

APPENDIX J

NOISE AND VIBRATION ANALYSIS



HERITAGE VILLAGE BUSINESS CENTER

NOISE AND VIBRATION ANALYSIS



Prepared By:

Bill Maddux, INCE | bmaddux@urbanxroads.com

Noah Johnson | njohnson@urbanxroads.com

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LIST OF ABBREVIATED TERMS

(1)	Reference
ANSI	American National Standards Institute
Calveno	California Vehicle Noise
CEQA	California Environmental Quality Act
City	City of Meniffee
CNEL	Community Noise Equivalent Level
dBA	A-weighted decibels
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
INCE	Institute of Noise Control Engineering
Leq	Equivalent continuous (average) sound level
Lmax	Maximum level measured over the time interval
mph	Miles per hour
PPV	Peak Particle Velocity
Project	Heritage Village Business Center
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 noise exposure and the necessary noise mitigation measures for the Heritage Village Business Center (Project) in the City of Menifee. The Project consists of developing an 829,755 square foot warehouse building, which includes 10,000 square feet of office support space on a 41.16-acre site. This noise study has been prepared to satisfy applicable City of Menifee noise standards and significance criteria based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1)

The results of this Noise and Vibration Analysis are summarized below based on the significance criteria in Section 4 of this report, consistent with Appendix G of the CEQA Guidelines. (1) Table ES-1 shows the findings of significance for each potential noise and/or vibration impact under CEQA before and after any required mitigation measures.

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS

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

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1 INTRODUCTION

This Noise and Vibration Analysis has been completed to determine the noise impacts associated with the development of the Heritage Village Business Center (“Project”). This noise and vibration analysis briefly describes the Project, provides information regarding noise fundamentals, sets out the local regulatory setting, presents the study methods and procedures for noise analysis, evaluates the future exterior noise environment, potential off-site traffic impacts, the Project-related long-term stationary-source operational noise, and Project-related short-term construction noise and vibration impacts.

1.1 SITE LOCATION

The Project site is located south of Ethanac Road, east of Trumble Road, west of Sherman Road, and north of McLaughlin Road in the City of Menifee, as shown in Exhibit 1-1. The Project is bound by vacant land to the east, south, and west, and commercial uses to the north.

1.2 PROJECT DESCRIPTION

The Project includes the development of an 829,755 square foot warehouse building, which includes 10,000 square feet of office support space on a 41.16-acre site (see Exhibit 1-2). It is our understanding the Project Planning Application consists of a Plot Plan (PLN24-0195), General Plan Amendment (PLN24-0197) to change the land use from Heavy Industrial to Menifee North Specific Plan for APNs 331-110-024, 025, and 026, Change of Zone (PLN24-0198) to change to zoning from Heavy Industrial to Menifee North Specific Plan for APNs 331-110-024, 025, and 026, and a Specific Plan Amendment (PLN24-0199) to modify the boundary of the existing Menifee North Specific Plan to include the Project and designating it as Planning Area 2 (Industrial).

The site is currently occupied by a few non-conforming existing residential units and businesses. Driveway counts were collected to determine the trips associated with the existing uses in order to be utilized as a credit against the Project trip generation.

The Project is anticipated to have an Opening Year of 2027. Access is proposed along Trumble Road (via two passenger car driveways only) and Sherman Road (via two driveways that would serve cars and trucks). All driveways are assumed to allow for full access (no turn restrictions).

EXHIBIT 1-1: PROJECT LOCATION

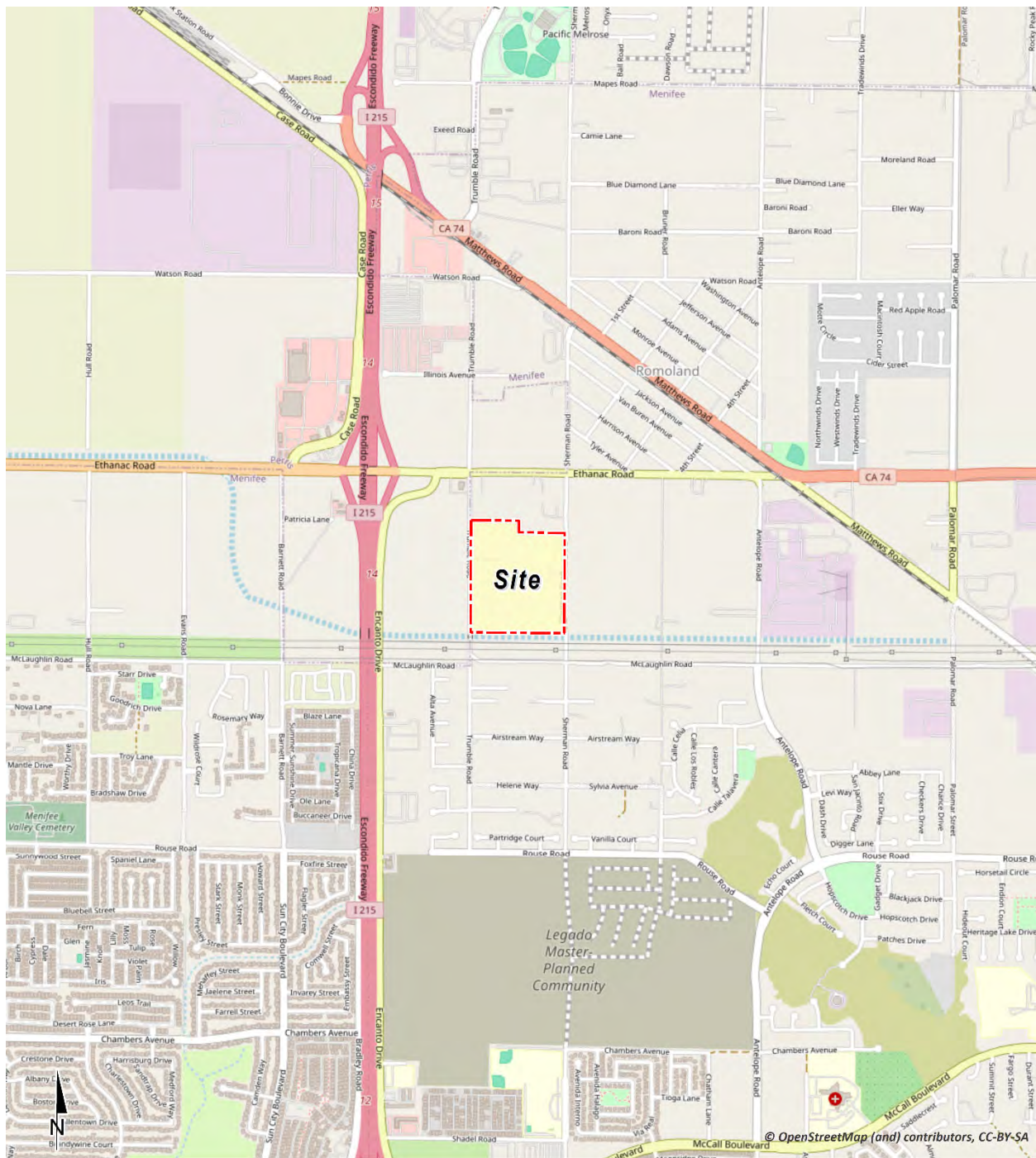
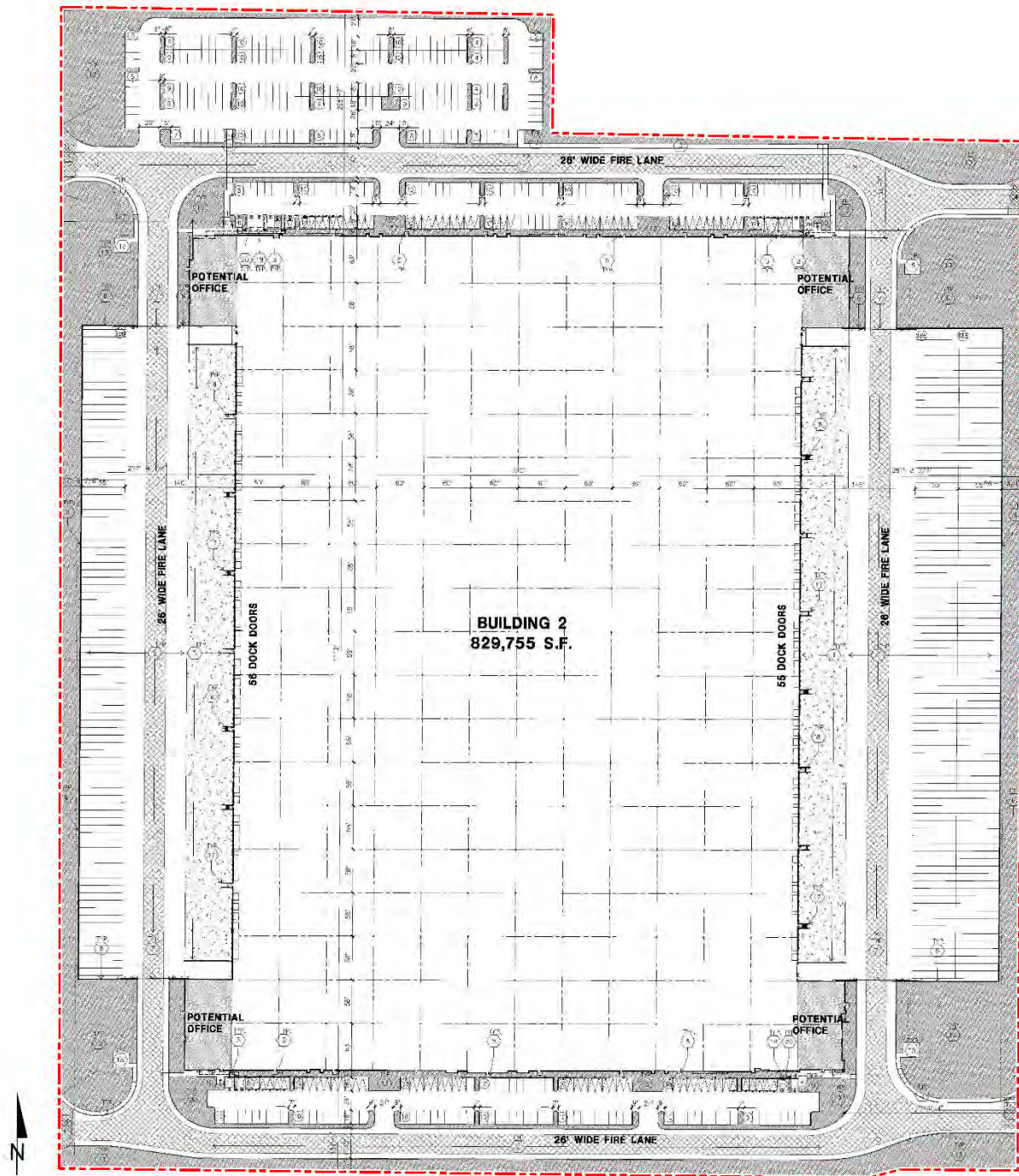


EXHIBIT 1-2: SITE PLAN



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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 a 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 that are audible to the human ear. Exhibit 2-1 presents a summary of the typical noise levels and their subjective loudness and effects that are described in more detail below.

EXHIBIT 2-1: 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	SPEECH INTERFERENCE
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		
NOISY URBAN AREA, DAYTIME	VACUUM CLEANER AT 3m (10 ft)	70	LOUD	SLEEP DISTURBANCE
HEAVY TRAFFIC AT 90m (300 ft)	NORMAL SPEECH AT 1m (3 ft)	60		
QUIET URBAN DAYTIME	LARGE BUSINESS OFFICE	50	MODERATE	NO EFFECT
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

1,000 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 on instantaneous noise levels. The most used metric is the equivalent level (Leq). 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 (Leq) represents a steady state sound level containing the same total energy as a time-varying signal over a given sample period 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 Leq sound levels in the evening from 7:00 p.m. to 10:00 p.m., and the addition of 10 decibels to dBA Leq 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 noise can become more intrusive. CNEL does not represent the actual sound level heard at any time, but rather represents the total sound exposure. The City of Menifee 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. (5)

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 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 block the line-of-sight path of sound from the noise source.

2.6 LAND USE COMPATIBILITY WITH NOISE

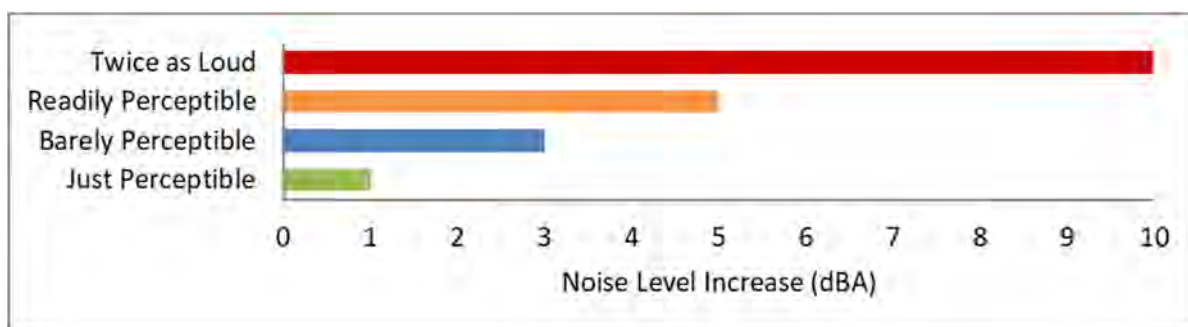
Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches, and residences are more sensitive to noise intrusion than commercial or industrial developments and related activities. As ambient noise levels affect the perceived amenity or livability of a development, 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. (6)

2.7 COMMUNITY RESPONSE TO NOISE

Approximately sixteen 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 may occur. Twenty to thirty percent of the population will not complain even in very severe noise environments. (7 pp. 8-6) Thus, a variety of reactions can be expected from people exposed to any given noise environment.

Surveys have shown that community response to noise varies from no reaction to vigorous action for newly introduced noises averaging from 10 dB below existing to 25 dB above existing. (8) According to research originally published in the Noise Effects Handbook (7), the percentage of high annoyance ranges from approximately 0 percent at 45 dB or less, 10 percent are highly annoyed around 60 dB, and increases rapidly to approximately 70 percent being highly annoyed at approximately 85 dB or greater. 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 2-2. A change of 3 dBA is considered barely perceptible, and changes of 5 dBA are considered readily perceptible. (4)

EXHIBIT 2-2: NOISE LEVEL INCREASE PERCEPTION



2.8 VIBRATION

Per the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual*, 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.

Additionally, in contrast to airborne noise, ground-borne vibration outdoors is not a common environmental problem, and annoyance from ground-borne vibration is almost exclusively an indoor phenomenon (8). Therefore, the effects of vibrations should only be evaluated at a structure, and the effects of the building structure on the vibration should be considered. Wood-frame buildings, such as typical residential structures, are more easily excited by ground vibration than heavier buildings. In contrast, large masonry buildings with spread footings have a low response to ground vibration (8). In general, the heavier a building is, the lower the response will be to the incident vibration energy. However, all structures reduce vibration levels due to the coupling of the building to the soil.

There are several methods used to quantify vibration levels. Peak Particle Velocity (PPV) is defined as the maximum instantaneous peak of a vibration signal and is most commonly used to evaluate the impact of vibration on buildings (9) (8). However, PPV is not always suitable for assessing human response (e.g., annoyance), as the human body does not respond instantly to vibration signals. Instead, it responds to the average amplitude, more accurately represented by the Root Mean Square (RMS) value of the vibration (8).

RMS is defined as the square root of the average of the squared signal amplitude and is commonly used to evaluate human exposure to vibration. RMS and PPV are mathematically related—RMS is typically about 70% of the PPV for certain waveforms (10) (11). However, deriving RMS from PPV requires knowing the full waveform or making assumptions (e.g., sinusoidal or steady-state signals). Without this information, converting PPV to RMS introduces uncertainty and provides limited insight, especially in cases involving transient or impact vibrations (12).

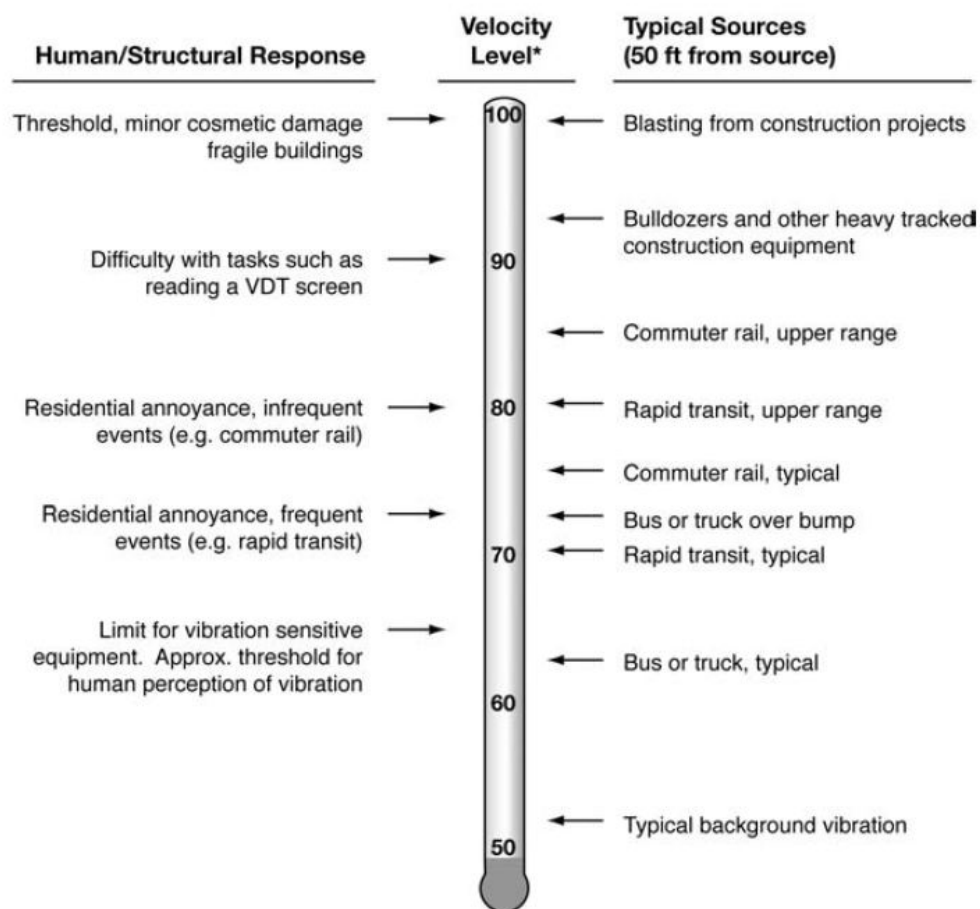
This distinction is important because human annoyance to vibration is often triggered by abrupt, intermittent events, rather than sustained energy levels. Construction-related vibrations are typically impulsive and broadband, in contrast to the continuous, tonal vibrations associated with transit systems. The FTA's RMS-based criteria were developed with train activity in mind and are not well-suited for construction vibration, where perception is driven by factors like suddenness, impact, and repetition (8).

In essence, RMS tends to average out short-duration, high-intensity events—the very events that people find most disturbing. Therefore, for construction activities, PPV-based thresholds, such as those recommended by Caltrans, are more appropriate for assessing potential human annoyance and structural impact (11).

While not universally accepted, vibration decibel notation (VdB) is another RMS-based vibration notation developed and used by the FTA in their guidance manual to describe vibration levels and provide a background of common vibration levels and set vibration limits (8). Decibel notation (VdB) serves to reduce the range of numbers used to describe vibration levels and is used in this report to describe vibration levels.

As stated in the FTA guidance manual, 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 2-3: 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. (13) 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 MENIFEE GENERAL PLAN NOISE ELEMENT

The City of Menifee has adopted a Noise Element of the General Plan to control and abate environmental noise and to protect the citizens of the City of Menifee from excessive exposure to noise. (14) The Noise Element specifies the maximum allowable unmitigated exterior noise levels for new developments impacted by transportation noise sources such as arterial roads, freeways, airports, and railroads. In addition, the Noise Element identifies several policies to minimize the impacts of excessive noise levels throughout the community and establishes noise level requirements for all land uses. To protect City of Menifee residents from excessive noise, the Noise Element contains the following goal related to the Project:

N-1 Noise-sensitive land uses are protected from excessive noise and vibration exposure.

The noise policies specified in the City of Menifee Noise Element provide the guidelines necessary to satisfy this goal. Policy N-1.2 states that new developments are required to *comply with the noise standards of local, regional, and state building code regulations*, including the City's Municipal Code, Title 24 of the California Code of Regulations, and the California Green Building Code, and this analysis has been prepared to satisfy the 45 dBA CNEL interior noise level standards of the Title 24 of the California Code of Regulations, previously discussed in Section 3.2. The Noise Element provides Policy N-1.11 to reduce excessive noise impacts from transportation and discourages the siting of noise-sensitive uses in areas in excess of 65 dBA CNEL without appropriate mitigation. (14)

3.2.1 Land Use Compatibility

The noise criteria identified in the City of Menifee Noise Element are guidelines to evaluate the land use compatibility of transportation-related noise. The compatibility criteria, shown in Exhibit 3-1, provide the City with a planning tool to gauge the compatibility of land uses relative to existing and future exterior noise levels.

Per the City's *Noise Element Background Document and Definitions, Land Use Compatibility for Community Noise Environments* (Table N-b3), the single-family residential land use within the Project is considered *normally acceptable* with noise levels below 60 dBA CNEL. *Conditionally acceptable* single-family residential land uses experience noise levels approaching 70 dBA CNEL. For *conditionally acceptable* land use, *new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and the needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.*

Consistent with the land use compatibility guidelines and Noise Element Policy N-1.11, this noise study has been prepared to satisfy an exterior noise level of less than 65 dBA CNEL for single-family residential land use. An interior noise level of less than 45 dBA CNEL shall be required for residential uses within the Project. The 65 dBA CNEL exterior noise standards typically apply to outdoor areas where people congregate. In the case of residential projects, the standards typically apply to private yards of single-family homes and first-floor patio areas for multi-family units.

3.3 OPERATIONAL NOISE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property, such as Heritage Village Business Center Project, stationary-source (operational) noise, such as the expected parking lot vehicle movements, loading dock activity, truck/trailer parking activity, truck movements, trash enclosure activity, and roof-top air conditioning units are typically evaluated against standards established under a jurisdiction's Code of Ordinances or General Plan. The City of Menifee Code of Ordinances, Section 9.210.060 Noise Control Regulations, included in Appendix 3.1, outlines the performance standards to control the non-transportation noise impacts. Table 9.210.060-1 (Table 3-1 of this report) establishes the exterior noise level criteria for noise-sensitive residential properties affected by stationary noise sources. For residential properties, the exterior noise level shall not exceed 65 dBA L_{eq} during daytime hours (7:00 a.m. to 10:00 p.m.) and shall not exceed 45 dBA L_{eq} during the nighttime hours (10:00 p.m. to 7:00 a.m.). (15)

TABLE 3-1: OPERATIONAL NOISE STANDARDS

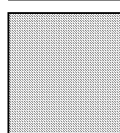
Jurisdiction	Land Use	Time Period	Noise Level Standard (dBA) ^{1,2}
City of Menifee	Residential	Daytime (7:01 a.m. - 10:00 p.m.)	65 dBA L_{eq}
		Nighttime (10:01 p.m. - 7:00 a.m.)	45 dBA L_{eq}

¹ City of Menifee Code of Ordinances, Table 9.210.060-1 (Appendix 3.1).

² L_{eq} represents a steady state sound level containing the same total energy as a time-varying signal over a given period.

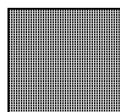
EXHIBIT 3-1: LAND USE COMPATIBILITY FOR COMMUNITY NOISE ENVIRONMENTS

Land Uses	CNEL (dBA)					
	55	60	65	70	75	80
Residential-Low Density Single Family, Duplex, Mobile Homes						
Residential- Multiple Family						
Transient Lodging, Motels, Hotels						
Schools, Libraries, Churches, Hospitals, Nursing Homes						
Auditoriums, Concert Halls, Amphitheaters						
Sports Arena, Outdoor Spectator Sports						
Playgrounds, Neighborhood Parks						
Golf Courses, Riding Stables, Water Recreation, Cemeteries						
Office Buildings, Businesses, Commercial and Professional						
Industrial, Manufacturing, Utilities, Agricultural						



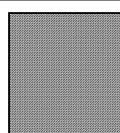
Normally Acceptable:

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 the needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.



Normally Unacceptable:

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



Clearly Unacceptable:

New construction or development generally should not be undertaken.

Source: California Office of Noise Control. Guidelines for the Preparation and Content of Noise Elements of the General Plan. February 1976.
Adapted from the US EPA Office of Noise Abatement Control, Washington D.C. Community Noise. Prepared by Wyle Laboratories.
December 1971.

Source: City of Menifee General Plan, Noise Background Document and Definitions, Table N-b3.

3.4 CONSTRUCTION NOISE STANDARDS

To control noise impacts associated with the construction of the Project, the City of Menifee has established limits to the hours of operation. Section 9.210.060[C] of the City of Menifee Code of Ordinances indicates that private construction projects, located within one-quarter of a mile from an occupied residence, are considered exempt from the Development Code noise standards if they occur within the permitted hours of 6:30 a.m. and 7:00 p.m., with no activity allowed on Sundays and nationally recognized holidays (15). However, neither the City of Menifee General Plan Noise Element or Development Code establish numeric maximum acceptable construction source noise levels at potentially affected receivers, which would allow for a quantified determination of what CEQA constitutes a *substantial temporary or permanent increase in ambient noise levels*. Therefore, a numerical construction threshold based on the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* is used for analysis of daytime construction impacts, as discussed below.

According to the FTA, local noise ordinances are typically not very useful in evaluating construction noise. They usually relate to nuisance and hours of allowed activity, and sometimes specify limits in terms of maximum levels, but are generally not practical for assessing the impact of a construction project. Project construction noise criteria should account for the existing noise environment, the absolute noise levels during construction activities, the duration of the construction, and the adjacent land use. Due to the lack of standardized construction noise thresholds, the FTA provides guidelines that can be considered reasonable criteria for construction noise assessment. The FTA considers a daytime exterior construction noise level of 80 dBA L_{eq} as a reasonable threshold to assess construction noise level impacts based on the FTA's detailed analysis of construction noise criteria, with a nighttime exterior construction noise level of 70 dBA L_{eq} . (16 p. 179)

3.5 VIBRATION STANDARDS

Construction activity can result in varying degrees of ground-borne vibration, depending on the equipment and methods used, distance to the affected structures and soil type. Construction vibration is generally associated with pile driving and rock blasting. Other construction equipment such as air compressors, light trucks, hydraulic loaders, etc., generates little or no ground vibration. (16) To analyze vibration impacts originating from the operation and construction of the Heritage Village Business Center, vibration-generating activities are appropriately evaluated against standards established under a City's Municipal Code, if such standards exist. However, the City of Menifee does not identify specific vibration level limits. Therefore, for analysis purposes, the Caltrans *Transportation and Construction Vibration Guidance Manual*, (11 p. 38) Table 19, vibration damage are used in this noise study to assess potential temporary construction-related impacts at adjacent building locations. The nearest noise sensitive buildings adjacent to the Project site can best be described as "older residential structures" with a maximum acceptable continuous vibration threshold of 0.3 PPV (in/sec).

4 SIGNIFICANCE CRITERIA

The following significance criteria are based on currently adopted guidance provided by Appendix G of the State CEQA Guidelines. (17) For the purposes of this report, impacts would be potentially significant if the Project results in or causes:

- A. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?
- B. Generation of excessive ground-borne vibration or ground-borne noise levels?
- C. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

4.1 NOISE LEVEL INCREASES (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 baseline ambient noise levels, and the location of noise-sensitive receivers to determine if a noise increase represents a significant adverse environmental impact. This approach recognizes *that there is no single noise increase that renders a noise impact significant*. (18) This is primarily because of the wide variation in individual thresholds of annoyance and differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted—the so-called *ambient* environment. In general, the more a new noise level exceeds the previously existing ambient noise level, the less acceptable the new noise level will typically be judged.

4.1.1 Noise-Sensitive Receivers

The Federal Interagency Committee on Noise (FICON) (19) developed guidance to be used for the assessment of project-generated increases in noise levels that consider the ambient noise level. The FICON recommendations are based on studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (CNEL) and equivalent continuous noise level (L_{eq}).

As previously stated, the approach used in this noise study recognizes *that there is no single noise increase that renders a noise impact significant*, based on a 2008 California Court of Appeal ruling on *Gray v. County of Madera*. (18) For example, if the ambient noise environment is quiet (<60 dBA) and the new noise source greatly increases the noise levels, an impact may occur if the noise criteria may be exceeded. Therefore, for this analysis, a *readily perceptible* 5 dBA or greater project-related

noise level increase is considered a significant impact when the without project noise levels are below 60 dBA. Per the FICON, in areas where the without project noise levels range from 60 to 65 dBA, a 3 dBA *barely perceptible* noise level increase appears to be appropriate for most people. When the without project noise levels already exceed 65 dBA, any increase in community noise louder than 1.5 dBA or greater is considered a significant impact if the noise criteria for a given land use is exceeded, since it likely contributes to an existing noise exposure exceedance. The FICON guidance provides an established source of criteria to assess the impacts of substantial temporary or permanent increase in baseline ambient noise levels. Based on the FICON criteria, the amount to which a given noise level increase is considered acceptable is reduced when the without Project (baseline) noise levels are already shown to exceed certain land-use specific exterior noise level criteria. The specific levels are based on typical responses to noise level increases of 5 dBA or *readily perceptible*, 3 dBA or *barely perceptible*, and 1.5 dBA depending on the underlying without Project noise levels for noise-sensitive uses. These levels of increases and their perceived acceptance at noise sensitive receiver locations are consistent with guidance provided by both the Federal Highway Administration (4 p. 9) and Caltrans (20 p. 2_48).

4.1.2 Construction Noise (Substantial Temporary Noise Level Increase)

To control the noise-generating construction activities, the temporary noise level increases over the existing ambient conditions must be considered under CEQA Significance Threshold A. Although noise ordinances vary across jurisdictions, many cities and counties in California, including Los Angeles, San Diego, and San Francisco, set construction noise limits between 75 and 80 dBA L_{eq} and typically restrict construction activities to the daytime hours. In contrast, everyday noise regulations are more stringent because they apply to continuous, long-term noise sources that can significantly impact the quality of life. As a result, many jurisdictions establish daytime residential noise limits around 55 dBA L_{eq} . This suggests that a reasonable 20 dBA increase over the daytime noise limit can be tolerated without significant adverse effects. This is also illustrated in the adoption of many CEQA documents statewide that use an 80 dBA L_{eq} limit for assessing construction impacts while using everyday noise level limits of local noise ordinances in assessing on-site operational impacts.

Therefore, if the Project-related construction noise levels generate a temporary noise level increase over the existing daytime ambient noise levels more than 20 dBA L_{eq} then the Project construction noise increases will be considered a *significant* impact.

4.2 VIBRATION (THRESHOLD B)

As described in Section 3.4, the vibration impacts originating from the construction of Heritage Village Business Center, vibration-generating activities are appropriately evaluated using the Caltrans vibration damage thresholds to assess potential temporary construction-related impacts at adjacent building locations. The nearest noise sensitive buildings adjacent to the Project site can best be described as “older residential structures” with a maximum acceptable continuous vibration threshold of 0.3 PPV (in/sec).

4.3 CEQA GUIDELINES NOT FURTHER ANALYZED (THRESHOLD C)

The nearest airport, which would require additional noise analysis under CEQA Guidelines Appendix G, Guideline C, is the Perris Valley Airport. As previously described in Section 3.5, the Project is located outside the 55 dBA CNEL noise level contours of the Perris Valley Airport. As shown on Exhibit 3-C, the Project site is located outside the 55 dBA CNEL noise level contour boundaries and is considered *clearly acceptable*. Therefore, based on the RC ALUCP compatibility criteria, the potential impacts under CEQA Guidelines Appendix G, Guideline C, are *less than significant* and are not further analyzed in this noise study.

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 that includes the allowable criteria used to identify potentially significant incremental noise level increases.

TABLE 4-1: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Receiving Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
Off-Site Traffic	Noise-Sensitive	If ambient is < 60 dBA CNEL ¹ If ambient is 60 - 65 dBA CNEL ¹ If ambient is > 65 dBA CNEL ¹	≥ 5 dBA CNEL Project increase ≥ 3 dBA CNEL Project increase ≥ 1.5 dBA CNEL Project increase	
Off-Site Traffic	Non-Noise-Sensitive	If ambient is > 70 dBA CNEL ²	≥ 3 dBA CNEL Project increase	
Operational	Noise-Sensitive	Residential Exterior Noise Level ³ If ambient is < 60 dBA Leq ¹ If ambient is 60 - 65 dBA Leq ¹ If ambient is > 65 dBA Leq ¹	65 dBA Leq ≥ 5 dBA Leq Project increase ≥ 3 dBA Leq Project increase ≥ 1.5 dBA Leq Project increase	45 dBA Leq
Construction	Noise-Sensitive	Noise Level Threshold ⁴ Exterior Noise Level Increase ⁵ Vibration Level Threshold ⁶	80 dBA Leq 20 dBA Leq 0.3 PPV (in/sec)	70 dBA Leq

¹ FICON, 1992.

² City of Menifee General Plan Noise Element, Table N-b3.

³ City of Menifee Development Code, Table 9.210.060-1 (Appendix 3.1).

⁴ Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual.

⁵ Temporary construction noise increases that can be tolerated without significant adverse effects.

⁶ Caltrans Transportation and Construction Vibration Manual, April 2020 Table 19

"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

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5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, 24-hour noise level measurements were taken at four 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 5-1 provides the boundaries of the Project study area and the noise level measurement locations. To fully describe the existing noise conditions, long-term noise level measurements were collected by Urban Crossroads, Inc. on Tuesday, July 15, 2025. 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 equivalent daytime and nighttime hourly noise levels. 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. (21)

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 equivalent 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 that 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. (8)

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. (8) 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.

EXHIBIT 5-1: NOISE MEASUREMENT LOCATIONS



LEGEND:

- Site Boundary
- ▲ Measurement Locations

Collecting 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 increase due to the Project's contribution to the ambient noise levels. This approach is necessary to calculate the temporary or permanent increase in ambient noise levels as required by the CEQA Guidelines Environmental Checklist.

5.3 NOISE MEASUREMENT RESULTS

The noise measurements presented below focus on the equivalent or the hourly energy average sound levels (L_{eq}) to describe the existing ambient conditions. Table 5-1 provides the (energy average) noise levels used to describe 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. 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. The daytime and nighttime equivalent noise levels represent the average of all hourly noise levels observed during these time periods expressed as a single number.

TABLE 5-1: AMBIENT NOISE LEVEL MEASUREMENTS

Location ¹	Description	Energy Average Noise Level (dBA L_{eq}) ²	
		Daytime	Nighttime
L1	Located north of the site near the residence at 26105 Sherman Rd.	62.7	58.5
L2	Located north of the site near the residence at 27531 Ethanac Rd.	66.7	58.3
L3	Located south of the site near the residence at 26552 Trumble Rd.	60.9	44.6
L4	Located south of the site near the residence at 26505 Trumble Rd.	59.6	48.6

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 equivalent noise levels used to describe the daytime and nighttime ambient conditions for each of the measurements. Appendix 5.2 provides summary worksheets of the noise levels for each hour as well as the minimum, maximum, L1, L2, L5, L8, L25, L50, L90, L95, and L99 percentile noise levels observed during the daytime and nighttime periods.

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6 TRAFFIC NOISE METHODS AND PROCEDURES

The following section outlines the methods and procedures used to estimate and analyze the future traffic noise environment. Consistent with the City of Menifee General Plan, Table S-1, Maximum Allowable Noise Exposure from Mobile Noise, all transportation-related noise levels for the outdoor activity areas are presented in terms of the 24-hour CNELs. Unlike a simple arithmetic average noise level, CNEL represents the logarithmic summation of the equivalent hourly noise levels with evening and nighttime noise penalties, recognizing that noise may have different impacts on people depending on when it occurs.

6.1 FHWA TRAFFIC NOISE PREDICTION MODEL

The expected roadway noise level increases from vehicular traffic was calculated by Urban Crossroads, Inc. using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. (22) This methodology is commonly used to describe the off-site traffic noise levels throughout Southern California. The FHWA Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL) by vehicle type. REMEL represents the maximum sound level (L_{max}) of individual vehicle "pass by" events by vehicle type when measured at a "reference distance" of 50 feet from the center of the travel lane. This is the same methodology and approach used for the City of Menifee General Plan. (23) In California, the national REMELs are substituted with the California Vehicle Noise (Calveno) Emission Levels. (20) 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. (24)

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 6 off-site study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications per the City of Menifee General Plan Circulation Element, and the vehicle speeds. The ADT volumes used in this study area, presented in Table 6-2, are based on the Heritage Village Business Center Traffic Analysis prepared by Urban Crossroads, Inc. for the following traffic scenarios (25):

- Existing without Project (E)
- Existing with Project (EP)
- Existing plus Ambient plus Cumulative (EAC) 2028 without Project
- Existing plus Ambient plus Cumulative (EACP) 2028 with Project

- Horizon Year 2045 (HY) without Project
- Horizon Year 2045 (HYP) with Project

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 at the boundary of the right-of-way of the receiving adjacent land use, without and with project ADT traffic volumes from the Project traffic analysis. Consistent with the Heritage Village Business Center Traffic Analysis, the Project is anticipated to generate a net total of 1,245 two-way trips per day (actual vehicles) that includes 431 truck trips.

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Receiving Land Use ¹	Classification ²	Distance from Centerline to Receiving Land Use (Feet) ³	Vehicle Speed (mph)
1	Ethanac Rd.	w/o I-215 SB Ramps	Sensitive	Expressway	100'	45
2	Ethanac Rd.	e/o I-215 SB Ramps	Non-Sensitive	Expressway	100'	45
3	Ethanac Rd.	e/o I-215 NB Ramps	Non-Sensitive	Expressway	100'	45
4	Ethanac Rd.	e/o Encanto Rd.	Non-Sensitive	Expressway	100'	45
5	Ethanac Rd.	e/o Trumble Rd.	Sensitive	Expressway	100'	45
6	Ethanac Rd.	e/o Sherman Rd.	Sensitive	Expressway	100'	45
7	Trumble Rd.	s/o Ethanac Rd.	Sensitive	Collector	30'	45
8	Sherman Rd.	n/o Ethanac Rd.	Sensitive	Major	59'	35
9	Sherman Rd.	s/o Ethanac Rd.	Sensitive	Major	59'	35

¹ Based on a review of existing aerial imagery.

² Heritage Valley Business Center (PLN24-0195) Traffic Analysis, Urban Crossroads, Inc.

³ 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 (Actual Vehicles) ¹					
			Existing Without Project	Existing With Project	EAC (2028) Without Project	EACP (2028) With Project	Horizon Year (2045) Without Project	Horizon Year (2045) With Project
1	Ethanac Rd.	w/o I-215 SB Ramps	20,545	20,626	50,761	50,842	55,837	55,918
2	Ethanac Rd.	e/o I-215 SB Ramps	17,124	17,840	41,247	41,963	49,902	50,618
3	Ethanac Rd.	e/o I-215 NB Ramps	16,922	17,923	38,969	39,970	43,768	44,769
4	Ethanac Rd.	e/o Encanto Rd.	14,335	15,336	34,670	35,671	38,137	39,138
5	Ethanac Rd.	e/o Trumble Rd.	13,653	14,084	28,407	28,838	31,248	31,679
6	Ethanac Rd.	e/o Sherman Rd.	9,988	10,086	26,038	26,136	28,642	28,740
7	Trumble Rd.	s/o Ethanac Rd.	1,495	1,942	1,695	2,143	1,865	2,313
8	Sherman Rd.	n/o Ethanac Rd.	2,810	2,875	4,129	4,194	5,205	5,270
9	Sherman Rd.	s/o Ethanac Rd.	337	931	6,157	6,751	6,773	7,367

¹ Heritage Valley Business Center (PLN24-0195) Traffic Analysis, Urban Crossroads, Inc.

To quantify the off-site noise levels, Project-related truck trips were added to the heavy truck category in the FHWA noise prediction model. The addition of the Project-related truck trips increases the percentage of heavy trucks in the vehicle mix. This approach recognizes that the FHWA noise prediction model is significantly influenced by the number of heavy trucks in the vehicle mix. The unadjusted daily Project truck trip-ends were assigned to the individual off-site study area roadway segments based on the Project truck trip distribution percentages documented in the traffic study. Table 6-3 provides the time of day (daytime, evening, and nighttime) vehicle splits and the traffic flow by vehicle type (vehicle mix) used for all without Project traffic scenarios. Tables 6-4 to 6-6 show the with Project vehicle mix. Due to the added Project truck trips, the increase in Project traffic volumes, and the distributions of trucks on the study area road segments, the percentage of autos, medium trucks, and heavy trucks will vary for each of the traffic scenarios. This explains why the existing and future traffic volumes and vehicle mixes vary between seemingly identical study area roadway segments.

TABLE 6-3: TIME OF DAY VEHICLE SPLITS

Time of Day	Vehicle Mix ¹			Time of Day Split ¹
	Autos ²	Medium Trucks ³	Heavy Trucks ⁴	
Daytime	65.15%	5.13%	3.41%	73.69%
Evening	10.90%	0.34%	0.16%	11.40%
Nighttime	13.26%	0.87%	0.78%	14.92%
Daily	89.32%	6.33%	4.35%	100.00%

¹ Based on the 24-hour directional vehicle classification count collected on Ethanac Rd. West of Sherman Road on Tuesday, May 20, 2025, (Heritage Valley Business Center (PLN24-0195) Traffic Analysis, Urban Crossroads, Inc.)

² All vehicles with two axles and four wheels designed primarily for transportation of nine or fewer passengers (automobiles) or transportation of cargo (light trucks).

³ All vehicles with two axles and six wheels designed for transportation of cargo.

⁴ All vehicles with three or more axles designed for the transportation of cargo.

TABLE 6-4: EXISTING WITH PROJECT VEHICLE MIX

ID	Roadway	Segment	With Project ¹			
			Autos	Medium Trucks	Heavy Trucks	Total ²
1	Ethanac Rd.	w/o I-215 SB Ramps	89.36%	6.31%	4.33%	100.00%
2	Ethanac Rd.	e/o I-215 SB Ramps	87.02%	7.09%	5.89%	100.00%
3	Ethanac Rd.	e/o I-215 NB Ramps	87.23%	6.97%	5.80%	100.00%
4	Ethanac Rd.	e/o Encanto Rd.	86.88%	7.08%	6.04%	100.00%
5	Ethanac Rd.	e/o Trumble Rd.	86.16%	7.44%	6.40%	100.00%
6	Ethanac Rd.	e/o Sherman Rd.	89.43%	6.26%	4.30%	100.00%
7	Trumble Rd.	s/o Ethanac Rd.	92.02%	4.73%	3.25%	100.00%
8	Sherman Rd.	n/o Ethanac Rd.	89.59%	6.17%	4.24%	100.00%
9	Sherman Rd.	s/o Ethanac Rd.	47.52%	20.50%	31.98%	100.00%

¹ Total of vehicle mix percentage values rounded to the nearest one-hundredth.

TABLE 6-5: EACP (2027) WITH PROJECT VEHICLE MIX

ID	Roadway	Segment	With Project ¹			
			Autos	Medium Trucks	Heavy Trucks	Total ²
1	Ethanac Rd.	w/o I-215 SB Ramps	89.34%	6.32%	4.34%	100.00%
2	Ethanac Rd.	e/o I-215 SB Ramps	88.34%	6.66%	5.01%	100.00%
3	Ethanac Rd.	e/o I-215 NB Ramps	88.38%	6.62%	5.00%	100.00%
4	Ethanac Rd.	e/o Encanto Rd.	88.26%	6.66%	5.08%	100.00%
5	Ethanac Rd.	e/o Trumble Rd.	87.77%	6.87%	5.35%	100.00%
6	Ethanac Rd.	e/o Sherman Rd.	89.36%	6.31%	4.33%	100.00%
7	Trumble Rd.	s/o Ethanac Rd.	91.78%	4.88%	3.35%	100.00%
8	Sherman Rd.	n/o Ethanac Rd.	89.50%	6.22%	4.27%	100.00%
9	Sherman Rd.	s/o Ethanac Rd.	83.08%	8.45%	8.47%	100.00%

¹ Total of vehicle mix percentage values rounded to the nearest one-hundredth.

TABLE 6-6: HY (2045) WITH PROJECT VEHICLE MIX

ID	Roadway	Segment	With Project ¹			
			Autos	Medium Trucks	Heavy Trucks	Total ²
1	Ethanac Rd.	w/o I-215 SB Ramps	89.33%	6.32%	4.34%	100.00%
2	Ethanac Rd.	e/o I-215 SB Ramps	88.50%	6.60%	4.89%	100.00%
3	Ethanac Rd.	e/o I-215 NB Ramps	88.48%	6.59%	4.93%	100.00%
4	Ethanac Rd.	e/o Encanto Rd.	88.36%	6.63%	5.02%	100.00%
5	Ethanac Rd.	e/o Trumble Rd.	87.91%	6.83%	5.26%	100.00%
6	Ethanac Rd.	e/o Sherman Rd.	89.36%	6.31%	4.33%	100.00%
7	Trumble Rd.	s/o Ethanac Rd.	91.60%	4.98%	3.42%	100.00%
8	Sherman Rd.	n/o Ethanac Rd.	89.47%	6.25%	4.29%	100.00%
9	Sherman Rd.	s/o Ethanac Rd.	83.59%	8.27%	8.13%	100.00%

¹ Total of vehicle mix percentage values rounded to the nearest one-hundredth.

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7 OFF-SITE TRAFFIC NOISE ANALYSIS

To assess the off-site transportation CNEL noise level impacts associated with the development of the Project, noise contours were developed based on the Heritage Village Business Center Traffic Analysis prepared by Urban Crossroads, Inc. (25) 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 for each traffic condition. Appendix 7.1 includes a summary of the dBA CNEL traffic noise level contour worksheets for each of the traffic conditions.

7.2 EXISTING PROJECT TRAFFIC NOISE LEVEL INCREASES

An analysis of existing traffic noise levels plus traffic noise generated by the Project has been included in this report for informational purposes and to fully analyze all the existing traffic scenarios identified in the *Heritage Village Business Center* Traffic Analysis prepared by Urban Crossroads, Inc. Table 7-1 shows the Existing without Project conditions CNEL noise levels. The Existing without-Project exterior noise levels range from 53.5 to 70.7 dBA CNEL without accounting for any noise attenuation features such as noise barriers or topography. Table 7-2 shows the Existing with Project conditions range from 62.7 to 70.9 dBA CNEL. Table 7-5 shows that the Project off-site traffic noise level increases range from less than 0.1 to 11.9 dBA CNEL on the study area roadway segments.

Based on the significance criteria for off-site traffic noise presented in Table 4-1, existing noise-sensitive uses on the following study area roadway segments are shown to experience *significant* off-site traffic noise level increases due to the Project traffic under Existing with Project conditions.

- Sherman Road south of Ethanac Road (Segment #9)

Based on a review of the land uses along this segment, there is one impacted noise-sensitive receiver along Sherman Road south of Ethanac Road. Due to its location, this receiver is also exposed to traffic noise from Ethanac Road. Therefore, additional analysis is necessary to determine if this increase is substantial due to the additional existing noise levels.

The affected receiver is represented by R2, which is 295 feet south of the centerline of Ethanac Road and 80 feet from the centerline of Sherman Road. Based on the distances noise from each of these roadways, the Existing without Project noise levels would be 60.5 dBA CNEL for Ethanac Road and

51.5 dBA CNEL for Sherman Road, which would result in a combined future noise level of 61.0 dBA CNEL at this location. At this same location, the Existing with Project noise levels would be 60.5 dBA CNEL for Ethanac Road and 63.4 dBA CNEL for Sherman Road, which would result in a combined future noise level of 65.2 dBA CNEL at this location. Therefore, the existing noise-sensitive uses along Sherman Road will experience off-site traffic noise level increases of 4.2 dBA CNEL, which is less than the 5 dBA CNEL threshold identified in Table 4-1. It should be noted that the analysis of existing off-site traffic noise levels plus traffic noise generated by the Project scenario will not actually occur since the Project would not be fully constructed and operational until future conditions when the Project is built and fully occupied. All other roadway segments would not experience noise level increases under Existing with Project conditions that would exceed the established thresholds of significance. Therefore, affected noise-sensitive uses will experience *less than significant* off-site traffic noise level increases.

TABLE 7-1: EXISTING WITHOUT PROJECT CONTOURS

ID	Road	Segment	Receiving 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	Ethanac Rd.	w/o I-215 SB Ramps	Sensitive	70.7	111	239	514
2	Ethanac Rd.	e/o I-215 SB Ramps	Non-Sensitive	69.9	98	211	455
3	Ethanac Rd.	e/o I-215 NB Ramps	Non-Sensitive	69.8	97	210	452
4	Ethanac Rd.	e/o Encanto Rd.	Non-Sensitive	69.1	87	188	404
5	Ethanac Rd.	e/o Trumble Rd.	Sensitive	68.9	84	182	391
6	Ethanac Rd.	e/o Sherman Rd.	Sensitive	67.5	68	147	318
7	Trumble Rd.	s/o Ethanac Rd.	Sensitive	66.0	16	35	76
8	Sherman Rd.	n/o Ethanac Rd.	Sensitive	62.7	RW	41	89
9	Sherman Rd.	s/o Ethanac Rd.	Sensitive	53.5	RW	RW	RW

¹ Based on a review of existing aerial imagery.

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 CONTOURS

ID	Road	Segment	Receiving 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	Ethanac Rd.	w/o I-215 SB Ramps	Sensitive	70.7	111	239	514
2	Ethanac Rd.	e/o I-215 SB Ramps	Non-Sensitive	70.9	114	246	531
3	Ethanac Rd.	e/o I-215 NB Ramps	Non-Sensitive	70.9	114	245	529
4	Ethanac Rd.	e/o Encanto Rd.	Non-Sensitive	70.3	105	225	485
5	Ethanac Rd.	e/o Trumble Rd.	Sensitive	70.1	101	218	470
6	Ethanac Rd.	e/o Sherman Rd.	Sensitive	67.5	69	148	318
7	Trumble Rd.	s/o Ethanac Rd.	Sensitive	66.5	17	38	81
8	Sherman Rd.	n/o Ethanac Rd.	Sensitive	62.7	RW	42	90
9	Sherman Rd.	s/o Ethanac Rd.	Sensitive	65.4	RW	62	134

¹ Based on a review of existing aerial imagery.

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.

7.3 EACP (2028) PROJECT TRAFFIC NOISE LEVEL INCREASES

Table 7-3 presents the EAC (2028) without Project conditions CNEL noise levels. The EAC (2028) without Project exterior noise levels range from 64.4 to 74.6 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-4 shows the EAC (2028) with Project conditions ranging from 64.4 to 74.6 dBA CNEL. Table 7-6 shows that the Project off-site traffic noise level increases range from less than 0.1 to 2.5 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Table 4-1, existing noise-sensitive uses on the following study area roadway segment are shown to experience *significant* off-site traffic noise level increases due to the Project traffic under Horizon Year with Project conditions.

- Sherman Road south of Ethanac Road (Segment #9)

As before, there is one impacted noise-sensitive receiver along Sherman Road south of Ethanac Road. Due to its location, this receiver is also exposed to traffic noise from Ethanac Road. Therefore, additional analysis is necessary to determine if this increase is substantial due to the additional existing noise levels. The affected receiver is represented by R2, which is 295 feet south of the centerline of Ethanac Road and 80 feet from the centerline of Sherman Road. Based on the distances noise from each of these roadways, the EAC (2028) without Project noise levels would be 64.7 dBA CNEL for Ethanac Road and 64.1 dBA CNEL for Sherman Road, which would result in a combined future noise level of 67.4 dBA CNEL at this location. At this same location, the EAC (2028) with Project noise levels would be 64.7 dBA CNEL for Ethanac Road and 66.6 dBA CNEL for Sherman Road, which would result in a combined future noise level of 68.8 dBA CNEL at this location. Therefore, the affected noise-sensitive use along Sherman Road will experience an off-site traffic noise level increase of 1.4 dBA CNEL, which is lower than the 1.5 dBA CNEL threshold identified in Table 4-1. All other roadway segments would not experience noise level increases under Existing

with Project conditions that would exceed the established thresholds of significance. Therefore, affected noise-sensitive uses will experience *less than significant* off-site traffic noise level increases.

TABLE 7-3: EAC (2028) WITHOUT PROJECT CONTOURS

ID	Road	Segment	Receiving 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	Ethanac Rd.	w/o I-215 SB Ramps	Sensitive	74.6	202	436	939
2	Ethanac Rd.	e/o I-215 SB Ramps	Non-Sensitive	73.7	176	380	818
3	Ethanac Rd.	e/o I-215 NB Ramps	Non-Sensitive	73.4	170	365	787
4	Ethanac Rd.	e/o Encanto Rd.	Non-Sensitive	72.9	157	338	728
5	Ethanac Rd.	e/o Trumble Rd.	Sensitive	72.1	137	296	638
6	Ethanac Rd.	e/o Sherman Rd.	Sensitive	71.7	130	279	602
7	Trumble Rd.	s/o Ethanac Rd.	Sensitive	66.6	18	38	82
8	Sherman Rd.	n/o Ethanac Rd.	Sensitive	64.4	RW	54	116
9	Sherman Rd.	s/o Ethanac Rd.	Sensitive	66.1	32	70	151

¹ Based on a review of existing aerial imagery.

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: EACP (2028) WITH PROJECT CONTOURS

ID	Road	Segment	Receiving 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	Ethanac Rd.	w/o I-215 SB Ramps	Sensitive	74.6	202	436	939
2	Ethanac Rd.	e/o I-215 SB Ramps	Non-Sensitive	74.1	189	406	875
3	Ethanac Rd.	e/o I-215 NB Ramps	Non-Sensitive	73.9	183	393	847
4	Ethanac Rd.	e/o Encanto Rd.	Non-Sensitive	73.5	170	367	791
5	Ethanac Rd.	e/o Trumble Rd.	Sensitive	72.7	151	325	701
6	Ethanac Rd.	e/o Sherman Rd.	Sensitive	71.7	130	280	602
7	Trumble Rd.	s/o Ethanac Rd.	Sensitive	67.0	19	41	87
8	Sherman Rd.	n/o Ethanac Rd.	Sensitive	64.4	RW	54	116
9	Sherman Rd.	s/o Ethanac Rd.	Sensitive	68.6	48	103	222

¹ Based on a review of existing aerial imagery.

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.

7.4 HY (2045) PROJECT TRAFFIC NOISE LEVEL INCREASES

Table 7-5 presents the Horizon Year (2045) without Project conditions, expected to range from 65.4 to 75.0 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-6 shows the HY (2045) with Project conditions will range from 65.4 to 75.0 dBA CNEL. Table 7-9 shows that the Project off-site traffic noise level increases will range from less than

0.1 to 2.4 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Table 4-1, existing noise-sensitive uses on the following study area roadway segment are shown to experience *significant* off-site traffic noise level increases due to the Project traffic under Horizon Year with Project conditions.

- Sherman Road south of Ethanac Road (Segment #9)

As before, there is one impacted noise-sensitive receiver along Sherman Road south of Ethanac Road. Due to its location, this receiver is also exposed to traffic noise from Ethanac Road. Therefore, additional analysis is necessary to determine if this increase is substantial due to the additional existing noise levels. The affected receiver is represented by R2, which is 295 feet south of the centerline of Ethanac Road and 80 feet from the centerline of Sherman Road. Based on the combined distances from each of these roadways, the Horizon Year (2045) without Project noise levels would be 65.1 dBA CNEL for Ethanac Road and 66.9 dBA CNEL for Sherman Road, which would result in a combined future noise level of 67.8 dBA CNEL at this location. At this same location, the Horizon Year (2045) with Project noise levels would be 65.1 dBA CNEL for Ethanac Road and 66.9 dBA CNEL for Sherman Road, which would result in a combined future noise level of 69.1 dBA CNEL at this location. Therefore, the affected noise-sensitive use along Sherman Road will experience an off-site traffic noise level increase of 1.3 dBA CNEL, which is lower than the 1.5 dBA CNEL threshold identified in Table 4-1. All other roadway segments would not experience noise level increases under Existing with Project conditions that would exceed the established thresholds of significance. Therefore, affected noise-sensitive uses will experience *less than significant* off-site traffic noise level increases.

TABLE 7-5: HY (2045) WITHOUT PROJECT CONTOURS

ID	Road	Segment	Receiving 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	Ethanac Rd.	w/o I-215 SB Ramps	Sensitive	75.0	216	465	1,001
2	Ethanac Rd.	e/o I-215 SB Ramps	Non-Sensitive	74.5	200	431	929
3	Ethanac Rd.	e/o I-215 NB Ramps	Non-Sensitive	73.9	183	395	851
4	Ethanac Rd.	e/o Encanto Rd.	Non-Sensitive	73.3	167	360	776
5	Ethanac Rd.	e/o Trumble Rd.	Sensitive	72.5	146	315	680
6	Ethanac Rd.	e/o Sherman Rd.	Sensitive	72.1	138	298	641
7	Trumble Rd.	s/o Ethanac Rd.	Sensitive	67.0	19	41	88
8	Sherman Rd.	n/o Ethanac Rd.	Sensitive	65.4	RW	63	135
9	Sherman Rd.	s/o Ethanac Rd.	Sensitive	66.5	35	75	161

¹ Based on a review of existing aerial imagery.

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: HY (2045) WITH PROJECT CONTOURS

ID	Road	Segment	Receiving 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	Ethanac Rd.	w/o I-215 SB Ramps	Sensitive	75.0	216	465	1,001
2	Ethanac Rd.	e/o I-215 SB Ramps	Non-Sensitive	74.9	212	456	983
3	Ethanac Rd.	e/o I-215 NB Ramps	Non-Sensitive	74.4	196	422	909
4	Ethanac Rd.	e/o Encanto Rd.	Non-Sensitive	73.8	180	388	836
5	Ethanac Rd.	e/o Trumble Rd.	Sensitive	73.0	160	344	741
6	Ethanac Rd.	e/o Sherman Rd.	Sensitive	72.1	138	298	642
7	Trumble Rd.	s/o Ethanac Rd.	Sensitive	67.3	20	43	93
8	Sherman Rd.	n/o Ethanac Rd.	Sensitive	65.4	RW	63	135
9	Sherman Rd.	s/o Ethanac Rd.	Sensitive	68.9	50	107	230

¹ Based on a review of existing aerial imagery.

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 7-7: EXISTING WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use ¹	CNEL at Receiving Land Use (dBA) ²			Incremental Noise Level Increase Threshold ³	
				No Project	With Project	Project Addition	Limit	Exceeded?
1	Ethanac Rd.	w/o I-215 SB Ramps	Sensitive	70.7	70.7	0.0	1.5	No
2	Ethanac Rd.	e/o I-215 SB Ramps	Non-Sensitive	69.9	70.9	1.0	n/a	No
3	Ethanac Rd.	e/o I-215 NB Ramps	Non-Sensitive	69.8	70.9	1.1	n/a	No
4	Ethanac Rd.	e/o Encanto Rd.	Non-Sensitive	69.1	70.3	1.2	n/a	No
5	Ethanac Rd.	e/o Trumble Rd.	Sensitive	68.9	70.1	1.2	1.5	No
6	Ethanac Rd.	e/o Sherman Rd.	Sensitive	67.5	67.5	0.0	1.5	No
7	Trumble Rd.	s/o Ethanac Rd.	Sensitive	66.0	66.5	0.5	1.5	No
8	Sherman Rd.	n/o Ethanac Rd.	Sensitive	62.7	62.7	0.0	3.0	No
9	Sherman Rd.	s/o Ethanac Rd.	Sensitive	53.5	65.4	11.9	5.0	Yes

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 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)?

"n/a" Per the City of Menifee General Plan Noise Element, Noise and Land Use Compatibility Guidelines, unmitigated normally acceptable exterior noise levels of less than 70 dBA CNEL are considered less than significant and a barely perceptible 3 dBA or greater noise level increase is considered a significant impact when the non-noise sensitive noise level is greater than the normally acceptable 70 dBA CNEL land use compatibility guidelines.

TABLE 7-8: EACP (2028) WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use ¹	CNEL at Receiving Land Use (dBA) ²			Incremental Noise Level Increase Threshold ³	
				No Project	With Project	Project Addition	Limit	Exceeded?
1	Ethanac Rd.	w/o I-215 SB Ramps	Sensitive	74.6	74.6	0.0	1.5	No
2	Ethanac Rd.	e/o I-215 SB Ramps	Non-Sensitive	73.7	74.1	0.4	n/a	No
3	Ethanac Rd.	e/o I-215 NB Ramps	Non-Sensitive	73.4	73.9	0.5	n/a	No
4	Ethanac Rd.	e/o Encanto Rd.	Non-Sensitive	72.9	73.5	0.6	n/a	No
5	Ethanac Rd.	e/o Trumble Rd.	Sensitive	72.1	72.7	0.6	1.5	No
6	Ethanac Rd.	e/o Sherman Rd.	Sensitive	71.7	71.7	0.0	1.5	No
7	Trumble Rd.	s/o Ethanac Rd.	Sensitive	66.6	67.0	0.4	1.5	No
8	Sherman Rd.	n/o Ethanac Rd.	Sensitive	64.4	64.4	0.0	3.0	No
9	Sherman Rd.	s/o Ethanac Rd.	Sensitive	66.1	68.6	2.5	1.5	Yes

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 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)?

"n/a" Per the City of Menifee General Plan Noise Element, Noise and Land Use Compatibility Guidelines, unmitigated normally acceptable exterior noise levels of less than 70 dBA CNEL are considered less than significant and a barely perceptible 3 dBA or greater noise level increase is considered a significant impact when the non-noise sensitive noise level is greater than the normally acceptable 70 dBA CNEL land use compatibility guidelines.

TABLE 7-9: HY (2045) WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use ¹	CNEL at Receiving Land Use (dBA) ²			Incremental Noise Level Increase Threshold ³	
				No Project	With Project	Project Addition	Limit	Exceeded?
1	Ethanac Rd.	w/o I-215 SB Ramps	Sensitive	75.0	75.0	0.0	1.5	No
2	Ethanac Rd.	e/o I-215 SB Ramps	Non-Sensitive	74.5	74.9	0.4	n/a	No
3	Ethanac Rd.	e/o I-215 NB Ramps	Non-Sensitive	73.9	74.4	0.5	n/a	No
4	Ethanac Rd.	e/o Encanto Rd.	Non-Sensitive	73.3	73.8	0.5	n/a	No
5	Ethanac Rd.	e/o Trumble Rd.	Sensitive	72.5	73.0	0.5	1.5	No
6	Ethanac Rd.	e/o Sherman Rd.	Sensitive	72.1	72.1	0.0	1.5	No
7	Trumble Rd.	s/o Ethanac Rd.	Sensitive	67.0	67.3	0.3	1.5	No
8	Sherman Rd.	n/o Ethanac Rd.	Sensitive	65.4	65.4	0.0	1.5	No
9	Sherman Rd.	s/o Ethanac Rd.	Sensitive	66.5	68.9	2.4	1.5	Yes

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 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)?

"n/a" Per the City of Menifee General Plan Noise Element, Noise and Land Use Compatibility Guidelines, unmitigated normally acceptable exterior noise levels of less than 70 dBA CNEL are considered less than significant and a barely perceptible 3 dBA or greater noise level increase is considered a significant impact when the non-noise sensitive noise level is greater than the normally acceptable 70 dBA CNEL land use compatibility guidelines.

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8 RECEIVER LOCATIONS

To assess the potential for long-term operational and short-term construction noise impacts, the following receiver locations, as shown on Exhibit 8-1, were identified as representative locations for analysis. 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. 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, eight receiver locations in the vicinity of the Project site were identified. 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 an existing residence near the Project site, approximately 281 feet north of the Project site. Receiver R1 is placed at the façade 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 residence near the Project site, approximately 532 feet northeast of the Project site. Receiver R2 is placed at the façade 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 residence near the Project site, approximately 494 feet south of the Project site. Receiver R3 is placed at the façade 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 residence near the Project site, approximately 510 feet west of the Project site. Receiver R4 is placed at the façade facing the Project site. A 24-hour noise measurement was taken near this location, L4, to describe the existing ambient noise environment.

EXHIBIT 8-1: RECEIVER LOCATIONS



LEGEND:

Site Boundary
 Receiver Locations
 —●— Distance from receiver to Project site boundary (in feet)

9 OPERATIONAL NOISE ANALYSIS

This section analyzes the potential stationary-source operational noise impacts at the nearby receiver locations, identified in Section 8, resulting from the operation of the Heritage Village Business Center Project. To conservatively describe the potential worst-case noise environment, Exhibit 9-1 presents the noise sources used to assess the operational noise levels.

9.1 OPERATIONAL NOISE SOURCES

This operational noise analysis is intended to describe noise level impacts associated with the expected typical 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. Consistent with similar warehouse and industrial uses, the Project business operations would primarily be conducted within the enclosed buildings, except for traffic movement, parking, and loading and unloading of trucks at designated loading bays. The on-site Project-related noise sources are expected to include: parking lot vehicle movements, loading dock activity, truck/trailer parking activity, truck movements, trash enclosure activity, and roof-top air conditioning units.

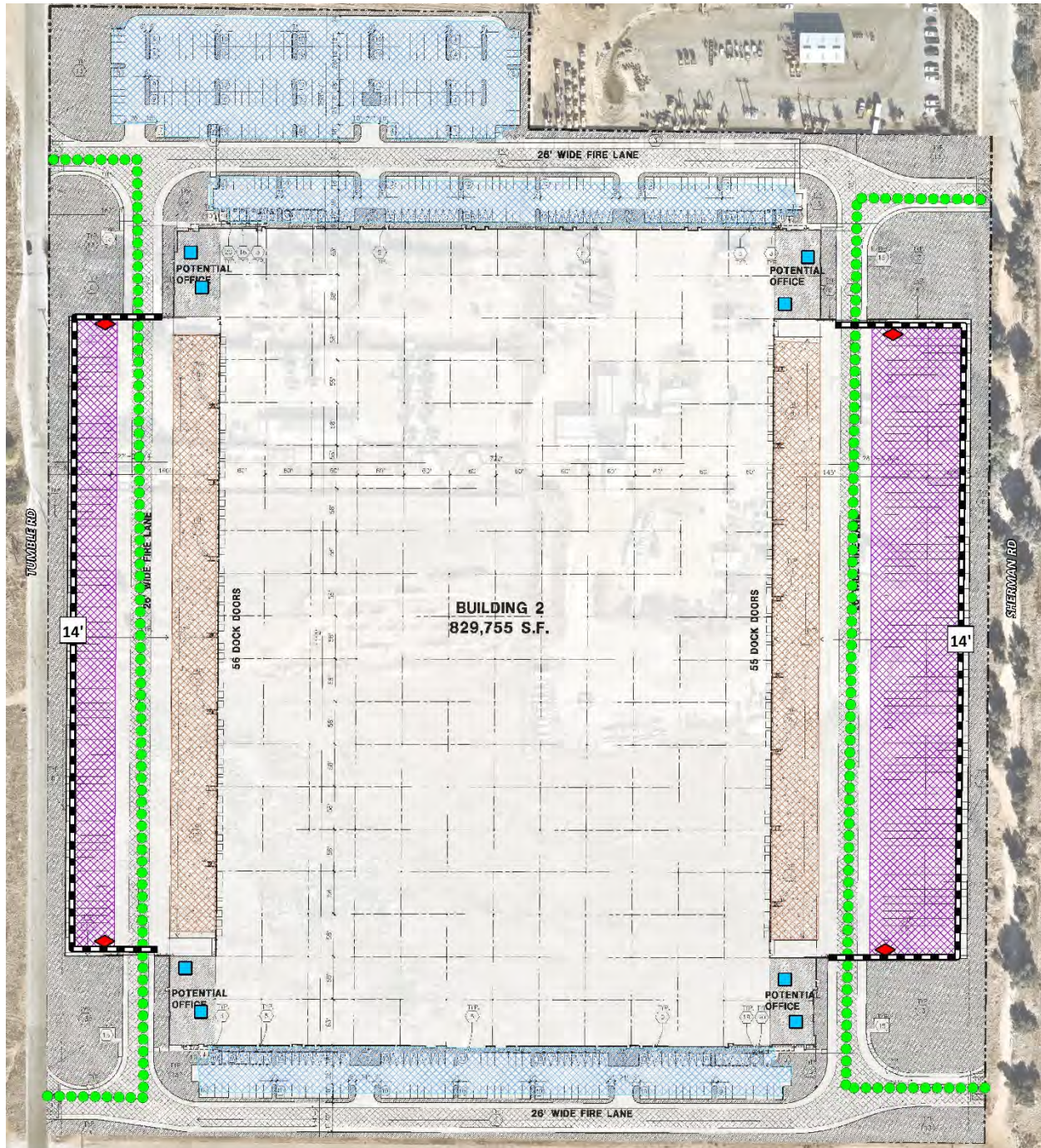
9.2 REFERENCE NOISE LEVELS

To estimate the Project's 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 Project. This section provides a detailed description of the reference noise level measurements shown in Table 9-1 used to estimate the Project's operational noise impacts. It is important to note that the following projected noise levels assume the worst-case noise environment with all noise source activity 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 precision sound level meter (serial number 01146). The LxT sound level meter was calibrated using a Larson-Davis calibrator, Model CAL 200, which 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. (21)

EXHIBIT 9-1: OPERATIONAL NOISE SOURCE LOCATIONS



LEGEND:



- | | | |
|--------------------------------|------------------------------------|-----------------------|
| Roof-Top Air Conditioning Unit | Truck Parking Activity | Truck Movements |
| Trash Enclosure Activity | Cold Storage Loading Dock Activity | Planned Noise Barrier |
| | Parking Lot Vehicle Movements | |

TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS

Reference 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		
Parking Lot Vehicle Movements	5'	60	60	52.6	84.2
Cold Storage Loading Dock Activity	8'	60	60	79.9	111.5
Truck/Trailer Parking Activity	8'	60	60	62.8	94.4
Truck Movements	8'	60	60	61.6	93.2
Trash Enclosure Activity	8'	10	10	57.4	89.0
Roof-Top Air Conditioning Units	5'	39	28	57.3	88.9

¹ Reference noise level collected 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. Numbers may vary due to size differences between point and area noise sources.

9.2.2 Parking Lot Vehicle Movements

To describe the on-site parking lot activity, a long-term reference noise level measurement was collected in the center of activity within the staff parking lot of a warehouse distribution center. At 50 feet from the center of activity, the parking lot produced a reference noise level of 52.6 dBA L_{eq}. The parking lot noise levels are mainly due to cars pulling in and out of parking spaces in combination with car doors opening and closing.

9.2.3 Cold Storage Loading Dock Activity

The reference cold storage loading dock activities are intended to describe the typical outdoor operational noise activities associated with the Project. This includes truck idling, reefer activity (refrigerator truck/cold storage), deliveries, backup alarms, trailer docking, including a combination of tractor-trailer semi-trucks, two-axle delivery trucks, and background operation activities. Since the noise levels generated by cold storage loading dock activity can be higher due to the use of refrigerated trucks or reefers, this reference noise level conservatively assumes that all loading dock activity is associated with cold storage facilities. The reference noise level measurement was taken in the center of the loading dock activity area and represents multiple concurrent noise sources resulting in a combined noise level of 79.9 dBA L_{eq} at a uniform distance of 50 feet. Specifically, the reference noise level measurement represents one truck located approximately 30 feet from the noise level meter, with another truck passing by to park roughly 20 feet away, both with their engines idling. Throughout the reference noise level measurement, a separate docked and running reefer truck was located approximately 50 feet east of the measurement location. Additional background noise sources included truck pass-by noise, truck drivers talking to each other next to docked trucks, and air brake release noise when trucks were parked.

9.2.4 Truck/Trailer Parking Activity

To evaluate the noise levels associated with truck idling, backup alarms, trailer movements, and storage activities, Urban Crossroads collected a reference noise level measurement at an existing parcel hub facility to describe the potential operational noise levels associated with Project operational activities. The measured reference noise level at 50 feet from the activity was measured at 62.8 dBA L_{eq} . The reference noise level measurement includes a semi-truck with trailer pass-by event, background switcher cab trailer towing, drop-off, idling, and backup alarm events. Noise associated with trailer storage activity is expected to operate for the entire hour (60 minutes).

9.2.5 Truck Movements

The truck movements represent multiple heavy trucks entering and exiting the outdoor loading dock area, producing a reference noise level of 61.6 dBA L_{eq} at 50 feet. The noise sources included at this measurement location account for trucks entering and exiting the Project driveways and maneuvering in and out of the outdoor loading dock activity area.

9.2.6 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 the concrete floor sounds, dumpster movement on metal wheels, and 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 57.4 dBA L_{eq} for the trash enclosure activity. The reference noise level describes the expected noise source activities associated with the trash enclosures for the Project's proposed building.

9.2.7 Roof-Top Air Conditioning Units

The noise level measurements describe a single mechanical roof-top air conditioning unit. The reference noise level represents a Lennox SCA120 series 10-ton model packaged air conditioning unit. At the uniform reference distance of 50 feet, the reference noise level is 57.3 dBA L_{eq} . Based on the typical operating conditions observed over a four-day measurement period, the roof-top air conditioning units are estimated to operate for an average 39 minutes per hour during the daytime hours, and 28 minutes per hour during the nighttime hours. These operating conditions reflect peak summer cooling requirements with measured temperatures approaching 96 degrees Fahrenheit (°F) with average daytime temperatures of 82°F. For this noise analysis, the air conditioning units are expected to be located on the roof of the Project buildings.

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 dBA L_{eq} 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 Project operations that include parking lot vehicle movements, loading dock activity, truck/trailer parking activity, truck movements, trash enclosure activity, and roof-top air conditioning units, 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. Table 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 35.7 to 41.5 dBA L_{eq}.

TABLE 9-2: DAYTIME PROJECT OPERATIONAL NOISE LEVELS

Noise Source ¹	Operational Noise Levels by Receiver Location (dBA L _{eq})			
	R1	R2	R3	R4
Parking Lot Vehicle Movements	29.3	23.4	24.8	21.8
Loading Dock Activity	21.7	39.3	21.3	39.4
Truck Parking Activity	25.6	31.4	25.0	31.5
Truck Movements	30.1	30.8	29.4	31.1
Trash Enclosure Activity	30.1	31.7	29.7	32.0
Roof-Top Air Conditioning Units	31.3	29.7	30.5	29.2
Total (All Noise Sources)	36.8	41.4	35.7	41.5

¹ See Exhibit 9-1 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 existing off-site receiver locations are expected to range from 34.8 to 41.3 dBA Leq. The differences between the daytime and nighttime noise levels are largely related to the estimated duration of noise activity as outlined in Table 9-1. Appendix 9.1 includes the detailed noise model inputs.

TABLE 9-3: NIGHTTIME PROJECT OPERATIONAL NOISE LEVELS

Noise Source ¹	Operational Noise Levels by Receiver Location (dBA Leq)			
	R1	R2	R3	R4
Parking Lot Vehicle Movements	29.3	23.4	24.8	21.8
Loading Dock Activity	21.7	39.3	21.3	39.4
Truck Parking Activity	25.6	31.4	25.0	31.5
Truck Movements	29.2	29.8	28.4	30.1
Trash Enclosure Activity	30.1	31.7	29.7	32.0
Roof-Top Air Conditioning Units	28.9	27.3	28.0	26.8
Total (All Noise Sources)	36.0	41.2	34.8	41.3

¹ See Exhibit 9-1 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 unmitigated Project-only operational noise levels are evaluated against exterior noise level thresholds based on the exterior noise level standards at nearby receiver locations. Table 9-4 shows that the mitigated operational noise levels associated with the Project will not exceed the daytime and nighttime exterior noise level standards at the existing nearby noise-sensitive receiver locations. Therefore, the mitigated 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	36.8	36.0	65.0	45.0	No	No
R2	41.4	41.2	65.0	45.0	No	No
R3	35.7	34.8	65.0	45.0	No	No
R4	41.5	41.3	65.0	45.0	No	No

¹ See Exhibit 8-1 for the receiver locations.

² Project unmitigated operational noise levels as shown in Tables 9-2 and 9-3.

³ Exterior noise level standards, as shown in 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 that may be 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:

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

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 in the existing ambient noise environment. Noise levels that would be experienced at receiver locations when Project-source noise is added to the daytime and nighttime ambient conditions are presented in Tables 9-5 and 9-6, respectively. As indicated in Table 9-5, the Project will generate daytime operational noise increases ranging from less than 0.1 to 0.1 dBA L_{eq} at the nearest receiver locations. Table 9-6 shows that the Project will generate nighttime operational noise level increases ranging from less than 0.1 to 0.7 dBA L_{eq} at the nearest receiver locations. Project-related operational noise level increases would not exceed the operational noise level increase significance criteria presented in Table 4-1. Therefore, Project-related operational noise level increases at the sensitive receiver locations will be *less than significant*.

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	36.8	L1	62.7	62.7	0.0	5.0	No
R2	41.4	L2	66.7	66.7	0.0	1.5	No
R3	35.7	L3	60.9	60.9	0.0	5.0	No
R4	41.5	L4	59.6	59.7	0.1	5.0	No

¹ See Exhibit 8-1 for the receiver locations.

² Total Project daytime operational noise levels as shown in Table 9-2.

³ Reference noise level measurement locations as shown on Exhibit 5-A.

⁴ Observed daytime ambient noise levels as shown in Table 5-1.

⁵ Represents the combined ambient conditions plus the Project activities.

⁶ The noise level increase expected with the addition of the Project activities.

⁷ Significance increase criteria as shown in 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	36.0	L1	58.5	58.5	0.0	5.0	No
R2	41.2	L2	58.3	58.4	0.1	5.0	No
R3	34.8	L3	44.6	45.0	0.4	5.0	No
R4	41.3	L4	48.6	49.3	0.7	5.0	No

¹ See Exhibit 8-A for the receiver locations.

² Total Project nighttime operational noise levels as shown in Table 9-3.

³ Reference noise level measurement locations as shown on Exhibit 5-A.

⁴ Observed nighttime ambient noise levels as shown in Table 5-1.

⁵ Represents the combined ambient conditions plus the Project activities.

⁶ The noise level increase expected with the addition of the Project activities.

⁷ Significance increase criteria as shown in Table 4-1.

10 CONSTRUCTION IMPACTS

This section analyzes potential impacts resulting from the short-term construction activities associated with the development of the Project. Exhibit 10-1 shows the construction noise source activity in relation to the nearest sensitive receiver locations previously described in Section 8. Section 9.210.060[C] of the City of Menifee Code of Ordinances, provided in Appendix 3.1, indicates that construction located one-quarter of a mile or more from an inhabited dwelling is permitted anytime, and construction within one-quarter of a mile from an inhabited dwelling is permitted Monday through Saturday, except nationally recognized holidays, between 6:30 a.m. and 7:00 p.m. No construction is permitted on Sunday or nationally recognized holidays. (26)

10.1 CONSTRUCTION NOISE LEVELS

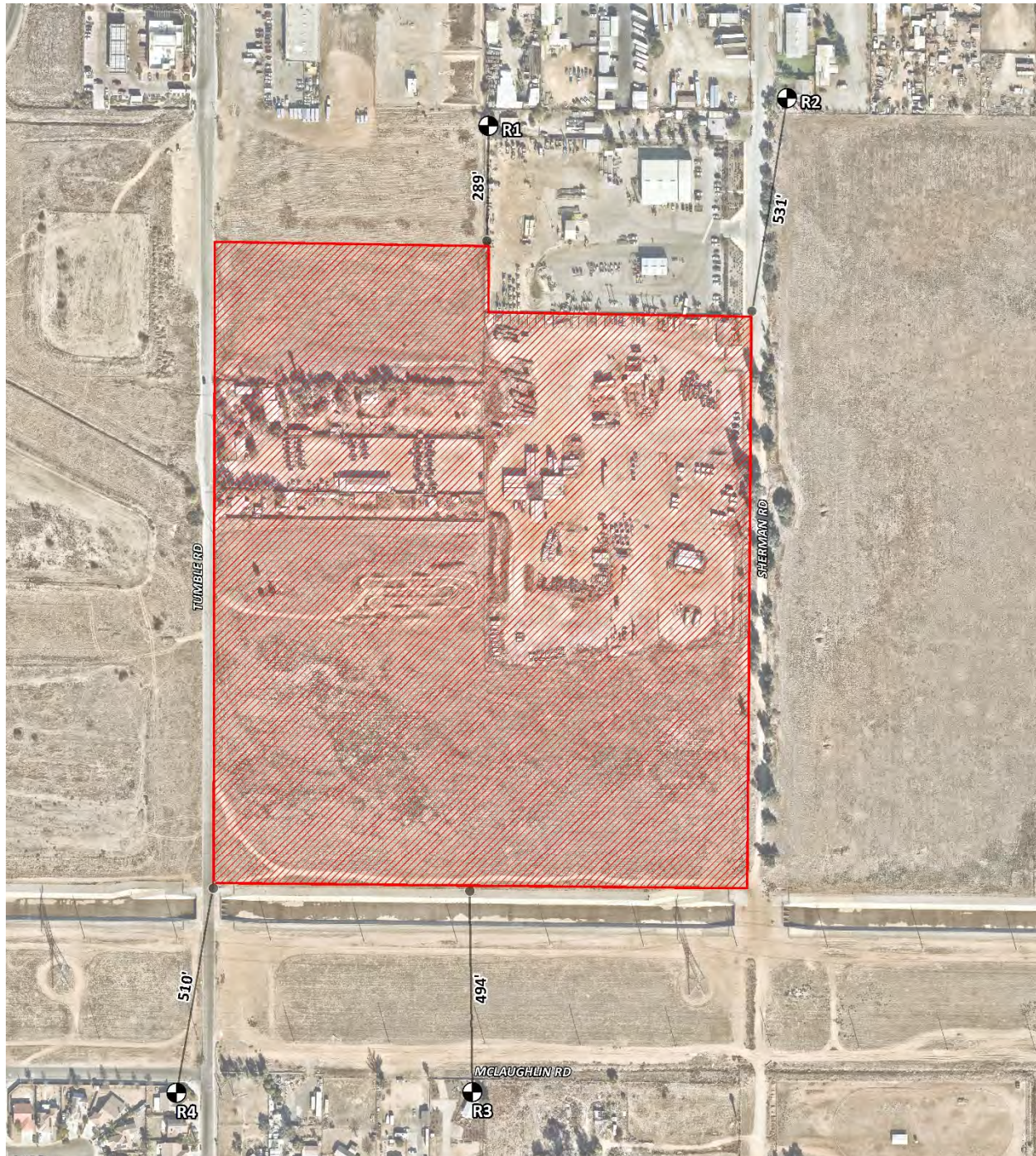
The FTA *Transit Noise and Vibration Impact Assessment Manual* recognizes that construction projects are accomplished in several different stages and outlines the procedures for assessing noise impacts during construction. Each stage has a specific equipment mix, depending on the work to be completed during that stage. As a result of the equipment mix, each stage has its own noise characteristics; some stages have higher continuous noise levels than others, and some have higher impact noise levels than others. The Project construction activities are expected to occur in the following stages:

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

10.2 CONSTRUCTION REFERENCE NOISE LEVELS

To describe construction noise activities, this construction noise analysis was prepared using reference construction equipment noise levels from the Federal Highway Administration (FHWA), which published the Roadway Construction Noise Model (RCNM), which includes a national database of construction equipment reference noise emission levels. (27) The RCNM equipment database provides a comprehensive list of the noise-generating characteristics of specific types of construction equipment. In addition, the database provides an acoustical usage factor to estimate the fraction of time each piece of construction equipment is operating at full power (i.e., its loudest condition) during a construction operation. According to the EPA, FTA, and FHWA, the overall construction noise level is governed primarily by the noisiest pieces of equipment. The quieter pieces do not affect the overall level, but they do reduce the magnitude of the fluctuations in the noise level. Therefore, a rough estimate of the noise level need only include the noisiest pieces of equipment expected at the site. (28) (8) (29) Consistent with FHWA and FTA guidance for detailed construction noise assessment, Table 10-1 presents the combined noise levels for the loudest construction activities expected for each stage, assuming all equipment operates simultaneously.

EXHIBIT 10-1: CONSTRUCTION NOISE SOURCE LOCATIONS



LEGEND:

Construction Activity
 Receiver Locations
 —●— Distance from receiver to construction activity (in feet)

TABLE 10-1: CONSTRUCTION REFERENCE NOISE LEVELS

Construction Stage	Reference Construction Equipmnet ¹	Reference Noise Level @ 50 Feet (dBA L _{eq})	Composite Reference Noise Level (dBA L _{eq}) ²	Reference Power Level (dBA L _w) ³
Demolition	Concrete Saw	83	86.1	117.7
	Excavator	77		
	Jack Hammer	82		
Site Preparation	Tractor	80	82.9	114.5
	Front End Loader	75		
	Dozer	78		
Grading	Tractor	80	84.2	115.9
	Grader	81		
	Compactor (ground)	76		
Building Construction	Crane	73	82.1	113.7
	Generator	78		
	Gradall	79		
Paving	Paver	74	77.8	109.5
	Dump Truck	72		
	Roller	73		
Architectural Coating	Man Lift	68	76.2	107.8
	Compressor (air)	74		
	Generator (<25kVA)	70		

¹ FHWA Road Construction Noise Model.

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.

³ Sound power level represents the total amount of acoustical energy (noise level) produced by a sound source, independent of distance or surroundings.

10.3 CONSTRUCTION NOISE ANALYSIS

Construction projects involve various stages, and activities frequently shift from one location to another. For example, during site preparation and grading, noise-generating activities may concentrate in an area for a short period to remove an obstruction, while the majority of the grading involves the equipment moving back and forth in a predictable pattern throughout the site; building construction and foundation work generally concentrate near the building footprint, while paving generally involves a predictable pattern of movement throughout the site. Therefore, construction activities are best evaluated as multiple moving point sources within the construction area since the speed and power of the equipment vary, and the equipment constantly changes position in terms of its distance and direction relative to the receivers. (8) (30) Using the reference construction equipment noise levels and the CadnaA noise prediction model, calculations of the Project construction noise level impacts by phase at the nearby sensitive receiver locations were completed. To account for the dynamic nature of construction activities, the CadnaA construction noise analysis evaluates the noise source activities as multiple moving point sources, or construction crews, within

the limits of construction. Construction impacts are based on the loudest activity and the highest noise level calculated at each receiver location. As shown in Table 10-2, the highest construction noise levels are expected to range from 58.5 to 61.4 dBA L_{eq} at the nearby receiver locations. Appendix 10.1 includes the detailed CadnaA construction noise model inputs.

TABLE 10-2: CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

Receiver Location ¹	Construction Noise Levels (dBA L_{eq})						
	Demolition	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Levels ²
R1	61.4	58.2	59.5	57.4	53.1	51.5	61.4
R2	60.0	56.8	58.1	56.0	51.7	50.1	60.0
R3	58.6	55.4	56.7	54.6	50.3	48.7	58.6
R4	58.5	55.3	56.6	54.5	50.2	48.6	58.5

¹ Construction noise source and receiver locations are shown in Exhibit 10-1.

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 PROJECT SITE CONSTRUCTION NOISE LEVEL COMPLIANCE

To evaluate whether the Project will generate potentially significant short-term noise levels at the 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 in Table 10-3. Therefore, the noise impacts due to the Project construction noise would not exceed the reasonable daytime noise level limit of 80 dBA L_{eq} at any receiver location.

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	61.4	80	No
R2	60.0	80	No
R3	58.6	80	No
R4	58.5	80	No

¹ Construction noise source and receiver locations are shown on Exhibit 10-1.

² Highest construction noise level calculations based on distance from the construction noise source activity to the nearest receiver locations, as shown in Table 10-2.

³ Construction noise level thresholds as shown in Table 4-1.

⁴ Do the estimated Project construction noise levels exceed the construction noise level threshold?

10.5 TEMPORARY CONSTRUCTION NOISE LEVEL INCREASES

To describe the temporary Project construction noise level contributions to the existing ambient noise environment, the Project construction noise levels were combined with the existing ambient

noise levels measurements at the nearest off-site receiver locations. The difference between the combined Project-construction and ambient noise levels is used to describe the construction noise level contributions. Temporary noise level increases that would be experienced at sensitive receiver locations when the Project construction-source noise is added to the ambient daytime conditions are presented in Table 10-4. A temporary noise level increase of 20 dBA is considered *potentially significant*.

As indicated in Table 10-4, the Project construction will contribute to temporary noise level increases ranging from 0.8 to 2.5 dBA L_{eq} during the daytime hours at the nearest receiver locations. The unmitigated construction noise analysis shows that the nearest receiver locations will not exceed the *substantial* 20 dBA L_{eq} noise level increase significance threshold during Project construction activities. The temporary construction noise level increase analysis shows that the noise impacts due to the Project's construction are considered *less than significant*.

TABLE 10-4: DAYTIME CONSTRUCTION NOISE LEVEL INCREASES

Receiver Location ¹	Typical Project Construction Noise Level ²	Measurement Location ³	Reference Ambient Noise Levels ⁴	Combined Project and Ambient ⁵	Project Increase ⁶	Increase Criteria	Increase Criteria Exceeded?
R1	61.4	L1	62.7	65.1	2.4	20	No
R2	60.0	L2	66.7	67.5	0.8	20	No
R3	58.6	L3	60.9	62.9	2.0	20	No
R4	58.5	L4	59.6	62.1	2.5	20	No

¹ Construction noise source and receiver locations are shown on Exhibit 10-1.

² Typical Project daytime construction noise levels as shown in Table 10-3.

³ Reference noise level measurement locations as shown on Exhibit 5-A.

⁴ Observed daytime ambient noise levels as shown in Table 5-1.

⁵ Represents the combined ambient conditions plus the Project construction activities.

⁶ The noise level increase expected with the addition of the Project construction activities.

10.6 CONSTRUCTION VIBRATION ANALYSIS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods employed. The 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 in Table 10-5. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the potential for human response (annoyance) and building damage using the following vibration assessment methods defined by Caltrans. To describe the vibration impacts Caltrans provides the following equation: $PPV_{equip} = PPV_{ref} \times (25/D)^1$

Using the vibration source level of construction equipment provided in Table 10-5 and the construction vibration assessment methodology published by the FTA, it is possible to estimate the Project vibration impacts. Table 10-6 presents the expected Project-related vibration levels at the nearby receiver locations. At distances ranging from 281 to 532 feet from the Project construction

activities, construction vibration velocity levels are estimated to range from 0.01 to 0.02 PPV in/sec. Based on the maximum acceptable continuous vibration threshold of 0.30 PPV (in/sec), the typical Project construction vibration levels will fall below the building damage thresholds at all the noise-sensitive receiver locations. Therefore, the Project-related vibration impacts are considered *less than significant* during typical construction activities at the Project site.

TABLE 10-5: 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
Vibratory Roller	0.210

Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual

TABLE 10-6: PROJECT CONSTRUCTION VIBRATION LEVELS

Location 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	Jack-hammer	Loaded Trucks	Large bulldozer	Vibratory Roller	Highest Vibration Level		
R1	281'	0.00	0.00	0.01	0.01	0.02	0.02	0.30	No
R2	532'	0.00	0.00	0.00	0.00	0.01	0.01	0.30	No
R3	494'	0.00	0.00	0.00	0.00	0.01	0.01	0.30	No
R4	510'	0.00	0.00	0.00	0.00	0.01	0.01	0.30	No

¹ Construction noise source and receiver locations are shown in Exhibit 10-1.

² Distance from receiver building facade to Project construction boundary (Project site boundary).

³ Based on the Vibration Source Levels of Construction Equipment (Table 10-5).

⁴ Caltrans Transportation and Construction Vibration Guidance Manual, 2020.

⁵ Does the peak vibration exceed the acceptable vibration thresholds?

"PPV" = Peak Particle Velocity

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12 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the 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 (619) 788-1971.

William Maddux, INCE
Senior Associate
URBAN CROSSROADS, INC.

(619) 788-1971
bmaddux@urbanxroads.com

Education

Bachelor of Science in Urban and Regional Planning
California Polytechnic State University, Pomona • June 2000

Professional Affiliations

ASA – Acoustical Society of America
AEP – Association of Environmental Planners
AWMA – Air and Waste Management Association
INCE – Institute of Noise Control Engineers

Professional Certifications

Approved Acoustical Consultant • County of San Diego
FHWA Traffic Noise Model of Training • November 2004
CadnaA Basic and Advanced Training Certificate • October 2008

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APPENDIX 3.1:

CITY OF MENIFEE CODE OF ORDINANCES

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TITLE 9: PLANNING AND ZONING

ARTICLE 4: SITE DEVELOPMENT REGULATIONS AND PERFORMANCE STANDARDS

Chapter 9.210 Performance Standards

9.210.060 Noise Control Regulations ^{AG}

- A. **Intent.** At certain levels, sound becomes noise and may jeopardize the health, safety or general welfare of city residents and degrade their quality of life. Pursuant to its police power, the City Council hereby declares that noise shall be regulated in the manner described herein. This chapter is intended to establish citywide 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 (CEQA), and no such thresholds are hereby established.
- B. **General Exemptions.** Sound emanating from the following sources are 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 and private schools and school-sponsored activities.
 6. Agricultural operations on land designated Agriculture in the City's General Plan, or land zoned AG (Agriculture), 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 noise provisions of the Menifee Municipal Code.
 8. Property maintenance, including, but not limited to, the operation of lawnmowers, leaf blowers, etc., provided such maintenance occurs between the hours of 7:00 a.m. and 8:00 p.m.
 9. Motor vehicles (factory equipped), other than off-highway vehicles. This exemption does not include sound emanating from motor vehicle sound systems.
 10. Heating and air conditioning equipment in proper repair.
 11. 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.
 12. The discharge of firearms consistent with all state laws.

13. Bars, nightclubs, cocktail lounges, cabarets, billiards/pool halls, restaurants, drive-ins and eating establishments that have a Conditional Use Permit for on-site alcohol sales and live entertainment (interior noise). Outdoor patios and similar areas shall be subject to the requirements of this chapter, unless conditioned otherwise under Conditional Use Permit review.
- C. **Construction-Related Exemptions.** Exceptions may be requested from the standards set forth in Section 9.210.060 of this chapter and may be characterized as construction-related, single event or continuous events exceptions.
 1. Private construction projects, with or without a Building Permit, located one-quarter of a mile or more from an inhabited dwelling.
 2. Private construction projects, with or without a building permit, located within one-quarter of a mile from an inhabited dwelling, shall be permitted Monday through Saturday, except nationally recognized holidays, 6:30 a.m. to 7:00 p.m., or specified in Section 8.01.010. There shall be no construction permitted on Sunday or nationally recognized holidays unless approval is obtained from the City Building Official or City Engineer.
 3. Construction-related exceptions. If construction occurs during off hours or exceeds noise thresholds, an application for a construction-related exception shall be made using the temporary use application provided by the Community Development Director in [Chapter 9.105](#) of this Title. For construction activities on Sunday or nationally recognized holidays, Section 8.01.010 of this Code shall prevail.
- D. **General Sound Level Standards.** No person shall create any sound, or allow the creation of any sound, on any property that causes the exterior and interior sound level on any other occupied property to exceed the sound level standards set forth in Table 9.210.060-1, Stationary Source Noise Standards.

Table 9.210.060-1 Stationary Source Noise Standards		
Land Use	Interior Standards	Exterior Standards
10:00 p.m. to 7:00 a.m.	40 L _{eq} (10-minute)	45 L _{eq} (10-minute)
7:00 a.m. to 10:00 p.m.	55 L _{eq} (10-minute)	65 L _{eq} (10-minute)

- E. **Sound Level Measurement Methodology.** 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 9.210.060.G. 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 reverified. Sound level meters and calibration equipment shall be certified annually.
- F. **Special Sound Level Measurement Methodology.** The general sound level standards set forth in Section 9.210.060.E 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; failure to comply with these standards constitutes 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 96 dBA if the vehicle was manufactured on or after January 1, 1986, or is not more than 101 dBA if the vehicle was manufactured before January 1, 1986. For purposes of this division, emitted noise shall be measured a distance of 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 10:00 p.m. and 8:00 a.m. the following morning, 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 100 feet from the vehicle.
 2. Power tools and equipment. No person shall operate any power tools or equipment as specified in Section 8.01.010, such that the power tools or equipment is 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 100 feet from the power tools or equipment.
 3. Audio equipment. No person shall operate any audio equipment, whether portable or not, between the hours of 10:00 p.m. and 8:00 a.m. the following morning such that the equipment is audible to the human ear inside an inhabited dwelling other than a dwelling in which the equipment may be located. No person shall operate any audio equipment, whether portable or not, at any other time such that the equipment is audible to the human ear at a distance greater than 100 feet from the equipment.
 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 unless such activities comply with the following requirements. To the extent that these requirements conflict with any conditions of approval attached to an underlying land use permit, these requirements shall control.
 - a. Sound-amplifying equipment or live music is prohibited between the hours of 10:00 p.m. and 8:00 a.m. the following morning on Sunday through Thursday and between the hours of 11:00 p.m. and 8:00 a.m. the following morning on Friday and Saturday.
 - b. Sound emanating from sound-amplifying equipment or live music at any other time shall not be audible to the human ear at a distance greater than 200 feet from the equipment or music.
- G. **Duty to Cooperate.** No person shall refuse to cooperate with, or obstruct, any peace officer or code enforcement officer when he or she is 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.

APPENDIX 5.1:

STUDY AREA PHOTOS

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16568 - Heritage Village Business Center

16568_L1_East

33, 44' 9.090000"117, 11' 1.320000"



16568_L1_North

33, 44' 9.110000"117, 11' 1.570000"



16568_L1_South

33, 44' 9.120000"117, 11' 1.380000"



16568_L1_West

33, 44' 30.570000"117, 10' 49.650000"



16568 - Heritage Village Business Center

16568_L2_East

33, 44' 30.580000"117, 10' 49.760000"



16568_L2_North

33, 44' 31.450000"117, 10' 50.800000"



16568_L2_South

33, 44' 30.570000"117, 10' 49.730000"



16568_L2_West

33, 44' 28.240000"117, 10' 50.010000"



16568 - Heritage Village Business Center

16568_L3_East

33, 44' 8.240000"117, 11' 5.360000"



16568_L3_North

33, 44' 8.340000"117, 11' 5.470000"



16568_L3_South

33, 44' 8.230000"117, 11' 5.390000"



16568_L3_West

33, 44' 9.190000"117, 11' 1.540000"



16568 - Heritage Village Business Center

16568_L4_West

33, 44' 8.410000"117, 11' 5.520000"



16568_L4_North

33, 44' 28.440000"117, 10' 50.010000"



16568_L4_East

33, 44' 28.260000"117, 10' 49.980000"



16568_L4_South

33, 44' 28.280000"117, 10' 49.950000"



APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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24-Hour Noise Level Measurement Summary

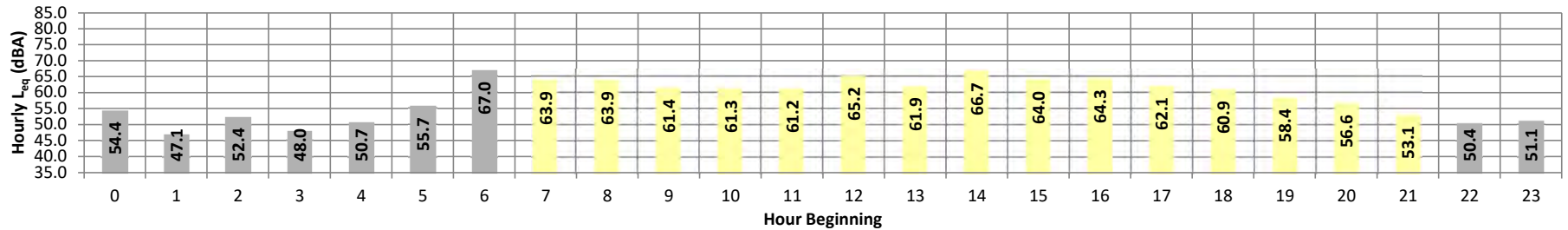
Date: Tuesday, July 15, 2025
Project: Heritage Valley Business Center

Location: L1 - Located north of the site near the residence at 26105
Source: Sherman Rd.

Meter: Piccolo II

JN: 16568
Analyst: Z. Ibrahim

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	54.4	62.7	46.4	62.5	62.2	61.1	59.4	53.7	51.8	48.2	47.2	46.5	54.4	10.0	64.4	
	1	47.1	55.9	43.3	55.4	54.7	51.5	49.6	46.6	45.6	44.1	43.8	43.5	47.1	10.0	57.1	
	2	52.4	64.2	44.5	63.7	63.0	59.9	56.3	49.2	46.7	45.2	44.9	44.6	52.4	10.0	62.4	
	3	48.0	57.9	43.0	57.5	56.8	54.0	51.6	46.8	45.2	43.6	43.3	43.0	48.0	10.0	58.0	
	4	50.7	61.4	43.6	61.2	60.7	58.1	55.5	48.1	45.6	44.1	43.9	43.7	50.7	10.0	60.7	
	5	55.7	66.1	48.7	65.7	65.0	62.3	60.6	54.6	50.9	49.2	49.0	48.8	55.7	10.0	65.7	
	6	67.0	76.7	58.4	75.9	74.9	73.1	72.0	67.9	62.7	59.3	59.0	58.6	67.0	10.0	77.0	
Day	7	63.9	74.8	55.7	74.0	72.7	69.3	67.4	63.5	60.7	56.8	56.3	55.8	63.9	0.0	63.9	
	8	63.9	74.7	57.0	73.4	72.4	69.2	67.2	63.9	61.1	58.0	57.5	57.1	63.9	0.0	63.9	
	9	61.4	69.9	53.0	69.6	69.1	67.2	66.0	62.3	58.0	53.7	53.4	53.1	61.4	0.0	61.4	
	10	61.3	69.5	54.1	69.1	68.7	67.0	65.6	61.8	58.7	55.3	54.8	54.3	61.3	0.0	61.3	
	11	61.2	70.4	52.7	69.9	69.4	67.7	66.1	61.3	57.8	53.7	53.2	52.8	61.2	0.0	61.2	
	12	65.2	74.4	57.2	73.6	72.7	70.8	69.7	65.7	61.8	58.2	57.7	57.3	65.2	0.0	65.2	
	13	61.9	72.0	53.6	71.5	70.7	68.4	66.2	61.6	58.3	54.5	54.1	53.7	61.9	0.0	61.9	
	14	66.7	76.9	55.4	76.0	74.7	73.0	71.8	67.3	62.5	57.1	56.3	55.6	66.7	0.0	66.7	
	15	64.0	73.1	56.4	72.6	72.0	69.8	68.0	64.1	61.5	57.9	57.3	56.6	64.0	0.0	64.0	
	16	64.3	75.9	55.6	74.8	73.5	70.2	68.2	63.9	60.5	56.7	56.2	55.8	64.3	0.0	64.3	
	17	62.1	71.0	52.3	70.7	70.3	68.5	66.8	62.5	58.2	53.2	52.8	52.4	62.1	0.0	62.1	
	18	60.9	70.3	51.6	70.0	69.4	67.4	66.1	61.0	56.2	52.5	52.2	51.7	60.9	0.0	60.9	
	19	58.4	66.9	50.4	66.7	66.2	64.7	63.5	58.6	54.5	51.1	50.8	50.5	58.4	5.0	63.4	
	20	56.6	66.6	49.2	66.2	65.6	63.3	61.6	55.9	51.5	49.6	49.4	49.3	56.6	5.0	61.6	
	21	53.1	61.8	47.4	61.4	61.0	59.4	57.6	52.8	49.9	48.0	47.7	47.5	53.1	5.0	58.1	
Night	22	50.4	56.9	47.6	56.5	56.0	54.5	53.3	50.4	49.3	48.1	47.9	47.7	50.4	10.0	60.4	
	23	51.1	57.5	46.6	57.2	56.8	55.6	54.8	51.8	49.5	47.2	47.0	46.7	51.1	10.0	61.1	
Timeframe	Hour	L _{eq}	L _{max}	L _{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	24-Hour CNEL	Leq (dBA)		
Day	Min	53.1	61.8	47.4	61.4	61.0	59.4	57.6	52.8	49.9	48.0	47.7	47.5		Daytime (7am-10pm)	62.7	Nighttime (10pm-7am)
	Max	66.7	76.9	57.2	76.0	74.7	73.0	71.8	67.3	62.5	58.2	57.7	57.3				
Energy Average		62.7	Average:		70.6	69.9	67.7	66.1	61.8	58.1	54.4	54.0	53.6		65.9		
Night	Min	47.1	55.9	43.0	55.4	54.7	51.5	49.6	46.6	45.2	43.6	43.3	43.0	58.5			
	Max	67.0	76.7	58.4	75.9	74.9	73.1	72.0	67.9	62.7	59.3	59.0	58.6				
Energy Average		58.5	Average:		61.7	61.1	58.9	57.0	52.1	49.7	47.7	47.3	47.0				

24-Hour Noise Level Measurement Summary

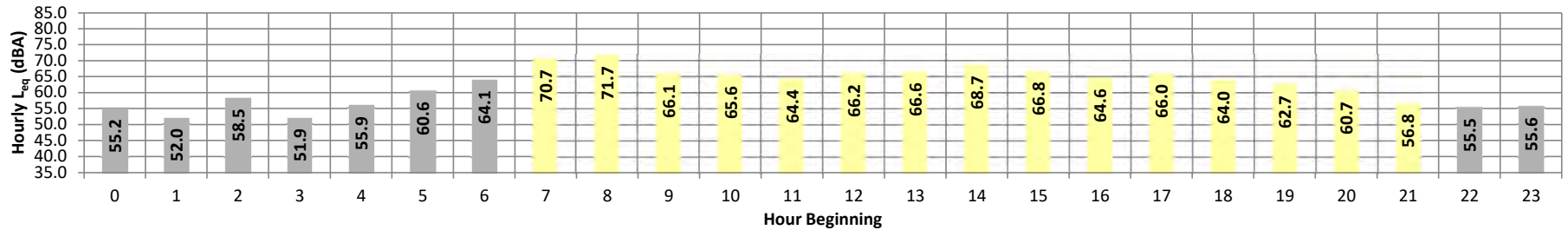
Date: Tuesday, July 15, 2025
Project: Heritage Valley Business Center

Location: L2 - Located north of the site near the residence at 27531
Source: Ethanac Rd.

Meter: Piccolo II

JN: 16568
Analyst: Z. Ibrahim

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	55.2	61.0	51.2	60.8	60.5	59.4	58.6	56.3	53.0	51.7	51.5	51.3	55.2	10.0	65.2
	1	52.0	58.2	49.3	57.9	57.5	55.8	54.4	51.9	51.2	49.9	49.7	49.4	52.0	10.0	62.0
	2	58.5	72.1	49.2	71.2	70.2	66.0	61.0	53.0	51.1	49.8	49.5	49.2	58.5	10.0	68.5
	3	51.9	58.6	49.1	58.4	57.9	56.0	54.5	51.8	50.9	49.6	49.4	49.2	51.9	10.0	61.9
	4	55.9	64.5	49.6	64.2	63.8	62.0	60.3	56.2	52.6	50.2	50.0	49.7	55.9	10.0	65.9
	5	60.6	70.1	53.7	69.8	69.3	67.3	65.6	59.7	56.6	54.4	54.1	53.8	60.6	10.0	70.6
Day	6	64.1	73.1	55.2	72.8	72.4	70.7	69.0	63.7	60.2	56.9	55.6	55.2	64.1	10.0	74.1
	7	70.7	77.8	66.5	77.4	76.8	75.2	74.2	71.5	68.6	67.0	66.8	66.5	70.7	0.0	70.7
	8	71.7	76.1	66.4	75.9	75.5	74.5	73.9	72.3	71.4	68.5	67.3	66.6	71.7	0.0	71.7
	9	66.1	76.0	57.6	75.5	74.8	72.7	71.0	66.0	61.9	58.2	57.9	57.7	66.1	0.0	66.1
	10	65.6	75.4	58.1	75.0	74.4	72.2	70.3	65.1	61.4	58.7	58.4	58.1	65.6	0.0	65.6
	11	64.4	73.0	57.4	72.7	72.1	70.2	68.6	64.8	61.6	58.2	57.8	57.5	64.4	0.0	64.4
	12	66.2	74.0	59.7	73.6	73.1	71.5	70.2	66.9	64.1	60.4	60.1	59.8	66.2	0.0	66.2
	13	66.6	77.7	57.5	77.3	76.5	74.7	72.0	63.8	60.6	58.2	57.9	57.6	66.6	0.0	66.6
	14	68.7	81.6	57.5	81.3	80.2	75.4	71.8	66.0	61.7	58.1	57.8	57.5	68.7	0.0	68.7
	15	66.8	77.8	56.9	77.5	76.7	74.4	72.2	64.5	60.9	57.5	57.3	57.0	66.8	0.0	66.8
	16	64.6	74.5	57.0	74.2	73.7	71.4	69.3	64.0	60.2	57.6	57.3	57.1	64.6	0.0	64.6
	17	66.0	76.7	57.5	76.1	75.0	72.8	71.0	64.8	61.0	58.1	57.8	57.5	66.0	0.0	66.0
	18	64.0	72.0	57.4	71.7	71.2	69.7	68.6	64.4	60.9	58.0	57.8	57.5	64.0	0.0	64.0
	19	62.7	71.5	56.1	71.2	70.8	68.7	67.1	62.8	59.5	56.7	56.5	56.2	62.7	5.0	67.7
	20	60.7	70.2	55.1	69.7	69.3	67.3	65.4	59.9	56.9	55.5	55.4	55.2	60.7	5.0	65.7
Night	21	56.8	66.2	53.1	65.3	64.5	61.4	59.7	56.3	55.0	53.6	53.4	53.2	56.8	5.0	61.8
	22	55.5	61.4	53.1	61.1	60.7	58.9	57.4	55.5	54.7	53.6	53.5	53.2	55.5	10.0	65.5
	23	55.6	60.1	52.4	59.7	59.4	58.9	58.6	56.9	54.3	53.0	52.8	52.5	55.6	10.0	65.6
Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	Leq (dBA)		
Day	Min	56.8	66.2	53.1	65.3	64.5	61.4	59.7	56.3	55.0	53.6	53.4	53.2	24-Hour CNEL	Daytime (7am-10pm)	Nighttime (10pm-7am)
	Max	71.7	81.6	66.5	81.3	80.2	75.4	74.2	72.3	71.4	68.5	67.3	66.6			
Energy Average		66.7	Average:		74.3	73.6	71.5	69.7	64.9	61.7	58.9	58.6	58.3	67.7	66.7	58.3
Night	Min	51.9	58.2	49.1	57.9	57.5	55.8	54.4	51.8	50.9	49.6	49.4	49.2			
	Max	64.1	73.1	55.2	72.8	72.4	70.7	69.0	63.7	60.2	56.9	55.6	55.2			
Energy Average		58.3	Average:		64.0	63.5	61.7	59.9	56.1	53.8	52.1	51.8	51.5			

24-Hour Noise Level Measurement Summary

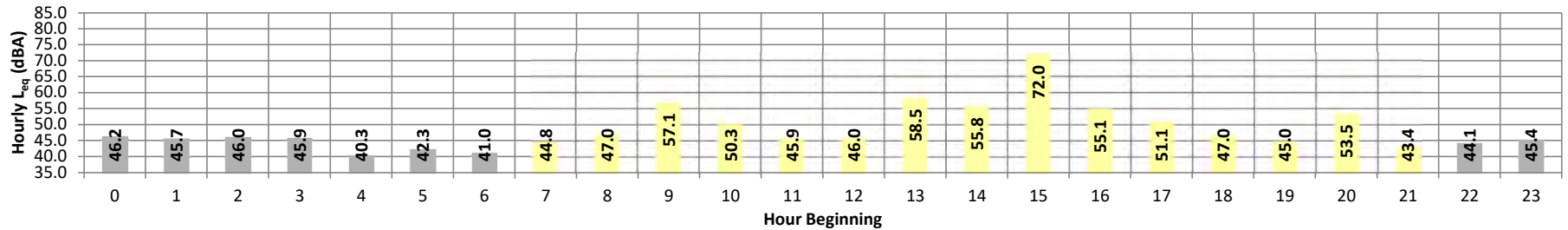
Date: Tuesday, July 15, 2025
Project: Heritage Valley Business Center

Location: L3 - Located south of the site near the residence at 26552
Source: Trumble Rd.

Meter: Piccolo II

JN: 16568
Analyst: Z. Ibrahim

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	46.2	46.9	45.5	46.8	46.7	46.7	46.6	46.4	46.2	45.8	45.7	45.6	46.2	10.0	56.2
	1	45.7	46.6	44.8	46.4	46.4	46.3	46.2	45.9	45.7	45.2	45.1	44.9	45.7	10.0	55.7
	2	46.0	47.4	44.8	47.2	47.2	46.9	46.7	46.3	46.0	45.4	45.2	45.0	46.0	10.0	56.0
	3	45.9	46.7	45.2	46.5	46.5	46.4	46.3	46.1	45.8	45.5	45.4	45.3	45.9	10.0	55.9
	4	40.3	41.2	39.4	41.1	41.0	40.9	40.8	40.6	40.3	39.8	39.7	39.6	40.3	10.0	50.3
	5	42.3	47.4	39.2	46.7	46.2	45.2	44.6	43.2	41.8	39.8	39.7	39.4	42.3	10.0	52.3
	6	41.0	47.7	35.0	47.0	46.5	45.7	44.9	42.1	39.2	35.8	35.5	35.1	41.0	10.0	51.0
Day	7	44.8	54.8	39.0	54.0	53.3	50.3	48.0	45.1	41.7	39.4	39.2	39.1	44.8	0.0	44.8
	8	47.0	58.1	40.5	57.1	56.3	54.4	52.4	44.7	42.4	40.9	40.7	40.5	47.0	0.0	47.0
	9	57.1	63.0	50.8	62.7	62.5	61.9	61.4	58.4	54.6	52.2	51.5	51.0	57.1	0.0	57.1
	10	50.3	58.6	47.0	57.4	56.3	54.1	53.0	50.5	48.7	47.4	47.3	47.1	50.3	0.0	50.3
	11	45.9	51.0	44.1	50.6	50.2	49.4	48.6	45.9	45.2	44.4	44.3	44.2	45.9	0.0	45.9
	12	46.0	50.6	43.6	50.2	49.8	48.9	48.5	46.6	45.2	44.0	43.8	43.7	46.0	0.0	46.0
	13	58.5	63.8	51.3	63.3	62.9	62.1	61.6	59.7	58.0	54.0	52.4	51.5	58.5	0.0	58.5
	14	55.8	62.0	49.7	61.7	61.4	60.4	59.5	56.9	54.4	51.5	50.7	49.9	55.8	0.0	55.8
	15	72.0	78.1	62.5	77.8	77.5	76.8	76.5	73.2	70.1	64.9	63.6	62.7	72.0	0.0	72.0
	16	55.1	69.1	40.3	67.7	66.4	62.7	59.4	50.4	45.8	41.7	41.0	40.5	55.1	0.0	55.1
	17	51.1	60.0	44.9	58.8	57.8	55.9	54.6	51.5	49.3	46.8	45.9	45.0	51.1	0.0	51.1
	18	47.0	55.0	38.7	54.6	54.3	53.7	52.0	47.9	42.6	39.3	39.1	38.8	47.0	0.0	47.0
	19	45.0	55.6	38.4	54.3	52.6	49.8	48.3	45.1	42.7	39.6	39.3	38.6	45.0	5.0	50.0
	20	53.5	66.0	39.2	64.5	62.8	59.8	58.3	52.5	48.2	41.6	40.8	39.8	53.5	5.0	58.5
	21	43.4	49.0	41.1	48.3	47.7	46.5	45.8	43.4	42.6	41.6	41.4	41.2	43.4	5.0	48.4
Night	22	44.1	46.4	43.3	46.0	45.5	44.9	44.7	44.3	44.0	43.7	43.6	43.4	44.1	10.0	54.1
	23	45.4	51.4	43.8	50.3	49.0	48.1	47.2	45.2	44.7	44.2	44.1	43.9	45.4	10.0	55.4
Timeframe	Hour	L _{eq}	L _{max}	L _{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	24-Hour CNEL	Leq (dBA)	
Day	Min	43.4	49.0	38.4	48.3	47.7	46.5	45.8	43.4	41.7	39.3	39.1	38.6		Daytime (7am-10pm)	Nighttime (10pm-7am)
	Max	72.0	78.1	62.5	77.8	77.5	76.8	76.5	73.2	70.1	64.9	63.6	62.7			
Energy Average		60.9	Average:		58.9	58.1	56.4	55.2	51.5	48.8	45.9	45.4	44.9	59.6	60.9	44.6
Night	Min	40.3	41.2	35.0	41.1	41.0	40.9	40.8	40.6	39.2	35.8	35.5	35.1			
	Max	46.2	51.4	45.5	50.3	49.0	48.1	47.2	46.4	46.2	45.8	45.7	45.6			
Energy Average		44.6	Average:		46.4	46.1	45.7	45.3	44.4	43.7	42.8	42.7	42.5			

24-Hour Noise Level Measurement Summary

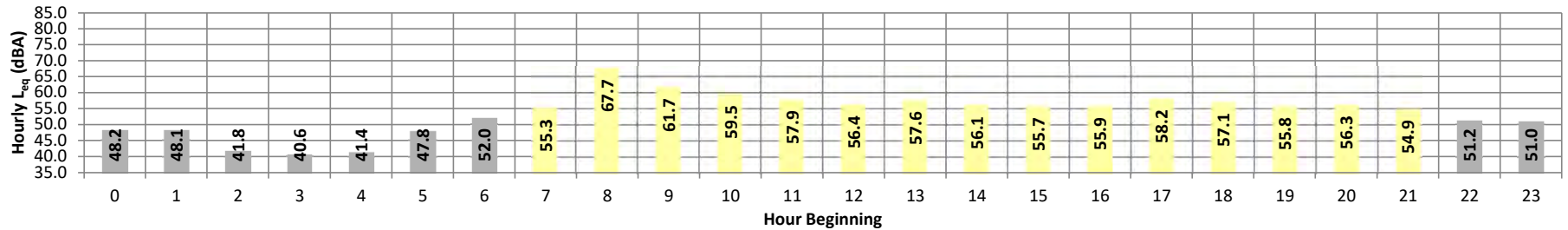
Date: Tuesday, July 15, 2025
Project: Heritage Valley Business Center

Location: L4 - Located south of the site near the residence at 26505
Source: Trumble Rd.

Meter: Piccolo II

JN: 16568
Analyst: Z. Ibrahim

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	48.2	58.6	39.5	58.3	58.0	55.7	52.8	46.3	43.3	40.6	40.1	39.7	48.2	10.0	58.2
	1	48.1	60.0	36.4	59.7	59.3	56.3	53.0	43.6	38.7	36.9	36.7	36.5	48.1	10.0	58.1
	2	41.8	51.9	35.6	51.7	51.4	49.2	46.5	39.5	37.2	36.0	35.9	35.7	41.8	10.0	51.8
	3	40.6	50.2	35.5	49.9	49.5	47.1	44.9	39.6	37.1	35.8	35.7	35.5	40.6	10.0	50.6
	4	41.4	50.1	34.8	49.9	49.6	47.9	46.3	40.9	37.7	35.3	35.0	34.8	41.4	10.0	51.4
	5	47.8	58.5	35.5	58.2	57.7	55.5	53.5	46.2	40.5	36.6	36.1	35.7	47.8	10.0	57.8
Day	6	52.0	62.9	39.2	62.4	61.9	59.6	57.6	49.9	44.9	40.4	40.0	39.4	52.0	10.0	62.0
	7	55.3	64.8	42.4	64.3	63.8	61.9	60.5	55.5	50.4	44.3	43.4	42.7	55.3	0.0	55.3
	8	67.7	76.6	55.7	76.4	76.3	75.3	73.7	66.9	62.0	57.1	56.7	55.9	67.7	0.0	67.7
	9	61.7	73.6	45.3	73.3	72.6	69.6	66.7	59.1	53.4	46.7	46.0	45.4	61.7	0.0	61.7
	10	59.5	69.7	48.7	69.0	68.4	66.4	63.7	59.2	55.9	51.1	50.0	48.9	59.5	0.0	59.5
	11	57.9	67.1	45.7	66.8	66.2	64.3	62.8	58.4	53.8	47.4	46.6	45.9	57.9	0.0	57.9
	12	56.4	65.9	44.4	65.6	65.2	63.2	61.6	56.4	51.0	45.9	45.2	44.6	56.4	0.0	56.4
	13	57.6	66.4	47.6	66.0	65.5	63.7	62.4	58.2	54.6	48.8	48.3	47.7	57.6	0.0	57.6
	14	56.1	65.6	45.2	65.2	64.8	62.7	61.1	56.4	51.5	46.4	45.9	45.3	56.1	0.0	56.1
	15	55.7	65.4	43.8	65.0	64.5	62.5	61.0	55.7	50.5	45.1	44.5	44.0	55.7	0.0	55.7
	16	55.9	65.1	44.5	64.6	64.0	62.1	61.1	56.5	51.2	45.5	45.0	44.5	55.9	0.0	55.9
	17	58.2	68.2	45.7	67.8	67.3	65.0	63.1	58.0	53.3	47.4	46.6	45.9	58.2	0.0	58.2
	18	57.1	66.5	44.6	66.1	65.6	63.5	62.2	57.6	52.3	45.9	45.3	44.8	57.1	0.0	57.1
	19	55.8	67.0	43.5	66.4	65.6	62.6	60.8	55.0	49.7	44.6	44.0	43.6	55.8	5.0	60.8
	20	56.3	66.0	50.1	65.5	64.7	62.5	60.9	55.8	52.5	50.4	50.3	50.1	56.3	5.0	61.3
	21	54.9	65.6	42.0	65.0	64.2	61.8	60.2	54.4	48.8	42.9	42.4	42.1	54.9	5.0	59.9
Night	22	51.2	61.9	39.5	61.6	61.2	58.8	56.7	49.3	44.0	40.2	39.9	39.6	51.2	10.0	61.2
	23	51.0	60.4	46.5	60.1	59.6	57.0	55.0	49.9	48.0	46.7	46.6	46.5	51.0	10.0	61.0
Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	Leq (dBA)		
Day	Min	54.9	64.8	42.0	64.3	63.8	61.8	60.2	54.4	48.8	42.9	42.4	42.1	24-Hour CNEL	Daytime (7am-10pm)	Nighttime (10pm-7am)
	Max	67.7	76.6	55.7	76.4	76.3	75.3	73.7	66.9	62.0	57.1	56.7	55.9			
Energy Average		59.6	Average:		67.1	66.6	64.5	62.8	57.5	52.7	47.3	46.7	46.1	59.7	59.6	48.6
Night	Min	40.6	50.1	34.8	49.9	49.5	47.1	44.9	39.5	37.1	35.3	35.0	34.8			
	Max	52.0	62.9	46.5	62.4	61.9	59.6	57.6	49.9	48.0	46.7	46.6	46.5			
Energy Average		48.6	Average:		56.9	56.5	54.1	51.8	45.0	41.2	38.7	38.4	38.2			

APPENDIX 7.1:

OFF-SITE TRAFFIC NOISE LEVEL CALCULATIONS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E
Road Name: Ethanac Rd.
Road Segment: w/o I-215 SB Ramps

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	20,545 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	1,695 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 89.32%				
Barrier Height:	0.0 feet	Medium Trucks: 80.9% 5.3% 13.8% 6.33%				
Barrier Type (0-Wall, 1-Berm):	0.0	Heavy Trucks: 78.4% 3.6% 18.0% 4.35%				
Centerline Dist. to Barrier:	100.0 feet	Noise Source Elevations (in feet)				
Centerline Dist. to Observer:	100.0 feet	Autos: 0.000				
Barrier Distance to Observer:	0.0 feet	Medium Trucks: 2.297				
Observer Height (Above Pad):	5.0 feet	Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation:	0.0 feet	Lane Equivalent Distance (in feet)				
Road Elevation:	0.0 feet	Autos: 83.666				
Road Grade:	0.0%	Medium Trucks: 83.560				
Left View:	-90.0 degrees	Heavy Trucks: 83.570				
Right View:	90.0 degrees					

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.04	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-11.53	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-13.16	-3.45	-1.20	-5.16	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:	63.8	62.4	60.7	56.8	64.5	65.0
Medium Trucks:	63.3	62.4	56.6	55.9	63.8	64.0
Heavy Trucks:	66.4	65.4	58.1	60.3	67.7	67.8
Vehicle Noise:	69.5	68.4	63.6	62.9	70.4	70.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	107	230	496	1,068
CNEL:	111	239	514	1,107

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E+P
 Road Name: Ethanac Rd.
 Road Segment: w/o I-215 SB Ramps

Project Name: Heritage Valley Business c
 Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	20,637 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	1,703 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 89.36%				
Barrier Height: 0.0 feet		Medium Trucks: 80.9% 5.3% 13.8% 6.31%				
Barrier Type (0-Wall, 1-Berm): 0.0		Heavy Trucks: 78.4% 3.6% 18.0% 4.33%				
Centerline Dist. to Barrier: 100.0 feet		Noise Source Elevations (in feet)				
Centerline Dist. to Observer: 100.0 feet		Autos: 0.000				
Barrier Distance to Observer: 0.0 feet		Medium Trucks: 2.297				
Observer Height (Above Pad): 5.0 feet		Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation: 0.0 feet		Lane Equivalent Distance (in feet)				
Road Elevation: 0.0 feet		Autos: 83.666				
Road Grade: 0.0%		Medium Trucks: 83.560				
Left View: -90.0 degrees		Heavy Trucks: 83.570				
Right View: 90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.01	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-11.53	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-13.16	-3.45	-1.20	-5.16	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:	63.8	62.5	60.7	56.8	64.5	65.0
Medium Trucks:	63.3	62.4	56.6	55.9	63.8	64.0
Heavy Trucks:	66.4	65.4	58.1	60.3	67.7	67.8
Vehicle Noise:	69.5	68.4	63.6	62.9	70.4	70.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	107	230	496	1,069
CNEL:	111	239	514	1,108

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: EAC
 Road Name: Ethanac Rd.
 Road Segment: w/o I-215 SB Ramps

Project Name: Heritage Valley Business c
 Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	50,761 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	4,188 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 89.32%				
Barrier Height: 0.0 feet		Medium Trucks: 80.9% 5.3% 13.8% 6.33%				
Barrier Type (0-Wall, 1-Berm): 0.0		Heavy Trucks: 78.4% 3.6% 18.0% 4.35%				
Centerline Dist. to Barrier: 100.0 feet		Noise Source Elevations (in feet)				
Centerline Dist. to Observer: 100.0 feet		Autos: 0.000				
Barrier Distance to Observer: 0.0 feet		Medium Trucks: 2.297				
Observer Height (Above Pad): 5.0 feet		Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation: 0.0 feet		Lane Equivalent Distance (in feet)				
Road Elevation: 0.0 feet		Autos: 83.666				
Road Grade: 0.0%		Medium Trucks: 83.560				
Left View: -90.0 degrees		Heavy Trucks: 83.570				
Right View: 90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.89	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-7.60	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-9.23	-3.45	-1.20	-5.16	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:	67.7	66.4	64.6	60.7	68.4	68.9
Medium Trucks:	67.2	66.3	60.5	59.9	67.7	67.9
Heavy Trucks:	70.4	69.4	62.0	64.2	71.6	71.7
Vehicle Noise:	73.4	72.4	67.5	66.8	74.4	74.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	195	420	906	1,951
CNEL:	202	436	939	2,023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: EACP
Road Name: Ethanac Rd.
Road Segment: w/o I-215 SB Ramps

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	50,853 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	4,195 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet					
Site Data		VehicleType	Day	Evening	Night	Daily
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 100.0 feet Centerline Dist. to Observer: 100.0 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		Autos:	72.9%	12.2%	14.9%	89.34%
		Medium Trucks:	80.9%	5.3%	13.8%	6.32%
		Heavy Trucks:	78.4%	3.6%	18.0%	4.34%
		Noise Source Elevations (in feet)				
		Autos:	0.000			
		Medium Trucks:	2.297			
		Heavy Trucks:	8.004	Grade Adjustment: 0.0		
		Lane Equivalent Distance (in feet)				
		Autos:	83.666			
		Medium Trucks:	83.560			
Heavy Trucks:	83.570					

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.90	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-7.60	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-9.23	-3.45	-1.20	-5.16	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:	67.7	66.4	64.6	60.7	68.4	68.9
Medium Trucks:	67.2	66.3	60.5	59.9	67.7	67.9
Heavy Trucks:	70.4	69.4	62.0	64.2	71.6	71.7
Vehicle Noise:	73.4	72.4	67.5	66.8	74.4	74.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	195	421	906	1,952
CNEL:	202	436	939	2,024

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY
Road Name: Ethanac Rd.
Road Segment: w/o I-215 SB Ramps

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	55,837 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	4,607 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 89.32%				
Barrier Height:	0.0 feet	Medium Trucks: 80.9% 5.3% 13.8% 6.33%				
Barrier Type (0-Wall, 1-Berm):	0.0	Heavy Trucks: 78.4% 3.6% 18.0% 4.35%				
Centerline Dist. to Barrier:	100.0 feet	Noise Source Elevations (in feet)				
Centerline Dist. to Observer:	100.0 feet	Autos: 0.000				
Barrier Distance to Observer:	0.0 feet	Medium Trucks: 2.297				
Observer Height (Above Pad):	5.0 feet	Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation:	0.0 feet	Lane Equivalent Distance (in feet)				
Road Elevation:	0.0 feet	Autos: 83.666				
Road Grade:	0.0%	Medium Trucks: 83.560				
Left View:	-90.0 degrees	Heavy Trucks: 83.570				
Right View:	90.0 degrees					

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	4.31	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-7.19	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-8.82	-3.45	-1.20	-5.16	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:	68.1	66.8	65.0	61.1	68.8	69.3
Medium Trucks:	67.6	66.7	60.9	60.3	68.1	68.4
Heavy Trucks:	70.8	69.8	62.5	64.6	72.0	72.1
Vehicle Noise:	73.8	72.8	67.9	67.2	74.8	75.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	208	448	965	2,079
CNEL:	216	465	1,001	2,156

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY+P
 Road Name: Ethanac Rd.
 Road Segment: w/o I-215 SB Ramps

Project Name: Heritage Valley Business c
 Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	55,929 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	4,614 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet					
Site Data		VehicleType	Day	Evening	Night	Daily
		Autos: 72.9% 12.2% 14.9% 89.33%				
		Medium Trucks: 80.9% 5.3% 13.8% 6.32%				
		Heavy Trucks: 78.4% 3.6% 18.0% 4.34%				
		Noise Source Elevations (in feet)				
		Autos: 0.000				
		Medium Trucks: 2.297				
		Heavy Trucks: 8.004 Grade Adjustment: 0.0				
		Lane Equivalent Distance (in feet)				
		Autos: 83.666				
		Medium Trucks: 83.560				
		Heavy Trucks: 83.570				

FHWA Noise Model Calculations							
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	4.31	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-7.19	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-8.82	-3.45	-1.20	-5.16	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:	68.1	66.8	65.0	61.1	68.8	69.3
Medium Trucks:	67.6	66.7	60.9	60.3	68.1	68.4
Heavy Trucks:	70.8	69.8	62.5	64.6	72.0	72.1
Vehicle Noise:	73.8	72.8	67.9	67.2	74.8	75.0

Centerline Distance to Noise Contour (in feet)				
	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	208	448	965	2,080
CNEL:	216	465	1,001	2,157

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E
Road Name: Ethanac Rd.
Road Segment: e/o I-215 SB Ramps

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	17,124 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	1,413 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 89.32%				
Barrier Height: 0.0 feet		Medium Trucks: 80.9% 5.3% 13.8% 6.33%				
Barrier Type (0-Wall, 1-Berm): 0.0		Heavy Trucks: 78.4% 3.6% 18.0% 4.35%				
Centerline Dist. to Barrier: 100.0 feet		Noise Source Elevations (in feet)				
Centerline Dist. to Observer: 100.0 feet		Autos: 0.000				
Barrier Distance to Observer: 0.0 feet		Medium Trucks: 2.297				
Observer Height (Above Pad): 5.0 feet		Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation: 0.0 feet		Lane Equivalent Distance (in feet)				
Road Elevation: 0.0 feet		Autos: 83.666				
Road Grade: 0.0%		Medium Trucks: 83.560				
Left View: -90.0 degrees		Heavy Trucks: 83.570				
Right View: 90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.83	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-12.32	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-13.95	-3.45	-1.20	-5.16	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:	63.0	61.6	59.9	56.0	63.7	64.2
Medium Trucks:	62.5	61.6	55.8	55.2	63.0	63.2
Heavy Trucks:	65.7	64.6	57.3	59.5	66.9	67.0
Vehicle Noise:	68.7	67.6	62.8	62.1	69.6	69.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	95	204	439	946
CNEL:	98	211	455	981

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E+P
 Road Name: Ethanac Rd.
 Road Segment: e/o I-215 SB Ramps

Project Name: Heritage Valley Business c
 Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	17,947 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	1,481 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet					
Site Data		VehicleType	Day	Evening	Night	Daily
		Autos: 72.9% 12.2% 14.9% 87.02%				
		Medium Trucks: 80.9% 5.3% 13.8% 7.09%				
		Heavy Trucks: 78.4% 3.6% 18.0% 5.89%				
		Noise Source Elevations (in feet)				
		Autos: 0.000				
		Medium Trucks: 2.297				
		Heavy Trucks: 8.004 Grade Adjustment: 0.0				
		Lane Equivalent Distance (in feet)				
		Autos: 83.666				
		Medium Trucks: 83.560				
		Heavy Trucks: 83.570				

FHWA Noise Model Calculations							
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.74	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-11.63	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-12.43	-3.45	-1.20	-5.16	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:	63.1	61.7	60.0	56.1	63.8	64.3
Medium Trucks:	63.2	62.3	56.5	55.9	63.7	63.9
Heavy Trucks:	67.2	66.2	58.8	61.0	68.4	68.5
Vehicle Noise:	69.7	68.6	63.5	63.1	70.7	70.9

Centerline Distance to Noise Contour (in feet)				
	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	111	238	513	1,106
CNEL:	114	246	531	1,143

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: EAC
 Road Name: Ethanac Rd.
 Road Segment: e/o I-215 SB Ramps

Project Name: Heritage Valley Business c
 Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	41,247 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	3,403 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet					
Site Data		VehicleType	Day	Evening	Night	Daily
		Autos: 72.9% 12.2% 14.9% 89.32%				
		Medium Trucks: 80.9% 5.3% 13.8% 6.33%				
		Heavy Trucks: 78.4% 3.6% 18.0% 4.35%				
		Noise Source Elevations (in feet)				
		Autos: 0.000				
		Medium Trucks: 2.297				
		Heavy Trucks: 8.004 Grade Adjustment: 0.0				
		Lane Equivalent Distance (in feet)				
		Autos: 83.666				
		Medium Trucks: 83.560				
		Heavy Trucks: 83.570				

FHWA Noise Model Calculations							
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.99	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-8.50	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-10.13	-3.45	-1.20	-5.16	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	65.5	63.7	59.8	67.5	68.0
Medium Trucks:	66.3	65.4	59.6	59.0	66.8	67.0
Heavy Trucks:	69.5	68.5	61.1	63.3	70.7	70.8
Vehicle Noise:	72.5	71.5	66.6	65.9	73.5	73.7

Centerline Distance to Noise Contour (in feet)				
	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	170	366	789	1,699
CNEL:	176	380	818	1,762

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: EACP
Road Name: Ethanac Rd.
Road Segment: e/o I-215 SB Ramps

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	42,069 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	3,471 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 88.34%				
Barrier Height: 0.0 feet		Medium Trucks: 80.9% 5.3% 13.8% 6.66%				
Barrier Type (0-Wall, 1-Berm): 0.0		Heavy Trucks: 78.4% 3.6% 18.0% 5.01%				
Centerline Dist. to Barrier: 100.0 feet		Noise Source Elevations (in feet)				
Centerline Dist. to Observer: 100.0 feet		Autos: 0.000				
Barrier Distance to Observer: 0.0 feet		Medium Trucks: 2.297				
Observer Height (Above Pad): 5.0 feet		Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation: 0.0 feet		Lane Equivalent Distance (in feet)				
Road Elevation: 0.0 feet		Autos: 83.666				
Road Grade: 0.0%		Medium Trucks: 83.560				
Left View: -90.0 degrees		Heavy Trucks: 83.570				
Right View: 90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.03	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-8.20	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-9.44	-3.45	-1.20	-5.16	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	65.5	63.8	59.8	67.6	68.0
Medium Trucks:	66.6	65.7	59.9	59.3	67.1	67.3
Heavy Trucks:	70.2	69.2	61.8	64.0	71.4	71.5
Vehicle Noise:	73.0	71.9	66.9	66.4	73.9	74.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	182	392	845	1,821
CNEL:	189	406	875	1,886

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY
Road Name: Ethanac Rd.
Road Segment: e/o I-215 SB Ramps

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS								
Highway Data		Site Conditions (Hard = 10, Soft = 15)								
Average Daily Traffic (Adt):	49,902 vehicles	Autos:					15			
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles):					15			
Peak Hour Volume:	4,117 vehicles	Heavy Trucks (3+ Axles):					15			
Vehicle Speed:	45 mph	Vehicle Mix								
Near/Far Lane Distance:	110 feet									
		VehicleType	Day	Evening	Night	Daily				
Site Data		Autos:					72.9%	12.2%	14.9%	89.32%
Barrier Height:		0.0 feet								
Barrier Type (0-Wall, 1-Berm):		0.0								
Centerline Dist. to Barrier:		100.0 feet								
Centerline Dist. to Observer:		100.0 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 Source Elevations (in feet)								
		Autos:					0.000			
		Medium Trucks:					2.297			
		Heavy Trucks:					8.004	Grade Adjustment: 0.0		
		Lane Equivalent Distance (in feet)								
		Autos:					83.666			
		Medium Trucks:					83.560			
		Heavy Trucks:					83.570			

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.82	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-7.68	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-9.31	-3.45	-1.20	-5.16	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:	67.6	66.3	64.6	60.6	68.3	68.8
Medium Trucks:	67.1	66.2	60.5	59.8	67.7	67.9
Heavy Trucks:	70.3	69.3	62.0	64.1	71.5	71.6
Vehicle Noise:	73.4	72.3	67.4	66.7	74.3	74.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	193	416	895	1,929
CNEL:	200	431	929	2,000

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY+P
 Road Name: Ethanac Rd.
 Road Segment: e/o I-215 SB Ramps

Project Name: Heritage Valley Business c
 Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	50,725 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	4,185 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 88.50%				
Barrier Height:	0.0 feet	Medium Trucks: 80.9% 5.3% 13.8% 6.60%				
Barrier Type (0-Wall, 1-Berm):	0.0	Heavy Trucks: 78.4% 3.6% 18.0% 4.89%				
Centerline Dist. to Barrier:	100.0 feet	Noise Source Elevations (in feet)				
Centerline Dist. to Observer:	100.0 feet	Autos: 0.000				
Barrier Distance to Observer:	0.0 feet	Medium Trucks: 2.297				
Observer Height (Above Pad):	5.0 feet	Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation:	0.0 feet	Lane Equivalent Distance (in feet)				
Road Elevation:	0.0 feet	Autos: 83.666				
Road Grade:	0.0%	Medium Trucks: 83.560				
Left View:	-90.0 degrees	Heavy Trucks: 83.570				
Right View:	90.0 degrees					

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.85	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-7.42	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-8.72	-3.45	-1.20	-5.16	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:	67.7	66.3	64.6	60.7	68.4	68.8
Medium Trucks:	67.4	66.5	60.7	60.1	67.9	68.1
Heavy Trucks:	70.9	69.9	62.6	64.7	72.1	72.2
Vehicle Noise:	73.7	72.7	67.7	67.1	74.7	74.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	204	440	949	2,044
CNEL:	212	456	983	2,117

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E
Road Name: Ethanac Rd.
Road Segment: e/o I-215 NB Ramps

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	16,922 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	1,396 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 89.32%				
Barrier Height: 0.0 feet		Medium Trucks: 80.9% 5.3% 13.8% 6.33%				
Barrier Type (0-Wall, 1-Berm): 0.0		Heavy Trucks: 78.4% 3.6% 18.0% 4.35%				
Centerline Dist. to Barrier: 100.0 feet		Noise Source Elevations (in feet)				
Centerline Dist. to Observer: 100.0 feet		Autos: 0.000				
Barrier Distance to Observer: 0.0 feet		Medium Trucks: 2.297				
Observer Height (Above Pad): 5.0 feet		Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation: 0.0 feet		Lane Equivalent Distance (in feet)				
Road Elevation: 0.0 feet		Autos: 83.666				
Road Grade: 0.0%		Medium Trucks: 83.560				
Left View: -90.0 degrees		Heavy Trucks: 83.570				
Right View: 90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.88	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-12.37	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-14.00	-3.45	-1.20	-5.16	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:	62.9	61.6	59.9	55.9	63.6	64.1
Medium Trucks:	62.4	61.6	55.8	55.1	63.0	63.2
Heavy Trucks:	65.6	64.6	57.3	59.4	66.8	66.9
Vehicle Noise:	68.7	67.6	62.7	62.0	69.6	69.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	94	202	435	938
CNEL:	97	210	452	973

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E+P
 Road Name: Ethanac Rd.
 Road Segment: e/o I-215 NB Ramps

Project Name: Heritage Valley Business c
 Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	18,067 vehicles	Autos: 15					
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	1,491 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	45 mph	Vehicle Mix					
Near/Far Lane Distance:	110 feet						
Site Data		VehicleType	Day	Evening	Night	Daily	
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 100.0 feet Centerline Dist. to Observer: 100.0 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		Autos: 72.9% 12.2% 14.9% 87.23%					
		Medium Trucks: 80.9% 5.3% 13.8% 6.97%					
		Heavy Trucks: 78.4% 3.6% 18.0% 5.80%					
		Noise Source Elevations (in feet)					
		Autos: 0.000					
		Medium Trucks: 2.297					
		Heavy Trucks: 8.004 Grade Adjustment: 0.0					
		Lane Equivalent Distance (in feet)					
		Autos: 83.666					
		Medium Trucks: 83.560					
Heavy Trucks: 83.570							

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.70	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-11.67	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-12.47	-3.45	-1.20	-5.16	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:	63.1	61.8	60.0	56.1	63.8	64.3
Medium Trucks:	63.1	62.3	56.5	55.8	63.7	63.9
Heavy Trucks:	67.1	66.1	58.8	61.0	68.3	68.5
Vehicle Noise:	69.7	68.6	63.4	63.1	70.6	70.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	110	237	511	1,102
CNEL:	114	245	529	1,139

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: EAC
Road Name: Ethanac Rd.
Road Segment: e/o I-215 NB Ramps

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	38,969 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	3,215 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 89.32%				
Barrier Height: 0.0 feet		Medium Trucks: 80.9% 5.3% 13.8% 6.33%				
Barrier Type (0-Wall, 1-Berm): 0.0		Heavy Trucks: 78.4% 3.6% 18.0% 4.35%				
Centerline Dist. to Barrier: 100.0 feet		Noise Source Elevations (in feet)				
Centerline Dist. to Observer: 100.0 feet		Autos: 0.000				
Barrier Distance to Observer: 0.0 feet		Medium Trucks: 2.297				
Observer Height (Above Pad): 5.0 feet		Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation: 0.0 feet		Lane Equivalent Distance (in feet)				
Road Elevation: 0.0 feet		Autos: 83.666				
Road Grade: 0.0%		Medium Trucks: 83.560				
Left View: -90.0 degrees		Heavy Trucks: 83.570				
Right View: 90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.74	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-8.75	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-10.38	-3.45	-1.20	-5.16	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:	66.5	65.2	63.5	59.6	67.3	67.7
Medium Trucks:	66.1	65.2	59.4	58.7	66.6	66.8
Heavy Trucks:	69.2	68.2	60.9	63.1	70.4	70.6
Vehicle Noise:	72.3	71.2	66.4	65.6	73.2	73.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	164	352	759	1,636
CNEL:	170	365	787	1,696

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: EACP
 Road Name: Ethanac Rd.
 Road Segment: e/o I-215 NB Ramps

Project Name: Heritage Valley Business c
 Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	40,115 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	3,309 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 88.38%				
Barrier Height:	0.0 feet	Medium Trucks: 80.9% 5.3% 13.8% 6.62%				
Barrier Type (0-Wall, 1-Berm):	0.0	Heavy Trucks: 78.4% 3.6% 18.0% 5.00%				
Centerline Dist. to Barrier:	100.0 feet	Noise Source Elevations (in feet)				
Centerline Dist. to Observer:	100.0 feet	Autos: 0.000				
Barrier Distance to Observer:	0.0 feet	Medium Trucks: 2.297				
Observer Height (Above Pad):	5.0 feet	Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation:	0.0 feet	Lane Equivalent Distance (in feet)				
Road Elevation:	0.0 feet	Autos: 83.666				
Road Grade:	0.0%	Medium Trucks: 83.560				
Left View:	-90.0 degrees	Heavy Trucks: 83.570				
Right View:	90.0 degrees					

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.82	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-8.43	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-9.65	-3.45	-1.20	-5.16	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:	66.6	65.3	63.6	59.6	67.3	67.8
Medium Trucks:	66.4	65.5	59.7	59.0	66.9	67.1
Heavy Trucks:	70.0	68.9	61.6	63.8	71.2	71.3
Vehicle Noise:	72.7	71.7	66.7	66.1	73.7	73.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	176	380	818	1,763
CNEL:	183	393	847	1,825

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY
Road Name: Ethanac Rd.
Road Segment: e/o I-215 NB Ramps

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	43,768 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	3,611 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 89.32%				
Barrier Height:	0.0 feet	Medium Trucks: 80.9% 5.3% 13.8% 6.33%				
Barrier Type (0-Wall, 1-Berm):	0.0	Heavy Trucks: 78.4% 3.6% 18.0% 4.35%				
Centerline Dist. to Barrier:	100.0 feet	Noise Source Elevations (in feet)				
Centerline Dist. to Observer:	100.0 feet	Autos: 0.000				
Barrier Distance to Observer:	0.0 feet	Medium Trucks: 2.297				
Observer Height (Above Pad):	5.0 feet	Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation:	0.0 feet	Lane Equivalent Distance (in feet)				
Road Elevation:	0.0 feet	Autos: 83.666				
Road Grade:	0.0%	Medium Trucks: 83.560				
Left View:	-90.0 degrees	Heavy Trucks: 83.570				
Right View:	90.0 degrees					

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.25	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-8.24	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-9.88	-3.45	-1.20	-5.16	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	65.7	64.0	60.1	67.8	68.2
Medium Trucks:	66.6	65.7	59.9	59.2	67.1	67.3
Heavy Trucks:	69.7	68.7	61.4	63.6	70.9	71.1
Vehicle Noise:	72.8	71.7	66.9	66.2	73.7	73.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	177	381	821	1,768
CNEL:	183	395	851	1,833

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY+P
 Road Name: Ethanac Rd.
 Road Segment: e/o I-215 NB Ramps

Project Name: Heritage Valley Business c
 Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	44,913 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	3,705 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 88.48%				
Barrier Height:	0.0 feet	Medium Trucks: 80.9% 5.3% 13.8% 6.59%				
Barrier Type (0-Wall, 1-Berm):	0.0	Heavy Trucks: 78.4% 3.6% 18.0% 4.93%				
Centerline Dist. to Barrier:	100.0 feet	Noise Source Elevations (in feet)				
Centerline Dist. to Observer:	100.0 feet	Autos: 0.000				
Barrier Distance to Observer:	0.0 feet	Medium Trucks: 2.297				
Observer Height (Above Pad):	5.0 feet	Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation:	0.0 feet	Lane Equivalent Distance (in feet)				
Road Elevation:	0.0 feet	Autos: 83.666				
Road Grade:	0.0%	Medium Trucks: 83.560				
Left View:	-90.0 degrees	Heavy Trucks: 83.570				
Right View:	90.0 degrees					

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.32	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-7.96	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-9.22	-3.45	-1.20	-5.16	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	65.8	64.1	60.1	67.8	68.3
Medium Trucks:	66.8	66.0	60.2	59.5	67.4	67.6
Heavy Trucks:	70.4	69.4	62.1	64.2	71.6	71.7
Vehicle Noise:	73.2	72.1	67.2	66.6	74.1	74.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	189	407	877	1,890
CNEL:	196	422	909	1,957

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E
Road Name: Ethanac Rd.
Road Segment: e/o Encanto Rd.

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	14,335 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	1,183 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet					
		VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 89.32%				
Barrier Height: 0.0 feet		Medium Trucks: 80.9% 5.3% 13.8% 6.33%				
Barrier Type (0-Wall, 1-Berm): 0.0		Heavy Trucks: 78.4% 3.6% 18.0% 4.35%				
Centerline Dist. to Barrier: 100.0 feet		Noise Source Elevations (in feet)				
Centerline Dist. to Observer: 100.0 feet						
Barrier Distance to Observer: 0.0 feet		Autos: 0.000				
Observer Height (Above Pad): 5.0 feet		Medium Trucks: 2.297				
Pad Elevation: 0.0 feet		Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Road Elevation: 0.0 feet		Lane Equivalent Distance (in feet)				
Road Grade: 0.0%						
Left View: -90.0 degrees		Autos: 83.666				
Right View: 90.0 degrees		Medium Trucks: 83.560				
		Heavy Trucks: 83.570				

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.60	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-13.09	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-14.72	-3.45	-1.20	-5.16	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:	62.2	60.9	59.1	55.2	62.9	63.4
Medium Trucks:	61.7	60.8	55.0	54.4	62.2	62.5
Heavy Trucks:	64.9	63.9	56.6	58.7	66.1	66.2
Vehicle Noise:	67.9	66.9	62.0	61.3	68.9	69.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	84	181	390	840
CNEL:	87	188	404	871

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E+P
 Road Name: Ethanac Rd.
 Road Segment: e/o Encanto Rd.

Project Name: Heritage Valley Business c
 Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	15,480 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	1,277 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 86.88%				
Barrier Height: 0.0 feet		Medium Trucks: 80.9% 5.3% 13.8% 7.08%				
Barrier Type (0-Wall, 1-Berm): 0.0		Heavy Trucks: 78.4% 3.6% 18.0% 6.04%				
Centerline Dist. to Barrier: 100.0 feet		Noise Source Elevations (in feet)				
Centerline Dist. to Observer: 100.0 feet		Autos: 0.000				
Barrier Distance to Observer: 0.0 feet		Medium Trucks: 2.297				
Observer Height (Above Pad): 5.0 feet		Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation: 0.0 feet		Lane Equivalent Distance (in feet)				
Road Elevation: 0.0 feet		Autos: 83.666				
Road Grade: 0.0%		Medium Trucks: 83.560				
Left View: -90.0 degrees		Heavy Trucks: 83.570				
Right View: 90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.39	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-12.28	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-12.96	-3.45	-1.20	-5.16	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:	62.4	61.1	59.3	55.4	63.1	63.6
Medium Trucks:	62.5	61.6	55.9	55.2	63.1	63.3
Heavy Trucks:	66.6	65.6	58.3	60.5	67.9	68.0
Vehicle Noise:	69.1	68.1	62.8	62.5	70.1	70.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	101	218	470	1,012
CNEL:	105	225	485	1,046

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: EAC
 Road Name: Ethanac Rd.
 Road Segment: e/o Encanto Rd.

Project Name: Heritage Valley Business c
 Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	34,670 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	2,860 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 89.32%				
Barrier Height: 0.0 feet		Medium Trucks: 80.9% 5.3% 13.8% 6.33%				
Barrier Type (0-Wall, 1-Berm): 0.0		Heavy Trucks: 78.4% 3.6% 18.0% 4.35%				
Centerline Dist. to Barrier: 100.0 feet		Noise Source Elevations (in feet)				
Centerline Dist. to Observer: 100.0 feet		Autos: 0.000				
Barrier Distance to Observer: 0.0 feet		Medium Trucks: 2.297				
Observer Height (Above Pad): 5.0 feet		Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation: 0.0 feet		Lane Equivalent Distance (in feet)				
Road Elevation: 0.0 feet		Autos: 83.666				
Road Grade: 0.0%		Medium Trucks: 83.560				
Left View: -90.0 degrees		Heavy Trucks: 83.570				
Right View: 90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.24	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-9.26	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-10.89	-3.45	-1.20	-5.16	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	64.7	63.0	59.1	66.8	67.2
Medium Trucks:	65.5	64.7	58.9	58.2	66.1	66.3
Heavy Trucks:	68.7	67.7	60.4	62.6	69.9	70.1
Vehicle Noise:	71.8	70.7	65.9	65.1	72.7	72.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	151	326	702	1,513
CNEL:	157	338	728	1,569

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: EACP
 Road Name: Ethanac Rd.
 Road Segment: e/o Encanto Rd.

Project Name: Heritage Valley Business c
 Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	35,815 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	2,955 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 88.26%				
Barrier Height:	0.0 feet	Medium Trucks: 80.9% 5.3% 13.8% 6.66%				
Barrier Type (0-Wall, 1-Berm):	0.0	Heavy Trucks: 78.4% 3.6% 18.0% 5.08%				
Centerline Dist. to Barrier:	100.0 feet	Noise Source Elevations (in feet)				
Centerline Dist. to Observer:	100.0 feet	Autos: 0.000				
Barrier Distance to Observer:	0.0 feet	Medium Trucks: 2.297				
Observer Height (Above Pad):	5.0 feet	Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation:	0.0 feet	Lane Equivalent Distance (in feet)				
Road Elevation:	0.0 feet	Autos: 83.666				
Road Grade:	0.0%	Medium Trucks: 83.560				
Left View:	-90.0 degrees	Heavy Trucks: 83.570				
Right View:	90.0 degrees					

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.33	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-8.90	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-10.07	-3.45	-1.20	-5.16	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:	66.1	64.8	63.1	59.1	66.8	67.3
Medium Trucks:	65.9	65.0	59.2	58.6	66.4	66.6
Heavy Trucks:	69.5	68.5	61.2	63.4	70.7	70.9
Vehicle Noise:	72.3	71.2	66.2	65.7	73.2	73.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	164	354	764	1,645
CNEL:	170	367	791	1,703

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY
Road Name: Ethanac Rd.
Road Segment: e/o Encanto Rd.

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	38,137 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	3,146 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet					
Site Data		VehicleType	Day	Evening	Night	Daily
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 100.0 feet Centerline Dist. to Observer: 100.0 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		Autos: 72.9% 12.2% 14.9% 89.32%				
		Medium Trucks: 80.9% 5.3% 13.8% 6.33%				
		Heavy Trucks: 78.4% 3.6% 18.0% 4.35%				
		Noise Source Elevations (in feet)				
		Autos: 0.000				
		Medium Trucks: 2.297				
		Heavy Trucks: 8.004 Grade Adjustment: 0.0				
		Lane Equivalent Distance (in feet)				
		Autos: 83.666				
		Medium Trucks: 83.560				
Heavy Trucks: 83.570						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.65	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-8.84	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-10.48	-3.45	-1.20	-5.16	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:	66.5	65.1	63.4	59.5	67.2	67.6
Medium Trucks:	66.0	65.1	59.3	58.6	66.5	66.7
Heavy Trucks:	69.1	68.1	60.8	63.0	70.3	70.5
Vehicle Noise:	72.2	71.1	66.3	65.6	73.1	73.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	161	347	749	1,613
CNEL:	167	360	776	1,672

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY+P
Road Name: Ethanac Rd.
Road Segment: e/o Encanto Rd.

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	39,282 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	3,241 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 88.36%				
Barrier Height:	0.0 feet	Medium Trucks: 80.9% 5.3% 13.8% 6.63%				
Barrier Type (0-Wall, 1-Berm):	0.0	Heavy Trucks: 78.4% 3.6% 18.0% 5.02%				
Centerline Dist. to Barrier:	100.0 feet	Noise Source Elevations (in feet)				
Centerline Dist. to Observer:	100.0 feet	Autos: 0.000				
Barrier Distance to Observer:	0.0 feet	Medium Trucks: 2.297				
Observer Height (Above Pad):	5.0 feet	Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation:	0.0 feet	Lane Equivalent Distance (in feet)				
Road Elevation:	0.0 feet	Autos: 83.666				
Road Grade:	0.0%	Medium Trucks: 83.560				
Left View:	-90.0 degrees	Heavy Trucks: 83.570				
Right View:	90.0 degrees					

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.73	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-8.52	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-9.73	-3.45	-1.20	-5.16	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:	66.5	65.2	63.5	59.5	67.3	67.7
Medium Trucks:	66.3	65.4	59.6	59.0	66.8	67.0
Heavy Trucks:	69.9	68.9	61.6	63.7	71.1	71.2
Vehicle Noise:	72.7	71.6	66.6	66.1	73.6	73.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	174	375	808	1,740
CNEL:	180	388	836	1,802

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E
Road Name: Ethanac Rd.
Road Segment: e/o Trumble Rd.

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	13,653 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	1,126 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 89.32%				
Barrier Height: 0.0 feet		Medium Trucks: 80.9% 5.3% 13.8% 6.33%				
Barrier Type (0-Wall, 1-Berm): 0.0		Heavy Trucks: 78.4% 3.6% 18.0% 4.35%				
Centerline Dist. to Barrier: 100.0 feet		Noise Source Elevations (in feet)				
Centerline Dist. to Observer: 100.0 feet		Autos: 0.000				
Barrier Distance to Observer: 0.0 feet		Medium Trucks: 2.297				
Observer Height (Above Pad): 5.0 feet		Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation: 0.0 feet		Lane Equivalent Distance (in feet)				
Road Elevation: 0.0 feet		Autos: 83.666				
Road Grade: 0.0%		Medium Trucks: 83.560				
Left View: -90.0 degrees		Heavy Trucks: 83.570				
Right View: 90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.81	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-13.30	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-14.94	-3.45	-1.20	-5.16	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:	62.0	60.7	58.9	55.0	62.7	63.2
Medium Trucks:	61.5	60.6	54.8	54.2	62.0	62.2
Heavy Trucks:	64.7	63.7	56.3	58.5	65.9	66.0
Vehicle Noise:	67.7	66.7	61.8	61.1	68.7	68.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	81	175	377	813
CNEL:	84	182	391	843

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E+P
 Road Name: Ethanac Rd.
 Road Segment: e/o Trumble Rd.

Project Name: Heritage Valley Business c
 Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	14,153 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	1,168 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 86.16%				
Barrier Height:	0.0 feet	Medium Trucks: 80.9% 5.3% 13.8% 7.44%				
Barrier Type (0-Wall, 1-Berm):	0.0	Heavy Trucks: 78.4% 3.6% 18.0% 6.40%				
Centerline Dist. to Barrier:	100.0 feet	Noise Source Elevations (in feet)				
Centerline Dist. to Observer:	100.0 feet	Autos: 0.000				
Barrier Distance to Observer:	0.0 feet	Medium Trucks: 2.297				
Observer Height (Above Pad):	5.0 feet	Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation:	0.0 feet	Lane Equivalent Distance (in feet)				
Road Elevation:	0.0 feet	Autos: 83.666				
Road Grade:	0.0%	Medium Trucks: 83.560				
Left View:	-90.0 degrees	Heavy Trucks: 83.570				
Right View:	90.0 degrees					

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.81	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-12.45	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-13.10	-3.45	-1.20	-5.16	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:	62.0	60.7	58.9	55.0	62.7	63.2
Medium Trucks:	62.4	61.5	55.7	55.0	62.9	63.1
Heavy Trucks:	66.5	65.5	58.2	60.3	67.7	67.8
Vehicle Noise:	68.9	67.9	62.6	62.3	69.9	70.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	98	211	455	981
CNEL:	101	218	470	1,013

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: EAC
Road Name: Ethanac Rd.
Road Segment: e/o Trumble Rd.

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	28,407 vehicles	Autos: 15					
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	2,344 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	45 mph	Vehicle Mix					
Near/Far Lane Distance:	110 feet						
Site Data		VehicleType	Day	Evening	Night	Daily	
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 100.0 feet Centerline Dist. to Observer: 100.0 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		Autos:	72.9%	12.2%	14.9%	89.32%	
		Medium Trucks:	80.9%	5.3%	13.8%	6.33%	
		Heavy Trucks:	78.4%	3.6%	18.0%	4.35%	
		Noise Source Elevations (in feet)					
		Autos:	0.000				
		Medium Trucks:	2.297				
		Heavy Trucks:	8.004	Grade Adjustment: 0.0			
		Lane Equivalent Distance (in feet)					
		Autos:	83.666				
		Medium Trucks:	83.560				
Heavy Trucks:	83.570						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.37	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-10.12	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-11.75	-3.45	-1.20	-5.16	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:	65.2	63.8	62.1	58.2	65.9	66.4
Medium Trucks:	64.7	63.8	58.0	57.4	65.2	65.4
Heavy Trucks:	67.8	66.8	59.5	61.7	69.1	69.2
Vehicle Noise:	70.9	69.8	65.0	64.3	71.8	72.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	133	285	615	1,325
CNEL:	137	296	638	1,374

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: EACP
 Road Name: Ethanac Rd.
 Road Segment: e/o Trumble Rd.

Project Name: Heritage Valley Business c
 Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	28,907 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	2,385 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 87.77%				
Barrier Height: 0.0 feet		Medium Trucks: 80.9% 5.3% 13.8% 6.87%				
Barrier Type (0-Wall, 1-Berm): 0.0		Heavy Trucks: 78.4% 3.6% 18.0% 5.35%				
Centerline Dist. to Barrier: 100.0 feet		Noise Source Elevations (in feet)				
Centerline Dist. to Observer: 100.0 feet		Autos: 0.000				
Barrier Distance to Observer: 0.0 feet		Medium Trucks: 2.297				
Observer Height (Above Pad): 5.0 feet		Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation: 0.0 feet		Lane Equivalent Distance (in feet)				
Road Elevation: 0.0 feet		Autos: 83.666				
Road Grade: 0.0%		Medium Trucks: 83.560				
Left View: -90.0 degrees		Heavy Trucks: 83.570				
Right View: 90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.37	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-9.69	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-10.78	-3.45	-1.20	-5.16	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:	65.2	63.8	62.1	58.2	65.9	66.4
Medium Trucks:	65.1	64.2	58.4	57.8	65.6	65.9
Heavy Trucks:	68.8	67.8	60.5	62.7	70.0	70.2
Vehicle Noise:	71.5	70.5	65.4	64.9	72.5	72.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	146	314	678	1,460
CNEL:	151	325	701	1,511

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY
Road Name: Ethanac Rd.
Road Segment: e/o Trumble Rd.

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	31,248 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	2,578 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph					
Near/Far Lane Distance:	110 feet					
Site Data		Vehicle Mix				
		VehicleType	Day	Evening	Night	Daily
Barrier Height:	0.0 feet	Autos:	72.9%	12.2%	14.9%	89.32%
Barrier Type (0-Wall, 1-Berm):	0.0	Medium Trucks:	80.9%	5.3%	13.8%	6.33%
Centerline Dist. to Barrier:	100.0 feet	Heavy Trucks:	78.4%	3.6%	18.0%	4.35%
Centerline Dist. to Observer:	100.0 feet	Noise Source Elevations (in feet)				
Barrier Distance to Observer:	0.0 feet	Autos:	0.000			
Observer Height (Above Pad):	5.0 feet	Medium Trucks:	2.297			
Pad Elevation:	0.0 feet	Heavy Trucks:	8.004	Grade Adjustment:	0.0	
Road Elevation:	0.0 feet	Lane Equivalent Distance (in feet)				
Road Grade:	0.0%	Autos:	83.666			
Left View:	-90.0 degrees	Medium Trucks:	83.560			
Right View:	90.0 degrees	Heavy Trucks:	83.570			

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.78	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-9.71	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-11.34	-3.45	-1.20	-5.16	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	64.3	62.5	58.6	66.3	66.8
Medium Trucks:	65.1	64.2	58.4	57.8	65.6	65.8
Heavy Trucks:	68.3	67.2	59.9	62.1	69.5	69.6
Vehicle Noise:	71.3	70.3	65.4	64.7	72.2	72.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	141	304	655	1,412
CNEL:	146	315	680	1,464

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY+P
Road Name: Ethanac Rd.
Road Segment: e/o Trumble Rd.

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	31,748 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	2,619 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet					
Site Data		VehicleType	Day	Evening	Night	Daily
		Autos: 72.9% 12.2% 14.9% 87.91%				
		Medium Trucks: 80.9% 5.3% 13.8% 6.83%				
		Heavy Trucks: 78.4% 3.6% 18.0% 5.26%				
		Noise Source Elevations (in feet)				
		Autos: 0.000				
		Medium Trucks: 2.297				
		Heavy Trucks: 8.004 Grade Adjustment: 0.0				
		Lane Equivalent Distance (in feet)				
		Autos: 83.666				
Medium Trucks: 83.560						
Heavy Trucks: 83.570						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.78	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-9.31	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-10.44	-3.45	-1.20	-5.16	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	64.3	62.5	58.6	66.3	66.8
Medium Trucks:	65.5	64.6	58.8	58.2	66.0	66.2
Heavy Trucks:	69.2	68.1	60.8	63.0	70.4	70.5
Vehicle Noise:	71.9	70.8	65.8	65.3	72.8	73.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	154	332	716	1,543
CNEL:	160	344	741	1,597

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E
Road Name: Ethanac Rd.
Road Segment: e/o Sherman Rd.

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	9,988 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	824 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 89.32%				
Barrier Height: 0.0 feet		Medium Trucks: 80.9% 5.3% 13.8% 6.33%				
Barrier Type (0-Wall, 1-Berm): 0.0		Heavy Trucks: 78.4% 3.6% 18.0% 4.35%				
Centerline Dist. to Barrier: 100.0 feet		Noise Source Elevations (in feet)				
Centerline Dist. to Observer: 100.0 feet		Autos: 0.000				
Barrier Distance to Observer: 0.0 feet		Medium Trucks: 2.297				
Observer Height (Above Pad): 5.0 feet		Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation: 0.0 feet		Lane Equivalent Distance (in feet)				
Road Elevation: 0.0 feet		Autos: 83.666				
Road Grade: 0.0%		Medium Trucks: 83.560				
Left View: -90.0 degrees		Heavy Trucks: 83.570				
Right View: 90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.17	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-14.66	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-16.29	-3.45	-1.20	-5.16	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:	60.6	59.3	57.6	53.6	61.4	61.8
Medium Trucks:	60.1	59.3	53.5	52.8	60.7	60.9
Heavy Trucks:	63.3	62.3	55.0	57.1	64.5	64.6
Vehicle Noise:	66.4	65.3	60.4	59.7	67.3	67.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	66	142	306	660
CNEL:	68	147	318	685

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E+P
 Road Name: Ethanac Rd.
 Road Segment: e/o Sherman Rd.

Project Name: Heritage Valley Business c
 Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	10,099 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	833 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet					
		VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 89.43%				
Barrier Height: 0.0 feet		Medium Trucks: 80.9% 5.3% 13.8% 6.26%				
Barrier Type (0-Wall, 1-Berm): 0.0		Heavy Trucks: 78.4% 3.6% 18.0% 4.30%				
Centerline Dist. to Barrier: 100.0 feet		Noise Source Elevations (in feet)				
Centerline Dist. to Observer: 100.0 feet						
Barrier Distance to Observer: 0.0 feet		Autos: 0.000				
Observer Height (Above Pad): 5.0 feet		Medium Trucks: 2.297				
Pad Elevation: 0.0 feet		Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Road Elevation: 0.0 feet		Lane Equivalent Distance (in feet)				
Road Grade: 0.0%						
Left View: -90.0 degrees		Autos: 83.666				
Right View: 90.0 degrees		Medium Trucks: 83.560				
		Heavy Trucks: 83.570				

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-3.12	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-14.66	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-16.29	-3.45	-1.20	-5.16	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:	60.7	59.4	57.6	53.7	61.4	61.9
Medium Trucks:	60.1	59.3	53.5	52.8	60.7	60.9
Heavy Trucks:	63.3	62.3	55.0	57.1	64.5	64.6
Vehicle Noise:	66.4	65.3	60.5	59.7	67.3	67.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	66	143	307	662
CNEL:	69	148	318	686

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: EAC
Road Name: Ethanac Rd.
Road Segment: e/o Sherman Rd.

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	26,038 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	2,148 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet					
Site Data		VehicleType	Day	Evening	Night	Daily
		Autos:	72.9%	12.2%	14.9%	89.32%
		Medium Trucks:	80.9%	5.3%	13.8%	6.33%
		Heavy Trucks:	78.4%	3.6%	18.0%	4.35%
		Noise Source Elevations (in feet)				
		Autos:	0.000			
		Medium Trucks:	2.297			
		Heavy Trucks:	8.004	Grade Adjustment:	0.0	
		Lane Equivalent Distance (in feet)				
		Autos:	83.666			
		Medium Trucks:	83.560			
		Heavy Trucks:	83.570			

FHWA Noise Model Calculations							
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.99	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-10.50	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-12.13	-3.45	-1.20	-5.16	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:	64.8	63.5	61.7	57.8	65.5	66.0
Medium Trucks:	64.3	63.4	57.6	57.0	64.8	65.0
Heavy Trucks:	67.5	66.5	59.1	61.3	68.7	68.8
Vehicle Noise:	70.5	69.5	64.6	63.9	71.5	71.7

Centerline Distance to Noise Contour (in feet)				
	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	125	269	580	1,250
CNEL:	130	279	602	1,297

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: EACP
Road Name: Ethanac Rd.
Road Segment: e/o Sherman Rd.

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	26,149 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	2,157 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph					
Near/Far Lane Distance:	110 feet					
Site Data		Vehicle Mix				
		VehicleType	Day	Evening	Night	Daily
Barrier Height:	0.0 feet	Autos:	72.9%	12.2%	14.9%	89.36%
Barrier Type (0-Wall, 1-Berm):	0.0	Medium Trucks:	80.9%	5.3%	13.8%	6.31%
Centerline Dist. to Barrier:	100.0 feet	Heavy Trucks:	78.4%	3.6%	18.0%	4.33%
Centerline Dist. to Observer:	100.0 feet	Noise Source Elevations (in feet)				
Barrier Distance to Observer:	0.0 feet	Autos:	0.000			
Observer Height (Above Pad):	5.0 feet	Medium Trucks:	2.297			
Pad Elevation:	0.0 feet	Heavy Trucks:	8.004	Grade Adjustment:	0.0	
Road Elevation:	0.0 feet	Lane Equivalent Distance (in feet)				
Road Grade:	0.0%	Autos:	83.666			
Left View:	-90.0 degrees	Medium Trucks:	83.560			
Right View:	90.0 degrees	Heavy Trucks:	83.570			

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.01	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-10.50	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-12.13	-3.45	-1.20	-5.16	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:	64.8	63.5	61.7	57.8	65.5	66.0
Medium Trucks:	64.3	63.4	57.6	57.0	64.8	65.0
Heavy Trucks:	67.5	66.5	59.1	61.3	68.7	68.8
Vehicle Noise:	70.5	69.5	64.6	63.9	71.5	71.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	125	270	581	1,251
CNEL:	130	280	602	1,298

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY
Road Name: Ethanac Rd.
Road Segment: e/o Sherman Rd.

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	28,642 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	2,363 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 89.32%				
Barrier Height:	0.0 feet	Medium Trucks: 80.9% 5.3% 13.8% 6.33%				
Barrier Type (0-Wall, 1-Berm):	0.0	Heavy Trucks: 78.4% 3.6% 18.0% 4.35%				
Centerline Dist. to Barrier:	100.0 feet	Noise Source Elevations (in feet)				
Centerline Dist. to Observer:	100.0 feet	Autos: 0.000				
Barrier Distance to Observer:	0.0 feet	Medium Trucks: 2.297				
Observer Height (Above Pad):	5.0 feet	Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation:	0.0 feet	Lane Equivalent Distance (in feet)				
Road Elevation:	0.0 feet	Autos: 83.666				
Road Grade:	0.0%	Medium Trucks: 83.560				
Left View:	-90.0 degrees	Heavy Trucks: 83.570				
Right View:	90.0 degrees					

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.41	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-10.09	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-11.72	-3.45	-1.20	-5.16	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:	65.2	63.9	62.1	58.2	65.9	66.4
Medium Trucks:	64.7	63.8	58.0	57.4	65.2	65.5
Heavy Trucks:	67.9	66.9	59.6	61.7	69.1	69.2
Vehicle Noise:	70.9	69.9	65.0	64.3	71.9	72.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	133	287	618	1,332
CNEL:	138	298	641	1,382

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY+P
 Road Name: Ethanac Rd.
 Road Segment: e/o Sherman Rd.

Project Name: Heritage Valley Business c
 Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	28,753 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	2,372 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	110 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 89.36%				
Barrier Height: 0.0 feet		Medium Trucks: 80.9% 5.3% 13.8% 6.31%				
Barrier Type (0-Wall, 1-Berm): 0.0		Heavy Trucks: 78.4% 3.6% 18.0% 4.33%				
Centerline Dist. to Barrier: 100.0 feet		Noise Source Elevations (in feet)				
Centerline Dist. to Observer: 100.0 feet		Autos: 0.000				
Barrier Distance to Observer: 0.0 feet		Medium Trucks: 2.297				
Observer Height (Above Pad): 5.0 feet		Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation: 0.0 feet		Lane Equivalent Distance (in feet)				
Road Elevation: 0.0 feet		Autos: 83.666				
Road Grade: 0.0%		Medium Trucks: 83.560				
Left View: -90.0 degrees		Heavy Trucks: 83.570				
Right View: 90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.43	-3.46	-1.20	-4.77	0.000	0.000
Medium Trucks:	79.45	-10.09	-3.45	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-11.72	-3.45	-1.20	-5.16	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:	65.2	63.9	62.2	58.2	65.9	66.4
Medium Trucks:	64.7	63.8	58.0	57.4	65.2	65.5
Heavy Trucks:	67.9	66.9	59.6	61.7	69.1	69.2
Vehicle Noise:	70.9	69.9	65.0	64.3	71.9	72.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	133	287	619	1,333
CNEL:	138	298	642	1,383

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E
Road Name: Trumble Rd.
Road Segment: s/o Ethanac Rd.

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	1,495 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	123 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	12 feet					
Site Data		VehicleType	Day	Evening	Night	Daily
		Autos:	72.9%	12.2%	14.9%	89.32%
		Medium Trucks:	80.9%	5.3%	13.8%	6.33%
		Heavy Trucks:	78.4%	3.6%	18.0%	4.35%
		Noise Source Elevations (in feet)				
		Autos:	0.000			
		Medium Trucks:	2.297			
		Heavy Trucks:	8.004	Grade Adjustment:	0.0	
		Lane Equivalent Distance (in feet)				
		Autos:	29.816			
		Medium Trucks:	29.518			
		Heavy Trucks:	29.547			

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-11.42	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	79.45	-22.91	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-24.54	3.32	-1.20	-5.77	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:	59.1	57.8	56.0	52.1	59.8	60.3
Medium Trucks:	58.7	57.8	52.0	51.3	59.2	59.4
Heavy Trucks:	61.8	60.8	53.5	55.7	63.0	63.2
Vehicle Noise:	64.9	63.8	58.9	58.2	65.8	66.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	16	34	73	158
CNEL:	16	35	76	163

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E+P
 Road Name: Trumble Rd.
 Road Segment: s/o Ethanac Rd.

Project Name: Heritage Valley Business c
 Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS					
Highway Data		Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):	2,002 vehicles	Autos: 15					
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15					
Peak Hour Volume:	165 vehicles	Heavy Trucks (3+ Axles): 15					
Vehicle Speed:	45 mph	Vehicle Mix					
Near/Far Lane Distance:	12 feet						
Site Data		VehicleType	Day	Evening	Night	Daily	
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 30.0 feet Centerline Dist. to Observer: 30.0 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		Autos:	72.9%	12.2%	14.9%	92.02%	
		Medium Trucks:	80.9%	5.3%	13.8%	4.73%	
		Heavy Trucks:	78.4%	3.6%	18.0%	3.25%	
		Noise Source Elevations (in feet)					
		Autos:	0.000				
		Medium Trucks:	2.297				
		Heavy Trucks:	8.004	Grade Adjustment: 0.0			
		Lane Equivalent Distance (in feet)					
		Autos:	29.816				
		Medium Trucks:	29.518				
Heavy Trucks:	29.547						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-10.02	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	79.45	-22.91	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-24.54	3.32	-1.20	-5.77	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:	60.5	59.2	57.4	53.5	61.2	61.7
Medium Trucks:	58.7	57.8	52.0	51.3	59.2	59.4
Heavy Trucks:	61.8	60.8	53.5	55.7	63.0	63.2
Vehicle Noise:	65.3	64.2	59.7	58.6	66.2	66.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	17	36	78	168
CNEL:	17	38	81	174

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: EAC
Road Name: Trumble Rd.
Road Segment: s/o Ethanac Rd.

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	1,695 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	140 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	12 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 89.32%				
Barrier Height:	0.0 feet	Medium Trucks: 80.9% 5.3% 13.8% 6.33%				
Barrier Type (0-Wall, 1-Berm):	0.0	Heavy Trucks: 78.4% 3.6% 18.0% 4.35%				
Centerline Dist. to Barrier:	30.0 feet	Noise Source Elevations (in feet)				
Centerline Dist. to Observer:	30.0 feet	Autos: 0.000				
Barrier Distance to Observer:	0.0 feet	Medium Trucks: 2.297				
Observer Height (Above Pad):	5.0 feet	Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation:	0.0 feet	Lane Equivalent Distance (in feet)				
Road Elevation:	0.0 feet	Autos: 29.816				
Road Grade:	0.0%	Medium Trucks: 29.518				
Left View:	-90.0 degrees	Heavy Trucks: 29.547				
Right View:	90.0 degrees					

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-10.87	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	79.45	-22.36	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-24.00	3.32	-1.20	-5.77	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:	59.7	58.3	56.6	52.7	60.4	60.8
Medium Trucks:	59.2	58.3	52.5	51.9	59.7	60.0
Heavy Trucks:	62.4	61.4	54.1	56.2	63.6	63.7
Vehicle Noise:	65.4	64.4	59.5	58.8	66.4	66.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	17	37	80	171
CNEL:	18	38	82	178

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: EACP
Road Name: Trumble Rd.
Road Segment: s/o Ethanac Rd.

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	2,202 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	182 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	12 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 91.78%				
Barrier Height:	0.0 feet	Medium Trucks: 80.9% 5.3% 13.8% 4.88%				
Barrier Type (0-Wall, 1-Berm):	0.0	Heavy Trucks: 78.4% 3.6% 18.0% 3.35%				
Centerline Dist. to Barrier:	30.0 feet	Noise Source Elevations (in feet)				
Centerline Dist. to Observer:	30.0 feet	Autos: 0.000				
Barrier Distance to Observer:	0.0 feet	Medium Trucks: 2.297				
Observer Height (Above Pad):	5.0 feet	Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation:	0.0 feet	Lane Equivalent Distance (in feet)				
Road Elevation:	0.0 feet	Autos: 29.816				
Road Grade:	0.0%	Medium Trucks: 29.518				
Left View:	-90.0 degrees	Heavy Trucks: 29.547				
Right View:	90.0 degrees					

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-9.62	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	79.45	-22.36	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-24.00	3.32	-1.20	-5.77	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:	60.9	59.6	57.8	53.9	61.6	62.1
Medium Trucks:	59.2	58.3	52.5	51.9	59.7	60.0
Heavy Trucks:	62.4	61.4	54.1	56.2	63.6	63.7
Vehicle Noise:	65.8	64.7	60.2	59.1	66.7	67.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	18	39	84	181
CNEL:	19	41	87	188

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY
Road Name: Trumble Rd.
Road Segment: s/o Ethanac Rd.

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	1,865 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	154 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	12 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 89.32%				
Barrier Height:	0.0 feet	Medium Trucks: 80.9% 5.3% 13.8% 6.33%				
Barrier Type (0-Wall, 1-Berm):	0.0	Heavy Trucks: 78.4% 3.6% 18.0% 4.35%				
Centerline Dist. to Barrier:	30.0 feet	Noise Source Elevations (in feet)				
Centerline Dist. to Observer:	30.0 feet	Autos: 0.000				
Barrier Distance to Observer:	0.0 feet	Medium Trucks: 2.297				
Observer Height (Above Pad):	5.0 feet	Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation:	0.0 feet	Lane Equivalent Distance (in feet)				
Road Elevation:	0.0 feet	Autos: 29.816				
Road Grade:	0.0%	Medium Trucks: 29.518				
Left View:	-90.0 degrees	Heavy Trucks: 29.547				
Right View:	90.0 degrees					

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-10.46	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	79.45	-21.95	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-23.58	3.32	-1.20	-5.77	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:	60.1	58.7	57.0	53.1	60.8	61.3
Medium Trucks:	59.6	58.8	53.0	52.3	60.2	60.4
Heavy Trucks:	62.8	61.8	54.5	56.6	64.0	64.1
Vehicle Noise:	65.8	64.8	59.9	59.2	66.8	67.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	18	39	85	183
CNEL:	19	41	88	189

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY+P
Road Name: Trumble Rd.
Road Segment: s/o Ethanac Rd.

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	2,372 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	196 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	45 mph	Vehicle Mix				
Near/Far Lane Distance:	12 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 91.60%				
Barrier Height:	0.0 feet	Medium Trucks: 80.9% 5.3% 13.8% 4.98%				
Barrier Type (0-Wall, 1-Berm):	0.0	Heavy Trucks: 78.4% 3.6% 18.0% 3.42%				
Centerline Dist. to Barrier:	30.0 feet	Noise Source Elevations (in feet)				
Centerline Dist. to Observer:	30.0 feet	Autos: 0.000				
Barrier Distance to Observer:	0.0 feet	Medium Trucks: 2.297				
Observer Height (Above Pad):	5.0 feet	Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation:	0.0 feet	Lane Equivalent Distance (in feet)				
Road Elevation:	0.0 feet	Autos: 29.816				
Road Grade:	0.0%	Medium Trucks: 29.518				
Left View:	-90.0 degrees	Heavy Trucks: 29.547				
Right View:	90.0 degrees					

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-9.30	3.26	-1.20	-4.49	0.000	0.000
Medium Trucks:	79.45	-21.95	3.33	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-23.58	3.32	-1.20	-5.77	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:	61.2	59.9	58.2	54.2	61.9	62.4
Medium Trucks:	59.6	58.8	53.0	52.3	60.2	60.4
Heavy Trucks:	62.8	61.8	54.5	56.6	64.0	64.1
Vehicle Noise:	66.2	65.1	60.5	59.5	67.1	67.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	41	89	192
CNEL:	20	43	93	199

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E
Road Name: Sherman Rd.
Road Segment: n/o Ethanac Rd.

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	2,810 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	232 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	35 mph	Vehicle Mix				
Near/Far Lane Distance:	48 feet					
Site Data		VehicleType	Day	Evening	Night	Daily
		Autos: 72.9% 12.2% 14.9% 89.32%				
		Medium Trucks: 80.9% 5.3% 13.8% 6.33%				
		Heavy Trucks: 78.4% 3.6% 18.0% 4.35%				
		Noise Source Elevations (in feet)				
		Autos: 0.000				
		Medium Trucks: 2.297				
		Heavy Trucks: 8.004 Grade Adjustment: 0.0				
		Lane Equivalent Distance (in feet)				
		Autos: 54.129				
		Medium Trucks: 53.966				
		Heavy Trucks: 53.982				

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-7.58	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	75.75	-19.08	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	81.57	-20.71	-0.60	-1.20	-5.35	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:	54.9	53.6	51.8	47.9	55.6	56.1
Medium Trucks:	54.9	54.0	48.2	47.5	55.4	55.6
Heavy Trucks:	59.1	58.0	50.7	52.9	60.3	60.4
Vehicle Noise:	61.5	60.5	55.3	55.0	62.5	62.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	40	86	186
CNEL:	19	41	89	193

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E+P
 Road Name: Sherman Rd.
 Road Segment: n/o Ethanac Rd.

Project Name: Heritage Valley Business c
 Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	2,884 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	238 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	35 mph	Vehicle Mix				
Near/Far Lane Distance:	48 feet					
Site Data		VehicleType	Day	Evening	Night	Daily
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 59.0 feet Centerline Dist. to Observer: 59.0 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		Autos: 72.9% 12.2% 14.9% 89.59%				
		Medium Trucks: 80.9% 5.3% 13.8% 6.17%				
		Heavy Trucks: 78.4% 3.6% 18.0% 4.24%				
		Noise Source Elevations (in feet)				
		Autos: 0.000				
		Medium Trucks: 2.297				
		Heavy Trucks: 8.004 Grade Adjustment: 0.0				
		Lane Equivalent Distance (in feet)				
		Autos: 54.129				
		Medium Trucks: 53.966				
		Heavy Trucks: 53.982				

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-7.46	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	75.75	-19.08	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	81.57	-20.71	-0.60	-1.20	-5.35	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:	55.0	53.7	52.0	48.0	55.7	56.2
Medium Trucks:	54.9	54.0	48.2	47.5	55.4	55.6
Heavy Trucks:	59.1	58.0	50.7	52.9	60.3	60.4
Vehicle Noise:	61.6	60.5	55.3	55.0	62.5	62.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	40	87	187
CNEL:	19	42	90	193

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: EAC
Road Name: Sherman Rd.
Road Segment: n/o Ethanac Rd.

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	4,129 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	341 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	35 mph	Vehicle Mix				
Near/Far Lane Distance:	48 feet					
Site Data		VehicleType	Day	Evening	Night	Daily
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 59.0 feet Centerline Dist. to Observer: 59.0 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		Autos:	72.9%	12.2%	14.9%	89.32%
		Medium Trucks:	80.9%	5.3%	13.8%	6.33%
		Heavy Trucks:	78.4%	3.6%	18.0%	4.35%
		Noise Source Elevations (in feet)				
		Autos:	0.000	Grade Adjustment: 0.0		
		Medium Trucks:	2.297			
		Heavy Trucks:	8.004			
		Lane Equivalent Distance (in feet)				
		Autos:	54.129			
		Medium Trucks:	53.966			
Heavy Trucks:	53.982					

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-5.91	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	75.75	-17.41	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	81.57	-19.04	-0.60	-1.20	-5.35	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:	56.6	55.2	53.5	49.6	57.3	57.8
Medium Trucks:	56.5	55.7	49.9	49.2	57.1	57.3
Heavy Trucks:	60.7	59.7	52.4	54.6	61.9	62.1
Vehicle Noise:	63.2	62.1	56.9	56.6	64.2	64.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	24	52	112	241
CNEL:	25	54	116	249

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: EACP
 Road Name: Sherman Rd.
 Road Segment: n/o Ethanac Rd.

Project Name: Heritage Valley Business c
 Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	4,203 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	347 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	35 mph	Vehicle Mix				
Near/Far Lane Distance:	48 feet					
Site Data		VehicleType	Day	Evening	Night	Daily
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 59.0 feet Centerline Dist. to Observer: 59.0 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		Autos: 72.9% 12.2% 14.9% 89.50%				
		Medium Trucks: 80.9% 5.3% 13.8% 6.22%				
		Heavy Trucks: 78.4% 3.6% 18.0% 4.27%				
		Noise Source Elevations (in feet)				
		Autos: 0.000				
		Medium Trucks: 2.297				
		Heavy Trucks: 8.004 Grade Adjustment: 0.0				
		Lane Equivalent Distance (in feet)				
		Autos: 54.129				
		Medium Trucks: 53.966				
		Heavy Trucks: 53.982				

FHWA Noise Model Calculations							
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-5.83	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	75.75	-17.41	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	81.57	-19.04	-0.60	-1.20	-5.35	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:	56.7	55.3	53.6	49.7	57.4	57.8
Medium Trucks:	56.5	55.7	49.9	49.2	57.1	57.3
Heavy Trucks:	60.7	59.7	52.4	54.6	61.9	62.1
Vehicle Noise:	63.2	62.2	57.0	56.6	64.2	64.4

Centerline Distance to Noise Contour (in feet)				
	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	24	52	112	241
CNEL:	25	54	116	250

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY
Road Name: Sherman Rd.
Road Segment: n/o Ethanac Rd.

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	5,205 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	429 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	35 mph	Vehicle Mix				
Near/Far Lane Distance:	48 feet					
Site Data		VehicleType	Day	Evening	Night	Daily
		Autos:	72.9%	12.2%	14.9%	89.32%
		Medium Trucks:	80.9%	5.3%	13.8%	6.33%
		Heavy Trucks:	78.4%	3.6%	18.0%	4.35%
		Noise Source Elevations (in feet)				
		Autos:	0.000			
		Medium Trucks:	2.297			
		Heavy Trucks:	8.004	Grade Adjustment:	0.0	
		Lane Equivalent Distance (in feet)				
		Autos:	54.129			
		Medium Trucks:	53.966			
		Heavy Trucks:	53.982			

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-4.91	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	75.75	-16.40	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	81.57	-18.03	-0.60	-1.20	-5.35	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:	57.6	56.2	54.5	50.6	58.3	58.8
Medium Trucks:	57.5	56.7	50.9	50.2	58.1	58.3
Heavy Trucks:	61.7	60.7	53.4	55.6	62.9	63.1
Vehicle Noise:	64.2	63.2	57.9	57.6	65.2	65.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	61	130	281
CNEL:	29	63	135	291

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY+P
Road Name: Sherman Rd.
Road Segment: n/o Ethanac Rd.

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	5,279 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	435 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	35 mph	Vehicle Mix				
Near/Far Lane Distance:	48 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 89.47%				
Barrier Height: 0.0 feet		Medium Trucks: 80.9% 5.3% 13.8% 6.25%				
Barrier Type (0-Wall, 1-Berm): 0.0		Heavy Trucks: 78.4% 3.6% 18.0% 4.29%				
Centerline Dist. to Barrier: 59.0 feet		Noise Source Elevations (in feet)				
Centerline Dist. to Observer: 59.0 feet		Autos: 0.000				
Barrier Distance to Observer: 0.0 feet		Medium Trucks: 2.297				
Observer Height (Above Pad): 5.0 feet		Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation: 0.0 feet		Lane Equivalent Distance (in feet)				
Road Elevation: 0.0 feet		Autos: 54.129				
Road Grade: 0.0%		Medium Trucks: 53.966				
Left View: -90.0 degrees		Heavy Trucks: 53.982				
Right View: 90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-4.84	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	75.75	-16.40	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	81.57	-18.03	-0.60	-1.20	-5.35	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:	57.6	56.3	54.6	50.7	58.4	58.8
Medium Trucks:	57.5	56.7	50.9	50.2	58.1	58.3
Heavy Trucks:	61.7	60.7	53.4	55.6	62.9	63.1
Vehicle Noise:	64.2	63.2	58.0	57.6	65.2	65.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	61	131	282
CNEL:	29	63	135	291

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E
Road Name: Sherman Rd.
Road Segment: s/o Ethanac Rd.

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	337 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	28 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	35 mph	Vehicle Mix				
Near/Far Lane Distance:	48 feet					
Site Data		VehicleType	Day	Evening	Night	Daily
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 59.0 feet Centerline Dist. to Observer: 59.0 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		Autos: 72.9% 12.2% 14.9% 89.32%				
		Medium Trucks: 80.9% 5.3% 13.8% 6.33%				
		Heavy Trucks: 78.4% 3.6% 18.0% 4.35%				
		Noise Source Elevations (in feet)				
		Autos: 0.000				
		Medium Trucks: 2.297				
		Heavy Trucks: 8.004 Grade Adjustment: 0.0				
		Lane Equivalent Distance (in feet)				
		Autos: 54.129				
		Medium Trucks: 53.966				
		Heavy Trucks: 53.982				

FHWA Noise Model Calculations							
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-16.80	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	75.75	-28.29	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	81.57	-29.92	-0.60	-1.20	-5.35	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:	45.7	44.4	42.6	38.7	46.4	46.9
Medium Trucks:	45.7	44.8	39.0	38.3	46.2	46.4
Heavy Trucks:	49.8	48.8	41.5	43.7	51.1	51.2
Vehicle Noise:	52.3	51.3	46.1	45.7	53.3	53.5

Centerline Distance to Noise Contour (in feet)				
	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	10	21	45
CNEL:	5	10	22	47

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E+P
Road Name: Sherman Rd.
Road Segment: s/o Ethanac Rd.

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	1,021 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	84 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	35 mph	Vehicle Mix				
Near/Far Lane Distance:	48 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 47.52%				
Barrier Height:	0.0 feet	Medium Trucks: 80.9% 5.3% 13.8% 20.50%				
Barrier Type (0-Wall, 1-Berm):	0.0	Heavy Trucks: 78.4% 3.6% 18.0% 31.98%				
Centerline Dist. to Barrier:	59.0 feet	Noise Source Elevations (in feet)				
Centerline Dist. to Observer:	59.0 feet	Autos: 0.000				
Barrier Distance to Observer:	0.0 feet	Medium Trucks: 2.297				
Observer Height (Above Pad):	5.0 feet	Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation:	0.0 feet	Lane Equivalent Distance (in feet)				
Road Elevation:	0.0 feet	Autos: 54.129				
Road Grade:	0.0%	Medium Trucks: 53.966				
Left View:	-90.0 degrees	Heavy Trucks: 53.982				
Right View:	90.0 degrees					

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-14.72	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	75.75	-18.37	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	81.57	-16.44	-0.60	-1.20	-5.35	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:	47.8	46.4	44.7	40.8	48.5	48.9
Medium Trucks:	55.6	54.7	48.9	48.3	56.1	56.3
Heavy Trucks:	63.3	62.3	55.0	57.2	64.5	64.7
Vehicle Noise:	64.1	63.1	56.3	57.8	65.2	65.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	61	131	283
CNEL:	29	62	134	289

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: EAC
 Road Name: Sherman Rd.
 Road Segment: s/o Ethanac Rd.

Project Name: Heritage Valley Business c
 Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	6,157 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	508 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	35 mph	Vehicle Mix				
Near/Far Lane Distance:	48 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 89.32%				
Barrier Height:	0.0 feet	Medium Trucks: 80.9% 5.3% 13.8% 6.33%				
Barrier Type (0-Wall, 1-Berm):	0.0	Heavy Trucks: 78.4% 3.6% 18.0% 4.35%				
Centerline Dist. to Barrier:	59.0 feet	Noise Source Elevations (in feet)				
Centerline Dist. to Observer:	59.0 feet	Autos: 0.000				
Barrier Distance to Observer:	0.0 feet	Medium Trucks: 2.297				
Observer Height (Above Pad):	5.0 feet	Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation:	0.0 feet	Lane Equivalent Distance (in feet)				
Road Elevation:	0.0 feet	Autos: 54.129				
Road Grade:	0.0%	Medium Trucks: 53.966				
Left View:	-90.0 degrees	Heavy Trucks: 53.982				
Right View:	90.0 degrees					

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-4.18	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	75.75	-15.67	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	81.57	-17.30	-0.60	-1.20	-5.35	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:	58.3	57.0	55.2	51.3	59.0	59.5
Medium Trucks:	58.3	57.4	51.6	51.0	58.8	59.0
Heavy Trucks:	62.5	61.4	54.1	56.3	63.7	63.8
Vehicle Noise:	64.9	63.9	58.7	58.4	65.9	66.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	31	68	146	314
CNEL:	32	70	151	325

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: EACP
 Road Name: Sherman Rd.
 Road Segment: s/o Ethanac Rd.

Project Name: Heritage Valley Business c
 Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	6,841 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	564 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	35 mph	Vehicle Mix				
Near/Far Lane Distance:	48 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 83.08%				
Barrier Height: 0.0 feet		Medium Trucks: 80.9% 5.3% 13.8% 8.45%				
Barrier Type (0-Wall, 1-Berm): 0.0		Heavy Trucks: 78.4% 3.6% 18.0% 8.47%				
Centerline Dist. to Barrier: 59.0 feet		Noise Source Elevations (in feet)				
Centerline Dist. to Observer: 59.0 feet		Autos: 0.000				
Barrier Distance to Observer: 0.0 feet		Medium Trucks: 2.297				
Observer Height (Above Pad): 5.0 feet		Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation: 0.0 feet		Lane Equivalent Distance (in feet)				
Road Elevation: 0.0 feet		Autos: 54.129				
Road Grade: 0.0%		Medium Trucks: 53.966				
Left View: -90.0 degrees		Heavy Trucks: 53.982				
Right View: 90.0 degrees						

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-4.04	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	75.75	-13.96	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	81.57	-13.95	-0.60	-1.20	-5.35	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:	58.4	57.1	55.4	51.5	59.2	59.6
Medium Trucks:	60.0	59.1	53.3	52.7	60.5	60.7
Heavy Trucks:	65.8	64.8	57.5	59.7	67.0	67.2
Vehicle Noise:	67.4	66.4	60.5	61.0	68.4	68.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	46	100	216	465
CNEL:	48	103	222	478

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY
Road Name: Sherman Rd.
Road Segment: s/o Ethanac Rd.

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	6,773 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	559 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	35 mph	Vehicle Mix				
Near/Far Lane Distance:	48 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 89.32%				
Barrier Height:	0.0 feet	Medium Trucks: 80.9% 5.3% 13.8% 6.33%				
Barrier Type (0-Wall, 1-Berm):	0.0	Heavy Trucks: 78.4% 3.6% 18.0% 4.35%				
Centerline Dist. to Barrier:	59.0 feet	Noise Source Elevations (in feet)				
Centerline Dist. to Observer:	59.0 feet	Autos: 0.000				
Barrier Distance to Observer:	0.0 feet	Medium Trucks: 2.297				
Observer Height (Above Pad):	5.0 feet	Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation:	0.0 feet	Lane Equivalent Distance (in feet)				
Road Elevation:	0.0 feet	Autos: 54.129				
Road Grade:	0.0%	Medium Trucks: 53.966				
Left View:	-90.0 degrees	Heavy Trucks: 53.982				
Right View:	90.0 degrees					

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-3.76	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	75.75	-15.26	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	81.57	-16.89	-0.60	-1.20	-5.35	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:	58.7	57.4	55.6	51.7	59.4	59.9
Medium Trucks:	58.7	57.8	52.0	51.4	59.2	59.4
Heavy Trucks:	62.9	61.9	54.6	56.7	64.1	64.2
Vehicle Noise:	65.3	64.3	59.1	58.8	66.3	66.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	33	72	155	335
CNEL:	35	75	161	346

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: HY+P
Road Name: Sherman Rd.
Road Segment: s/o Ethanac Rd.

Project Name: Heritage Valley Business c
Job Number: 16568

SITE SPECIFIC INPUT DATA		NOISE MODEL INPUTS				
Highway Data		Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):	7,457 vehicles	Autos: 15				
Peak Hour Percentage:	8.25%	Medium Trucks (2 Axles): 15				
Peak Hour Volume:	615 vehicles	Heavy Trucks (3+ Axles): 15				
Vehicle Speed:	35 mph	Vehicle Mix				
Near/Far Lane Distance:	48 feet	VehicleType	Day	Evening	Night	Daily
Site Data		Autos: 72.9% 12.2% 14.9% 83.59%				
Barrier Height:	0.0 feet	Medium Trucks: 80.9% 5.3% 13.8% 8.27%				
Barrier Type (0-Wall, 1-Berm):	0.0	Heavy Trucks: 78.4% 3.6% 18.0% 8.13%				
Centerline Dist. to Barrier:	59.0 feet	Noise Source Elevations (in feet)				
Centerline Dist. to Observer:	59.0 feet	Autos: 0.000				
Barrier Distance to Observer:	0.0 feet	Medium Trucks: 2.297				
Observer Height (Above Pad):	5.0 feet	Heavy Trucks: 8.004 Grade Adjustment: 0.0				
Pad Elevation:	0.0 feet	Lane Equivalent Distance (in feet)				
Road Elevation:	0.0 feet	Autos: 54.129				
Road Grade:	0.0%	Medium Trucks: 53.966				
Left View:	-90.0 degrees	Heavy Trucks: 53.982				
Right View:	90.0 degrees					

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-3.63	-0.62	-1.20	-4.69	0.000	0.000
Medium Trucks:	75.75	-13.68	-0.60	-1.20	-4.88	0.000	0.000
Heavy Trucks:	81.57	-13.75	-0.60	-1.20	-5.35	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:	58.8	57.5	55.8	51.9	59.6	60.0
Medium Trucks:	60.3	59.4	53.6	52.9	60.8	61.0
Heavy Trucks:	66.0	65.0	57.7	59.8	67.2	67.4
Vehicle Noise:	67.7	66.6	60.8	61.2	68.7	68.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	48	104	224	482
CNEL:	50	107	230	496

APPENDIX 9.1:

CADNAA OPERATIONAL NOISE CALCULATIONS

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16568 - Heritage Village Specific Plan

CadnaA Noise Prediction Model: 16568-02_Operation.cna

Date: 16.10.25

Analyst: B. Maddux

Calculation Configuration

Configuration	
Parameter	Value
General	
Max. Error (dB)	0.00
Max. Search Radius (ft)	6561.70
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (ft)	3280.80
Min. Length of Section (ft)	3.30
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
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	328.08
Search Radius Rcvr	328.08
Max. Distance Source - Rcvr	3280.84 3280.84
Min. Distance Rcvr - Reflector	3.28 3.28
Min. Distance Source - Reflector	0.33
Industrial (ISO 9613 (1996))	
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 (°F)	50
rel. Humidity (%)	70
Ground Absorption G	0.50
Wind Speed for Dir. (mph)	6.7
Roads (TNM)	
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	36.4	35.8	42.3	65.0	45.0	0.0				5.00	r 6278207.69	2214847.22	5.00
R2		R2	43.3	43.2	49.9	65.0	45.0	0.0				5.00	r 6278896.50	2214923.53	5.00
R3		R3	35.4	34.7	41.2	65.0	45.0	0.0				5.00	r 6278112.60	2212543.57	5.00
R4		R4	43.3	43.2	49.9	65.0	45.0	0.0				5.00	r 6277402.96	2212521.88	5.00

Point Source(s)

Name	M.	ID	Result. PWL			Lw / Li		Operating Time			Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night		X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(ft)	(ft)	(ft)	(ft)
AC1		AC1	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	5.00	g 6277688.57	2214245.51	55.00
AC2		AC2	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	5.00	g 6277703.66	2214197.72	55.00
AC3		AC3	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	5.00	g 6278529.91	2214239.22	55.00
AC4		AC4	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	5.00	g 6278498.47	2214175.09	55.00
AC5		AC5	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	5.00	g 6278498.47	2213254.51	55.00
AC6		AC6	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	5.00	g 6278513.56	2213196.66	55.00
AC7		AC7	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	5.00	g 6277681.02	2213269.60	55.00
AC8		AC8	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	5.00	g 6277702.40	2213210.50	55.00
TRASH1		TRASH1	89.0	89.0	89.0	Lw	89		900.00	0.00	540.00	8.00	r 6278644.71	2213298.66	8.00
TRASH2		TRASH2	89.0	89.0	89.0	Lw	89		900.00	0.00	540.00	8.00	r 6277591.75	2213305.14	8.00
TRASH3		TRASH3	89.0	89.0	89.0	Lw	89		900.00	0.00	540.00	8.00	r 6277566.13	2214138.24	8.00
TRASH4		TRASH4	89.0	89.0	89.0	Lw	89		900.00	0.00	540.00	8.00	r 6278639.61	2214128.21	8.00

Line Source(s)

Urban Crossroads, Inc.

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Operating Time			Moving Pt. Src			Height			
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	Number		Speed	(ft)			
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	Day	Evening	Night			(mph)	
TRUCK1		TRUCK1	93.5	-19.0	93.5	66.7	-45.9	66.7	PWL-Pt	93.2						18.0	0.0	18.0	5.0	8	r
TRUCK2		TRUCK2	93.4	-19.2	93.4	66.7	-45.9	66.7	PWL-Pt	93.2						18.0	0.0	18.0	5.0	8	r

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
TRUCK1	TRUCK1	8.00	r	6278772.21	2213106.51	8.00	0.00
				6278581.24	2213106.51	8.00	0.00
				6278596.43	2214319.61	8.00	0.00
				6278774.38	2214317.44	8.00	0.00
TRUCK2	TRUCK2	8.00	r	6277494.67	2214371.71	8.00	0.00
				6277615.53	2214371.70	8.00	0.00
				6277624.21	2213093.49	8.00	0.00
				6277490.04	2213095.68	8.00	0.00

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Quantity			Operating Time			Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Work Crews			Day	Special	Night	(ft)	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	Daytime	Evening	Nighttime	(min)	(min)	(min)		
PARK1		PARK1	84.2	84.2	84.2	45.2	45.2	45.2	Lw	84.2								5	r
PARK2		PARK2	84.2	84.2	84.2	47.9	47.9	47.9	Lw	84.2								5	r
PARK3		PARK3	84.2	84.2	84.2	47.6	47.6	47.6	Lw	84.2								5	r
TPARK1		TPARK1	94.4	94.4	94.4	57.9	57.9	57.9	Lw	94.4								8	r
TPARK2		TPARK2	94.4	94.4	94.4	54.6	54.6	54.6	Lw	94.4								8	r
LOAD1		LOAD1	111.5	111.5	111.5	74.8	74.8	74.8	Lw	111.5								8	r
LOAD2		LOAD2	111.5	111.5	111.5	75.4	75.4	75.4	Lw	111.5								8	r

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
PARK1	PARK1	5.00	r	6277582.93	2214549.85	5.00	0.00
				6277616.49	2214566.26	5.00	0.00
				6278102.95	2214560.01	5.00	0.00
				6278136.28	2214539.79	5.00	0.00
				6278129.99	2214412.77	5.00	0.00
				6278112.38	2214412.77	5.00	0.00
				6278113.64	2214400.20	5.00	0.00
				6277961.47	2214398.94	5.00	0.00
				6277961.47	2214421.58	5.00	0.00
				6277906.13	2214422.83	5.00	0.00
				6277906.13	2214400.20	5.00	0.00
				6277652.10	2214402.71	5.00	0.00
				6277652.10	2214422.83	5.00	0.00
				6277581.67	2214419.06	5.00	0.00
PARK2	PARK2	5.00	r	6277714.98	2214347.38	5.00	0.00
				6278509.79	2214337.32	5.00	0.00
				6278514.82	2214297.07	5.00	0.00
				6278497.21	2214295.82	5.00	0.00
				6278500.98	2214281.98	5.00	0.00
				6277740.13	2214287.01	5.00	0.00
				6277740.13	2214304.62	5.00	0.00
				6277714.98	2214303.36	5.00	0.00
PARK3	PARK3	5.00	r	6277701.14	2213101.08	5.00	0.00
				6277697.37	2213147.62	5.00	0.00
				6277714.98	2213145.10	5.00	0.00
				6277713.72	2213162.71	5.00	0.00
				6278483.38	2213160.19	5.00	0.00
				6278484.63	2213138.81	5.00	0.00
				6278508.53	2213136.30	5.00	0.00
				6278506.01	2213116.18	5.00	0.00
				6278490.92	2213114.92	5.00	0.00
				6278494.70	2213096.05	5.00	0.00
TPARK1	TPARK1	8.00	r	6277532.60	2214155.52	8.00	0.00
				6277588.06	2214154.48	8.00	0.00
				6277583.99	2213299.63	8.00	0.00
				6277527.87	2213297.67	8.00	0.00
TPARK2	TPARK2	8.00	r	6278739.85	2214143.88	8.00	0.00
				6278732.18	2213286.27	8.00	0.00
				6278613.91	2213287.79	8.00	0.00
				6278617.02	2214144.97	8.00	0.00
LOAD1	LOAD1	8.00	r	6278485.89	2214124.78	8.00	0.00
				6278552.20	2214123.23	8.00	0.00
				6278535.77	2213307.72	8.00	0.00
				6278479.78	2213309.07	8.00	0.00
LOAD2	LOAD2	8.00	r	6277721.26	2213318.65	8.00	0.00
				6277669.04	2213318.98	8.00	0.00

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
				6277668.87	2214132.90	8.00	0.00
				6277723.67	2214131.51	8.00	0.00

Barrier(s)

Name	Sel.	M.	ID	Absorption		Z-Ext.	Cantilever		Height		Coordinates			
				left	right		horz.	vert.	Begin	End	x	y	z	Ground
						(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
B1			B1						14.00	r	6278539.94	2213273.99	14.00	0.00
											6278742.20	2213273.99	14.00	0.00
											6278742.44	2214146.16	14.00	0.00
											6278557.03	2214147.00	14.00	0.00
B2			B2						14.00	r	6277663.23	2214156.21	14.00	0.00
											6277530.11	2214157.48	14.00	0.00
											6277526.33	2213296.01	14.00	0.00
											6277662.34	2213295.95	14.00	0.00
B3			B3						0.00	r	6277489.96	2213046.15	0.00	0.00
											6278774.64	2213032.92	0.00	0.00
B4			B4						0.00	r	6277499.25	2214564.74	0.00	0.00
											6277495.06	2214576.58	0.00	0.00
											6278151.13	2214569.02	0.00	0.00
											6278153.02	2214415.98	0.00	0.00
											6278774.64	2214398.97	0.00	0.00

Building(s)

Name	Sel.	M.	ID	RB	Residents	Absorption	Height		Coordinates			
							Begin		x	y	z	Ground
							(ft)		(ft)	(ft)	(ft)	(ft)
BUILDING			BUILDING00001	x	0		50.00	r	6277665.93	2214275.69	50.00	0.00
									6278545.00	2214266.89	50.00	0.00
									6278557.58	2214147.42	50.00	0.00
									6278545.00	2214146.16	50.00	0.00
									6278486.23	2214146.18	50.00	0.00
									6278485.89	2214124.78	50.00	0.00
									6278479.60	2213275.76	50.00	0.00
									6278538.59	2213275.51	50.00	0.00
									6278536.20	2213163.97	50.00	0.00
									6277662.16	2213170.25	50.00	0.00
									6277662.16	2213297.27	50.00	0.00
									6277721.18	2213295.87	50.00	0.00
									6277721.26	2213318.65	50.00	0.00
									6277723.78	2214151.46	50.00	0.00
									6277664.42	2214150.70	50.00	0.00

Ground Absorption(s)

Name	Sel.	M.	ID	G	Coordinates	
					x	y
					(ft)	(ft)

Vertical Area Source(s)

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Rail

Name	Sel.	M.	ID	Lw'		Train Class	Correct.	Vmax
				Day	Night		Track	
				(dBA)	(dBA)		(dB)	(km(mph)

Sound Level Spectra

Name		ID	Type	Oktave Spectrum (dB)											Source	
				Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	

Roads

Name	Sel.	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
				Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Drefl	Hbuild	Dist.
				(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(mph)	(mph)		(dB)		(%)	(dB)	(ft)	(ft)

RoadsGeo

Roads

Name	Sel.	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
				Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Drefl	Hbuild	Dist.
				(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(mph)	(mph)		(dB)		(%)	(dB)	(ft)	(ft)

RoadsGeo

Name	Height		Coordinates					Dist	LSlope
	Begin	End	x	y	z	Ground	(ft)	(%)	
	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			

APPENDIX 10.1:

CONSTRUCTION NOISE CALCULATIONS

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16568 - Heritage Village Specific Plan

CadnaA Noise Prediction Model: 16568-02_Construction.cna

Date: 19.08.25

Analyst: B. Maddux

Calculation Configuration

Configuration	
Parameter	Value
General	
Max. Error (dB)	0.00
Max. Search Radius (ft)	6561.70
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (ft)	3280.80
Min. Length of Section (ft)	3.30
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
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	328.08
Search Radius Rcvr	328.08
Max. Distance Source - Rcvr	3280.84 3280.84
Min. Distance Rcvr - Reflector	3.28 3.28
Min. Distance Source - Reflector	0.33
Industrial (ISO 9613 (1996))	
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 (°F)	50
rel. Humidity (%)	70
Ground Absorption G	0.50
Wind Speed for Dir. (mph)	6.7
Roads (TNM)	
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	61.5	-43.3	58.4	0.0	0.0	0.0	x	Total	5.00	r	6278207.69	2214847.22	5.00
R2		R2	58.5	-46.2	55.5	0.0	0.0	0.0	x	Total	5.00	r	6278896.50	2214923.53	5.00
R3		R3	60.0	-44.7	57.0	0.0	0.0	0.0	x	Total	5.00	r	6278112.60	2212543.57	5.00
R4		R4	58.4	-46.4	55.4	0.0	0.0	0.0	x	Total	5.00	r	6277402.96	2212521.88	5.00

Point Source(s)

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			Height	Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night		X	Y	Z
			(dBA)	(dBA)	(dBA)		dB(A)		(min)	(min)	(min)	(ft)	(ft)	(ft)	(ft)

Line Source(s)

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Operating Time			Moving Pt. Src			Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	Number		Speed		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	Day	Evening	Night	(mph)	(ft)

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL"			Lw / Li			Quantity			Operating Time			Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Work Crews			Day	Special	Night	(ft)	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	Daytime	Evening	Nighttime	(min)	(min)	(min)		
CA1		CA1	122.5	17.7	17.7	70.1	-34.7	-34.7	PWL-Pt	117.7		3.0	0.0	0.0				8	r

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
CA1	CA1	8.00	r	6277494.63	2214583.05	8.00	0.00
				6278152.02	2214572.73	8.00	0.00
				6278150.77	2214414.73	8.00	0.00
				6278781.48	2214403.73	8.00	0.00
				6278771.80	2213030.85	8.00	0.00
				6277491.77	2213043.74	8.00	0.00

Barrier(s)

Name	Sel.	M.	ID	Absorption		Z-Ext.	Cantilever		Height		Coordinates			
				left	right		horz.	vert.	Begin	End	x	y	z	Ground
						(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Building(s)

Name	Sel.	M.	ID	RB	Residents	Absorption	Height	Coordinates				
								Begin	x	y	z	Ground
							(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Ground Absorption(s)

Name	Sel.	M.	ID	G	Coordinates	
					x	y
					(ft)	(ft)

Contour(s)

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)

Vertical Area Source(s)

Name	ID	Height			Coordinates			
		Begin	End		x	y	z	Ground
		(ft)	(ft)		(ft)	(ft)	(ft)	(ft)

Rail

Name	Sel.	M.	ID	Lw'		Train Class	Correct.	Vmax
				Day	Night			
				(dBA)	(dBA)		(dB)	(km(mph)

Sound Level Spectra

Name				ID	Type	Oktave Spectrum (dB)											Source	
						Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	

Roads

Name	Sel.	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
				Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Drefl	Hbuild	Dist.
				(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(mph)	(mph)		(dB)		(%)	(dB)	(ft)	(ft)

RoadsGeo

Name	Height		Coordinates				Dist	LSlope
	Begin	End	x	y	z	Ground	(ft)	(%)
	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		