Vernola Marketplace Apartment Community (MA 21046)

NOISE IMPACT ANALYSIS

CITY OF JURUPA VALLEY

PREPARED BY:

Bill Lawson, PE, INCE
blawson@urbanxroads.com
(949) 584-3148

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
ANSI	American National Standards Institute
Calveno	California Vehicle Noise
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dBA	A-weighted decibels
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
INCE	Institute of Noise Control Engineering
L_{eq}	Equivalent continuous (average) sound level
L_{max}	Maximum level measured over the time interval
L_{min}	Minimum level measured over the time interval
mph	Miles per hour
OPR	Office of Planning and Research
PPV	Peak particle velocity
Project	Vernola Marketplace Apartment Community
REMEL	Reference Energy Mean Emission Level
RMS	Root-mean-square
VdB	Vibration Decibels

EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the potential noise impacts and the necessary noise mitigation measures, if any, for the proposed Vernola Marketplace Apartment Community development ("Project"). The Project site is located east of the I-15 freeway between Limonite Avenue and 68th Street, west of Pats Ranch Road in the City of Jurupa Valley. The Project includes a 3-story multifamily housing community with 210 units. This study has been prepared to satisfy applicable City of Jurupa Valley standards and thresholds of significance based on guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1)

The results of this Vernola Marketplace Apartment Community Noise Impact Analysis are summarized below based on the significance criteria in Section 4 of this report consistent with Appendix G of the California Environmental Quality Act (CEQA) Guidelines (1). Table ES-1 shows the findings of significance for each potential noise and/or vibration impact under CEQA. All impacts are considered less than significant without mitigation.

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
Off-Site Traffic Noise	7	*Less Than Significant*	-
Operational Noise	9	*Less Than Significant*	-
Construction Noise	10	*Less Than Significant*	-
Construction Vibration		*Less Than Significant*	-

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1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of the proposed Vernola Marketplace Apartment Community ("Project"). This noise study briefly describes the proposed Project, provides information regarding noise fundamentals, describes the local regulatory setting, provides the study methods and procedures for transportation related CNEL traffic noise analysis, and evaluates the future exterior noise environment. In addition, this study includes an analysis of the potential Project-related long-term stationary-source operational noise and short-term construction impacts.

1.1 SITE LOCATION

The proposed project is located east of the I-15 freeway between Limonite Avenue and 68th Street, west of Pats Ranch Road in the City of Jurupa Valley as shown on Exhibit 1-A. The nearest existing residential land uses are located east of the Project site across Pats Ranch Road and west of the Project site across the I-15 Freeway. The initial Phase A Vernola Marketplace Apartment Community project is located to the south.

1.2 PROJECT DESCRIPTION

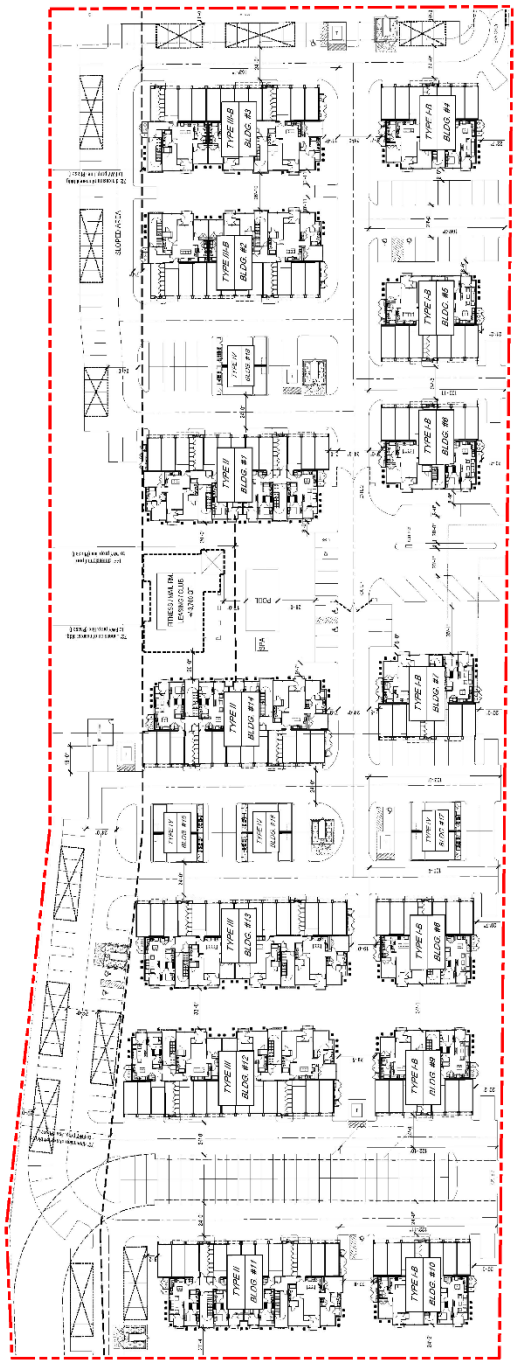
The project includes a 3-story multifamily housing community with 210 units. The proposed project site is currently zoned as light industrial land use. The project proposes to change the land use in the General Plan to highest density residential (HHDR). Exhibit 1-B illustrates a preliminary site plan for the Project. The Vernola Marketplace Apartment Community is not expected to include any specific type of operational noise (stationary source) levels beyond the typical noise sources associated with the planned residential land use. This includes residents moving around the site, air conditioning units, trash enclosure activity, pool/spa activity and parking lot vehicle movements. Residential land use is generally considered a noise-sensitive receiving land use.

1.3 BACKGROUND

Consistent with the February 22, 2021, MA 21046 1st Review CEQA comments provided by the City of Jurupa Valley, this analysis focuses only on the noise the Project generates and not the exposure of noise on the Project. The City of Jurupa Valley CEQA review comments are included in Appendix 1.1.

EXHIBIT 1-A: LOCATION MAP

EXHIBIT 1-B: SITE PLAN



LEGEND:

N

Site Boundary

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2 FUNDAMENTALS

Noise is simply defined as "unwanted sound." Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Noise is measured on a logarithmic scale of sound pressure level known as a decibel (dB). A-weighted decibels (dBA) approximate the subjective response of the human ear to broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies which are audible to the human ear. Exhibit 2-A presents a summary of the typical noise levels and their subjective loudness and effects that are described in more detail below.

EXHIBIT 2-A: TYPICAL NOISE LEVELS

COMMON OUTDOOR ACTIVITIES	COMMON INDOOR ACTIVITIES	A - WEIGHTED SOUND LEVEL dBA	SUBJECTIVE LOUDNESS	EFFECTS OF NOISE
THRESHOLD OF PAIN		140	INTOLERABLE OR DEAFENING	HEARING LOSS
NEAR JET ENGINE		130		
		120		
JET FLY-OVER AT 300m (1000 ft)	ROCK BAND	110		
LOUD AUTO HORN		100	VERY NOISY	
GAS LAWN MOWER AT 1m (3 ft)		90		
DIESEL TRUCK AT 15m (50 ft), at 80 km/hr (50 mph)	FOOD BLENDER AT 1m (3 ft)	80		SPEECH INTERFERENCE
NOISY URBAN AREA, DAYTIME	VACUUM CLEANER AT 3m (10 ft)	70	LOUD	
HEAVY TRAFFIC AT 90m (300 ft)	NORMAL SPEECH AT 1m (3 ft)	60		
QUIET URBAN DAYTIME	LARGE BUSINESS OFFICE	50	MODERATE	SLEEP DISTURBANCE
QUIET URBAN NIGHTTIME	THEATER, LARGE CONFERENCE ROOM (BACKGROUND)	40		
QUIET SUBURBAN NIGHTTIME	LIBRARY	30	FAINT	NO EFFECT
QUIET RURAL NIGHTTIME	BEDROOM AT NIGHT, CONCERT HALL (BACKGROUND)	20		
	BROADCAST/RECORDING STUDIO	10	VERY FAINT	
LOWEST THRESHOLD OF HUMAN HEARING	LOWEST THRESHOLD OF HUMAN HEARING	0		

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

2.1 RANGE OF NOISE

Since the range of intensities that the human ear can detect is so large, the scale frequently used to measure intensity is a scale based on multiples of 10, the logarithmic scale. The scale for measuring intensity is the decibel scale. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud (2). The most common sounds vary between 40 dBA (very quiet) to 100 dBA (very loud). Normal conversation at three feet is roughly at 60 dBA, while loud jet engine noises equate to 110 dBA

at approximately 100 feet, which can cause serious discomfort (3). Another important aspect of noise is the duration of the sound and the way it is described and distributed in time.

2.2 NOISE DESCRIPTORS

Environmental noise descriptors are generally based on averages, rather than instantaneous, noise levels. The most used figure is the equivalent level (L_{eq}). Equivalent sound levels are not measured directly but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period (typically one hour) and is commonly used to describe the "average" noise levels within the environment.

Peak hour or average noise levels, while useful, do not completely describe a given noise environment. Noise levels lower than peak hour may be disturbing if they occur during times when quiet is most desirable, namely evening and nighttime (sleeping) hours. To account for this, the Community Noise Equivalent Level (CNEL), representing a composite 24-hour noise level is utilized. The CNEL is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time-of-day corrections require the addition of 5 decibels to dBA L_{eq} sound levels in the evening from 7:00 p.m. to 10:00 p.m., and the addition of 10 decibels to dBA L_{eq} sound levels at night between 10:00 p.m. and 7:00 a.m. These additions are made to account for the noise sensitive time periods during the evening and night hours when sound appears louder. CNEL does not represent the actual sound level heard at any time, but rather represents the total sound exposure. The City of Jurupa Valley relies on the 24-hour CNEL level to assess land use compatibility with transportation related noise sources.

2.3 SOUND PROPAGATION

When sound propagates over a distance, it changes in level and frequency content. The way noise reduces with distance depends on the following factors.

2.3.1 GEOMETRIC SPREADING

Sound from a localized source (i.e., a stationary point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source. (2)

2.3.2 GROUND ABSORPTION

The propagation path of noise from a highway to a receiver is usually very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually

sufficiently accurate for distances of less than 200 feet. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receiver such as soft dirt, grass, or scattered bushes and trees), an excess ground attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance from a line source. (4)

2.3.3 ATMOSPHERIC EFFECTS

Receivers located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects. (2)

2.3.4 SHIELDING

A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Shielding by trees and other such vegetation typically only has an "out of sight, out of mind" effect. That is, the perception of noise impact tends to decrease when vegetation blocks the line-of-sight to nearby residents. However, for vegetation to provide a substantial, or even noticeable, noise reduction, the vegetation area must be at least 15 feet in height, 100 feet wide and dense enough to completely obstruct the line-of sight between the source and the receiver. This size of vegetation may provide up to 5 dBA of noise reduction. The Federal Highway Administration (FHWA) does not consider the planting of vegetation to be a noise abatement measure. (4)

2.3.5 REFLECTION

Field studies conducted by the FHWA have shown that the reflection from barriers and buildings does not substantially increase noise levels. (4) If all the noise striking a structure was reflected back to a given receiving point, the increase would be theoretically limited to 3 dBA. Further, not all the acoustical energy is reflected back to same point. Some of the energy would go over the structure, some is reflected to points other than the given receiving point, some is scattered by ground coverings (e.g., grass and other plants), and some is blocked by intervening structures and/or obstacles (e.g., the noise source itself). Additionally, some of the reflected energy is lost due to the longer path that the noise must travel. FHWA measurements made to quantify reflective increases in traffic noise have not shown an increase of greater than 1-2 dBA; an increase that is not perceptible to the average human ear.

2.4 NOISE CONTROL

Noise control is the process of obtaining an acceptable noise environment for an observation point or receiver by controlling the noise source, transmission path, receiver, or all three. This

concept is known as the source-path-receiver concept. In general, noise control measures can be applied to these three elements.

2.5 NOISE BARRIER ATTENUATION

Effective noise barriers can reduce noise levels by up to 10 to 15 dBA, cutting the loudness of traffic noise in half. A noise barrier is most effective when placed close to the noise source or receiver. Noise barriers, however, do have limitations. For a noise barrier to work, it must be high enough and long enough to block the path of the noise source. (4)

2.6 LAND USE COMPATIBILITY WITH NOISE

Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches, and residences are more sensitive to noise intrusion than are commercial or industrial developments and related activities.

As ambient noise levels affect the perceived amenity or livability of a development, so too can the mismanagement of noise impacts impair the economic health and growth potential of a community by reducing the area's desirability as a place to live, shop and work. For this reason, land use compatibility with the noise environment is an important consideration in the planning and design process. The FHWA encourages State and Local government to regulate land development in such a way that noise-sensitive land uses are either prohibited from being located adjacent to a highway, or that the developments are planned, designed, and constructed in such a way that noise impacts are minimized. (5)

2.7 COMMUNITY RESPONSE TO NOISE

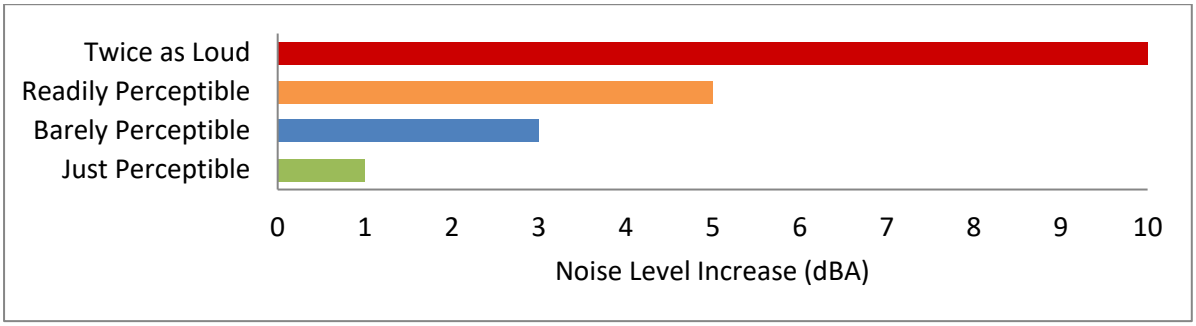
Community responses to noise may range from registering a complaint by telephone or letter, to initiating court action depending upon everyone's susceptibility to noise and personal attitudes about noise. Several factors are related to the level of community annoyance including:

- Fear associated with noise producing activities;
- Socio-economic status and educational level;
- Perception that those affected are being unfairly treated;
- Attitudes regarding the usefulness of the noise-producing activity;
- Belief that the noise source can be controlled.

Approximately ten percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints will occur. Twenty-five percent of the population will not complain even in very severe noise environments. Thus, a variety of reactions can be expected from people exposed to any given noise environment. (6) Surveys have shown that about ten percent of the people exposed to traffic noise of 60 dBA will report being highly annoyed with the noise, and each increase of one dBA is associated with approximately two percent more people being highly annoyed. When traffic noise exceeds 60 dBA or aircraft noise exceeds 55 dBA, people may begin to complain. (6) Despite this variability in behavior on an individual level, the population can be expected to exhibit the following responses to changes in noise levels as shown on Exhibit 2-B. A change of

3 dBA are considered *barely perceptible*, and changes of 5 dBA are considered *readily perceptible*. (4)

EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION



2.8 VIBRATION

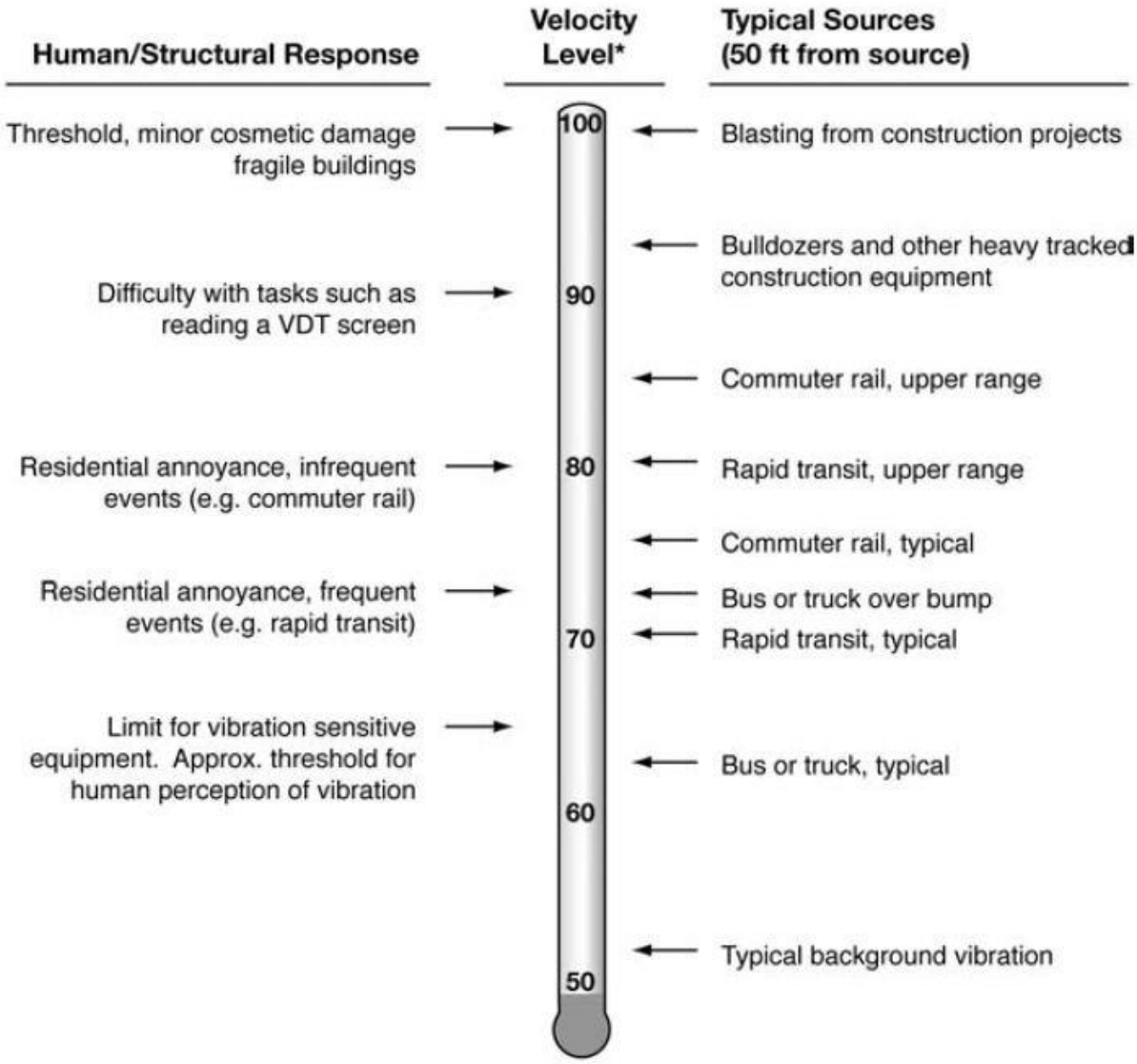
Per the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* (7), vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structure-borne noise. Sources of ground-borne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or transient, such as explosions. As is the case with airborne sound, ground-borne vibrations may be described by amplitude and frequency.

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings but is not always suitable for evaluating human response (annoyance) because it takes some time for the human body to respond to vibration signals. Instead, the human body responds to average vibration amplitude often described as the root mean square (RMS). The RMS amplitude is defined as the average of the squared amplitude of the signal and is most frequently used to describe the effect of vibration on the human body. Decibel notation (VdB) is commonly used to measure RMS. Decibel notation (VdB) serves to reduce the range of numbers used to describe human response to vibration. Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receivers for vibration include structures (especially older masonry structures), people (especially residents, the elderly, and sick), and vibration-sensitive equipment and/or activities

The background vibration-velocity level in residential areas is generally 50 VdB. Ground-borne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground-borne vibration is rarely perceptible. The range of interest is from approximately 50

VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Exhibit 2-C illustrates common vibration sources and the human and structural response to ground-borne vibration.

EXHIBIT 2-C: TYPICAL LEVELS OF GROUND-BORNE VIBRATION



* *RMS Vibration Velocity Level in VdB relative to 10^{-6} inches/second*

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

3 REGULATORY SETTING

To limit population exposure to physically and/or psychologically damaging as well as intrusive noise levels, the federal government, the State of California, various county governments, and most municipalities in the state have established standards and ordinances to control noise. In most areas, automobile and truck traffic is the major source of environmental noise. Traffic activity generally produces an average sound level that remains constant with time. Air and rail traffic, and commercial and industrial activities are also major sources of noise in some areas. Federal, state, and local agencies regulate different aspects of environmental noise. Federal and state agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is left to local agencies.

3.1 STATE OF CALIFORNIA NOISE REQUIREMENTS

The State of California regulates freeway noise, sets standards for sound transmission, provides occupational noise control criteria, identifies noise standards, and provides guidance for local land use compatibility. State law requires that each county and city adopt a General Plan that includes a Noise Element which is to be prepared per guidelines adopted by the Governor's Office of Planning and Research (OPR). (8) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*. In addition, the California Environmental Quality Act (CEQA) requires that all known environmental effects of a project be analyzed, including environmental noise impacts.

3.2 CITY OF JURUPA VALLEY GENERAL PLAN

The City of Jurupa Valley adopted the General Plan on September 7, 2017 (9) The Noise Element identifies several polices to minimize the impacts of excessive noise levels throughout the community and establishes noise level compatibility guidelines for all land uses.

3.2.1 POLICIES AND PROGRAMS

To protect City of Jurupa Valley residents from excessive noise, the Noise Element contains the following policies and programs related to the noise the Project generates:

NE 1.3 New or Modified Stationary Noise Sources. Noise created by new stationary noise sources, or by existing stationary noise sources that undergo modifications that may increase noise levels, shall be mitigated so as not exceed the noise level standards of Figure 7-3. This policy does not apply to noise levels associated with agricultural operations existing in 2017.

NE 1.4 Acoustical Assessment. Require an acoustical assessment for proposed General Plan amendments and rezones that exceed the "Normally Acceptable" thresholds of the Land Use/Noise Compatibility Matrix.

NE 3.1 Noise Analysis. Require that a noise analysis be conducted by an acoustical specialist for all proposed development projects that have the potential to generate significant noise near a noise-sensitive land use, or on or near land designated for noise-sensitive land uses and ensure that recommended mitigation measures are implemented.

NE 3.5 Construction Noise. Limit commercial construction activities adjacent to or within 200 feet of residential uses to weekdays, between 7:00 a.m. and 6:00 p.m., and limit high-noise-generating construction activities (e.g., grading, demolition, pile driving) near sensitive receptors to weekdays between 9:00 a.m. and 3:00 p.m.

To ensure noise-sensitive land uses are protected from new or Modified Stationary Noise Sources, Policy (NE 1.3), Figure 7-3 of the Noise Element identifies guidelines to evaluate proposed developments based on exterior noise level limits for land uses and requires a noise analysis to determine needed mitigation measures if necessary. The Noise Element requires an acoustical assessment for proposed General Plan amendments and rezones that exceed the "*Normally Acceptable*" thresholds of the Land Use/Noise Compatibility Matrix (NE 1.4).

To control stationary noise sources, Policy (NE 3.1) requires that a noise analysis be conducted by an acoustical specialist for all proposed development projects. Maximum noise exposure levels from stationary sources for noise-sensitive uses are regulated by the Municipal Code. To prevent high levels of construction noise from impacting noise-sensitive land uses, Policy NE 3.5 limits construction activities within 200 feet of residential uses to weekdays, between 7:00 a.m. and 6:00 p.m., and limit high-noise-generating construction activities (e.g., grading, demolition, pile driving) near sensitive receptors to weekdays between 9:00 a.m. and 3:00 p.m.

3.2.2 LAND USE COMPATIBILITY

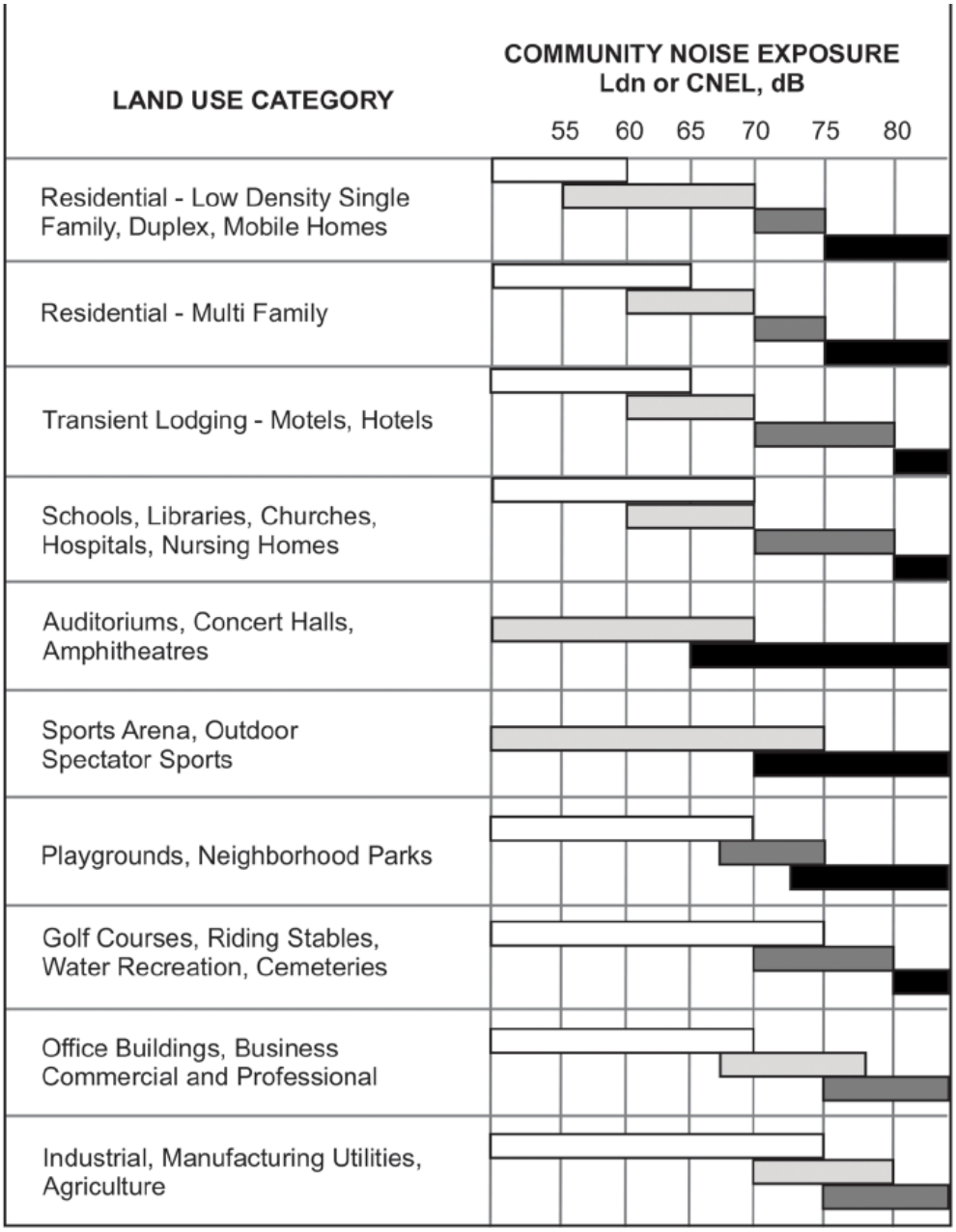
The noise criteria identified in the City of Jurupa Valley Noise Element (Figure 7-3) are guidelines to evaluate the land use compatibility of transportation related noise. The compatibility criteria, shown on Exhibit 3-A, provides the city with a planning tool to gauge the compatibility of land uses relative to existing and future exterior noise levels. The *Land Use/Noise Compatibility Matrix* describes categories of compatibility and not specific noise standards. The existing residential designated land uses in the Project study area are considered *normally acceptable* with exterior noise levels below 60 dBA CNEL, and *conditionally acceptable* with exterior noise levels of up to 70 dBA CNEL.

3.3 OPERATIONAL NOISE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property such as Vernola Marketplace Apartment Community Project, stationary-source (operational) noise such as the expected air conditioning units, trash enclosure activity, pool/spa activity and parking lot vehicle movements are typically evaluated against standards established under a jurisdiction's Municipal Code.

However, Section 11.05.010 of the City of Jurupa Valley Municipal Code (10) indicates that this chapter is not intended to establish city-wide standards regulating noise. Therefore, potential Project related stationary-source (operational) noise impacts are limited to the generation of a substantial temporary or permanent relative increase in the ambient noise levels. This is consistent with the February 22, 2021, MA 21046 1st Review CEQA comments provided by the City of Jurupa Valley. The City of Jurupa Valley Municipal Code is included in Appendix 3.1

EXHIBIT 3-A: LAND USE/NOISE COMPATIBILITY MATRIX



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

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

NORMALLY UNACCEPTABLE
New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise reduction features included in the design.

CLEARLY UNACCEPTABLE
New construction or development should generally not be undertaken.

Source: Jurupa Valley General Plan, 2017 Figure 7-3.

3.4 CONSTRUCTION NOISE STANDARDS

To control noise impacts associated with the construction of the proposed Project, the City of Jurupa Valley Municipal Code has established limits to the hours of operation. Section 11.05.020 indicates that noise associated with any private construction activity located within one-quarter of a mile from an inhabited dwelling is considered exempt between the hours of 6:00 a.m. and 6:00 p.m., during the months of June through September, and 7:00 a.m. and 6:00 p.m., during the months of October through May. (10) In addition, City of Jurupa Valley General Plan Noise Element Policy NE 3.5 limits commercial construction activities adjacent to or within 200 feet of residential uses to weekdays, between 7:00 a.m. and 6:00 p.m., as well as limiting high-noise-generating construction activities (e.g., grading, demolition, pile driving) near sensitive receptors to weekdays between 9:00 a.m. and 3:00 p.m. (9)

Neither the General Plan nor Municipal Code establish numeric maximum acceptable construction source noise levels at potentially affected receivers for CEQA analysis purposes. Therefore, this analysis relies on a numerical daytime construction threshold based on Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual.* According to the FTA, local noise ordinances are typically not very useful in evaluating construction noise. They usually relate to nuisance and hours of allowed activity, and sometimes specify limits in terms of maximum levels, but are generally not practical for assessing the impact of a construction project. Project construction noise criteria should account for the existing noise environment, the absolute noise levels during construction activities, the duration of the construction, and the adjacent land use. Due to the lack of standardized construction noise thresholds, the FTA provides guidelines that can be considered reasonable criteria for construction noise assessment. The FTA considers a daytime exterior construction noise level of 80 dBA L_{eq} as a reasonable threshold for noise sensitive land use. (7 p. 179)

3.5 CONSTRUCTION VIBRATION STANDARDS

To analyze vibration impacts originating from the construction of the Vernola Marketplace Apartment Community, vibration-generating activities are evaluated against the standards identified by the City of Jurupa Valley as a threshold of 0.2 inches per second (in/sec) peak-particle-velocity (PPV). (11)

4 SIGNIFICANCE CRITERIA

The following significance criteria are based on currently adopted guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (8) For the purposes of this report, impacts would be potentially significant if the Project results in or causes:

A. (Threshold A) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

B. (Threshold B) Generation of excessive ground-borne vibration or ground-borne noise levels?

C. (Threshold C) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

4.1 NOISE LEVEL INCREASE (THRESHOLD A)

Noise level increases resulting from the Project are evaluated based on the Appendix G CEQA Guidelines described above at the closest sensitive receiver locations. Under CEQA, consideration must be given to the magnitude of the increase, the existing ambient noise levels, and the location of noise-sensitive receivers to determine if a noise increase represents a significant adverse environmental impact. According to the City of Jurupa Valley, a noticeable increase of 3 dBA or more than City standards is considered a significant impact. (12) The City of Jurupa Valley noise related CEQA thresholds guidance is provided in Appendix 4.1.

4.2 VIBRATION (THRESHOLD B)

As described in Section 3.5, the vibration impacts originating from the construction of the Vernola Marketplace Apartment Community, vibration-generating activities are appropriately evaluated the thresholds of significance identified by the City of Jurupa Valley. The City of Jurupa Valley maintains a 0.2 inches per second (in/sec) peak-particle-velocity (PPV) vibration threshold during Project construction. (11)

4.3 CEQA GUIDELINES NOT FURTHER ANALYZED (THRESHOLD C)

CEQA Noise Threshold C applies when there are nearby public and private airports and/or air strips and focuses on land use compatibility of the Project to nearby airports and airstrips. The Project site is not located within two miles of an airport or airstrip. The closest major airport is the Ontario International Airport located roughly 5.7 miles northwest of the Project site. As such, the Project site would not be exposed to excessive noise levels from airport operations, and therefore, impacts are considered *less than significant,* and no further noise analysis is conducted in relation to Appendix G to the CEQA Guidelines, Noise Threshold C.

4.4 SIGNIFICANCE CRITERIA SUMMARY

Noise impacts shall be considered significant if any of the following occur as a direct result of the proposed development. Table 4-1 shows the significance criteria summary matrix.

TABLE 4-1: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Receiving Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
Off-Site	Noise-Sensitive	If ambient is < 65 dBA CNEL[1]	Project plus ambient > 65 dBA CNEL and a ≥ 3 dBA CNEL Project increase[2]	
	Non-Noise-Sensitive	If ambient is < 70 dBA CNEL[1]	Project plus ambient > 70 dBA CNEL and a ≥ 3 dBA CNEL Project increase[2]	
Operational	Noise-Sensitive	Exterior Noise Level Standards[2]	65 dBA L_{eq}	45 dBA L_{eq}
		If ambient is > 65 dBA L_{eq}[1]	≥ 3 dBA L_{eq} Project increase[2]	
Construction	Noise-Sensitive	Limit typical construction activities to weekdays between 7:00 a.m. and 6:00 p.m. Limit grading, demolition, pile driving to weekdays between 9:00 a.m. and 3:00 p.m.[3]		
		Noise Level Threshold[4]	80 dBA L_{eq}	70 dBA L_{eq}
		Vibration Level Threshold[2]	0.2 in/sec PPV	

[1] City of Jurupa Valley General Plan Noise Element Policy NE 1.5 and Figure 7-3 *normally acceptable* noise exposure.
[2] City of Jurupa Valley noise related CEQA thresholds guidance for noise sensitive receivers (Appendix 4.1).
[3] City of Jurupa Valley Municipal Code, Section 11.05.020.(9).
[4] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.; "PPV" = Peak Particle Velocity

5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, 24-hour noise level measurements were taken at five locations in the Project study area. The receiver locations were selected to describe and document the existing noise environment within the Project study area. Exhibit 5-A provides the boundaries of the Project study area and the noise level measurement locations. To fully describe the existing noise conditions, noise level measurements were collected by Urban Crossroads, Inc. on Wednesday, July 8, 2021. Appendix 5.1 includes study area photos.

5.1 MEASUREMENT PROCEDURE AND CRITERIA

To describe the existing noise environment, the hourly noise levels were measured during typical weekday conditions over a 24-hour period. By collecting individual hourly noise level measurements, it is possible to describe the daytime and nighttime hourly noise levels and calculate the 24-hour CNEL. The long-term noise readings were recorded using Piccolo Type 2 integrating sound level meter and dataloggers. The Piccolo sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 150. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (13)

5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest sensitive receiver locations as possible to assess the existing ambient hourly noise levels surrounding the Project site. Both Caltrans and the FTA recognize that it is not reasonable to collect noise level measurements that can fully represent every part of a private yard, patio, deck, or balcony normally used for human activity when estimating impacts for new development projects. This is demonstrated in the Caltrans general site location guidelines which indicate that, *sites must be free of noise contamination by sources other than sources of interest. Avoid sites located near sources such as barking dogs, lawnmowers, pool pumps, and air conditioners unless it is the express intent of the analyst to measure these sources*. (2) Further, FTA guidance states, t*hat it is not necessary nor recommended that existing noise exposure be determined by measuring at every noise-sensitive location in the project area. Rather, the recommended approach is to characterize the noise environment for clusters of sites based on measurements or estimates at representative locations in the community*. (7)

Based on recommendations of Caltrans and the FTA, it is not necessary to collect measurements at each individual building or residence, because each receiver measurement represents a group of buildings that share acoustical equivalence. (7) In other words, the area represented by the receiver shares similar shielding, terrain, and geometric relationship to the reference noise source. Receivers represent a location of noise sensitive areas and are used to estimate the future noise level impacts. Collecting reference ambient noise level measurements at the nearby sensitive receiver locations allows for a comparison of the before and after Project noise levels

and is necessary to assess potential noise impacts due to the Project's contribution to the ambient noise levels.

5.3 NOISE MEASUREMENT RESULTS

The noise measurements presented below focus on the average or equivalent sound levels (L_{eq}). The equivalent sound level (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. Table 5-1 identifies the hourly daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) noise levels at each noise level measurement location. Appendix 5.2 provides a summary of the existing hourly ambient noise levels.

TABLE 5-1: 24-HOUR AMBIENT NOISE LEVEL MEASUREMENTS

Location[1]	Description	Energy Average Noise Level (dBA L_{eq})[2]	
		Daytime	Nighttime
L1	Located northwest of the Project Site near single-family residence at 12334 Constellation St.	52.9	51.3
L2	Located east of the Project Site on Pats Ranch Road near single-family residence at 6491 Tigers Eye Ct.	68.6	62.9
L3	Located east of the Project Site on Pats Ranch Road near single-family residence at 12013 65th St.	68.7	63.3
L4	Located east of the Project Site on Pats Ranch Road near Limonite Meadows Park at 6596 Meander Way.	61.5	56.7
L5	Located southwest of the Project Site near single-family residence at 6770 Leanne St.	62.3	60.8

[1] See Exhibit 5-A for the noise level measurement locations.
[2] Energy (logarithmic) average levels. The long-term 24-hour measurement worksheets are included in Appendix 5.2.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

Table 5-1 provides the (energy average) noise levels used to describe the daytime and nighttime ambient conditions. These daytime and nighttime energy average noise levels represent the average of all hourly noise levels observed during these time periods expressed as a single number. Appendix 5.2 provides summary worksheets of the noise levels for each hour as well as the minimum, maximum, L_1, L_2, L_5, L_8, L_{25}, L_{50}, L_{90}, L_{95}, and L_{99} percentile noise levels observed during the daytime and nighttime periods.

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS

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6 METHODS AND PROCEDURES

The following section outlines the methods and procedures used to model and analyze the future traffic noise environment. Consistent with the City of Jurupa Valley General Plan *Land Use/Noise Compatibility Matrix*, all transportation related noise levels are presented in terms of the 24-hour CNEL's.

6.1 FHWA TRAFFIC NOISE PREDICTION MODEL

The expected roadway noise level increases from vehicular traffic were calculated by Urban Crossroads, Inc. using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. (14) The FHWA Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). In California the national REMELs are substituted with the California Vehicle Noise (Calveno) Emission Levels. (15) Adjustments are then made to the REMEL to account for: the roadway classification (e.g., collector, secondary, major or arterial), the roadway active width (i.e., the distance between the center of the outermost travel lanes on each side of the roadway), the total average daily traffic (ADT), the travel speed, the percentages of automobiles, medium trucks, and heavy trucks in the traffic volume, the roadway grade, the angle of view (e.g., whether the roadway view is blocked), the site conditions ("hard" or "soft" relates to the absorption of the ground, pavement, or landscaping), and the percentage of total ADT which flows each hour throughout a 24-hour period. Research conducted by Caltrans has shown that the use of soft site conditions is appropriate for the application of the FHWA traffic noise prediction model used in this analysis. (16)

This methodology is consistent with the County of Riverside Office of Industrial Hygiene *Requirements for Determining and Mitigating Traffic Noise Impacts to Residential Structures*, which specifically requires the FHWA RD-77-108 model to be used in analysis within the County's jurisdiction. (17)

6.2 OFF-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

Table 6-1 presents the roadway parameters used to assess the Project's off-site dBA CNEL transportation noise impacts. Table 6-1 identifies the six study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications per the City of Jurupa Valley General Plan Circulation Element, and the vehicle speeds. The ADT volumes used in this study area presented on Table 6-2 are based on the *Vernola Marketplace Apartment Community Traffic Impact Analysis*, prepared by Albert A. Webb Associates for the following traffic scenarios under both Without and With Project alternatives: Existing 2021, Opening Day (2023), and Horizon Year (2035) Conditions. (18)

The ADT volumes vary for each roadway segment based on the existing traffic volumes and the combination of project traffic distributions. This analysis relies on a comparative evaluation of the off-site traffic noise impacts, without and with project ADT traffic volumes from the Project traffic study.

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Receiving Existing Land Use[1]	Distance from Centerline to Receiving Land Use (Feet)[2]	Vehicle Speed (mph)
1	Pats Ranch Rd.	s/o Limonite Ave.	Sensitive	50'	50
2	Pats Ranch Rd.	n/o 65th St.	Sensitive	50'	50
3	Pats Ranch Rd.	s/o 65th St.	Sensitive	50'	50
4	Limonite Ave.	w/o Pats Ranch Rd.	Non-Sensitive	77'	50
5	Limonite Ave.	e/o Pats Ranch Rd.	Sensitive	77'	50
6	68th St.	w/o Pats Ranch Rd.	Sensitive	50'	50

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] Distance to receiving land use is based upon the right-of-way distances.

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic Volumes[1]					
			Existing (2021)		Opening Day (2023)		Horizon Year (2035)	
			Without Project	With Project	Without Project	With Project	Without Project	With Project
1	Pats Ranch Rd.	s/o Limonite Ave.	9,770	10,770	11,280	12,280	14,810	15,810
2	Pats Ranch Rd.	n/o 65th St.	7,460	8,460	7,740	8,740	13,320	14,320
3	Pats Ranch Rd.	s/o 65th St.	7,480	7,660	7,920	8,100	13,610	13,790
4	Limonite Ave.	w/o Pats Ranch Rd.	30,320	31,210	33,380	34,270	41,680	42,570
5	Limonite Ave.	e/o Pats Ranch Rd.	25,800	25,910	28,740	28,850	35,470	35,580
6	68th St.	w/o Pats Ranch Rd.	10,250	10,430	12,210	12,390	18,490	18,670

[1] Vernola Marketplace Apartment Community Traffic Impact Analysis, Albert A. Webb Associates.

Table 6-3 provides the time of day (daytime, evening, and nighttime) vehicle splits and Table 6-4 presents the traffic flow distributions (vehicle mix) used for this analysis. The vehicle mix provides the hourly distribution percentages of automobile, medium trucks, and heavy trucks for input into the FHWA noise prediction model.

TABLE 6-3: TIME OF DAY VEHICLE SPLITS

Vehicle Type	Time of Day Splits[1]			Total of Time of Day Splits
	Daytime	Evening	Nighttime	
Autos	77.50%	12.90%	9.60%	100.00%
Medium Trucks	84.80%	4.90%	10.30%	100.00%
Heavy Trucks	86.50%	2.70%	10.80%	100.00%

[1] County of Riverside Office of Industrial Hygiene. Values rounded to the nearest one-hundredth.
"Daytime" = 7:00 a.m. to 7:00 p.m.; "Evening" = 7:00 p.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

TABLE 6-4: TRAFFIC FLOW BY VEHICLE TYPE (VEHICLE MIX)

Classification	Total % Traffic Flow			Total
	Autos	Medium Trucks	Heavy Trucks	
All Segments	97.42%	1.84%	0.74%	100.00%

1 County of Riverside Office of Industrial Hygiene. Values rounded to the nearest one-hundredth.

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7 OFF-SITE TRANSPORTATION NOISE IMPACTS

To assess the off-site transportation CNEL noise level impacts associated with the proposed Project, noise contours were developed based on the *Vernola Marketplace Apartment Community Traffic Analysis*. (18) Noise contour boundaries represent the equal levels of noise exposure and are measured in CNEL from the center of the roadway.

7.1 TRAFFIC NOISE CONTOURS

Noise contours were used to assess the Project's incremental 24-hour dBA CNEL traffic-related noise impacts at land uses adjacent to roadways conveying Project traffic. The noise contours represent the distance to noise levels of a constant value and are measured from the center of the roadway for the 70, 65, and 60 dBA CNEL noise levels. The noise contours do not consider the effect of any existing noise barriers or topography that may attenuate ambient noise levels. In addition, because the noise contours reflect modeling of vehicular noise on area roadways, they appropriately do not reflect noise contributions from the surrounding stationary noise sources within the Project study area.

Tables 7-1 through 7-6 present a summary of the exterior dBA CNEL traffic noise levels without barrier attenuation. Roadway segments are analyzed from the without Project to the with Project conditions in each of the following timeframes: Existing 2021, Opening Day (2023), and Horizon Year (2035) Conditions. Appendix 7.1 includes a summary of the dBA CNEL traffic noise level contours for each of the traffic scenarios.

TABLE 7-1: EXISTING WITHOUT PROJECT NOISE CONTOURS

ID	Road	Segment	Receiving Existing Land Use[1]	CNEL at Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Pats Ranch Rd.	s/o Limonite Ave.	Sensitive	67.9	RW	79	169
2	Pats Ranch Rd.	n/o 65th St.	Sensitive	66.8	RW	66	141
3	Pats Ranch Rd.	s/o 65th St.	Sensitive	66.8	RW	66	142
4	Limonite Ave.	w/o Pats Ranch Rd.	Non-Sensitive	70.6	84	182	391
5	Limonite Ave.	e/o Pats Ranch Rd.	Sensitive	69.9	RW	163	351
6	68th St.	w/o Pats Ranch Rd.	Sensitive	68.2	RW	81	175

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of the receiving adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-2: EXISTING WITH PROJECT NOISE CONTOURS

ID	Road	Segment	Receiving Existing Land Use[1]	CNEL at Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Pats Ranch Rd.	s/o Limonite Ave.	Sensitive	68.4	RW	84	181
2	Pats Ranch Rd.	n/o 65th St.	Sensitive	67.3	RW	71	154
3	Pats Ranch Rd.	s/o 65th St.	Sensitive	66.9	RW	67	144
4	Limonite Ave.	w/o Pats Ranch Rd.	Non-Sensitive	70.8	86	185	399
5	Limonite Ave.	e/o Pats Ranch Rd.	Sensitive	69.9	RW	164	352
6	68th St.	w/o Pats Ranch Rd.	Sensitive	68.2	RW	82	177

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of the receiving adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-3: OPENING DAY (2023) WITHOUT PROJECT NOISE CONTOURS

ID	Road	Segment	Receiving Existing Land Use[1]	CNEL at Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Pats Ranch Rd.	s/o Limonite Ave.	Sensitive	68.6	RW	86	186
2	Pats Ranch Rd.	n/o 65th St.	Sensitive	66.9	RW	67	145
3	Pats Ranch Rd.	s/o 65th St.	Sensitive	67.0	RW	68	147
4	Limonite Ave.	w/o Pats Ranch Rd.	Non-Sensitive	71.1	90	194	417
5	Limonite Ave.	e/o Pats Ranch Rd.	Sensitive	70.4	81	175	378
6	68th St.	w/o Pats Ranch Rd.	Sensitive	68.9	RW	91	196

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of the receiving adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-4: OPENING DAY (2023) WITH PROJECT NOISE CONTOURS

ID	Road	Segment	Receiving Existing Land Use[1]	CNEL at Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Pats Ranch Rd.	s/o Limonite Ave.	Sensitive	68.9	RW	91	197
2	Pats Ranch Rd.	n/o 65th St.	Sensitive	67.5	RW	73	157
3	Pats Ranch Rd.	s/o 65th St.	Sensitive	67.1	RW	69	149
4	Limonite Ave.	w/o Pats Ranch Rd.	Non-Sensitive	71.2	91	197	425
5	Limonite Ave.	e/o Pats Ranch Rd.	Sensitive	70.4	82	176	379
6	68th St.	w/o Pats Ranch Rd.	Sensitive	69.0	RW	92	198

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of the receiving adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-5: HORIZON YEAR (2035) WITHOUT PROJECT NOISE CONTOURS

ID	Road	Segment	Receiving Existing Land Use[1]	CNEL at Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Pats Ranch Rd.	s/o Limonite Ave.	Sensitive	69.7	RW	104	223
2	Pats Ranch Rd.	n/o 65th St.	Sensitive	69.3	RW	97	208
3	Pats Ranch Rd.	s/o 65th St.	Sensitive	69.4	RW	98	211
4	Limonite Ave.	w/o Pats Ranch Rd.	Non-Sensitive	72.0	104	225	484
5	Limonite Ave.	e/o Pats Ranch Rd.	Sensitive	71.3	94	202	434
6	68th St.	w/o Pats Ranch Rd.	Sensitive	70.7	56	120	259

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of the receiving adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-6: HORIZON YEAR (2035) WITH PROJECT NOISE CONTOURS

ID	Road	Segment	Receiving Existing Land Use[1]	CNEL at Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Pats Ranch Rd.	s/o Limonite Ave.	Sensitive	70.0	50	108	233
2	Pats Ranch Rd.	n/o 65th St.	Sensitive	69.6	RW	101	218
3	Pats Ranch Rd.	s/o 65th St.	Sensitive	69.4	RW	99	213
4	Limonite Ave.	w/o Pats Ranch Rd.	Non-Sensitive	72.1	106	228	491
5	Limonite Ave.	e/o Pats Ranch Rd.	Sensitive	71.3	94	202	435
6	68th St.	w/o Pats Ranch Rd.	Sensitive	70.8	56	121	261

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of the receiving adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

7.2 EXISTING PROJECT TRAFFIC NOISE LEVEL INCREASES

An analysis of existing traffic noise levels plus traffic noise generated by the proposed Project has been included in this report to fully analyze all the existing traffic scenarios identified in the *Vernola Marketplace Apartment Community Traffic Impact Analysis*. This condition is provided solely for informational purposes and will not occur, since the Project will not be fully developed and occupied under Existing conditions. Table 7-1 shows the Existing without Project conditions CNEL noise levels. The Existing without Project exterior noise levels are expected to range from 66.8 to 70.6 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-2 shows the Existing with Project conditions will range from 66.9 to 70.8 dBA CNEL. Table 7-7 shows that the Project off-site traffic noise level impacts will range from 0.0 to 0.5 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Table 4-1, land uses adjacent to the study area roadway segments would experience *less than significant* noise level increases on receiving land uses due to the Project-related traffic.

7.3 OPENING DAY (2023) PROJECT TRAFFIC NOISE LEVEL INCREASES

Table 7-3 presents the Opening Day (2023) without Project conditions CNEL noise levels. The Opening Day (2023) without Project exterior noise levels are expected to range from 66.9 to 71.1 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-4 shows the Opening Day (2023) with Project conditions will range from 67.1 to 71.2 dBA CNEL. Table 7-8 shows that the Project off-site traffic noise level increases will range from 0.0 to 0.5 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Table 4-1, land uses adjacent to the study area roadway segments would experience *less than significant* noise level increases on receiving land uses due to the Project-related traffic.

7.4 HORIZON YEAR (2035) PROJECT TRAFFIC NOISE LEVEL INCREASES

Table 7-5 presents the Horizon Year (2035) without Project conditions CNEL noise levels. The Horizon Year (2035) without Project exterior noise levels are expected to range from 69.3 to 72.0 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-6 shows the Horizon Year (2035) with Project conditions will range from 69.4 to 72.1 dBA CNEL. Table 7-9 shows that the Project off-site traffic noise level increases will range from 0.0 to 0.3 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Table 4-1, land uses adjacent to the study area roadway segments would experience *less than significant* noise level increases on receiving land uses due to the Project-related traffic.

TABLE 7-7: EXISTING WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Existing Land Use[1]	CNEL at Receiving Land Use (dBA)[2]			Noise Sensitive Land Use?	Exterior Noise Standard	Incremental Noise Level Increase Threshold[3]	
				No Project	With Project	Project Addition			Limit	Exceeded?
1	Pats Ranch Rd.	s/o Limonite Ave.	Sensitive	67.9	68.4	0.4	Yes	65	3	No
2	Pats Ranch Rd.	n/o 65th St.	Sensitive	66.8	67.3	0.5	Yes	65	3	No
3	Pats Ranch Rd.	s/o 65th St.	Sensitive	66.8	66.9	0.1	Yes	65	3	No
4	Limonite Ave.	w/o Pats Ranch Rd.	Non-Sensitive	70.6	70.8	0.1	No	70	3	No
5	Limonite Ave.	e/o Pats Ranch Rd.	Sensitive	69.9	69.9	0.0	Yes	65	3	No
6	68th St.	w/o Pats Ranch Rd.	Sensitive	68.2	68.2	0.1	Yes	65	3	No

[1] Noise sensitive uses limited to existing residential land uses.

[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the receiving land use.

[3] Does the Project create an incremental noise level increase exceeding the significance criteria (Table 4-1)?

TABLE 7-8: OPENING DAY (2023) WITH PROJECT TRAFFIC NOISE INCREASES

ID	Road	Segment	Receiving Existing Land Use[1]	CNEL at Receiving Land Use (dBA)[2]			Noise Sensitive Land Use?	Exterior Noise Standard	Incremental Noise Level Increase Threshold[3]	
				No Project	With Project	Project Addition			Limit	Exceeded?
1	Pats Ranch Rd.	s/o Limonite Ave.	Sensitive	68.6	68.9	0.4	Yes	65	3	No
2	Pats Ranch Rd.	n/o 65th St.	Sensitive	66.9	67.5	0.5	Yes	65	3	No
3	Pats Ranch Rd.	s/o 65th St.	Sensitive	67.0	67.1	0.1	Yes	65	3	No
4	Limonite Ave.	w/o Pats Ranch Rd.	Non-Sensitive	71.1	71.2	0.1	No	70	3	No
5	Limonite Ave.	e/o Pats Ranch Rd.	Sensitive	70.4	70.4	0.0	Yes	65	3	No
6	68th St.	w/o Pats Ranch Rd.	Sensitive	68.9	69.0	0.1	Yes	65	3	No

[1] Noise sensitive uses limited to existing residential land uses.

[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the receiving land use.

[3] Does the Project create an incremental noise level increase exceeding the significance criteria (Table 4-1)?

TABLE 7-9: HORIZON YEAR (2035) WITH PROJECT TRAFFIC NOISE INCREASES

ID	Road	Segment	Receiving Existing Land Use[1]	CNEL at Receiving Land Use (dBA)[2]			Noise Sensitive Land Use?	Exterior Noise Standard	Incremental Noise Level Increase Threshold[3]	
				No Project	With Project	Project Addition			Limit	Exceeded?
1	Pats Ranch Rd.	s/o Limonite Ave.	Sensitive	69.7	70.0	0.3	Yes	65	3	No
2	Pats Ranch Rd.	n/o 65th St.	Sensitive	69.3	69.6	0.3	Yes	65	3	No
3	Pats Ranch Rd.	s/o 65th St.	Sensitive	69.4	69.4	0.1	Yes	65	3	No
4	Limonite Ave.	w/o Pats Ranch Rd.	Non-Sensitive	72.0	72.1	0.1	No	70	3	No
5	Limonite Ave.	e/o Pats Ranch Rd.	Sensitive	71.3	71.3	0.0	Yes	65	3	No
6	68th St.	w/o Pats Ranch Rd.	Sensitive	70.7	70.8	0.0	Yes	65	3	No

[1] Noise sensitive uses limited to existing residential land uses.

[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the receiving land use.

[3] Does the Project create an incremental noise level increase exceeding the significance criteria (Table 4-1)?

8 SENSITIVE RECEIVER LOCATIONS

To assess the potential for long-term operational and short-term construction noise impacts, the following sensitive receiver locations, as shown on Exhibit 8-A, were identified as representative locations for analysis. Sensitive receivers are generally defined as locations where people reside or where the presence of unwanted sound could otherwise adversely affect the use of the land. Noise-sensitive land uses are generally considered to include schools, hospitals, single-family dwellings, mobile home parks, churches, libraries, and recreation areas. Moderately noise-sensitive land uses typically include multi-family dwellings, hotels, motels, dormitories, out-patient clinics, cemeteries, golf courses, country clubs, athletic/tennis clubs, and equestrian clubs. Land uses that are considered relatively insensitive to noise include business, commercial, and professional developments. Land uses that are typically not affected by noise include: industrial, manufacturing, utilities, agriculture, undeveloped land, parking lots, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals.

To describe the potential off-site Project noise levels, five receiver locations in the vicinity of the Project site were identified. All distances are measured from the Project site boundary to the outdoor living areas (e.g., private backyards) or at the building façade, whichever is closer to the Project site. The selection of receiver locations is based on FHWA guidelines and is consistent with additional guidance provided by Caltrans and the FTA, as previously described in Section 5.2. Other sensitive land uses in the Project study area that are located at greater distances than those identified in this noise study will experience lower noise levels than those presented in this report due to the additional attenuation from distance and the shielding of intervening structures. Distance is measured in a straight line from the project boundary to each receiver location.

R1: Location R1 represents the existing noise sensitive residence at 6420 Harrow Street, approximately 410 feet northwest of the Project site. R1 is placed in the private outdoor living areas (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

R2: Location R2 represents the existing noise sensitive residence at 6491 Tigers Eye Court, approximately 387 feet east of the Project site. R2 is placed in the private outdoor living areas (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L2, to describe the existing ambient noise environment.

R3: Location R3 represents the existing noise sensitive residence at 12013 65th Street, approximately 380 feet east of the Project site. R3 is placed in the private outdoor living areas (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L3, to describe the existing ambient noise environment.

R4: Location R4 represents the existing noise sensitive residence at 661 Tanzanite Street, approximately 481 feet southeast of the Project site. R4 is placed in the private outdoor living areas (backyard) facing the Project site. A 24-hour noise measurement near this location, L4, is used to describe the existing ambient noise environment.

R5: Location R5 represents the existing noise sensitive residence at 6620 Alexis Circle, approximately 353 feet west of the Project site. R5 is placed in the private outdoor living

areas (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L5, to describe the existing ambient noise environment.

EXHIBIT 8-A: SENSITIVE RECEIVER LOCATIONS

9 OPERATIONAL NOISE IMPACTS

This section analyzes the potential stationary-source operational noise impacts at the nearest receiver locations, identified in Section 8, resulting from the operation of the proposed Vernola Marketplace Apartment Community Project. Exhibit 9-A identifies the representative receiver locations and noise source locations used to assess the hourly average L_{eq} operational noise levels consistent with the City of Jurupa Valley noise related CEQA thresholds guidance for noise sensitive receivers included in Appendix 4.1. (12)

9.1 OPERATIONAL NOISE SOURCES

This operational noise analysis is intended to describe noise level impacts associated with the expected typical of daytime and nighttime activities at the Project site. To present the potential worst-case noise conditions, this analysis assumes the Project would be operational 24 hours per day, seven days per week. The on-site Project-related noise sources are expected to include: air conditioning units, trash enclosure activity, pool/spa activity and parking lot vehicle movements.

9.2 REFERENCE NOISE LEVELS

To estimate the Project operational noise impacts, reference noise level measurements were collected from similar types of activities to represent the noise levels expected with the development of the proposed Project. This section provides a detailed description of the reference noise level measurements shown on Table 9-1 used to estimate the Project operational noise impacts. It is important to note that the following projected noise levels assume the worst-case noise environment with the air conditioning units, trash enclosure activity, pool/spa activity and parking lot vehicle movements all operating at the same time. These sources of noise activity will likely vary throughout the day.

9.2.1 MEASUREMENT PROCEDURES

The reference noise level measurements presented in this section were collected using a Larson Davis LxT Type 1 precisions sound level meter (serial number 01146). The LxT sound level meter was calibrated using a Larson-Davis calibrator, Model CAL 200, was programmed in "slow" mode to record noise levels in "A" weighted form and was located at approximately five feet above the ground elevation for each measurement. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (13)

EXHIBIT 9-A: OPERATIONAL NOISE SOURCE LOCATIONS

TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS

Noise Source[1]	Noise Source Height (Feet)	Min./Hour[2]		Reference Noise Level (dBA L_{eq}) @ 50 Feet	Sound Power Level (dBA)[3]
		Day	Night		
Air Conditioning Units	3'	60'	60'	43.3	75.0
Trash Enclosure Activity	5'	10'	10'	57.3	89.0
Pool/Spa Activity	4'	60'	0'	54.7	94.6
Parking Lot Vehicle Movements	5'	60'	60'	40.8	72.5

[1] As measured by Urban Crossroads, Inc.
[2] Anticipated duration (minutes within the hour) of noise activity during typical hourly conditions expected at the Project site. "Daytime" = 7:00 a.m. - 10:00 p.m.; "Nighttime" = 10:00 p.m. - 7:00 a.m.
[3] Sound power level represents the total amount of acoustical energy (noise level) produced by a sound source independent of distance or surroundings. Sound power levels calculated using the CadnaA noise model at the reference distance to the noise source.

9.2.2 AIR CONDITIONING UNITS

To assess the noise levels created by the roof-top air conditioning units, reference noise levels were taken from the Carrier model 24ACC4 product data sheet. The product data sheet for Carrier model 24ACC4 indicates that each air conditioning units will produce a maximum sound power level of 75 dBA L_w. For this noise analysis, the air conditioning units are expected operate continuously for 60 minutes per hour during the daytime and nighttime hours.

9.2.3 TRASH ENCLOSURE ACTIVITY

To describe the noise levels associated with a trash enclosure activity, Urban Crossroads collected a reference noise level measurement at an existing trash enclosure containing two dumpster bins. The trash enclosure noise levels describe metal gates opening and closing, metal scraping against concrete floor sounds, dumpster movement on metal wheels, trash dropping into the metal dumpster. The reference noise levels describe trash enclosure noise activities when trash is dropped into an empty metal dumpster, as would occur at the Project site. The measured reference noise level at the uniform 50-foot reference distance is 57.3 dBA L_{eq} for the trash enclosure activity. The reference noise level describes the expected noise source activities associated with the trash enclosures for each of the Project buildings. Trash enclosure activities are estimated to occur for 10 minutes per hour.

9.2.4 POOL/SPA ACTIVITY

To represent the noise levels associated with pool activities, Urban Crossroads collected a reference noise level measurement at the Covenant Hill Clubhouse Pool in the unincorporated community of Ladera Ranch in the County of Orange. The reference noise level at 50 feet is 54.7 dBA L_{eq} for pool activity. The pool activity noise levels include kids playing, running, screaming, splashing, playing with a ball, and parents talking. Pool and Spa activities are estimated to occur for 60 minutes during all the daytime hours, with no nighttime activities.

9.2.5 PARKING LOT VEHICLE MOVEMENTS

To determine the noise levels associated with a residential apartment community parking lot, Urban Crossroads collected reference noise level measurements at the Windemere Apartment community in the City of Riverside. At 50 feet, the parking lot vehicle movements produced a reference noise level of 40.8 dBA L_{eq}. The residential parking lot noise levels are mainly due to cars pulling in and out of spaces and residents going to and from their apartment homes and includes horns honking in the parking lot. Noise associated with parking lot vehicle movements is expected during the typical daytime, and nighttime conditions for the entire hour (60 minutes).

9.3 CADNAA NOISE PREDICTION MODEL

To fully describe the exterior operational noise levels from the Project, Urban Crossroads, Inc. developed a noise prediction model using the CadnaA (Computer Aided Noise Abatement) computer program. CadnaA can analyze multiple types of noise sources using the spatially accurate Project site plan, georeferenced Nearmap aerial imagery, topography, buildings, and barriers in its calculations to predict outdoor noise levels.

Using the ISO 9613-2 protocol, CadnaA will calculate the distance from each noise source to the noise receiver locations, using the ground absorption, distance, and barrier/building attenuation inputs to provide a summary of noise level at each receiver and the partial noise level contributions by noise source. Consistent with the ISO 9613-2 protocol, the CadnaA noise prediction model relies on the reference sound power level (L_w) to describe individual noise sources. While sound pressure levels (e.g. L_{eq}) quantify in decibels the intensity of given sound sources at a reference distance, sound power levels (L_w) are connected to the sound source and are independent of distance. Sound pressure levels vary substantially with distance from the source and diminish because of intervening obstacles and barriers, air absorption, wind, and other factors. Sound power is the acoustical energy emitted by the sound source and is an absolute value that is not affected by the environment.

The operational noise level calculations provided in this noise study account for the distance attenuation provided due to geometric spreading, when sound from a localized stationary source (i.e., a point source) propagates uniformly outward in a spherical pattern. A default ground attenuation factor of 0.5 was used in the noise analysis to account for mixed ground representing a combination of hard and soft surfaces. Appendix 9.1 includes the detailed noise model inputs used to estimate the Project operational noise levels presented in this section.

9.4 PROJECT OPERATIONAL NOISE LEVELS

Using the reference noise levels to represent the proposed Project operations that include air conditioning units, trash enclosure activity, pool/spa activity and parking lot vehicle movements, Urban Crossroads, Inc. calculated the operational source noise levels that are expected to be generated at the Project site and the Project-related noise level increases that would be experienced at each of the sensitive receiver locations. Tables 9-2 shows the Project operational noise levels during the daytime hours of 7:00 a.m. to 10:00 p.m. The daytime hourly noise levels at the off-site receiver locations are expected to range from 40.6 to 44.3 dBA L_{eq}.

TABLE 9-2: DAYTIME PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1]	Operational Noise Levels by Receiver Location (dBA Leq)				
	R1	R2	R3	R4	R5
Air Conditioning Units	33.7	36.8	37.1	34.3	36.0
Trash Enclosure Activity	34.0	36.4	36.5	33.6	37.1
Pool/Spa Activity	38.8	41.8	42.1	37.8	40.4
Parking Lot Vehicle Movements	28.2	30.5	30.8	27.6	30.7
Total (All Noise Sources)	**41.2**	**44.0**	**44.3**	**40.6**	**43.3**

[1] See Exhibit 9-A for the noise source locations. CadnaA noise model calculations are included in Appendix 9.1.

Table 9-3 shows the Project operational noise levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. The nighttime hourly noise levels at the off-site receiver locations are expected to range from 35.3 to 38.5 dBA L_{eq}. The differences between the daytime and nighttime noise levels are largely related to the duration of noise activity (Table 9-1).

TABLE 9-3: NIGHTTIME PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1]	Operational Noise Levels by Receiver Location (dBA Leq)				
	R1	R2	R3	R4	R5
Air Conditioning Units	33.7	36.8	37.1	34.3	36.0
Trash Enclosure Activity	26.2	28.6	28.7	25.8	29.3
Pool/Spa Activity	0.0	0.0	0.0	0.0	0.0
Parking Lot Vehicle Movements	28.2	30.5	30.8	27.6	30.7
Total (All Noise Sources)	**35.3**	**38.2**	**38.5**	**35.6**	**37.8**

[1] See Exhibit 9-A for the noise source locations. CadnaA noise model calculations are included in Appendix 9.1.

9.5 PROJECT OPERATIONAL NOISE LEVEL COMPLIANCE

To demonstrate compliance with local noise regulations, the Project-only operational noise levels are evaluated against exterior noise level thresholds based on the City of Jurupa Valley exterior noise level standards at nearby noise-sensitive receiver locations. Table 9-4 shows the operational noise levels associated with Vernola Marketplace Apartment Community Project will satisfy the City of Jurupa Valley 65 dBA L_{eq} daytime and 45 dBA L_{eq} nighttime exterior noise level standards at all nearby receiver locations. Therefore, the operational noise impacts are considered *less than significant* at the nearby noise-sensitive receiver locations.

TABLE 9-4: OPERATIONAL NOISE LEVEL COMPLIANCE

Receiver Location[1]	Project Operational Noise Levels (dBA Leq)[2]		Noise Level Standards (dBA Leq)[3]		Noise Level Standards Exceeded?[4]	
	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime
R1	41.2	35.3	65	45	No	No
R2	44.0	38.2	65	45	No	No
R3	44.3	38.5	65	45	No	No
R4	40.6	35.6	65	45	No	No
R5	43.3	37.8	65	45	No	No

[1] See Exhibit 8-A for the receiver locations.
[2] Proposed Project operational noise levels as shown on Tables 9-2 and 9-3.
[3] Exterior noise level standards for source (commercial) land use, as shown on Table 4-1.
[4] Do the estimated Project operational noise source activities exceed the noise level standards?
"Daytime" = 7:00 a.m. - 10:00 p.m.; "Nighttime" = 10:00 p.m. - 7:00 a.m.

9.6 PROJECT OPERATIONAL NOISE LEVEL INCREASES

To describe the Project operational noise level increases, the Project operational noise levels are combined with the existing ambient noise levels measurements for the nearby receiver locations potentially impacted by Project operational noise sources. Since the units used to measure noise, decibels (dB), are logarithmic units, the Project-operational and existing ambient noise levels cannot be combined using standard arithmetic equations. (2) Instead, they must be logarithmically added using the following base equation:

$$SPL_{Total} = 10\log_{10}[10^{SPL1/10} + 10^{SPL2/10} + \ldots 10^{SPLn/10}]$$

Where "SPL1," "SPL2," etc. are equal to the sound pressure levels being combined, or in this case, the Project-operational and existing ambient noise levels. The difference between the combined Project and ambient noise levels describes the Project noise level increases to the existing ambient noise environment. As indicated on Tables 9-5 and 9-6, the Project will generate a daytime and nighttime operational noise level increase ranging from 0.0 to 0.3 dBA L_{eq} at the nearby receiver locations. This is largely due to the high existing background ambient noise levels from the I-15 Freeway. Project-related operational noise level increases will satisfy the operational noise level increase significance criteria presented on Table 4-1. Therefore, the incremental Project operational noise level increase is considered *less than significant* at all receiver locations.

TABLE 9-5: DAYTIME PROJECT OPERATIONAL NOISE LEVEL INCREASES

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Increase Criteria[7]	Increase Criteria Exceeded?
R1	41.2	L1	52.9	53.2	0.3	3	No
R2	44.0	L2	68.6	68.6	0.0	3	No
R3	44.3	L3	68.7	68.7	0.0	3	No
R4	40.6	L4	61.5	61.5	0.0	3	No
R5	43.3	L5	61.6	61.7	0.1	3	No

[1] See Exhibit 8-A for the receiver locations.
[2] Total Project daytime operational noise levels as shown on Table 9-2.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed daytime ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance increase criteria as shown on Table 4-1.

TABLE 9-6: NIGHTTIME OPERATIONAL NOISE LEVEL INCREASES

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Increase Criteria[7]	Increase Criteria Exceeded?
R1	35.3	L1	51.3	51.4	0.1	3	No
R2	38.2	L2	62.9	62.9	0.0	3	No
R3	38.5	L3	63.3	63.3	0.0	3	No
R4	35.6	L4	56.7	56.7	0.0	3	No
R5	37.8	L5	59.1	59.1	0.0	3	No

[1] See Exhibit 8-A for the receiver locations.
[2] Total Project nighttime operational noise levels as shown on Table 9-3.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed nighttime ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance increase criteria as shown on Table 4-1.

10 CONSTRUCTION IMPACTS

This section analyzes potential equivalent dBA L_{eq} impacts resulting from the short-term construction activities associated with the development of the Project. Exhibit 10-A shows the construction noise source locations in relation to the nearest sensitive receiver locations previously described in Section 8.

To prevent high levels of construction noise from impacting noise-sensitive land uses, City of Jurupa Valley General Plan Noise Element Policy NE 3.5 limits construction activities within 200 feet of residential uses to weekdays, between 7:00 a.m. and 6:00 p.m., and limit high-noise-generating construction activities (e.g., grading, demolition, pile driving) near sensitive receptors to weekdays between 9:00 a.m. and 3:00 p.m.

10.1 CONSTRUCTION NOISE LEVELS

Noise generated by the Project construction equipment will include a combination of trucks, power tools, concrete mixers, and portable generators that when combined can reach high levels. The number and mix of construction equipment are expected to occur in the following stages:

- Site Preparation
- Grading
- Building Construction
- Paving
- Architectural Coating

10.2 CONSTRUCTION REFERENCE NOISE LEVELS

To describe peak construction noise activities, this construction noise analysis was prepared using reference noise level measurements published in the Update of Noise Database for Prediction of Noise on Construction and Open Sites by the Department for Environment, Food and Rural Affairs (DEFRA). (19). The DEFRA database provides the most recent and comprehensive source of reference construction noise levels. Table 10-1 provides a summary of the DEFRA construction reference noise level measurements expressed in hourly average dBA L_{eq} using the estimated FHWA Roadway Construction Noise Model (RCNM) usage factors (20) to describe the typical construction activities for each stage of Project construction.

EXHIBIT 10-A: CONSTRUCTION NOISE SOURCE LOCATIONS

TABLE 10-1: CONSTRUCTION REFERENCE NOISE LEVELS

Construction Stage	Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})[1]	Combined Noise Level (dBA L_{eq})
Site Preparation	Crawler Tractors	77	79
	Hauling Trucks	71	
	Rubber Tired Dozers	71	
Grading	Graders	79	79
	Compactors	67	
	Excavators	64	
Building Construction	Tractors	72	74
	Cranes	67	
	Welders	65	
Paving	Pavers	70	74
	Paving Equipment	69	
	Rollers	69	
Architectural Coating	Cranes	67	72
	Air Compressors	67	
	Generator Sets	67	

[1] Update of Noise Database for Prediction of Noise on Construction and Open Sites by the Department for Environment, Food and Rural Affairs (DEFRA) expressed in hourly average L_{eq} based on estimated usage factors from the FHWA Roadway Construction Noise Model (RCNM).
[2] Represents the combined noise level for all equipment assuming they operate at the same time consistent with FTA Transit Noise and Vibration Impact Assessment guidance for general construction noise assessment.

10.3 CONSTRUCTION NOISE ANALYSIS

Using the reference construction equipment noise levels and the CadnaA noise prediction model, calculations of the Project construction noise level impacts at the nearby sensitive receiver locations were completed. To assess the worst-case construction noise levels, the Project construction noise analysis relies on the highest noise level impacts when the equipment with the highest reference noise level is operating at the closest point from the edge of primary construction activity (Project site boundary) to each receiver location. Consistent with FTA guidance for general construction noise assessment, Table 10-1 presents the combined noise level for all equipment, assuming they operate at the same time. As shown on Table 10-2, the construction noise levels are expected to range from 56.9 to 66.7 dBA L_{eq}, and the highest construction levels are expected to range from 63.9 to 66.7 dBA L_{eq} at the nearby receiver locations. Appendix 10.1 includes the detailed CadnaA construction noise model inputs.

The construction noise analysis presents a conservative approach with the highest combined noise-level-producing equipment for each stage of Project construction operating at the closest point from primary construction activity to the nearby sensitive receiver locations. This scenario is unlikely to occur during typical construction activities and likely overstates the construction noise levels which will be experienced at each receiver location.

TABLE 10-2: CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})					
	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Levels[2]
R1	64.2	64.2	59.2	59.2	57.2	64.2
R2	66.5	66.5	61.5	61.5	59.5	66.5
R3	66.7	66.7	61.7	61.7	59.7	66.7
R4	63.9	63.9	58.9	58.9	56.9	63.9
R5	66.2	66.2	61.2	61.2	59.2	66.2

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Construction noise level calculations based on distance from the construction activity, which is measured from the Project site boundary to the nearest receiver locations. CadnaA construction noise model inputs are included in Appendix 10.1.

10.4 CONSTRUCTION NOISE LEVEL COMPLIANCE

To evaluate whether the Project will generate potentially significant short-term noise levels at nearest receiver locations, a construction-related daytime noise level threshold of 80 dBA L_{eq} is used as a reasonable threshold to assess the daytime construction noise level impacts. The construction noise analysis shows that the nearest receiver locations will satisfy the reasonable daytime 80 dBA L_{eq} significance threshold during Project construction activities as shown on Table 10-3. Therefore, the noise impacts due to Project construction noise are considered *less than significant* at all receiver locations.

TABLE 10-3: CONSTRUCTION NOISE LEVEL COMPLIANCE

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})		
	Highest Construction Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
R1	64.2	80	No
R2	66.5	80	No
R3	66.7	80	No
R4	63.9	80	No
R5	66.2	80	No

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Highest construction noise level calculations based on distance from the construction noise source activity to the nearest receiver locations as shown on Table 10-2.
[3] Construction noise level thresholds as shown on Table 4-1.
[4] Do the estimated Project construction noise levels exceed the construction noise level threshold?

10.5 CONSTRUCTION VIBRATION IMPACTS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods employed. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Ground vibration levels associated with various types of construction equipment are summarized on Table 10-4. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the potential for building damage using the following vibration assessment methods defined by the FTA. To describe the vibration impacts the FTA provides the following equation: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$

TABLE 10-4: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	PPV (in/sec) at 25 feet
Small bulldozer	0.003
Jackhammer	0.035
Loaded Trucks	0.076
Large bulldozer	0.089

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

Table 10-6 presents the expected Project related vibration levels at the nearest receiver locations. At distances ranging from 353 to 481 feet from Project construction activities, construction vibration velocity levels are estimated to range from 0.001 to 0.002 PPV (in/sec). Based on City of Jurupa Valley maximum acceptable continuous vibration threshold of 0.2 PPV (in/sec), the typical Project construction vibration levels will satisfy the vibration thresholds at all receiver locations. In addition, the typical construction vibration levels at the nearest sensitive receiver locations are unlikely to be sustained during the entire construction period but will occur rather only during the times that heavy construction equipment is operating adjacent to the Project site boundaries.

TABLE 10-5: PROJECT CONSTRUCTION VIBRATION LEVELS

Receiver[1]	Distance to Const. Activity (Feet)[2]	Typical Construction Vibration Levels PPV (in/sec)[3]					Thresholds PPV (in/sec)[4]	Thresholds Exceeded?[5]
		Small bulldozer	Jackhammer	Loaded Trucks	Large bulldozer	Highest Vibration Level		
R1	410'	0.000	0.001	0.001	0.001	0.001	0.2	No
R2	387'	0.000	0.001	0.001	0.001	0.001	0.2	No
R3	380'	0.000	0.001	0.001	0.002	0.002	0.2	No
R4	481'	0.000	0.000	0.001	0.001	0.001	0.2	No
R5	353'	0.000	0.001	0.001	0.002	0.002	0.2	No

[1] Receiver locations are shown on Exhibit 10-A.
[2] Distance from receiver location to Project construction boundary.
[3] Based on the Vibration Source Levels of Construction Equipment (Table 10-4).
[4] Based on guidance from the City of Jurupa Valley Planning Department.
[5] Does the peak vibration exceed the acceptable vibration thresholds?
"PPV" = Peak Particle Velocity

11 REFERENCES

1. **State of California.** *California Environmental Quality Act, Appendix G.* 2018.
2. **California Department of Transportation Environmental Program.** *Technical Noise Supplement - A Technical Supplement to the Traffic Noise Analysis Protocol.* Sacramento, CA : s.n., September 2013.
3. **Environmental Protection Agency Office of Noise Abatement and Control.** *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.* March 1974. EPA/ONAC 550/9/74-004.
4. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning, Noise and Air Quality Branch.** *Highway Traffic Noise Analysis and Abatement Policy and Guidance.* December 2011.
5. **U.S. Department of Transportation, Federal Highway Administration.** *Highway Traffic Noise in the United States, Problem and Response.* April 2000. p. 3.
6. **U.S. Environmental Protection Agency Office of Noise Abatement and Control.** *Noise Effects Handbook-A Desk Reference to Health and Welfare Effects of Noise.* October 1979 (revised July 1981). EPA 550/9/82/106.
7. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment Manual.* September 2018.
8. **Office of Planning and Research.** *State of California General Plan Guidelines.* October 2017.
9. **City of Jurupa Valley.** *General Plan Noise Element.* September 2017.
10. —. *Municipal Code, Chapter 11.05 - Noise Regulations.*
11. —. *MA 21046 1st Review CEQA Comments.* February 22, 2021.
12. **City of Jurupa Valley Planning Department.** *Noise Thresholds of Significance Guidance (MA16170, Project: Agua Mansa Commerce Park Specific Plan, Noise Comment 2).* December 19, 2018.
13. **American National Standards Institute (ANSI).** *Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.*
14. **U.S. Department of Transportation, Federal Highway Administration.** *FHWA Highway Traffic Noise Prediction Model.* December 1978. FHWA-RD-77-108.
15. **California Department of Transportation Environmental Program, Office of Environmental Engineering.** *Use of California Vehicle Noise Reference Energy Mean Emission Levels (Calveno REMELs) in FHWA Highway Traffic Noise Prediction.* September 1995. TAN 95-03.
16. **California Department of Transportation.** *Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report.* June 1995. FHWA/CA/TL-95/23.
17. **County of Riverside, Office of Industrial Hygiene.** *Requirements for Determining and Mitigating Traffic Noise Impacts to Residential Structures.* April 2015.
18. **Albert A. Webb Associates.** *Vernola Marketplace Apartment Community Traffic Impact Analysis.* September 2021.
19. **Department of Environment, Food and Rural Affiars (Defra).** *Update of Noise Database for Prediction of Noise on Construction and Open Sites.* 2004.
20. **FHWA.** *Roadway Construction Noise Model.* January 2006.

12 CERTIFICATIONS

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Vernola Marketplace Apartment Community Project. The information contained in this noise study report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 584-3148.

Bill Lawson, P.E., INCE
Principal
URBAN CROSSROADS, INC.
1133 Camelback #8329
Newport Beach, CA 92658
(949) 581-3148
blawson@urbanxroads.com

EDUCATION

Master of Science in Civil and Environmental Engineering
California Polytechnic State University, San Luis Obispo • December, 1993

Bachelor of Science in City and Regional Planning
California Polytechnic State University, San Luis Obispo • June, 1992

PROFESSIONAL REGISTRATIONS

PE – Registered Professional Traffic Engineer – TR 2537 • January, 2009
AICP – American Institute of Certified Planners – 013011 • June, 1997–January 1, 2012
PTP – Professional Transportation Planner • May, 2007 – May, 2013
INCE – Institute of Noise Control Engineering • March, 2004

PROFESSIONAL AFFILIATIONS

ASA – Acoustical Society of America
ITE – Institute of Transportation Engineers

PROFESSIONAL CERTIFICATIONS

Certified Acoustical Consultant – County of San Diego • March, 2018
Certified Acoustical Consultant – County of Orange • February, 2011
FHWA-NHI-142051 Highway Traffic Noise Certificate of Training • February, 2013

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APPENDIX 1.1:

CITY OF JURUPA VALLEY CEQA REVIEW COMMENTS

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City of Jurupa Valley

MEMORANDUM

TO: Andrea Hoff, Associate Planner

FROM: Ernest Perea, CEQA Administrator

SUBJECT: MA 21046 1st Review CEQA Comments

DATE: February 22, 2021

PROJECT DESCRIPTION

Pre-application review of proposal to construct 200 apartments with clubhouse, pool, and spa. The Project Includes a General Plan amendment, specific plan amendment, and a zone change from industrial to a residential land use designation.

PROJECT LOCATION

North of 68th Street, South of Limonite Ave, East of I-15, West of Pats Ranch Road.

CEQA ENVIRONMENTAL ASSESSMENT

The preparation of an Initial Study is required and will be prepared by City staff. No presumptions regarding the appropriate CEQA determination for the proposed Project can be made until the Initial Study is completed. However, given the Project characteristics, a Mitigated Negative Declaration may be the likely outcome.

COMMENTS FOR CITY STAFF

1. Assembly Bill (AB) 52 Native American Tribal Cultural Resources

Assembly Bill (AB) 52 created a process for consultation with California Native American Tribes in the CEQA process. Tribal Governments can request consultation with the City and give input into potential impacts to tribal cultural resources before the City circulates a CEQA document for public review.

The Planning Department will notify the following California Native American Tribes per the requirements of AB52:

- □ Gabrieleño Band of Mission Indians – Kizh` Nation.
- □ Soboba Band Luiseño Indians.
- □ San Manuel Band of Mission Indians.

- ☐ Torres Martinez Band of Cahuilla Indians.

Upon receipt of the notice, Tribes have 30-days to notify the City if they want to consult with the City.

2. Senate Bill (SB) 18 Traditional Tribal Cultural Places

Because the Project involves a General Plan and specific plan amendment it is also subject to the requirements of SB18, which is a separate process that the AB52 process described above. SB18 also created a process for consultation with California Native American Tribes in the CEQA process.

The Planning Department is required to notify the Native American Heritage Commission (NAHC) of the Project who will then provide the City with a list of the appropriate Tribes that have cultural places located on land within City that is affected by the proposed plan adoption or amendment. Tribes have 90 days from the date on which they receive notification to request consultation unless a shorter timeframe has been agreed to by the Tribe.

3. Engineering Technical Reports

Please provide digital copies of the following reports:

- ☐ Preliminary Geotechnical Report.
- ☐ Project Specific Preliminary Water Quality Management Plan.
- ☐ Preliminary Hydrology/Drainage Report.

4. Inter-Agency Project Review Comments

Please provide a copy of the 1st Review Inter-Agency Project Review Comments when available.

5. CEQA Schedule

The Initial Study cannot be completed until:

- ☐ All technical studies listed above are submitted and determined to be adequate for CEQA purposes.
- ☐ The Native American Tribal Consultation required by AB52 is concluded.

COMMENTS FOR APPLICANT

6. Air Quality and Greenhouse Gas Emissions

An Air Quality and Greenhouse Gas Emissions Analysis is required using the CalEEMod computer program which is a statewide land use emissions computer model designed to provide a uniform platform to quantify potential criteria pollutant and greenhouse gas (GHG) emissions associated with both construction and operations from a variety of land use projects.

In addition, although case law has held that CEQA requires an analysis of the project's impact on the environment, rather than the environment's impact on the project, vehicle emissions from the adjacent I-15 freeway on future residents are a concern. As such, a Mobile Source Air Toxic and Criteria Pollutant Health Risk Assessment (HRA) is required for the Planning Department to determine consistency with applicable General Plan policies intended to ensure that sensitive receptors are protected from unhealthful levels of air pollution, separate from the analysis contained in the Initial Study. The assessment and dispersion modeling methodologies used in the preparation of the HRA shall include all relevant and appropriate procedures presented by the U.S. Environmental Protection Agency, California Environmental Protection Agency and South Coast Air Quality Management District (SCAQMD).

7. Biological Resources

A report titled, *Biological Technical Report for Vernola Market Place Apartments,* Glenn Lukos, September 12, 2014 was previously submitted. Because the City only accepts biological reports less than one year old, a letter report update is required.

8. Cultural Resources

A report titled, *Cultural Resources Assessment, The 8.34-Acre Phase B Vernola Marketplace Apartments,* LSA, *August 2014* was previously submitted and is acceptable for CEQA purposes.

9. Energy

CEQA requires that a project's energy use be analyzed to address the following impacts:

- *Potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?*
- *Conflict with or obstruct a state or local plan for renewable energy or energy efficiency*.

The analysis must provide quantitative data for the following:

- Estimated Construction Electricity Usage.
- Estimated Construction Fuel Consumption.
- Estimated Construction Worker Fuel Consumption.

- □ Estimated Construction Vendor Fuel Consumption.
- □ Estimated Construction Hauling Fuel Consumption.
- □ Estimated Annual Operational Automobile Fuel Consumption.
- □ Estimated Annual Natural Gas and Electricity Consumption.
- □ A discussion why the project will/will not result in wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation.

10. Geology and Soils (Paleontological Resources)

A report titled, *Vernola Marketplace Apartments, Paleontological Resources Assessment-Adjacent Property*, LSA, August 2014 was previously submitted and is acceptable for CEQA purposes only.

11. Hazards and Hazardous Materials

A report titled, *Vernola Marketplace Apartments, Phase I Environmental Site Assessment*, PIC Environmental, August 12, 2014 was previously submitted. Please submit a letter or technical memorandum verifying that no new Recognized Environmental Conditions have occurred on the property since August 2014. (*Note: This does not supersede submittal of an updated Phase I ESA if required by the County of Riverside, Department of Environmental Health as part of their separate review comments for this Project*).

12. Noise

A Noise Impact Analysis is required to address the following impacts:

- □ 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.
- □ Generation of excessive groundborne vibration or groundborne noise levels

The analysis only needs to focus on the noise the project generates and not the exposure of noise on the project. Please note that Chapter 11.05.010. – Intent states that "*...This chapter is not intended to establish thresholds of significance for the purpose of any analysis required by the California Environmental Quality Act (Pub. Resources Code Section 21000 et seq.) and no such thresholds are established.*"

The report shall use the following thresholds of significance:

Construction:

A project may have a significant impact if:

- □ The project is inconsistent with General Plan Policy NE 3.5: Construction Noise. Limit commercial construction activities adjacent to or within 200 feet of residential uses to weekdays, between 7:00 a.m. and 6:00 p.m., and limit high-noise-generating construction activities (e.g., grading, demolition, pile driving) near sensitive receptors to weekdays between 9:00 a.m. and 3:00 p.m.; and

- □ Construction noise levels exceed the levels identified in the latest version of the Federal Transit Administration Transit Noise and Vibration Impact Assessment Manual.

Operational Noise (Stationary):

A project may have a significant impact if it:

- □ The project is inconsistent with General Plan Policy NE 1.3 New or Modified Stationary Noise Sources. Noise created by new stationary noise sources, or by existing stationary noise sources that undergo modifications that may increase noise levels, shall be mitigated so as not exceed the noise level standards of General Plan Figure 7-3. This policy does not apply to noise levels associated with agricultural operations existing in 2017. If the existing ambient noise levels in the project vicinity (as described in a noise study approved by the City), exceed the noise levels in General Plan Figure 7-3, the impact is significant and requires mitigation,

Operational Noise (Transportation)

- □ A project may have a significant impact if traffic generated by the project would result in a noticeable increase in roadway noise in areas where exterior noise is already in excess of City standards. A noticeable increase in roadway noise would occur in traffic noise increased by 3 dBA or more.

Groundborne Vibration or Groundborne Noise

A project may have a significant impact if it:

- □ Creates construction or operational vibration in excess of 0.20 PPV inch/second adjacent to or within one-quarter mile of sensitive receptors.

13. Transportation

For purposes of SB 743 compliance, the Project shall be screened by the Engineering Department to determine if a full Vehicle Miles Traveled (VMT) analysis is required. Please refer to the *City of Jurupa Valley Traffic Impact Analysis Guidelines,* August 2020 available at:

https://www.jurupavalley.org/DocumentCenter/View/1611/City-of-Jurupa-Valley-TIA-Preparation-Guidelines-2020-PDF.

14. Additional Studies

At this time it does not appear that any other additional information is required than what is listed above. However, during the preparation of the Initial Study, the City may require the applicant to submit additional information needed for environmental evaluation of the Project. Requiring such additional information after the application is complete does not change the status of the application.

QUESTIONS

Please direct any questions on these comments to Ernest Perea, CEQA Administrator, at (951) 729-5383 or eperea@jurupavalley.org.

Thank-you.

END OF COMMENTS

APPENDIX 3.1:

CITY OF JURUPA VALLEY DEVELOPMENT CODE

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CHAPTER 11.05. - NOISE REGULATIONS

Sec. 11.05.010. - Intent.

At certain levels, sound becomes noise and may jeopardize the health, safety or general welfare of City of Jurupa Valley residents and degrade their quality of life. Pursuant to its police power, the City Council declares that noise shall be regulated in the manner described in this chapter. This chapter is intended to establish city-wide standards regulating noise. This chapter is not intended to establish thresholds of significance for the purpose of any analysis required by the California Environmental Quality Act (Pub. Resources Code Section 21000 *et seq.*) and no such thresholds are established.

(Ord. No. 2012-01, § 1(11.10.010), 2-16-2012)

Sec. 11.05.020. - Exemptions.

Sound emanating from the following sources is exempt from the provisions of this chapter:

(1) Facilities owned or operated by or for a governmental agency;

(2) Capital improvement projects of a governmental agency;

(3) The maintenance or repair of public properties;

(4) Public safety personnel in the course of executing their official duties, including, but not limited to, sworn peace officers, emergency personnel and public utility personnel. This exemption includes, without limitation, sound emanating from all equipment used by such personnel, whether stationary or mobile;

(5) Public or private schools and school-sponsored activities;

(6) Agricultural operations on land designated "agriculture" in the Jurupa Valley General Plan, or land zoned A-1 (light agriculture), A-P (light agriculture with poultry), A-2 (heavy agriculture), or A-D (agriculture-dairy), provided such operations are carried out in a manner consistent with accepted industry standards. This exemption includes, without limitation, sound emanating from all equipment used during such operations, whether stationary or mobile;

(7) Wind energy conversion systems (WECS), provided such systems comply with the WECS noise provisions of Jurupa Valley Municipal Code or Title 9;

(8) Private construction projects located one-quarter (¼) of a mile or more from an inhabited dwelling;

(9) Private construction projects located within one-quarter (¼) of a mile from an inhabited dwelling, provided that:

(a) Construction does not occur between the hours of six (6:00) p.m. and six (6:00) a.m. during the months of June through September; and

(b) Construction does not occur between the hours of six (6:00) p.m. and seven (7:00) a.m. during the months of October through May;

(10) Property maintenance, including, but not limited to, the operation of lawnmowers, leaf blowers, etc., provided such maintenance occurs between the hours of seven (7:00) a.m. and eight (8:00) p.m.;

(11) Motor vehicles, other than off-highway vehicles. This exemption does not include sound emanating from motor vehicle sound systems;

(12) Heating and air conditioning equipment;

(13) Safety, warning and alarm devices, including, but not limited to, house and car alarms, and other warning devices that are designed to protect the public health, safety, and welfare; or

(14) The discharge of firearms consistent with all state laws.

(Ord. No. 2012-01, § 1(11.10.020), 2-16-2012)

Sec. 11.05.030. - Definitions.

The following words, terms and phrases, when used in this chapter, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

Audio equipment means a television, stereo, radio, tape player, compact disc player, mp3 player, iPod or other similar device.

Decibel (dB) means a unit for measuring the relative amplitude of a sound equal approximately to the smallest difference normally detectable by the human ear, the range of which includes approximately one hundred and thirty (130) decibels on a scale beginning with zero decibels for the faintest detectable sound. Decibels are measured with a sound level meter using different methodologies as defined below:

(1) "A-weighting (dBA)" means the standard A-weighted frequency response of a sound level meter, which de-emphasizes low and high frequencies of sound in a manner similar to the human ear for moderate sounds.

(2) "Maximum sound level (Lmax)" means the maximum sound level measured on a sound level meter.

Governmental agency means the United States, the State of California, Riverside County, City of Jurupa Valley, any city within Riverside County, any special district within Riverside County or any combination of these agencies.

Land use permit means a discretionary permit issued by Jurupa Valley pursuant to Jurupa Valley Municipal Code or Title 9.

Motor vehicle means a vehicle that is self-propelled.

Motor vehicle sound system means a stereo, radio, tape player, compact disc player, mp3 player, iPod or other similar device.

Noise means any loud, discordant or disagreeable sound.

Occupied property means property upon which is located a residence, business or industrial or manufacturing use.

Off-highway vehicle means a motor vehicle designed to travel over any terrain.

Public or private school means an institution conducting academic instruction at the preschool, elementary school, junior high school, high school, or college level.

Public property means property owned by a governmental agency or held open to the public, including, but not limited to, parks, streets, sidewalks, and alleys.

Sensitive receptor means a land use that is identified as sensitive to noise in the noise element of the Jurupa Valley General Plan, as applicable to the City of Jurupa Valley by Chapter 1.35, including, but not limited to, residences, schools, hospitals, churches, rest homes, cemeteries or public libraries.

Sound-amplifying equipment means a loudspeaker, microphone, megaphone or other similar device.

Sound level meter means an instrument meeting the standards of the American National Standards Institute for Type 1 or Type 2 sound level meters or an instrument that provides equivalent data.

(Ord. No. 2012-01, § 1(11.10.040), 2-16-2012)

Sec. 11.05.040. - General sound level standards.

No person shall create any sound, or allow the creation of any sound, on any property that causes the exterior sound level on any other occupied property to exceed the sound level standards set forth in Table 1 of this section or that violates the special sound source standards set forth in Section 11.05.060.

Table 1
Sound Level Standards (Db Lmax)

General Plan Foundation Component	*General Plan Land Use Designation*	*General Plan Land Use Designation Name*	*Density*	*Maximum Decibel Level*	
				7 a.m.—10 p.m.	*10 p.m.—7 a.m.*
Community Development	EDR	Estate density residential	2 AC	55	45
	VLDR	Very low density residential	1 AC	55	45
	LDR	Low density residential	1/2 AC	55	45
	MDR	Medium density residential	2—5	55	45
	MHDR	Medium high density residential	5—8	55	45
	HDR	High density residential	8—14	55	45
	VHDR	Very high density residential	14—20	55	45
	HTDR	Highest density residential	20+	55	45
	CR	Retail commercial		65	55
	CO	Office commercial		65	55
	CT	Tourist commercial		65	55
	CC	Community center		65	55
	I	Light industrial		75	55
	HI	Heavy industrial		75	75

	BP	Business park		65	45
	PF	Public facility		65	45
	SP	Specific plan—Residential		55	45
		Specific plan—Commercial		65	55
		Specific plan—Light Industrial		75	55
		Specific plan—Heavy Industrial		75	75
Rural Community	EDR	Estate density residential	2 AC	55	45
	VLDR	Very low density residential	AC	55	45
	LDR	Low density residential	1/2 AC	55	45
Rural	RR	Rural residential	5 AC	45	45
	RM	Rural mountainous	10 AC	45	45
	RD	Rural desert	0 AC	45	45
Agriculture	AG	Agriculture	10 AC	45	45
Open Space	C	Conservation		45	45
	CH	Conservation habitat		45	45
	REC	Recreation		45	45
	RUR	Rural	20 AC	45	45
	W	Watershed		45	45
	MR	Mineral resources		75	45

(Ord. No. 2012-01, § 1(11.10.040), 2-16-2012)

Sec. 11.05.050. - Sound level measurement methodology.

If the sound standard being applied is measured in decibels, then sound level measurements pursuant to this section shall be required to establish a violation of this chapter. If the sound standard being applied is not measured in decibels, then sound level measurements are not required to establish a violation of this chapter. Sound level measurements may be made anywhere within the boundaries of an occupied property. The actual location of a sound level measurement shall be at the discretion of the Enforcement Officials identified in Section 11.05.080. Sound level measurements shall be made with a sound level meter. Immediately before a measurement is made, the sound level meter shall be calibrated utilizing an acoustical calibrator meeting the standards of the American National Standards Institute. Following a sound level measurement, the calibration of the sound level meter shall be re-verified. Sound level meters and calibration equipment shall be certified annually.

(Ord. No. 2012-01, § 1(11.10.050), 2-16-2012)

Sec. 11.05.060. - Special sound sources standards.

The general sound level standards set forth in Section 11.05.040 apply to sound emanating from all sources, including the following special sound sources, and the person creating, or allowing the creation of, the sound is subject to the requirements of that section. The following special sound sources are also subject to the following additional standards, the failure to comply with which constitute separate violations of this chapter:

(1) *Motor vehicles.*

(a) *Off-highway vehicles.*

(i) No person shall operate an off-highway vehicle unless it is equipped with a USDA-qualified spark arrester and a constantly operating and properly maintained muffler. A muffler is not considered constantly operating and properly maintained if it is equipped with a cutout, bypass or similar device.

(ii) No person shall operate an off-highway vehicle unless the noise emitted by the vehicle is not more than ninety-six (96) dBA if the vehicle was manufactured on or after January 1, 1986, or is not more than one hundred and one (101) dBA if the vehicle was manufactured before January 1, 1986. For purposes of this subsection, emitted noise shall be measured a distance of twenty (20) inches from the vehicle tailpipe using test procedures established by the Society of Automotive Engineers under Standard J-1287.

(b) *Sound systems.* No person shall operate a motor vehicle sound system, whether affixed to the vehicle or not, between the hours of ten (10:00) p.m. and eight (8:00) a.m., such that the sound system is audible to the human ear inside any inhabited dwelling. No person shall operate a motor vehicle sound system, whether affixed to the vehicle or not, at any other time such that the sound system is audible to the human ear at a distance greater than one hundred (100) feet from the vehicle. Sound level measurements may be used, but are not required to establish a violation of this subsection.

(2) *Power tools and equipment.* No person shall operate any power tools or equipment between the hours of ten (10:00) p.m. and eight (8:00) a.m. such that the power tools or equipment are audible to the human ear inside an inhabited dwelling other than a dwelling in which the power tools or equipment may be located. No person shall operate any power tools or equipment at any other time such that the power tools or equipment are audible to the human ear at a

distance greater than one hundred (100) feet from the power tools or equipment. Sound level measurements may be used, but are not required to establish a violation of this subsection.

(3) *Audio equipment.* No person shall operate any audio equipment, whether portable or not, such that the equipment is audible to the human ear at a distance greater than one hundred (100) feet from the equipment. Sound level measurements may be used, but are not required to establish a violation of this subsection.

(4) *Sound-amplifying equipment and live music.* No person shall install, use or operate sound-amplifying equipment, or perform, or allow to be performed, live music if the sound emanating from sound-amplifying equipment or live music is audible to the human ear at a distance greater than one hundred (100) feet from the equipment or music. To the extent that these requirements conflict with any conditions of approval attached to an underlying land use permit, these requirements shall control. Sound level measurements may be used, but are not required to establish a violation of this subsection.

(Ord. No. 2012-01, § 1(11.10.060), 2-16-2012; Ord. No. 2015-08, § 1, 6-18-2015)

Sec. 11.05.070. - Exceptions.

Exceptions may be requested from the standards set forth in Section 11.10.040 or 11.10.060 of this chapter and may be characterized as construction-related or continuous-events exceptions.

(1) *Application and processing.*

(a) *Construction-related exceptions.* An application for a construction-related exception shall be made to and considered by the Building Official of the city on forms provided by the Building and Safety Division and shall be accompanied by the appropriate filing fee. No public hearing is required.

(b) *Continuous events exceptions.* An application for a continuous events exception shall be made to the Planning Director on forms provided by the Planning Department and shall be accompanied by the appropriate filing fee. Upon receipt of an application for a continuous events exception, the Planning Director shall set the matter for public hearing before the Planning Commission, notice of which shall be given as provided in Section 9.240.250 of this Code. Notwithstanding the above, an application for a continuous events exception that is associated with an application for a land use permit shall be processed concurrently with the land use permit in the same manner that the land use permit is required to be processed.

(2) *Requirements for approval.* The appropriate decision-making body or officer shall not approve an exception application unless the applicant demonstrates that the activities described in the application would not be detrimental to the health, safety or general welfare of the community. In determining whether activities are detrimental to the health, safety or general welfare of the community, the appropriate decision-making body or officer shall consider such factors as the proposed duration of the activities and their location in relation to sensitive receptors. If an exception application is approved, reasonable conditions may be imposed to minimize the public detriment, including, but not limited to, restrictions on sound level, sound duration and operating hours.

(3) *Appeals.* The Building Official's decision on an application for a construction-relation exception is considered final. After making a decision on an application for a continuous-events exception, the appropriate decision-making body or officer shall mail notice of the decision to the applicant. Within ten (10) calendar days after the mailing of such notice, the applicant or interested person may appeal the decision pursuant to and in accordance with the provisions of Chapter 2.40 of this Code.

(Ord. No. 2012-01, § 1(11.10.070), 2-16-2012; Ord. No. 2015-08, § 2, 6-18-2015; Ord. No. 2016-04, § 11(11.10.070), 4-7-2016)

Sec. 11.05.080. - Violations and penalties.

A. Violation of the provisions of this chapter may be enforced pursuant to the enforcement provisions set forth in Title 1 of this Code, including Chapter 1.10, Code Enforcement Generally, Chapter 1.15, Criminal Prosecution, Chapter 1.20, Administrative Penalties, or Chapter 1.25, Public Nuisance Injunctions.

B. The fine schedule for a violation of this chapter enforced pursuant to Chapter 1.20, shall be in the amount of:

(1) Two hundred dollars ($200) for the first violation occurring within a three hundred and sixty-six (366) day period;

(2) Five hundred dollars ($500) for a second violation occurring within three hundred and sixty-six (366) days of the first violation;

(3) Seven hundred and fifty dollars ($750) for a third violation occurring within three hundred and sixty-six (366) days of the first violation; or

(4) One thousand dollars ($1,000) for a fourth violation and each subsequent violation occurring within three hundred and sixty-six (366) days of the first violation.

C. The fines set forth in subsection (B) of this section may be modified by a resolution of the City Council establishing an administrative citation schedule not to exceed one thousand dollars ($1,000) per violation and which may include increased fines for repeat violations and penalties.

D. The City Manager or his designee may reduce the fines set forth in subsections (B) or (C) of this section in the event he or she finds that the violation is not likely to reoccur, the violator cooperated with Enforcement Officials in attempting to enforce the provisions of this chapter and resolve the issues giving rise to the violation, the actions of the violator giving rise to the violation were not malicious and were not taken in deliberate disregard of the provisions of this chapter, and the ends of justice would not be served by imposing the full fine.

(Ord. No. 2012-01, § 1(11.10.080), 2-16-2012)

Sec. 11.05.090. - Duty to cooperate.

No person shall refuse to cooperate with, or obstruct, the Enforcement Officials identified in Section 11.05.080 when they are engaged in the process of enforcing the provisions of this chapter. This duty to cooperate may require a person to extinguish a sound source so that it can be determined whether sound emanating from the source violates the provisions of this chapter.

(Ord. No. 2012-01, § 1(11.10.090), 2-16-2012)

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APPENDIX 4.1:

CITY OF JURUPA VALLEY CEQA THRESHOLDS

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Noise Impact Analysis October 30, 2018		Comment
		increase and, if appropriate, the project's contribution to a potentially significant cumulative traffic noise increase.
2	Global	Sec. 11.05.010 of the Municipal Code states in part: "*...This chapter is intended to establish city-wide standards regulating noise. This chapter is not intended to establish thresholds of significance for the purpose of any analysis required by the California Environmental Quality Act (Pub. Resources Code Section 21000 et seq.) and no such thresholds are established...*" **Please use the following standards for CEQA significance thresholds and revise report throughout:** • Construction Noise: For sensitive residential land uses nearby, the daytime and nighttime 8-hour standards are 80 dBA Leq and 70 dBA Leq, respectively (FTA Transit Noise and Vibration Impact Assessment). • Operational Noise (stationary): During operation of the Project, a significant noise-related impact would occur if Project operational noise at a noise-sensitive receptor exceeds: o 65 dBA Leq (10 minutes) between 7:00 a.m. and 10:00 p.m., or o 45 dBA Leq (10 min) between 10:00 p.m. and 7:00 a.m. • Operational Noise (traffic): Project-related traffic increases the noise level at a: o Residential land use by 3 dBA or more to 65 dBA CNEL or above; or o Commercial land use by 3 dBA or more to 70 dBA CNEL or above. • Vibration: A significant vibration-related impact would occur if the Project would expose a vibration-sensitive receptor to vibration levels that exceed 0.2 in/sec PPV during either long-term operation or construction of the Project *Note: The Municipal Code noise standards may be used for planning purposes only (i.e. to demonstrate that the project meets the City code requirements for site plan approval).*
3	Page 23	Construction exemptions for San Bernardino County are not discussed and are contained in Section 83.01.080(g) (3), i.e., 7 am – 7pm, except Sundays and federal holidays.
4	Page 24 and global	Policy NE 4.4 is intended for train operation but is being used to assess projects. Please convert this RMS level to VdB so that it can

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APPENDIX 5.1:

STUDY AREA PHOTOS

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JN:14172 Study Area Photos

L1-E
33, 58' 25.480000"117, 33' 9.600000"

L1-N
33, 58' 25.480000"117, 33' 9.600000"

L1-S
33, 58' 25.480000"117, 33' 9.600000"

L1-W
33, 58' 25.530000"117, 33' 9.240000"

L2-E
33, 58' 11.390000"117, 32' 45.100000"

L2-N
33, 58' 11.520000"117, 32' 45.260000"

JN:14172 Study Area Photos

L2-S
33, 58' 11.840000"117, 32' 45.370000"

L2-W
33, 58' 11.940000"117, 32' 45.620000"

L3-E
33, 58' 11.170000"117, 32' 45.730000"

L3-N
33, 58' 11.070000"117, 32' 45.730000"

L3-S
33, 58' 11.030000"117, 32' 45.760000"

L3-W
33, 58' 11.240000"117, 32' 45.760000"

JN:14172 Study Area Photos

L4-E
33, 58' 5.390000"117, 32' 45.290000"

L4-N
33, 58' 5.390000"117, 32' 45.290000"

L4-S
33, 58' 5.370000"117, 32' 45.290000"

L4-W
33, 58' 5.490000"117, 32' 45.290000"

L5-E
33, 57' 53.790000"117, 33' 4.650000"

L5-N
33, 57' 53.530000"117, 33' 4.190000"

JN:14172 Study Area Photos

L5-S
33, 57' 53.790000"117, 33' 4.650000"

L5-W
33, 57' 53.790000"117, 33' 4.650000"

APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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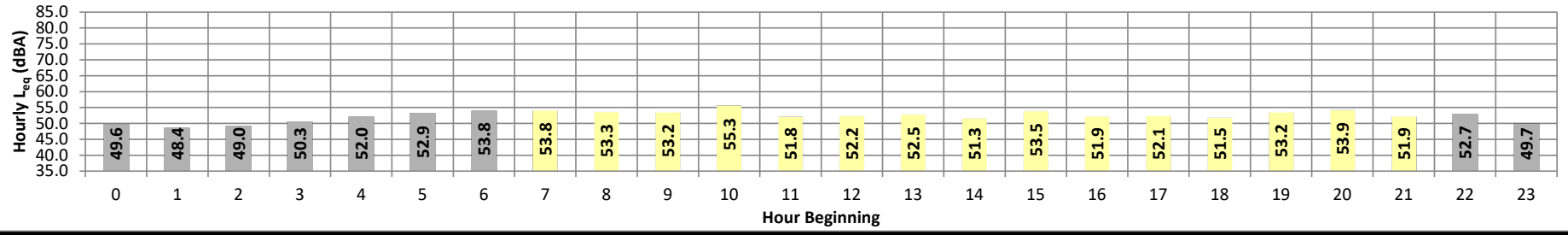
24-Hour Noise Level Measurement Summary

Date: Thursday, July 8, 2021 *Location:* L1- Located northwest of the Project Site near single-family *Meter:* Piccolo II *JN:* 14172

Project: Vernola Marketplace Apartment Community *Source:* residence at 12334 Constellation St. *Analyst:* A. Khan

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	49.6	53.9	47.9	53.6	53.1	52.0	51.2	49.8	49.2	48.3	48.2	48.0	49.6	10.0	59.6
	1	48.4	51.3	46.9	51.1	50.8	50.2	49.8	48.8	48.1	47.3	47.1	46.9	48.4	10.0	58.4
	2	49.0	53.8	46.7	53.5	53.1	52.0	51.3	49.5	48.2	47.2	47.0	46.8	49.0	10.0	59.0
	3	50.3	55.2	48.0	54.9	54.6	53.4	52.7	50.5	49.5	48.5	48.3	48.1	50.3	10.0	60.3
	4	52.0	58.4	49.5	57.7	57.0	56.1	55.3	51.8	50.8	49.9	49.7	49.5	52.0	10.0	62.0
	5	52.9	57.4	50.7	57.0	56.6	55.7	55.0	53.2	52.2	51.2	51.0	50.8	52.9	10.0	62.9
	6	53.8	59.0	51.0	58.7	58.3	57.3	56.5	54.2	52.8	51.6	51.4	51.1	53.8	10.0	63.8
Day	7	53.8	58.9	50.7	58.6	58.3	57.3	56.6	54.4	52.8	51.3	51.0	50.8	53.8	0.0	53.8
	8	53.3	60.0	50.3	59.7	59.0	57.2	56.1	53.3	52.2	50.8	50.6	50.4	53.3	0.0	53.3
	9	53.2	61.6	49.0	61.4	61.0	58.5	56.3	52.9	51.1	49.6	49.4	49.1	53.2	0.0	53.2
	10	55.3	67.3	47.7	66.8	65.7	61.6	58.6	53.8	50.8	48.4	48.1	47.9	55.3	0.0	55.3
	11	51.8	59.0	47.6	58.7	58.3	57.2	55.5	51.9	50.0	48.2	48.0	47.7	51.8	0.0	51.8
	12	52.2	60.4	47.9	60.1	59.7	58.6	56.2	51.4	50.0	48.4	48.2	48.0	52.2	0.0	52.2
	13	52.5	61.1	47.6	60.6	59.8	57.9	56.8	52.0	50.1	48.2	47.9	47.7	52.5	0.0	52.5
	14	51.3	56.1	48.9	55.8	55.4	54.4	53.5	51.7	50.6	49.4	49.3	49.0	51.3	0.0	51.3
	15	53.5	60.6	50.0	59.7	59.0	57.5	56.4	53.9	52.4	50.6	50.3	50.1	53.5	0.0	53.5
	16	51.9	57.9	49.2	57.5	57.1	55.6	54.4	52.1	50.8	49.7	49.4	49.2	51.9	0.0	51.9
	17	52.1	56.8	49.3	56.4	56.1	55.3	54.7	52.7	51.2	49.9	49.7	49.4	52.1	0.0	52.1
	18	51.5	57.2	48.7	56.7	56.2	54.5	53.5	51.8	50.7	49.4	49.1	48.8	51.5	0.0	51.5
	19	53.2	60.7	49.9	60.1	59.4	57.3	56.3	53.3	51.8	50.5	50.3	50.0	53.2	5.0	58.2
	20	53.9	61.3	50.7	60.9	60.2	58.0	56.5	53.9	52.5	51.2	51.0	50.8	53.9	5.0	58.9
	21	51.9	56.7	50.1	56.4	55.8	54.4	53.6	52.2	51.3	50.4	50.3	50.1	51.9	5.0	56.9
Night	22	52.7	61.4	49.0	61.0	60.1	57.6	55.7	52.4	50.7	49.5	49.3	49.1	52.7	10.0	62.7
	23	49.7	54.5	47.6	54.1	53.7	52.5	51.9	50.0	49.0	48.1	47.9	47.7	49.7	10.0	59.7

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	51.3	56.1	47.6	55.8	55.4	54.4	53.5	51.4	50.0	48.2	47.9	47.7
	Max	55.3	67.3	50.7	66.8	65.7	61.6	58.6	54.4	52.8	51.3	51.0	50.8
Energy Average		52.9	Average:		59.3	58.7	57.0	55.7	52.8	51.2	49.7	49.5	49.3
Night	Min	48.4	51.3	46.7	51.1	50.8	50.2	49.8	48.8	48.1	47.2	47.0	46.8
	Max	53.8	61.4	51.0	61.0	60.1	57.6	56.5	54.2	52.8	51.6	51.4	51.1
Energy Average		51.3	Average:		55.7	55.2	54.1	53.3	51.1	50.1	49.1	48.9	48.7

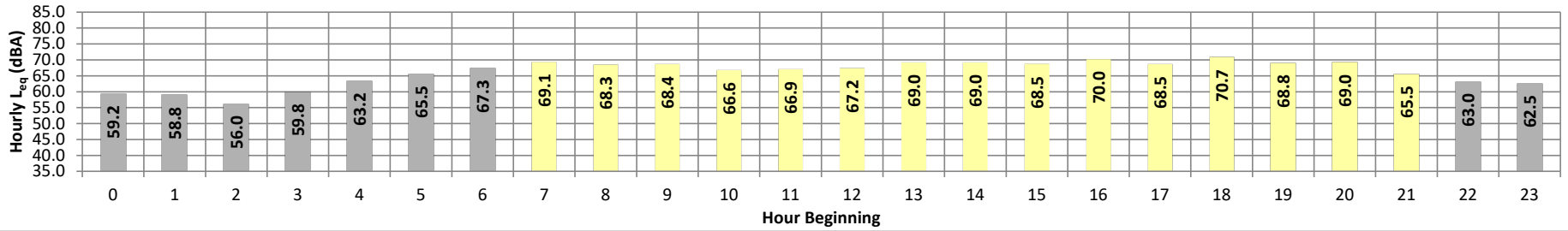
L_{eq} (dBA)		
24-Hour	*Daytime (7am-10pm)*	*Nighttime (10pm-7am)*
52.4	**52.9**	**51.3**

24-Hour Noise Level Measurement Summary

Date: Thursday, July 8, 2021 | *Location:* L2- Located east of the Project Site on Pats Ranch Road near | *Meter:* Piccolo II | *JN:* 14172

Project: Vernola Marketplace Apartment Community | *Source:* single-family residence at 6491 Tigers Eye Ct. | *Analyst:* A. Khan

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	59.2	70.9	49.1	70.5	69.7	66.7	63.9	55.9	52.7	50.0	49.7	49.2	59.2	10.0	69.2
	1	58.8	70.4	50.0	70.0	69.1	66.1	63.7	55.9	52.9	50.9	50.5	50.1	58.8	10.0	68.8
	2	56.0	66.8	48.6	66.4	65.6	62.8	60.5	54.3	51.7	49.5	49.1	48.7	56.0	10.0	66.0
	3	59.8	71.1	51.8	70.7	69.7	66.9	64.4	57.7	54.7	52.5	52.2	51.9	59.8	10.0	69.8
	4	63.2	74.7	54.9	74.3	73.4	70.4	68.0	60.4	57.7	55.6	55.3	55.0	63.2	10.0	73.2
	5	65.5	76.8	56.0	76.4	75.3	72.8	70.6	63.8	59.7	56.8	56.4	56.1	65.5	10.0	75.5
	6	67.3	77.4	56.8	76.9	76.1	73.9	72.3	67.2	62.5	57.8	57.3	56.9	67.3	10.0	77.3
Day	7	69.1	79.8	55.7	79.2	78.2	75.6	74.0	68.9	64.3	57.6	56.5	55.8	69.1	0.0	69.1
	8	68.3	79.5	55.0	79.1	78.2	75.2	73.1	67.5	62.3	56.6	55.8	55.2	68.3	0.0	68.3
	9	68.4	80.9	54.0	80.3	79.4	75.6	73.0	66.1	61.2	55.3	54.7	54.1	68.4	0.0	68.4
	10	66.6	77.1	55.8	76.4	75.5	73.0	71.4	66.5	62.1	57.5	56.6	56.0	66.6	0.0	66.6
	11	66.9	77.9	56.9	77.4	76.5	73.5	71.5	65.9	61.9	58.0	57.6	57.0	66.9	0.0	66.9
	12	67.2	77.6	58.9	77.0	76.3	73.8	71.7	66.7	63.3	60.0	59.5	59.0	67.2	0.0	67.2
	13	69.0	80.7	60.0	79.8	79.0	75.7	73.2	67.7	64.0	60.9	60.5	60.1	69.0	0.0	69.0
	14	69.0	79.8	59.4	79.3	78.5	75.9	73.8	67.8	63.9	60.6	60.0	59.5	69.0	0.0	69.0
	15	68.5	78.6	59.8	78.2	77.3	74.9	73.2	68.4	64.7	60.9	60.4	60.0	68.5	0.0	68.5
	16	70.0	82.4	59.5	82.1	81.0	76.6	73.3	67.9	64.5	60.6	60.1	59.6	70.0	0.0	70.0
	17	68.5	77.7	60.9	77.3	76.6	74.6	73.0	68.5	65.2	61.7	61.3	61.0	68.5	0.0	68.5
	18	70.7	82.5	60.3	81.7	80.8	77.6	75.3	69.0	64.8	61.4	60.9	60.4	70.7	0.0	70.7
	19	68.8	79.7	59.3	79.1	78.6	75.5	73.0	67.9	64.4	60.4	59.9	59.4	68.8	5.0	73.8
	20	69.0	81.0	57.1	80.4	79.6	76.4	73.9	66.9	62.8	58.3	57.7	57.2	69.0	5.0	74.0
	21	65.5	76.0	54.5	75.6	74.9	72.5	70.6	64.9	60.4	55.7	55.1	54.6	65.5	5.0	70.5
Night	22	63.0	73.5	52.5	72.9	72.1	70.0	68.4	62.3	57.8	53.5	53.1	52.6	63.0	10.0	73.0
	23	62.5	74.5	51.6	74.0	73.0	69.7	67.5	60.2	55.8	52.5	52.1	51.7	62.5	10.0	72.5

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	65.5	76.0	54.0	75.6	74.9	72.5	70.6	64.9	60.4	55.3	54.7	54.1
	Max	70.7	82.5	60.9	82.1	81.0	77.6	75.3	69.0	65.2	61.7	61.3	61.0
Energy Average		68.6	Average:		78.9	78.0	75.1	72.9	67.4	63.3	59.0	58.4	57.9
Night	Min	56.0	66.8	48.6	66.4	65.6	62.8	60.5	54.3	51.7	49.5	49.1	48.7
	Max	67.3	77.4	56.8	76.9	76.1	73.9	72.3	67.2	62.5	57.8	57.3	56.9
Energy Average		62.9	Average:		72.5	71.6	68.8	66.6	59.7	56.2	53.2	52.8	52.5

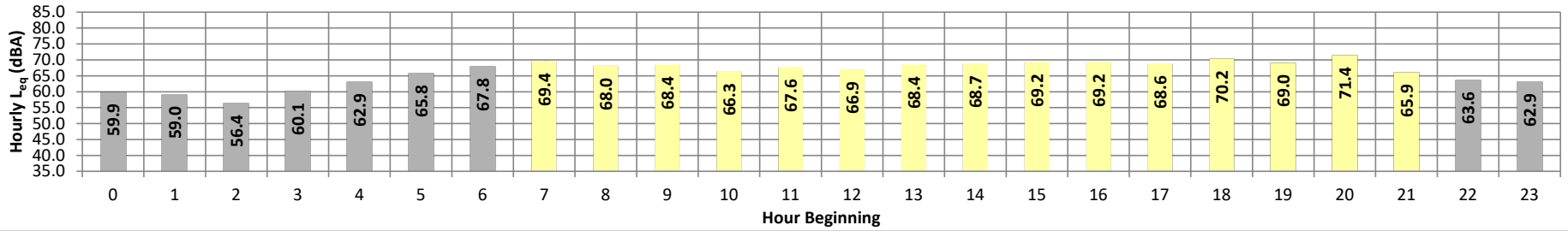
	L_{eq} (dBA)		
24-Hour	Daytime (7am-10pm)	Nighttime (10pm-7am)
67.2	**68.6**	**62.9**

24-Hour Noise Level Measurement Summary

Date: Thursday, July 8, 2021 *Location:* L3- Located east of the Project Site on Pats Ranch Road near *Meter:* Piccolo II *JN:* 14172

Project: Vernola Marketplace Apartment Community *Source:* single-family residence at 12013 65th St. *Analyst:* A. Khan

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	59.9	71.8	49.4	71.4	70.6	67.6	64.6	56.7	52.9	50.2	49.8	49.5	59.9	10.0	69.9
	1	59.0	70.1	50.2	69.6	69.0	66.3	64.1	57.0	53.1	51.0	50.7	50.3	59.0	10.0	69.0
	2	56.4	67.1	49.0	66.7	66.2	63.7	61.2	54.1	52.0	49.7	49.4	49.1	56.4	10.0	66.4
	3	60.1	71.7	51.8	71.3	70.7	67.6	64.8	56.9	54.4	52.4	52.1	51.9	60.1	10.0	70.1
	4	62.9	74.0	54.6	73.5	72.8	70.2	68.2	60.1	57.1	55.2	55.0	54.7	62.9	10.0	72.9
	5	65.8	76.0	56.5	75.6	74.9	72.5	70.9	65.2	60.3	57.4	56.9	56.6	65.8	10.0	75.8
	6	67.8	77.9	57.1	77.2	76.6	74.5	72.8	67.9	63.4	58.2	57.6	57.2	67.8	10.0	77.8
Day	7	69.4	79.0	57.1	78.7	78.0	75.9	74.0	69.6	65.4	59.1	58.1	57.3	69.4	0.0	69.4
	8	68.0	78.0	56.1	77.7	76.9	74.6	73.1	67.9	63.1	57.7	57.0	56.3	68.0	0.0	68.0
	9	68.4	80.3	54.0	79.8	79.0	76.1	73.1	66.5	61.6	55.5	54.7	54.1	68.4	0.0	68.4
	10	66.3	75.4	56.0	75.0	74.4	72.4	71.0	66.7	62.5	57.6	56.9	56.1	66.3	0.0	66.3
	11	67.6	78.4	56.9	78.0	77.2	74.7	72.5	66.3	62.2	58.1	57.6	57.0	67.6	0.0	67.6
	12	66.9	76.3	59.4	75.8	75.1	73.1	71.4	66.9	63.7	60.4	59.9	59.5	66.9	0.0	66.9
	13	68.4	79.0	60.0	78.3	77.4	74.8	73.0	67.9	64.4	61.0	60.6	60.1	68.4	0.0	68.4
	14	68.7	78.9	59.9	78.5	77.9	75.6	73.6	67.7	64.4	61.1	60.6	60.0	68.7	0.0	68.7
	15	69.2	80.1	60.3	79.2	78.1	75.4	73.5	68.7	65.4	61.4	60.9	60.4	69.2	0.0	69.2
	16	69.2	80.1	60.3	79.6	78.4	75.4	73.3	68.7	65.4	61.5	61.0	60.4	69.2	0.0	69.2
	17	68.6	77.0	61.6	76.7	76.1	74.4	73.0	69.0	66.0	62.7	62.2	61.7	68.6	0.0	68.6
	18	70.2	80.4	61.0	79.9	79.4	77.2	75.3	69.2	65.5	62.0	61.6	61.1	70.2	0.0	70.2
	19	69.0	79.8	59.8	79.1	78.4	75.7	73.7	68.1	64.9	60.9	60.4	59.9	69.0	5.0	74.0
	20	71.4	84.2	58.0	83.4	82.5	78.6	76.3	68.2	63.6	59.3	58.7	58.1	71.4	5.0	76.4
	21	65.9	75.8	54.8	75.3	74.8	72.9	71.2	65.5	61.0	56.0	55.3	54.9	65.9	5.0	70.9
Night	22	63.6	74.1	52.6	73.7	72.9	70.6	68.6	63.0	58.4	53.7	53.2	52.7	63.6	10.0	73.6
	23	62.9	75.0	51.3	74.5	73.6	70.7	67.6	60.3	55.8	52.2	51.8	51.4	62.9	10.0	72.9

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	65.9	75.4	54.0	75.0	74.4	72.4	71.0	65.5	61.0	55.5	54.7	54.1
	Max	71.4	84.2	61.6	83.4	82.5	78.6	76.3	69.6	66.0	62.7	62.2	61.7
Energy Average		68.7	Average:		78.3	77.6	75.1	73.2	67.8	64.0	59.6	59.0	58.5
Night	Min	56.4	67.1	49.0	66.7	66.2	63.7	61.2	54.1	52.0	49.7	49.4	49.1
	Max	67.8	77.9	57.1	77.2	76.6	74.5	72.8	67.9	63.4	58.2	57.6	57.2
Energy Average		63.3	Average:		72.6	71.9	69.3	67.0	60.1	56.4	53.3	53.0	52.6

L_{eq} (dBA)		
24-Hour	*Daytime (7am-10pm)*	*Nighttime (10pm-7am)*
67.3	**68.7**	**63.3**

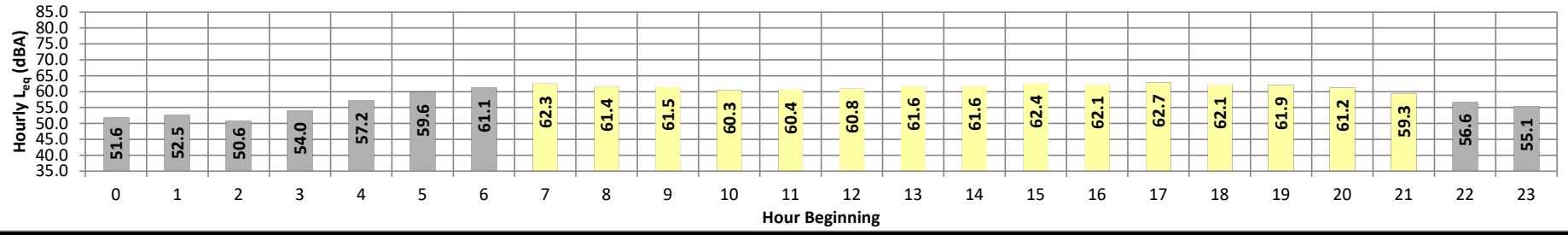
URBAN CROSSROADS

24-Hour Noise Level Measurement Summary

Date: Thursday, July 8, 2021 *Location:* L4- Located east of the Project Site on Pats Ranch Road near *Meter:* Piccolo II *JN:* 14172

Project: Vernola Marketplace Apartment Community *Source:* Limonite Meadows Park at 6596 Meander Way. *Analyst:* A. Khan

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	51.6	62.0	44.5	61.6	60.8	58.1	56.1	50.1	48.0	45.4	45.0	44.6	51.6	10.0	61.6
	1	52.5	63.3	45.6	63.0	62.4	59.5	56.8	50.5	48.5	46.5	46.1	45.7	52.5	10.0	62.5
	2	50.6	60.4	44.1	60.2	59.7	56.9	54.3	49.7	47.6	45.1	44.7	44.2	50.6	10.0	60.6
	3	54.0	65.4	46.6	64.8	64.0	60.9	58.3	51.6	49.5	47.4	47.1	46.7	54.0	10.0	64.0
	4	57.2	68.3	50.1	67.8	67.1	64.1	62.0	54.6	52.4	50.8	50.4	50.2	57.2	10.0	67.2
	5	59.6	69.3	52.9	69.0	68.4	66.1	64.3	59.1	55.5	53.6	53.3	53.0	59.6	10.0	69.6
	6	61.1	70.3	52.3	70.0	69.3	67.4	66.0	61.4	56.6	53.1	52.7	52.4	61.1	10.0	71.1
Day	7	62.3	71.3	52.8	70.8	70.1	68.1	66.7	63.1	59.1	54.1	53.4	52.9	62.3	0.0	62.3
	8	61.4	71.9	51.3	71.3	70.3	67.4	65.7	61.8	57.0	52.3	51.9	51.4	61.4	0.0	61.4
	9	61.5	73.1	50.9	72.8	71.8	68.3	65.8	60.0	55.6	51.8	51.3	51.0	61.5	0.0	61.5
	10	60.3	69.3	52.4	68.8	68.1	66.3	65.0	60.8	57.1	53.3	52.9	52.4	60.3	0.0	60.3
	11	60.4	69.0	53.8	68.6	67.8	65.8	64.6	60.9	57.6	54.8	54.3	53.9	60.4	0.0	60.4
	12	60.8	67.6	55.6	67.4	66.9	65.5	64.5	61.6	58.8	56.4	56.0	55.7	60.8	0.0	60.8
	13	61.6	70.1	56.5	69.6	68.7	66.3	64.9	61.8	59.6	57.4	57.0	56.6	61.6	0.0	61.6
	14	61.6	70.6	55.9	70.0	69.2	66.4	65.1	61.8	59.2	56.8	56.4	56.0	61.6	0.0	61.6
	15	62.4	70.0	56.5	69.6	68.9	67.3	66.1	63.1	60.5	57.5	57.1	56.6	62.4	0.0	62.4
	16	62.1	69.9	56.5	69.4	68.7	66.7	65.6	62.7	60.3	57.5	57.1	56.6	62.1	0.0	62.1
	17	62.7	69.7	58.0	69.4	68.8	67.1	66.1	63.2	61.2	58.9	58.6	58.1	62.7	0.0	62.7
	18	62.1	68.6	57.1	68.3	67.8	66.4	65.5	62.9	60.6	58.0	57.6	57.2	62.1	0.0	62.1
	19	61.9	71.0	55.6	70.8	70.1	67.3	65.3	62.0	59.2	56.5	56.2	55.7	61.9	5.0	66.9
	20	61.2	71.0	53.1	70.5	69.7	67.1	65.4	61.4	57.7	54.1	53.7	53.2	61.2	5.0	66.2
	21	59.3	69.5	49.9	69.1	68.4	66.0	64.2	58.8	54.8	50.9	50.5	50.0	59.3	5.0	64.3
Night	22	56.6	66.3	47.6	66.0	65.4	63.3	61.8	56.0	52.0	48.5	48.1	47.7	56.6	10.0	66.6
	23	55.1	66.3	46.6	65.8	64.9	61.8	59.5	53.9	50.3	47.5	47.1	46.7	55.1	10.0	65.1

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	59.3	67.6	49.9	67.4	66.9	65.5	64.2	58.8	54.8	50.9	50.5	50.0
	Max	62.7	73.1	58.0	72.8	71.8	68.3	66.7	63.2	61.2	58.9	58.6	58.1
Energy Average		61.5	Average:		69.8	69.0	66.8	65.4	61.7	58.6	55.3	54.9	54.5
Night	Min	50.6	60.4	44.1	60.2	59.7	56.9	54.3	49.7	47.6	45.1	44.7	44.2
	Max	61.1	70.3	52.9	70.0	69.3	67.4	66.0	61.4	56.6	53.6	53.3	53.0
Energy Average		56.7	Average:		65.4	64.7	62.0	59.9	54.1	51.1	48.6	48.3	47.9

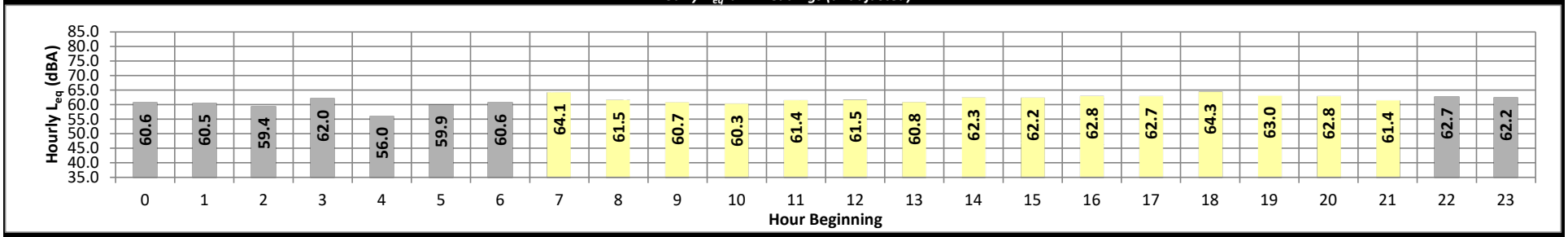
L_{eq} (dBA)		
24-Hour	Daytime (7am-10pm)	Nighttime (10pm-7am)
60.3	**61.5**	**56.7**

24-Hour Noise Level Measurement Summary

Date: Thursday, July 8, 2021 *Location:* L5- Located southwest of the Project Site near single-family *Meter:* Piccolo II *JN:* 14172

Project: Vernola Marketplace Apartment Community *Source:* residence at 6770 Leanne St. *Analyst:* A. Khan

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	60.6	64.8	58.8	64.6	64.3	63.2	62.5	60.7	60.0	59.2	59.1	58.9	60.6	10.0	70.6
	1	60.5	66.4	58.9	66.1	65.7	63.9	62.6	60.1	59.7	59.2	59.1	59.0	60.5	10.0	70.5
	2	59.4	67.1	56.9	66.8	66.5	64.2	62.4	58.4	58.0	57.4	57.3	57.0	59.4	10.0	69.4
	3	62.0	74.6	52.1	73.9	73.2	71.2	65.2	55.3	53.6	52.6	52.4	52.3	62.0	10.0	72.0
	4	56.0	65.8	49.7	65.5	65.0	63.1	60.9	54.5	51.7	50.2	50.0	49.8	56.0	10.0	66.0
	5	59.9	69.6	48.4	69.3	68.9	67.1	65.5	59.8	53.7	49.1	48.8	48.6	59.9	10.0	69.9
	6	60.6	68.6	51.3	68.4	68.0	66.5	65.3	61.5	57.2	52.1	51.7	51.4	60.6	10.0	70.6
Day	7	64.1	72.0	53.0	71.7	71.3	69.8	68.5	64.8	61.9	55.7	54.3	53.2	64.1	0.0	64.1
	8	61.5	69.6	50.9	69.2	68.7	67.3	66.2	62.3	58.8	52.7	51.8	51.1	61.5	0.0	61.5
	9	60.7	69.2	47.4	68.9	68.4	67.1	65.8	61.5	57.5	49.1	48.2	47.5	60.7	0.0	60.7
	10	60.3	68.4	47.5	68.1	67.6	66.1	64.7	61.4	57.6	49.6	48.7	47.7	60.3	0.0	60.3
	11	61.4	69.6	49.5	69.3	68.7	67.0	65.6	62.2	59.1	52.4	50.9	49.7	61.4	0.0	61.4
	12	61.5	69.5	50.7	69.2	68.7	67.1	65.7	62.4	59.3	52.9	52.0	51.0	61.5	0.0	61.5
	13	60.8	68.4	49.9	68.1	67.7	66.3	65.1	61.8	58.7	52.3	51.2	50.0	60.8	0.0	60.8
	14	62.3	71.1	50.6	70.9	70.6	68.5	66.4	62.4	60.0	53.8	52.1	50.8	62.3	0.0	62.3
	15	62.2	69.6	52.5	69.2	68.8	67.4	66.4	63.2	60.5	55.0	53.9	52.8	62.2	0.0	62.2
	16	62.8	71.0	51.9	70.4	69.8	68.1	66.8	63.5	61.0	54.7	53.3	52.1	62.8	0.0	62.8
	17	62.7	69.8	52.0	69.4	68.9	67.3	66.5	63.8	61.4	55.6	54.0	52.4	62.7	0.0	62.7
	18	64.3	74.2	51.4	73.4	72.7	70.7	69.3	64.1	61.3	54.2	52.7	51.6	64.3	0.0	64.3
	19	63.0	71.5	51.1	70.9	70.0	68.3	67.3	63.9	61.0	53.8	52.5	51.3	63.0	5.0	68.0
	20	62.8	71.7	50.0	71.2	70.6	68.6	67.1	63.3	60.4	53.1	51.6	50.3	62.8	5.0	67.8
	21	61.4	70.2	49.7	69.9	69.4	67.2	65.8	62.2	58.5	51.3	50.6	49.8	61.4	5.0	66.4
Night	22	62.7	71.0	57.5	70.6	70.2	68.2	66.5	62.9	60.3	58.0	57.9	57.6	62.7	10.0	72.7
	23	62.2	75.7	50.4	75.0	73.9	69.8	65.1	58.0	53.5	50.9	50.7	50.5	62.2	10.0	72.2

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	60.3	68.4	47.4	68.1	67.6	66.1	64.7	61.4	57.5	49.1	48.2	47.5
	Max	64.3	74.2	53.0	73.4	72.7	70.7	69.3	64.8	61.9	55.7	54.3	53.2
Energy Average		62.3	Average:		70.0	69.5	67.8	66.5	62.9	59.8	53.1	51.9	50.8
Night	Min	56.0	64.8	48.4	64.6	64.3	63.1	60.9	54.5	51.7	49.1	48.8	48.6
	Max	62.7	75.7	58.9	75.0	73.9	71.2	66.5	62.9	60.3	59.2	59.1	59.0
Energy Average		60.8	Average:		68.9	68.4	66.3	64.0	59.0	56.4	54.3	54.1	53.9

L_{eq} (dBA)		
24-Hour	Daytime (7am-10pm)	Nighttime (10pm-7am)
61.8	**62.3**	**60.8**

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APPENDIX 7.1:

OFF-SITE TRAFFIC NOISE CONTOURS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Pats Ranch Rd.
Road Segment: s/o Limonite Ave.

Project Name: Vernola Marketplace
Job Number: 14172

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,770 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	977 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.51	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-19.75	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-23.70	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.8	64.9	63.1	57.1	65.7	66.3
Medium Trucks:	60.4	58.9	52.5	51.0	59.4	59.7
Heavy Trucks:	60.8	59.4	50.4	51.6	60.0	60.1
Vehicle Noise:	68.5	66.8	63.7	58.9	67.5	67.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	34	73	158	339
CNEL:	36	79	169	365

Tuesday, October 12, 2021

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Pats Ranch Rd.
Road Segment: s/o 65th St.

Project Name: Vernola Marketplace
Job Number: 14172

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,480 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	748 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-3.67	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-20.91	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-24.86	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.6	63.7	62.0	55.9	64.5	65.2
Medium Trucks:	59.2	57.7	51.4	49.8	58.3	58.5
Heavy Trucks:	59.6	58.2	49.2	50.4	58.8	58.9
Vehicle Noise:	67.3	65.6	62.5	57.8	66.3	66.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	61	132	284
CNEL:	31	66	142	305

Tuesday, October 12, 2021

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Pats Ranch Rd.
Road Segment: n/o 65th St.

Project Name: Vernola Marketplace
Job Number: 14172

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,460 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	746 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-3.68	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-20.92	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-24.88	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.6	63.7	62.0	55.9	64.5	65.1
Medium Trucks:	59.2	57.7	51.3	49.8	58.3	58.5
Heavy Trucks:	59.6	58.2	49.2	50.4	58.8	58.9
Vehicle Noise:	67.3	65.6	62.5	57.8	66.3	66.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	61	132	283
CNEL:	30	66	141	305

Tuesday, October 12, 2021

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Limonite Ave.
Road Segment: w/o Pats Ranch Rd.

Project Name: Vernola Marketplace
Job Number: 14172

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,320 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,032 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	78 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.5 feet
Centerline Dist. to Observer:	76.5 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	66.002
Medium Trucks:	65.868
Heavy Trucks:	65.881

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	2.41	-1.91	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-14.83	-1.90	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-18.79	-1.90	-1.20	-5.24	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.5	67.6	65.8	59.8	68.4	69.0
Medium Trucks:	63.1	61.6	55.2	53.7	62.1	62.4
Heavy Trucks:	63.5	62.1	53.0	54.3	62.6	62.8
Vehicle Noise:	71.2	69.4	66.4	61.6	70.2	70.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	78	169	364	785
CNEL:	84	182	391	843

Tuesday, October 12, 2021

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Limonite Ave.
Road Segment: e/o Pats Ranch Rd.

Project Name: Vernola Marketplace
Job Number: 14172

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,800 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,580 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	78 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.5 feet
Centerline Dist. to Observer:	76.5 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	66.002
Medium Trucks:	65.868
Heavy Trucks:	65.881

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	1.71	-1.91	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-15.53	-1.90	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-19.49	-1.90	-1.20	-5.24	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.8	66.9	65.1	59.1	67.7	68.3
Medium Trucks:	62.4	60.9	54.5	53.0	61.4	61.6
Heavy Trucks:	62.8	61.4	52.3	53.6	61.9	62.1
Vehicle Noise:	70.5	68.7	65.7	60.9	69.5	69.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	70	152	327	705
CNEL:	76	163	351	757

Tuesday, October 12, 2021

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Pats Ranch Rd.
Road Segment: s/o Limonite Ave.

Project Name: Vernola Marketplace
Job Number: 14172

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,770 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,077 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.09	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-19.32	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-23.28	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.2	65.3	63.6	57.5	66.1	66.7
Medium Trucks:	60.8	59.3	52.9	51.4	59.9	60.1
Heavy Trucks:	61.2	59.8	50.8	52.0	60.4	60.5
Vehicle Noise:	68.9	67.2	64.1	59.3	67.9	68.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	36	78	168	362
CNEL:	39	84	181	389

Tuesday, October 12, 2021

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: 68th St.
Road Segment: w/o Pats Ranch Rd.

Project Name: Vernola Marketplace
Job Number: 14172

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,250 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,025 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.30	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-19.54	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-23.50	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.0	65.1	63.3	57.3	65.9	66.5
Medium Trucks:	60.6	59.1	52.7	51.2	59.6	59.9
Heavy Trucks:	61.0	59.6	50.6	51.8	60.2	60.3
Vehicle Noise:	68.7	67.0	63.9	59.1	67.7	68.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	35	75	163	350
CNEL:	38	81	175	376

Tuesday, October 12, 2021

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Pats Ranch Rd.
Road Segment: n/o 65th St.

Project Name: Vernola Marketplace
Job Number: 14172

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,460 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	846 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-3.13	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-20.37	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-24.33	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.2	64.3	62.5	56.5	65.1	65.7
Medium Trucks:	59.8	58.3	51.9	50.4	58.8	59.0
Heavy Trucks:	60.2	58.8	49.7	51.0	59.3	59.5
Vehicle Noise:	67.9	66.1	63.1	58.3	66.8	67.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	31	66	143	308
CNEL:	33	71	154	331

Tuesday, October 12, 2021

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Pats Ranch Rd.
Road Segment: s/o 65th St.
Project Name: Vernola Marketplace
Job Number: 14172

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,660 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	766 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-3.57	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	81.00	-20.80	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-24.76	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.7	63.9	62.1	56.0	64.7	65.3
Medium Trucks:	59.3	57.8	51.5	49.9	58.4	58.6
Heavy Trucks:	59.8	58.3	49.3	50.5	58.9	59.0
Vehicle Noise:	67.5	65.7	62.7	57.9	66.4	66.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	29	62	134	289
CNEL:	31	67	144	310

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Limonite Ave.
Road Segment: e/o Pats Ranch Rd.
Project Name: Vernola Marketplace
Job Number: 14172

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,910 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,591 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	78 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.5 feet
Centerline Dist. to Observer:	76.5 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	66.002
Medium Trucks:	65.868
Heavy Trucks:	65.881

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	1.73	-1.91	-1.20	*-4.73*	0.000	0.000
Medium Trucks:	81.00	-15.51	-1.90	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-19.47	-1.90	-1.20	*-5.24*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.8	66.9	65.2	59.1	67.7	68.3
Medium Trucks:	62.4	60.9	54.5	53.0	61.4	61.7
Heavy Trucks:	62.8	61.4	52.4	53.6	62.0	62.1
Vehicle Noise:	70.5	68.8	65.7	60.9	69.5	69.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	71	152	328	707
CNEL:	76	164	352	759

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Limonite Ave.
Road Segment: w/o Pats Ranch Rd.
Project Name: Vernola Marketplace
Job Number: 14172

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,210 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,121 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	78 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.5 feet
Centerline Dist. to Observer:	76.5 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	66.002
Medium Trucks:	65.868
Heavy Trucks:	65.881

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	2.53	-1.91	-1.20	*-4.73*	0.000	0.000
Medium Trucks:	81.00	-14.70	-1.90	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-18.66	-1.90	-1.20	*-5.24*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.6	67.7	66.0	59.9	68.5	69.1
Medium Trucks:	63.2	61.7	55.3	53.8	62.2	62.5
Heavy Trucks:	63.6	62.2	53.2	54.4	62.8	62.9
Vehicle Noise:	71.3	69.6	66.5	61.7	70.3	70.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	80	172	371	800
CNEL:	86	185	399	859

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: 68th St.
Road Segment: w/o Pats Ranch Rd.
Project Name: Vernola Marketplace
Job Number: 14172

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,430 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,043 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.23	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	81.00	-19.46	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-23.42	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.1	65.2	63.4	57.4	66.0	66.6
Medium Trucks:	60.7	59.2	52.8	51.3	59.7	60.0
Heavy Trucks:	61.1	59.7	50.6	51.9	60.2	60.4
Vehicle Noise:	68.8	67.0	64.0	59.2	67.8	68.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	35	76	165	354
CNEL:	38	82	177	381

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2023 | Project Name: Vernola Marketplace
Road Name: Pats Ranch Rd. | Job Number: 14172
Road Segment: s/o Limonite Ave.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,280 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,128 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.89	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	81.00	-19.12	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-23.08	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.4	65.5	63.8	57.7	66.3	66.9
Medium Trucks:	61.0	59.5	53.1	51.6	60.1	60.3
Heavy Trucks:	61.4	60.0	51.0	52.2	60.6	60.7
Vehicle Noise:	69.1	67.4	64.3	59.6	68.1	68.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	37	80	173	373
CNEL:	40	86	186	401

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2023 | Project Name: Vernola Marketplace
Road Name: Pats Ranch Rd. | Job Number: 14172
Road Segment: s/o 65th St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,920 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	792 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-3.42	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	81.00	-20.66	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-24.62	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.9	64.0	62.2	56.2	64.8	65.4
Medium Trucks:	59.5	58.0	51.6	50.1	58.5	58.8
Heavy Trucks:	59.9	58.5	49.4	50.7	59.0	59.2
Vehicle Noise:	67.6	65.8	62.8	58.0	66.6	67.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	30	64	137	295
CNEL:	32	68	147	317

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2023 | Project Name: Vernola Marketplace
Road Name: Pats Ranch Rd. | Job Number: 14172
Road Segment: n/o 65th St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,740 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	774 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-3.52	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	81.00	-20.76	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-24.72	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.8	63.9	62.1	56.1	64.7	65.3
Medium Trucks:	59.4	57.9	51.5	50.0	58.4	58.7
Heavy Trucks:	59.8	58.4	49.3	50.6	58.9	59.1
Vehicle Noise:	67.5	65.7	62.7	57.9	66.5	66.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	29	63	135	291
CNEL:	31	67	145	312

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2023 | Project Name: Vernola Marketplace
Road Name: Limonite Ave. | Job Number: 14172
Road Segment: w/o Pats Ranch Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	33,380 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,338 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	78 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.5 feet
Centerline Dist. to Observer:	76.5 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	66.002
Medium Trucks:	65.868
Heavy Trucks:	65.881

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	2.83	-1.91	-1.20	*-4.73*	0.000	0.000
Medium Trucks:	81.00	-14.41	-1.90	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-18.37	-1.90	-1.20	*-5.24*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.9	68.0	66.3	60.2	68.8	69.4
Medium Trucks:	63.5	62.0	55.6	54.1	62.5	62.8
Heavy Trucks:	63.9	62.5	53.5	54.7	63.1	63.2
Vehicle Noise:	71.6	69.9	66.8	62.0	70.6	71.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	84	180	388	837
CNEL:	90	194	417	899

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2023 | Project Name: Vernola Marketplace
Road Name: Limonite Ave. | Job Number: 14172
Road Segment: e/o Pats Ranch Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,740 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,874 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	78 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.5 feet
Centerline Dist. to Observer:	76.5 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	66.002
Medium Trucks:	65.868
Heavy Trucks:	65.881

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	2.18	-1.91	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-15.06	-1.90	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-19.02	-1.90	-1.20	-5.24	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.3	67.4	65.6	59.5	68.2	68.8
Medium Trucks:	62.8	61.3	55.0	53.4	61.9	62.1
Heavy Trucks:	63.3	61.8	52.8	54.1	62.4	62.5
Vehicle Noise:	71.0	69.2	66.2	61.4	69.9	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	76	163	351	757
CNEL:	81	175	378	813

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2023 + P | Project Name: Vernola Marketplace
Road Name: Pats Ranch Rd. | Job Number: 14172
Road Segment: s/o Limonite Ave.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,280 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,228 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.52	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-18.75	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-22.71	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.8	65.9	64.1	58.1	66.7	67.3
Medium Trucks:	61.4	59.9	53.5	52.0	60.4	60.7
Heavy Trucks:	61.8	60.4	51.3	52.6	60.9	61.1
Vehicle Noise:	69.5	67.7	64.7	59.9	68.5	68.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	40	85	183	395
CNEL:	42	91	197	425

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2023 | Project Name: Vernola Marketplace
Road Name: 68th St. | Job Number: 14172
Road Segment: w/o Pats Ranch Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,210 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,221 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.54	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-18.78	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-22.74	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.8	65.9	64.1	58.1	66.7	67.3
Medium Trucks:	61.4	59.9	53.5	51.9	60.4	60.6
Heavy Trucks:	61.8	60.4	51.3	52.6	60.9	61.1
Vehicle Noise:	69.5	67.7	64.7	59.9	68.4	68.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	39	85	183	394
CNEL:	42	91	196	423

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2023 + P | Project Name: Vernola Marketplace
Road Name: Pats Ranch Rd. | Job Number: 14172
Road Segment: n/o 65th St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,740 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	874 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.99	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-20.23	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-24.19	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.3	64.4	62.7	56.6	65.2	65.8
Medium Trucks:	59.9	58.4	52.0	50.5	59.0	59.2
Heavy Trucks:	60.3	58.9	49.9	51.1	59.5	59.6
Vehicle Noise:	68.0	66.3	63.2	58.4	67.0	67.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	32	68	146	315
CNEL:	34	73	157	338

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2023 + P
Road Name: Pats Ranch Rd.
Road Segment: s/o 65th St.
Project Name: Vernola Marketplace
Job Number: 14172

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,100 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	810 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-3.32	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-20.56	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-24.52	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.0	64.1	62.3	56.3	64.9	65.5
Medium Trucks:	59.6	58.1	51.7	50.2	58.6	58.9
Heavy Trucks:	60.0	58.6	49.5	50.8	59.1	59.3
Vehicle Noise:	67.7	65.9	62.9	58.1	66.7	67.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	30	65	139	299
CNEL:	32	69	149	322

Tuesday, October 12, 2021

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2023 + P
Road Name: Limonite Ave.
Road Segment: e/o Pats Ranch Rd.
Project Name: Vernola Marketplace
Job Number: 14172

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,850 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,885 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	78 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.5 feet
Centerline Dist. to Observer:	76.5 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	66.002
Medium Trucks:	65.868
Heavy Trucks:	65.881

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	2.19	-1.91	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-15.05	-1.90	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-19.00	-1.90	-1.20	-5.24	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.3	67.4	65.6	59.6	68.2	68.8
Medium Trucks:	62.9	61.3	55.0	53.4	61.9	62.1
Heavy Trucks:	63.3	61.9	52.8	54.1	62.4	62.6
Vehicle Noise:	71.0	69.2	66.2	61.4	69.9	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	76	164	352	759
CNEL:	82	176	379	816

Tuesday, October 12, 2021

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2023 + P
Road Name: Limonite Ave.
Road Segment: w/o Pats Ranch Rd.
Project Name: Vernola Marketplace
Job Number: 14172

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	34,270 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,427 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	78 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.5 feet
Centerline Dist. to Observer:	76.5 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	66.002
Medium Trucks:	65.868
Heavy Trucks:	65.881

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	2.94	-1.91	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-14.30	-1.90	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-18.25	-1.90	-1.20	-5.24	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.0	68.1	66.4	60.3	68.9	69.5
Medium Trucks:	63.6	62.1	55.7	54.2	62.7	62.9
Heavy Trucks:	64.0	62.6	53.6	54.8	63.2	63.3
Vehicle Noise:	71.7	70.0	66.9	62.1	70.7	71.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	85	183	395	851
CNEL:	91	197	425	915

Tuesday, October 12, 2021

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2023 + P
Road Name: 68th St.
Road Segment: w/o Pats Ranch Rd.
Project Name: Vernola Marketplace
Job Number: 14172

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,390 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,239 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.48	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-18.72	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-22.67	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.8	65.9	64.2	58.1	66.7	67.3
Medium Trucks:	61.4	59.9	53.6	52.0	60.5	60.7
Heavy Trucks:	61.8	60.4	51.4	52.6	61.0	61.1
Vehicle Noise:	69.5	67.8	64.7	60.0	68.5	69.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	40	86	185	398
CNEL:	43	92	198	427

Tuesday, October 12, 2021

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY 2035 | Project Name: Vernola Marketplace
Road Name: Pats Ranch Rd. | Job Number: 14172
Road Segment: s/o Limonite Ave.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,810 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,481 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.70	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	81.00	-17.94	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-21.90	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.6	66.7	64.9	58.9	67.5	68.1
Medium Trucks:	62.2	60.7	54.3	52.8	61.2	61.5
Heavy Trucks:	62.6	61.2	52.2	53.4	61.8	61.9
Vehicle Noise:	70.3	68.6	65.5	60.7	69.3	69.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	45	96	208	448
CNEL:	48	104	223	481

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY 2035 | Project Name: Vernola Marketplace
Road Name: Pats Ranch Rd. | Job Number: 14172
Road Segment: s/o 65th St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,610 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,361 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.07	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	81.00	-18.31	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-22.26	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.2	66.3	64.6	58.5	67.1	67.8
Medium Trucks:	61.8	60.3	54.0	52.4	60.9	61.1
Heavy Trucks:	62.2	60.8	51.8	53.0	61.4	61.5
Vehicle Noise:	69.9	68.2	65.1	60.4	68.9	69.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	42	91	196	423
CNEL:	45	98	211	455

Tuesday, October 12, 2021

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY 2035 | Project Name: Vernola Marketplace
Road Name: Pats Ranch Rd. | Job Number: 14172
Road Segment: n/o 65th St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,320 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,332 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.16	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	81.00	-18.40	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-22.36	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.2	66.3	64.5	58.4	67.1	67.7
Medium Trucks:	61.7	60.2	53.9	52.3	60.8	61.0
Heavy Trucks:	62.2	60.7	51.7	52.9	61.3	61.4
Vehicle Noise:	69.9	68.1	65.1	60.3	68.8	69.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	42	90	194	417
CNEL:	45	97	208	448

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY 2035 | Project Name: Vernola Marketplace
Road Name: Limonite Ave. | Job Number: 14172
Road Segment: w/o Pats Ranch Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	41,680 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	4,168 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	78 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.5 feet
Centerline Dist. to Observer:	76.5 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	66.002
Medium Trucks:	65.868
Heavy Trucks:	65.881

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	3.79	-1.91	-1.20	*-4.73*	0.000	0.000
Medium Trucks:	81.00	-13.45	-1.90	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	85.38	-17.40	-1.90	-1.20	*-5.24*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.9	69.0	67.2	61.2	69.8	70.4
Medium Trucks:	64.5	62.9	56.6	55.0	63.5	63.7
Heavy Trucks:	64.9	63.5	54.4	55.7	64.0	64.1
Vehicle Noise:	72.6	70.8	67.8	63.0	71.5	72.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	97	209	450	970
CNEL:	104	225	484	1,042

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY 2035 | Project Name: Vernola Marketplace
Road Name: Limonite Ave. | Job Number: 14172
Road Segment: e/o Pats Ranch Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	35,470 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,547 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	78 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.5 feet
Centerline Dist. to Observer:	76.5 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	66.002
Medium Trucks:	65.868
Heavy Trucks:	65.881

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	3.09	-1.91	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-14.15	-1.90	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-18.10	-1.90	-1.20	-5.24	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.2	68.3	66.5	60.5	69.1	69.7
Medium Trucks:	63.8	62.2	55.9	54.3	62.8	63.0
Heavy Trucks:	64.2	62.8	53.7	55.0	63.3	63.4
Vehicle Noise:	71.9	70.1	67.1	62.3	70.8	71.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	87	188	404	871
CNEL:	94	202	434	936

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY+P 2035 | Project Name: Vernola Marketplace
Road Name: Pats Ranch Rd. | Job Number: 14172
Road Segment: s/o Limonite Ave.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,810 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,581 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.42	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-17.66	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-21.61	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.9	67.0	65.2	59.2	67.8	68.4
Medium Trucks:	62.5	61.0	54.6	53.1	61.5	61.8
Heavy Trucks:	62.9	61.5	52.4	53.7	62.0	62.2
Vehicle Noise:	70.6	68.8	65.8	61.0	69.6	70.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	47	101	217	468
CNEL:	50	108	233	502

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY 2035 | Project Name: Vernola Marketplace
Road Name: 68th St. | Job Number: 14172
Road Segment: w/o Pats Ranch Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,490 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,849 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	0.26	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-16.98	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-20.93	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.6	67.7	65.9	59.9	68.5	69.1
Medium Trucks:	63.2	61.7	55.3	53.7	62.2	62.4
Heavy Trucks:	63.6	62.2	53.1	54.4	62.7	62.9
Vehicle Noise:	71.3	69.5	66.5	61.7	70.2	70.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	52	112	241	519
CNEL:	56	120	259	558

Tuesday, October 12, 2021

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY+P 2035 | Project Name: Vernola Marketplace
Road Name: Pats Ranch Rd. | Job Number: 14172
Road Segment: n/o 65th St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,320 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,432 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.85	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-18.09	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-22.04	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.5	66.6	64.8	58.7	67.4	68.0
Medium Trucks:	62.1	60.5	54.2	52.6	61.1	61.3
Heavy Trucks:	62.5	61.0	52.0	53.3	61.6	61.7
Vehicle Noise:	70.2	68.4	65.4	60.6	69.1	69.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	44	94	203	438
CNEL:	47	101	218	470

Tuesday, October 12, 2021

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY+P 2035 | Project Name: Vernola Marketplace
Road Name: Pats Ranch Rd. | Job Number: 14172
Road Segment: s/o 65th St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,790 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,379 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-1.01	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-18.25	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-22.21	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.3	66.4	64.6	58.6	67.2	67.8
Medium Trucks:	61.9	60.4	54.0	52.5	60.9	61.2
Heavy Trucks:	62.3	60.9	51.8	53.1	61.5	61.6
Vehicle Noise:	70.0	68.3	65.2	60.4	69.0	69.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	43	92	198	427
CNEL:	46	99	213	459

Tuesday, October 12, 2021

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY+P 2035 | Project Name: Vernola Marketplace
Road Name: Limonite Ave. | Job Number: 14172
Road Segment: e/o Pats Ranch Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	35,580 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,558 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	78 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.5 feet
Centerline Dist. to Observer:	76.5 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	66.002
Medium Trucks:	65.868
Heavy Trucks:	65.881

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	3.10	-1.91	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-14.13	-1.90	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-18.09	-1.90	-1.20	-5.24	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.2	68.3	66.5	60.5	69.1	69.7
Medium Trucks:	63.8	62.3	55.9	54.4	62.8	63.0
Heavy Trucks:	64.2	62.8	53.7	55.0	63.3	63.5
Vehicle Noise:	71.9	70.1	67.1	62.3	70.9	71.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	87	188	405	873
CNEL:	94	202	435	938

Tuesday, October 12, 2021

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY+P 2035 | Project Name: Vernola Marketplace
Road Name: Limonite Ave. | Job Number: 14172
Road Segment: w/o Pats Ranch Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	42,570 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	4,257 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	78 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	76.5 feet
Centerline Dist. to Observer:	76.5 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	66.002
Medium Trucks:	65.868
Heavy Trucks:	65.881

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	3.88	-1.91	-1.20	-4.73	0.000	0.000
Medium Trucks:	81.00	-13.36	-1.90	-1.20	-4.88	0.000	0.000
Heavy Trucks:	85.38	-17.31	-1.90	-1.20	-5.24	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.0	69.1	67.3	61.3	69.9	70.5
Medium Trucks:	64.5	63.0	56.7	55.1	63.6	63.8
Heavy Trucks:	65.0	63.5	54.5	55.8	64.1	64.2
Vehicle Noise:	72.7	70.9	67.9	63.1	71.6	72.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	98	212	457	984
CNEL:	106	228	491	1,057

Tuesday, October 12, 2021

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY+P 2035 | Project Name: Vernola Marketplace
Road Name: 68th St. | Job Number: 14172
Road Segment: w/o Pats Ranch Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,670 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,867 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	0.30	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	81.00	-16.94	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-20.89	0.34	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.6	67.7	66.0	59.9	68.5	69.1
Medium Trucks:	63.2	61.7	55.3	53.8	62.2	62.5
Heavy Trucks:	63.6	62.2	53.2	54.4	62.8	62.9
Vehicle Noise:	71.3	69.6	66.5	61.7	70.3	70.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	52	113	243	523
CNEL:	56	121	261	561

Tuesday, October 12, 2021

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APPENDIX 9.1:

CADNAA OPERATIONAL NOISE MODEL INPUTS

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14172 - Vernola Marketplace

CadnaA Noise Prediction Model: 14172_02.cna
Date: 12.10.21
Analyst: B. Lawson

Calculation Configuration

Configuration	
Parameter	Value
General	
Country	(user defined)
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.01
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	999.99
Min. Length of Section (#(Unit,LEN))	1.01
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	5.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	2
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rvcr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Incl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (#(Unit,TEMP))	10
rel. Humidity (%)	70
Ground Absorption G	0.50
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (RLS-90)	
Strictly acc. to RLS-90	
Railways (FTA/FRA)	
Aircraft (???)	
Strictly acc. to AzB	

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
R1		R1	41.2	41.2	47.9	65.0	45.0	0.0				5.00	a	6167654.37	2299533.57	5.00
R2		R2	44.1	44.1	50.7	65.0	45.0	0.0				5.00	a	6168750.64	2299027.72	5.00
R3		R3	44.3	44.3	51.0	65.0	45.0	0.0				5.00	a	6168741.90	2298853.49	5.00
R4		R4	40.6	40.6	47.3	65.0	45.0	0.0				5.00	a	6168829.57	2298271.90	5.00
R5		R5	43.2	43.2	49.9	65.0	45.0	0.0				5.00	a	6167642.69	2298493.45	5.00

Point Source(s)

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			K0	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night				X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(dB)	(ft)		(ft)	(ft)	(ft)
POINTSOURCE		AC00	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168099.61	2298847.72	3.00
POINTSOURCE		AC01	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168099.87	2298851.16	3.00
POINTSOURCE		AC01	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168095.31	2299255.66	3.00
POINTSOURCE		AC02	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168099.61	2298855.13	3.00
POINTSOURCE		AC02	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168095.31	2299251.82	3.00
POINTSOURCE		AC03	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168102.52	2298859.63	3.00
POINTSOURCE		AC03	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168095.13	2299247.27	3.00
POINTSOURCE		AC04	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168116.02	2298863.34	3.00
POINTSOURCE		AC04	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168095.13	2299239.75	3.00
POINTSOURCE		AC05	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168121.32	2298863.34	3.00
POINTSOURCE		AC05	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168095.48	2299205.29	3.00

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			K0	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night				X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(dB)	(ft)		(ft)	(ft)	(ft)
POINTSOURCE		AC06	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168138.53	2298863.61	3.00
POINTSOURCE		AC06	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168095.31	2299197.59	3.00
POINTSOURCE		AC07	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168144.88	2298863.61	3.00
POINTSOURCE		AC07	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168095.31	2299193.57	3.00
POINTSOURCE		AC08	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168155.74	2298863.61	3.00
POINTSOURCE		AC08	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168095.48	2299189.37	3.00
POINTSOURCE		AC09	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168159.44	2298863.87	3.00
POINTSOURCE		AC09	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168109.94	2298403.99	3.00
POINTSOURCE		AC10	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168170.56	2298864.14	3.00
POINTSOURCE		AC10	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168109.94	2298400.01	3.00
POINTSOURCE		AC11	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168177.18	2298863.87	3.00
POINTSOURCE		AC11	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168110.46	2298395.25	3.00
POINTSOURCE		AC12	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168192.54	2298864.66	3.00
POINTSOURCE		AC12	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168110.46	2298391.54	3.00
POINTSOURCE		AC13	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168201.54	2298865.46	3.00
POINTSOURCE		AC13	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168113.91	2298387.31	3.00
POINTSOURCE		AC14	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168217.16	2298865.46	3.00
POINTSOURCE		AC14	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168126.88	2298383.86	3.00
POINTSOURCE		AC15	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168227.75	2298862.55	3.00
POINTSOURCE		AC15	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168133.23	2298383.86	3.00
POINTSOURCE		AC16	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168227.49	2298857.78	3.00
POINTSOURCE		AC16	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168149.12	2298384.13	3.00
POINTSOURCE		AC17	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168231.19	2298855.13	3.00
POINTSOURCE		AC17	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168155.21	2298383.86	3.00
POINTSOURCE		AC18	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168230.93	2298850.37	3.00
POINTSOURCE		AC18	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168166.06	2298384.13	3.00
POINTSOURCE		AC19	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168269.58	2298867.84	3.00
POINTSOURCE		AC19	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168169.77	2298384.13	3.00
POINTSOURCE		AC20	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168269.58	2298871.28	3.00
POINTSOURCE		AC20	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168181.68	2298383.86	3.00
POINTSOURCE		AC21	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168269.58	2298875.52	3.00
POINTSOURCE		AC21	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168187.77	2298383.86	3.00
POINTSOURCE		AC22	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168273.82	2298878.70	3.00
POINTSOURCE		AC22	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168204.72	2298383.34	3.00
POINTSOURCE		AC23	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168279.65	2298878.96	3.00
POINTSOURCE		AC23	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168212.66	2298383.86	3.00
POINTSOURCE		AC24	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168340.27	2298865.19	3.00
POINTSOURCE		AC24	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168227.75	2298383.60	3.00
POINTSOURCE		AC25	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168340.01	2298869.17	3.00
POINTSOURCE		AC25	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168238.08	2298386.25	3.00
POINTSOURCE		AC26	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168340.27	2298873.67	3.00
POINTSOURCE		AC26	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168238.34	2298391.01	3.00
POINTSOURCE		AC27	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168340.27	2298877.90	3.00
POINTSOURCE		AC27	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168242.31	2298393.66	3.00
POINTSOURCE		AC28	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168337.10	2298880.82	3.00
POINTSOURCE		AC28	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168242.05	2298397.90	3.00
POINTSOURCE		AC29	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168097.49	2298985.13	3.00
POINTSOURCE		AC29	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168265.61	2298401.07	3.00
POINTSOURCE		AC30	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168097.23	2298981.42	3.00
POINTSOURCE		AC30	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168265.35	2298396.57	3.00
POINTSOURCE		AC31	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168108.08	2298978.78	3.00
POINTSOURCE		AC31	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168265.61	2298392.34	3.00
POINTSOURCE		AC32	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168122.38	2298978.25	3.00
POINTSOURCE		AC32	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168269.58	2298388.90	3.00
POINTSOURCE		AC33	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168132.44	2298978.78	3.00
POINTSOURCE		AC33	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168276.20	2298389.16	3.00
POINTSOURCE		AC34	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168147.53	2298978.78	3.00
POINTSOURCE		AC34	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168332.86	2298387.57	3.00
POINTSOURCE		AC35	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168154.94	2298979.57	3.00
POINTSOURCE		AC35	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168336.30	2298391.01	3.00
POINTSOURCE		AC36	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168165.80	2298979.31	3.00
POINTSOURCE		AC36	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168336.04	2298395.25	3.00
POINTSOURCE		AC37	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168169.24	2298979.04	3.00
POINTSOURCE		AC37	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168336.04	2298399.22	3.00
POINTSOURCE		AC38	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168180.63	2298979.31	3.00
POINTSOURCE		AC38	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168336.30	2298403.72	3.00
POINTSOURCE		AC39	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168186.72	2298979.31	3.00
POINTSOURCE		AC39	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168338.16	2298587.73	3.00
POINTSOURCE		AC40	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168202.60	2298979.83	3.00
POINTSOURCE		AC40	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168338.16	2298591.43	3.00
POINTSOURCE		AC41	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168209.48	2298979.83	3.00
POINTSOURCE		AC41	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168338.16	2298595.94	3.00
POINTSOURCE		AC42	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168221.66	2298982.75	3.00
POINTSOURCE		AC42	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168337.89	2298600.44	3.00
POINTSOURCE		AC43	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168224.84	2298986.45	3.00
POINTSOURCE		AC43	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168334.45	2298604.14	3.00
POINTSOURCE		AC44	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168224.84	2298990.69	3.00

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			K0	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night				X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(dB)	(ft)		(ft)	(ft)	(ft)
POINTSOURCE		AC44	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168276.73	2298601.23	3.00
POINTSOURCE		AC45	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168224.84	2298994.93	3.00
POINTSOURCE		AC45	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168270.64	2298601.76	3.00
POINTSOURCE		AC46	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168224.84	2298999.16	3.00
POINTSOURCE		AC46	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168266.41	2298598.32	3.00
POINTSOURCE		AC47	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168271.17	2299017.70	3.00
POINTSOURCE		AC47	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168266.94	2298594.08	3.00
POINTSOURCE		AC48	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168270.91	2299013.19	3.00
POINTSOURCE		AC48	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168266.41	2298590.38	3.00
POINTSOURCE		AC49	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168271.17	2299008.43	3.00
POINTSOURCE		AC49	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168237.28	2298588.52	3.00
POINTSOURCE		AC50	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168275.14	2299005.25	3.00
POINTSOURCE		AC50	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168237.28	2298592.49	3.00
POINTSOURCE		AC51	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168282.29	2299005.78	3.00
POINTSOURCE		AC51	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168237.28	2298596.73	3.00
POINTSOURCE		AC52	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168338.42	2299004.72	3.00
POINTSOURCE		AC52	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168233.84	2298601.23	3.00
POINTSOURCE		AC53	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168342.13	2299007.37	3.00
POINTSOURCE		AC53	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168199.69	2298606.26	3.00
POINTSOURCE		AC54	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168342.13	2299011.87	3.00
POINTSOURCE		AC54	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168182.74	2298606.53	3.00
POINTSOURCE		AC55	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168342.39	2299016.37	3.00
POINTSOURCE		AC55	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168174.80	2298605.47	3.00
POINTSOURCE		AC56	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168342.13	2299020.34	3.00
POINTSOURCE		AC56	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168160.24	2298605.20	3.00
POINTSOURCE		AC57	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168342.39	2299144.40	3.00
POINTSOURCE		AC57	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168160.24	2298600.70	3.00
POINTSOURCE		AC58	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168342.28	2299148.52	3.00
POINTSOURCE		AC58	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168153.89	2298600.97	3.00
POINTSOURCE		AC59	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168342.28	2299152.65	3.00
POINTSOURCE		AC59	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168149.91	2298600.70	3.00
POINTSOURCE		AC60	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168342.28	2299156.78	3.00
POINTSOURCE		AC60	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168143.82	2298600.70	3.00
POINTSOURCE		AC61	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168338.73	2299160.22	3.00
POINTSOURCE		AC61	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168143.56	2298605.73	3.00
POINTSOURCE		AC62	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168271.42	2299146.69	3.00
POINTSOURCE		AC62	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168130.85	2298605.47	3.00
POINTSOURCE		AC63	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168271.42	2299151.05	3.00
POINTSOURCE		AC63	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168121.06	2298605.20	3.00
POINTSOURCE		AC64	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168271.19	2299155.17	3.00
POINTSOURCE		AC64	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168105.43	2298605.20	3.00
POINTSOURCE		AC65	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168275.09	2299158.27	3.00
POINTSOURCE		AC65	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168087.17	2298601.50	3.00
POINTSOURCE		AC66	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168281.58	2299158.40	3.00
POINTSOURCE		AC66	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168083.19	2298597.26	3.00
POINTSOURCE		AC67	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168227.22	2299246.57	3.00
POINTSOURCE		AC67	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168083.19	2298588.79	3.00
POINTSOURCE		AC68	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168150.43	2299241.20	3.00
POINTSOURCE		AC68	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168082.93	2298584.82	3.00
POINTSOURCE		AC69	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168139.36	2299241.83	3.00
POINTSOURCE		AC69	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168092.73	2298655.24	3.00
POINTSOURCE		AC70	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168227.22	2299193.48	3.00
POINTSOURCE		AC70	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168092.99	2298651.27	3.00
POINTSOURCE		AC71	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168227.22	2299196.96	3.00
POINTSOURCE		AC71	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168092.46	2298642.80	3.00
POINTSOURCE		AC72	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168227.54	2299200.43	3.00
POINTSOURCE		AC72	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168096.17	2298638.30	3.00
POINTSOURCE		AC73	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168223.43	2299203.59	3.00
POINTSOURCE		AC73	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168114.17	2298634.86	3.00
POINTSOURCE		AC74	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168223.75	2299208.02	3.00
POINTSOURCE		AC74	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168130.59	2298635.91	3.00
POINTSOURCE		AC75	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168196.57	2299209.28	3.00
POINTSOURCE		AC75	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168139.59	2298635.38	3.00
POINTSOURCE		AC76	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168164.96	2299209.60	3.00
POINTSOURCE		AC76	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168153.36	2298635.91	3.00
POINTSOURCE		AC77	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168151.37	2299204.86	3.00
POINTSOURCE		AC77	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168153.89	2298640.15	3.00
POINTSOURCE		AC78	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168145.05	2299204.86	3.00
POINTSOURCE		AC78	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168159.71	2298640.42	3.00
POINTSOURCE		AC79	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168140.00	2299205.17	3.00
POINTSOURCE		AC79	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168163.42	2298640.15	3.00
POINTSOURCE		AC80	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168133.68	2299205.17	3.00
POINTSOURCE		AC80	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168170.04	2298640.42	3.00
POINTSOURCE		AC81	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168337.84	2299241.20	3.00
POINTSOURCE		AC81	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168169.77	2298635.65	3.00
POINTSOURCE		AC82	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168341.95	2299244.05	3.00
POINTSOURCE		AC82	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168183.54	2298635.65	3.00

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			K0	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night				X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(dB)	(ft)		(ft)	(ft)	(ft)
POINTSOURCE		AC83	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168341.95	2299248.47	3.00
POINTSOURCE		AC83	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168192.54	2298635.65	3.00
POINTSOURCE		AC84	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168341.95	2299252.26	3.00
POINTSOURCE		AC84	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168209.48	2298635.38	3.00
POINTSOURCE		AC85	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168341.95	2299257.00	3.00
POINTSOURCE		AC85	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168243.37	2298640.94	3.00
POINTSOURCE		AC86	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168281.58	2299241.83	3.00
POINTSOURCE		AC86	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168246.55	2298645.45	3.00
POINTSOURCE		AC87	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168275.26	2299241.83	3.00
POINTSOURCE		AC87	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168246.55	2298649.42	3.00
POINTSOURCE		AC88	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168271.15	2299245.31	3.00
POINTSOURCE		AC88	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168247.08	2298653.39	3.00
POINTSOURCE		AC89	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168271.15	2299249.10	3.00
POINTSOURCE		AC89	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168267.73	2298652.59	3.00
POINTSOURCE		AC90	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168271.15	2299253.21	3.00
POINTSOURCE		AC90	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168267.20	2298648.62	3.00
POINTSOURCE		AC91	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168197.20	2299236.78	3.00
POINTSOURCE		AC91	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168267.20	2298644.12	3.00
POINTSOURCE		AC92	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168164.33	2299236.46	3.00
POINTSOURCE		AC92	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168270.91	2298641.21	3.00
POINTSOURCE		AC93	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168136.20	2299238.99	3.00
POINTSOURCE		AC93	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168278.32	2298641.21	3.00
POINTSOURCE		AC94	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168146.32	2299238.99	3.00
POINTSOURCE		AC94	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168334.71	2298639.62	3.00
POINTSOURCE		AC95	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168225.01	2299241.20	3.00
POINTSOURCE		AC95	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168338.69	2298642.53	3.00
POINTSOURCE		AC96	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168228.49	2299252.26	3.00
POINTSOURCE		AC96	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168338.42	2298647.03	3.00
POINTSOURCE		AC97	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168338.69	2298651.53	3.00
POINTSOURCE		AC98	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168338.69	2298656.04	3.00
POINTSOURCE		AC99	75.0	75.0	75.0	Lw	75					0.0	3.00	a	6168099.61	2298843.48	3.00
POINTSOURCE		PARK01	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168049.07	2298372.74	5.00
POINTSOURCE		PARK02	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168049.32	2298400.54	5.00
POINTSOURCE		PARK03	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168049.84	2298428.08	5.00
POINTSOURCE		PARK04	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168088.19	2298421.13	5.00
POINTSOURCE		PARK05	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168088.71	2298395.14	5.00
POINTSOURCE		PARK06	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168314.46	2298483.69	5.00
POINTSOURCE		PARK07	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168270.44	2298503.51	5.00
POINTSOURCE		PARK08	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168229.77	2298483.94	5.00
POINTSOURCE		PARK09	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168185.75	2298504.02	5.00
POINTSOURCE		PARK10	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168139.16	2298486.52	5.00
POINTSOURCE		PARK11	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168100.29	2298503.51	5.00
POINTSOURCE		PARK12	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168036.71	2298460.52	5.00
POINTSOURCE		PARK13	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168018.18	2298498.61	5.00
POINTSOURCE		PARK14	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168021.52	2298546.24	5.00
POINTSOURCE		PARK15	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168065.54	2298577.64	5.00
POINTSOURCE		PARK16	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168028.47	2298599.26	5.00
POINTSOURCE		PARK17	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168069.40	2298621.66	5.00
POINTSOURCE		PARK18	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168032.34	2298653.57	5.00
POINTSOURCE		PARK19	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168038.00	2298699.39	5.00
POINTSOURCE		PARK20	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168041.60	2298745.47	5.00
POINTSOURCE		PARK21	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168257.00	2298696.59	5.00
POINTSOURCE		PARK22	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168349.58	2298698.05	5.00
POINTSOURCE		PARK23	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168285.61	2298736.14	5.00
POINTSOURCE		PARK24	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168348.49	2298763.66	5.00
POINTSOURCE		PARK25	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168349.77	2298808.13	5.00
POINTSOURCE		PARK26	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168315.14	2298807.40	5.00
POINTSOURCE		PARK27	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168283.61	2298807.22	5.00
POINTSOURCE		PARK28	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168202.85	2299104.13	5.00
POINTSOURCE		PARK29	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168269.92	2298902.14	5.00
POINTSOURCE		PARK30	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168230.69	2298899.05	5.00
POINTSOURCE		PARK31	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168229.72	2298936.65	5.00
POINTSOURCE		PARK32	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168229.88	2298965.63	5.00
POINTSOURCE		PARK33	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168318.60	2298987.93	5.00
POINTSOURCE		PARK34	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168301.02	2298929.65	5.00
POINTSOURCE		PARK35	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168340.73	2298931.44	5.00
POINTSOURCE		PARK36	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168139.59	2299080.95	5.00
POINTSOURCE		PARK37	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168104.94	2299105.15	5.00
POINTSOURCE		PARK38	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168353.53	2299098.06	5.00
POINTSOURCE		PARK39	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168271.69	2299176.15	5.00
POINTSOURCE		PARK40	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168290.27	2299223.79	5.00
POINTSOURCE		PARK41	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168323.68	2299177.14	5.00
POINTSOURCE		PARK42	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168351.16	2299224.38	5.00
POINTSOURCE		PARK43	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168059.40	2299064.97	5.00
POINTSOURCE		PARK44	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168057.26	2299130.60	5.00
POINTSOURCE		PARK45	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168055.83	2299162.70	5.00
POINTSOURCE		PARK46	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168055.12	2299201.22	5.00

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			K0	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night				X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(dB)	(ft)		(ft)	(ft)	(ft)
POINTSOURCE		PARK47	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168055.83	2299262.57	5.00
POINTSOURCE		PARK48	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168055.83	2299297.53	5.00
POINTSOURCE		PARK49	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168121.46	2299336.76	5.00
POINTSOURCE		PARK50	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168162.12	2299339.62	5.00
POINTSOURCE		PARK51	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168212.06	2299338.90	5.00
POINTSOURCE		PARK52	72.5	72.5	72.5	Lw	72.5					0.0	5.00	a	6168308.36	2299339.62	5.00
POINTSOURCE		POOL01	94.6	94.6	94.6	Lw	94.6		900.00	0.00	0.00	0.0	4.00	a	6168173.56	2298939.58	4.00
POINTSOURCE		POOL02	94.6	94.6	94.6	Lw	94.6		900.00	0.00	0.00	0.0	4.00	a	6168190.00	2298939.58	4.00
POINTSOURCE		POOL03	94.6	94.6	94.6	Lw	94.6		900.00	0.00	0.00	0.0	4.00	a	6168172.75	2298901.98	4.00
POINTSOURCE		POOL04	94.6	94.6	94.6	Lw	94.6		900.00	0.00	0.00	0.0	4.00	a	6168190.33	2298903.28	4.00
POINTSOURCE		POOL05	94.6	94.6	94.6	Lw	94.6		900.00	0.00	0.00	0.0	4.00	a	6168181.70	2298889.12	4.00
POINTSOURCE		TRASH01	89.0	89.0	89.0	Lw	89		150.00	0.00	90.00	0.0	5.00	a	6168226.24	2298751.00	5.00
POINTSOURCE		TRASH02	89.0	89.0	89.0	Lw	89		150.00	0.00	90.00	0.0	5.00	a	6168087.64	2298377.38	5.00
POINTSOURCE		TRASH03	89.0	89.0	89.0	Lw	89		150.00	0.00	90.00	0.0	5.00	a	6168073.58	2298658.74	5.00
POINTSOURCE		TRASH04	89.0	89.0	89.0	Lw	89		150.00	0.00	90.00	0.0	5.00	a	6168220.70	2299089.38	5.00
POINTSOURCE		TRASH05	89.0	89.0	89.0	Lw	89		150.00	0.00	90.00	0.0	5.00	a	6168273.76	2299342.23	5.00

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APPENDIX 10.1:

CADNAA CONSTRUCTION NOISE MODEL INPUTS

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14172 - Vernola Marketplace

CadnaA Noise Prediction Model: 14172-02_Construction.cna
Date: 12.10.21
Analyst: B. Lawson

Calculation Configuration

Configuration	
Parameter	Value
General	
Country	(user defined)
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.01
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	999.99
Min. Length of Section (#(Unit,LEN))	1.01
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	5.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	2
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rvcr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Incl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (#(Unit,TEMP))	10
rel. Humidity (%)	70
Ground Absorption G	0.50
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (RLS-90)	
Strictly acc. to RLS-90	
Railways (FTA/FRA)	
Aircraft (???)	
Strictly acc. to AzB	

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
R1		R1	64.2	64.2	70.9	65.0	45.0	0.0				5.00	a	6167654.37	2299533.57	5.00
R2		R2	66.5	66.5	73.2	65.0	45.0	0.0				5.00	a	6168750.64	2299027.72	5.00
R3		R3	66.7	66.7	73.4	65.0	45.0	0.0				5.00	a	6168741.90	2298853.49	5.00
R4		R4	63.9	63.9	70.5	65.0	45.0	0.0				5.00	a	6168829.57	2298271.90	5.00
R5		R5	66.2	66.2	72.8	65.0	45.0	0.0				5.00	a	6167642.69	2298493.45	5.00

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL"			Lw / Li			Operating Time			Height
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	(ft)
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	
SITEBOUNDARY		SITEBOUNDARY00001	124.0	124.0	124.0	79.0	79.0	79.0	Lw"	79					8

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
SITEBOUNDARY	8.00	a			6168024.81	2299357.92	8.00	0.00
					6168366.56	2299359.65	8.00	0.00
					6168357.00	2298362.24	8.00	0.00
					6167996.99	2298362.24	8.00	0.00
					6167992.64	2298459.64	8.00	0.00
					6168024.81	2298752.69	8.00	0.00