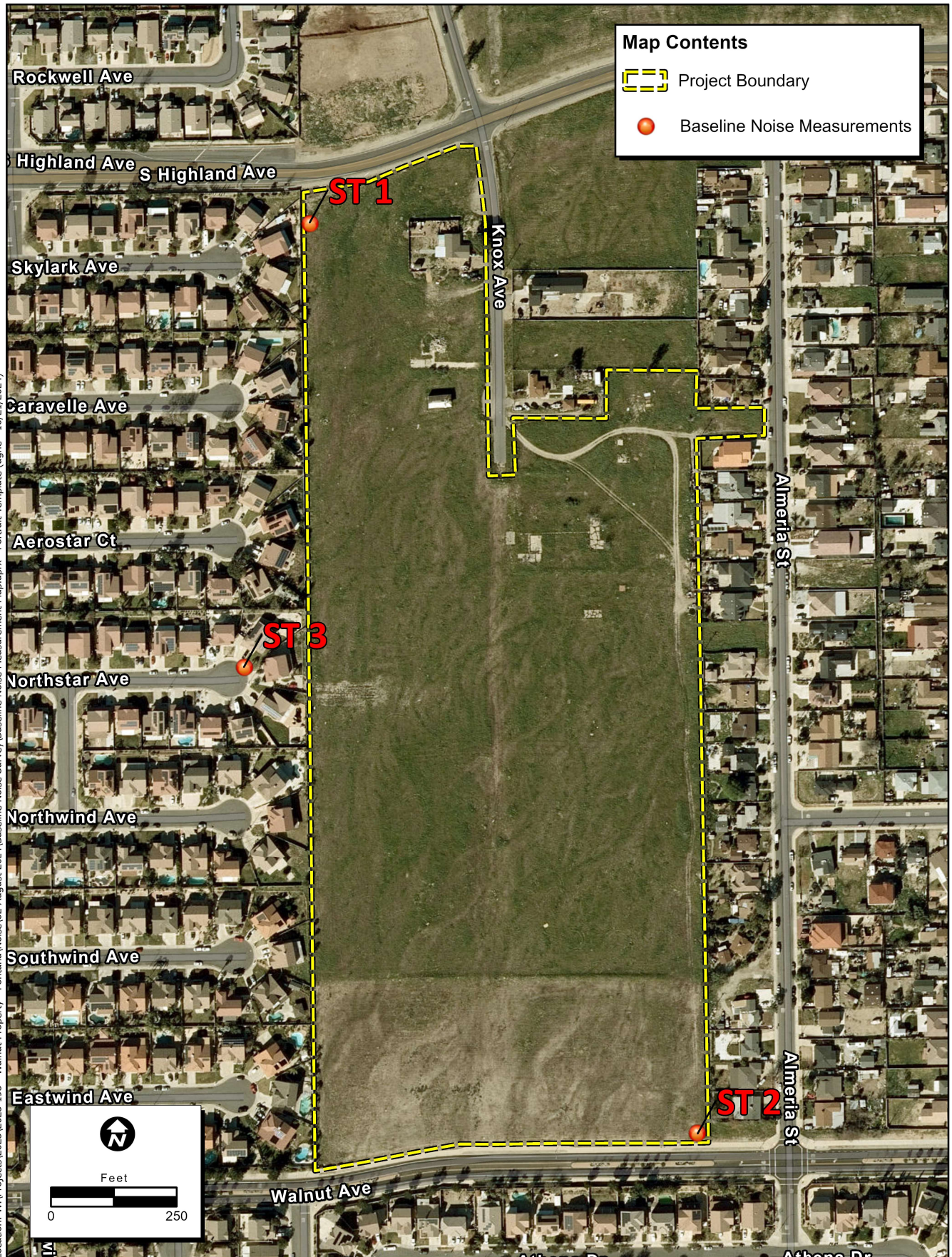
LIST OF ATTACHMENTS

Attachment A - Baseline (Existing) Noise Measurements – Project Site and Vicinity

Attachment B - Federal Highway Administration Highway Noise Prediction Model (FHWA-RD-77-108)
Outputs

Attachment C - Federal Highway Administration Roadway Construction Noise Model Outputs – Project
Construction

Baseline (Existing) Noise Measurements – Project Site and Vicinity



Baseline Noise Measurement Map

Site Number: 1			
Recorded By: Lindsay Buck			
Job Number: 2023-193			
Date: 8/5/2024			
Time: 10:15 a.m. – 10:33 a.m.			
Location: South of Highland Avenue; Northwest Corner of Project Site			
Source of Peak Noise: Vehicles along Highland Avenue; Highway 210			
Noise Data			
Leq (dB)	Lmin (dB)	Lmax (dB)	Peak (dB)
58.0	45.5	81.2	92.7

Equipment						
Category	Type	Vendor	Model	Serial No.	Cert. Date	Note
Sound	Sound Level Meter	Larson Davis	Spartan 821	30100	05/22/2024	
	Microphone	Larson Davis	377B02	352537	04/12/2024	
	Preamp	Larson Davis	PRM821	001679	04/26/2024	
	Calibrator	Larson Davis	CAL200	226638	05/20/2024	
Weather Data						
Est.	Duration: 15 min		Sky: clear			
	Note: dBA Offset = 0.1		Sensor Height (ft): 3.5			
	Wind Ave Speed (mph)	Temperature (degrees Fahrenheit)		Barometer Pressure (hPa)		
	3	93		29.86		

Photo of Measurement Location





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Spartan 821 Summary:2024-08-07 08:18:50

User:

Location:

Job Description:

Notes:

Meter General Information

	Model	Serial
Meter	Spartan 821	30100
Preamp	PRM821	
Microphone	377B02	
Unique File Id	00A:00007594:66B0A636:0000020F	

Overall Measurement

Start Date & Time	2024-08-05 10:15:18		
Stop Date & Time	2024-08-05 10:30:18		
Run Time	00:15:00		
Pre-Calibration			
Date/Time	2024-08-05 10:14:07		
Calibrator Level	114.0 dB		
Meter Sensitivity	-25.99 dB re 1V/Pa		
Post-Calibration			
Date/Time	---		
Calibrator Level	---		
Meter Sensitivity	---		
Sensitivity Delta	---		
L _A eq	61.8 dB		
	A	C	Z
L _w eq	58.0	69.6	71.9
L _w pk	92.7 dB	99.5 dB	99.7 dB
	2024-08-05 10:24:36	2024-08-05 10:18:04	2024-08-05 10:18:04
L _w Smin	44.7 dB	59.2 dB	64.1 dB
	2024-08-05 10:22:26	2024-08-05 10:24:01	2024-08-05 10:24:01
L _w Smax	76.3 dB	88.6 dB	88.8 dB
	2024-08-05 10:24:36	2024-08-05 10:18:04	2024-08-05 10:18:04
L _w Fmin	43.7 dB	57.3 dB	61.6 dB
	2024-08-05 10:27:30	2024-08-05 10:26:20	2024-08-05 10:24:01
L _w Fmax	79.6 dB	92.3 dB	92.6 dB
	2024-08-05 10:24:36	2024-08-05 10:18:04	2024-08-05 10:18:04
L _w Imin	45.5 dB	61.8 dB	68.0 dB
	2024-08-05 10:22:23	2024-08-05 10:24:01	2024-08-05 10:26:35
L _w Imax	81.2 dB	92.9 dB	93.2 dB
	2024-08-05 10:24:36	2024-08-05 10:18:04	2024-08-05 10:18:04
<i>w</i> = frequency weighting (A, C or Z)			
Overload Count	0		
Overload Duration	00:00:00		
	A	C	Z
Under Range Peak	50.0 dB	50.0 dB	62.0 dB
Under Range Limit	24.0 dB	27.0 dB	37.0 dB
Noise Floor	17.0 dB	18.0 dB	25.0 dB

Ln Percentiles

LAS 5.0	62.3 dB
LAS 10.0	60.6 dB
LAS 33.3	55.6 dB
LAS 50.0	52.1 dB
LAS 66.6	48.9 dB
LAS 90.0	46.7 dB

Virtual Dosimeters

	1	2	3	4
Configuration	OSHA-PEL	OSHA-HC	ACGIH	NIOSH
Dose	0.0%	0.0%	0.0%	0.0%
Projected Dose	0.0%	0.0%	0.0%	0.0%
Lavg	--- dB	--- dB	--- dB	--- dB
TWA(8)	--- dB	--- dB	--- dB	--- dB
Projected TWA(8)	--- dB	--- dB	--- dB	--- dB
Criterion Level	90.0 dB	90.0 dB	85.0 dB	85.0 dB
Threshold Level	90.0 dB	80.0 dB	80.0 dB	80.0 dB
Exchange Rate	5 dB	5 dB	3 dB	3 dB
LEP'd/Lex,8h	42.9 dB	42.9 dB	42.9 dB	42.9 dB
Projected LEP'd/Lex,8h	58.0 dB	58.0 dB	58.0 dB	58.0 dB
Shift Time	8 hours	8 hours	8 hours	8 hours

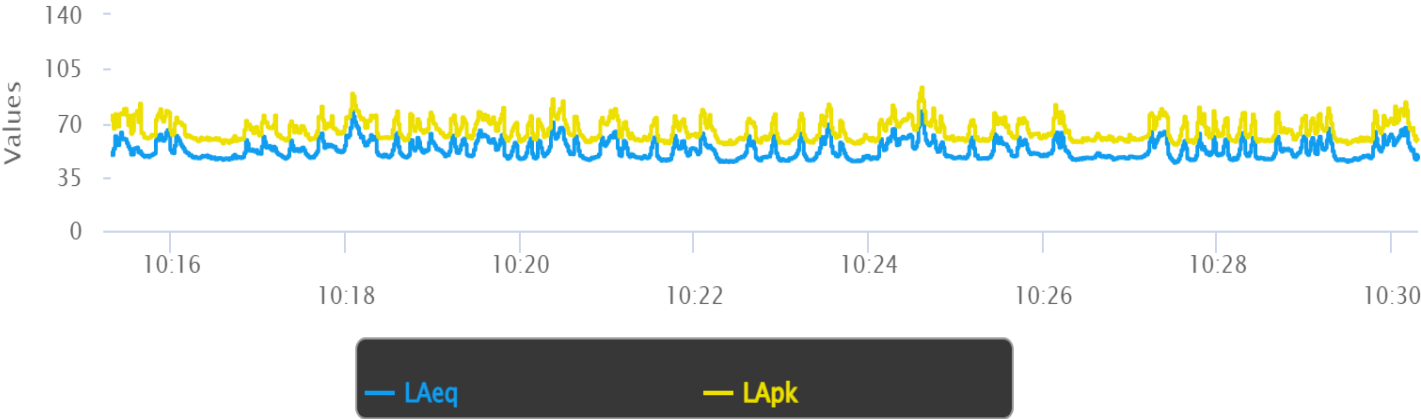
Exceedances

	Count	Duration
LAS > 85 dB	0	0
LAS > 95 dB	0	0
LCpk > 135 dB	0	0
LCpk > 137 dB	0	0
LCpk > 140 dB	0	0

Sound Exposure

SELA	87.5 dB
EA (Pa²s)	0.2 Pa²s
EA,8 h (Pa²s)	7.3 Pa²s
EA,40 h (Pa²s)	36.3 Pa²s
EA (Pa²h)	0.0 Pa²h
EA,8 h (Pa²h)	0.0 Pa²h
EA,40 h (Pa²h)	0.0 Pa²h

Time History



Site Number: 2			
Recorded By: Lindsay Buck			
Job Number: 2023-193			
Date: 8/5/2024			
Time: 10:33 a.m. – 10:51 a.m.			
Location: Southeast Corner of Property; North of Walnut Street and West of Almeria Avenue			
Source of Peak Noise: Vehicles along Walnut Street			
Noise Data			
Leq (dB)	Lmin (dB)	Lmax (dB)	Peak (dB)
53.9	42.3	72.6	84.0

Equipment						
Category	Type	Vendor	Model	Serial No.	Cert. Date	Note
Sound	Sound Level Meter	Larson Davis	Spartan 821	30100	05/22/2024	
	Microphone	Larson Davis	377B02	352537	04/12/2024	
	Preamp	Larson Davis	PRM821	001679	04/26/2024	
	Calibrator	Larson Davis	CAL200	226638	05/20/2024	
Weather Data						
Est.	Duration: Short Term			Sky: clear		
	Note: dBA Offset = 0.1			Sensor Height (ft): 3.5		
	Wind Ave Speed (mph)		Temperature (degrees Fahrenheit)		Barometer Pressure (hPa)	
	3		93		29.86	





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Spartan 821 Summary:2024-08-07 08:19:29

User:

Location:

Job Description:

Notes:

Meter General Information

	Model	Serial
Meter	Spartan 821	30100
Preamp	PRM821	
Microphone	377B02	
Unique File Id	00A:00007594:66B0AA64:00000217	

Overall Measurement

Start Date & Time	2024-08-05 10:33:08		
Stop Date & Time	2024-08-05 10:51:12		
Run Time	00:18:04		
Pre-Calibration			
Date/Time	2024-08-05 10:14:07		
Calibrator Level	114.0 dB		
Meter Sensitivity	-25.99 dB re 1V/Pa		
Post-Calibration			
Date/Time	---		
Calibrator Level	---		
Meter Sensitivity	---		
Sensitivity Delta	---		
LAeq	56.4 dB		
	A	C	Z
Lweq	53.9	65.6	68.2
Lwpk	84.0 dB	94.4 dB	94.5 dB
	2024-08-05 10:33:21	2024-08-05 10:49:34	2024-08-05 10:49:34
LwSmin	41.4 dB	52.2 dB	58.7 dB
	2024-08-05 10:45:18	2024-08-05 10:45:14	2024-08-05 10:45:28
LwSmax	68.8 dB	83.9 dB	84.5 dB
	2024-08-05 10:49:34	2024-08-05 10:41:13	2024-08-05 10:41:13
LwFmin	40.8 dB	50.7 dB	55.6 dB
	2024-08-05 10:45:16	2024-08-05 10:45:14	2024-08-05 10:45:42
LwFmax	71.3 dB	86.0 dB	86.5 dB
	2024-08-05 10:49:34	2024-08-05 10:41:12	2024-08-05 10:41:12
Lwlmin	42.3 dB	54.4 dB	63.0 dB
	2024-08-05 10:45:18	2024-08-05 10:45:14	2024-08-05 10:47:11
Lwlmax	72.6 dB	89.1 dB	101.2 dB
	2024-08-05 10:49:34	2024-08-05 10:33:08	2024-08-05 10:33:08
w = frequency weighting (A, C or Z)			
Overload Count	0		
Overload Duration	00:00:00		
	A	C	Z
Under Range Peak	50.0 dB	50.0 dB	62.0 dB
Under Range Limit	24.0 dB	27.0 dB	37.0 dB
Noise Floor	17.0 dB	18.0 dB	25.0 dB

Ln Percentiles

LAS 5.0	59.7 dB
LAS 10.0	57.8 dB
LAS 33.3	51.4 dB
LAS 50.0	49.1 dB
LAS 66.6	47.5 dB
LAS 90.0	44.5 dB

Virtual Dosimeters

	1	2	3	4
Configuration	OSHA-PEL	OSHA-HC	ACGIH	NIOSH
Dose	0.0%	0.0%	0.0%	0.0%
Projected Dose	0.0%	0.0%	0.0%	0.0%
Lavg	--- dB	--- dB	--- dB	--- dB
TWA(8)	--- dB	--- dB	--- dB	--- dB
Projected TWA(8)	--- dB	--- dB	--- dB	--- dB
Criterion Level	90.0 dB	90.0 dB	85.0 dB	85.0 dB
Threshold Level	90.0 dB	80.0 dB	80.0 dB	80.0 dB
Exchange Rate	5 dB	5 dB	3 dB	3 dB
LEP'd/Lex,8h	39.7 dB	39.7 dB	39.7 dB	39.7 dB
Projected LEP'd/Lex,8h	53.9 dB	53.9 dB	53.9 dB	53.9 dB
Shift Time	8 hours	8 hours	8 hours	8 hours

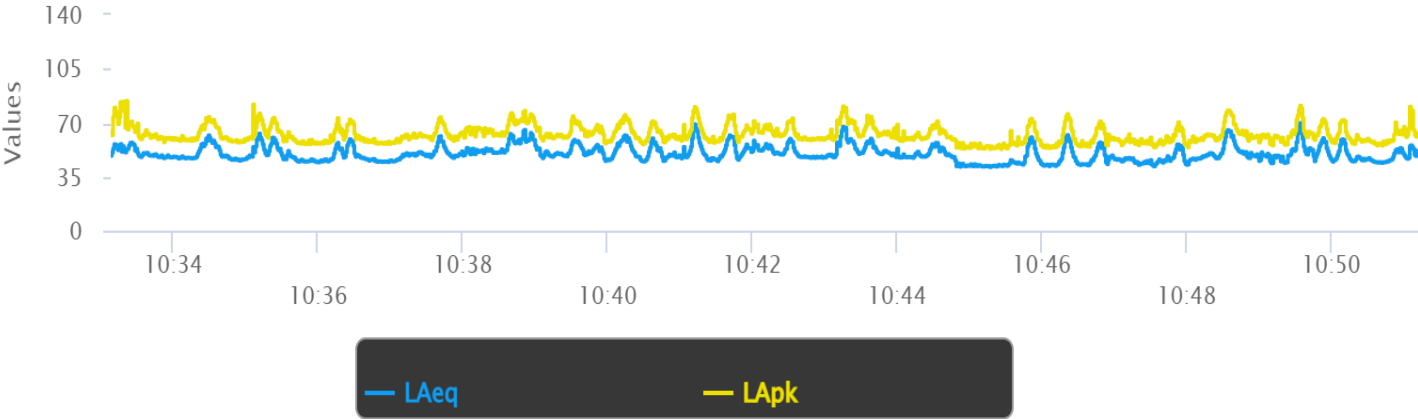
Exceedances

	Count	Duration
LAS > 85 dB	0	0
LAS > 95 dB	0	0
LCpk > 135 dB	0	0
LCpk > 137 dB	0	0
LCpk > 140 dB	0	0

Sound Exposure

SELA	84.3 dB
EA (Pa²s)	0.1 Pa²s
EA,8 h (Pa²s)	2.8 Pa²s
EA,40 h (Pa²s)	14.2 Pa²s
EA (Pa²h)	0.0 Pa²h
EA,8 h (Pa²h)	0.0 Pa²h
EA,40 h (Pa²h)	0.0 Pa²h

Time History



Site Number: 3			
Recorded By: Lindsay Buck			
Job Number: 2023-193			
Date: 8/5/2024			
Time: 10:55 a.m. – 11:11 a.m.			
Location: Eastern End of Northstar Avenue			
Source of Peak Noise: Traffic along Northstar Avenue			
Noise Data			
Leq (dB)	Lmin (dB)	Lmax (dB)	Peak (dB)
46.3	37.7	85.5	106.8

Equipment						
Category	Type	Vendor	Model	Serial No.	Cert. Date	Note
Sound	Sound Level Meter	Larson Davis	Spartan 821	30100	05/22/2024	
	Microphone	Larson Davis	377B02	352537	04/12/2024	
	Preamp	Larson Davis	PRM821	001679	04/26/2024	
	Calibrator	Larson Davis	CAL200	226638	05/20/2024	
Weather Data						
Est.	Duration: Short Term			Sky: clear		
	Note: dBA Offset = 0.1			Sensor Height (ft): 3.5		
	Wind Ave Speed (mph)		Temperature (degrees Fahrenheit)		Barometer Pressure (hPa)	
	3		93		29.86	





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Spartan 821 Summary:2024-08-07 08:19:46

User:

Location:

Job Description:

Notes:

Meter General Information

	Model	Serial
Meter	Spartan 821	30100
Preamp	PRM821	
Microphone	377B02	
Unique File Id	00A:00007594:66B0AF92:0000021E	

Overall Measurement

Start Date & Time	2024-08-05 10:55:14		
Stop Date & Time	2024-08-05 11:11:46		
Run Time	00:16:32		
Pre-Calibration			
Date/Time	2024-08-05 10:14:07		
Calibrator Level	114.0 dB		
Meter Sensitivity	-25.99 dB re 1V/Pa		
Post-Calibration			
Date/Time	---		
Calibrator Level	---		
Meter Sensitivity	---		
Sensitivity Delta	---		
L _A eq	58.6 dB		
	A	C	Z
L _w eq	46.3	57.6	66.2
L _w pk	106.8 dB	104.8 dB	106.2 dB
	2024-08-05 10:55:29	2024-08-05 10:55:29	2024-08-05 10:55:29
L _w Smin	36.8 dB	52.3 dB	58.8 dB
	2024-08-05 11:03:54	2024-08-05 11:05:13	2024-08-05 11:05:57
L _w Smax	72.5 dB	74.3 dB	81.6 dB
	2024-08-05 10:55:29	2024-08-05 11:11:12	2024-08-05 11:11:35
L _w Fmin	36.3 dB	49.7 dB	55.0 dB
	2024-08-05 11:03:34	2024-08-05 11:05:20	2024-08-05 10:59:12
L _w Fmax	81.2 dB	82.1 dB	86.1 dB
	2024-08-05 10:55:29	2024-08-05 10:55:29	2024-08-05 11:11:35
L _w Imin	37.7 dB	54.9 dB	62.5 dB
	2024-08-05 11:01:16	2024-08-05 11:06:01	2024-08-05 11:05:57
L _w Imax	85.5 dB	85.7 dB	88.8 dB
	2024-08-05 10:55:29	2024-08-05 10:55:29	2024-08-05 11:11:12
<i>w = frequency weighting (A, C or Z)</i>			
Overload Count	0		
Overload Duration	00:00:00		
	A	C	Z
Under Range Peak	50.0 dB	50.0 dB	62.0 dB
Under Range Limit	24.0 dB	27.0 dB	37.0 dB
Noise Floor	17.0 dB	18.0 dB	25.0 dB

Ln Percentiles

LAS 5.0	47.4 dB
LAS 10.0	45.1 dB
LAS 33.3	39.4 dB
LAS 50.0	38.6 dB
LAS 66.6	38.1 dB
LAS 90.0	37.5 dB

Virtual Dosimeters

	1	2	3	4
Configuration	OSHA-PEL	OSHA-HC	ACGIH	NIOSH
Dose	0.0%	0.0%	0.0%	0.0%
Projected Dose	0.0%	0.0%	0.0%	0.0%
Lavg	--- dB	--- dB	--- dB	--- dB
TWA(8)	--- dB	--- dB	--- dB	--- dB
Projected TWA(8)	--- dB	--- dB	--- dB	--- dB
Criterion Level	90.0 dB	90.0 dB	85.0 dB	85.0 dB
Threshold Level	90.0 dB	80.0 dB	80.0 dB	80.0 dB
Exchange Rate	5 dB	5 dB	3 dB	3 dB
LEP'd/Lex,8h	31.7 dB	31.7 dB	31.7 dB	31.7 dB
Projected LEP'd/Lex,8h	46.3 dB	46.3 dB	46.3 dB	46.3 dB
Shift Time	8 hours	8 hours	8 hours	8 hours

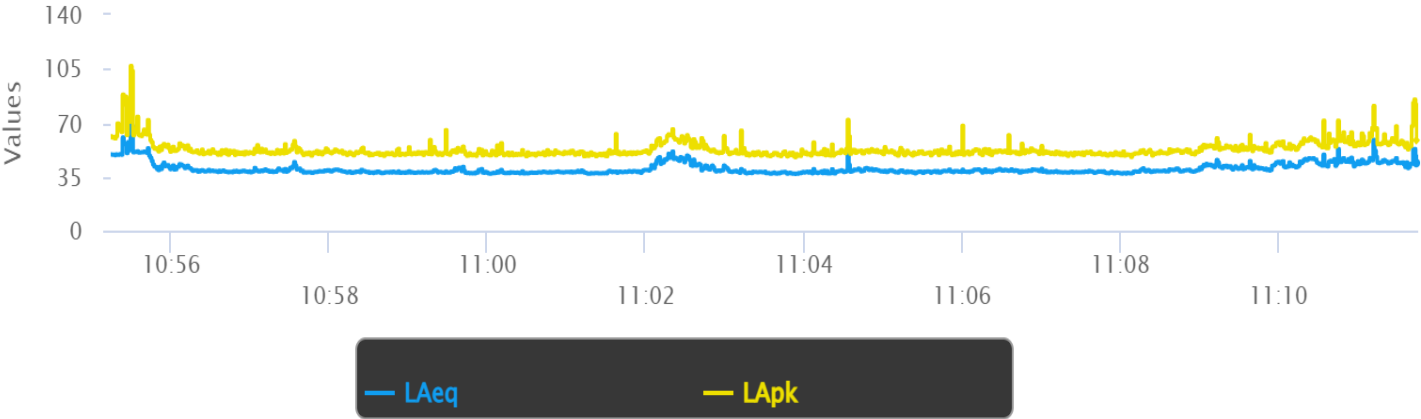
Exceedances

	Count	Duration
LAS > 85 dB	0	0
LAS > 95 dB	0	0
LCpk > 135 dB	0	0
LCpk > 137 dB	0	0
LCpk > 140 dB	0	0

Sound Exposure

SELA	76.3 dB
EA (Pa²s)	0.0 Pa²s
EA,8 h (Pa²s)	0.5 Pa²s
EA,40 h (Pa²s)	2.5 Pa²s
EA (Pa²h)	0.0 Pa²h
EA,8 h (Pa²h)	0.0 Pa²h
EA,40 h (Pa²h)	0.0 Pa²h

Time History



ATTACHMENT B

Federal Highway Administration Highway Noise Prediction Model (FHWA-RD-77-108) Outputs

TRAFFIC NOISE LEVELS

Project Number: 2023-193
Project Name: Walnut Property Project

Background Information

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Analysis Scenario(s): Existing
Source of Traffic Volumes: Caltrans and Fontana General Plan
Community Noise Descriptor: L_{dn}: CNEL: X

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%

Traffic Noise Levels

Analysis Condition	Land Use	Lanes	Median Width	Peak Hour Volume	ADT Volume	Design Speed (mph)	Dist. from Center to Receptor ¹	Alpha Factor	Barrier Attn. dB(A)	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	Peak Hour dB(A) L _{eq}	24-Hour dB(A) CNEL
Roadway Segment													
South Highland Avenue Between Beech Avenue and Citrus Avenue	Proposed Residential	2	8	572	5,150	45	30	0	0	1.8%	0.7%	68.3	67.1
Highway 210 Between Cherry Avenue and Citrus Avenue	Proposed Residential	8	40	18,222	164,000	65	935	0.5	0	1.8%	0.7%	66.0	64.8
Walnut Street Between Beech Avenue and Citrus Avenue	Proposed Residential	2	12	267	2,400	35	40	0	0	1.8%	0.7%	60.9	59.7

¹ Distance is from the centerline of the roadway segment to the receptor location.

Federal Highway Administration Roadway Construction Noise Model Outputs – Project
Construction

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 7/24/2024
Case Description: Walnut Property Project

Description Land Use
Site Preparation Residential

Description			Equipment		Receptor Distance (feet)	Estimated Shielding (dBA)
	Impact Device	Usage(%)	Spec	Actual		
			Lmax (dBA)	Lmax (dBA)		
Dozer	No	40		81.7	365	0
Dozer	No	40		81.7	365	0
Dozer	No	40		81.7	365	0
Backhoe	No	40		77.6	365	0
Backhoe	No	40		77.6	365	0
Backhoe	No	40		77.6	365	0
Backhoe	No	40		77.6	365	0

Results

Calculated (dBA)		
Equipment	*Lmax	Leq
Dozer	64.4	60.4
Dozer	64.4	60.4
Dozer	64.4	60.4
Backhoe	60.3	56.3
Backhoe	60.3	56.3
Backhoe	60.3	56.3
Backhoe	60.3	56.3
Total	64.4	67

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 7/24/2024

Case Description: Walnut Property Project

Description

Grading

Land Use

Residential

Description			Equipment		Receptor Distance (feet)	Estimated Shielding (dBA)
	Impact Device	Usage(%)	Spec	Actual		
			Lmax (dBA)	Lmax (dBA)		
Grader	No	40	85		365	0
Dozer	No	40		81.7	365	0
Scraper	No	40		83.6	365	0
Scraper	No	40		83.6	365	0
Backhoe	No	40		77.6	365	0
Backhoe	No	40		77.6	365	0
Excavator	No	40		80.7	365	0
Excavator	No	40		80.7	365	0

Results

Calculated (dBA)

Equipment	*Lmax	Leq
Grader	67.7	63.8
Dozer	64.4	60.4
Scraper	66.3	62.3
Scraper	66.3	62.3
Backhoe	60.3	56.3
Backhoe	60.3	56.3
Excavator	63.4	59.5
Excavator	63.4	59.5

Total 67.7 **69.8**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 7/24/2024

Case Description: Walnut Property Project

Description
Building
Construction,
Paving, and
Arcitectural Coating

Land Use
Residential

Description	Impact Device	Usage(%)	Equipment		Receptor Distance (feet)	Estimated Shielding (dBA)
			Spec	Actual		
			Lmax (dBA)	Lmax (dBA)		
Crane	No	16		80.6	365	0
Gradall	No	40		83.4	365	0
Gradall	No	40		83.4	365	0
Gradall	No	40		83.4	365	0
Generator	No	50		80.6	365	0
Backhoe	No	40		77.6	365	0
Backhoe	No	40		77.6	365	0
Backhoe	No	40		77.6	365	0
Welder / Torch	No	40		74	365	0
Paver	No	50		77.2	365	0
Paver	No	50		77.2	365	0
Pavement Scarafier	No	20		89.5	365	0
Pavement Scarafier	No	20		89.5	365	0
Roller	No	20		80	365	0
Roller	No	20		80	365	0
Compressor (air)	No	40		77.7	365	0

Results

Calculated (dBA)

Equipment	*Lmax	Leq
Crane	63.3	55.3
Gradall	66.1	62.2
Gradall	66.1	62.2
Gradall	66.1	62.2
Generator	63.4	60.4

Backhoe	60.3	56.3
Backhoe	60.3	56.3
Backhoe	60.3	56.3
Welder / Torch	56.7	52.8
Paver	60	56.9
Paver	60	56.9
Pavement Scarafier	72.2	65.2
Pavement Scarafier	72.2	65.2
Roller	62.7	55.7
Roller	62.7	55.7
Compressor (air)	60.4	56.4
Total	72.2	56.4

*Calculated Lmax is the Loudest value.