BALSAM AT WINONA APARTMENTS PROJECT NOISE IMPACT ANALYSIS

City of Victorville

January 7, 2021

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

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Project No. 19305

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EXECUTIVE SUMMARY

The proposed project is located at the southeast corner of Balsam Avenue and the extension of Winona Street in the City of Victorville. The project site is currently undeveloped.

The project involves development of the site with 212 apartment dwelling units. Vehicular access is proposed at Winona Street and Balsam Road.

Construction Impacts

The City of Victorville General Plan and Municipal Code do not identify specific construction noise level thresholds. As the City of Victorville has not adopted a numerical threshold that identifies what a substantial increase would be, for purposes of this analysis, the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment (2006) criteria will be used to establish significance thresholds. The FTA provides reasonable criteria for assessing construction noise impacts based on the potential for adverse community reaction. For residential uses, the daytime noise threshold is 80 dBA L_{eq} averaged over an 8-hour period ($L_{eq\ (8\text{-}hr)}$; and the nighttime noise threshold is 70 dBA $L_{eq\ (8\text{-}hr)}$. For commercial uses, the daytime and nighttime noise threshold is 85 dBA $L_{eq\ (8\text{-}hr)}$.

Modeled unmitigated construction noise levels when combined with existing measured noise levels reached up to 73.9 dBA L_{eq} at the nearest residential property line to the east, 63.7 dBA L_{eq} at the nearest residential property line to the northeast, 75.3 dBA L_{eq} at the nearest residential property line to the south, 75.2 dBA L_{eq} at the nearest commercial property line to the southwest, and 72.2 dBA L_{eq} at the nearest school property line to the west of the project site.

Construction noise levels would not be anticipated to exceed the FTA's daytime residential or commercial construction noise thresholds. It is not anticipated that the proposed project would undergo construction activities during the noise-sensitive nighttime hours (10:00 PM to 7:00 AM). However, the City's Municipal Code does not specify allowed hours of construction activities. Modeled construction noise levels would be anticipated to exceed the FTA's residential nighttime construction noise threshold of 70 dBA $L_{eq\ (8\text{-}hr)}$ at the residential uses located to the south and east of the project site. Therefore, a mitigation measure prohibiting construction during the nighttime hours as been included in Section 7 of this report. Therefore, with incorporation of the measures identified in Section 7, project construction is not anticipated to exceed the FTA's residential nighttime construction noise thresholds.

Impacts related to construction noise will be further minimized with implementation of the measures presented in Section 7 of this report. Impacts would be less than significant.

Noise Impacts to Off-Site Receptors Due to Project Generated Trips

Existing and Existing Plus project traffic noise levels were modeled for roadways affected by project generated traffic utilizing the FHWA Traffic Noise Prediction Model FHWA-RD-77-108 in order to quantify the proposed project's contribution to increases in ambient noise levels.

For off-site project generated noise, increases in ambient noise along affected roadways due to project generated vehicle traffic is considered substantial if they result in an increase of at least 5 dBA CNEL and: (1) the existing noise levels already exceed the applicable land use compatibility standard for the affected sensitive receptors set forth in the Noise Element of the City's General Plan; or (2) the project increases noise levels by at least 5 dBA CNEL and raises the ambient noise level from below the applicable standard to above the applicable standard.

Per the noise modeling, all of the modeled roadway segments are anticipated to change the noise a nominal amount (approximately 0.02 to 4.26 dBA CNEL). Therefore, a change in noise level would not be audible and would be considered less than significant.

Transportation Noise Impacts to the Proposed Project

Interior noise levels at the proposed units may reach up to 45 dB CNEL and are not expected to exceed the State's interior noise standard for residential units of 55 dBA Leq. This impact would be less than significant. No mitigation is required.

Groundborne Vibration Impacts

Construction equipment is anticipated to be located at a distance of at least 45 feet or more from any receptor. Temporary vibration levels could be considered annoying to the receptors to the east. Annoyance is expected to be short-term, occurring only during grading and site preparation. Mitigation measures to reduce potential impacts related to annoyance are presented in Section 8 of this report. Temporary vibration levels associated with project construction would be less than significant in regards to potential architectural damage. Therefore, impacts associated with construction activities would be less than significant.

Construction Noise Reduction Measures

The following measures are recommended to reduce construction noise and vibrations, emanating from the proposed project:

1. During all project site excavation and grading on-site, construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturer standards.

2. The contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the project site.

3. Equipment shall be shut off and not left to idle when not in use.

4. The contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise/vibration sources and sensitive receptors nearest the project site during all project construction.

5. Jackhammers, pneumatic equipment and all other portable stationary noise sources shall be shielded and noise shall be directed away from sensitive receptors.

6. The project proponent shall mandate that the construction contractor prohibit the use of music or sound amplification on the project site during construction.

7. The construction contractor shall limit haul truck deliveries to the same hours specified for construction equipment.

8. Construction activities are prohibited during noise-sensitive nighttime hours of 10:00 PM to 7:00 AM.

1. INTRODUCTION

This section describes the purpose of this noise impact analysis, project location, proposed development, and study area. Figure 1 shows the project location map and Figure 2 illustrates the project site plan.

PURPOSE AND OBJECTIVES

The purpose of this report is to provide an assessment of the noise impacts resulting from development of the proposed Balsam at Winona Apartments 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 in light of applicable federal, state and local policies, including those of the City of Victorville.

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 proposed project is located at the southeast corner of Balsam Avenue and the extension of Winona Street in the City of Victorville. The project site is currently undeveloped. A vicinity map showing the project location is provided on Figure 1.

PROJECT DESCRIPTION

The project involves development of the site with 212 apartment dwelling units. Vehicular access is proposed at Winona Street and Balsam Road. Figure 2 illustrates the project site plan.

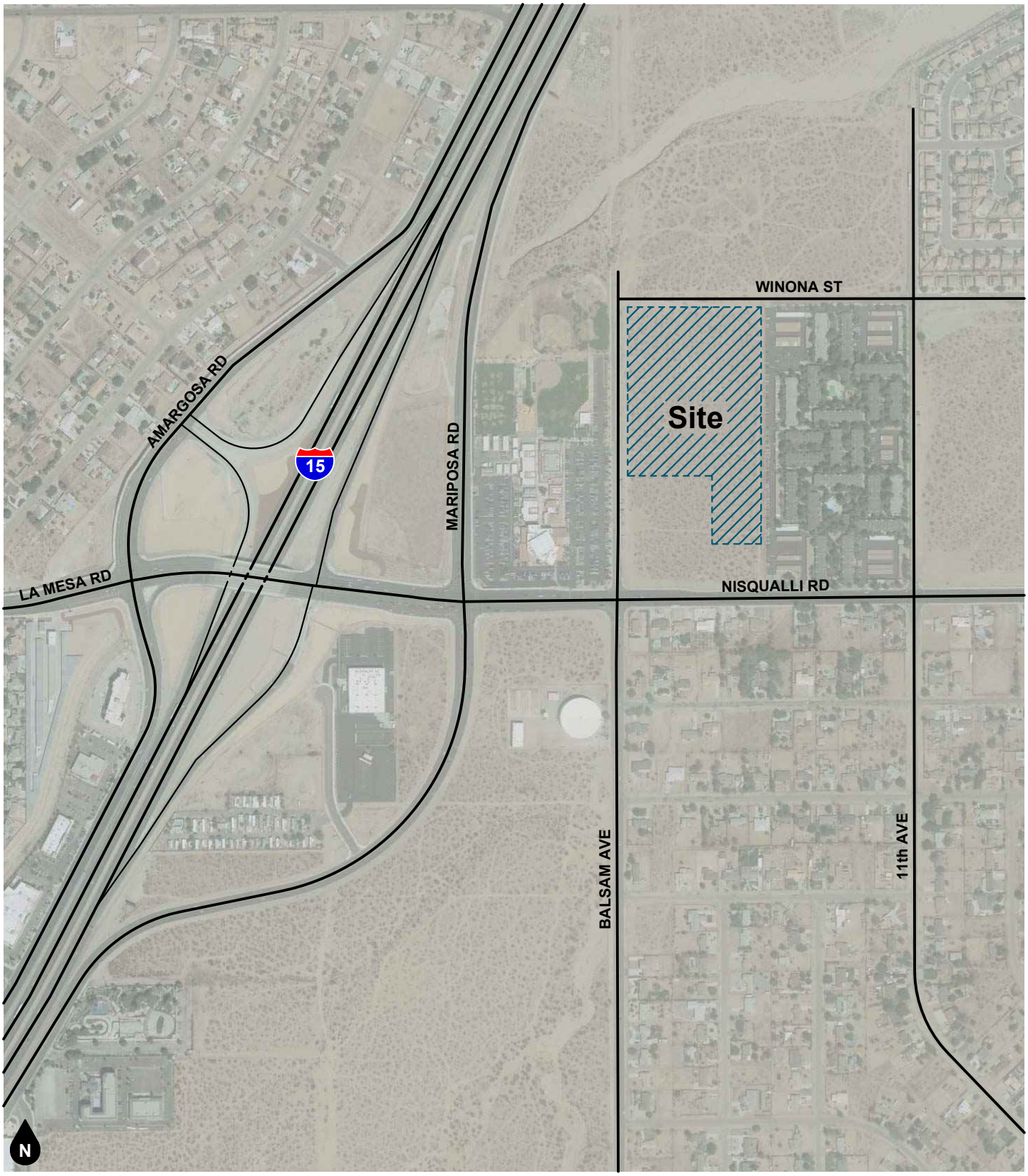


Figure 1
Project Location Map

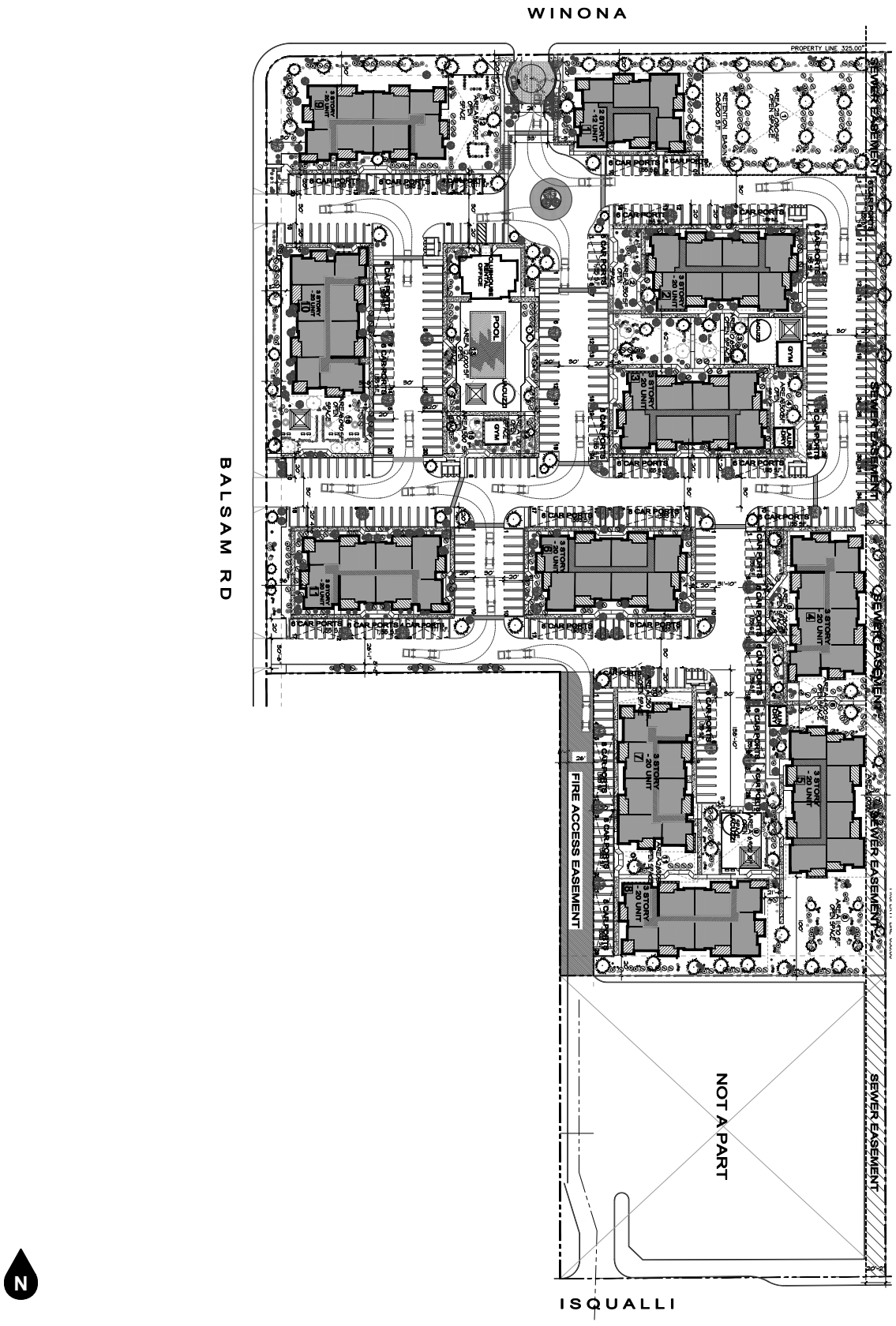


Figure 2
Site Plan

2. NOISE AND VIBRATION FUNDAMENTALS

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, $L_{eq(3\text{-}hr)}$ 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 Raleigh 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 the figure, 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.

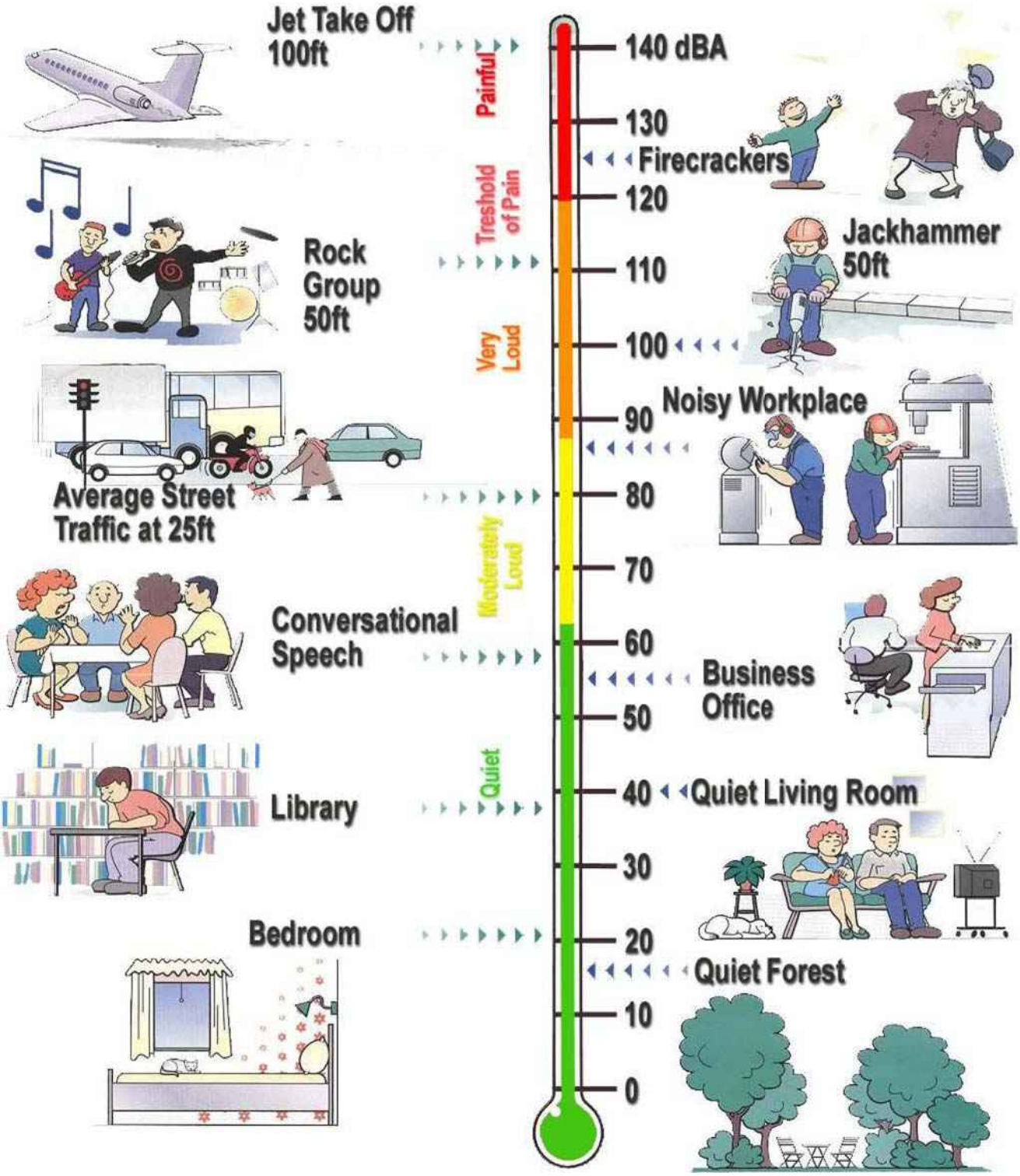
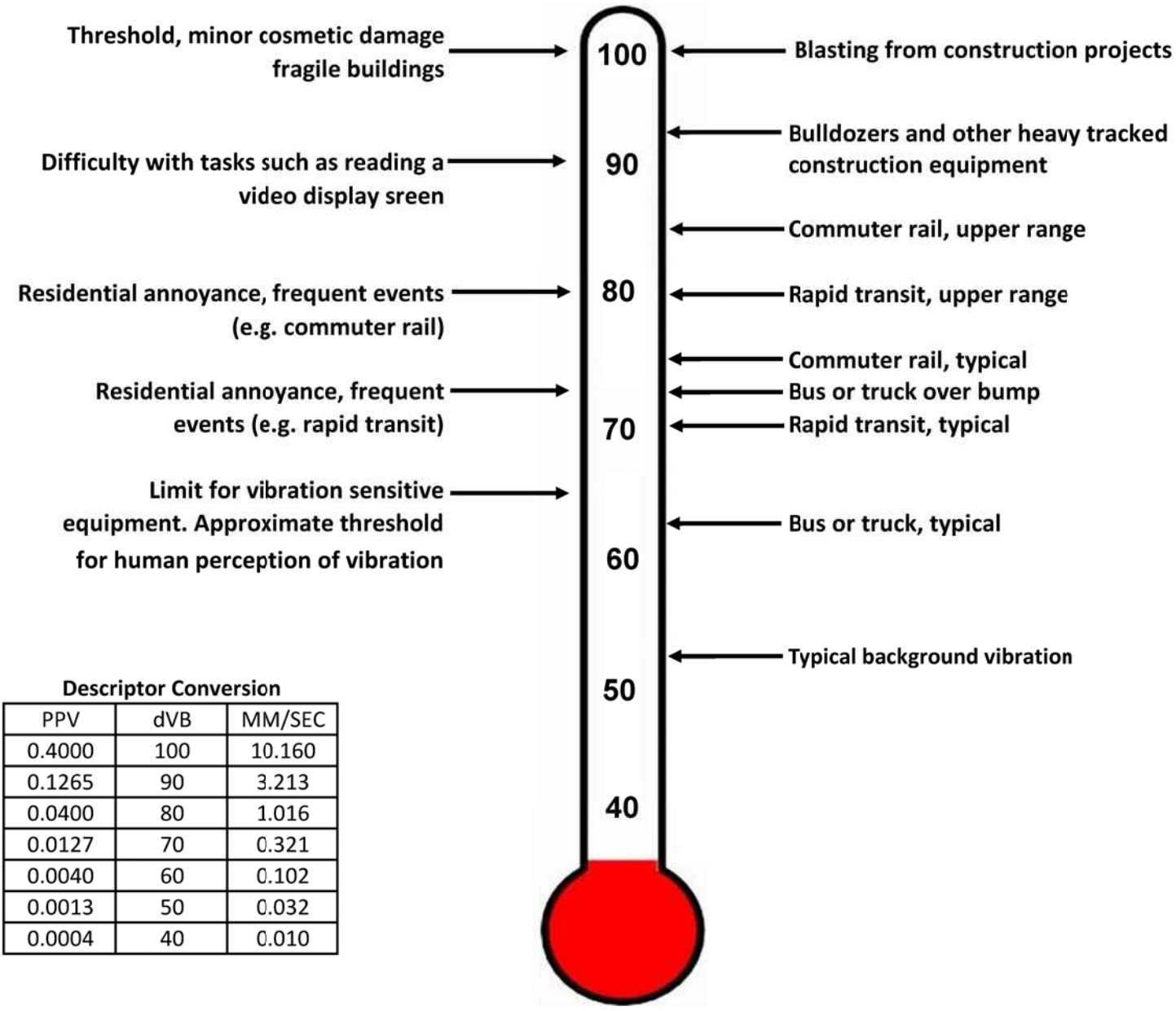


Figure 3
Weighted Sound Levels and Human Response

Source: Bruel & Kjaer 2001



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

EXISTING LAND USES AND SENSITIVE RECEPTORS

The project site is bordered vacant land to the south, residential uses to the east, Winona Street to the north, and Balsam Road to the west.

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 existing multi-family residential dwelling units located adjacent to the east, school use located approximately 50 feet west (across Balsam Avenue), the single-family residential dwelling units located approximately 330 feet south (across Nisqualli Road) and 690 feet northeast 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, four (4) 15-minute daytime noise measurements were taken between 11:19 AM and 1:16 PM on December 7, 2020. Field worksheets and noise measurement output data are included in Appendix C.

As shown on Figure 5, the noise measurements were taken near single-family residential uses located to the south of the project site (along Nisqualli Road) (NM1), near the school use to the west of the project site (along Balsam Avenue) (NM2), near the single-family residential uses to the northeast of the project site (at the intersection of 11th Avenue and Winona Street) (NM3), and near the multi-family residential use located adjacent to the east of the project site (NM4). Table 1 provides a summary of the short-term ambient noise data. Short-term ambient noise levels were measured between 49.6 and 74.9 dBA L_{eq}. The dominant noise sources were vehicles traveling along Nisqualli Road, Balsam Avenue, Interstate 15 Freeway, 11th Avenue, and Winona Street as well as residential noise.

Table 1
Noise Measurement Summary (dBA)

Site Location	Time Started	Leq	Lmax	Lmin	L(2)	L(8)	L(25)	L(50)
NM1	11:19 AM	74.9	93.5	46.9	82.6	78.5	74.7	69.9
NM2	11:55 AM	53.1	70.6	46.6	60.0	54.5	51.4	50.1
NM3	12:29 PM	57.1	73.3	42.0	66.6	61.8	54.7	49.7
NM4	1:01 PM	49.6	56.2	44.5	52.5	51.6	50.2	49.1

Notes:

(1) See Figure 5 for noise measurement locations. Each noise measurement was performed over a 15-minute duration.

(2) Noise measurements performed on December 7, 2020.

Legend

⊕ Noise Measurement Location

NM 1

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 addition, the Levels of Environmental Noise identified five (5) dBA as an "adequate margin of safety" for a noise level increase relative to a baseline noise exposure level of 55 dBA Ldn (i.e., there would not be a noticeable increase in adverse community reaction with an increase of five dBA or less from this baseline level). The EPA did not promote these findings as universal standards or regulatory goals with mandatory applicability to all communities, but rather as advisory exposure levels below which there would be no risk to a community from any health or welfare effect of noise.

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. The City of Victorville uses their own version of the Land Use Compatibility Matrix (see Table 2).

California Environmental Quality Act

The California Environmental Quality Act Guidelines (Appendix G) establishes thresholds for noise impact analysis. This noise study includes analysis of noise and vibration impacts necessary to assess the project in light of the following Appendix G Checklist Thresholds.

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?

Substantial increases in ambient noise levels are usually associated with project construction noise (temporary) and project operational noise (permanent).

Project Construction Noise: The City of Victorville General Plan and Municipal Code do not identify specific construction noise level thresholds. As the City of Victorville has not adopted a numerical threshold that identifies what a substantial increase would be, for purposes of this analysis, the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment (2006) criteria will be used to establish significance thresholds. The FTA provides reasonable criteria for assessing construction noise impacts based on the potential for adverse community reaction. For residential uses, the daytime noise threshold is 80 dBA L_{eq} averaged over an 8-hour period ($L_{eq\ (8\text{-}hr)}$; and the nighttime noise threshold is 70 dBA $L_{eq\ (8\text{-}hr)}$. For commercial uses, the daytime and nighttime noise threshold is 85 dBA $L_{eq\ (8\text{-}hr)}$.

Project Operational Noise (permanent): On-site operational noise is usually only evaluated for commercial and industrial projects. Quantitative analysis of on-site operational noise is typically not conducted for residential projects as they usually do not include stationary noise sources that could result in substantial increases in ambient noise levels resulting in violation of established standards. Therefore, the evaluation of project operational noise in this study is limited to the potential impacts associated with project generated vehicle traffic (off-site noise). Depending upon how many units are proposed and the existing noise environment, project generated vehicle trips could result in substantial increases in noise levels.

For off-site project generated noise, increases in ambient noise along affected roadways due to project generated vehicle traffic is considered substantial if they result in an increase of at least 5 dBA CNEL and: (1) the existing noise levels already exceed the applicable land use compatibility standard for the affected sensitive receptors set forth in the Noise Element of the City's General Plan; or (2) the project increases noise levels by at least 5 dBA CNEL and raises the ambient noise level from below the applicable standard to above the applicable standard.

b) Generate excessive groundborne vibration or groundborne noise levels?

As shown in Table 10, the threshold at which there is a risk to "architectural" damage to historic and some older buildings is a peak particle velocity (PPV) of 0.25, at older residential structures a PPV of 0.3, and at new residential structures a PPV of 0.5. Table 9 shows that a PPV of 0.04 is the threshold at which groundborne vibration becomes distinctly perceptible in regards to annoyance. Impacts would be significant if construction activities result in groundborne vibration of 0.25 PPV or higher at a sensitive receptor.

California Department of Transportation (Caltrans)

The California Department of Transportation has published one of the seminal works for the analysis of ground-borne noise and vibration relating to transportation- and construction-induced vibrations and although the project is not subject to these regulations, it serves as useful tools to evaluate vibration impacts. These guidelines recommend that a standard of 0.25 inches per second (in/sec) PPV not be exceeded for the protection of historic and some old buildings (California Department of Transportation, 2020).

LOCAL REGULATIONS

City of Victorville General Plan

The City of Victorville adopted their General Plan 2030 in 2008. The Noise Element of the General Plan includes the following noise-related goals, objectives and policies that are applicable to implementation of the proposed project.

Goal 1 **Noise Sensitivity** – Identify significant noise sources that could adversely affect community.

Objective 1.1 Locate noise sensitive land uses away from existing excessive noise sources, and locate new excessive noise generators away from existing sensitive land uses

Policy 1.1.1 Implement Table 2 regarding placement of new land uses.

Policy 1.1.2 Continue to ensure that there is no conflict or inconsistency between the operation of the Southern California Logistics Airport and future land uses within the Planning Area.

Goal 2 **Noise Control** – Manage the effects of noise emissions to help ensure reduction of adverse effects on the community.

Objective 2.1 Ensure existing and future noise sources are properly attenuated

Policy 2.1.1 Continue to implement acceptable standards for noise for various land uses throughout the City.

City of Victorville Municipal Code

13.01.040 Base ambient noise levels.

All ambient noise measurements shall commence in decibels within the respective zones and times as shown in Table 3. If the ambient noise level exceeds the applicable limit as noted in Table 3, the ambient noise level shall be the standard.

13.01.050 Noise levels prohibited.

Noise levels shall not exceed the ambient noise levels in Section 13.01.040 by the following dB(A) levels for the cumulative period of time specified:

1) Less than 5dB(A) for a cumulative period of more than thirty minutes in any hour;
2) Less than 10 dB(A) for a cumulative period of more than fifteen minutes in any hour;
3) Less than 15 dB(A) for a cumulative period of more than five minutes in any hour;
4) Less than 20 dB(A) for a cumulative period of more than one minute in any hour;
5) 20 dB(A) or more for any period of time.

13.01.060 Noise source exemptions.

The following activities shall be exempted from the provisions of this chapter:

(1) All mechanical devices, apparatus or equipment used, related to or connected with emergency machinery, vehicle or work.
(2) The provisions of this regulation shall not preclude the construction, operation, maintenance and repairs of equipment, apparatus or facilities of park and recreation projects, public works projects

or essential public works services and facilities, including those utilities subject to the regulatory jurisdiction of the California Public Utilities Commission.

(3) Activities conducted on the grounds of any elementary, intermediate or secondary school or college.

(4) Outdoor gatherings, public dances and shows, provided said events are conducted pursuant to a permit as required by this code.

(5) Activities conducted in public parks and public playgrounds, provided said events are conducted pursuant to a permit as required by this code.

(6) Any activity to the extent regulation thereof has been preempted by state or federal law.

(7) Traffic on any roadway or railroad right-of-way.

(8) The operation of the Southern California Logistics Airport.

(9) Construction activity on private properties that are determined by the director of building and safety to be essential to the completion of a project.

Table 2
City of Victorville Land Use Compatibility Standards

Land Use Categories	Community Noise Exposure Ldn or CNEL, dB						
	55	60	65	70	75	80+	
Residential - Low Density, Single Family, Duplex, Multifamily, Mobile Home	1	1	2	2	3	4	4
Transient Lodging- Motel, Hotels	1	1	2	2	3	3	4
Schools, Libraries, Churches, Hospitals, Nursing Homes	1	1	2	3	3	4	4
Auditoriums, Concert Halls, Amphitheatres	2	2	3	3	4	4	4
Sports Arena, Outdoor Spectator Sports	2	2	2	2	3	3	3
Playgrounds, Neighborhood Parks	1	1	1	2	3	3	3
Golf Courses, Riding Stables, Water Recreation, Cemeteries	1	1	1	2	2	4	4
Office Buildings, Business Commercial, Retail Commercial and Professional	1	1	1	2	2	3	3
Industrial, Manufacturing, Utilities	1	1	1	1	2	2	2
Agriculture	1	1	1	1	1	1	1

Notes:

Source: City of Victorville General Plan 2030 Noise Element Table N-3, 2011.

CNEL = Community Noise Equivalent Level

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

2 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, with closed windows and fresh air supply systems or air conditioning will normally suffice.

3 Normally Unacceptable:

4 Clearly Unacceptable:

Table 3
City of Victorville Base Ambient Noise Levels

Zone	Time	Sound Level Decibels
All residential zones	10:00 PM to 7:00 AM	55 dB(A)
	7:00 AM to 10:00 PM	65 dB(A)
All commercial zones	Anytime	70 dB(A)
All industrial zones	Anytime	75 dB(A)

Notes:
(1) City ofVictorville Municipal Code Section 13.01.040

5. ANALYTICAL METHODOLOGY AND MODEL PARAMETERS

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

CONSTRUCTION NOISE MODELING

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. Distances to receptors were based on the acoustical center of 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, Global Climate Change, and Energy Impact Analysis prepared for the proposed project (Ganddini Group, Inc., 2020). For construction noise 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. Construction noise worksheets are provided in Appendix D.

FHWA TRAFFIC NOISE PREDICTION MODEL – EXISTING AND EXISTING PLUS PROJECT TRAFFIC NOISE COMPARISON

Existing and Existing Plus project traffic noise levels were modeled for roadways affected by project generated traffic utilizing the Federal Highway Administration Traffic Noise Prediction Model (FHWA) Traffic Noise Prediction Model FHWA-RD-77-108 in order to quantify the proposed project's contribution to increases in ambient noise levels.

The FHWA Traffic Noise Prediction Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). Adjustments are then made to the REMEL to account for: total average daily traffic volumes, roadway classification, width, speed and truck mix, roadway grade and site conditions (hard or soft ground surface). Surfaces adjacent to all modeled roadways were assumed to have a "hard site" to predict worst-case, conservative noise levels. A hard site, such as pavement, is highly reflective and does not attenuate noise as quickly as grass or other soft sites. Possible reductions in noise levels due to intervening topography and buildings were not accounted for in this analysis.

Existing and Existing Plus Project vehicle mix were obtained from the project's traffic study (Ganddini Group 2020). Existing Plus Project vehicle mixes were calculated by adding the proposed project trips to existing conditions. FHWA spreadsheets are included in Appendix E.

SOUNDPLAN – FUTURE TRAFFIC NOISE

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. It is a three-dimensional noise modeling software that takes into account the shielding and reflective effects associated with intervening topography and nearby buildings. Roadway parameters utilized to model roadway noise model include location, traffic volume, speed and vehicle mix (autos, medium trucks, and heavy trucks).

The loudest noise levels associated with vehicle traffic occurs when the maximum amount of cars pass at the greatest speed which usually corresponds to Level of Service Conditions (C), or about 75% of buildout capacity. Therefore, Burbank Boulevard is expected to accommodate up to 40,500 vehicles per day at Level of Service C. Speed was modeled as posted and day/night/evening mixes and truck mixes, as recommended by the County of Riverside Department of Industrial Hygiene were utilized for modeling purposes.

SoundPLAN input and output data for traffic noise to the project is provided in Appendix F.

6. IMPACT ANALYSIS

This impact discussion analyzes the potential for noise and/or groundborne vibration impacts to cause the exposure of a person to, or generation of, noise levels in excess of established City of Victorville standards related to: construction and transportation noise related impacts to, or from, the proposed project.

IMPACTS RELATED TO CONSTRUCTION NOISE

The existing residential uses located to the northeast, east, and south and the existing school use located to the west of the project site 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.

The construction phases for the proposed project are anticipated to include grading, building construction, paving and architectural coating. A summary of noise level data for a variety of construction equipment compiled by the U.S. Department of Transportation is presented in Table 4. Typical operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings.

Construction noise associated with the proposed project was calculated 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. Distances to receptors were based on the acoustical center of the proposed construction activity. Construction noise levels were calculated for each phase. Anticipated noise levels during each construction phase are presented in Table 5. Worksheets for each phase are included as Appendix D.

A comparison of existing noise levels and existing plus project construction noise levels are presented in Table 5. NM1 was chosen to represent noise levels at the property lines of the residential uses to the south and commercial uses to the southwest, NM2 was chosen to represent noise levels at the property line of the school use to the west, NM3 was chosen to represent the property line of the residential uses to the northeast, and NM4 was chosen to represent the property lines of the residential properties to the east of the project site.

Modeled unmitigated construction noise levels when combined with existing measured noise levels reached up to 73.9 dBA L_{eq} at the nearest residential property line to the east, 63.7 dBA L_{eq} at the nearest residential property line to the northeast, 75.3 dBA L_{eq} at the nearest residential property line to the south, 75.2 dBA L_{eq} at the nearest commercial property line to the southwest, and 72.2 dBA L_{eq} at the nearest school property line to the west of the project site.

As discussed earlier, the City of Victorville General Plan and Municipal Code do not identify specific construction noise level thresholds. As the City of Victorville has not adopted a numerical threshold that identifies what a substantial increase would be, for purposes of this analysis, the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment (2006) criteria will be used to establish significance thresholds. The FTA provides reasonable criteria for assessing construction noise impacts based on the potential for adverse community reaction. For residential uses, the daytime noise threshold is 80 dBA L_{eq} averaged over an 8-hour period ($L_{eq\ (8\text{-}hr)}$; and the nighttime noise threshold is 70 dBA $L_{eq\ (8\text{-}hr)}$. For commercial uses, the daytime and nighttime noise threshold is 85 dBA $L_{eq\ (8\text{-}hr)}$.

Construction noise levels would not be anticipated to exceed the FTA's daytime residential or commercial construction noise thresholds. It is not anticipated that the proposed project would undergo construction activities during the noise-sensitive nighttime hours (10:00 PM to 7:00 AM). However, the City's Municipal

Code does not specify allowed hours of construction activities. As shown in Table 5, modeled construction noise levels would be anticipated to exceed the FTA's residential nighttime construction noise threshold of 70 dBA $L_{eq\ (8\text{-}hr)}$ at the residential uses located to the south and east of the project site. Therefore, a mitigation measure prohibiting construction during the nighttime hours as been included in Section 7 of this report. Therefore, with incorporation of the measures identified in Section 7, project construction is not anticipated to exceed the FTA's residential nighttime construction noise thresholds.

Impacts related to construction noise will be further minimized with implementation of the measures presented in Section 7 of this report.

Noise Impacts to Off-Site Receptors Due to Project Generated Trips

During operation, the proposed project is expected to generate approximately 1,153 average daily trips with 76 trips during the AM peak-hour and 93 trips during the PM peak-hour. A worst-case project generated traffic noise level was modeled utilizing the FHWA Traffic Noise Prediction Model - FHWA-RD-77-108. Traffic noise levels were calculated at the right of way 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 levels are shown for comparative purposes only to show the difference in with and without project conditions. Roadway input parameters including average daily traffic volumes (ADTs), speeds, and vehicle distribution data is shown in Table 6. The potential off-site noise impacts caused by an increase of traffic from operation of the proposed project on the nearby roadways were calculated for the following scenarios:

Existing Year (without Project): This scenario refers to existing year traffic noise conditions and is demonstrated in Table 7

Existing Year (With Project): This scenario refers to existing year plus project traffic noise conditions and is demonstrated in Table 7.

As shown in Table 7, modeled Existing traffic noise levels range between 55-79 dBA CNEL at the right-of-way of each modeled roadway segment; and the modeled Existing Plus Project traffic noise levels range between 56-79 dBA CNEL at the right-of-way of each modeled roadway segment.

As stated previously, for purposes of this project, increases in ambient noise along affected roadways due to project generated vehicle traffic is considered substantial if they result in an increase of at least 5 dBA CNEL and: (1) the existing noise levels already exceed the applicable land use compatibility standard for the affected sensitive receptors set forth in the Noise Element of the City's General Plan; or (2) the project increases noise levels by at least 3 dBA CNEL and raises the ambient noise level from below the applicable standard to above the applicable standard.

All modeled roadway segments are anticipated to change the noise a nominal amount (between approximately 0.02 to 4.3 dBA CNEL). Noise increases in ambient noise along affected roadways due to project generated vehicle traffic are considered substantial if they result in an increase of at least 5 dBA CNEL and: (1) the existing noise levels already exceed the applicable land use compatibility standard for the affected sensitive receptors set forth in the Noise Element of the City's General Plan; or (2) if the project increases noise levels by at least 3 dBA CNEL and raises the ambient noise level from below the applicable standard to above the applicable standard. Project

One road segment (Balsam Avenue, north of Nisqually Road would be exposed to a 4.3 dB increase in ambient noise levels. Thee affected land use is a parking lot associated with a church. The church is situated near Nisqualli Road. Existing modeled noise levels at this location are 56.61 dBA CNEL. Existing Plus project modeled noise levels at this location are 60.87. Noise levels of up to 65 are considered to be "normally acceptable" per the City's Land Use Compatibility Standards presented in Table 2. This impact would be less than significant. No mitigation is required.

TRANSPORTATION NOISE IMPACTS TO THE PROPOSED PROJECT

The project site is bound by Winona Street, Balsam Avenue, and Nisqualli Road. Per the City of Victorville General Plan Circulation Map, Winona Street and Balsam Avenue are classified as Collector roadways and Nisqualli Road (in the vicinity of the project site) is classified as a Major Arterial roadway. Nisqualli Road is an acoustically significant roadway. The project site is also influenced by vehicle traffic noise associated with Interstate 15 (I-15) which is located approximately 255 feet to the northwest. As shown in Figures 6 and 7, future traffic noise levels on the project site are expected to range between 57 and 65 dBA CNEL and would fall in the normally acceptable to conditionally acceptable category presented in Table 2. Where future noise levels reach 65 dBA CNEL, 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, with closed windows and fresh air supply systems or air conditioning will normally suffice.

The expected interior noise level of the proposed commercial building is the difference between the projected exterior noise level at the structure's facade and the noise reduction provided by the structure itself. Typical commercial building construction will provide a noise level reduction of 15 dBA with a "windows open" condition and a 20 dBA with a "windows closed" condition. A "windows closed" condition requires mechanical fresh air ventilation (e.g. air conditioning). It is assumed that the proposed units will be provided with HVAC/Air circulation systems. Interior noise levels at the proposed units may reach up to 45 dB CNEL and are not expected to exceed the State's interior noise standard for residential units of 55 dBA Leq. This impact would be less than significant. No mitigation is required.

GROUNDBORNE VIBRATION IMPACTS

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 PPV at a distance of 25 feet; and operation of a large bulldozer (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 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.

Annoyance to Persons

The primary effect of perceptible vibration is often a concern. However, secondary effects, such as the rattling of a china cabinet, can also occur, even when vibration levels are well below perception. Any effect (primary perceptible vibration, secondary effects, or a combination of the two) can lead to annoyance. The degree to which a person is annoyed depends on the activity in which they are participating at the time of the disturbance. For example, someone sleeping or reading will be more sensitive than someone who is running on a treadmill. Reoccurring primary and secondary vibration effects often lead people to believe that the vibration is damaging their home, although vibration levels are well below minimum thresholds for damage potential. (California Department of Transportation, 2020)

As shown in Table 9 vibration becomes distinctly perceptible to people in buildings at a PPV of 0.04.

At 45 feet, which is the closest distance to the closest off-site buildings, the carports associated with the multi-family residential uses to the east, use of a vibratory roller would be expected to generate a PPV of 0.087 and a bulldozer would be expected to generate a PPV of 0.037. Therefore, use of a bulldozer would not be considered annoying; however, use of a vibratory roller could be considered annoying to the receptors to the east. Annoyance is expected to be short-term, occurring only during grading and site preparation.

Mitigation measures to reduce potential impacts related to annoyance are presented in Section 8 of this report.

Architectural Damage

Vibration generated by construction activity generally has the potential to damage structures. This damage could be structural damage, such as cracking of floor slabs, foundations, columns, beams, or wells, or cosmetic architectural damage, such as cracked plaster, stucco, or tile. (California Department of Transportation, 2020)

Table 10 identifies a PPV level of 0.25 as the threshold at which there is a risk to "architectural" damage to historic and some old buildings. Temporary vibration levels associated with project construction would be less than significant. No mitigation is required. Vibration worksheets are provided in Appendix G.

Table 4 (1 of 2)
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
Auger Drill Rig	No	20	85	84	36
Backhoe	No	40	80	78	372
Bar Bender	No	20	80	-N/A-	0
Blasting	Yes	-N/A-	94	-N/A-	0
Boring Jack Power Unit	No	50	80	83	1
Chain Saw	No	20	85	84	46
Clam Shovel (dropping)	Yes	20	93	87	4
Compactor (ground)	No	20	80	83	57
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
Concrete Saw	No	20	90	90	55
Crane	No	16	85	81	405
Dozer	No	40	85	82	55
Drill Rig Truck	No	20	84	79	22
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
Generator	No	50	82	81	19
Generator (<25KVA, VMS signs)	No	50	70	73	74
Gradall	No	40	85	83	70
Grader	No	40	85	-N/A-	0
Grapple (on backhoe)	No	40	85	87	1
Horizontal Boring Hydr. Jack	No	25	80	82	6
Hydra Break Ram	Yes	10	90	-N/A-	0
Impact Pile Driver	Yes	20	95	101	11
Jackhammer	Yes	20	85	89	133
Man Lift	No	20	85	75	23
Mounted Impact hammer (hoe ram)	Yes	20	90	90	212
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

Table 4 (2 of 2)
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)
Pneumatic Tools	No	50	85	85	90
Pumps	No	50	77	81	17
Refrigerator Unit	No	100	82	73	3
Rivit Buster/chipping gun	Yes	20	85	79	19
Rock Drill	No	20	85	81	3
Roller	No	20	85	80	16
Sand Blasting (Single Nozzle)	No	20	85	96	9
Scraper	No	40	85	84	12
Shears (on backhoe)	No	40	85	96	5
Slurry Plant	No	100	78	78	1
Slurry Trenching Machine	No	50	82	80	75
Soil Mix Drill Rig	No	50	80	-N/A-	0
Tractor	No	40	84	-N/A-	0
Vacuum Excavator (Vac-truck)	No	40	85	85	149
Vacuum Street Sweeper	No	10	80	82	19
Ventilation Fan	No	100	85	79	13
Vibrating Hopper	No	50	85	87	1
Vibratory Concrete Mixer	No	20	80	80	1
Vibratory Pile Driver	No	20	95	101	44
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 5
Construction Noise Levels (L_{eq})

Phase	Receptor Location	Existing Ambient Noise Levels (Leq)[2]	Construction Noise Levels (Leq)	Combined Noise Levels (Leq)	Increase (dB)
Grading	Residential to East	49.6	73.9	73.9	24.3
	Residential to Northeast	57.1	62.6	63.7	6.6
	Residential to South	74.9	65.2	75.3	0.4
	Commercial to Southwest	74.9	64.1	75.2	0.3
	School to West	53.1	72.1	72.2	19.1
Building Construction	Residential to East	49.6	70.1	70.1	20.5
	Residential to Northeast	57.1	58.9	61.1	4.0
	Residential to South	74.9	61.5	75.1	0.2
	Commercial to Southwest	74.9	60.4	75.1	0.2
	School to West	53.1	68.4	68.5	15.4
Paving	Residential to East	49.6	68.7	68.8	19.2
	Residential to Northeast	57.1	57.4	60.3	3.2
	Residential to South	74.9	60.0	75.0	0.1
	Commercial to Southwest	74.9	58.9	75.0	0.1
	School to West	53.1	66.9	67.1	14.0
Architectural Coating	Residential to East	49.6	60.1	60.5	10.9
	Residential to Northeast	57.1	48.8	57.7	0.6
	Residential to South	74.9	51.4	74.9	0.0
	Commercial to Southwest	74.9	50.3	74.9	0.0
	School to West	53.1	58.3	59.4	6.3

Notes:

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

(2) Per measured existing ambient noise levels. NM4 used for residential receptors to the east, NM3 for residential receptors to the northeast, NM1 for residential receptors to the south and commercial receptors to the southwest, and NM2 for school receptors to the west.

Table 6
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		
Amargosa Road	North of La Mesa Road	25,400	25,500	45	Hard
Mariposa Road	North of Nisqualli Road	11,300	11,400	50	Hard
	South of Nisqualli Road	15,500	15,600	45	Hard
Balsam Avenue	North of Nisqualli Road	600	1,600	35	Hard
	South of Nisqualli Road	11,400	11,600	55	Hard
11th Avenue	North of Nisqualli Road	2,000	2,100	35	Hard
Winona Street	West of 11th Avenue	400	600	35	Hard
	East of 11th Avenue	400	500	35	Hard
La Mesa Road	West of Amargosa Road	26,900	27,000	45	Hard
	Amargosa Road to Interstate 15 Freeway	39,300	39,500	45	Hard
Nisqualli Road	Interstate 15 Freeway to Mariposa Road	41,000	41,500	45	Hard
	Mariposa Road to Balsam Avenue	35,700	36,300	45	Hard
	Balsam Avenue to 11th Avenue	27100	27,300	45	Hard
	East of 11th Avenue	23500	23,800	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 Balsam At Winon Apartments Project Traffic Impact Analysis, Ganddini Group Inc. (December 2020).

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

Table 7

Change 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	Exceeds Standards[3]	Increase of 5 dB or More?
Amargosa Road	North of La Mesa Road	42	77.71	77.73	0.02	Yes	No
Mariposa Road	North of Nisqualli Road	42	74.89	74.93	0.04	Yes	No
	South of Nisqualli Road	42	75.57	75.60	0.03	Yes	No
Balsam Avenue	North of Nisqualli Road	32	56.61	60.87	4.26	Yes	No
	South of Nisqualli Road	42	75.59	75.66	0.07	Yes	No
11th Avenue	North of Nisqualli Road	32	61.84	62.05	0.21	Yes	No
Winona Street	West of 11th Avenue	32	54.85	56.61	1.76	No	No
	East of 11th Avenue	32	54.85	55.82	0.97	No	No
La Mesa Road	West of Amargosa Road	50	77.20	77.22	0.02	Yes	No
	Amargosa Road to Interstate 15 Freeway	50	78.85	78.87	0.02	Yes	No
Nisqualli Road	Interstate 15 Freeway to Mariposa Road	62	78.10	78.15	0.05	Yes	No
	Mariposa Road to Balsam Avenue	62	77.50	77.57	0.07	Yes	No
	Balsam Avenue to 11th Avenue	50	77.24	77.27	0.03	Yes	No
	East of 11th Avenue	50	76.62	76.67	0.05	Yes	No

Notes:

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

(2) Right of way per the City of Victorville General Plan Circulation Element.

(3) Per the City of Victorville normally acceptable standard for residential dwelling units (see Table 3).

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

Table 9
Guideline Vibration Annoyance Potential Criteria

Human Response	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.4

Notes:

Source: California Department of Transportation. Transportation and Construction Vibration Guidance Manual, Chapter 7 Table 20, April 2020.

(1) Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Table 10
Guideline Vibration Damage Potential Threshold Criteria

Structure Condition	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, and	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Notes:

Source: California Department of Transportation. Transportation and Construction Vibration Guidance Manual, Chapter 7 Table 19, April 2020.

(1) Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Figure 6
Future On-Site Noise Levels

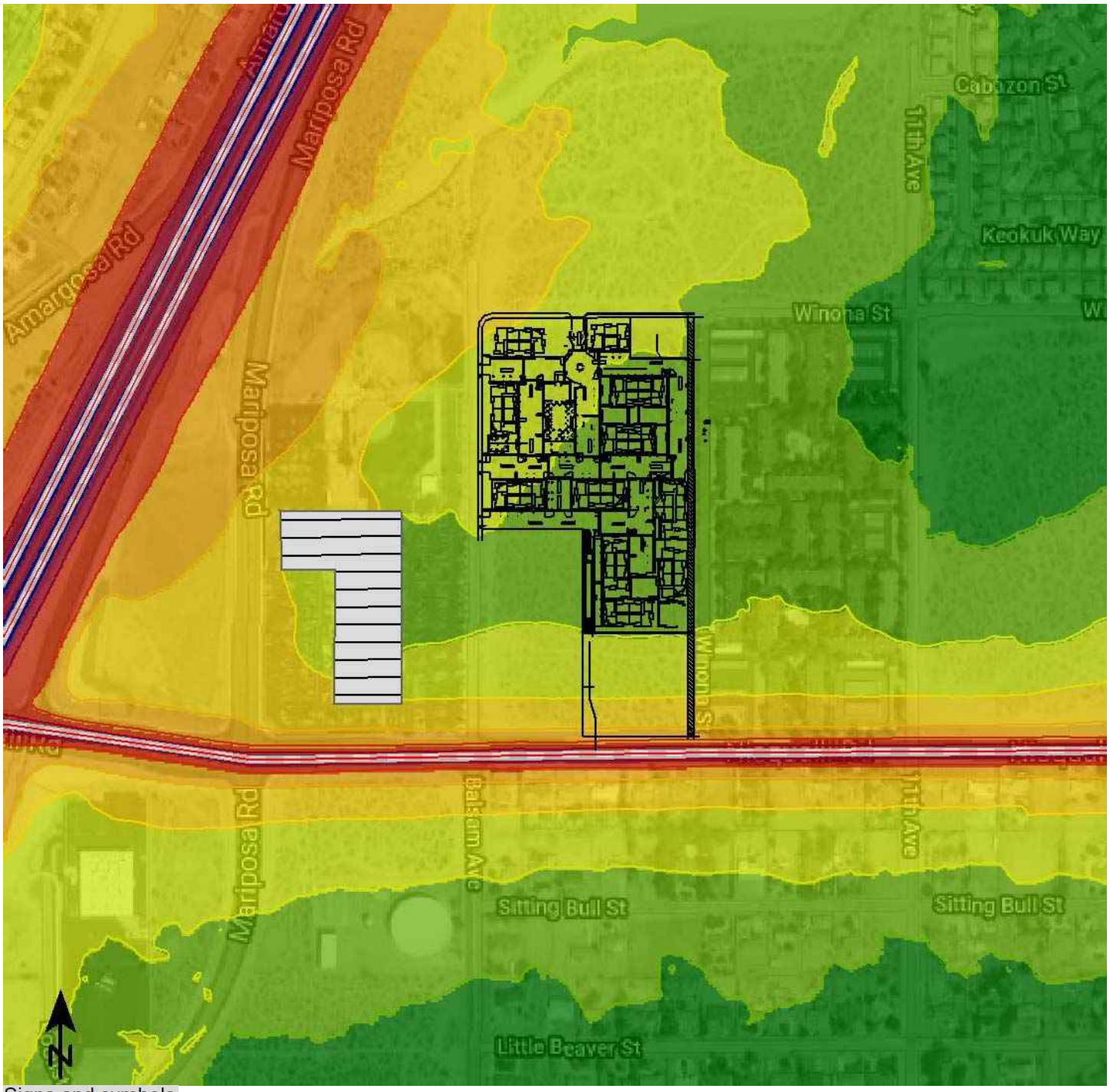


Figure 7
Future On-Site Noise Level Contours

7. MEASURES TO REDUCE IMPACTS

CONSTRUCTION NOISE REDUCTION MEASURES

In addition to adherence to the City of Victorville Municipal Code which limits the construction hours of operation, the following measures are recommended to reduce construction noise and vibrations, emanating from the proposed project:

1. During all project site excavation and grading on-site, construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturer standards.

2. The contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the project site.

3. Equipment shall be shut off and not left to idle when not in use.

4. The contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise/vibration sources and sensitive receptors nearest the project site during all project construction.

5. Jackhammers, pneumatic equipment and all other portable stationary noise sources shall be shielded and noise shall be directed away from sensitive receptors.

6. The project proponent shall mandate that the construction contractor prohibit the use of music or sound amplification on the project site during construction.

7. The construction contractor shall limit haul truck deliveries to the same hours specified for construction equipment.

8. Construction activities are prohibited during noise-sensitive nighttime hours of 10:00 PM to 7:00 AM.

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2009 County of Riverside Industrial Hygiene Guidelines for Determining and Mitigating Traffic Noise Impacts to Residential Structures and County.

U.S. Department of Transportation
2006 FHWA Roadway Construction Noise Model User's Guide. January.

Victorville, City of
2008 City of Victorville General Plan 2030. October 21.
2020 City of Victorville Municipal Code.

APPENDICES

Appendix A List of Acronyms
Appendix B Definitions of Acoustical Terms
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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

DEFINITIONS OF ACOUSTICAL TERMS

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}	L_{max} 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. L_{min} 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 WORKSHEET

Noise Measurement
Field Data

Project Name: Balsam at Winona Apartments, City of Victorville **Date:** December 7, 2020

Project #: JN 19305

Noise Measurement #: NM1 Run Time: 15 minutes (1 x 15 minutes) **Technician:** Ian Gallagher

Nearest Address or Cross Street: 15343 Nisqualli Road, Victorville, California.

Site Description (Type of Existing Land Use and any other notable features): Project site: Empty lot w/ vacant land to north, multi-family residential to east, Nisqualli Rd to south with single-family residential further south, and Balsam Rd to west with school use further west. Noise Measurement Site: Nisqualli Rd to north and single-family residential to south.

Weather: Overcast, cloud burning off, occasional filtered sun. **Settings:** SLOW FAST

Temperature: 59 deg F **Wind:** 5-10mph **Humidity:** 12% **Terrain:** Flat

Start Time: 11:19 AM **End Time:** 11:34 AM **Run Time:**

Leq: 74.9 dB **Primary Noise Source:** Traffic noise from 363 vehicles traveling along Nasqualli Road during measurement.

Lmax 93.5 dB

L2 82.6 dB **Secondary Noise Sources:** Traffic ambiance from Balsam, 11th Ave & 15 Freeway. Residential ambiance.

L8 78.5 dB

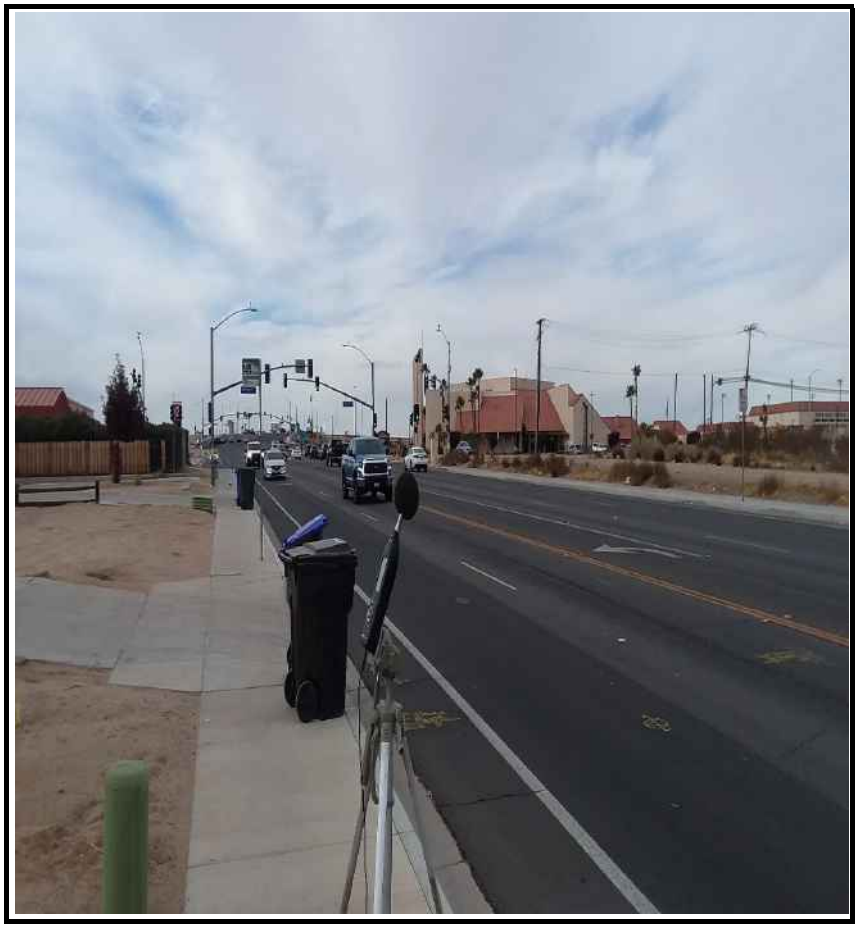
L25 74.7 dB

L50 69.9 dB

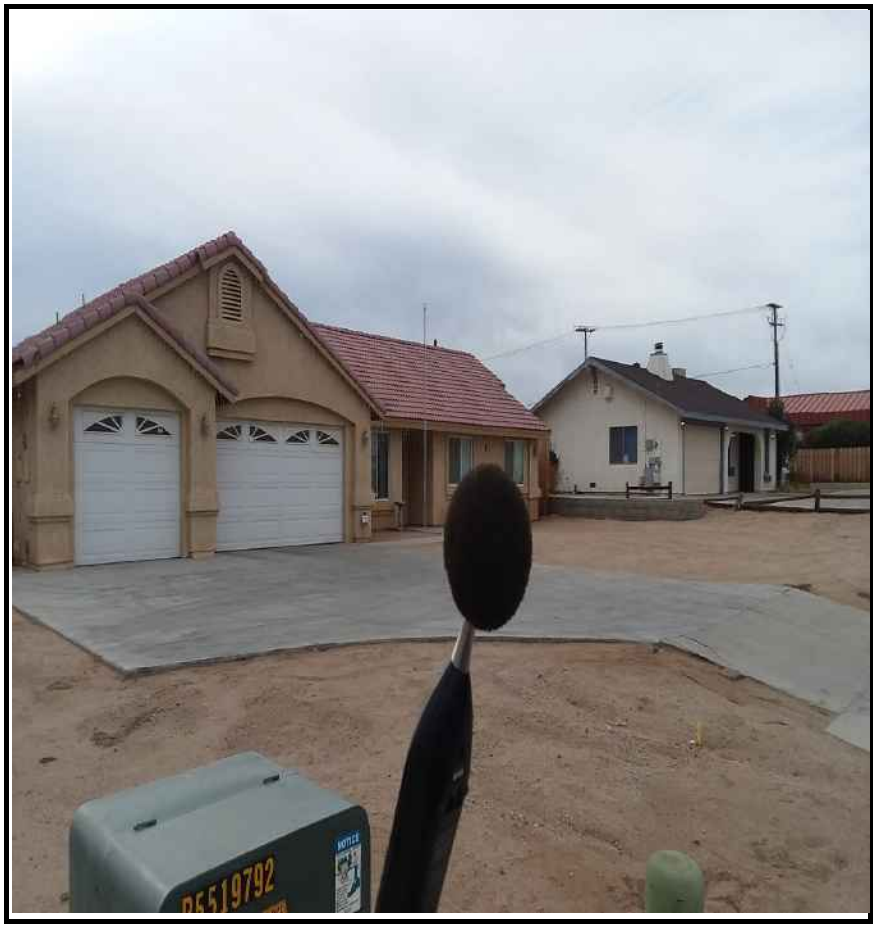
NOISE METER:	SoundTrack LXT Class 1	**CALIBRATOR:**	Larson Davis CAL250
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	Cal 250
SERIAL NUMBER:	3099	**SERIAL NUMBER:**	2733
FACTORY CALIBRATION DATE:	4/9/2020	**FACTORY CALIBRATION DATE:**	4/2/2020
FIELD CALIBRATION DATE:	12/7/2020		

Noise Measurement
Field Data

PHOTOS:



NM1 looking W down Nisqualli Road towards Balsam Avenue intersection.



NM1 looking SW towards residence 15343 Nisqualli Road, Victorville.

Summary	
File Name on Meter	LxT_Data.028
File Name on PC	SLM_0003099_LxT_Data_028.01.ldbin
Serial Number	0003099
Model	SoundTrack LxT®
Firmware Version	2.402
User	Ian Edward Gallagher
Location	NM1 JN 19305 34°29'6.22"N 117°19'43.87"W
Job Description	15 minute noise measurement (1 x 15 minutes)

Measurement	
Start	2020-12-07 11:19:40
Stop	2020-12-07 11:34:40
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre Calibration	2020-12-07 11:19:16
Post Calibration	None

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1L
Microphone Correction	Off
Integration Method	Linear
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	125.3 dB

Results			
L_{Aeq}	74.9		
LAE	104.4		
EA	3.088	mPa²h	
EA8	98.807	mPa²h	
EA40	494.034	mPa²h	
$L_{Zpeak\ (max)}$	2020-12-07 11:21:09	116.8	dB
L_{ASmax}	2020-12-07 11:21:09	93.5	dB
L_{ASmin}	2020-12-07 11:32:54	46.9	dB
SEA	-99.9	dB	

			Statistics	
L_{Ceq}	81.8	dB	**LAI2.00**	82.6 dB
L_{Aeq}	74.9	dB	**LAI8.00**	78.5 dB
L_{Ceq} - L_{Aeq}	6.9	dB	**LAI25.00**	74.7 dB
L_{AIeq}	77.9	dB	**LAI50.00**	69.9 dB
L_{Aeq}	74.9	dB	**LAI66.60**	66.2 dB
L_{AIeq} - L_{Aeq}	3.0	dB	**LAI90.00**	57.1 dB
# Overloads	0			

Noise Measurement
Field Data

Project Name: Balsam at Winona Apartments, City of Victorville **Date:** December 7, 2020

Project #: JN 19305

Noise Measurement #: NM2 Run Time: 15 minutes (1 x 15 minutes) **Technician:** Ian Gallagher

Nearest Address or Cross Street: 15260 Nasqualli Road, Victorville, California.

Site Description (Type of Existing Land Use and any other notable features): Project site: Empty lot w/ vacant land to north, multi-family residential to east, Nisqualli Rd to south with single-family residential further south, and Balsam Rd to west with school use further west. Noise Measurement Site: Balsam Rd to east with vacant project site further east and school to west.

Weather: Overcast, cloud burning off, occasional filtered sun. **Settings:** SLOW FAST

Temperature: 59 deg F **Wind:** 5-10mph **Humidity:** 12% **Terrain:** Flat

Start Time: 11:55 AM **End Time:** 12:10 PM **Run Time:**

Leq: 53.1 dB **Primary Noise Source:** Traffic ambiance from vehicles traveling along Nisqualli Road & 15 Freeway.

Lmax 70.6 dB 3 vehicles passed microphone on Balsam Ave during measurement.

L2 60.0 dB **Secondary Noise Sources:** Breeze blowing through leaves in foliage. No children present at school SW of

L8 54.5 dB microphone.

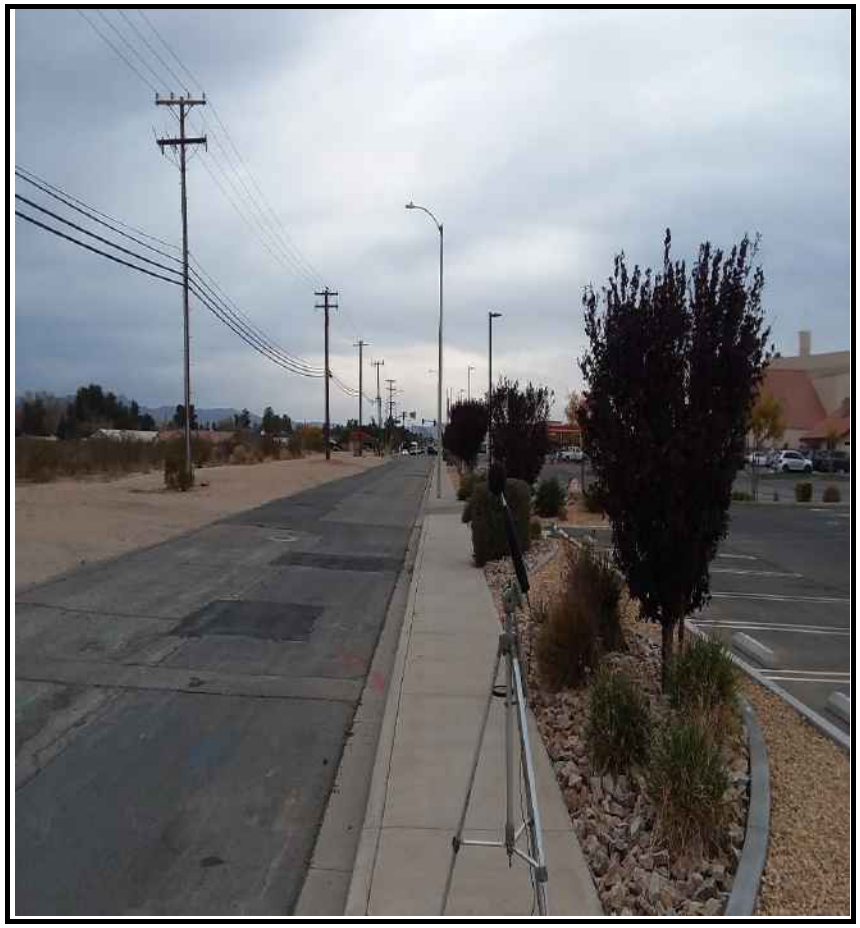
L25 51.4 dB

L50 50.1 dB

NOISE METER:	SoundTrack LXT Class 1	**CALIBRATOR:**	Larson Davis CAL250
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	Cal 250
SERIAL NUMBER:	3099	**SERIAL NUMBER:**	2733
FACTORY CALIBRATION DATE:	4/9/2020	**FACTORY CALIBRATION DATE:**	4/2/2020
FIELD CALIBRATION DATE:	12/7/2020		

Noise Measurement
Field Data

PHOTOS:



NM2 looking S down Balsam Ave towards Nisqualli Road intersection.

NM2 looking SW towards school, no children present.

Summary				
File Name on Meter		LxT_Data.029		
File Name on PC	SLM_0003099_LxT_Data_029.01.ldbin			
Serial Number		0003099		
Model		SoundTrack LxT®		
Firmware Version		2.402		
User	Ian Edward Gallagher			
Location	NM2 JN 19305 34°29'14.34"N 117°19'48.32"W			
Job Description	15 minute noise measurement (1 x 15 minutes)			
Measurement				
Start		2020-12-07 11:55:17		
Stop		2020-12-07 12:10:17		
Duration		00:15:00.0		
Run Time		00:15:00.0		
Pause		00:00:00.0		
Pre Calibration		2020-12-07 11:54:57		
Post Calibration		None		
Overall Settings				
RMS Weight		A Weighting		
Peak Weight		Z Weighting		
Detector		Slow		
Preamp		PRMLxT1L		
Microphone Correction		Off		
Integration Method		Linear		
OBA Range		Low		
OBA Bandwidth		1/1 and 1/3		
OBA Freq. Weighting		Z Weighting		
OBA Max Spectrum		Bin Max		
Overload		122.5 dB		
Results				
LAeq		53.1		
LAE		82.6		
EA		20.186 µPa²h		
EA8		645.959 µPa²h		
EA40		3.230 mPa²h		
LZpeak (max)	2020-12-07	12:04:07	105.6 dB	
LASmax	2020-12-07	12:04:19	70.6 dB	
LASmin	2020-12-07	12:10:17	46.6 dB	
SEA		-99.9 dB		

		Statistics	
LCeq	72.3 dB	**LAI2.00**	60.0 dB
LAeq	53.1 dB	**LAI8.00**	54.5 dB
LCeq - LAeq	19.2 dB	**LAI25.00**	51.4 dB
LAIeq	55.2 dB	**LAI50.00**	50.1 dB
LAeq	53.1 dB	**LAI66.60**	49.4 dB
LAIeq - LAeq	2.2 dB	**LAI90.00**	48.4 dB
# Overloads	0		

Noise Measurement
Field Data

Project Name: Balsam at Winona Apartments, City of Victorville **Date:** December 7, 2020

Project #: JN 19305

Noise Measurement #: NM3 Run Time: 15 minutes (1 x 15 minutes) **Technician:** Ian Gallagher

Nearest Address or Cross Street: 15512 Winona Street, Victorville, California.

Site Description (Type of Existing Land Use and any other notable features): Project site: Empty lot w/ vacant land to north, multi-family residential to east, Nisqualli Rd to south with single-family residential further south, and Balsam Rd to west with school use further west. Noise Measurement Site: Winona St to south, single-family residential to north/northeast, 11th Ave to west and construction site further west/northwest.

Weather: Overcast, cloud burning off, occasional filtered sun. **Settings:** SLOW FAST

Temperature: 59 deg F **Wind:** 5-10mph **Humidity:** 12% **Terrain:** Flat

Start Time: 12:29 PM **End Time:** 12:44 PM **Run Time:**

Leq: 57.1 dB

Lmax 73.3 dB

L2 66.6 dB

L8 61.8 dB

L25 54.7 dB

L50 49.7 dB

Primary Noise Source: Traffic noise from the 27 vehicles traveling through intersection 11th Avenue & Winona Street during measurement. Residential ambiance.

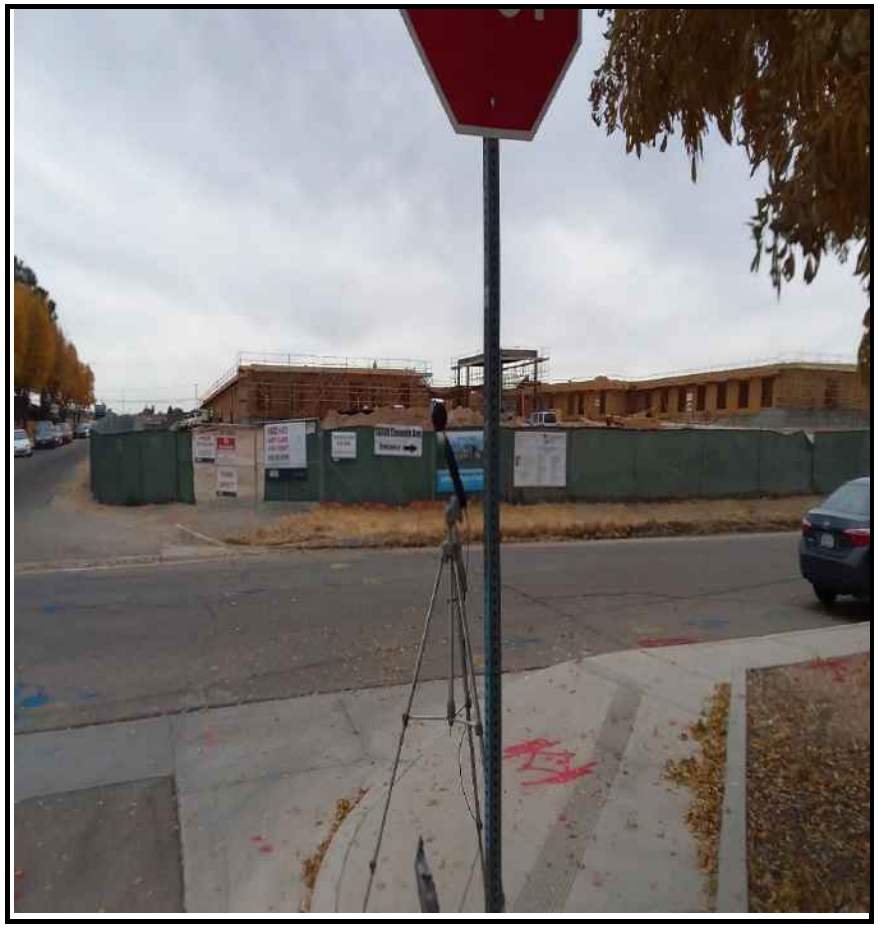
Secondary Noise Sources: Breeze blowing through leaves in foliage. Traffic ambiance from vehicles traveling along Nisqualli Rd, 11th & 9th Ave, Balsam Ave & 15 Freeway. Construction site.

NOISE METER:	SoundTrack LXT Class 1	**CALIBRATOR:**	Larson Davis CAL250
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	Cal 250
SERIAL NUMBER:	3099	**SERIAL NUMBER:**	2733
FACTORY CALIBRATION DATE:	4/9/2020	**FACTORY CALIBRATION DATE:**	4/2/2020
FIELD CALIBRATION DATE:	12/7/2020		

Noise Measurement
Field Data

PHOTOS:

NM3 looking SE down Winona Street.



NM3 looking NW at construction site 13300 11th Avenue.

Summary				
File Name on Meter	LxT_Data.030			
File Name on PC	SLM_0003099_LxT_Data_030.01.ldbin			
Serial Number	0003099			
Model	SoundTrack LxT®			
Firmware Version	2.402			
User	Ian Edward Gallagher			
Location	NM3 JN 19305 34°29'20.05"N 117°19'31.78"W			
Job Description	15 minute noise measurement (1 x 15 minutes)			
Measurement				
Start	2020-12-07 12:29:40			
Stop	2020-12-07 12:44:40			
Duration	00:15:00.0			
Run Time	00:15:00.0			
Pause	00:00:00.0			
Pre Calibration	2020-12-07 12:29:29			
Post Calibration	None			
Overall Settings				
RMS Weight	A Weighting			
Peak Weight	Z Weighting			
Detector	Slow			
Preamp	PRMLxT1L			
Microphone Correction	Off			
Integration Method	Linear			
OBA Range	Low			
OBA Bandwidth	1/1 and 1/3			
OBA Freq. Weighting	Z Weighting			
OBA Max Spectrum	Bin Max			
Overload	122.3 dB			
Results				
LAeq	57.1			
LAE	86.6			
EA	51.132 µPa²h			
EA8	1.636 mPa²h			
EA40	8.181 mPa²h			
LZpeak (max)	2020-12-07 12:30:58	104.2 dB		
LASmax	2020-12-07 12:41:40	73.3 dB		
LASmin	2020-12-07 12:38:41	42.0 dB		
SEA	-99.9 dB			
			Statistics	
LCeq	66.0 dB		**LAI2.00**	66.6 dB
LAeq	57.1 dB		**LAI8.00**	61.8 dB
LCeq - LAeq	8.9 dB		**LAI25.00**	54.7 dB
LAIeq	59.9 dB		**LAI50.00**	49.7 dB
LAeq	57.1 dB		**LAI66.60**	47.9 dB
LAIeq - LAeq	2.8 dB		**LAI90.00**	45.7 dB
# Overloads	0			

Noise Measurement
Field Data

Project Name: Balsam at Winona Apartments, City of Victorville **Date:** December 7, 2020

Project #: JN 19305

Noise Measurement #: NM4 Run Time: 15 minutes (1 x 15 minutes) **Technician:** Ian Gallagher

Nearest Address or Cross Street: No obvious address or cross street , 34°29'15.41"N 117°19'40.55"W Victorville, California.

Site Description (Type of Existing Land Use and any other notable features): Project site: Empty lot w/ vacant land to north, multi-family residential to east, Nisqualli Rd to south with single-family residential further south, and Balsam Rd to west with school use further west. Noise Measurement Site: Vacant project site to north/west/south, multi-family residential to east, construction site to northeast.

Weather: Overcast, cloud burning off, occasional filtered sun. **Settings:** SLOW FAST

Temperature: 59 deg F **Wind:** 5-10mph **Humidity:** 12% **Terrain:** Flat

Start Time: 1:01 PM **End Time:** 1:16 PM **Run Time:**

Leq: 49.6 dB **Primary Noise Source:** Traffic ambiance from Winona Street, 11th Avenue, Balsam Ave, Nisqualli Road & 15 Freeway. Residential ambiance, distant leaf blower in operation.

Lmax 56.2 dB

L2 52.5 dB **Secondary Noise Sources:** Breeze blowing through desert vegetation & joshua tree. Construction site ambiance.

L8 51.6 dB

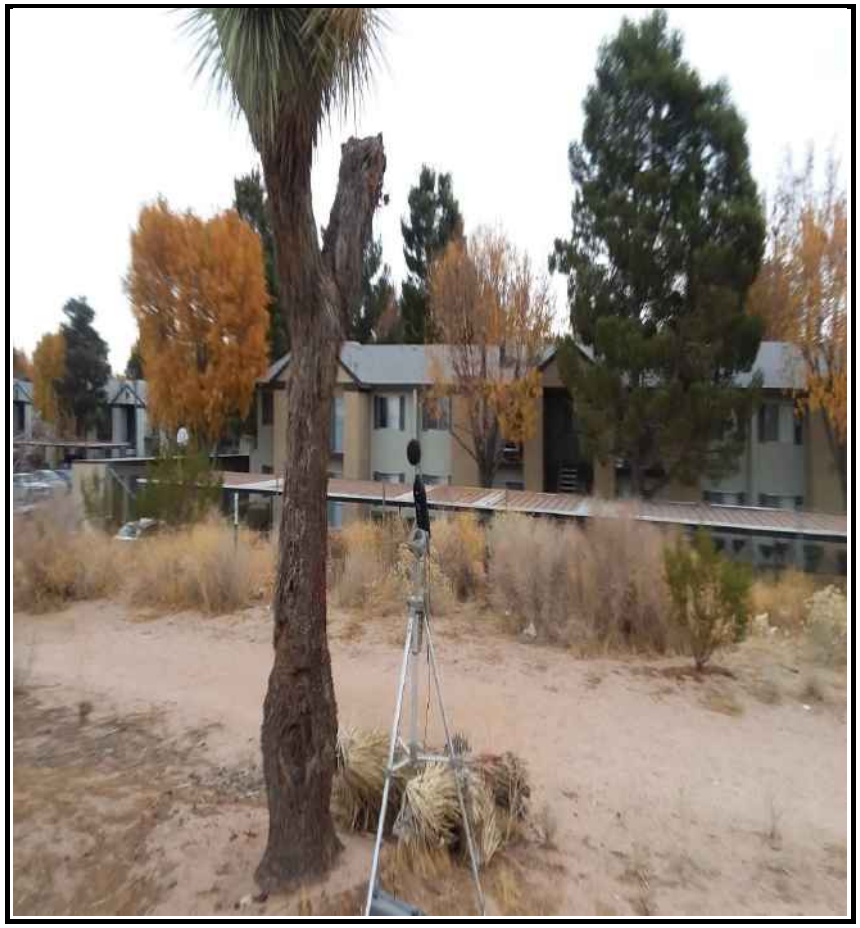
L25 50.2 dB

L50 49.1 dB

NOISE METER:	SoundTrack LXT Class 1	**CALIBRATOR:**	Larson Davis CAL250
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	Cal 250
SERIAL NUMBER:	3099	**SERIAL NUMBER:**	2733
FACTORY CALIBRATION DATE:	4/9/2020	**FACTORY CALIBRATION DATE:**	4/2/2020
FIELD CALIBRATION DATE:	12/7/2020		

Noise Measurement
Field Data

PHOTOS:



NM4 looking E towards parking lot and multi family residences.

NM4 looking SW across vacant land towards Nisqualli Rd & Balsam Ave intersection.

Summary					
File Name on Meter	LxT_Data.031				
File Name on PC	SLM_0003099_LxT_Data_031.01.ldbin				
Serial Number	0003099				
Model	SoundTrack LxT®				
Firmware Version	2.402				
User	Ian Edward Gallagher				
Location	NM4 JN 19305 34°29'15.41"N 117°19'40.55"W				
Job Description	15 minute noise measurement (1 x 15 minutes)				
Measurement					
Start	2020-12-07 13:01:12				
Stop	2020-12-07 13:16:12				
Duration	00:15:00.0				
Run Time	00:15:00.0				
Pause	00:00:00.0				
Pre Calibration	2020-12-07 13:00:49				
Post Calibration	None				
Overall Settings					
RMS Weight	A Weighting				
Peak Weight	Z Weighting				
Detector	Slow				
Preamp	PRMLxT1L				
Microphone Correction	Off				
Integration Method	Linear				
OBA Range	Low				
OBA Bandwidth	1/1 and 1/3				
OBA Freq. Weighting	Z Weighting				
OBA Max Spectrum	Bin Max				
Overload	122.2 dB				
Results					
LA_{eq}	49.6				
LAE	79.1				
EA	9.041 µPa²h				
EA8	289.307 µPa²h				
EA40	1.447 mPa²h				
$LZ_{peak\ (max)}$	2020-12-07 13:06:01	111.0 dB			
LAS_{max}	2020-12-07 13:06:53	56.2 dB			
LAS_{min}	2020-12-07 13:07:58	44.5 dB			
SEA	-99.9 dB				
			Statistics		
LC_{eq}	66.0 dB		**LAI2.00**	52.5 dB	
LA_{eq}	49.6 dB		**LAI8.00**	51.6 dB	
LC_{eq} - LA_{eq}	16.4 dB		**LAI25.00**	50.2 dB	
LAI_{eq}	53.7 dB		**LAI50.00**	49.1 dB	
LA_{eq}	49.6 dB		**LAI66.60**	48.5 dB	
LAI_{eq} - LA_{eq}	4.1 dB		**LAI90.00**	47.6 dB	
# Overloads	0				

APPENDIX D

CONSTRUCTION NOISE MODELING

Receptor - Multi-Family Residential to East

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[3]	Item Usage Percent	Usage Factor	Receptor Item Leq, dBA	Required Mitigation	Mitigated Noise Level	Reduction (dBA Leq)
Grading									
Excavators	2	85	314	40	0.8	68.1	Muffler (10 dB Reduction)	58.1	
Graders	1	85	314	40	0.4	65.1	Muffler (10 dB Reduction)	55.1	
Rubber Tired Dozers	1	85	314	40	0.4	65.1	Muffler (10 dB Reduction)	55.1	10.0
Scrapers	2	85	314	40	0.8	68.1	Muffler (10 dB Reduction)	58.1	
Tractors/Loaders/Backhoes	2	84	314	40	0.80	67.1	Muffler (10 dB Reduction)	57.1	
						73.9		63.9	
Building Construction									
Cranes	1	83	314	16	0.16	59.1	Muffler (10 dB Reduction)	49.1	
Forklifts [2]	3	48	314	40	1.20	32.8	n/a	32.8	
Generator Sets	1	81	314	50	0.50	62.0	Enclosure or Acoustic Tent (10 dB Reduction)	52.0	9.1
Tractors/Loaders/Backhoes	3	84	314	40	1.20	68.8	Muffler (10 dB Reduction)	58.8	
Welders	1	74	314	40	0.40	54.1	n/a	54.1	
						70.1		61.0	
Paving									
Pavers	2	77	314	50	1.00	61.0	Muffler (10 dB Reduction)	51.0	
Rollers	2	80	314	20	0.40	60.1	Muffler (10 dB Reduction)	50.1	10.0
Tractors/Loaders/Backhoes	2	84	314	40	0.80	67.1	Muffler (10 dB Reduction)	57.1	
						68.7		58.7	
Architectural Coating									
Air Compressors	1	80	314	40	0.40	60.1	Enclosure or Acoustic Tent (10 dB Reduction)	50.1	10.0
						60.1		50.1	

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 Construciton 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 (structure).

Receptor - Single-Family Residential to Northeast

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[3]	Item Usage Percent	Usage Factor	Receptor Item Leq, dBA	Required Mitigation	Mitigated Noise Level	Reduction (dBA Leq)
Grading									
Excavators	2	85	1150	40	0.8	56.8	Muffler (10 dB Reduction)	46.8	10.0
Graders	1	85	1150	40	0.4	53.8	Muffler (10 dB Reduction)	43.8	
Rubber Tired Dozers	1	85	1150	40	0.4	53.8	Muffler (10 dB Reduction)	43.8	
Scrapers	2	85	1150	40	0.8	56.8	Muffler (10 dB Reduction)	46.8	
Tractors/Loaders/Backhoes	2	84	1150	40	0.80	55.8	Muffler (10 dB Reduction)	45.8	
						62.6		52.6	
Building Construction									
Cranes	1	83	1150	16	0.16	47.8	Muffler (10 dB Reduction)	37.8	9.1
Forklifts [2]	3	48	1150	40	1.20	21.6	n/a	21.6	
Generator Sets	1	81	1150	50	0.50	50.8	Enclosure or Acoustic Tent (10 dB Reduction)	40.8	
Tractors/Loaders/Backhoes	3	84	1150	40	1.20	57.6	Muffler (10 dB Reduction)	47.6	
Welders	1	74	1150	40	0.40	42.8	n/a	42.8	
						58.9		49.7	
Paving									
Pavers	2	77	1150	50	1.00	49.8	Muffler (10 dB Reduction)	39.8	10.0
Rollers	2	80	1150	20	0.40	48.8	Muffler (10 dB Reduction)	38.8	
Tractors/Loaders/Backhoes	2	84	1150	40	0.80	55.8	Muffler (10 dB Reduction)	45.8	
						57.4		47.4	
Architectural Coating									
Air Compressors	1	80	1150	40	0.40	48.8	Enclosure or Acoustic Tent (10 dB Reduction)	38.8	10.0
						48.8		38.8	

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 Construciton 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 (structure).

Receptor - Single-Family Residential to South

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[3]	Item Usage Percent	Usage Factor	Receptor Item Leq, dBA	Required Mitigation	Mitigated Noise Level	Reduction (dBA Leq)
Grading									
Excavators	2	85	852	40	0.8	59.4	Muffler (10 dB Reduction)	49.4	10.0
Graders	1	85	852	40	0.4	56.4	Muffler (10 dB Reduction)	46.4	
Rubber Tired Dozers	1	85	852	40	0.4	56.4	Muffler (10 dB Reduction)	46.4	
Scrapers	2	85	852	40	0.8	59.4	Muffler (10 dB Reduction)	49.4	
Tractors/Loaders/Backhoes	2	84	852	40	0.80	58.4	Muffler (10 dB Reduction)	48.4	
						65.2		55.2	
Building Construction									
Cranes	1	83	852	16	0.16	50.4	Muffler (10 dB Reduction)	40.4	9.1
Forklifts [2]	3	48	852	40	1.20	24.2	n/a	24.2	
Generator Sets	1	81	852	50	0.50	53.4	Enclosure or Acoustic Tent (10 dB Reduction)	43.4	
Tractors/Loaders/Backhoes	3	84	852	40	1.20	60.2	Muffler (10 dB Reduction)	50.2	
Welders	1	74	852	40	0.40	45.4	n/a	45.4	
						61.5		52.3	
Paving									
Pavers	2	77	852	50	1.00	52.4	Muffler (10 dB Reduction)	42.4	10.0
Rollers	2	80	852	20	0.40	51.4	Muffler (10 dB Reduction)	41.4	
Tractors/Loaders/Backhoes	2	84	852	40	0.80	58.4	Muffler (10 dB Reduction)	48.4	
						60.0		50.0	
Architectural Coating									
Air Compressors	1	80	852	40	0.40	51.4	Enclosure or Acoustic Tent (10 dB Reduction)	41.4	10.0
						51.4		41.4	

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 Construciton 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 (structure).

Receptor - Commercial to Southwest

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[3]	Item Usage Percent	Usage Factor	Receptor Item Leq, dBA	Required Mitigation	Mitigated Noise Level	Reduction (dBA Leq)
Grading									
Excavators	2	85	963	40	0.8	58.3	Muffler (10 dB Reduction)	48.3	10.0
Graders	1	85	963	40	0.4	55.3	Muffler (10 dB Reduction)	45.3	
Rubber Tired Dozers	1	85	963	40	0.4	55.3	Muffler (10 dB Reduction)	45.3	
Scrapers	2	85	963	40	0.8	58.3	Muffler (10 dB Reduction)	48.3	
Tractors/Loaders/Backhoes	2	84	963	40	0.80	57.3	Muffler (10 dB Reduction)	47.3	
						64.1		54.1	
Building Construction									
Cranes	1	83	963	16	0.16	49.3	Muffler (10 dB Reduction)	39.3	9.1
Forklifts [2]	3	48	963	40	1.20	23.1	n/a	23.1	
Generator Sets	1	81	963	50	0.50	52.3	Enclosure or Acoustic Tent (10 dB Reduction)	42.3	
Tractors/Loaders/Backhoes	3	84	963	40	1.20	59.1	Muffler (10 dB Reduction)	49.1	
Welders	1	74	963	40	0.40	44.3	n/a	44.3	
						60.4		51.3	
Paving									
Pavers	2	77	963	50	1.00	51.3	Muffler (10 dB Reduction)	41.3	10.0
Rollers	2	80	963	20	0.40	50.3	Muffler (10 dB Reduction)	40.3	
Tractors/Loaders/Backhoes	2	84	963	40	0.80	57.3	Muffler (10 dB Reduction)	47.3	
						58.9		48.9	
Architectural Coating									
Air Compressors	1	80	963	40	0.40	50.3	Enclosure or Acoustic Tent (10 dB Reduction)	40.3	10.0
						50.3		40.3	

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 Construciton 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 (structure).

Receptor - School to West

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[3]	Item Usage Percent	Usage Factor	Receptor Item Leq, dBA	Required Mitigation	Mitigated Noise Level	Reduction (dBA Leq)
Grading									
Excavators	2	85	384	40	0.8	66.3	Muffler (10 dB Reduction)	56.3	
Graders	1	85	384	40	0.4	63.3	Muffler (10 dB Reduction)	53.3	
Rubber Tired Dozers	1	85	384	40	0.4	63.3	Muffler (10 dB Reduction)	53.3	10.0
Scrapers	2	85	384	40	0.8	66.3	Muffler (10 dB Reduction)	56.3	
Tractors/Loaders/Backhoes	2	84	384	40	0.80	65.3	Muffler (10 dB Reduction)	55.3	
						72.1		62.1	
Building Construction									
Cranes	1	83	384	16	0.16	57.3	Muffler (10 dB Reduction)	47.3	
Forklifts [2]	3	48	384	40	1.20	31.1	n/a	31.1	
Generator Sets	1	81	384	50	0.50	60.3	Enclosure or Acoustic Tent (10 dB Reduction)	50.3	9.1
Tractors/Loaders/Backhoes	3	84	384	40	1.20	67.1	Muffler (10 dB Reduction)	57.1	
Welders	1	74	384	40	0.40	52.3	n/a	52.3	
						68.4		59.3	
Paving									
Pavers	2	77	384	50	1.00	59.3	Muffler (10 dB Reduction)	49.3	
Rollers	2	80	384	20	0.40	58.3	Muffler (10 dB Reduction)	48.3	10.0
Tractors/Loaders/Backhoes	2	84	384	40	0.80	65.3	Muffler (10 dB Reduction)	55.3	
						66.9		56.9	
Architectural Coating									
Air Compressors	1	80	384	40	0.40	58.3	Enclosure or Acoustic Tent (10 dB Reduction)	48.3	10.0
						58.3		48.3	

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 Construciton 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 (structure).

APPENDIX E

PROJECT GENERATED TRIPS FHWA WORKSHEETS

Existing Traffic Noise

			Vehicle Distribution (Heavy Truck Mix)					
1	:Id		Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow	ADT 25400
Amargosa Road	:Road		Automobiles	75.54	14.02	10.43	92.00	Speed 45
North of La Mesa Road	:Segment		Medium Trucks	48.00	2.00	50.00	3.00	Distance 42
			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	1471.02	30.48	50.80	1092.06	5.08	8.47	270.81	42.33	70.56
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	24.84	8.00	10.22	23.54	0.22	2.44	17.49	9.43	11.65
Distance	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
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	69.87	61.31	68.05	68.58	53.53	60.27	62.52	62.74	69.48
	DAY LEQ	72.42		EVENING LEQ	69.29		NIGHT LEQ	70.98	

F		CNEL	77.71	Day hour	89.00
		DAY LEQ	72.42	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

1	:Id	
Amargosa Road	:Road	
North of La Mesa 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	25500
Speed	45
Distance	42
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	1476.81	30.60	51.00	1096.36	5.10	8.50	271.88	42.50	70.83
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	24.86	8.02	10.24	23.56	0.24	2.46	17.51	9.45	11.66
Distance	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
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	69.89	61.33	68.07	68.59	53.55	60.29	62.54	62.76	69.49
	DAY LEQ	72.43		EVENING LEQ	69.31		NIGHT LEQ	71.00	

CNEL	77.73
DAY LEQ	72.43

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 heavy truck mix.

Existing Traffic Noise

2	:Id	
Mariposa Road	:Road	
North of Nisqualli 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	11300
Speed	50
Distance	42
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	654.43	13.56	22.60	485.84	2.26	3.77	120.48	18.83	31.39
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	20.86	4.03	6.25	19.57	-3.75	-1.54	13.51	5.45	7.67
Distance	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
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	67.67	58.51	64.95	66.38	50.73	57.17	60.32	59.93	66.38
	DAY LEQ	69.86		EVENING LEQ	66.97		NIGHT LEQ	68.07	

CNEL	74.89
DAY LEQ	69.86

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 heavy truck mix.

Existing Plus Project Traffic Noise

2	:Id	
Mariposa Road	:Road	
North of Nisqualli 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	11400
Speed	50
Distance	42
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	660.22	13.68	22.80	490.14	2.28	3.80	121.54	19.00	31.67
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	20.90	4.07	6.28	19.61	-3.72	-1.50	13.55	5.49	7.71
Distance	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
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	67.71	58.55	64.99	66.41	50.76	57.21	60.36	59.97	66.42
	DAY LEQ	69.90		EVENING LEQ	67.01		NIGHT LEQ	68.10	

CNEL	74.93
DAY LEQ	69.90

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 heavy truck mix.

Existing Traffic Noise

3	:Id	
Mariposa Road	:Road	
South of Nisqualli 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	15500
Speed	45
Distance	42
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	897.67	18.60	31.00	666.42	3.10	5.17	165.26	25.83	43.06
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	22.69	5.86	8.08	21.40	-1.92	0.29	15.34	7.28	9.50
Distance	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
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	67.72	59.17	65.90	66.43	51.39	58.12	60.38	60.59	67.33
	DAY LEQ	70.27		EVENING LEQ	67.15		NIGHT LEQ	68.83	

CNEL	75.57
DAY LEQ	70.27

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 heavy truck mix.

Existing Plus Project Traffic Noise

3	:Id	
Mariposa Road	:Road	
South of Nisqualli 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	15600
Speed	45
Distance	42
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	903.46	18.72	31.20	670.72	3.12	5.20	166.32	26.00	43.33
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	22.72	5.89	8.10	21.43	-1.90	0.32	15.37	7.31	9.53
Distance	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
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	67.75	59.19	65.93	66.46	51.41	58.15	60.40	60.62	67.36
	DAY LEQ	70.30		EVENING LEQ	67.17		NIGHT LEQ	68.86	

CNEL	75.60
DAY LEQ	70.30

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 heavy truck mix.

Existing Traffic Noise

4	:Id	
Balsam Avenue	:Road	
North of Nisqualli 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	35
Distance	32
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	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
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	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	9.91	-9.21	-13.32	8.60	-16.72	-16.71	2.59	-7.97	-12.07
Distance	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87
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	42.48	43.60	50.58	34.97	40.20	44.56	43.73	44.85
	DAY LEQ	52.90		EVENING LEQ	51.07		NIGHT LEQ	49.18	

CNEL	56.61	Day hour	92.00
DAY LEQ	52.90	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
Balsam Avenue	:Road
North of Nisqualli 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	1600
Speed	35
Distance	32
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	98.13	1.20	0.47	72.52	0.21	0.21	18.16	1.60	0.62
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
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	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	14.17	-4.95	-9.06	12.86	-12.46	-12.45	6.85	-3.71	-7.81
Distance	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87
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	56.15	46.74	47.86	54.84	39.23	44.46	48.82	47.99	49.11
	DAY LEQ	57.16		EVENING LEQ	55.33		NIGHT LEQ	53.44	

CNEL	60.87	Day hour	92.00
DAY LEQ	57.16	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	
Balsam Avenue	:Road	
South of Nisqualli 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	11400
Speed	55
Distance	42
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	660.22	13.68	22.80	490.14	2.28	3.80	121.54	19.00	31.67
Speed in MPH	55.00	55.00	55.00	55.00	55.00	55.00	55.00	55.00	55.00
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	72.73	79.85	83.81	72.73	79.85	83.81	72.73	79.85	83.81
ADJUSTMENTS									
Flow	20.49	3.65	5.87	19.19	-4.13	-1.91	13.14	5.08	7.30
Distance	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
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	68.90	59.19	65.37	67.61	51.41	57.59	61.55	60.62	66.80
	DAY LEQ	70.81		EVENING LEQ	68.11		NIGHT LEQ	68.67	

CNEL	75.59
DAY LEQ	70.81

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 heavy truck mix.

Existing Plus Project Traffic Noise

5	:Id	
Balsam Avenue	:Road	
South of Nisqualli 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	11600
Speed	55
Distance	42
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	671.80	13.92	23.20	498.74	2.32	3.87	123.68	19.33	32.22
Speed in MPH	55.00	55.00	55.00	55.00	55.00	55.00	55.00	55.00	55.00
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	72.73	79.85	83.81	72.73	79.85	83.81	72.73	79.85	83.81
ADJUSTMENTS									
Flow	20.56	3.73	5.95	19.27	-4.05	-1.84	13.21	5.15	7.37
Distance	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
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	68.98	59.27	65.45	67.68	51.49	57.67	61.63	60.69	66.87
	DAY LEQ	70.88		EVENING LEQ	68.19		NIGHT LEQ	68.75	

CNEL	75.66	Day hour	93.00
DAY LEQ	70.88	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 heavy truck mix.

Existing Traffic Noise

6	:Id
11th Avenue	:Road
North of Nisqualli 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	2000
Speed	35
Distance	32
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	122.66	1.50	0.58	90.65	0.27	0.27	22.71	2.00	0.78
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
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	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	15.14	-3.99	-8.09	13.83	-11.49	-11.48	7.81	-2.74	-6.84
Distance	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87
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	57.12	47.71	48.83	55.81	40.20	45.43	49.79	48.96	50.08
	DAY LEQ	58.13		EVENING LEQ	56.29		NIGHT LEQ	54.41	

CNEL	61.84
DAY LEQ	58.13

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
11th Avenue	:Road
North of Nisqualli 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	2100
Speed	35
Distance	32
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	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
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	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	15.35	-3.77	-7.88	14.04	-11.28	-11.27	8.03	-2.52	-6.63
Distance	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87
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	57.33	47.92	49.04	56.02	40.41	45.64	50.00	49.17	50.29
	DAY LEQ	58.34		EVENING LEQ	56.51		NIGHT LEQ	54.62	

CNEL	62.05	Day hour	94.00
DAY LEQ	58.34	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	
Winona Street	:Road	
West of 11th 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	35
Distance	32
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	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
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	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	8.15	-10.98	-15.08	6.84	-18.48	-18.47	0.82	-9.73	-13.83
Distance	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87
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	50.13	40.72	41.84	48.82	33.21	38.44	42.80	41.97	43.09
	DAY LEQ	51.14		EVENING LEQ	49.30		NIGHT LEQ	47.42	

CNEL	54.85	Day hour	95.00
DAY LEQ	51.14	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 light truck mix.

Existing Plus Project Traffic Noise

7	:Id
Winona Street	:Road
West of 11th 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	600
Speed	35
Distance	32
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	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
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	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	9.91	-9.21	-13.32	8.60	-16.72	-16.71	2.59	-7.97	-12.07
Distance	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87
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	42.48	43.60	50.58	34.97	40.20	44.56	43.73	44.85
	DAY LEQ	52.90		EVENING LEQ	51.07		NIGHT LEQ	49.18	

CNEL	56.61	Day hour	95.00
DAY LEQ	52.90	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 light truck mix.

Existing Traffic Noise

8	:Id	
Winona Street	:Road	
East of 11th 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	35
Distance	32
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	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
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	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	8.15	-10.98	-15.08	6.84	-18.48	-18.47	0.82	-9.73	-13.83
Distance	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87
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	50.13	40.72	41.84	48.82	33.21	38.44	42.80	41.97	43.09
	DAY LEQ	51.14		EVENING LEQ	49.30		NIGHT LEQ	47.42	

CNEL	54.85	Day hour	96.00
DAY LEQ	51.14	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 light truck mix.

Existing Plus Project Traffic Noise

8	:Id
Winona Street	:Road
East of 11th 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	500
Speed	35
Distance	32
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	30.66	0.37	0.15	22.66	0.07	0.07	5.68	0.50	0.19
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
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	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05
ADJUSTMENTS									
Flow	9.12	-10.01	-14.11	7.81	-17.52	-17.50	1.79	-8.76	-12.86
Distance	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87
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	51.10	41.69	42.81	49.78	34.18	39.41	43.77	42.94	44.06
	DAY LEQ	52.11		EVENING LEQ	50.27		NIGHT LEQ	48.39	

CNEL	55.82	Day hour	96.00
DAY LEQ	52.11	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 light truck mix.

Existing Traffic Noise

9	:Id	
La Mesa Road	:Road	
West of Amargosa 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	26900
Speed	45
Distance	50
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	1557.89	32.28	53.80	1156.56	5.38	8.97	286.80	44.83	74.72
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	25.09	8.25	10.47	23.79	0.47	2.69	17.74	9.68	11.90
Distance	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
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	69.36	60.80	67.54	68.07	53.02	59.76	62.01	62.23	68.97
	DAY LEQ	71.91		EVENING LEQ	68.78		NIGHT LEQ	70.47	

CNEL	77.20
DAY LEQ	71.91

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 Plus Project Traffic Noise

9	:Id
La Mesa Road	:Road
West of Amargosa 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	27000
Speed	45
Distance	50
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	1563.68	32.40	54.00	1160.86	5.40	9.00	287.87	45.00	75.00
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	25.10	8.27	10.49	23.81	0.49	2.70	17.75	9.69	11.91
Distance	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
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	69.38	60.82	67.56	68.08	53.04	59.78	62.03	62.25	68.98
	DAY LEQ	71.92		EVENING LEQ	68.80		NIGHT LEQ	70.49	

F	CNEL	77.22	
	DAY LEQ	71.92	

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	
La Mesa Road	:Road	
Amargosa Road to Interstate 15 Freeway	: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	39300
Speed	45
Distance	50
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	2276.02	47.16	78.60	1689.69	7.86	13.10	419.01	65.50	109.17
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	26.73	9.90	12.12	25.44	2.12	4.33	19.38	11.32	13.54
Distance	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
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	71.01	62.45	69.19	69.71	54.67	61.41	63.66	63.88	70.61
	DAY LEQ	73.55		EVENING LEQ	70.43		NIGHT LEQ	72.12	

CNEL	78.85	Day hour	98.00
DAY LEQ	73.55	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	
La Mesa Road	:Road	
Amargosa Road to Interstate 15 Freeway	: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	39500
Speed	45
Distance	50
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	2287.60	47.40	79.00	1698.29	7.90	13.17	421.14	65.83	109.72
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	26.76	9.92	12.14	25.46	2.14	4.36	19.41	11.35	13.56
Distance	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
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	71.03	62.47	69.21	69.74	54.69	61.43	63.68	63.90	70.64
	DAY LEQ	73.58		EVENING LEQ	70.45		NIGHT LEQ	72.14	

CNEL	78.87
DAY LEQ	73.58

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 Traffic Noise

11	:Id	
Nisqualli Road	:Road	
Interstate 15 Freeway to Mariposa 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	41000
Speed	45
Distance	62
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	2374.47	49.20	82.00	1762.78	8.20	13.67	437.13	68.33	113.89
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	26.92	10.08	12.30	25.62	2.30	4.52	19.57	11.51	13.73
Distance	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
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	70.26	61.70	68.44	68.96	53.92	60.66	62.91	63.13	69.86
	DAY LEQ	72.80		EVENING LEQ	69.68		NIGHT LEQ	71.37	

CNEL	78.10	Day hour	99.00
DAY LEQ	72.80	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
Nisqualli Road	:Road
Interstate 15 Freeway to Mariposa 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	41500
Speed	45
Distance	62
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	2403.43	49.80	83.00	1784.28	8.30	13.83	442.46	69.17	115.28
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	26.97	10.13	12.35	25.68	2.35	4.57	19.62	11.56	13.78
Distance	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
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	70.31	61.75	68.49	69.02	53.97	60.71	62.96	63.18	69.92
	DAY LEQ	72.86		EVENING LEQ	69.73		NIGHT LEQ	71.42	

CNEL	78.15
DAY LEQ	72.86

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	
Nisqualli Road	:Road	
Mariposa Road to Balsam 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	35700
Speed	45
Distance	62
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	2067.53	42.84	71.40	1534.91	7.14	11.90	380.63	59.50	99.17
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	26.32	9.48	11.70	25.02	1.70	3.92	18.97	10.91	13.13
Distance	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
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	69.66	61.10	67.84	68.36	53.32	60.05	62.31	62.53	69.26
	DAY LEQ	72.20		EVENING LEQ	69.08		NIGHT LEQ	70.77	

CNEL	77.50
DAY LEQ	72.20

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
Nisqualli Road	:Road
Mariposa Road to Balsam 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	36300
Speed	45
Distance	62
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	2102.28	43.56	72.60	1560.71	7.26	12.10	387.02	60.50	100.83
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	26.39	9.55	11.77	25.10	1.77	3.99	19.04	10.98	13.20
Distance	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
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	69.73	61.17	67.91	68.44	53.39	60.13	62.38	62.60	69.34
	DAY LEQ	72.27		EVENING LEQ	69.15		NIGHT LEQ	70.84	

CNEL	77.57
DAY LEQ	72.27

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	
Nisqualli Road	:Road	
Balsam Avenue to 11th 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	27100
Speed	45
Distance	50
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	1569.47	32.52	54.20	1165.16	5.42	9.03	288.93	45.17	75.28
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	25.12	8.28	10.50	23.83	0.50	2.72	17.77	9.71	11.93
Distance	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
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	69.39	60.84	67.57	68.10	53.05	59.79	62.04	62.26	69.00
	DAY LEQ	71.94		EVENING LEQ	68.82		NIGHT LEQ	70.50	

CNEL	77.24	Day hour	0.00
DAY LEQ	71.94	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	
Nisqualli Road	:Road	
Balsam Avenue to 11th 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	27300
Speed	45
Distance	50
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	1581.05	32.76	54.60	1173.75	5.46	9.10	291.07	45.50	75.83
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	25.15	8.32	10.53	23.86	0.53	2.75	17.80	9.74	11.96
Distance	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
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	69.43	60.87	67.61	68.13	53.09	59.82	62.08	62.29	69.03
	DAY LEQ	71.97		EVENING LEQ	68.85		NIGHT LEQ	70.54	

CNEL	77.27
DAY LEQ	71.97

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	
Nisqualli Road	:Road	
East of 11th 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	23500
Speed	45
Distance	50
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	1360.98	28.20	47.00	1010.37	4.70	7.83	250.55	39.17	65.28
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	24.50	7.66	9.88	23.21	-0.12	2.10	17.15	9.09	11.31
Distance	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
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	60.22	66.95	67.48	52.44	59.17	61.43	61.64	68.38
	DAY LEQ	71.32		EVENING LEQ	68.20		NIGHT LEQ	69.88	

CNEL	76.62
DAY LEQ	71.32

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

14	:Id	
Nisqualli Road	:Road	
East of 11th 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	23800
Speed	45
Distance	50
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	1378.35	28.56	47.60	1023.27	4.76	7.93	253.75	39.67	66.11
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	24.56	7.72	9.94	23.26	-0.06	2.16	17.21	9.15	11.36
Distance	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
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	68.83	60.27	67.01	67.54	52.49	59.23	61.48	61.70	68.44
	DAY LEQ	71.38		EVENING LEQ	68.25		NIGHT LEQ	69.94	

CNEL	76.67
DAY LEQ	71.38

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.

APPENDIX F

SOUNDPLAN INPUT AND RESULTS

Receiver list

No.	Receiver name	Building side	Floor	Limit Lden dB(A)	Level Lden dB(A)	Conflict Lden dB
1	1	-	GF	-	58.7	-
2	2	-	GF	-	60.7	-
3	3	-	GF	-	62.9	-
4	4	-	GF	-	65.2	-
5	5	-	GF	-	64.9	-
6	6	-	GF	-	62.5	-
7	7	-	GF	-	59.9	-
8	8	-	GF	-	57.4	-
9	9	-	GF	-	60.2	-

Noise emissions of road traffic

Statio km	ADT Veh/24	Vehicles type	Vehicle name	Traffic values day Veh/h	evening Veh/h	night Veh/h	Speed km/h	Contr device	Cons Spee km/h	Affec veh. %	Road surface	Gradie Min / M %
I-15 NBound			Traffic direction: In entry direction									
0+00(	52450	Total	-	3117	2220	771	-	none	-	-	Average (of DGAC a	1.3
		Automobiles	-	2954	2193	544	105					
		Medium trucks	-	61	10	85	105					
		Heavy trucks	-	102	17	142	105					
		Buses	-	-	-	-	-					
		Motorcycles	-	-	-	-	-					
		Auxiliary vehicle	-	-	-	-	-					
I-15 SBound			Traffic direction: In entry direction									
0+00(	52450	Total	-	3117	2220	771	-	none	-	-	Average (of DGAC a	1.2
		Automobiles	-	2954	2193	544	105					
		Medium trucks	-	61	10	85	105					
		Heavy trucks	-	102	17	142	105					
		Buses	-	-	-	-	-					
		Motorcycles	-	-	-	-	-					
		Auxiliary vehicle	-	-	-	-	-					
Nisqualli Road			Traffic direction: In entry direction									
0+00(	37742	Total	-	2243	1598	555	-	none	-	-	Average (of DGAC a	-3.4
		Automobiles	-	2126	1578	392	72					
		Medium trucks	-	44	7	61	72					
		Heavy trucks	-	73	12	102	72					
		Buses	-	-	-	-	-					
		Motorcycles	-	-	-	-	-					
		Auxiliary vehicle	-	-	-	-	-					
0+25(	37742	Total	-	2243	1598	555	-	none	-	-	Average (of DGAC a	-1.9 / -(
		Automobiles	-	2126	1578	392	72					
		Medium trucks	-	44	7	61	72					
		Heavy trucks	-	73	12	102	72					
		Buses	-	-	-	-	-					
		Motorcycles	-	-	-	-	-					
		Auxiliary vehicle	-	-	-	-	-					
1+26(	37742	Total	-	2243	1598	555	-	none	-	-	Average (of DGAC a	-0.6
		Automobiles	-	2126	1578	392	72					
		Medium trucks	-	44	7	61	72					
		Heavy trucks	-	73	12	102	72					
		Buses	-	-	-	-	-					
		Motorcycles	-	-	-	-	-					
		Auxiliary vehicle	-	-	-	-	-					

APPENDIX G

VIBRATION WORKSHEETS

GROUNDBORNE VIBRATION ANALYSIS

Project:	19305 Balsam at Winona Apartments Project	Date:	10/19/20
Source:	Large Bulldozer		
Scenario:	Unmitigated		
Location:	Residential to East		
Address:			

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 =	45.00	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 =	0.037	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS

Project:	19305 Balsam at Winona Apartments Project	Date:	10/19/20
Source:	Vibratory Roller		
Scenario:	Unmitigated		
Location:	Residential to East		
Address:			

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 =	45.00	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 =	0.087	IN/SEC	OUTPUT IN BLUE

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