TTM 20707 (MAGNOLIA AND VERDEMONT) NOISE IMPACT ANALYSIS

City of San Bernardino

November 8, 2024

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Traffic Engineering ● Transportation Planning ● Parking ● Noise & Vibration
Air Quality ● Global Climate Change ● Health Risk Assessment

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Project No. 19741

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EXECUTIVE SUMMARY

The 107.7-acre project site (APN: 0348-111-02, 03, 10 and 0348-121-14, 27, 28) is located north of Verdemont Drive between Antique Street and Chason Way alignment in the City of San Bernardino, California. The project site is currently vacant and zoned as Residential Low (RL, 3.1DU/AC).

The proposed project (TTM 20707) involves construction of 115 single-family dwelling units. Vehicle access for the project site is proposed via three project internal circulation roadways to Verdemont Drive.

Existing Noise Environment

Sensitive receptors that may be affected by project generated noise include the proposed single-family residential use property lines located adjacent to the west and the existing single-family residential property lines located approximately 50 feet to the south (across Verdemont Drive) of the project site.

The measured short-term ambient noise level in the project vicinity is 44.3 dBA L_{eq}. The dominant noise source in the project vicinity was residential activity and bird song.

Project Construction Impacts – Onsite Equipment

Project construction will not occur outside of the hours outlined in Section 8.54.070 of the City of San Bernardino's Municipal Code which prohibits construction activities other than between the hours of 7:00 AM to 8:00 PM. Based on the modeled construction noise levels, construction noise levels are estimated to reach up to 67.1 dBA L_{eq} at the nearest residential property. Therefore, the project would not exceed City-established standards relating to construction noise. The project impact is less than significant; no mitigation is required.

Per the Federal Transit Administration (FTA), daytime construction noise levels should not exceed 80 dBA L_{eq} for an 8-hour period at residential uses and 85 dBA L_{eq} for an 8-hour period at commercial uses. Therefore, project construction would not be anticipated to exceed the FTA thresholds for either residential or commercial uses.

Notwithstanding the above, best management practices (BMPs) are provided in the Project Description and should be added to project plans and in contract specifications to minimize construction noise emanating from the proposed project.

Project Construction Impacts – Offsite Vehicle Trips

Project vehicle traffic generated during project construction would be anticipated to be nominal relative to existing roadway volumes and would not result in the doubling of traffic volume necessary to increase noise levels by 3 dBA. The project impact is less than significant; no mitigation is required.

Operational Noise Impacts – Traffic to Project

Verdemont Drive is located adjacent to the south of the project site and is currently designated as a Collector (60 feet ROW and 40 feet roadway) on the City of San Bernardino General Plan Circulation Element. Currently, the portion of Verdemont Drive adjacent to the project site is either a dirt road or undeveloped. Future traffic noise associated with vehicle traffic traveling on Verdemont Drive would not exceed the City's noise/land use compatibility criteria of 65 dBA CNEL at residential lots. Impacts would be less than significant; no mitigation is required.

Operational Noise Impacts – Offsite Vehicle Trips

During operation, the proposed project is expected to generate approximately 1,084 average daily trips. Modeled existing traffic noise levels range between 49 and 77 dBA CNEL and the modeled Existing Plus Project traffic noise levels range between 54 and 77 dBA CNEL.

Existing Plus Project noise levels along Verdemont Drive and Antique Street would exceed the 5 dB increase threshold. However, the modeled existing plus project noise levels would not cause ambient noise levels to exceed what is considered to be "normally acceptable" for residential land uses (60 dBA CNEL or less) at the residential land uses along Verdemont Drive and Antique Street. Therefore, this impact would be less than significant. No mitigation is required.

Groundborne Vibration Impacts

Groundborne vibration generated by project construction are anticipated to exceed the screening criteria for potential architectural damage to the residential structure to the south of the project site. In addition, the use of vibratory rollers and large bulldozers have the potential to exceed the FTA's annoyance standard for construction vibration; however, these impacts would be short-term in nature. The following measure is recommended to ensure project construction vibration does not exceed architectural damage thresholds at off-site sensitive receptors:

> **Mitigation Measure #1**
> The use of vibratory rollers, or other similar vibratory equipment, shall be prohibited within 26 feet and large bulldozers within 15 feet of residential structures to the south of the project site. Construction activity that must occur within these distances would need to be performed with smaller equipment types that do not exceed the vibratory threshold identified herein.

With implementation of Mitigation Measure #1, groundborne vibration generated by project construction would not exceed the levels necessary to cause architectural damage; therefore, the project impact would be less than significant.

The most substantial sources of groundborne vibration during post-construction project operations will include the movement of passenger vehicles and trucks on paved and generally smooth surfaces. Loaded trucks generally have a PPV of 0.076 at a distance of 25 feet (Caltrans 2020), which is a substantially lower PPV than that of a vibratory roller (0.210 in/sec PPV at 25 feet). Therefore, groundborne vibration levels generated by project operation would not exceed those modeled for project construction.

Air Traffic Impacts

The closest airport to the project site is the San Bernardino International Airport (SBIA), which is located approximately 10.06 miles to the southeast of the project site. Per the noise contour maps provided in the Federal Aviation Administration's (FAA) Finding of No Significant Impact (FONSI) and Record of Decision (ROD) for the proposed Eastgate Air Cargo Facility at San Bernardino International Airport (December 2019), the proposed project site is well outside the 65 dBA CNEL noise contours of the San Bernardino International Airport. Therefore, as the project is not within two miles of a public airport or in the vicinity of a private airstrip, the project would not expose people residing or working in the project area to excessive noise levels associated with airports.

1. INTRODUCTION

This section describes the purpose of this study and the proposed project.

PURPOSE AND OBJECTIVES

The purpose of this report is to provide an assessment of potential noise impacts associated with development and operation of the proposed project and to identify mitigation measures that may be necessary to reduce those impacts. The noise issues related to the proposed land use and development have been evaluated considering applicable Federal, State, and local policies, including those of the City of San Bernardino.

Although this is a technical report, effort has been made to write the report clearly and concisely. A list of acronyms and glossary are provided in Appendix A and Appendix B of this report to assist the reader with technical terms related to noise analysis.

PROJECT LOCATION

The 107.7-acre project site (APN: 0348-111-02, 03, 10 and 0348-121-14, 27, 28) is located north of Verdemont Drive between Antique Street and Chason Way alignment in the City of San Bernardino, California. The project site is currently vacant and zoned as Residential Low (RL, 3.1DU/AC). A vicinity map showing the project location is provided on Figure 1.

PROJECT DESCRIPTION

The proposed project (TTM 20707) involves construction of 115 single-family dwelling units. Vehicle access for the project site is proposed via three project internal circulation roadways to Verdemont Drive. Figure 2 illustrates the project site plan.

The following best management practices (BMPs) shall be provided on project plans and in contract specifications to minimize construction noise emanating from the proposed project:

1. All equipment, whether fixed or mobile, will be equipped with properly operating and maintained mufflers, consistent with manufacturer standards.
2. All stationary construction equipment will be placed so that emitted noise is directed away from the noise sensitive receptors nearest the project site.
3. As applicable, all equipment shall be shut off and not left to idle when not in use.
4. To the degree possible, equipment staging will be located in areas that create the greatest distance between construction-related noise and vibration sources and existing sensitive receptors.
5. Jackhammers, pneumatic equipment, and all other portable stationary noise sources will be directed away and shielded from existing residences in the vicinity of the project site. Either one-inch plywood or sound blankets can be utilized for this purpose. They should reach up from the ground and block the line of sight between equipment and existing residences. The shielding should be without holes and cracks.
6. No amplified music and/or voice will be allowed on the project site during construction.
7. Haul truck deliveries will not occur outside of the hours presented as exempt for construction per Section 8.54.070 of the City of San Bernardino's Municipal Code.

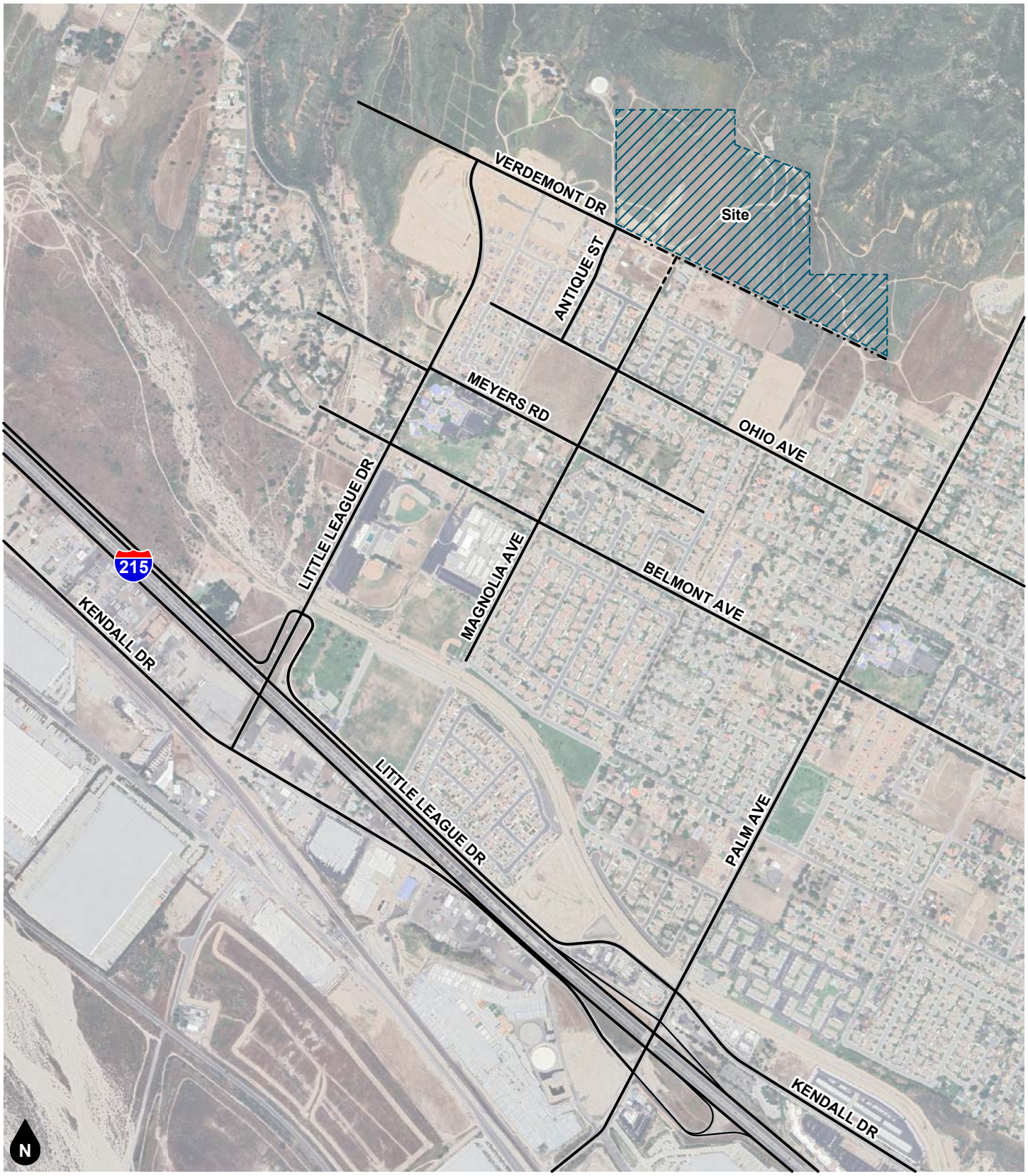


Figure 1
Project Location Map

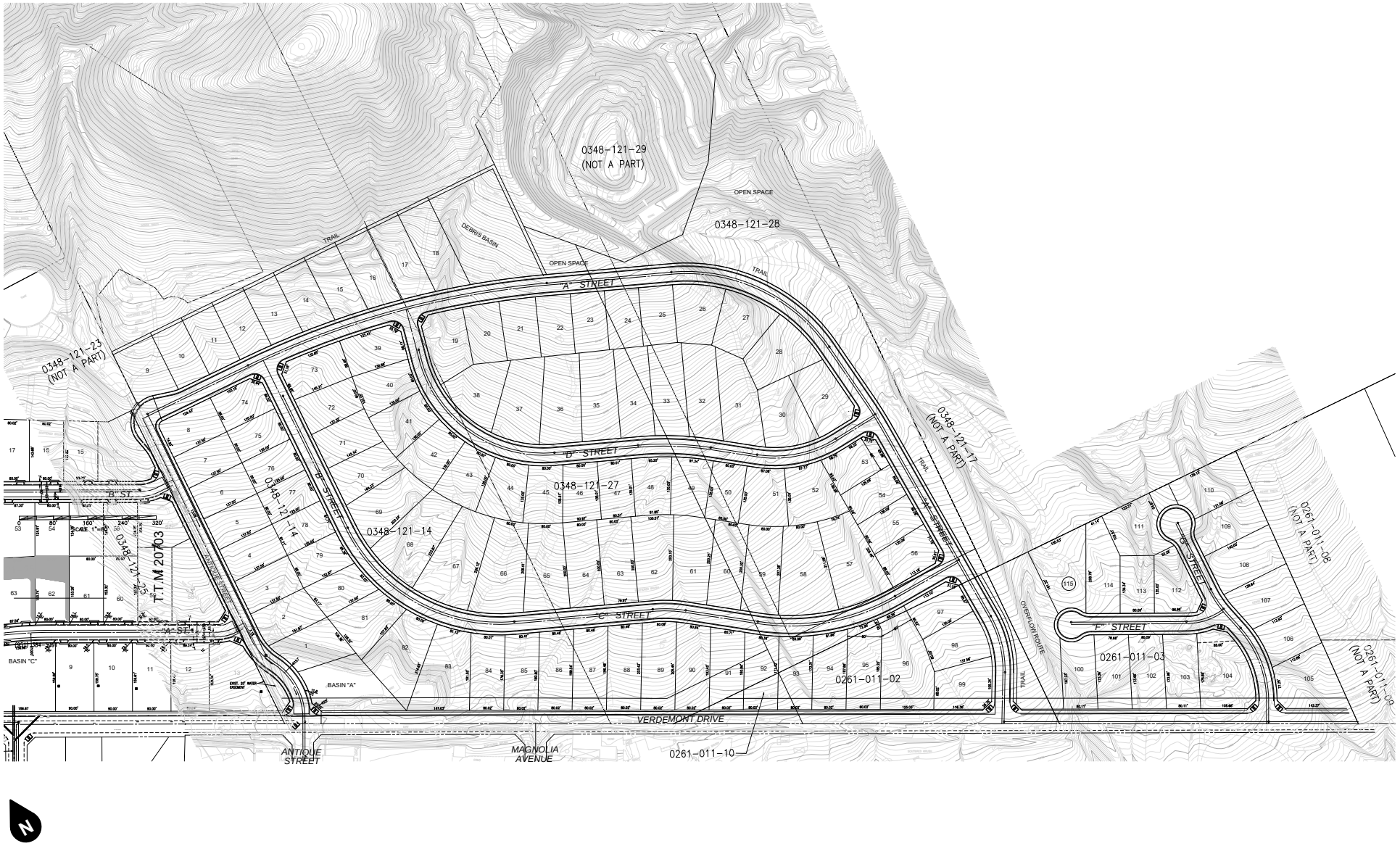


Figure 2
Site Plan

2. NOISE AND VIBRATION FUNDAMENTALS

This section provides an overview of key noise and vibration concepts.

NOISE FUNDAMENTALS

Sound is a pressure wave created by a moving or vibrating source that travels through an elastic medium such as air. Noise is defined as unwanted or objectionable sound. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance, and in extreme circumstances, hearing impairment.

Commonly used noise terms are presented in Appendix B. The unit of measurement used to describe a noise level is the decibel (dB). The human ear is not equally sensitive to all frequencies within the sound spectrum. Therefore, the "A-weighted" noise scale, which weights the frequencies to which humans are sensitive, is used for measurements. Noise levels using A-weighted measurements are written dB(A) or dBA.

From the noise source to the receiver, noise changes both in level and frequency spectrum. The most obvious is the decrease in noise as the distance from the source increases. The manner in which noise reduces with distance depends on whether the source is a point or line source as well as ground absorption, atmospheric effects and refraction, and shielding by natural and manmade features. Sound from point sources, such as air conditioning condensers, radiates uniformly outward as it travels away from the source in a spherical pattern. The noise drop-off rate associated with this geometric spreading is 6 dBA per each doubling of the distance (dBA/DD). Transportation noise sources such as roadways are typically analyzed as line sources, since at any given moment the receiver may be impacted by noise from multiple vehicles at various locations along the roadway. Because of the geometry of a line source, the noise drop-off rate associated with the geometric spreading of a line source is 3 dBA/DD.

Decibels are measured on a logarithmic scale, which quantifies sound intensity in a manner similar to the Richter scale used for earthquake magnitudes. Thus, a doubling of the energy of a noise source, such as a doubled traffic volume, would increase the noise levels by 3 dBA; halving of the energy would result in a 3 dBA decrease. Figure 3 shows the relationship of various noise levels to commonly experienced noise events.

Average noise levels over a period of minutes or hours are usually expressed as dBA L_{eq}, or the equivalent noise level for that period of time. For example, $L_{eq(3)}$ would represent a 3-hour average. When no period is specified, a one-hour average is assumed.

Noise standards for land use compatibility are stated in terms of the Community Noise Equivalent Level (CNEL) and the Day-Night Average Noise Level (DNL). CNEL is a 24-hour weighted average measure of community noise. CNEL is obtained by adding five decibels to sound levels in the evening (7:00 PM to 10:00 PM), and by adding ten decibels to sound levels at night (10:00 PM to 7:00 AM). This weighting accounts for the increased human sensitivity to noise during the evening and nighttime hours. DNL is a very similar 24-hour average measure that weights only the nighttime hours.

It is widely accepted that the average healthy ear can barely perceive changes of 3 dBA; that a change of 5 dBA is readily perceptible, and that an increase (decrease) of 10 dBA sounds twice (half) as loud. This definition is recommended by the California Department of Transportation's Technical Noise Supplement to the Traffic Noise Analysis Protocol (2013).

VIBRATION FUNDAMENTALS

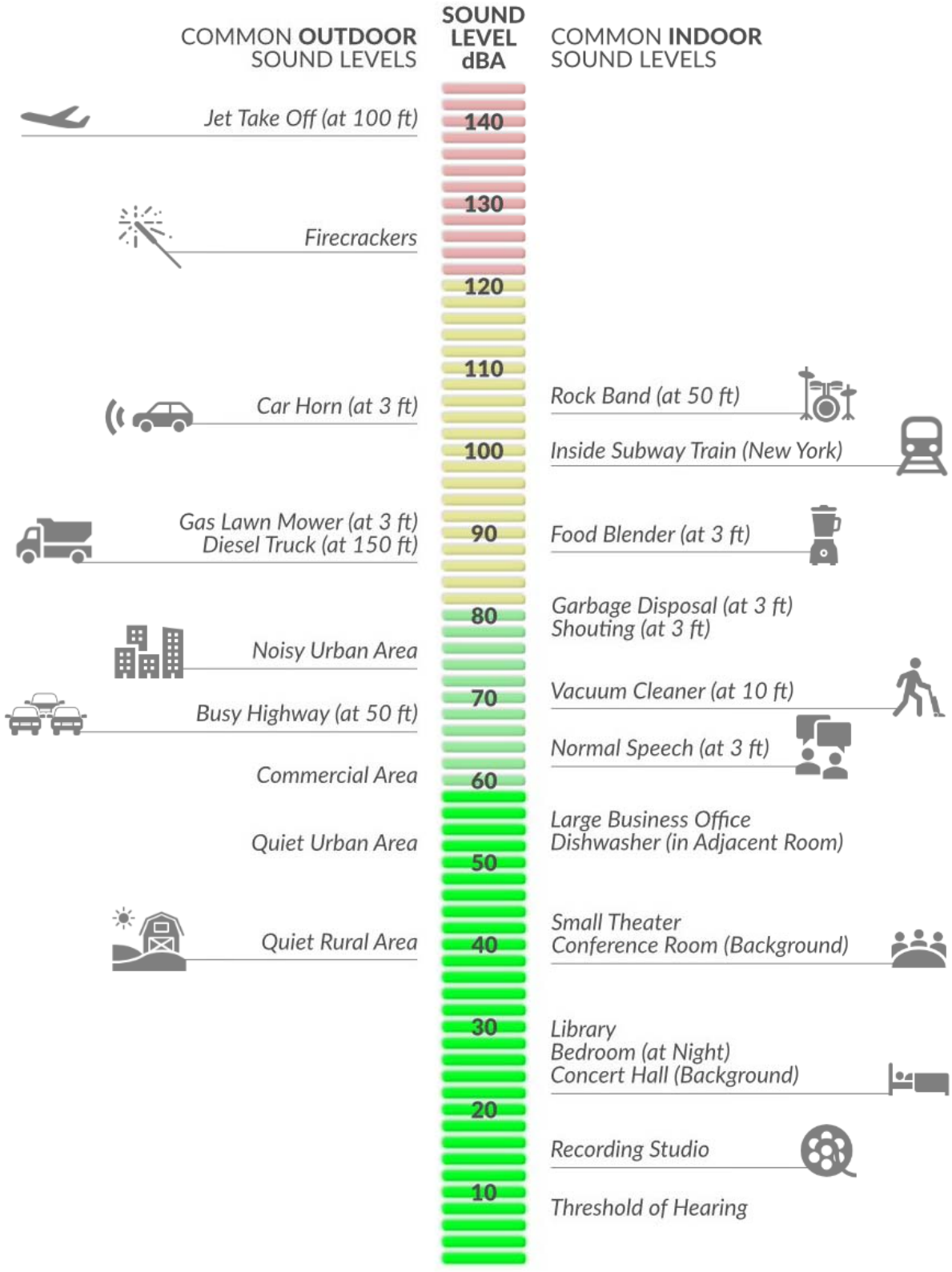
The way in which vibration is transmitted through the earth is called propagation. Propagation of earthborn vibrations is complicated and difficult to predict because of the endless variations in the soil through which waves travel. There are three main types of vibration propagation: surface, compression and shear waves.

Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by throwing a rock into a pool of water. Compression waves, or P-waves, are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. Shear waves, or S-waves, are also body waves that carry energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse or "side-to-side and perpendicular to the direction of propagation".

As vibration waves propagate from a source, the energy is spread over an ever-increasing area such that the energy level striking a given point is reduced with the distance from the energy source. This geometric spreading loss is inversely proportional to the square of the distance. Wave energy is also reduced with distance as a result of material damping in the form of internal friction, soil layering, and void spaces. The amount of attenuation provided by material damping varies with soil type and condition as well as the frequency of the wave.

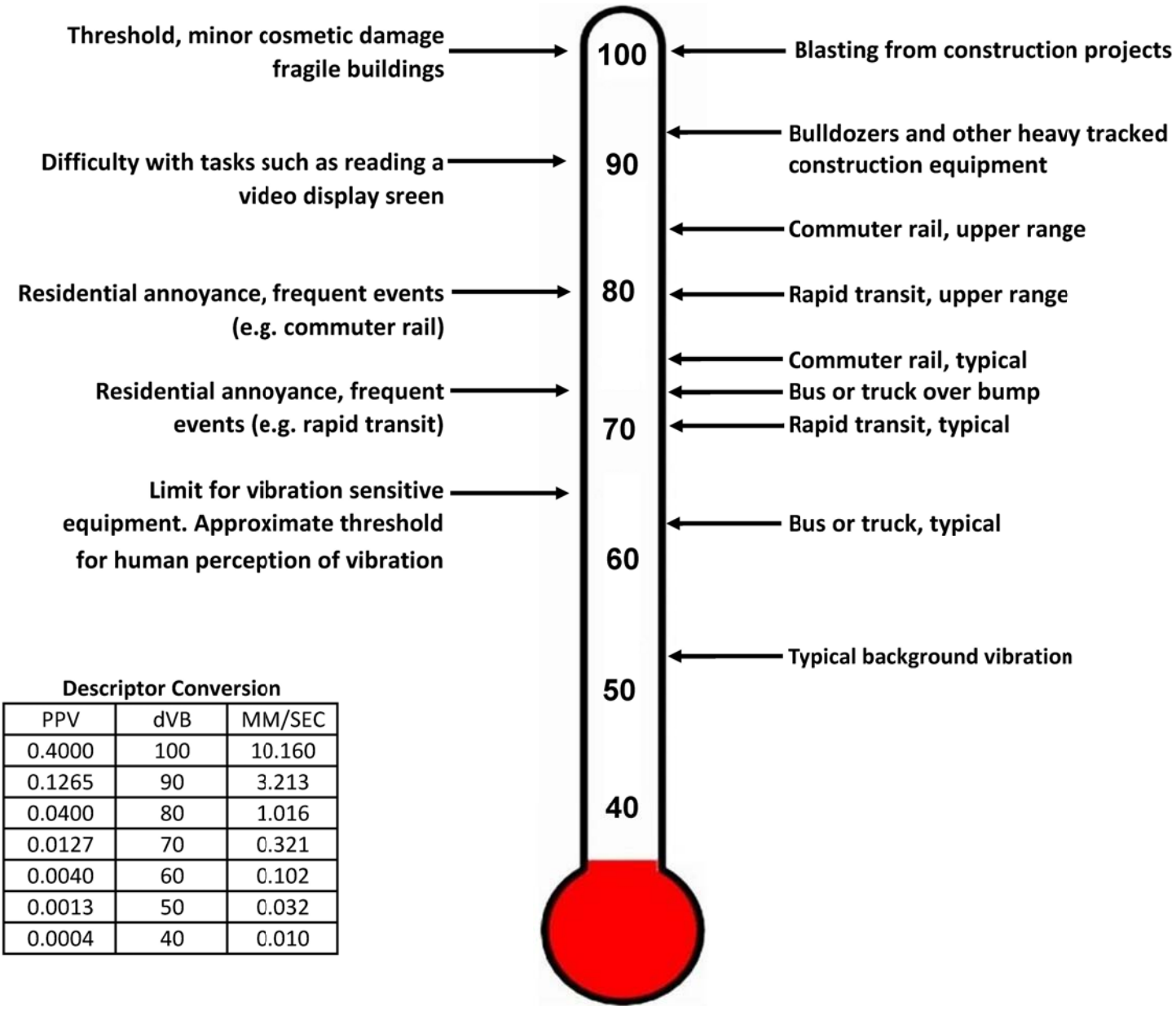
Vibration amplitudes are usually expressed as either peak particle velocity (PPV) or the root mean square (RMS) velocity. The PPV is defined as the maximum instantaneous peak of the vibration signal in inches per second. The RMS of a signal is the average of the squared amplitude of the signal in vibration decibels (VdB), ref one micro-inch per second. The Federal Railroad Administration uses the abbreviation "VdB" for vibration decibels to reduce the potential for confusion with sound decibel.

PPV is appropriate for evaluating the potential of building damage and VdB is commonly used to evaluate human response. Decibel notation acts to compress the range of numbers required in measuring vibration. Similar to the noise descriptors, L_{eq} and L_{max} can be used to describe the average vibration and the maximum vibration level observed during a single vibration measurement interval. Figure 4 illustrates common vibration sources and the human and structural responses to ground-borne vibration. As shown in Figure 4, the threshold of perception for human response is approximately 65 VdB; however, human response to vibration is not usually substantial unless the vibration exceeds 70 VdB. Vibration tolerance limits for sensitive instruments such as magnetic resonance imaging (MRI) or electron microscopes could be much lower than the human vibration perception threshold.



Based on Policy & Guidance from Federal Aviation Administration

Figure 3
A-Weighted Comparative Sound Levels



Descriptor Conversion

PPV	dVB	MM/SEC
0.4000	100	10.160
0.1265	90	3.213
0.0400	80	1.016
0.0127	70	0.321
0.0040	60	0.102
0.0013	50	0.032
0.0004	40	0.010

Source: FRA, 2012. Federal Railroad Administration High-Speed Ground Transportation Noise and Vibration Impact Assessment. Office of Railroad Policy Development, Washington, D.C. DOT/FRA/ORD-12/15. September.

Figure 4
Typical Levels of Groundborne Vibration

3. EXISTING NOISE ENVIRONMENT

This section describes the existing noise setting in the project vicinity.

EXISTING LAND USES AND SENSITIVE RECEPTORS

The project site is bordered by vacant land and a water tower to the north, vacant land to the east, vacant land to the west, and Verdemont Drive to the south.

The State of California defines sensitive receptors as those land uses that require serenity or are otherwise adversely affected by noise events or conditions. Schools, libraries, churches, hospitals, single and multiple-family residential, including transient lodging, motels and hotel uses make up the majority of these areas.

Sensitive land uses that may be affected by project noise include the proposed single-family residential use property lines located adjacent to the west and the existing single-family residential property lines located approximately 50 feet to the south (across Verdemont Drive) of the project site.

AMBIENT NOISE MEASUREMENTS

An American National Standards Institute (ANSI Section SI.4 2014, Class 1) Larson Davis model LxT sound level meter was used to document existing ambient noise levels. In order to document existing ambient noise levels in the project area, one (1) 15-minute daytime noise measurement was taken between 4:14 PM and 4:29 PM on April 11, 2024. Figure 5 shows the noise measurement location map. Field worksheets and noise measurement worksheets are provided in Appendix C

As shown on Figure 5, existing ambient noise measurements were taken at the following locations:

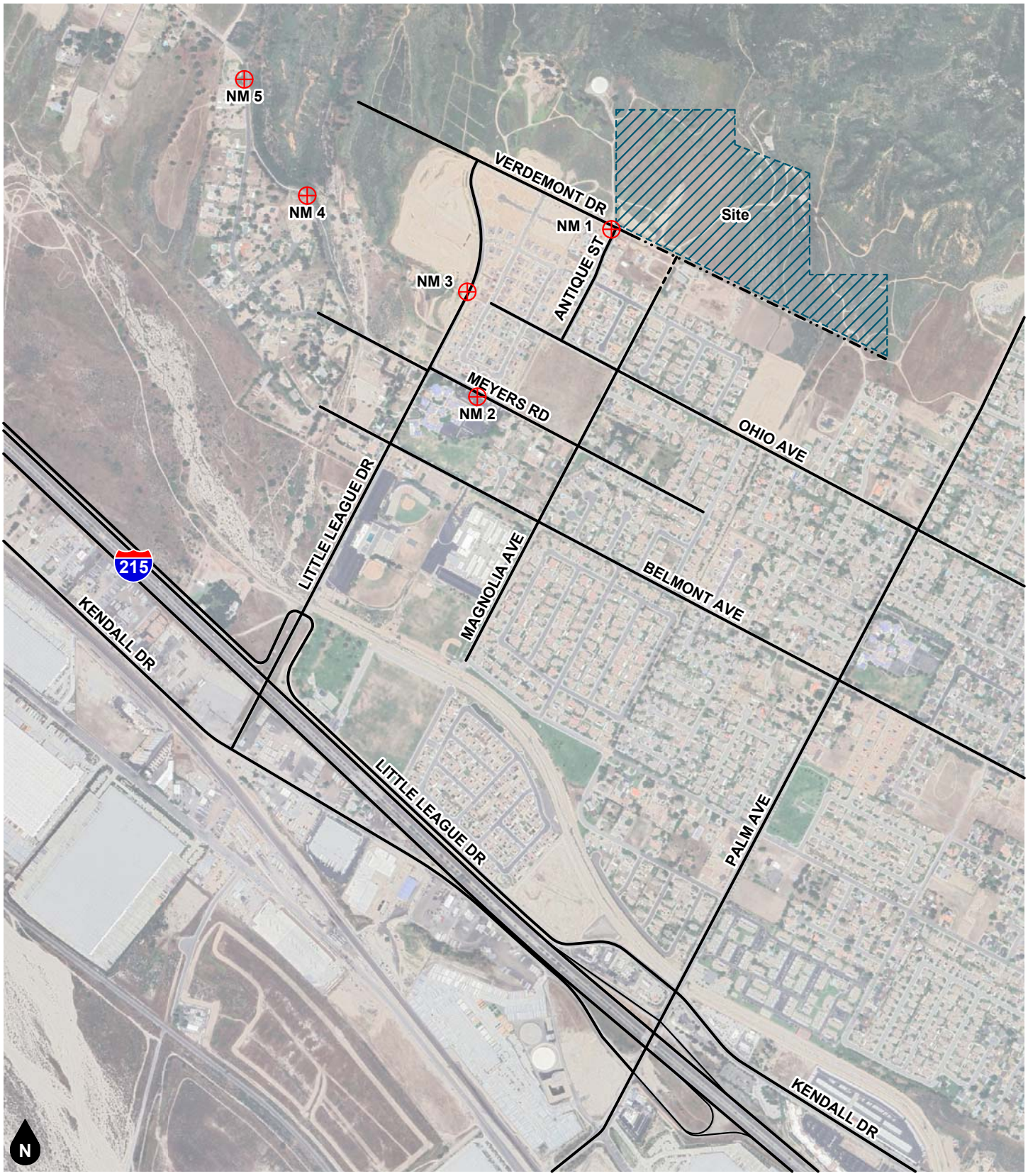
NM1: represents the existing noise environment of the residential uses located to the south and southwest of the project site along the southern side of Verdemont Drive (3304 Cathedral Court, San Bernardino). The noise meter was placed near the southwestern corner of the intersection of Verdemont Drive and Antique Street just northeast of the northern property line of the residential use.

Table 1 provides a summary of the short-term ambient noise data. The measured short-term ambient noise level is 44.3 dBA L_{eq}. The dominant noise source in the project vicinity was residential activity and bird song.

Table 1
Short-Term Noise Measurement Summary (dBA)

Daytime Measurements[1,2]								
Site Location	Time Started	Leq	Lmax	Lmin	L(2)	L(8)	L(25)	L(50)
NM1	4:14 PM	44.3	52.3	40.2	48.4	46.5	45.0	43.7

Notes:
(1) See Figure 5 for noise measurement location. The noise measurement was performed over a 15-minute duration.
(2) Noise measurement performed on April 11, 2024.



Legend

NM 1 Noise Measurement Location

Figure 5
Noise Measurement Location Map

4. REGULATORY SETTING

FEDERAL REGULATION

Federal Noise Control Act of 1972

The U.S. Environmental Protection Agency (EPA) Office of Noise Abatement and Control was originally established to coordinate federal noise control activities. After its inception, EPA's Office of Noise Abatement and Control issued the Federal Noise Control Act of 1972, establishing programs and guidelines to identify and address the effects of noise on public health, welfare, and the environment. In response, the EPA published Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (Levels of Environmental Noise). The Levels of Environmental Noise recommended that the Ldn should not exceed 55 dBA outdoors or 45 dBA indoors to prevent significant activity interference and annoyance in noise-sensitive areas.

In 1981, EPA administrators determined that subjective issues such as noise would be better addressed at lower levels of government. Consequently, in 1982 responsibilities for regulating noise control policies were transferred to State and local governments. However, noise control guidelines and regulations contained in EPA rulings in prior years remain in place by designated Federal agencies, allowing more individualized control for specific issues by designated Federal, State, and local government agencies.

STATE REGULATIONS

State of California General Plan Guidelines 2017

Though not adopted by law, the State of California General Plan Guidelines 2017, published by the California Governor's Office of Planning and Research (OPR) (OPR Guidelines), provides guidance for the compatibility of projects within areas of specific noise exposure. The OPR Guidelines identify the suitability of various types of construction relative to a range of outdoor noise levels and provide each local community some flexibility in setting local noise standards that allow for the variability in community preferences. Findings presented in the Levels of Environmental Noise Document (EPA 1974) influenced the recommendations of the OPR Guidelines, most importantly in the choice of noise exposure metrics (i.e., Ldn or CNEL) and in the upper limits for the normally acceptable outdoor exposure of noise-sensitive uses.

The OPR Guidelines include a Noise and Land Use Compatibility Matrix which identifies acceptable and unacceptable community noise exposure limits for various land use categories. Where the "normally acceptable" range is used, it is defined as the highest noise level that should be considered for the construction of the buildings which do not incorporate any special acoustical treatment or noise mitigation. The "conditionally acceptable" or "normally unacceptable" ranges include conditions calling for detailed acoustical study prior to the construction or operation of the proposed project.

Federal Transit Administration

The Federal Transit Administration (FTA) has adopted vibration standards that are used to evaluate potential building damage impacts related to construction activities. As shown in Table 2, the threshold at which there is a risk to "architectural" damage to reinforced-concrete, steel or timber (no plaster) buildings is a peak particle velocity (PPV) of 0.5, at engineered concrete and masonry (no plaster) buildings a PPV of 0.3, at non-engineered timber and masonry buildings a PPV of 0.2 and at buildings extremely susceptible to vibration damage a PPV of 0.1.

The FTA has also adopted standards associated with human annoyance for groundborne vibration impacts for the following three land-use categories:

(1) Vibration Category 1 – High Sensitivity,

(2) Vibration Category 2 – Residential, and

(3) Vibration Category 3 – Institutional.

The FTA defines Category 1 as buildings where vibration would interfere with operations within the building, including vibration-sensitive research and manufacturing facilities, hospitals with vibration-sensitive equipment, and university research operations. Vibration-sensitive equipment includes, but is not limited to, electron microscopes, high-resolution lithographic equipment, and normal optical microscopes. Category 2 refers to all residential land uses and any buildings where people sleep, such as hotels and hospitals. Category 3 refers to institutional land uses such as schools, churches, other institutions, and quiet offices that do not have vibration-sensitive equipment, but still have the potential for activity interference. The vibration criteria associated with human annoyance for these three land-use categories are shown in Table 3. Table 3 shows that 72 VdB is the threshold for annoyance from groundborne vibration at sensitive receptors.

Therefore, impacts related to building damage would be significant if construction activities result in groundborne vibration of 0.2 PPV or higher at residential structures and/or a PPV of 0.3 or higher at commercial structures. Impacts related to human annoyance would be significant if they result in groundborne vibration levels that exceed 72 VdB at sensitive receptor locations.

LOCAL REGULATIONS

City of San Bernardino General Plan

The General Plan Noise Element includes land use planning tools to reduce future noise related land use incompatibilities. These include criteria that specify acceptable limits of noise for various land uses throughout the City. These criteria are designed to integrate noise considerations into land use planning to prevent noise/land use conflicts. The City of San Bernardino has adopted their own version of the State Land Use Compatibility Guidelines (see Table 4). Table 4 presents criteria used to assess the compatibility of proposed land uses with the noise environment. These criteria are the basis for the development of specific Noise Standards (see Table 5). These tables are the primary tools which allow the City to ensure integrated planning for compatibility between land uses and outdoor noise.

The City has also established goals and policies regarding noise within the community. The goals and policies applicable to the proposed project are below.

Goal 14.1 Ensure that residents are protected from excessive noise through careful land planning.

Policies:

14.1.1 Minimize, reduce, or prohibit, as may be required, the new development of housing, health care facilities, schools, libraries, religious facilities, and other noise sensitive uses in areas where existing or future noise levels exceed an Ldn of 65 dB(A) exterior and an Ldn of 45 dB(A) interior if the noise cannot be reduced to these levels.

Goal 14.2 Encourage the reduction of noise from transportation-related noise sources such as motor vehicles, aircraft operations, and railroad movements.

Policies:

14.2.2 Employ noise sensitive mitigation practices when designing future streets and highways, and when improvements occur along existing road segments. Mitigation Measures should emphasize the establishment of natural buffers or setbacks between the arterial roadways and adjoining noise-sensitive areas.

14.2.3 Require that development that increases the ambient noise level adjacent to noise-sensitive land uses provide appropriate mitigation measures.

14.2.6 Buffer residential neighborhoods from noise caused by train operations and increasing high traffic volumes along major arterials and freeways.

14.2.8 Minimize noise attributable to vehicular travel in residential neighborhoods by inhibiting through trips by the use of cul-de-sacs, one-way streets, and other traffic controls.

14.2.10 Provide for the development of alternative transportation modes such as bicycle paths and pedestrian walkways to minimize the number of automobile trips.

14.2.19 As may be necessary, require acoustical analysis and ensure the provision of effective noise mitigation measures for sensitive land uses, especially residential uses, in areas significantly impacted by noise.

Goal 14.3 Protect residents from the negative effects of "spill over" or nuisance noise.

Policies:

14.3.1 Require that construction activities adjacent to residential units be limited as necessary to prevent adverse noise impacts.

14.3.2 Require that construction activities employ feasible and practical techniques that minimize the noise impacts on adjacent uses.

City of San Bernardino Municipal Code

8.54.020 Prohibited Acts.

It shall be unlawful for any person to engage in the following activities:

I. The creation of loud and excessive noise in connection with the loading or unloading of motor trucks and other vehicles.

L. The operation or use between the hours of 10:00 PM and 8:00 AM of any pile driver, steam shovel, pneumatic hammers, derrick, steam or electric hoist, power drive saw, or any other tool or apparatus, the use of which is attended by loud and excessive noise, except with the approval of the City.

M. Creating excessive noise adjacent to any school, church, court, or library while the same is in use, or adjacent to any hospital or care facility, 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 the presence of a school, institution of learning, church, court, or hospital.

N. Making or knowingly and unreasonably permitting to be made any unreasonably loud, unnecessary, or unusual noise that disturbs the comfort, repose, health, peace, and quiet, or which causes discomfort or annoyance to any reasonable person of normal sensitivity. The characteristics and conditions that may be considered in determining whether this section has been violated include, but are not limited to, the following:

1. The level of noise;
2. The level of background noise;
3. The proximity of the noise to sleeping facilities;
4. The nature and zoning of the areas within which the noise emanates;
5. The density of the inhabitation of the area within which the noise emanates;
6. The time of day or night the noise occurs;

7. The duration of the noise;
8. Whether the noise is recurrent, intermittent, or constant; and
9. Whether the noise is produced by a commercial or noncommercial activity.

8.54.050 Controlled Hours of Operation.

It shall be unlawful for any person to engage in the following activities other than between the hours of 8:00 AM and 8:00 PM in residential zones and between the hours of 7:00 AM and 8:00 PM in all other zones:

C. Operate or permit the use of domestic power tools, or machinery or any other equipment or tool in any garage, workshop, house, or any other structure.
D. Operate or permit the use of gasoline or electric powered leaf blowers, such as commonly used by gardeners and other persons for cleaning lawns, yards, driveways, gutters, and other property.

8.54.060 Exemptions.

The following activities and noise sources shall be exempt from the provisions of this chapter:

B. Such noises as are an accompaniment and effect of a lawful business, commercial or industrial enterprise carried on in an area zoned for that purpose, except where there is evidence that such noise is a nuisance and that such a nuisance is a result of the employment of unnecessary and injurious methods of operation.
C. Activities conducted on the grounds of any public or private school during regular hours of operation.
G. Construction, repair, or excavation necessary for the immediate preservation of life or property.
I. Construction, repair, or excavation work performed pursuant to a valid written agreement with the City, or any of its political subdivisions, which provides for noise mitigation measures.
J. Any activity to the extent that regulation thereof has been preempted by State and Federal law.

8.54.070 Disturbances from Construction Activity.

No person shall be engaged or employed or cause any other person to be engaged or employed, in any work of construction, erection, alteration, repair, addition, movement, demolition, or improvement to any building or structure except within the hours of 7:00 AM and 8:00 PM.

19.20.030.15 Property Development Standards – Noise.

No loudspeaker, bells, gongs, buzzers, mechanical equipment or other sounds, attention-attracting, or communication device associated with any use shall be discernible beyond any boundary line of the parcel, except fire protection devices, burglar alarms and church bells. The following provisions shall apply:

A. In residential areas, no exterior noise level shall exceed 65dBA and no interior noise level shall exceed 45dBA.

Table 2
Construction Vibration Damage Criteria

Building/Structural Category	PPV, in/sec	Approximate L_v[1]
I. Reinforced-concrete, steel or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extremelly susceptible to vibration damage	0.1	90

Source: Federal Transit Administration (FTA), Transit Noise and Vibration Impact Assessment Manual (September 2018).

(1) RMS velocity in decibels, VdB re 1 micro-in/sec.

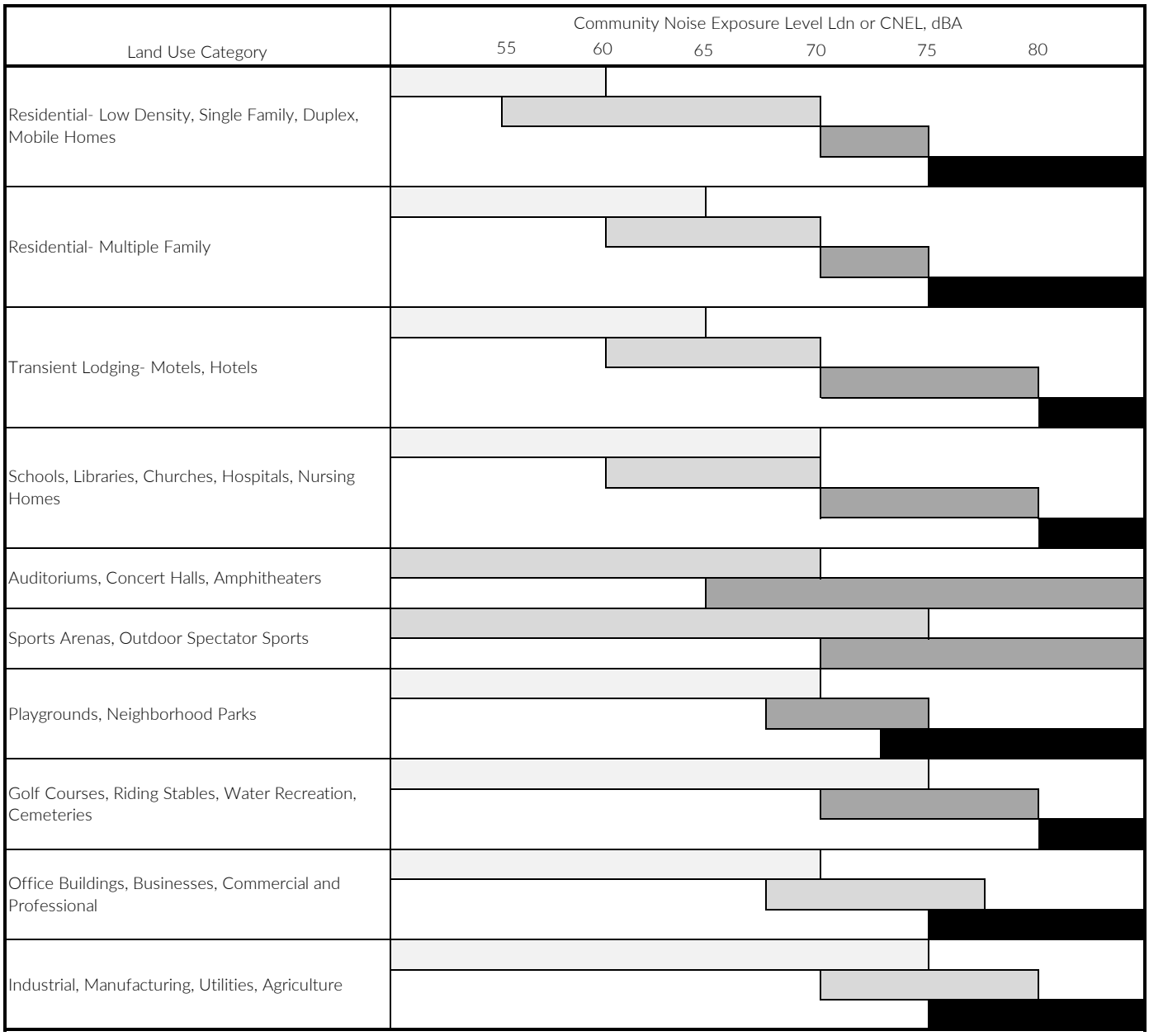
Table 3
Ground-Borne Vibration (GBV) Impact Criteria for General Vibration Assessment

Land Use Category	GBV Impact Levels (VdB re 1 micro-inch/sec)		
	Frequent Events	Occasional Events	Infrequent Events
Category 1: Buildings where vibration would interfere with interior operations.	65 VdB*	65 VdB*	65 VdB*
Category 2: Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB
Category 3: Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB

Source: Federal Transit Administration (FTA), Transit Noise and Vibration Impact Assessment Manual (September 2018).

*This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. For equipment that is more sensitive, a Detailed Vibration Analysis must be performed.

Table 4
City of San Bernardino Land Use Compatibility for Community Noise Exposure



Normally Acceptable:	Specified land use is satisfactory based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
Conditionally Acceptable:	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice. Outdoor environment will seem noisy.
Normally Unacceptable:	New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made with needed noise insulation features included in the design. Outdoor areas must be shielded.
Clearly Unacceptable:	New construction or development should generally not be undertaken. Construction cost to make the indoor environment acceptable would be prohibitive and the outdoor environment would not be usable.

Source: City of San Berarndino General Plan Noise Element, Figure N-1, November 2005.

Table 5
City of San Bernardino Interior and Exterior Noise Standards

Land Use Categories[1]		CNEL (dBA)	
Categories	Uses	Interior[2]	Exterior[3]
Residential	Single and Multiple-Family, Duplex	45 [4]	65
	Mobile Homes	---	65 [5]
Commercial	Hotel, Motel, Transient Housing	45	---
	Commercial Retail, Bank, Restaurant	55	---
	Office Building, Research and Development, Professional Offices	50	---
	Amphitheatre, Concert Hall, Auditorium, Meeting Hall	45	---
	Gymnasium (Multipurpose)	50	---
	Sports Club	55	---
	Manufacturing, Warehousing, Wholesale, Utilities	65	---
	Movie Theaters	45	---
Institutional/ Public	Hospital, School Classrooms/Playgrounds	45	65
	Church, Library	45	---
Open Space	Parks	---	65

Notes:

(1) Source: City of San Bernardino General Plan 2005: Table N-3, 2005.

(2) Indoor environment excluding: bathrooms, kitchens, toilets, closets, and corridors.

(3) Outdoor environment limited to:

- Private yard of single-family dwellings
- Multiple-family private patios or balconies accessed from within the dwelling (Balconies 6 feet deep or less are exempt)
- Mobile home parks
- Hotel and motel recreation area
- Park picnic areas
- School playgrounds
- Hospital patios

(4) Noise level requirement with closed windows, mechanical ventilation or other means of natural ventilation shall be provided as per Chapter 12, Section 1205 of the Uniform Building Code.

(5) Exterior noise levels should be such that interior noise levels will not exceed 45 dBA CNEL.

5. ANALYTICAL METHODOLOGY AND MODEL PARAMETERS

This section discusses the analysis methodologies used to assess noise impacts.

CONSTRUCTION NOISE MODELING

Construction noise will vary depending on the construction process, type of equipment involved, location of the construction site with respect to sensitive receptors, the schedule proposed to carry out each task (e.g., hours and days of the week) and the duration of the construction work.

Construction noise associated with the proposed project was calculated at the sensitive receptor locations utilizing methodology presented in the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (2018) together with several key construction parameters, including: distance to each sensitive receiver, equipment usage, percent usage factor, and baseline parameters for the project site.

The equipment used to calculate the construction noise levels for each phase were based on the assumptions provided in the CalEEMod modeling in the Air Quality Study prepared for the proposed project (Lilburn, 2024). For analysis purposes, the distance measured from the project site to sensitive receptors was assumed to be the acoustical center of the project site to the property line of residential properties with existing residential buildings. Sound emission levels associated with typical construction equipment as well as typical usage factors are provided in Table 6. Construction noise worksheets are provided in Appendix D.

MOBILE SOURCE NOISE MODELING

Existing and Existing Plus Project Traffic Noise Levels

Noise from vehicular traffic (Existing and Existing Plus Project) was modeled using a computer program that replicates the FHWA Traffic Noise Prediction Model (FHWA-RD-77-108). The FHWA model arrives at the predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). Key model parameters and REMEL adjustments are presented below:

- Roadway classification (e.g., freeway, major arterial, arterial, secondary, collector, etc.),
- Roadway active width (distance between the center of the outer most travel lanes on each side of the roadway),
- Average Daily Traffic (ADT) Volumes, Travel Speeds, Percentages of automobiles, medium trucks and heavy trucks,
- Roadway grade and angle of view,
- Site conditions (e.g., soft vs. hard), and
- Percentage of total ADT which flows each hour throughout a 24-hour period.

Traffic noise levels were calculated at the right-of-way based on distance from the centerline of the analyzed roadway. The modeling is theoretical and does not take into account any existing barriers, structures, and/or topographical features that may further reduce noise levels. Therefore, the modeled noise levels are shown for comparative purposes only to show the difference between with and without project conditions. Traffic noise calculation worksheets are included Appendix E
.

Project generated vehicle traffic is expected to utilize Verdemont Drive to access the project site. Existing average daily vehicle trips, project average daily vehicle trips, and project trip distribution were provided in the *TTM 20707 (Magnolia and Verdemont) Traffic Impact Analysis* (TIA) prepared for the project (Ganddini 2024). Per the TIA, the project is anticipated to generate 1,084 new daily trips. Table 7 includes the modeled roadway segments as well as the average daily traffic volumes, posted speed limits, and vehicle mix utilized in this analysis.

Future Roadway Noise

The SoundPLAN acoustical modeling software was utilized to model future roadway noise levels at the proposed sensitive receptors (e.g., residences). SoundPLAN is capable of evaluating both mobile and stationary noise sources (e.g., vehicle traffic, rail, parking lots, drive-thru menus, car wash equipment, vacuums, etc.). The SoundPLAN software utilizes algorithms (based on the inverse square law) to calculate noise level projections. The software allows the user to input specific noise sources, spectral content, sound barriers, building placement, topography, and sensitive receptor locations.

Verdemont Drive borders the project site to the south. As stated in the TIA prepared for the proposed project, Verdemont Drive east of Magnolia Avenue is currently designated as a Collector (60 feet ROW and 40 feet roadway) on the City of San Bernardino General Plan Circulation Element. Currently, the portion of Verdemont Drive adjacent to the project site is either a dirt road or undeveloped. The SoundPLAN noise model was used to model Future Level of Service C (noisiest condition) vehicle traffic noise associated with Verdemont Drive at the proposed residential lots. Verdemont Drive was modeled with an average daily trip volume of 4,300 (County of San Bernardino 2019) and a speed of 40 miles per hour. SoundPLAN data sheets are provided in Appendix F.

GROUNDBORNE VIBRATION MODELING

Groundborne vibration modeling was performed using vibration propagation equations and construction equipment source levels obtained from the FTA *Transit Noise and Vibration Impact Assessment Manual* (2018). Table 8 shows typical vibration levels associated with commonly used construction equipment based on data from the FTA.

There are several types of construction equipment that can cause vibration levels high enough to annoy persons in the vicinity and/or result in architectural or structural damage to nearby structures and improvements. For example, as shown in Table 8, a vibratory roller could generate up to 0.21 in/sec PPV at and operation of a large bulldozer could generate up to 0.089 PPV at a distance of 25 feet (two of the most vibratory pieces of construction equipment). Groundborne vibration at sensitive receptors associated with this equipment would drop off as the equipment moves away. For example, as the vibratory roller moves further than 100 feet from the sensitive receptors, the vibration associated with it would drop below 0.0026 in/sec PPV. It should be noted that these vibration levels are reference levels and may vary slightly depending upon soil type and specific usage of each piece of equipment. Groundborne vibration calculations are provided in Appendix G.

The fundamental equation used to calculate vibration propagation through average soil conditions and distance is as follows:

$$PPV_{equipment} = PPV_{ref} (25/D_{rec})^{n}$$

Where: PPV_{ref} = *reference PPV at 25ft.*
D_{rec} = *distance from equipment to receiver in ft.*
n = 1.5 (*the value related to the attenuation rate through ground*)

Table 6
CA/T Equipment Noise Emissions and Acoustical Usage Factor Database

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Spec. Lmax @ 50ft (dBA, slow)	Actual Measured Lmax @ 50ft (dBA, slow)	No. of Actual Data Samples (Count)
All Other Equipment > 5 HP	No	50	85	-N/A-	0
Backhoe	No	40	80	78	372
Compressor (air)	No	40	80	78	18
Concrete Batch Plant	No	15	83	-N/A-	0
Concrete Mixer Truck	No	40	85	79	40
Concrete Pump Truck	No	20	82	81	30
Crane	No	16	85	81	405
Dozer	No	40	85	82	55
Drum Mixer	No	50	80	80	1
Dump Truck	No	40	84	76	31
Excavator	No	40	85	81	170
Flat Bed Truck	No	40	84	74	4
Forklift[2,3]	No	50	n/a	61	n/a
Front End Loader	No	40	80	79	96
Grader	No	40	85	-N/A-	0
Jackhammer	Yes	20	85	89	133
Pavement Scarafier	No	20	85	90	2
Paver	No	50	85	77	9
Pickup Truck	No	50	85	77	9
Paving Equipment	No	50	85	77	9
Pneumatic Tools	No	50	85	85	90
Roller	No	20	85	80	16
Scraper	No	40	85	84	12
Tractor	No	40	84	-N/A-	0
Vibratory Concrete Mixer	No	20	80	80	1
Warning Horn	No	5	85	83	12
Welder/Torch	No	40	73	74	5

Notes:

(1) Source: FHWA Roadway Construction Noise Model User's Guide January 2006.

(2) Warehouse & Forklift Noise Exposure - NoiseTesting.info Carl Stautins, November 4, 2014 http://www.noisetesting.info/blog/carl-strautins/page-3/

(3) Data provided Leq as measured at the operator. Sound Level at 50 feet is calculated using Inverse Square Law.

Table 7
Project Average Daily Traffic Volumes and Roadway Parameters

Roadway	Segment	Average Daily Traffic Volume[1]		Posted Travel Speeds (MPH)	Site Conditions
		Existing	Existing Plus Project		
Verdemont Dr	Little League Dr to Antique St	177	617	25	Hard
	East of Antique St	177	777	25	Hard
Ohio Ave	West of Magnolia Ave	400	1,050	25	Hard
Meyers Road	Little League Dr to Magnolia Ave	1,100	1,150	25	Hard
Belmont Ave	Magnolia Ave to Palm Ave	2,300	2,840	25	Hard
	East of Palm Ave	2,100	2,150	25	Hard
Kendall Dr	Northwest of Little League Dr	5,600	5,930	45	Hard
	Southeast of Little League Dr	3,800	3,910	45	Hard
	East of Palm Ave	14,900	15,010	50	Hard
Little League Dr	Verdemont Dr to Meyers Road	400	840	25	Hard
	Meyers Road to Belmont Ave	1,800	2,240	25	Hard
	Belmont Ave to Little League Frontage Dr	2,300	2,740	25	Hard
	South of Little League Frontage Dr	2,500	2,940	25	Hard
Antique St	Verdemont Dr to Ohio Ave	147	797	25	Hard
Magnolia Ave	Ohio Ave to Meyers Road	600	1,250	25	Hard
	Meyers Road to Belmont Ave	1,400	1,990	25	Hard
	South of Belmont Ave	800	850	25	Hard
Palm Ave	Ohio Ave to Belmont Ave	4,500	4,550	25	Hard
	Belmont Ave to Little League Frontage Dr/Kendall Ave	12,800	13,230	45	Hard
	South of Little League Frontage Dr/Kendall Ave	20,400	20,720	45	Hard

Vehicle Distribution (Light Mix)[2]			
Motor-Vehicle Type	Daytime % (7 AM-7 PM)	Evening % (7 PM-10 PM)	Night % (10 PM-7 AM)
Automobiles	75.56	13.96	10.49
Medium Trucks	48.91	2.17	48.91
Heavy Trucks	47.30	5.41	47.30

Vehicle Distribution (Heavy Mix)[2]			
Motor-Vehicle Type	Daytime % (7 AM-7 PM)	Evening % (7 PM-10 PM)	Night % (10 PM-7 AM)
Automobiles	75.54	14.02	10.43
Medium Trucks	48.00	2.00	50.00
Heavy Trucks	48.00	2.00	50.00

Notes:

(1) Existing and Project average daily traffic volumes obtained from the TTM 20707 (Magnolia and Verdemont) Traffic Impact Analysis (Traffic Impact Analysis) prepared by Ganddini Group, Inc. (October 3, 2024). However, the existing trips for Verdemont Drive and Antique Street were labeled as 0 on Figure 12 of the Traffic Impact Analysis. Therefore, in order to model noise levels, the measured ambient noise level (Table 1, NM1) was used to estimate the exsting traffic volumes for these two segments. Furthermore, as not provided in the project's Traffic Impact Analysis, the existing traffic volumes for Kendall Drive northwest and southeast of Little League Drive were obtained from the Kendall Drive Industrial Building Noise Impact Analysis prepared by Ganddini Group, Inc. (revised July 28, 2023).

(2) Existing vehicle percentages are based on the Riverside County Industrial Hygiene Letter for Traffic Noise.

Table 8
Construction Equipment Vibration Source Levels

Equipment		PPV at 25 ft, in/sec	Approximate Lv* at 25 ft
Pile Driver (impact)	upper range	1.518	112
	typical	0.644	104
Pile Driver (sonic)	upper range	0.734	105
	typical	0.170	93
clam shovel drop (slurry wall)		0.202	94
Hydromill (slurry wall)	in soil	0.008	66
	in rock	0.017	75
Vibratory Roller		0.210	94
Hoe Ram		0.089	87
Large Bulldozer		0.089	87
Caisson Drilling		0.089	87
Loaded Trucks		0.076	86
Jackhammer		0.035	79
Small Bulldozer		0.003	58

Source: Federal Transit Administration: Transit Noise and Vibration Impact Assessment Manual, 2018.
*RMS velocity in decibels, VdB re 1 micro-in/sec

6. NOISE AND VIBRATION IMPACTS

This section analyzes the significance of project-related noise and groundborne vibration impacts relative to standards established by the City of San Bernardino and other applicable agencies in the context of CEQA. Appendix G of the California Environmental Quality Act Guidelines (Title 14, Division 6, Chapter 3 of the California Code of Regulations) includes an environmental checklist that identifies issues upon which findings of significance should be made. The CEQA Environmental Checklist Appendix G, XIII. Noise, requires determination if the project would result in:

a) *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?*

b) *Generation of excessive groundborne vibration or groundborne noise levels?*

c) *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 area to excessive noise levels?*

NOISE IMPACTS

Would the project result in:

a) *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?*

Finding: Less Than Significant

In relation to the Environmental Checklist noise issue "a", applicable standards established by the City of San Bernardino can be categorized into the following areas:

- Construction Noise
- Operational Noise

Project Construction

On-Site Equipment

Construction noise is regulated within Section 8.54.070 of the City of San Bernardino's Municipal Code which prohibits construction activities other than between the hours of 7:00 AM to 8:00 PM. However, neither the City of San Bernardino General Plan or Municipal Code establish numeric maximum acceptable construction source noise levels at potentially affected receivers, which would allow for a quantified determination of what CEQA consists as a *substantial temporary or periodic noise increase*. Therefore, a numerical construction noise threshold based on the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* is used for analysis of daytime construction impacts, as discussed below.

According to the FTA, local noise ordinances are typically not very useful in evaluating construction noise. They usually relate to nuisance and hours of allowed activity, and sometimes specify limits in terms of maximum levels, but are generally not practical for assessing the impact of a construction project. 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 adjacent land use. Due to the lack of standardized construction noise thresholds, the FTA provides guidelines that can be considered reasonable

criteria for construction noise assessment. The FTA considers a daytime exterior construction noise level of 80 dBA L_{eq} as a reasonable threshold for noise sensitive residential land use.

Accordingly, the project would result in a significant impact if:

- Project construction occurs outside the hours of 7:00 AM and 8:00 PM or,
- Project construction noise exceeds 80 dBA L_{eq} at a residential use.

Project construction noise levels at nearby sensitive receptors were calculated using the FTA methodology. Construction noise modeling worksheets for each phase are provided in Appendix D. Anticipated noise levels during each construction phase are presented in Table 9.

The single-family residential uses to the south of the project site boundaries may be affected by short-term noise impacts associated with construction noise. Construction noise will vary depending on the construction process, type of equipment involved, location of the construction site with respect to sensitive receptors, the schedule proposed to carry out each task (e.g., hours and days of the week) and the duration of the construction work. Assumptions for the phasing, duration, and required equipment for the construction of the proposed project were obtained from the project applicant.

As shown in Table 9 modeled construction noise levels are forecast to reach up to 67.1 dBA L_{eq} at the nearest residential property line to the south of the project site. Table 9 also includes a comparison of existing noise levels and project construction noise levels. Noise measurement (NM)1 was chosen to represent noise levels at the nearest property lines of the residential uses located to the south of the project site.

Project construction will not occur outside of the hours outlined as "exempt" in City of San Bernardino's Municipal Code Section 8.54.070. Based on the modeled construction noise levels (see Table 9), construction noise levels are estimated to reach up to 67.1 dBA L_{eq} at the nearest residential use and will not exceed the FTA residential construction noise standard of 80 dBA L_{eq}. Therefore, the project would not exceed established standards relating to construction noise. The project impact is less than significant; no mitigation is required.

Notwithstanding the above, best management practices (BMPs) provided in the Project Description should be added to project plans and in contract specifications to minimize construction noise emanating from the proposed project.

Off-Site Vehicle Trips

Construction truck trips would occur throughout the construction period. According to the FHWA, the traffic volumes need to be doubled in order to increase noise levels by 3 dBA CNEL.[1] The estimated existing average daily trips along Magnolia Avenue is between 600 to 1,400 daily vehicle trips.[2] As shown in the CalEEMod output files provided in the Air QualityStudy prepared for the proposed project (Lilburn, 2024) the greatest number of construction-related vehicle trips per day would be up to 54 vehicle trips per day during building construction (41.4 for worker trips and 12.3 for vendor trips). Given the project site's location, it is anticipated that vendor and/or haul truck traffic would take the most direct route to the 215 Freeway. Therefore, the addition of project vendor/haul trucks and worker vehicles per day along off-site roadway segments would

[1] Federal Highway Administration, Highway Noise Prediction Model, December 1978.

[2] This analysis does not compare the project generated construction vehicle trips to the existing trips along Verdemont Drive as the portion of Verdemont Drive that lies adjacent to the project site is currently a dirt road and/or undeveloped and is to be constructed as part of the proposed project. Therefore, as Verdemont Drive is part of the project, the construction trips have been analyzed as being added to Magnolia Aenue rather than Verdemont Drive. The existing average daily traffic volume for Magnolia Avenue was obtained from the TTM 20707 (Magnolia and Verdemont) Traffic Impact Analysis (Traffic Impact Analysis) prepared by Ganddini Group, Inc. (October 3, 2024).

not be anticipated to result in a doubling of traffic volumes. Off-site project generated construction vehicle trips would result in a negligible noise level increase and would not result in a substantial increase in ambient noise levels. Impacts would be less than significant. No mitigation measures are required.

Project Operational Noise

Future Roadway Noise to the Project

Verdemont Drive borders the project site to the south. As stated in the TIA prepared for the proposed project, Verdemont Drive east of Magnolia Avenue is currently designated as a Collector (60 feet ROW and 40 feet roadway) on the City of San Bernardino General Plan Circulation Element. Future traffic noise levels were modeled at the proposed residential lots using the SoundPLAN noise model. As shown in Figure 6, future traffic noise levels will not exceed 65 dBA CNEL at the proposed residential lots. Future traffic impacts to the proposed project associated with Verdemont Drive will be less than significant; no mitigation is required.

Offsite Operational Noise Sources

California courts have rejected use of what is effectively a single "absolute noise level" threshold of significance (e.g., exceed 65 dBA CNEL) on the grounds that the use of such a threshold fails to consider the magnitude or severity of increases in noise levels attributable to the project in different environments (see *King and Gardiner Farms, LLC v. County of Kern* (2020) 45 Cal.App.5th 814). California courts have also upheld the use of "ambient plus increment" thresholds for assessing project noise impacts as consistent with CEQA, noting however, that the severity of existing noise levels should not be ignored by incorporating a smaller incremental threshold for areas where existing ambient noise levels were already high (see *Mission Bay Alliance v. Office of Community Investment and Infrastructure* (2016) 6 Cal.App.5th 160).

The City of San Bernardino has adopted a Land Use Compatibility Guidelines (Table 4). The City of San Bernardino General Plan identifies exterior noise levels up to 60 dBA CNEL as normally acceptable and up to 70 dBA as conditionally acceptable for single-family residential uses (see Table 4). As shown in Table 5, the city also identifies noise standards for single-family residential uses of 65 dBA CNEL exterior and 45 dBA CNEL interior. Facades with anticipated noise levels of 65 dBA CNEL are expected to have interior noise levels that do not exceed 45 dBA CNEL. This is based on the assumption that heating and ventilation systems will be provided in order to allow for a windows-closed condition.

Based on the case described above, it is important to consider impacts in light of the existing ambient noise level and the adopted agency standards, which in this case includes the Land Use Compatibility Guidelines (Table 4). Furthermore, it is widely accepted that the average healthy human ear can barely perceive changes of 3 dBA in an outdoor environment and that a change of 5 dBA is readily perceptible.[3] Accordingly, the project's offsite roadway noise impacts shall be considered significant if any of the following occur as a direct result of the proposed development:

- Noise levels are expected to exceed the City's applicable "normally acceptable" noise level criteria found in their Land Use Compatibility Guidelines shown in Table 4, (e.g., 60 dBA CNEL for residential uses) and:
  - The project creates a 5 dBA CNEL or greater increase where pre-project ambient noise levels are 60 dBA CNEL or less; or,
  - The project creates a 3 dBA CNEL or greater increase where pre-project ambient noise levels exceed 60 dBA CNEL.

Roadway noise levels were calculated for land uses adjacent to roadways in the project vicinity based on the FHWA Traffic Noise Prediction Model methodology. During operation, the proposed project is expected to

[3] California Department of Transportation's *Technical Noise Supplement to the Traffic Noise Analysis Protocol* (2013)

generate a total of approximately 1,084 daily trips, including 81 trips during the AM peak hour and 108 trips during the PM peak hour.[4] Roadway noise levels were calculated for the following scenarios:

- Existing (without Project): This scenario refers to existing year traffic noise conditions.
- Existing Plus Project: This scenario refers to existing year plus project traffic noise conditions.

Table 10 shows the change in existing roadway noise levels with the addition of project-generated operational trips. FHWA Traffic Noise Prediction Model calculation worksheets are provided in Appendix E.

As shown in Table 10, modeled existing traffic noise levels range between 37-77 dBA CNEL and the modeled Existing Plus Project traffic noise levels range between 53-77 dBA CNEL at the right-of-way of each study roadway segment.

As shown in Table 10, the majority of the modeled roadway segments are below the lowest threshold of a 3 dB increase. Those segments that are above the lowest increase threshold are discussed below.

Verdemont Drive from Little League Drive to Antique Street has an existing noise level of 48.8 dBA CNEL; therefore, the appropriate increase threshold for this roadway segment is 5 dB. The increase along Verdemont Drive from Little League Drive to Antique Street is 5.42 dB, which is slightly above the 5 dB threshold. However, the modeled existing plus project noise levels would not cause ambient noise levels to exceed what is considered to be "normally acceptable" for residential land uses (60 dBA CNEL or less) at the affected residential land uses along Verdemont Drive.

Verdemont Drive East of Antique Street has an existing noise level of 48.8 dBA CNEL; therefore, the appropriate increase threshold for this roadway segment is 5 dB. The increase along Verdemont Drive East of Antique Street is 6.42 dB, which is above the 5 dB threshold. However, the modeled existing plus project noise levels would not cause ambient noise levels to exceed what is considered to be "normally acceptable" for residential land uses (60 dBA CNEL or less) at the affected residential land uses along Verdemont Drive.

Ohio Avenue west of Magnolia Avenue has an existing noise level of 52.34 dBA CNEL; therefore, the appropriate increase threshold for this roadway segment is 5 dB. The increase along Ohio Avenue west of Magnolia Avenue is 4.91 dB, which is below the 5 dB threshold.

Little League Drive from Verdemont Drive to Meyers Road has an existing noise level of 56.12 dBA CNEL; therefore, the appropriate increase threshold for this roadway segment is 5 dB. The increase along Little League Drive from Verdemont Drive to Meyers Road is 3.22 dB, which is below the 5 dB threshold.

Antique Street from Verdemont Drive to Ohio Avenue has an existing noise level of 48.78 dBA CNEL; therefore, the appropriate increase threshold for this roadway segment is 5 dB. The increase along Antique Street from Verdemont Drive to Ohio Avenue is 7.34 dB, which is above the 5 dB threshold. However, the modeled existing plus project noise levels would not cause ambient noise levels to exceed what is considered to be "normally acceptable" for residential land uses (60 dBA CNEL or less) at the affected residential land uses along Antique Street.

Magnolia Avenue from Ohio Avenue to Meyers Avenue has an existing noise level of 54.1 dBA CNEL; therefore, the appropriate increase threshold for this roadway segment is 5 dB. The increase along Magnolia Avenue from Ohio Avenue to Meyers Avenue is 3.19 dB, which is below the 5 dB threshold.

Therefore, the addition of project trips is not expected to change noise levels in excess of the applicable thresholds at the study roadway segments (see Table 10). The project impact is less than significant; no mitigation is required.

4 Project trip generation per the *TTM 20707 (Magnolia and Verdemont) Traffic Impact Analysis* (TIA) prepared for the project by Ganddini Group, Inc. (October 3, 2024).

GROUNDBORNE VIBRATION IMPACTS

Would the project result in:

b) Generation of excessive groundborne vibration or groundborne noise levels?

Finding: Less Than Significant with Mitigation

In relation to the Environmental Checklist noise issue "b", the City of San Bernardino has not established thresholds of significance concerning groundborne vibration. In the absence of City-established thresholds, groundborne vibration impacts are based on guidance from the *Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual* (FTA, September 2018) (see Regulatory Setting section). Accordingly, the project would result in a significant impact if:

- Groundborne vibration levels generated by the project have the potential to cause architectural damage at nearby buildings by exceeding the following PPV:
  - 0.10 in/sec at buildings extremely susceptible to vibration damage
  - 0.20 in/sec at non-engineered timber and masonry buildings
  - 0.30 in/sec at engineered concrete and masonry (no plaster) buildings
  - 0.50 in/sec at reinforced-concrete, steel or timber (no plaster) buildings
- Groundborne vibration levels generated by the project have the potential to cause annoyance at sensitive receptors by exceeding 72 VdB (0.006 PPV in/sec).

Groundborne vibration modeling worksheets are provided in Appendix G.

Construction-Related Vibration Impacts

Estimated groundborne vibration levels at the nearest sensitive receptors are presented in Table 11. As shown in Table 11, the closest existing structures to the project site are the residential structures located as close as approximately 12 feet from the southern project property line (taking into account that the project is to develop Verdemont Road). At 12 feet, the use of a vibratory roller would be expected to generate a PPV of 0.631 in/sec and a bulldozer would be expected to generate a PPV of 0.268 in/sec (see Table 11). Therefore, project construction activities would exceed the threshold of architectural damage to residential structures of 0.2 PPV in/sec. As shown in Table 11, prohibiting vibratory rollers within 26 feet and large bulldozers within 15 feet of residential structures to the south of the project site would reduce architectural damage impacts from project construction to less than the 0.2 PPV in/sec threshold. With implementation of Mitigation Measure #1, groundborne vibration generated by project construction would not exceed the levels necessary to cause either architectural damage; therefore, the project impact would be less than significant.

> **Mitigation Measure #1**
> The use of vibratory rollers, or other similar vibratory equipment, shall be prohibited within 26 feet and large bulldozers within 15 feet of residential structures to the south of the project site. Construction activity that must occur within these distances would need to be performed with smaller equipment types that do not exceed the vibratory threshold identified herein.

Rollers could be used within 12 feet of the residential land uses located at the south of the project site, resulting in a VdB of 100, which exceeds the FTA's annoyance standard for construction vibration. However, construction of the Verdemont Drive, which would include use of a roller would be short-term and therefore, the impact would be less than significant. The use of large bulldozers at the southern end of the project site would result in VdB levels reaching up to 97, which will also exceed the FTA's annoyance standard for construction vibration. The grading phase of construction may include the use of a large bulldozer at the

southern portion of the project site; however, the use of a large bulldozer would be short-term and therefore, the impact would be less than significant.

The most substantial sources of groundborne vibration during post-construction project operations will include the movement of passenger vehicles and trucks on paved and generally smooth surfaces. Loaded trucks generally have a PPV of 0.076 at a distance of 25 feet (Caltrans 2020), which is a substantially lower PPV than that of a vibratory roller (0.210 in/sec PPV at 25 feet). Therefore, groundborne vibration levels generated by project operation would not exceed those modeled for project construction.

AIR TRAFFIC IMPACTS

Would the project result in:

c) *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 area to excessive noise levels?*

Finding: No Impact

The closest airport to the project site is the San Bernardino International Airport (SBIA), which is located approximately 10.06 miles to the southeast of the project site. The City of San Bernardino General Plan states that, during the writing of the General Plan, the Airport Master Plan and the Comprehensive Land Use Plan (CLUP) for SBIA were in the process of being prepared and the Airport was operating under an Interim Airport Operating Plan. Therefore, the precise noise contours and safety zones were not available for inclusion in the City's General Plan. However, per the noise contour maps provided in the Federal Aviation Administration's (FAA) Finding of No Significant Impact (FONSI) and Record of Decision (ROD) for the proposed Eastgate Air Cargo Facility at San Bernardino International Airport (December 2019), the proposed project site is well outside the 65 dBA CNEL noise contours of the San Bernardino International Airport. Therefore, as the project is not within two miles of a public airport or in the vicinity of a private airstrip, the project would not expose people residing or working in the project area to excessive noise levels associated with airports.

Table 9
Construction Noise Levels (dBA L_{eq})

Phase	Receptor Location	Existing Ambient Noise Levels (Leq)[2]	Construction Noise Levels (Leq)	Construction Noise Levels Exceed 80 dBA FTA Threshold?
Demolition	Residential to South (7078 Magnolia Avenue, San Bernardino)	44.3	65.5	No
Site Preparation	Residential to South (7078 Magnolia Avenue, San Bernardino)	44.3	66.5	No
Grading	Residential to South (7078 Magnolia Avenue, San Bernardino)	44.3	67.1	No
Building Construction	Residential to South (7078 Magnolia Avenue, San Bernardino)	44.3	64.7	No
Paving	Residential to South (7078 Magnolia Avenue, San Bernardino)	44.3	60.0	No
Architectural Coating	Residential to South (7078 Magnolia Avenue, San Bernardino)	44.3	52.8	No

Notes:

(1) Construction noise worksheets are provided in Appendix D.

(2) Per measured existing ambient noise levels. NM1 was chosen to represent noise levels at the property lines of the single-family residential uses to the south of the project site.

Table 10
Increase in Existing Noise Levels Along Roadways as a Result of Project (dBA CNEL)

Roadway	Segment	Distance from roadway centerline to right-of-way (feet)[2]	Modeled Noise Levels (dBA CNEL)[1]					
			Existing Without Project at right-of-way	Existing Plus Project at right-of-way	Change in Noise Level	Applicable Increase Threshold (dB)	Normally Acceptable Standard[3]	Significant Impact?
Verdemont Dr	Little League Dr to Antique St	30	48.80	54.22	5.42	5	60	No
	East of Antique St	30	48.80	55.22	6.42	5	60	No
Ohio Ave	West of Magnolia Ave	30	52.34	56.53	4.19	5	60	No
Meyers Road	Little League Dr to Magnolia Ave	25	57.52	57.72	0.20	5	60	No
Belmont Ave	Magnolia Ave to Palm Ave	30	59.94	60.85	0.91	5	60	No
	East of Palm Ave	30	59.54	59.64	0.10	5	60	No
Kendall Dr	Northwest of Little League Dr	44	70.94	71.19	0.25	3	60	No
	Southeast of Little League Dr	44	69.26	69.38	0.12	3	60	No
	East of Palm Ave	44	75.89	75.92	0.03	3	60	No
Little League Dr	Verdemont Dr to Meyers Road	44	56.12	59.34	3.22	5	60	No
	Meyers Road to Belmont Ave	44	62.65	63.60	0.95	3	60	No
	Belmont Ave to Little League Frontage Dr	44	63.72	64.48	0.76	3	60	No
	South of Little League Frontage Dr	44	64.08	64.78	0.70	3	60	No
Antique St	Verdemont Dr to Ohio Ave	25	48.78	56.12	7.34	5	60	No
Magnolia Ave	Ohio Ave to Meyers Road	30	54.10	57.29	3.19	5	60	No
	Meyers Road to Belmont Ave	30	57.78	59.31	1.53	5	60	No
	South of Belmont Ave	30	55.35	55.61	0.26	5	60	No
Palm Ave	Ohio Ave to Belmont Ave	44	66.63	66.68	0.05	3	60	No
	Belmont Ave to Little League Frontage Dr/Kendall Ave	44	74.53	74.68	0.15	3	60	No
	South of Little League Frontage Dr/Kendall Ave	44	76.56	76.63	0.07	3	60	No

Notes:

(1) Exterior noise levels calculated 5 feet above pad elevation, perpendicular to subject roadway.

(2) Right-of-way per the City of San Bernardino General Plan Circulation Element.

(3) Per the City of San Bernardino exterior standards for residential uses (see Tables 4).

Table 11
Construction Vibration Levels at the Nearest Receptors

Receptor Location	Distance from Property Line to Nearest Structure (feet)	Equipment	Vibration Level[1]	Vibration Level Exceeded?[3]	Vibration Level with Mitigation[1,2]	Threshold Exceeded With Mitigation?[3]
Architectural Damage Analysis						
Residential to South (7078 Magnolia Avenue, San Bernardino)	12	Vibratory Roller	0.631	Yes	0.198	No
	12	Large Bulldozer	0.268	Yes	0.191	No
Annoyance Analysis						
Residential to South (7078 Magnolia Avenue, San Bernardino)	12	Vibratory Roller	100	Yes	-	-
	12	Large Bulldozer	97	Yes	-	-

Notes:

(1) Vibration levels are provided in PPV in/sec for architectural damage and VdB for annoyance.

(2) Mitigation for structural damage includes prohibiting vibratory rollers, or other similar vibratory equipment within 26 feet and large bulldozers within 15 feet of the residential structures to the south of the project's property lines.

(3) The FTA identifies the threshold at which there is a risk to "architectural" damage to reinforced-concrete, steel or timber (no plaster) buildings as a peak particle velocity (PPV) of 0.5 in/sec, at engineered concrete and masonry (no plaster) buildings as a PPV of 0.3 in/sec, at non-engineered timber and masonry buildings as a PPV of 0.2 in/sec and at buildings extremely susceptible to vibration damage as a PPV of 0.1 in/sec. Therefore, vibration impacts related to architectural damage would be significant if construction activities result in groundborne vibration of 0.2 PPV or higher at residential structures and/or a PPV of 0.3 or higher at commercial structures (see Table 2). In addition, the FTA identifies a vibration annoyance threshold of 72 VdB for residential uses (see Table 3). Per the FTA Transit Noise and VIbration Impact Assessment Manual (September 2018), commercial uses are not considered vibration-sensitive land uses; therefore, the annoyance threshold does not apply to commercial uses.

Figure 6
Future Traffic Noise Levels

7. REFERENCES

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1974 "Information on Levels of Environmental Noise Requisite to Protect Public Health And Welfare with an Adequate Margin of Safety," EPA/ONAC 550/9-74-004, March, 1974.

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APPENDICES

Appendix A List of Acronyms
Appendix B Glossary
Appendix C Noise Measurement Field Worksheets
Appendix D Construction Noise Modeling
Appendix E FHWA Worksheets
Appendix F SoundPLAN Data
Appendix G Vibration Worksheets

APPENDIX A

LIST OF ACRONYMS

Term	Definition
ADT	Average Daily Traffic
ANSI	American National Standard Institute
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
D/E/N	Day / Evening / Night
dB	Decibel
dBA or dB(A)	Decibel "A-Weighted"
dBA/DD	Decibel per Double Distance
dBA L_{eq}	Average Noise Level over a Period of Time
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
L_{02},L_{08},L_{50},L_{90}	A-weighted Noise Levels at 2 percent, 8 percent, 50 percent, and 90 percent, respectively, of the time period
DNL	Day-Night Average Noise Level
$L_{eq(x)}$	Equivalent Noise Level for '"x" period of time
L_{eq}	Equivalent Noise Level
L_{max}	Maximum Level of Noise (measured using a sound level meter)
L_{min}	Minimum Level of Noise (measured using a sound level meter)
LOS C	Level of Service C
OPR	California Governor's Office of Planning and Research
PPV	Peak Particle Velocities
RCNM	Road Construction Noise Model
REMEL	Reference Energy Mean Emission Level
RMS	Root Mean Square

APPENDIX B

GLOSSARY

Term	Definition
Ambient Noise Level	The all-encompassing noise environment associated with a given environment, at a specified time, usually a composite of sound from many sources, at many directions, near and far, in which usually no particular sound is dominant.
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. 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.
CNEL	Community Noise Equivalent Level. CNEL is a weighted 24-hour noise level that is obtained by adding five decibels to sound levels in the evening (7:00 PM to 10:00 PM), and by adding ten decibels to sound levels at night (10:00 PM to 7:00 AM). This weighting accounts for the increased human sensitivity to noise during the evening and nighttime hours.
Decibel, dB	A logarithmic unit of noise level measurement that relates the energy of a noise source to that of a constant reference level; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
DNL, Ldn	Day Night Level. The DNL, or Ldn is a weighted 24-hour noise level that is obtained by adding ten decibels to sound levels at night (10:00 PM to 7:00 AM). This weighting accounts for the increased human sensitivity to noise during the nighttime hours.
Equivalent Continuous Noise Level, L_{eq}	A level of steady state sound that in a stated time period, and a stated location, has the same A-weighted sound energy as the time-varying sound.
Fast/Slow Meter Response	The fast and slow meter responses are different settings on a sound level meter. The fast response setting takes a measurement every 100 milliseconds, while a slow setting takes one every second.
Frequency, Hertz	In a function periodic in time, the number of times that the quantity repeats itself in one second (i.e., the number of cycles per second).
L_{02}, L_{08}, L_{50}, L_{90}	The A-weighted noise levels that are equaled or exceeded by a fluctuating sound level, 2 percent, 8 percent, 50 percent, and 90 percent of a stated time period, respectively.
L_{max}, L_{min}	Lmax is the RMS (root mean squared) maximum level of a noise source or environment measured on a sound level meter, during a designated time interval, using fast meter response. Lmin is the minimum level.
Offensive/ Offending/Intrusive Noise	The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of sound depends on its amplitude, duration, frequency, and time of occurrence, and tonal information content as well as the prevailing ambient noise level.
Root Mean Square (RMS)	A measure of the magnitude of a varying noise source quantity. The name derives from the calculation of the square root of the mean of the squares of the values. It can be calculated from either a series of lone values or a continuous varying function.

APPENDIX C

NOISE MEASUREMENT FIELD WORKSHEETS

Noise Measurement
Field Data

Project Name: TTM 20707 (Magnolia and Verdemont), City of San Bernardino **Date:** April 11, 2024

Project #: 19741

Noise Measurement #: NM1 Run Time: 15 minutes **Technician:** Ian Edward Gallagher

Nearest Address or Cross Street: Antique Street & Verdemont Drive

Site Description (Type of Existing Land Use and any other notable features): Measurement Site: Near the southwestern corner of the intersection of Verdemont Drive and Antique Street. Adjacent: Verdemont Drive to north with project site to northeast and vacant land to northwest, Antique Street to southeast, and single-family residential to south/southwest.

Weather: Clear skies, sunny. Sunset 7:18 PM. **Settings:** SLOW FAST

Temperature: 81 deg f **Wind:** 5 mph **Humidity:** 21% **Terrain:** Hilly

Start Time: 4:14 PM **End Time:** 4:29 PM **Run Time:**

Leq: 44.3 dB **Primary Noise Source:** Residential ambiance, bird song.

Lmax 52.3 dB

L2 48.4 dB **Secondary Noise Sources:** Traffic ambiance from 215 Fwy & other surrounding roads. Residential ambiance.

L8 46.5 dB Leaf rustle from 6 mph breeze through vegetation. Distant train horn & air traffic.

L25 45.0 dB

L50 43.7 dB

NOISE METER:	SoundTrack LXT Class 1	**CALIBRATOR:**	Larson Davis CA 200
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	CA 200
SERIAL NUMBER:	3855	**SERIAL NUMBER:**	11178
FACTORY CALIBRATION DATE:	3/31/2021	**FACTORY CALIBRATION DATE:**	11/18/2021
FIELD CALIBRATION DATE:	4/11/2024		

Noise Measurement
Field Data

PHOTOS:

NM1 looking S down N Antique Street, crossing N Antique Street & Verdemont Drive intersection.

NM1 looking SSE towards residence 7039 N Antique Street, San Bernardino.

Summary	
File Name on Meter	LxT_Data.069.s
File Name on PC	LxT_0003855-20240411 161403-LxT_Data.069.ldbin
Serial Number	0003855
Model	SoundTrack LxT®
Firmware Version	2.404
User	Ian Edward Gallagher
Location	NM1 34°12'34.50"N 117°21'44.32"W
Job Description	15 minute noise measurement
Note	Ganddini Project# 19741 TTM 20707 (Magnolia and Verdemont), San

Measurement	
Start	2024-04-11 16:14:03
Stop	2024-04-11 16:29:03
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre-Calibration	2024-04-11 16:13:34
Post-Calibration	None

Overall Settings	
RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1
Microphone Correction	Off
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	Bin Max
Overload	145.2 dB

Results			
LA_{eq}	44.3		
LAE	73.9		
EA	2.711	µPa²h	
EA8	86.741	µPa²h	
EA40	433.706	µPa²h	
$LA_{peak\ (max)}$	2024-04-11 16:16:35	84.4	dB
LAS_{max}	2024-04-11 16:18:13	52.3	dB
LAS_{min}	2024-04-11 16:20:17	40.2	dB

			Statistics	
LC_{eq}	66.1	dB	**LA2.00**	48.4 dB
LA_{eq}	44.3	dB	**LA8.00**	46.5 dB
LC_{eq} - LA_{eq}	21.8	dB	**LA25.00**	45.0 dB
LAI_{eq}	46.9	dB	**LA50.00**	43.7 dB
LA_{eq}	44.3	dB	**LA66.60**	43.0 dB
LAI_{eq} - LA_{eq}	2.6	dB	**LA90.00**	41.9 dB
Overload Count	0			
Overload Duration	0.0	s		

Measurement Report

Report Summary

Meter's File Name	LxT_Data.069.s	Computer's File Name	LxT_0003855-20240411 161403-LxT_Data.069.ldbin
Meter	LxT1 0003855		
Firmware	2.404		
User	Ian Edward Gallagher	Location	NM1 34°12'34.50"N 117°21'44.32"W
Job Description	15 minute noise measurement		
Note	Ganddini Project # 19741 TTM 20707 (Magnolia and Verdemont), San Bernardino		
Start Time	2024-04-11 16:14:03	Duration	0:15:00.0
End Time	2024-04-11 16:29:03	Run Time	0:15:00.0
		Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	44.3 dB		
LAE	73.9 dB	SEA	--- dB
EA	2.7 µPa²h	LAFTM5	48.1 dB
EA8	86.7 µPa²h		
EA40	433.7 µPa²h		
LA_{peak}	84.4 dB	2024-04-11 16:16:35	
LAS_{max}	52.3 dB	2024-04-11 16:18:13	
LAS_{min}	40.2 dB	2024-04-11 16:20:17	
LA_{eq}	44.3 dB		
LC_{eq}	66.1 dB	LC_{eq} - LA_{eq}	21.8 dB
LAI_{eq}	46.9 dB	LAI_{eq} - LA_{eq}	2.6 dB

Exceedances

	Count	Duration
LAS > 65.0 dB	0	0:00:00.0
LAS > 85.0 dB	0	0:00:00.0
LApeak > 135.0 dB	0	0:00:00.0
LApeak > 137.0 dB	0	0:00:00.0
LApeak > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight
--- dB	--- dB	0.0 dB

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

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	44.3 dB		66.1 dB		--- dB	
$L_{S(max)}$	52.3 dB	2024-04-11 16:18:13	--- dB		--- dB	
$L_{S(min)}$	40.2 dB	2024-04-11 16:20:17	--- dB		--- dB	
$L_{Peak(max)}$	84.4 dB	2024-04-11 16:16:35	--- dB		--- dB	

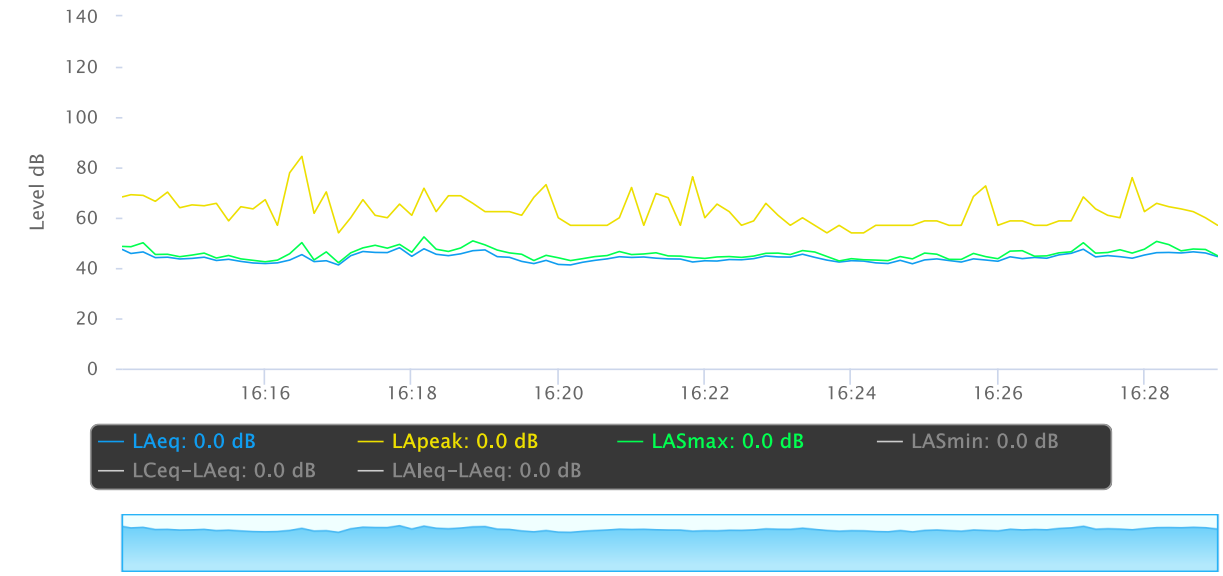
Overloads

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

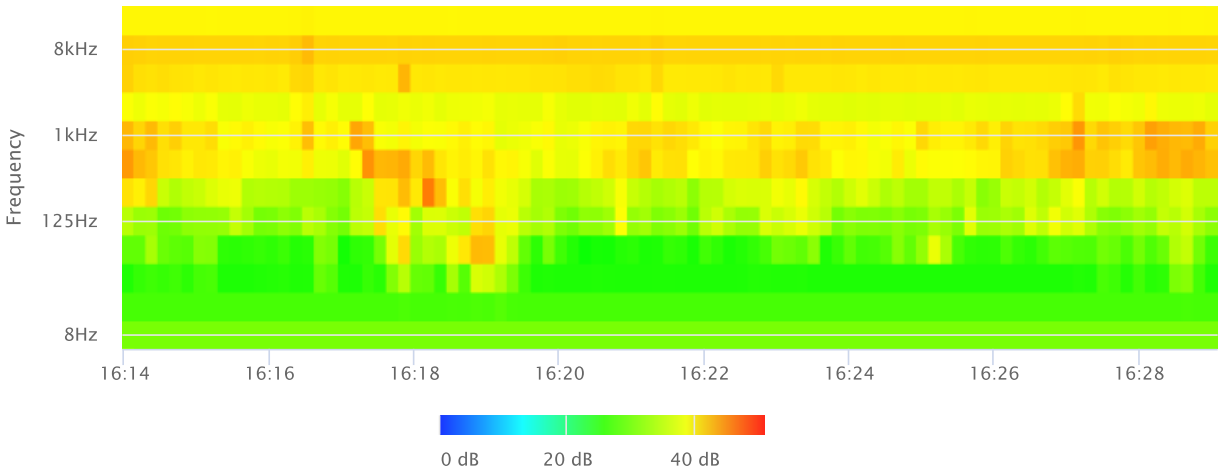
Statistics

LAS 2.0	48.4 dB
LAS 8.0	46.5 dB
LAS 25.0	45.0 dB
LAS 50.0	43.7 dB
LAS 66.6	43.0 dB
LAS 90.0	41.9 dB

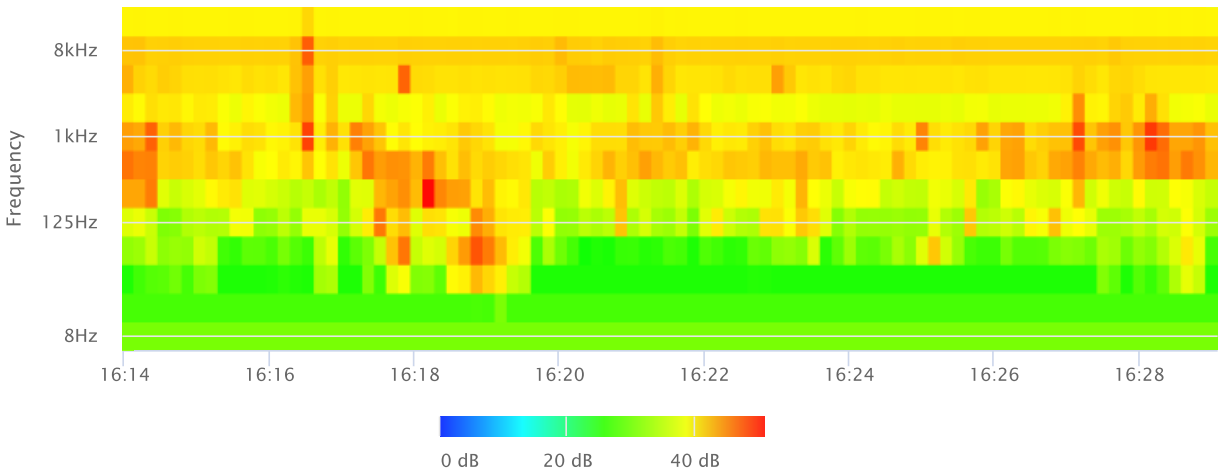
Time History



OBA 1/1 Leq



OBA 1/1 Lmax



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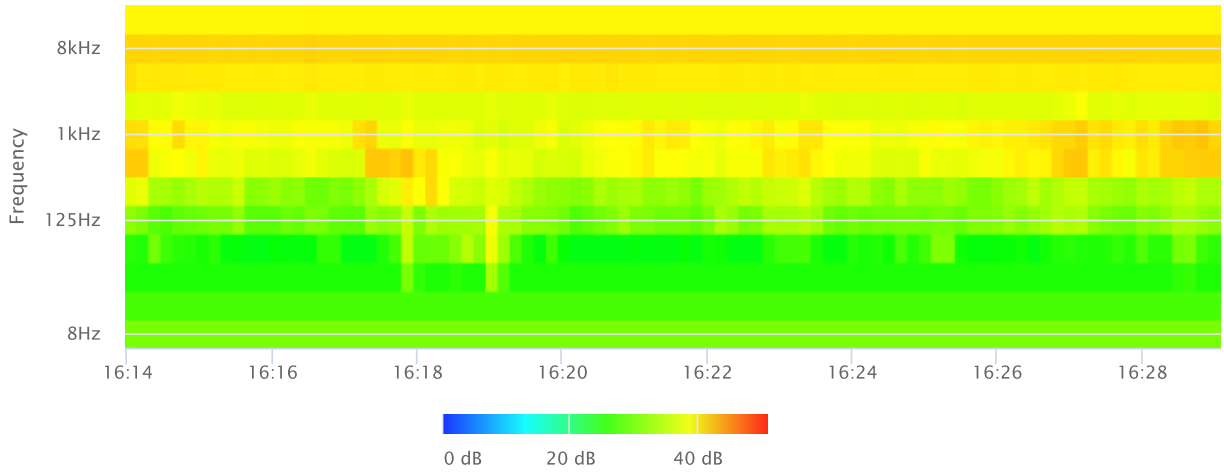
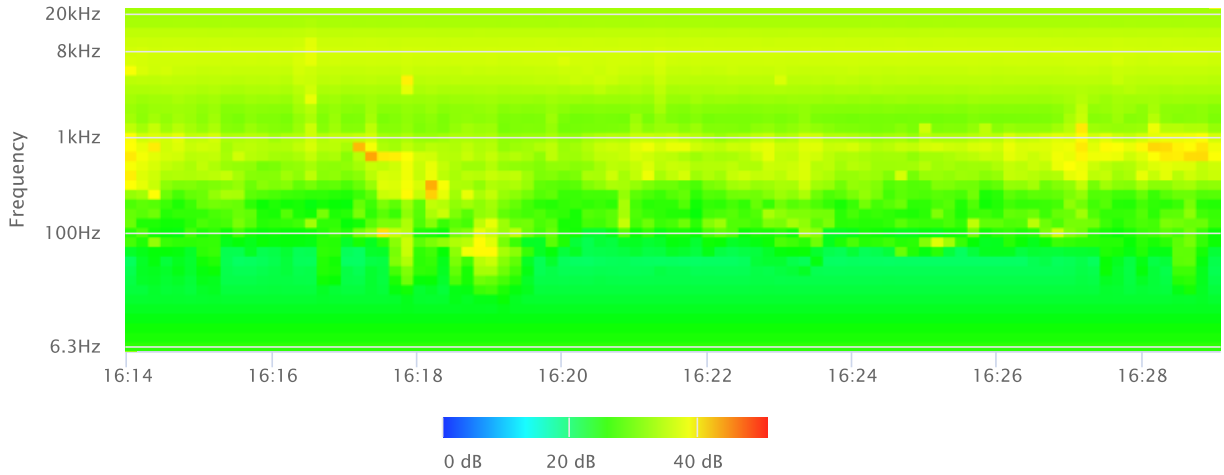
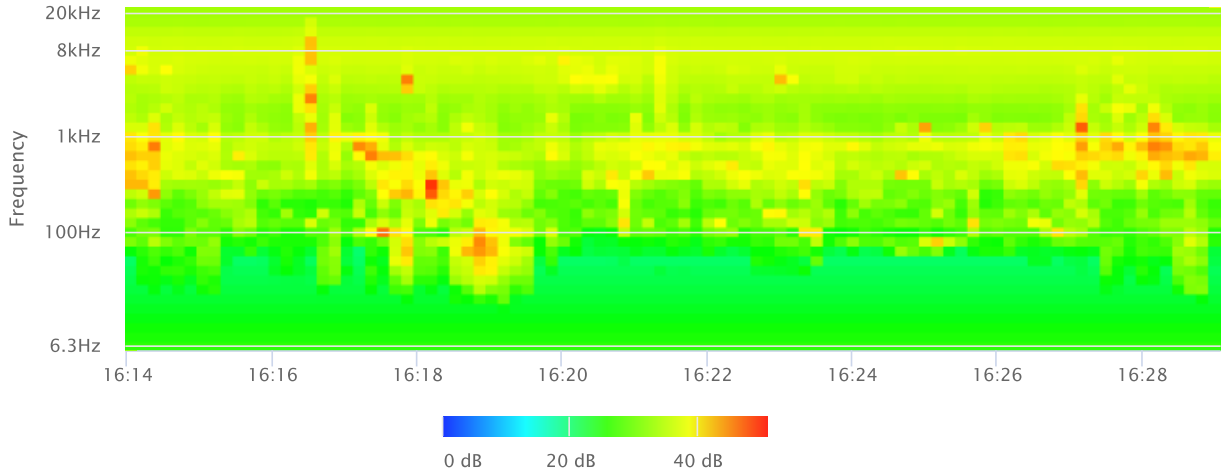


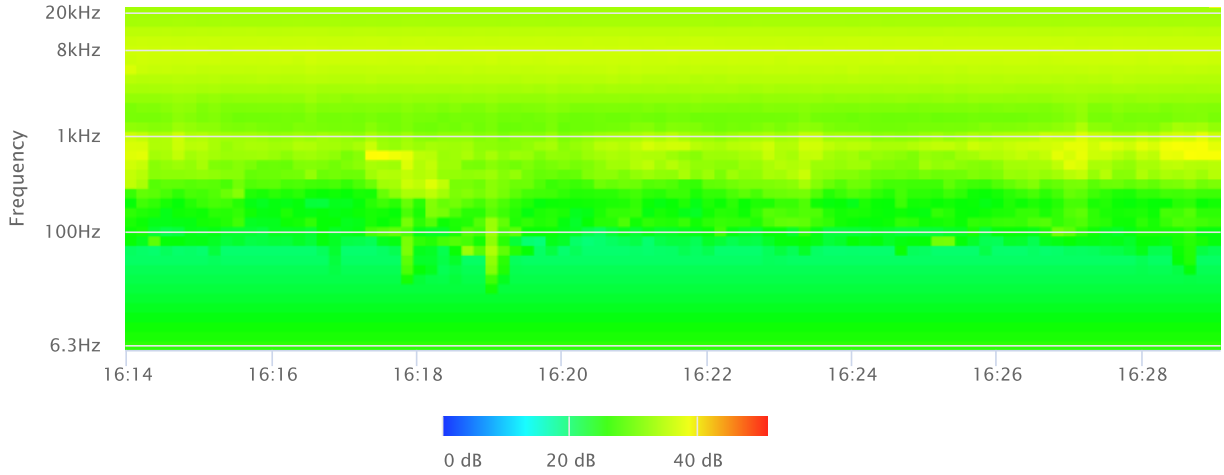
OBA 1/3 Leq



OBA 1/3 Lmax



OBA 1/3 Lmin


20kHz
8kHz
1kHz
100Hz
6.3Hz
Frequency
16:14
16:16
16:18
16:20
16:22
16:24
16:26
16:28
0 dB
20 dB
40 dB

APPENDIX D

CONSTRUCTION NOISE MODELING

Receptor - Residential to South (7078 Magnolia Avenue, San Bernardino)

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[3]	Item Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Receptor Item Lmax, dBA	Receptor Item Leq, dBA
Demolition									
Concrete/Industrial Saws	1	90	578	20	0.20	-21.3	-7.0	68.7	61.8
Excavators	3	81	578	40	1.20	-21.3	0.8	59.7	60.5
Rubber Tired Dozers	2	82	578	40	0.80	-21.3	-1.0	60.7	59.8
								Log Sum	65.5
Site Preparation									
Tractors/Loaders/Backhoes	4	84	578	40	1.60	-21.3	2.0	62.7	64.8
Rubber Tired Dozers	3	82	578	40	1.20	-21.3	0.8	60.7	61.5
								Log Sum	66.5
Grading									
Rubber Tired Dozers	1	82	578	40	0.40	-21.3	-4.0	60.7	56.8
Tractors/Loaders/Backhoes	2	84	578	40	0.80	-21.3	-1.0	62.7	61.8
Excavators	2	81	578	40	0.80	-21.3	-1.0	59.7	58.8
Scraper	2	84	578	40	0.80	-21.3	-1.0	62.7	61.8
Graders	1	85	578	40	0.40	-21.3	-4.0	63.7	59.8
								Log Sum	67.1
Building Construction									
Cranes	1	81	578	16	0.16	-21.3	-8.0	59.7	51.8
Forklifts[2]	3	48	578	40	1.20	-21.3	0.8	26.7	27.5
Generator Sets	1	81	578	50	0.50	-21.3	-3.0	59.7	56.7
Welders	1	74	578	40	0.40	-21.3	-4.0	52.7	48.8
Tractors/Loaders/Backhoes	3	84	578	40	1.20	-21.3	0.8	62.7	63.5
								Log Sum	64.7
Paving									
Pavers	2	77	578	50	1.00	-21.3	0.0	55.7	55.7
Paving Equipment	2	77	578	50	1.00	-21.3	0.0	55.7	55.7
Rollers	2	80	578	20	0.40	-21.3	-4.0	58.7	54.8
								Log Sum	60.2
Architectural Coating									
Air Compressors	1	78	578	40	0.40	-21.3	-4.0	56.7	52.8
								Log Sum	52.8

Notes:

(1) Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA Roadway Construction Noise Model User's Guide (January 2006)

(2) Source: SoundPLAN reference list.

(3) Distance to receptor calculated from center of site. Construction noise projected from the center of the project site to nearest sensitive use (property line).

APPENDIX E

FHWA WORKSHEETS

Existing Traffic Noise

1	:Id
Verdemont Drive	:Road
Little League Drive to Antique Street	:Segment

Vehicle Distribution (Light Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.56	13.96	10.49	97.40
Medium Trucks	48.91	2.17	48.91	1.84
Heavy Trucks	47.30	5.41	47.30	0.74

ADT	177
Speed	25
Distance	30
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	10.86	0.13	0.05	8.02	0.02	0.02	2.01	0.18	0.07
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	6.07	-13.06	-17.16	4.76	-20.56	-20.55	-1.25	-11.81	-15.91
Distance	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	42.66	35.18	37.23	41.35	27.67	33.84	35.33	36.43	38.48
	DAY LEQ	44.32		EVENING LEQ	42.21		NIGHT LEQ	41.72	

F	CNEL	48.80	
	DAY LEQ	44.32	

Day hour	89.00
Absorptive?	no
Use hour?	no
GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Plus Project Traffic Noise

1	:Id
Verdemont Drive	:Road
Little League Drive to Antique Street	:Segment

Vehicle Distribution (Light Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.56	13.96	10.49	97.40
Medium Trucks	48.91	2.17	48.91	1.84
Heavy Trucks	47.30	5.41	47.30	0.74

ADT	617
Speed	25
Distance	30
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	37.84	0.46	0.18	27.96	0.08	0.08	7.00	0.62	0.24
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	11.49	-7.63	-11.73	10.18	-15.14	-15.13	4.17	-6.38	-10.48
Distance	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	48.08	40.60	42.66	46.77	33.09	39.26	40.76	41.85	43.91
	DAY LEQ	49.74		EVENING LEQ	47.63		NIGHT LEQ	47.14	

CNEL	54.22
DAY LEQ	49.74

Day hour	89.00
Absorptive?	no
Use hour?	no
GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Traffic Noise

2	:Id
Verdemont Drive	:Road
East of Antique Street	:Segment

Vehicle Distribution (Light Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.56	13.96	10.49	97.40
Medium Trucks	48.91	2.17	48.91	1.84
Heavy Trucks	47.30	5.41	47.30	0.74

ADT	177
Speed	25
Distance	30
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	10.86	0.13	0.05	8.02	0.02	0.02	2.01	0.18	0.07
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	6.07	-13.06	-17.16	4.76	-20.56	-20.55	-1.25	-11.81	-15.91
Distance	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	42.66	35.18	37.23	41.35	27.67	33.84	35.33	36.43	38.48
	DAY LEQ	44.32		EVENING LEQ	42.21		NIGHT LEQ	41.72	

CNEL	48.80
DAY LEQ	44.32

Day hour	90.00
Absorptive?	no
Use hour?	no
GRADE dB	1.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Plus Project Traffic Noise

2	:Id
Verdemont Drive	:Road
East of Antique Street	:Segment

Vehicle Distribution (Light Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.56	13.96	10.49	97.40
Medium Trucks	48.91	2.17	48.91	1.84
Heavy Trucks	47.30	5.41	47.30	0.74

ADT	777
Speed	25
Distance	30
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	47.65	0.58	0.23	35.22	0.10	0.10	8.82	0.78	0.30
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	12.50	-6.63	-10.73	11.18	-14.14	-14.13	5.17	-5.38	-9.48
Distance	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	49.08	41.61	43.66	47.77	34.10	40.26	41.76	42.85	44.91
	DAY LEQ	50.74		EVENING LEQ	48.64		NIGHT LEQ	48.14	

CNEL	55.22
DAY LEQ	50.74

Day hour	90.00
Absorptive?	no
Use hour?	no
GRADE dB	1.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Traffic Noise

3	:Id
Ohio Avenue	:Road
West of Magnolia Avenue	:Segment

Vehicle Distribution (Light Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.56	13.96	10.49	97.40
Medium Trucks	48.91	2.17	48.91	1.84
Heavy Trucks	47.30	5.41	47.30	0.74

ADT	400
Speed	25
Distance	30
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	24.53	0.30	0.12	18.13	0.05	0.05	4.54	0.40	0.16
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	9.61	-9.51	-13.62	8.30	-17.02	-17.01	2.29	-8.26	-12.37
Distance	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	46.20	38.72	40.77	44.89	31.21	37.38	38.87	39.97	42.02
	DAY LEQ	47.86		EVENING LEQ	45.75		NIGHT LEQ	45.26	

CNEL	52.34
DAY LEQ	47.86

Day hour	91.00
Absorptive?	no
Use hour?	no
GRADE dB	2.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Plus Project Traffic Noise

3	:Id
Ohio Avenue	:Road
West of Magnolia Avenue	:Segment

Vehicle Distribution (Light Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.56	13.96	10.49	97.40
Medium Trucks	48.91	2.17	48.91	1.84
Heavy Trucks	47.30	5.41	47.30	0.74

ADT	1050
Speed	25
Distance	30
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	64.40	0.79	0.31	47.59	0.14	0.14	11.92	1.05	0.41
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	13.80	-5.32	-9.42	12.49	-12.83	-12.82	6.48	-4.07	-8.17
Distance	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	50.39	42.91	44.96	49.08	35.40	41.57	43.07	44.16	46.21
	DAY LEQ	52.05		EVENING LEQ	49.94		NIGHT LEQ	49.45	

CNEL	56.53
DAY LEQ	52.05

Day hour	91.00
Absorptive?	no
Use hour?	no
GRADE dB	2.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Traffic Noise

4	:Id	Vehicle Distribution (Light Truck Mix)				ADT	1100
		Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	
Meyers Road	:Road	Automobiles	75.56	13.96	10.49	97.40	Speed 25
Little League Drive to Magnolia Avenue	:Segment	Medium Trucks	48.91	2.17	48.91	1.84	Distance 25
		Heavy Trucks	47.30	5.41	47.30	0.74	Left Angle -90
							Right Angle 90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	67.46	0.82	0.32	49.86	0.15	0.15	12.49	1.10	0.43
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	14.01	-5.12	-9.22	12.69	-12.63	-12.62	6.68	-3.87	-7.97
Distance	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	51.39	43.91	45.96	50.07	36.40	42.56	44.06	45.16	47.21
	DAY LEQ	53.04		EVENING LEQ	50.94		NIGHT LEQ	50.45	

CNEL	57.52	Day hour	92.00
DAY LEQ	53.04	Absorptive?	no
		Use hour?	no
		GRADE dB	3.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Plus Project Traffic Noise

4	:Id	
Meyers Road	:Road	
Little League Drive to Magnolia Avenue	:Segment	

Vehicle Distribution (Light Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.56	13.96	10.49	97.40
Medium Trucks	48.91	2.17	48.91	1.84
Heavy Trucks	47.30	5.41	47.30	0.74

ADT	1150
Speed	25
Distance	25
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	70.53	0.86	0.34	52.12	0.15	0.15	13.06	1.15	0.45
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	14.20	-4.93	-9.03	12.88	-12.44	-12.43	6.87	-3.68	-7.78
Distance	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	51.58	44.10	46.15	50.27	36.59	42.76	44.25	45.35	47.40
	DAY LEQ	53.24		EVENING LEQ	51.13		NIGHT LEQ	50.64	

CNEL	57.72
DAY LEQ	53.24

Day hour	92.00
Absorptive?	no
Use hour?	no
GRADE dB	3.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Traffic Noise

5	:Id
Belmont Avenue	:Road
Magnolia Avenue to Palm Avenue	:Segment

Vehicle Distribution (Light Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.56	13.96	10.49	97.40
Medium Trucks	48.91	2.17	48.91	1.84
Heavy Trucks	47.30	5.41	47.30	0.74

ADT	2300
Speed	25
Distance	30
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	141.06	1.72	0.67	104.24	0.31	0.31	26.11	2.30	0.89
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	17.21	-1.92	-6.02	15.90	-9.43	-9.41	9.88	-0.67	-4.77
Distance	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	53.80	46.32	48.37	52.48	38.81	44.97	46.47	47.57	49.62
	DAY LEQ	55.46		EVENING LEQ	53.35		NIGHT LEQ	52.86	

CNEL	**59.94**
DAY LEQ	55.46

Day hour	93.00
Absorptive?	no
Use hour?	no
GRADE dB	4.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Plus Project Traffic Noise

5	:Id
Belmont Avenue	:Road
Magnolia Avenue to Palm Avenue	:Segment

Vehicle Distribution (Light Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.56	13.96	10.49	97.40
Medium Trucks	48.91	2.17	48.91	1.84
Heavy Trucks	47.30	5.41	47.30	0.74

ADT	2840
Speed	25
Distance	30
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	174.18	2.13	0.83	128.72	0.38	0.38	32.24	2.84	1.10
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	18.12	-1.00	-5.10	16.81	-8.51	-8.50	10.80	0.25	-3.85
Distance	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	54.71	47.23	49.29	53.40	39.73	45.89	47.39	48.48	50.54
	DAY LEQ	56.37		EVENING LEQ	54.26		NIGHT LEQ	53.77	

CNEL	60.85
DAY LEQ	56.37

Day hour	93.00
Absorptive?	no
Use hour?	no
GRADE dB	4.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Traffic Noise

6	:Id
Belmont Avenue	:Road
East of Palm Avenue	:Segment

Vehicle Distribution (Light Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.56	13.96	10.49	97.40
Medium Trucks	48.91	2.17	48.91	1.84
Heavy Trucks	47.30	5.41	47.30	0.74

ADT	2100
Speed	25
Distance	30
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	128.79	1.57	0.61	95.18	0.28	0.28	23.84	2.10	0.82
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	16.81	-2.31	-6.41	15.50	-9.82	-9.81	9.49	-1.06	-5.16
Distance	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	53.40	45.92	47.97	52.09	38.41	44.58	46.08	47.17	49.22
	DAY LEQ	55.06		EVENING LEQ	52.95		NIGHT LEQ	52.46	

CNEL	**59.54**
DAY LEQ	55.06

Day hour	94.00
Absorptive?	no
Use hour?	no
GRADE dB	5.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Plus Project Traffic Noise

6	:Id	Vehicle Distribution (Light Truck Mix)				ADT	2150
Belmont Avenue	:Road	Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	Speed	25
East of Palm Avenue	:Segment	Automobiles	75.56	13.96	10.49	97.40	Distance	30
		Medium Trucks	48.91	2.17	48.91	1.84	Left Angle	-90
		Heavy Trucks	47.30	5.41	47.30	0.74	Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	131.86	1.61	0.63	97.45	0.29	0.29	24.41	2.15	0.84
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	16.92	-2.21	-6.31	15.60	-9.72	-9.71	9.59	-0.96	-5.06
Distance	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	53.50	46.03	48.08	52.19	38.52	44.68	46.18	47.27	49.33
	DAY LEQ	55.16		EVENING LEQ	53.06		NIGHT LEQ	52.56	

CNEL	59.64	Day hour	94.00
DAY LEQ	55.16	Absorptive?	no
		Use hour?	no
		GRADE dB	5.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Traffic Noise

7	:Id
Kendall Drive	:Road
Northwest of Little League Drive	:Segment

Vehicle Distribution (Heavy Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.54	14.02	10.43	92.00
Medium Trucks	48.00	2.00	50.00	3.00
Heavy Trucks	48.00	2.00	50.00	5.00

ADT	5600
Speed	45
Distance	44
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	324.32	6.72	11.20	240.77	1.12	1.87	59.71	9.33	15.56
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	18.27	1.44	3.65	16.98	-6.35	-4.13	10.92	2.86	5.08
Distance	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	63.10	54.54	61.28	61.81	46.76	53.50	55.75	55.97	62.71
	DAY LEQ	65.65		EVENING LEQ	62.52		NIGHT LEQ	64.21	

CNEL	70.94
DAY LEQ	65.65

Day hour	95.00
Absorptive?	no
Use hour?	no
GRADE dB	6.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Plus Project Traffic Noise

7	:Id
Kendall Drive	:Road
Northwest of Little League Drive	:Segment

Vehicle Distribution (Heavy Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.54	14.02	10.43	92.00
Medium Trucks	48.00	2.00	50.00	3.00
Heavy Trucks	48.00	2.00	50.00	5.00

ADT	5930
Speed	45
Distance	44
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	343.43	7.12	11.86	254.96	1.19	1.98	63.22	9.88	16.47
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	18.52	1.68	3.90	17.23	-6.10	-3.88	11.17	3.11	5.33
Distance	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	63.35	54.79	61.53	62.06	47.01	53.75	56.00	56.22	62.96
	DAY LEQ	65.90		EVENING LEQ	62.77		NIGHT LEQ	64.46	

CNEL	71.19
DAY LEQ	65.90

Day hour	95.00
Absorptive?	no
Use hour?	no
GRADE dB	6.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Traffic Noise

8	:Id
Kendall Drive	:Road
Southeast of Little League Drive	:Segment

Vehicle Distribution (Heavy Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.54	14.02	10.43	92.00
Medium Trucks	48.00	2.00	50.00	3.00
Heavy Trucks	48.00	2.00	50.00	5.00

ADT	3800
Speed	45
Distance	44
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	220.07	4.56	7.60	163.38	0.76	1.27	40.51	6.33	10.56
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	16.59	-0.25	1.97	15.29	-8.03	-5.81	9.24	1.18	3.40
Distance	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	61.42	52.86	59.60	60.12	45.08	51.82	54.07	54.29	61.02
	DAY LEQ	63.96		EVENING LEQ	60.84		NIGHT LEQ	62.53	

CNEL	69.26
DAY LEQ	63.96

Day hour	96.00
Absorptive?	no
Use hour?	no
GRADE dB	7.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Plus Project Traffic Noise

8	:Id
Kendall Drive	:Road
Southeast of Little League Drive	:Segment

Vehicle Distribution (Heavy Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.54	14.02	10.43	92.00
Medium Trucks	48.00	2.00	50.00	3.00
Heavy Trucks	48.00	2.00	50.00	5.00

ADT	3910
Speed	45
Distance	44
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	226.44	4.69	7.82	168.11	0.78	1.30	41.69	6.52	10.86
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	16.71	-0.12	2.09	15.42	-7.91	-5.69	9.36	1.30	3.52
Distance	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	61.54	52.98	59.72	60.25	45.20	51.94	54.19	54.41	61.15
	DAY LEQ	64.09		EVENING LEQ	60.96		NIGHT LEQ	62.65	

CNEL	69.38
DAY LEQ	64.09

Day hour	96.00
Absorptive?	no
Use hour?	no
GRADE dB	7.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Traffic Noise

9	:Id	Vehicle Distribution (Heavy Truck Mix)				ADT	14900
Kendall Drive	:Road	Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	Speed	50
East of Palm Avenue	:Segment	Automobiles	75.54	14.02	10.43	92.00	Distance	44
		Medium Trucks	48.00	2.00	50.00	3.00	Left Angle	-90
		Heavy Trucks	48.00	2.00	50.00	5.00	Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	862.92	17.88	29.80	640.62	2.98	4.97	158.86	24.83	41.39
Speed in MPH	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	71.12	78.79	83.02	71.12	78.79	83.02	71.12	78.79	83.02
ADJUSTMENTS									
Flow	22.06	5.23	7.45	20.77	-2.55	-0.33	14.71	6.65	8.87
Distance	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	68.67	59.51	65.95	67.38	51.73	58.17	61.32	60.93	67.38
	DAY LEQ	70.86		EVENING LEQ	67.97		NIGHT LEQ	69.07	

CNEL	75.89	Day hour	97.00
DAY LEQ	70.86	Absorptive?	no
		Use hour?	no
		GRADE dB	8.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Plus Project Traffic Noise

9	:Id	
Kendall Drive	:Road	
East of Palm Avenue	:Segment	

Vehicle Distribution (Heavy Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.54	14.02	10.43	92.00
Medium Trucks	48.00	2.00	50.00	3.00
Heavy Trucks	48.00	2.00	50.00	5.00

ADT	15010
Speed	50
Distance	44
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	869.29	18.01	30.02	645.35	3.00	5.00	160.03	25.02	41.69
Speed in MPH	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	71.12	78.79	83.02	71.12	78.79	83.02	71.12	78.79	83.02
ADJUSTMENTS									
Flow	22.10	5.26	7.48	20.80	-2.52	-0.30	14.75	6.69	8.91
Distance	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	68.70	59.54	65.98	67.41	51.76	58.20	61.35	60.97	67.41
	DAY LEQ	70.89		EVENING LEQ	68.00		NIGHT LEQ	69.10	

F	**CNEL**	**75.92**	
	DAY LEQ	70.89	

Day hour	97.00
Absorptive?	no
Use hour?	no
GRADE dB	8.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Traffic Noise

10	:Id
Little League Drive	:Road
Verdemont Drive to Meyers Road	:Segment

Vehicle Distribution (Heavy Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.54	14.02	10.43	92.00
Medium Trucks	48.00	2.00	50.00	3.00
Heavy Trucks	48.00	2.00	50.00	5.00

ADT	400
Speed	25
Distance	44
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	23.17	0.48	0.80	17.20	0.08	0.13	4.26	0.67	1.11
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	9.36	-7.47	-5.25	8.07	-15.25	-13.04	2.01	-6.05	-3.83
Distance	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	44.29	39.10	47.47	42.99	31.32	39.69	36.94	40.53	48.90
	DAY LEQ	49.58		EVENING LEQ	44.86		NIGHT LEQ	49.72	

CNEL	56.12
DAY LEQ	49.58

Day hour	98.00
Absorptive?	no
Use hour?	no
GRADE dB	9.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Plus Project Traffic Noise

10	:Id
Little League Drive	:Road
Verdemont Drive to Meyers Road	:Segment

Vehicle Distribution (Heavy Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.54	14.02	10.43	92.00
Medium Trucks	48.00	2.00	50.00	3.00
Heavy Trucks	48.00	2.00	50.00	5.00

ADT	840
Speed	25
Distance	44
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	48.65	1.01	1.68	36.12	0.17	0.28	8.96	1.40	2.33
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	12.59	-4.25	-2.03	11.29	-12.03	-9.81	5.24	-2.82	-0.61
Distance	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	47.51	42.32	50.69	46.22	34.54	42.91	40.16	43.75	52.12
	DAY LEQ	52.80		EVENING LEQ	48.08		NIGHT LEQ	52.95	

CNEL	**59.34**
DAY LEQ	52.80

Day hour	98.00
Absorptive?	no
Use hour?	no
GRADE dB	9.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Traffic Noise

11	:Id
Little League Drive	:Road
Meyers Road to Belmont Avenue	:Segment

Vehicle Distribution (Heavy Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.54	14.02	10.43	92.00
Medium Trucks	48.00	2.00	50.00	3.00
Heavy Trucks	48.00	2.00	50.00	5.00

ADT	1800
Speed	25
Distance	44
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	104.25	2.16	3.60	77.39	0.36	0.60	19.19	3.00	5.00
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	15.90	-0.94	1.28	14.60	-8.72	-6.50	8.55	0.49	2.70
Distance	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	50.82	45.63	54.00	49.53	37.85	46.22	43.47	47.06	55.43
	DAY LEQ	56.11		EVENING LEQ	51.39		NIGHT LEQ	56.25	

CNEL	62.65
DAY LEQ	56.11

Day hour	99.00
Absorptive?	no
Use hour?	no
GRADE dB	10.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Plus Project Traffic Noise

11	:Id
Little League Drive	:Road
Meyers Road to Belmont Avenue	:Segment

Vehicle Distribution (Heavy Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.54	14.02	10.43	92.00
Medium Trucks	48.00	2.00	50.00	3.00
Heavy Trucks	48.00	2.00	50.00	5.00

ADT	2240
Speed	25
Distance	44
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	129.73	2.69	4.48	96.31	0.45	0.75	23.88	3.73	6.22
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	16.85	0.01	2.23	15.55	-7.77	-5.55	9.50	1.44	3.65
Distance	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	51.77	46.58	54.95	50.48	38.80	47.17	44.42	48.01	56.38
	DAY LEQ	57.06		EVENING LEQ	52.34		NIGHT LEQ	57.20	

CNEL	63.60
DAY LEQ	57.06

Day hour	99.00
Absorptive?	no
Use hour?	no
GRADE dB	10.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Traffic Noise

12	:Id	
Little League Drive	:Road	
Belmont Avenue to Little League Frontage Drive	:Segment	

Vehicle Distribution (Heavy Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.54	14.02	10.43	92.00
Medium Trucks	48.00	2.00	50.00	3.00
Heavy Trucks	48.00	2.00	50.00	5.00

ADT	2300
Speed	25
Distance	44
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	133.20	2.76	4.60	98.89	0.46	0.77	24.52	3.83	6.39
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	16.96	0.12	2.34	15.67	-7.66	-5.44	9.61	1.55	3.77
Distance	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	51.89	46.70	55.07	50.59	38.91	47.29	44.54	48.12	56.49
	DAY LEQ	57.18		EVENING LEQ	52.45		NIGHT LEQ	57.32	

CNEL	63.72
DAY LEQ	57.18

Day hour	0.00
Absorptive?	no
Use hour?	no
GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Plus Project Traffic Noise

12	:Id	
Little League Drive	:Road	
Belmont Avenue to Little League Frontage Drive	:Segment	

Vehicle Distribution (Heavy Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.54	14.02	10.43	92.00
Medium Trucks	48.00	2.00	50.00	3.00
Heavy Trucks	48.00	2.00	50.00	5.00

ADT	2740
Speed	25
Distance	44
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	158.68	3.29	5.48	117.81	0.55	0.91	29.21	4.57	7.61
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	17.72	0.88	3.10	16.43	-6.90	-4.68	10.37	2.31	4.53
Distance	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	52.65	47.46	55.83	51.35	39.67	48.05	45.30	48.88	57.25
	DAY LEQ	57.94		EVENING LEQ	53.21		NIGHT LEQ	58.08	

CNEL	64.48
DAY LEQ	57.94

Day hour	0.00
Absorptive?	no
Use hour?	no
GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Traffic Noise

13	:Id
Little League Drive	:Road
South of Little League Frontage Drive	:Segment

Vehicle Distribution (Heavy Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.54	14.02	10.43	92.00
Medium Trucks	48.00	2.00	50.00	3.00
Heavy Trucks	48.00	2.00	50.00	5.00

ADT	2500
Speed	25
Distance	44
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	144.79	3.00	5.00	107.49	0.50	0.83	26.65	4.17	6.94
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	17.32	0.49	2.70	16.03	-7.30	-5.08	9.97	1.91	4.13
Distance	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	52.25	47.06	55.43	50.95	39.28	47.65	44.90	48.49	56.86
	DAY LEQ	57.54		EVENING LEQ	52.82		NIGHT LEQ	57.68	

CNEL	64.08
DAY LEQ	57.54

Day hour	0.00
Absorptive?	no
Use hour?	no
GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Plus Project Traffic Noise

13	:Id
Little League Drive	:Road
South of Little League Frontage Drive	:Segment

Vehicle Distribution (Heavy Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.54	14.02	10.43	92.00
Medium Trucks	48.00	2.00	50.00	3.00
Heavy Trucks	48.00	2.00	50.00	5.00

ADT	2940
Speed	25
Distance	44
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	170.27	3.53	5.88	126.40	0.59	0.98	31.35	4.90	8.17
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	18.03	1.19	3.41	16.73	-6.59	-4.37	10.68	2.62	4.84
Distance	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	52.95	47.76	56.13	51.66	39.98	48.35	45.60	49.19	57.56
	DAY LEQ	58.25		EVENING LEQ	53.52		NIGHT LEQ	58.39	

CNEL	64.78
DAY LEQ	58.25

Day hour	0.00
Absorptive?	no
Use hour?	no
GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Traffic Noise

14	:Id
Antique Street	:Road
Verdemont Drive to Ohio Avenue	:Segment

Vehicle Distribution (Light Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.56	13.96	10.49	97.40
Medium Trucks	48.91	2.17	48.91	1.84
Heavy Trucks	47.30	5.41	47.30	0.74

ADT	147
Speed	25
Distance	25
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	9.02	0.11	0.04	6.66	0.02	0.02	1.67	0.15	0.06
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	5.26	-13.86	-17.96	3.95	-21.37	-21.36	-2.06	-12.61	-16.71
Distance	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	42.64	35.17	37.22	41.33	27.66	33.82	35.32	36.42	38.47
	DAY LEQ	44.30		EVENING LEQ	42.20		NIGHT LEQ	41.71	

CNEL	48.78
DAY LEQ	44.30

Day hour	0.00
Absorptive?	no
Use hour?	no
GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Plus Project Traffic Noise

14	:Id
Antique Street	:Road
Verdemont Drive to Ohio Avenue	:Segment

Vehicle Distribution (Light Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.56	13.96	10.49	97.40
Medium Trucks	48.91	2.17	48.91	1.84
Heavy Trucks	47.30	5.41	47.30	0.74

ADT	797
Speed	25
Distance	25
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	48.88	0.60	0.23	36.12	0.11	0.11	9.05	0.80	0.31
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	12.61	-6.52	-10.62	11.29	-14.03	-14.02	5.28	-5.27	-9.37
Distance	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94	2.94
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	49.99	42.51	44.56	48.67	35.00	41.16	42.66	43.76	45.81
	DAY LEQ	51.65		EVENING LEQ	49.54		NIGHT LEQ	49.05	

CNEL	56.12
DAY LEQ	51.65

Day hour	0.00
Absorptive?	no
Use hour?	no
GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Traffic Noise

15	:Id
Magnolia Avenue	:Road
Ohio Avenue to Meyers Road	:Segment

Vehicle Distribution (Light Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.56	13.96	10.49	97.40
Medium Trucks	48.91	2.17	48.91	1.84
Heavy Trucks	47.30	5.41	47.30	0.74

ADT	600
Speed	25
Distance	30
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	36.80	0.45	0.18	27.19	0.08	0.08	6.81	0.60	0.23
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	11.37	-7.75	-11.85	10.06	-15.26	-15.25	4.05	-6.50	-10.61
Distance	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	47.96	40.48	42.53	46.65	32.97	39.14	40.64	41.73	43.78
	DAY LEQ	49.62		EVENING LEQ	47.51		NIGHT LEQ	47.02	

CNEL	54.10
DAY LEQ	49.62

Day hour	0.00
Absorptive?	no
Use hour?	no
GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Plus Project Traffic Noise

15	:Id
Magnolia Avenue	:Road
Ohio Avenue to Meyers Road	:Segment

Vehicle Distribution (Light Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.56	13.96	10.49	97.40
Medium Trucks	48.91	2.17	48.91	1.84
Heavy Trucks	47.30	5.41	47.30	0.74

ADT	1250
Speed	25
Distance	30
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	76.66	0.94	0.36	56.65	0.17	0.17	14.19	1.25	0.49
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	14.56	-4.57	-8.67	13.25	-12.07	-12.06	7.23	-3.32	-7.42
Distance	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	51.15	43.67	45.72	49.84	36.16	42.33	43.82	44.92	46.97
	DAY LEQ	52.81		EVENING LEQ	50.70		NIGHT LEQ	50.21	

CNEL	57.29
DAY LEQ	52.81

Day hour	0.00
Absorptive?	no
Use hour?	no
GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Traffic Noise

16 :Id

Magnolia Avenue :Road

Meyers Road to Belmont Avenue :Segment

Vehicle Distribution (Light Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.56	13.96	10.49	97.40
Medium Trucks	48.91	2.17	48.91	1.84
Heavy Trucks	47.30	5.41	47.30	0.74

ADT	1400
Speed	25
Distance	30
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	85.86	1.05	0.41	63.45	0.19	0.19	15.89	1.40	0.54
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	15.05	-4.07	-8.17	13.74	-11.58	-11.57	7.73	-2.82	-6.93
Distance	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	51.64	44.16	46.21	50.33	36.65	42.82	44.32	45.41	47.46
	DAY LEQ	53.30		EVENING LEQ	51.19		NIGHT LEQ	50.70	

CNEL	57.78
DAY LEQ	53.30

Day hour	0.00
Absorptive?	no
Use hour?	no
GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Plus Project Traffic Noise

16	:Id
Magnolia Avenue	:Road
Meyers Road to Belmont Avenue	:Segment

Vehicle Distribution (Light Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.56	13.96	10.49	97.40
Medium Trucks	48.91	2.17	48.91	1.84
Heavy Trucks	47.30	5.41	47.30	0.74

ADT	1990
Speed	25
Distance	30
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	122.05	1.49	0.58	90.19	0.26	0.27	22.59	1.99	0.77
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	16.58	-2.55	-6.65	15.27	-10.06	-10.04	9.25	-1.30	-5.40
Distance	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	53.17	45.69	47.74	51.86	38.18	44.35	45.84	46.94	48.99
	DAY LEQ	54.83		EVENING LEQ	52.72		NIGHT LEQ	52.23	

CNEL	59.31
DAY LEQ	54.83

Day hour	0.00
Absorptive?	no
Use hour?	no
GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Traffic Noise

17	:Id	Vehicle Distribution (Light Truck Mix)				ADT	800
Magnolia Avenue	:Road	Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	Speed	25
South of Belmont Avenue	:Segment	Automobiles	75.56	13.96	10.49	97.40	Distance	30
		Medium Trucks	48.91	2.17	48.91	1.84	Left Angle	-90
		Heavy Trucks	47.30	5.41	47.30	0.74	Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	49.06	0.60	0.23	36.26	0.11	0.11	9.08	0.80	0.31
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	12.62	-6.50	-10.61	11.31	-14.01	-14.00	5.30	-5.25	-9.36
Distance	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	49.21	41.73	43.78	47.90	34.22	40.39	41.89	42.98	45.03
	DAY LEQ	50.87		EVENING LEQ	48.76		NIGHT LEQ	48.27	

CNEL	55.35	Day hour	0.00
DAY LEQ	50.87	Absorptive?	no
		Use hour?	no
		GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Plus Project Traffic Noise

17	:Id
Magnolia Avenue	:Road
South of Belmont Avenue	:Segment

Vehicle Distribution (Light Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.56	13.96	10.49	97.40
Medium Trucks	48.91	2.17	48.91	1.84
Heavy Trucks	47.30	5.41	47.30	0.74

ADT	850
Speed	25
Distance	30
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	52.13	0.64	0.25	38.52	0.11	0.11	9.65	0.85	0.33
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	12.89	-6.24	-10.34	11.57	-13.75	-13.74	5.56	-4.99	-9.09
Distance	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	49.47	41.99	44.05	48.16	34.49	40.65	42.15	43.24	45.30
	DAY LEQ	51.13		EVENING LEQ	49.03		NIGHT LEQ	48.53	

CNEL	55.61
DAY LEQ	51.13

Day hour	0.00
Absorptive?	no
Use hour?	no
GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside light truck mix.

Existing Traffic Noise

18	:Id	Vehicle Distribution (Heavy Truck Mix)				ADT	4500
Palm Avenue	:Road	Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	Speed	25
Ohio Avenue to Belmont Avenue	:Segment	Automobiles	75.54	14.02	10.43	92.00	Distance	44
		Medium Trucks	48.00	2.00	50.00	3.00	Left Angle	-90
		Heavy Trucks	48.00	2.00	50.00	5.00	Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	260.61	5.40	9.00	193.48	0.90	1.50	47.98	7.50	12.50
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	19.87	3.04	5.26	18.58	-4.74	-2.52	12.53	4.47	6.68
Distance	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	54.80	49.61	57.98	53.51	41.83	50.20	47.45	51.04	59.41
	DAY LEQ	60.09		EVENING LEQ	55.37		NIGHT LEQ	60.23	

CNEL	66.63	Day hour	0.00
DAY LEQ	60.09	Absorptive?	no
		Use hour?	no
		GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Plus Project Traffic Noise

18	:Id
Palm Avenue	:Road
Ohio Avenue to Belmont Avenue	:Segment

Vehicle Distribution (Heavy Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.54	14.02	10.43	92.00
Medium Trucks	48.00	2.00	50.00	3.00
Heavy Trucks	48.00	2.00	50.00	5.00

ADT	4550
Speed	25
Distance	44
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	263.51	5.46	9.10	195.63	0.91	1.52	48.51	7.58	12.64
Speed in MPH	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	59.44	71.09	77.24	59.44	71.09	77.24	59.44	71.09	77.24
ADJUSTMENTS									
Flow	19.92	3.09	5.31	18.63	-4.69	-2.48	12.57	4.51	6.73
Distance	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	54.85	49.66	58.03	53.55	41.88	50.25	47.50	51.09	59.46
	DAY LEQ	60.14		EVENING LEQ	55.42		NIGHT LEQ	60.28	

CNEL	66.68
DAY LEQ	60.14

Day hour	0.00
Absorptive?	no
Use hour?	no
GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Traffic Noise

			Vehicle Distribution (Heavy Truck Mix)					
19	:Id		Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	ADT 12800
Palm Avenue	:Road		Automobiles	75.54	14.02	10.43	92.00	Speed 45
Belmont Avenue to Little League Frontage Drive/Kendall Avenue	:Segment		Medium Trucks	48.00	2.00	50.00	3.00	Distance 44
			Heavy Trucks	48.00	2.00	50.00	5.00	Left Angle -90
								Right Angle 90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	741.30	15.36	25.60	550.33	2.56	4.27	136.47	21.33	35.56
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	21.86	5.03	7.24	20.57	-2.76	-0.54	14.51	6.45	8.67
Distance	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	66.69	58.13	64.87	65.40	50.35	57.09	59.34	59.56	66.30
	DAY LEQ	69.24		EVENING LEQ	66.11		NIGHT LEQ	67.80	

CNEL	74.53	Day hour	0.00
DAY LEQ	69.24	Absorptive?	no
		Use hour?	no
		GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Plus Project Traffic Noise

19	:Id	
Palm Avenue	:Road	
Belmont Avenue to Little League Frontage Drive/Kendall Avenue	:Segment	

Vehicle Distribution (Heavy Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.54	14.02	10.43	92.00
Medium Trucks	48.00	2.00	50.00	3.00
Heavy Trucks	48.00	2.00	50.00	5.00

ADT	13230
Speed	45
Distance	44
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	766.20	15.88	26.46	568.82	2.65	4.41	141.06	22.05	36.75
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	22.01	5.17	7.39	20.71	-2.61	-0.39	14.66	6.60	8.81
Distance	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	66.84	58.28	65.01	65.54	50.50	57.23	59.49	59.70	66.44
	DAY LEQ	69.38		EVENING LEQ	66.26		NIGHT LEQ	67.94	

CNEL	74.68
DAY LEQ	69.38

Day hour	0.00
Absorptive?	no
Use hour?	no
GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Traffic Noise

20	:Id	Vehicle Distribution (Heavy Truck Mix)				ADT	20400
		Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	
Palm Avenue	:Road	Automobiles	75.54	14.02	10.43	92.00	Speed 45
South of Little League Frontage Drive/Kendall Avenue	:Segment	Medium Trucks	48.00	2.00	50.00	3.00	Distance 44
		Heavy Trucks	48.00	2.00	50.00	5.00	Left Angle -90
							Right Angle 90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1181.45	24.48	40.80	877.09	4.08	6.80	217.50	34.00	56.67
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	23.89	7.05	9.27	22.59	-0.73	1.49	16.54	8.48	10.70
Distance	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	68.72	60.16	66.90	67.42	52.38	59.11	61.37	61.58	68.32
	DAY LEQ	71.26		EVENING LEQ	68.14		NIGHT LEQ	69.83	

CNEL	76.56	Day hour	0.00
DAY LEQ	71.26	Absorptive?	no
		Use hour?	no
		GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Plus Project Traffic Noise

20	:Id	
Palm Avenue	:Road	
South of Little League Frontage Drive/Kendall Avenue	:Segment	

Vehicle Distribution (Heavy Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.54	14.02	10.43	92.00
Medium Trucks	48.00	2.00	50.00	3.00
Heavy Trucks	48.00	2.00	50.00	5.00

ADT	20720
Speed	45
Distance	44
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	1199.98	24.86	41.44	890.85	4.14	6.91	220.91	34.53	57.56
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	23.95	7.12	9.34	22.66	-0.66	1.55	16.60	8.54	10.76
Distance	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	68.78	60.23	66.96	67.49	52.44	59.18	61.43	61.65	68.39
	DAY LEQ	71.33		EVENING LEQ	68.20		NIGHT LEQ	69.89	

CNEL	76.63
DAY LEQ	71.33

Day hour	0.00
Absorptive?	no
Use hour?	no
GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

APPENDIX F

SOUNDPLAN DATA

Statio km	ADT Veh/24	Vehicles type	Vehicle name	Traffic values day Veh/h	evening Veh/h	night Veh/h	Speed km/h	Contr devic	Cons Spee km/h	Affec veh. %	Road surface	Gradie Min / M %
1			Traffic direction: In entry direction									
0+00	4300	Total	-	268	196	55	-	none	-	-	Average (of DGAC a	-7.7 / 7
		Automobiles	-	264	195	49	64					
		Medium trucks	-	3	1	4	64					
		Heavy trucks	-	1	1	2	64					
		Buses	-	-	-	-	-					
		Motorcycles	-	-	-	-	-					
		Auxiliary vehicle	-	-	-	-	-					

Receiver list

No.	Receiver name	Building side	Floor	Limit Lden dB(A)	Level Lden dB(A)	Conflict Lden dB
1	1	-	EG	-	58.0	-
2	3	-	EG	-	57.5	-
3	5	-	EG	-	56.8	-
4	6	-	EG	-	61.1	-
5	8	-	EG	-	60.2	-
6	10	-	EG	-	60.0	-
7	11	-	EG	-	59.9	-
8	12	-	EG	-	58.4	-

APPENDIX G

VIBRATION WORKSHEETS

GROUNDBORNE VIBRATION ANALYSIS

Project:	19714 Verdemont Heights Residential	Date:	9/20/24
Source:	Vibratory Roller		
Scenario:	Unmitigated		
Location:	Residential to South		
Address:	7078 Magnolia Avenue, San Bernardino		

PPV = PPVref(25/D)^n (in/sec)

INPUT

Equipment Type =	1	Vibratory Roller	INPUT SECTION IN GREEN
PPVref =	0.21	Reference PPV (in/sec) at 25 ft.	
D =	12.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.

RESULTS

PPV =	0.631	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS

Project:	19714 Verdemont Heights Residential	Date:	9/20/24
Source:	Large Bulldozer		
Scenario:	Unmitigated		
Location:	Residential to South		
Address:	7078 Magnolia Avenue, San Bernardino		

PPV = PPVref(25/D)^n (in/sec)

INPUT

Equipment Type =	2	Large Bulldozer	INPUT SECTION IN GREEN
PPVref =	0.089	Reference PPV (in/sec) at 25 ft.	
D =	12.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.

RESULTS

PPV =	0.268	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS

Project:	19714 Verdemont Heights Residential	Date:	9/20/24
Source:	Vibratory Roller		
Scenario:	Mitigated		
Location:	Residential to South		
Address:	7078 Magnolia Avenue, San Bernardino		

PPV = PPVref(25/D)^n (in/sec)

INPUT

Equipment Type =	1	Vibratory Roller	INPUT SECTION IN GREEN
PPVref =	0.21	Reference PPV (in/sec) at 25 ft.	
D =	26.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.

RESULTS

PPV =	0.198	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS

Project:	19714 Verdemont Heights Residential	Date:	9/20/24
Source:	Large Bulldozer		
Scenario:	Mitigated		
Location:	Residential to South		
Address:	7078 Magnolia Avenue, San Bernardino		

PPV = PPVref(25/D)^n (in/sec)

INPUT

Equipment Type =	2	Large Bulldozer	INPUT SECTION IN GREEN
PPVref =	0.089	Reference PPV (in/sec) at 25 ft.	
D =	15.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.

RESULTS

PPV =	0.191	IN/SEC	OUTPUT IN BLUE

Construction Annoyance Vibration Calculations

Source: Federal Transit Administration (FTA), Transit Noise and Vibration Impact Assessment Manual (September 2018).

Eq. 7-3: $Lvdistance = Lvref - 30\log(D/25)$

Lvdistance = the rms velocity level adjsuted for distance, VdB
Lvref = the source reference vibration level at 25 feet, VdB
D = distance from the equipment to th receiver, ft.

Large Bulldozer:

Lvdistance = 87 - 30 log (12/25) = 96.56 VdB

Lvdistance = 87 - 30 log (80/25) = 71.85 VdB

Vibratory Roller:

Lvdistance = 94 - 30 log (12/25) = 99.56 VdB

Lvdistance = 94 - 30 log (136/25) = 71.93 VdB

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