Phelan Community Park

NOISE IMPACT ANALYSIS

COUNTY OF SAN BERNARDINO

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LIST OF ABBREVIATED TERMS

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

EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the potential noise impacts and the necessary noise mitigation measures, if any, for Phelan Community Park development ("Project"). The proposed Project consists of approximately 14 acres of recreational park use. This study has been prepared to satisfy applicable County of San Bernardino standards and thresholds of significance based on guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1)

The results of this Phelan Community Park Noise Impact Analysis are summarized below based on the significance criteria in Section 4 of this report. 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	*Less Than Significant*	-
Operational Noise	9	*Less Than Significant*	-
Construction Noise	10	*Less Than Significant*	-
Construction Vibration		*Less Than Significant*	-

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1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of Phelan Community Park ("Project"). This noise study briefly describes the proposed Project, provides information regarding noise fundamentals, sets out the local regulatory setting, presents the study methods and procedures, evaluates the potential Project traffic noise impacts, the potential Project-related long-term stationary-source noise impacts, and short-term construction noise and vibration impacts.

1.1 SITE LOCATION

The Phelan Community Park Project is located northeast of the intersection of Sheep Creek Road and Warbler Road in the Phelan community of unincorporated County of San Bernardino, as shown on Exhibit 1-A. The Project is located adjacent to existing noise sensitive residential land use with homes located to the west, north and east of the site.

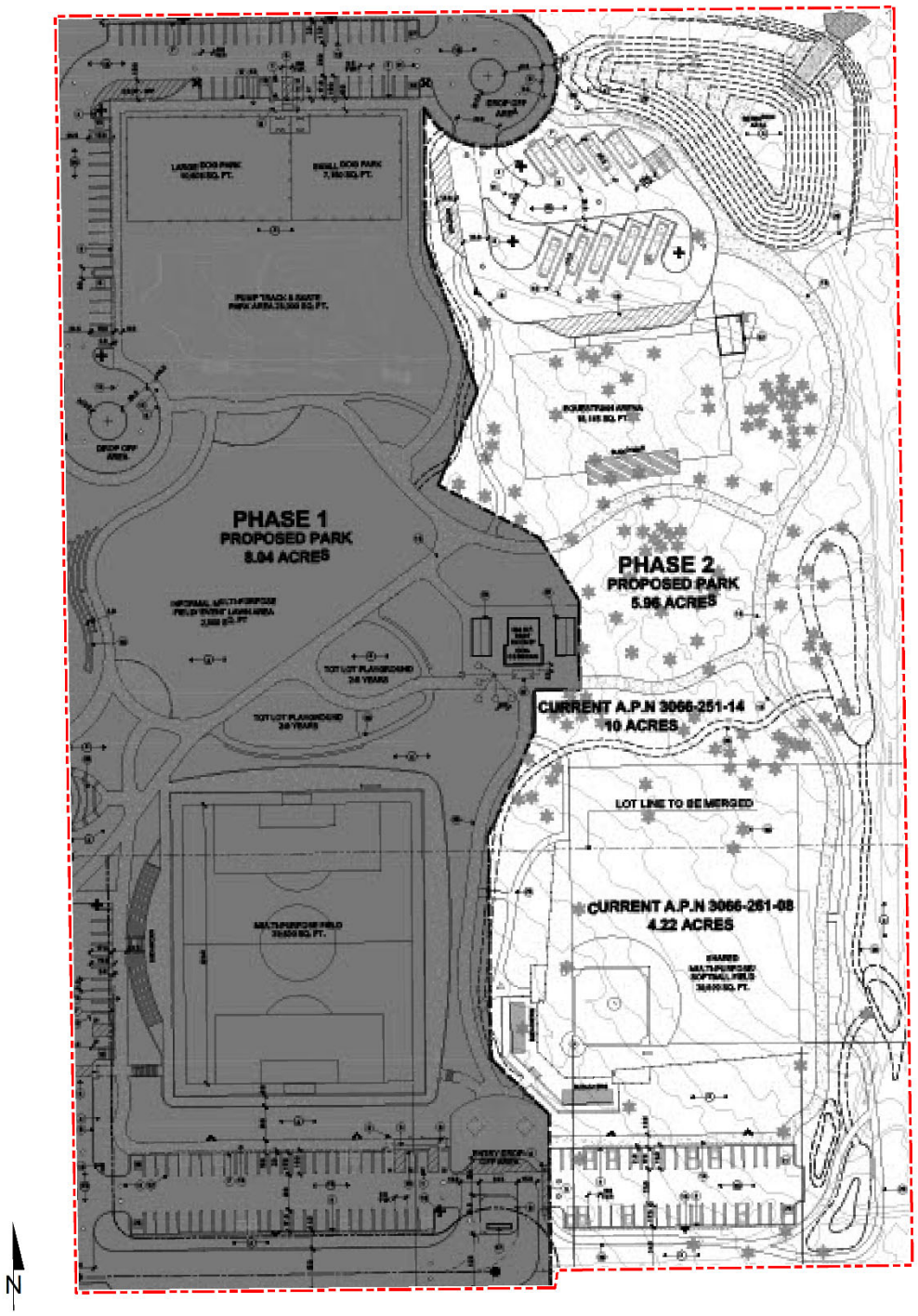
1.2 PROJECT DESCRIPTION

The Project involves the construction of 14.27 acres of local Park with passive open space, two multi-purpose fields, an approximate 26,000 square foot skate park, and an approximate 16,000 square foot equestrian arena. The Project includes parking provided for new services accessible from Sheep Creek Road and Warbler Road.

The on-site Project-related noise sources are expected to include: parking lot activities, dog parks, an equestrian area, outdoor gatherings, skate park, and athletic field activities. This noise analysis is intended to describe noise level impacts associated with the expected typical operational activities at the Project site. Similar to other San Bernardino County Parks, the Project uses would include daytime uses only.

EXHIBIT 1-A: LOCATION MAP

EXHIBIT 1-B: 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 broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies which are audible to the human ear. Exhibit 2-A presents a summary of the typical noise levels and their subjective loudness and effects that are described in more detail below.

EXHIBIT 2-A: TYPICAL NOISE LEVELS

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

2.1 RANGE OF NOISE

Since the range of intensities that the human ear can detect is so large, the scale frequently used to measure intensity is a scale based on multiples of 10, the logarithmic scale. The scale for measuring intensity is the decibel scale. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud. (2) The most common sounds vary between 40 dBA (very quiet) to 100 dBA (very loud). Normal conversation at three feet is roughly at 60 dBA, while loud jet engine noises equate to 110 dBA at approximately 100 feet, which can cause serious discomfort. (3) Another important aspect of noise is the duration of the sound and the way it is described and distributed in time.

2.2 NOISE DESCRIPTORS

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

To describe the time-varying character of environmental noise, the statistical or percentile noise descriptors L_{50}, L_{25}, L_8 and L_2, are commonly used. The percentile noise descriptors are the noise levels equaled or exceeded during 50 percent, 25 percent, 8 percent and 2 percent of a stated time. Sound levels associated with the L_2 and L_8 typically describe transient or short-term events, while levels associated with the L_{50} describe the steady state (or median) noise conditions. The relies on the percentile noise levels to describe the stationary source noise level limits. While the L_{50} describes the noise levels occurring 50 percent of the time, the L_{eq} accounts for the total energy (average) observed for the entire hour.

Peak hour or average noise levels, while useful, do not completely describe a given noise environment. Noise levels lower than peak hour may be disturbing if they occur during times when quiet is most desirable, namely evening and nighttime (sleeping) hours. To account for this, the Community Noise Equivalent Level (CNEL), representing a composite 24-hour noise level is utilized. The CNEL is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time of day corrections require the addition of 5 decibels to dBA L_{eq} sound levels in the evening from 7:00 p.m. to 10:00 p.m., and the addition of 10 decibels to dBA L_{eq} sound levels at night between 10:00 p.m. and 7:00 a.m. These additions are made to account for the noise sensitive time periods during the evening and night hours when sound appears louder. CNEL does not represent the actual sound level heard at any time, but rather represents the total sound exposure. The County of San Bernardino 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 ft. 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 nearest residents. However, for vegetation to provide a substantial, or even noticeable, noise reduction, the vegetation area must be at least 15 feet in height, 100 feet wide and dense enough to completely obstruct the line-of sight between the source and the receiver. This size of vegetation may provide up to 5 dBA of noise reduction. The Federal Highway Administration (FHWA) does not consider the planting of vegetation to be a noise abatement measure. (4)

2.3.5 REFLECTION

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

2.4 NOISE CONTROL

Noise control is the process of obtaining an acceptable noise environment for an observation point or receiver by controlling the noise source, transmission path, receiver, or all three. This concept is known as the source-path-receiver concept. In general, noise control measures can be applied to these three elements.

2.5 NOISE BARRIER ATTENUATION

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

2.6 LAND USE COMPATIBILITY WITH NOISE

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

2.7 COMMUNITY RESPONSE TO NOISE

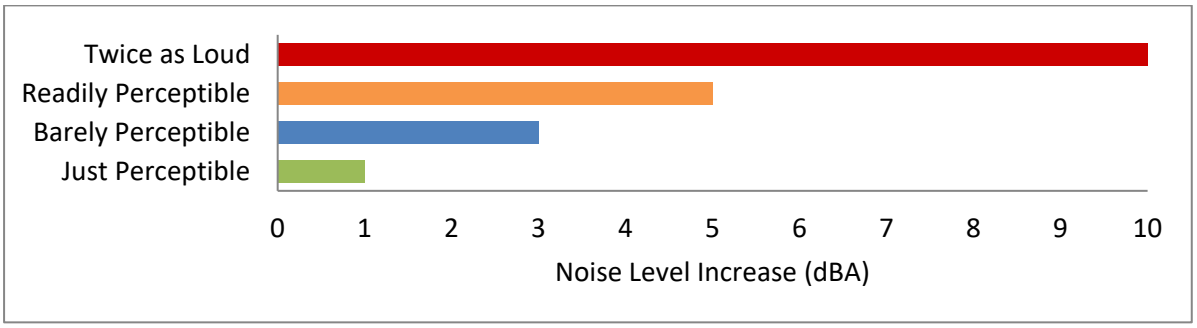
Community responses to noise may range from registering a complaint by telephone or letter, to initiating court action, depending upon everyone's susceptibility to noise and personal attitudes about noise. Several factors are related to the level of community annoyance including:

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

Approximately ten percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints will occur. Twenty-five percent of the population will not complain even in very severe noise environments. Thus, a variety of reactions can be expected from people exposed to any given noise environment. (6) Surveys have shown that about ten percent of the people exposed to traffic noise of 60 dBA will report being highly annoyed with the noise, and each increase of one dBA is associated with approximately two percent more people being highly

annoyed. When traffic noise exceeds 60 dBA or aircraft noise exceeds 55 dBA, people may begin to complain. (6) Despite this variability in behavior on an individual level, the population can be expected to exhibit the following responses to changes in noise levels as shown on Exhibit 2-B. A change of 3 dBA are considered *barely perceptible*, and changes of 5 dBA are considered *readily perceptible*. (4)

EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION



2.8 VIBRATION

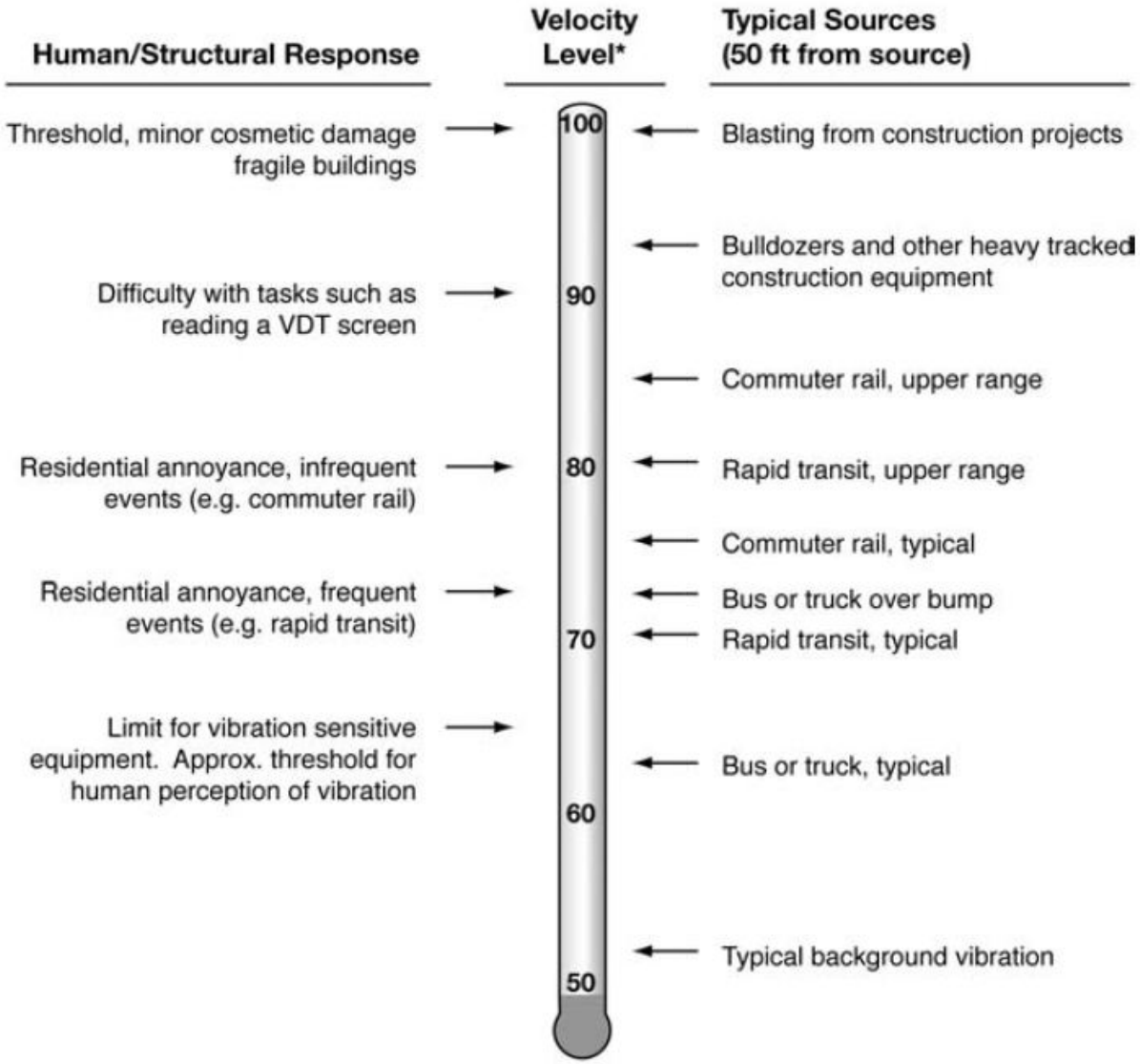
Per the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* (7), vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structure-borne noise. Sources of ground-borne vibrations include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

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

The background vibration-velocity level in residential areas is generally 50 VdB. Ground-borne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels. Typical outdoor sources of perceptible ground-borne vibration

are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground-borne vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Exhibit 2-C illustrates common vibration sources and the human and structural response to ground-borne vibration.

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



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

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

3 REGULATORY SETTING

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

3.1 STATE OF CALIFORNIA NOISE REQUIREMENTS

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

3.2 STATE OF CALIFORNIA GREEN BUILDING STANDARDS CODE

The State of California's Green Building Standards Code (CALGreen) contains mandatory measures for non-residential building construction in Section 5.507 on Environmental Comfort. (9) These noise standards are applied to new construction in California for controlling interior noise levels resulting from exterior noise sources. The regulations specify that acoustical studies must be prepared when non-residential structures are developed in areas where the exterior noise levels exceed 65 dBA CNEL, such as within a noise contour of an airport, freeway, railroad, and other areas where noise contours are not readily available. If the development falls within an airport or freeway 65 dBA CNEL noise contour, the combined sound transmission class (STC) rating of the wall and roof-ceiling assemblies shall be constructed to provide an interior noise environment attributable to exterior sources that does not exceed an hourly equivalent noise level of 50 dBA L_{eq} in occupied areas during any hour of operation (Section 5.507.4.2).

3.3 COUNTY OF SAN BERNARDINO GENERAL PLAN NOISE ELEMENT

The County of San Bernardino has adopted a Noise Element of the General Plan to limit the exposure of the community to excessive noise levels. (10) The most common sources of environmental noise in San Bernardino County are associated with roads, airports, railroad operations, and industrial activities. The facilities are used to transport residents, consumer products and provide basic infrastructure for the community. (10) To address these noise sources found in the County of San Bernardino, the following goals have been identified in the General Plan Noise Element:

N 1 *The County will abate and avoid excessive noise exposures through noise mitigation measures incorporated into the design of new noise-generating and new noise-sensitive land uses, while protecting areas within the County where the present noise environment is within acceptable limits.*

N 1.5 *Limit truck traffic in residential and commercial areas to designated truck routes; limit construction, delivery, and through-truck traffic to designated routes; and distribute maps of approved truck routes to County traffic officers.*

N 2 *The County will strive to preserve and maintain the quiet environment of mountain, desert and other rural areas.*

3.4 COUNTY OF SAN BERNARDINO DEVELOPMENT CODE

While the County of San Bernardino General Plan Noise Element provides guidelines and criteria to assess transportation noise on sensitive land uses, the County Code, Title 8 Development Code contains the noise level limits for mobile, stationary, and construction-related noise sources. (11)

3.4.1 TRANSPORTATION NOISE STANDARDS

Section 83.01.080(d), Table 83-3, contains the County of San Bernardino's mobile noise source-related standards, shown on Exhibit 3-A. Based on the County's mobile noise source standards, there are no exterior or interior noise level standards for the Project land use. Exterior transportation (mobile) noise level standards for residential land uses in the Project study area are shown to be 60 dBA CNEL, while non-noise-sensitive land uses, such as commercial and office uses, require exterior noise levels of 65 dBA CNEL per the County's Table 83-3 mobile noise source standards.

EXHIBIT 3-A: COUNTY OF SAN BERNARDINO MOBILE NOISE LEVEL STANDARDS

Noise Standards for Adjacent Mobile Noise Sources			
Land Use		*Ldn (or CNEL) dB(A)*	
Categories	*Uses*	*Interior (1)*	*Exterior (2)*
Residential	Single and multi-family, duplex, mobile homes	45	60(3)
Commercial	Hotel, motel, transient housing	45	60(3)
	Commercial retail, bank, restaurant	50	N/A
	Office building, research and development, professional offices	45	65
	Amphitheater, concert hall, auditorium, movie theater	45	N/A
Institutional/Public	Hospital, nursing home, school classroom, religious institution, library	45	65
Open Space	Park	N/A	65

Notes:

(1) The indoor environment shall exclude bathrooms, kitchens, toilets, closets and corridors.

(2) The outdoor environment shall be limited to:

- Hospital/office building patios
- Hotel and motel recreation areas
- Mobile home parks
- Multi-family private patios or balconies
- Park picnic areas
- Private yard of single-family dwellings
- School playgrounds

(3) An exterior noise level of up to 65 dB(A) (or CNEL) shall be allowed provided exterior noise levels have been substantially mitigated through a reasonable application of the best available noise reduction technology, and interior noise exposure does not exceed 45 dB(A) (or CNEL) with windows and doors closed. Requiring that windows and doors remain closed to achieve an acceptable interior noise level shall necessitate the use of air conditioning or mechanical ventilation.

CNEL = (Community Noise Equivalent Level). The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of approximately five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and ten decibels to sound levels in the night from 10:00 p.m. to 7:00 a.m.

Source: County of San Bernardino County Code, Title 8 Development Code, Table 83-3.

3.4.2 OPERATIONAL NOISE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property such as the Phelan Community Park Project, stationary-source (operational) noise such as the expected parking lot activities, dog parks, an equestrian area, outdoor gatherings, skate park, and athletic field activities are typically evaluated against standards established under a jurisdiction's Municipal Code. The County of San Bernardino County Code, Title 8 Development Code, Section 83.01.080(c) establishes the noise level standards for stationary noise sources. Since the Project's land use will potentially impact adjacent noise-sensitive uses in the Project study area, this noise study relies on the more conservative residential noise level standards to describe potential operational noise impacts.

For residential properties, the exterior noise level shall not exceed 55 dBA L_{eq} during the daytime hours (7:00 a.m. to 10:00 p.m.) and 45 dBA L_{eq} during the nighttime hours (10:00 p.m. to 7:00 a.m.) for both the whole hour, and for not more than 30 minutes in any hour. (11)

The exterior noise level standards shall apply for a cumulative period of 30 minutes in any hour, as well as the standard plus 5 dBA cannot be exceeded for a cumulative period of more than 15 minutes in any hour, or the standard plus 10 dBA for a cumulative period of more than 5

minutes in any hour, or the standard plus 15 dBA for a cumulative period of more than 1 minute in any hour, or the standard plus 20 dBA for any period of time. Further, Section 83.01.080(e) indicates that if the existing ambient noise level already exceeds any of the exterior noise level limit categories, then the standard shall be adjusted to reflect the ambient conditions. The County of San Bernardino operational noise level standards are shown on Table 3-1 and included in Appendix 3.1.

TABLE 3-1: OPERATIONAL NOISE LEVEL STANDARDS

Time Period	Exterior Noise Level Standards (dBA)[1]				
	L_{50} (30 mins)	L_{25} (15 mins)	L_8 (5 mins)	L_2 (1 min)	L_{max} (Anytime)
Daytime (7:00 a.m. to 10:00 p.m.)	55	60	65	70	75
Nighttime (10:00 p.m. to 7:00 a.m.)	45	50	55	60	65

[1] County of San Bernardino Development Code, Title 8, Section 83.01.080 (Appendix 3.1). The percent noise level is the level exceeded "n" percent of the time during the measurement period. L_{50} is the noise level exceeded 50% of the time. .

The percentile noise descriptors are provided to ensure that the duration of the noise source is fully considered. However, due to the relatively constant intensity of the Project operational activities, the L_{50} or average L_{eq} noise level metrics best describe the parking lot activities, dog parks, an equestrian area, outdoor gatherings, skate park, and athletic field activities. In addition, the L_{eq} noise level metric accounts for noise fluctuations over time by averaging the louder and quieter events and giving more weight to the louder events. In addition, due to the mathematical relationship between the median (L_{50}) and the mean (L_{eq}), the L_{eq} will always be larger than or equal to the L_{50}. The more variable the noise becomes, the larger the L_{eq} becomes in comparison to the L_{50}. Therefore, this noise study conservatively relies on the average L_{eq} sound level limits to describe the Project operational noise levels.

3.5 CONSTRUCTION NOISE STANDARDS

Section 83.01.080(g)(3) of the County of San Bernardino Development Code, provided in Appendix 3.1, indicates that construction activity is considered exempt from the noise level standards between the hours of 7:00 a.m. to 7:00 p.m. except on Sundays and Federal holidays. (11) However, neither the County of San Bernardino General Plan or Municipal Code establish numeric maximum acceptable construction source noise levels at potentially affected receivers, which would allow for a quantified determination of what CEQA constitutes a *substantial temporary or periodic noise increase*. Therefore, a numerical construction threshold based on Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* is used for analysis of daytime construction impacts, as discussed below.

According to the FTA, local noise ordinances are typically not very useful in evaluating construction noise. They usually relate to nuisance and hours of allowed activity, and sometimes specify limits in terms of maximum levels, but are generally not practical for assessing the impact of a construction project. Project construction noise criteria should account for the existing noise environment, the absolute noise levels during construction

activities, the duration of the construction, and the adjacent land use. Due to the lack of standardized construction noise thresholds, the FTA provides guidelines that can be considered reasonable criteria for construction noise assessment. The FTA considers a daytime exterior construction noise level of 80 dBA L_{eq} as a reasonable threshold for noise sensitive residential land use. (7 p. 179)

3.6 CONSTRUCTION VIBRATION STANDARDS

The County of San Bernardino Development Code, Section 83.01.090(a) states that vibration shall be no *greater than or equal to two-tenths inches per second measured at or beyond the lot line*. (11) Therefore, to determine if the vibration levels due to the operation and construction of the Project, the peak particle velocity (PPV) vibration level standard of 0.2 inches per second is used.

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4 SIGNIFICANCE CRITERIA

The following significance criteria are based on currently adopted guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1) 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?

While the County of San Bernardino General Plan Guidelines provide direction on noise compatibility and establish noise standards by land use type that are sufficient to assess the significance of noise impacts, they do not define the levels at which increases are considered substantial temporary or permanent for use under Guideline A. CEQA Appendix G Guideline C applies to the nearest public and private airports, if any, and the Project's land use compatibility.

4.1 CEQA GUIDELINES NOT FURTHER ANALYZED

The Project site is not located within two miles of a public airport or within an airport land use plan. The closest airport is the San Bernardino International Airport (SBD) located roughly 8 miles northeast of the Project site. As such, the Project site would not be exposed to excessive noise levels from airport operations, and therefore, impacts are considered *less than significant,* and no further noise analysis is conducted in relation to CEQA Appendix G Guideline C.

4.2 NOISE-SENSITIVE RECEIVERS

Noise level increases resulting from the Project are evaluated based on the Appendix G CEQA Guidelines described above at the nearest sensitive receiver locations. Under CEQA, consideration must be given to the magnitude of the increase, the existing ambient noise levels, and the location of noise-sensitive receivers to determine if a noise level increase represents a significant adverse environmental impact. In effect, *there is no single noise increase that renders the noise impact significant.* (12) Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or of the corresponding human reactions of annoyance and dissatisfaction. 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 exceeds the previously existing ambient noise level, the less acceptable the new noise will typically be judged.

Since neither the County of San Bernardino General Plan Noise Element or Municipal Code identify any noise level increase thresholds, the substantial noise level increase criteria are derived from the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual.* To describe the amount to which a given noise level increase is considered acceptable, the FTA criteria is used to evaluate the incremental noise level increase and establishes a method for comparing future project noise with existing ambient conditions under CEQA Significance Threshold A. In effect, the amount to which a given noise level increase is considered acceptable is reduced based on the existing ambient noise conditions.

4.3 SIGNIFICANCE CRITERIA SUMMARY

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

TABLE 4-1: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
Off-Site	Noise-Sensitive[1]	If ambient is < 55 dBA CNEL	≥ 5 dBA CNEL Project increase	
		If ambient is 55 - 60 dBA CNEL	≥ 3 dBA CNEL Project increase	
		If ambient is 60 - 65 dBA CNEL	≥ 2 dBA CNEL Project increase	
		If ambient is > 65 dBA CNEL	≥ 1 dBA CNEL Project increase	
Operational	Residential	Exterior Noise Level Limit[2]	55 dBA L_{eq}	45 dBA L_{eq}
	Noise-Sensitive[1]	If ambient is < 55 dBA L_{eq}	≥ 5 dBA L_{eq} Project increase	
		If ambient is 55 - 60 dBA L_{eq}	≥ 3 dBA L_{eq} Project increase	
		If ambient is 60 - 65 dBA L_{eq}	≥ 2 dBA L_{eq} Project increase	
		If ambient is < 65 dBA L_{eq}	≥ 1 dBA L_{eq} Project increase	
Construction	Noise-Sensitive	Permitted between 7:00 a.m. to 7:00 p.m.; except Sundays and Federal holidays.[3]		
		Noise Level Threshold[1]	80 dBA L_{eq}	n/a
		Vibration Level Threshold[4]	0.2 PPV in/sec	n/a

[1] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual.
[2] County of San Bernardino Development Code, Title 8, Section 83.01.080 (Appendix 3.1)
[3] Section 83.01.080(g)(3) of the County of San Bernardino County Code.
[4] Section 83.01.090(a) of the County of San Bernardino County Code.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m. "n/a" = construction activities are not planned during the nighttime hours; "PPV" = peak particle velocity.

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-A provides the boundaries of the Project study area and the noise level measurement locations. To fully describe the existing noise conditions, noise level measurements were collected by Urban Crossroads, Inc. on Wednesday, June 30^{h}, 2021. Appendix 5.1 includes study area photos.

5.1 MEASUREMENT PROCEDURE AND CRITERIA

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

5.2 NOISE MEASUREMENT LOCATIONS

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

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

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

5.3 NOISE MEASUREMENT RESULTS

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

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

The background ambient noise levels in the Project study area are dominated by the transportation-related noise associated from surface streets. This includes the auto and heavy truck activities on study area roadway segments near the noise level measurement locations. The 24-hour existing noise level measurement results are shown on Table 5-1.

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

Location[1]	Description	Energy Average Noise Level (dBA L_{eq})[2]		CNEL
		Daytime	Nighttime	
L1	Located north of the Project site on Valencia Street near the existing single-family residential home at 10644 Valencia Street.	57.2	54.5	61.7
L2	Located east of the Project site across Cedar Avenue near the Cedar Village Mobile Home Park at 10701 Cedar Avenue.	71.9	70.0	77.1
L3	Located south of the Project site near the Cedar House Life Change Center.	53.8	52.9	59.9
L4	Located west of the Project site near the existing single-family residential home at 10709 Linden Avenue.	56.6	56.5	63.1

[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.

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS

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6 TRAFFIC NOISE PREDICTION METHODS AND PROCEDURES

The following section outlines the methods and procedures used to model and analyze the future off-site traffic noise environment.

6.1 FHWA TRAFFIC NOISE PREDICTION MODEL

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

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 four study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications per the County of San Bernardino General Plan Circulation Element, and the posted vehicle speeds. The ADT volumes used in this study area presented on Table 6-2 are based on *Phelan Community Park Traffic Impact Analysis*, prepared by Ganddini Group, Inc. for the following traffic scenarios under both Without and With Project conditions: Existing 2021, Opening Year 2027 (OY), and Horizon Year 2040 (HY). (17)

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

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Receiving Land Use[1]	Distance from Centerline to Receiving Land Use (Feet)[2]	Vehicle Speed (mph)[3]
1	Sheep Creek Rd.	n/o Phelan Rd.	Non-Sensitive	52'	40
2	Sheep Creek Rd.	s/o Phelan Rd.	Sensitive	52'	40
3	Sheep Creek Rd.	n/o Nielson Rd.	Sensitive	52'	40
4	Sheep Creek Rd.	s/o Nielson Rd.	Sensitive	52'	40
5	Phelan Rd.	w/o Sheep Creek Rd.	Non-Sensitive	60'	35
6	Phelan Rd.	e/o Sheep Creek Rd.	Sensitive	60'	35
7	Warbler Rd.	e/o Sheep Creek Rd.	Non-Sensitive	25'	25
8	Nielson Rd.	w/o Sheep Creek Rd.	Non-Sensitive	30'	25
9	Nielson Rd.	e/o Sheep Creek Rd.	Non-Sensitive	30'	45

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] Distance to receiving land use is based upon the right-of-way distances.
[3] Cedar Avenue Trucking Storage (PROJ-2020-00035) Traffic Analysis, Urban Crossroads, Inc.

To quantify the off-site noise levels, the 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.

Table 6-3 provides the time of day (daytime, evening, and nighttime) vehicle splits. The 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 Analysis*. Using the Project truck trips in combination with the Project trip distribution, Urban Crossroads, Inc. calculated the number of additional Project truck trips and vehicle mix percentages for each of the study area roadway segments. Table 6-4 shows the traffic flow by vehicle type (vehicle mix) used for all without Project traffic scenarios, and Tables 6-5 to 6-8 show the vehicle mixes used for the with Project traffic scenarios.

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic Volumes[1]					
			Existing		Opening Year (2027)		General Plan Buildout (2040)	
			Without Project	With Project	Without Project	With Project	Without Project	With Project
1	Sheep Creek Rd.	n/o Phelan Rd.	8,360	8,640	10,130	10,410	10,790	11,070
2	Sheep Creek Rd.	s/o Phelan Rd.	7,330	8,110	9,700	10,480	10,400	11,180
3	Sheep Creek Rd.	n/o Nielson Rd.	6,870	7,520	8,880	9,530	9,750	10,400
4	Sheep Creek Rd.	s/o Nielson Rd.	7,310	7,460	8,740	8,890	9,650	9,800
5	Phelan Rd.	w/o Sheep Creek Rd.	12,880	13,100	15,720	15,940	16,070	16,290
6	Phelan Rd.	e/o Sheep Creek Rd.	13,950	14,230	17,490	17,770	17,840	18,120
7	Warbler Rd.	e/o Sheep Creek Rd.	270	1,200	360	1,290	360	1,290
8	Nielson Rd.	w/o Sheep Creek Rd.	2,350	2,630	3,300	3,580	3,460	3,740
9	Nielson Rd.	e/o Sheep Creek Rd.	3,230	3,450	4,020	4,240	4,100	4,320

[1] Phelan Community Park Traffic Impact Analysis, Ganddini, Inc.

TABLE 6-3: TIME OF DAY VEHICLE SPLITS

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

[1] Typical Southern California vehicle mix.
"Daytime" = 7:00 a.m. to 7:00 p.m.; "Evening" = 7:00 p.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

TABLE 6-4: WITHOUT PROJECT VEHICLE MIX

Classification	Total % Traffic Flow			Total
	Autos	Medium Trucks	Heavy Trucks	
All Segments	90.95%	3.51%	5.54%	100.00%

[1] Typical Southern California vehicle mix.

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7 OFF-SITE TRAFFIC NOISE IMPACTS

To assess the off-site transportation CNEL noise level impacts associated with the proposed Project, noise contours were developed based on *Phelan Community Park Traffic Impact Analysis*. (17) 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 7-8 present a summary of the exterior dBA CNEL traffic noise levels without barrier attenuation. Roadway segments are analyzed from the without Project to the with Project conditions in each of the following timeframes: Existing 2021, Opening Year 2027, and Horizon Year 2040. Appendix 7.1 includes a summary of the dBA CNEL traffic noise level contours for each of the traffic scenarios.

TABLE 7-1: EXISTING 2021 WITHOUT PROJECT NOISE 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	Sheep Creek Rd.	n/o Phelan Rd.	Non-Sensitive	66.1	RW	61	132
2	Sheep Creek Rd.	s/o Phelan Rd.	Sensitive	65.5	RW	56	121
3	Sheep Creek Rd.	n/o Nielson Rd.	Sensitive	65.2	RW	54	116
4	Sheep Creek Rd.	s/o Nielson Rd.	Sensitive	65.5	RW	56	121
5	Phelan Rd.	w/o Sheep Creek Rd.	Non-Sensitive	66.3	RW	73	157
6	Phelan Rd.	e/o Sheep Creek Rd.	Sensitive	66.6	RW	77	165
7	Warbler Rd.	e/o Sheep Creek Rd.	Non-Sensitive	49.9	RW	RW	RW
8	Nielson Rd.	w/o Sheep Creek Rd.	Non-Sensitive	58.4	RW	RW	RW
9	Nielson Rd.	e/o Sheep Creek Rd.	Non-Sensitive	66.0	RW	35	75

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

TABLE 7-2: EXISTING 2021 WITH PROJECT NOISE 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	Sheep Creek Rd.	n/o Phelan Rd.	Non-Sensitive	66.2	RW	63	135
2	Sheep Creek Rd.	s/o Phelan Rd.	Sensitive	66.0	RW	60	130
3	Sheep Creek Rd.	n/o Nielson Rd.	Sensitive	65.6	RW	57	123
4	Sheep Creek Rd.	s/o Nielson Rd.	Sensitive	65.6	RW	57	123
5	Phelan Rd.	w/o Sheep Creek Rd.	Non-Sensitive	66.3	RW	74	158
6	Phelan Rd.	e/o Sheep Creek Rd.	Sensitive	66.7	RW	78	167
7	Warbler Rd.	e/o Sheep Creek Rd.	Non-Sensitive	56.4	RW	RW	RW
8	Nielson Rd.	w/o Sheep Creek Rd.	Non-Sensitive	58.9	RW	RW	RW
9	Nielson Rd.	e/o Sheep Creek Rd.	Non-Sensitive	66.3	RW	36	78

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

TABLE 7-3: OY (2027) WITHOUT PROJECT NOISE 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	Sheep Creek Rd.	n/o Phelan Rd.	Non-Sensitive	66.9	RW	70	150
2	Sheep Creek Rd.	s/o Phelan Rd.	Sensitive	66.7	RW	68	146
3	Sheep Creek Rd.	n/o Nielson Rd.	Sensitive	66.4	RW	64	138
4	Sheep Creek Rd.	s/o Nielson Rd.	Sensitive	66.3	RW	63	136
5	Phelan Rd.	w/o Sheep Creek Rd.	Non-Sensitive	67.1	RW	83	179
6	Phelan Rd.	e/o Sheep Creek Rd.	Sensitive	67.6	RW	89	192
7	Warbler Rd.	e/o Sheep Creek Rd.	Non-Sensitive	51.1	RW	RW	RW
8	Nielson Rd.	w/o Sheep Creek Rd.	Non-Sensitive	59.9	RW	RW	30
9	Nielson Rd.	e/o Sheep Creek Rd.	Non-Sensitive	66.9	RW	40	87

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

TABLE 7-4: OY (2027) WITH PROJECT NOISE 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	Sheep Creek Rd.	n/o Phelan Rd.	Non-Sensitive	67.0	RW	71	153
2	Sheep Creek Rd.	s/o Phelan Rd.	Sensitive	67.1	RW	71	154
3	Sheep Creek Rd.	n/o Nielson Rd.	Sensitive	66.7	RW	67	144
4	Sheep Creek Rd.	s/o Nielson Rd.	Sensitive	66.4	RW	64	138
5	Phelan Rd.	w/o Sheep Creek Rd.	Non-Sensitive	67.2	RW	84	181
6	Phelan Rd.	e/o Sheep Creek Rd.	Sensitive	67.7	RW	90	194
7	Warbler Rd.	e/o Sheep Creek Rd.	Non-Sensitive	56.7	RW	RW	RW
8	Nielson Rd.	w/o Sheep Creek Rd.	Non-Sensitive	60.3	RW	RW	31
9	Nielson Rd.	e/o Sheep Creek Rd.	Non-Sensitive	67.1	RW	42	90

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

TABLE 7-5: HY (2040) WITHOUT PROJECT NOISE 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	Sheep Creek Rd.	n/o Phelan Rd.	Non-Sensitive	67.2	RW	73	157
2	Sheep Creek Rd.	s/o Phelan Rd.	Sensitive	67.0	RW	71	153
3	Sheep Creek Rd.	n/o Nielson Rd.	Sensitive	66.8	RW	68	147
4	Sheep Creek Rd.	s/o Nielson Rd.	Sensitive	66.7	RW	68	146
5	Phelan Rd.	w/o Sheep Creek Rd.	Non-Sensitive	67.2	RW	84	182
6	Phelan Rd.	e/o Sheep Creek Rd.	Sensitive	67.7	RW	90	195
7	Warbler Rd.	e/o Sheep Creek Rd.	Non-Sensitive	51.1	RW	RW	RW
8	Nielson Rd.	w/o Sheep Creek Rd.	Non-Sensitive	60.1	RW	RW	31
9	Nielson Rd.	e/o Sheep Creek Rd.	Non-Sensitive	67.0	RW	41	88

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

TABLE 7-6: HY (2040) WITH PROJECT NOISE 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	Sheep Creek Rd.	n/o Phelan Rd.	Non-Sensitive	67.3	RW	74	160
2	Sheep Creek Rd.	s/o Phelan Rd.	Sensitive	67.4	RW	75	161
3	Sheep Creek Rd.	n/o Nielson Rd.	Sensitive	67.0	RW	71	153
4	Sheep Creek Rd.	s/o Nielson Rd.	Sensitive	66.8	RW	68	147
5	Phelan Rd.	w/o Sheep Creek Rd.	Non-Sensitive	67.3	RW	85	183
6	Phelan Rd.	e/o Sheep Creek Rd.	Sensitive	67.7	RW	91	197
7	Warbler Rd.	e/o Sheep Creek Rd.	Non-Sensitive	56.7	RW	RW	RW
8	Nielson Rd.	w/o Sheep Creek Rd.	Non-Sensitive	60.5	RW	RW	32
9	Nielson Rd.	e/o Sheep Creek Rd.	Non-Sensitive	67.2	RW	42	91

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

7.2 EXISTING WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

An analysis of existing traffic noise levels plus traffic noise generated by the proposed Project has been included in this report to fully analyze all the existing traffic scenarios identified in *Phelan Community Park Traffic Analysis*. This condition is provided solely for informational purposes and will not occur, since the Project will not be fully developed and occupied under Existing conditions. Table 7-1 shows the Existing without Project conditions CNEL noise levels. The Existing without Project exterior noise levels are expected to range from 49.9 to 66.6 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-2 shows the Existing with Project conditions will range from 56.4 to 66.7 dBA CNEL. Table 7-9 shows that the Project off-site traffic noise level impacts will range from 0.0 to 6.5 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Table 4-1, land uses adjacent to the study area roadway segments would experience *less than significant* noise level impacts due to unmitigated Project-related traffic noise levels.

7.3 OY 2027 WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

Table 7-3 presents the Opening Year 2027 without Project conditions CNEL noise levels. The Opening Year 2027 without Project exterior noise levels are expected to range from 51.1 to 67.6 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-4 shows the Opening Year 2027 with Project conditions will range from 56.7 to 67.7 dBA CNEL. Table 7-10 shows that the Project off-site traffic noise level increases will range from 0.1 to 5.6 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Table 4-1, land uses adjacent to the study area roadway segments would experience *less than significant* noise level impacts due to the proposed Project truck trip distribution under Opening Year 2027 with Project conditions.

7.4 HORIZON YEAR 2040 PROJECT TRAFFIC NOISE LEVEL INCREASES

Table 7-5 presents the Horizon Year 2040 without Project conditions CNEL noise levels. The Horizon Year 2040 without Project exterior noise levels are expected to range from 51.1 to 67.7 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-6 shows that the Horizon Year 2040 with Project conditions will range from 56.7 to 67.7 dBA CNEL. Table 7-11 shows that the Project off-site traffic noise level increases will range from 0.0 to 5.6 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Table 4-1, land uses adjacent to the study area roadway segments would experience *less than significant* noise level impacts due to the proposed Project truck trip distribution under Horizon Year 2040 with Project conditions.

TABLE 7-9: 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	Sheep Creek Rd.	n/o Phelan Rd.	Non-Sensitive	66.1	66.2	0.1	n/a	No
2	Sheep Creek Rd.	s/o Phelan Rd.	Sensitive	65.5	66.0	0.5	1	No
3	Sheep Creek Rd.	n/o Nielson Rd.	Sensitive	65.2	65.6	0.4	1	No
4	Sheep Creek Rd.	s/o Nielson Rd.	Sensitive	65.5	65.6	0.1	1	No
5	Phelan Rd.	w/o Sheep Creek Rd.	Non-Sensitive	66.3	66.3	0.0	n/a	No
6	Phelan Rd.	e/o Sheep Creek Rd.	Sensitive	66.6	66.7	0.1	1	No
7	Warbler Rd.	e/o Sheep Creek Rd.	Non-Sensitive	49.9	56.4	6.5	n/a	No
8	Nielson Rd.	w/o Sheep Creek Rd.	Non-Sensitive	58.4	58.9	0.5	n/a	No

[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)?

TABLE 7-10: OY 2027 WITH PROJECT TRAFFIC NOISE 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	Sheep Creek Rd.	n/o Phelan Rd.	Non-Sensitive	66.9	67.0	0.1	n/a	No
2	Sheep Creek Rd.	s/o Phelan Rd.	Sensitive	66.7	67.1	0.4	1	No
3	Sheep Creek Rd.	n/o Nielson Rd.	Sensitive	66.4	66.7	0.3	1	No
4	Sheep Creek Rd.	s/o Nielson Rd.	Sensitive	66.3	66.4	0.1	1	No
5	Phelan Rd.	w/o Sheep Creek Rd.	Non-Sensitive	67.1	67.2	0.1	n/a	No
6	Phelan Rd.	e/o Sheep Creek Rd.	Sensitive	67.6	67.7	0.1	1	No
7	Warbler Rd.	e/o Sheep Creek Rd.	Non-Sensitive	51.1	56.7	5.6	n/a	No
8	Nielson Rd.	w/o Sheep Creek Rd.	Non-Sensitive	59.9	60.3	0.4	n/a	No

[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)?

TABLE 7-11: HY 2040 WITH PROJECT TRAFFIC NOISE 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	Sheep Creek Rd.	n/o Phelan Rd.	Non-Sensitive	67.2	67.3	0.1	n/a	No
2	Sheep Creek Rd.	s/o Phelan Rd.	Sensitive	67.0	67.4	0.4	1	No
3	Sheep Creek Rd.	n/o Nielson Rd.	Sensitive	66.8	67.0	0.2	1	No
4	Sheep Creek Rd.	s/o Nielson Rd.	Sensitive	66.7	66.8	0.1	1	No
5	Phelan Rd.	w/o Sheep Creek Rd.	Non-Sensitive	67.2	67.3	0.1	n/a	No
6	Phelan Rd.	e/o Sheep Creek Rd.	Sensitive	67.7	67.7	0.0	1	No
7	Warbler Rd.	e/o Sheep Creek Rd.	Non-Sensitive	51.1	56.7	5.6	n/a	No
8	Nielson Rd.	w/o Sheep Creek Rd.	Non-Sensitive	60.1	60.5	0.4	n/a	No

[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)?

8 SENSITIVE RECEIVER LOCATIONS

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

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

R1: Location R1 represents an existing noise sensitive residence north of Project site and south of the Phelan Elementary School, located approximately 182 feet northwest of the Project site. Receiver R1 was placed at the private outdoor living area (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

R2: Location R2 represents an existing noise sensitive residence at 9550 Riggins Road located approximately 17 feet east of the Project site across Cedar Avenue. Receiver R2 was placed in the private outdoor living area (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L2, to describe the existing ambient noise environment.

R3: Location R3 represents an existing noise sensitive residence at 4243 Warbler Road located approximately 43 feet south of the Project site. Receiver R3 is placed at the private outdoor living areas (backyards) 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 RTC Pure Water Filtration System at 9575 Malpaso Road, approximately 1791 feet west of the Project site. Since there are no private outdoor living areas (backyards) facing the Project site, receiver R4 is placed at the building

façade facing the Project site. A 24-hour noise measurement near this location, L4, is used to describe the existing ambient noise environment.

1EXHIBIT 8-A: SENSITIVE RECEIVER LOCATIONS

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9 OPERATIONAL NOISE IMPACTS

This section analyzes the potential stationary-source operational noise impacts at the nearest receiver locations, identified in Section 8, resulting from the operation of the Phelan Community Park Project. Exhibit 9-A identifies the representative noise source activities 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 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. The on-site Project-related noise sources are expected to include: parking lot activities, dog parks, an equestrian area, outdoor gatherings, skate park, and athletic field activities.

9.2 REFERENCE NOISE LEVELS

To estimate the Project operational noise impacts, reference noise level measurements were collected from similar types of activities to represent the noise levels expected with the development of the proposed Project. This section provides a detailed description of the reference noise level measurements shown on Table 9-1 used to estimate the Project operational noise impacts. It is important to note that the following projected noise levels assume the worst-case noise environment with the parking lot activities, dog parks, an equestrian area, outdoor gatherings, skate park, and athletic field activities all operating continuously. These sources of noise activity will likely vary throughout the day.

9.2.1 MEASUREMENT PROCEDURES

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

EXHIBIT 9-A: OPERATIONAL NOISE SOURCE LOCATIONS

TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS

Noise Source[1]	Noise Source Height (Feet)	Min./Hour[2]		Reference Noise Level @ 50' (dBA L_{eq})	Sound Power Level (dBA)[3]
		Day	Night		
Roof-Top Air Conditioning Units	3'	60	0	57.2	88.8
Dog Park Activities	5'	60'	0'	42.8	74.4
Parking Lot Activities	5'	60	0	40.4	72.0
Equestrian Activities	5'	60	0	68.0	99.6
Sports Fields	5'	60	0	74.7	106.3
Skate Park	5'	60	0	73.9	105.5

[1] As measured by Urban Crossroads, Inc.
[2] Anticipated duration (minutes within the hour) of noise activity during typical hourly conditions expected at the Project site. "Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 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

9.2.4 ROOF-TOP AIR CONDITIONING UNITS

To assess the noise levels created by the roof-top air conditioning units, reference noise level measurements were collected from a Lennox SCA120 series 10-ton model packaged air conditioning unit. At the uniform reference distance of 50 feet, the reference noise levels are 57.2 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 of 39 minutes per hour during the daytime hours, and 28 minutes per hour during the nighttime hours. For this noise analysis, the air conditioning units are expected to be located on the roof of the proposed building. This reference noise level describes the expected roof-top air conditioning units located 5 feet above the roof for the planned air conditioning units at the Project site.

9.2.2 DOG PARK ACTIVITIES

To describe the potential noise level impacts associated with the Project's dog park, Urban Crossroads, Inc. collected a reference noise level measurement at La Paws Dog Park in the City of Mission Viejo. The reference noise level measurement describes large and small dogs with people talking, dogs running, playing fetch, chasing each other, growling, barking, and owners talking on cell phones. At a uniform distance of 50 feet from the noise source, a reference noise level of 42.8 dBA Leq is used. Noise associated with dog park activity is expected for 60 minutes per hour during all daytime hours from 7:00 a.m. to 10:00 p.m.

9.2.2 PARKING LOT ACTIVITIES

To represent the potential noise level impacts associated with the repair shop activities, a reference noise level measurement was collected near an existing fleet maintenance building at 1333 Virginia Avenue in the City of Baldwin Park. The fleet maintenance building is used to service tractor trailer trucks as well as other operating equipment. The reference noise level

measurement includes vehicles entering and exiting the service bays, heavy equipment activities inside the service bays and staff performing a variety of maintenance services in the area. Using the uniform reference distance of 50 feet, the repair shop noise level is 56.4 dBA L_{eq}. Noise associated with parking lot activity is expected for 60 minutes per hour during all daytime hours from 7:00 a.m. to 10:00 p.m.

9.2.2 EQUESTRIAN ACTIVITIES

To describe the potential noise level impacts associated with the Project's equestrian facilities, Urban Crossroads, Inc. collected a reference noise level measurement at Pepper Creek Equine Center in the Ramona, California. The reference noise level measurement describes two horses trotting around the ring, one horse jumping obstacles, trainers and riders calling out commands, and a group of 10 people watching and talking in the background. At a uniform distance of 50 feet from the noise source, a reference noise level of 43.1 dBA L_{eq} was measured. Noise associated with equestrian activity is expected for 60 minutes per hour during all daytime hours from 7:00 a.m. to 10:00 p.m.

9.2.3 SPORTS FIELD ACTIVITY

To describe the potential noise levels associated with the Project's sports fields, a reference noise level measurement was collected by Urban Crossroads, Inc. The reference noise level measurement includes children playing on one soccer field, and adults watching the game from the sidelines. Using a uniform reference distance of 50 feet, the reference activity noise level is 52.0 dBA Leq. Noise associated with sports field activity is expected for 60 minutes per hour during all daytime hours from 7:00 a.m. to 10:00 p.m.

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 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 protocol, the CadnaA noise prediction model relies on the reference sound power level (PWL) 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 (PWL) are connected to the sound source and are independent of distance. Sound pressure levels vary substantially with distance from the source and diminish from 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 CadnaA noise analysis to account for hard site conditions. Appendix 9.1 includes the detailed noise model inputs.

9.4 PROJECT OPERATIONAL NOISE LEVELS

Using the reference noise levels to represent the proposed Project operations that include parking lot activities, dog parks, an equestrian area, outdoor gatherings, skate park, and athletic field activities, 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 38.3 to 52.6 dBA L_{eq}. Since the park would be closed after 10:00 p.m. the would not be any nighttime noise sources to consider.

TABLE 9-2: DAYTIME PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1]	Operational Noise Levels by Receiver Location (dBA Leq)			
	R1	R2	R3	R4
Roof-Top Air Conditioning Units	28.2	34.7	30.0	18.7
Dog Park Activities	49.8	46.1	41.0	34.1
Parking Lot Activities	21.1	20.2	26.2	6.8
Equestrian Activities	36.5	48.2	35.0	25.8
Sports Fields	43.8	48.5	52.2	35.7
Skate Park	46.6	45.6	41.3	32.9
Total (All Noise Sources)	**51.0**	**52.6**	**52.6**	**38.3**

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

9.5 PROJECT OPERATIONAL NOISE LEVEL COMPLIANCE

To demonstrate compliance with local noise regulations, the Project-only operational noise levels are evaluated against exterior noise level thresholds based on the County of San Bernardino exterior noise level standards at nearest noise-sensitive receiver locations. Table 9-3 shows the operational noise levels associated with Phelan Community Park Project will satisfy the County of San Bernardino exterior noise level standards at all nearby receiver locations. Therefore, the operational noise impacts are considered *less than significant* at the nearest noise-sensitive receiver locations.

TABLE 9-3: 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	53.1	0.0	55.0	45.0	No	No
R2	54.4	0.0	55.0	45.0	No	No
R3	54.1	0.0	55.0	45.0	No	No
R4	40.7	0.0	55.0	45.0	No	No

[1] See Exhibit 8-A for the receiver locations.
[2] Proposed Project operational noise levels as shown on Tables 9-3 and 9-4.
[3] Exterior noise level standards adjusted to reflect the ambient noise levels (see Table 5-1) per the County of San Bernardino Development Code, Title 8, Section 83.01.080 (Appendix 3.1).
[4] Do the estimated Project operational noise source activities exceed the noise level standards?
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 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 nearest receiver locations potentially impacted by Project operational noise sources. Since the units used to measure noise, decibels (dB), are logarithmic units, the Project-operational and existing ambient noise levels cannot be combined using standard arithmetic equations. (2) Instead, they must be logarithmically added using the following base equation:

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

Where "SPL1," "SPL2," etc. are equal to the sound pressure levels being combined, or in this case, the Project-operational and existing ambient noise levels. The difference between the combined Project and ambient noise levels describe the Project noise level increases to the existing ambient noise environment. As indicated on Table 9-4, the Project will generate daytime operational noise level increases ranging from 0.1 to 2.5 dBA L_{eq} at the nearest receiver locations. As previously stated, the Project would not have any nighttime noise sources. Project-related operational noise level increases will satisfy the operational noise level increase significance criteria presented on Table 4-1. Therefore, the incremental Project operational noise level increase is considered *less than significant* at all receiver locations.

TABLE 9-4: 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]	Noise Sensitive Land Use?	Increase Criteria[7]	Increase Criteria Exceeded?[7]
R1	51.0	L1	57.2	58.1	0.9	Yes	3	No
R2	52.6	L2	71.9	72.0	0.1	Yes	1	No
R2	52.6	L3	53.8	56.3	2.5	Yes	5	No
R3	38.3	L4	56.6	56.7	0.1	Yes	3	No

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

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10 CONSTRUCTION IMPACTS

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

10.1 CONSTRUCTION NOISE LEVELS

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

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

For this construction analysis the parcel to the west has been included in the noise assessment as it would be graded at the same time as the Project site. This construction noise analysis was prepared using reference noise level measurements taken from the Federal Highway Administration (FHWA) published the Roadway Construction Noise Model (RCNM) to describe the typical construction activity noise levels for each stage of Project construction. The list in Table 9-1 represents typical construction activity equipment and noise levels for multiple pieces of equipment operating simultaneously which is considered a conservative estimate of Project construction noise levels.

10.2 TYPICAL CONSTRUCTION REFERENCE NOISE LEVELS

To describe construction noise activities, this construction noise analysis was prepared using reference construction equipment noise levels from the FHWA RCNM, which includes a national database of construction equipment reference noise emission levels. (18) The RCNM equipment database, provides a comprehensive list of the noise generating characteristics for 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.

EXHIBIT 10-A: TYPICAL CONSTRUCTION NOISE SOURCE LOCATIONS

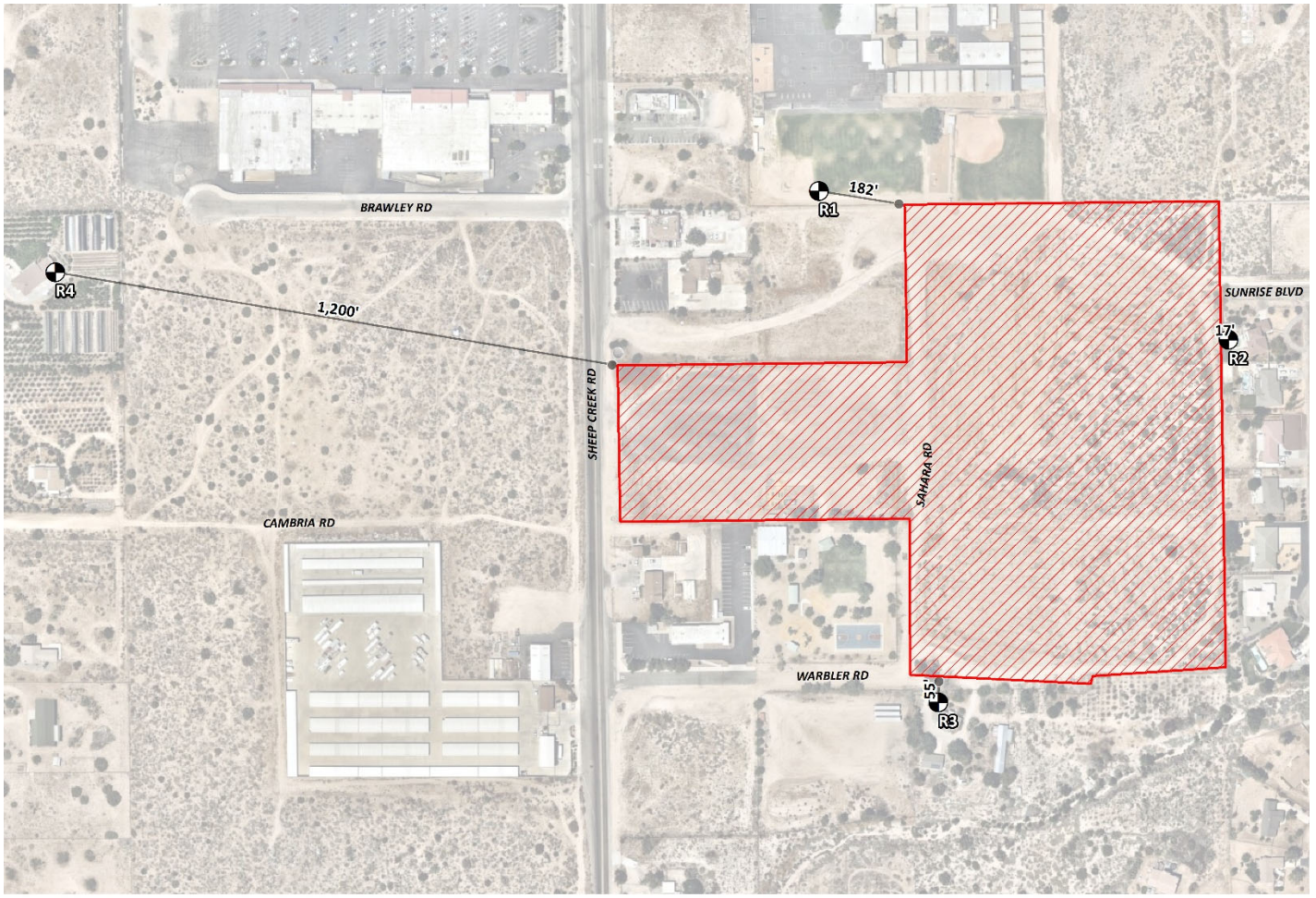

TABLE 10-1: TYPICAL CONSTRUCTION REFERENCE NOISE LEVELS

Construction Stage	Reference Construction Equipmnet[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})	Composite Reference Noise Level (dBA L_{eq})	Reference Power Level (dBA L_w)
Site Preparation	Tractor	80	84.0	115.6
	Backhoe	74		
	Grader	81		
Grading	Scraper	80	83.3	114.9
	Excavator	77		
	Dozer	78		
Building Construction	Crane	73	80.6	112.2
	Generator	78		
	Front End Loader	75		
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] University District Rock Crusher Conditional Use Permit, San Marcos

10.3 TYPICAL CONSTRUCTION NOISE ANALYSIS

Using the reference construction equipment noise levels and the CadnaA noise prediction model, calculations of the Project construction noise level impacts with multiple pieces of equipment operating simultaneously at the nearest sensitive receiver locations were completed. This includes the additional noise attenuation provided by the existing intervening building structures and noise barriers located between the Project site and the nearest receiver locations.

To assess the worst-case construction noise levels, the Project construction noise analysis relies on the highest noise level impacts when the equipment with the highest reference noise level is operating at the closest point from the edge of primary construction activity (Project site boundary) to each receiver location. As shown on Table 10-2, the construction noise levels are expected to range from 37.3 to 63.6 dBA L_{eq}, and the highest construction levels are expected to range from 45.1 to 63.6 dBA L_{eq} at the nearest receiver locations. Appendix 10.1 includes the detailed CadnaA construction noise model inputs.

TABLE 10-2: TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})					
	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Levels[2]
R1	55.9	55.2	52.5	49.8	48.1	55.9
R2	63.6	62.9	60.2	57.5	55.8	63.6
R3	60.4	59.7	57.0	54.3	52.6	60.4
R4	45.1	44.4	41.7	39.0	37.3	45.1

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Construction noise level calculations based on distance from the project site boundaries (construction activity area) to nearby receiver locations. CadnaA construction noise model inputs are included in Appendix 10.1.

10.4 TYPICAL CONSTRUCTION NOISE LEVEL COMPLIANCE

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

TABLE 10-3: TYPICAL CONSTRUCTION NOISE LEVEL COMPLIANCE

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})		
	Highest Construction Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
R1	55.9	80	No
R2	63.6	80	No
R3	60.4	80	No
R4	45.1	80	No

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Highest construction noise level calculations based on distance from the construction noise source activity to nearby receiver locations as shown on Table 10-2.
[3] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual.
[4] Do the estimated Project construction noise levels exceed the construction noise level threshold?

10.6 TYPICAL CONSTRUCTION VIBRATION IMPACTS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from Project construction activities would cause only intermittent, localized intrusion. Ground-borne vibration levels resulting from typical construction activities occurring within the Project site were estimated by data published by the Federal Transit

Administration (FTA). (7) However, while vehicular traffic is rarely perceptible, construction has the potential to result in varying degrees of temporary ground vibration, depending on the specific construction activities and equipment used. Ground vibration levels associated with various types of construction equipment are summarized on Table 10-4. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the potential Project construction vibration levels using the following vibration assessment methods defined by the FTA. To describe the human response (annoyance) associated with vibration impacts the FTA provides the following equation:
$PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$

TABLE 10-4: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

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

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

Table 10-5 presents the expected Project related vibration levels at the nearby receiver locations. At distances ranging from 17 feet (at location R2) to 1,200 feet (at location R4) from Project construction activities (at the Project site boundary), construction vibration levels are estimated to range up to 0.2 in/sec PPV and will remain below the County of San Bernardino 0.2 in/sec PPV threshold for vibration at all receiver locations. Therefore, the Project-related vibration impacts are considered *less than significant* during the construction activities at the Project site.

Further, vibration levels at the site of the closest sensitive receiver are unlikely to be sustained during the entire construction period but will occur rather only during the times that heavy construction equipment is operating simultaneously adjacent to the Project site perimeter.

TABLE 10-5: TYPICAL CONSTRUCTION EQUIPMENT VIBRATION LEVELS

Receiver[1]	Distance to Const. Activity (Feet)	Receiver PPV Levels (in/sec)[2]					Threshold PPV (in/sec)[3]	Threshold Exceeded?[4]
		Small Bulldozer	Jack-hammer	Loaded Trucks	Large Bulldozer	Peak Vibration		
R1	182'	0.0	0.0	0.0	0.0	0.0	0.2	No
R2	17'	0.0	0.1	0.1	0.2	0.2	0.2	No
R3	55'	0.0	0.0	0.0	0.0	0.0	0.2	No
R4	1,200'	0.0	0.0	0.0	0.0	0.0	0.2	No

[1] Receiver locations are shown on Exhibit 10-A.
[2] Based on the Vibration Source Levels of Construction Equipment included on Table 10-4.
[3] Section 83.01.090(a) of the San Bernardino County Code.
[4] Does the peak vibration exceed the County of San Bernardino maximum acceptable vibration threshold?

11 REFERENCES

1. **State of California.** *California Environmental Quality Act, Appendix G.* 2018.
2. **California Department of Transportation Environmental Program.** *Technical Noise Supplement - A Technical Supplement to the Traffic Noise Analysis Protocol.* Sacramento, CA : s.n., September 2013.
3. **Environmental Protection Agency Office of Noise Abatement and Control.** *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.* March 1974. EPA/ONAC 550/9/74-004.
4. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning, Noise and Air Quality Branch.** *Highway Traffic Noise Analysis and Abatement Policy and Guidance.* December 2011.
5. **U.S. Department of Transportation, Federal Highway Administration.** *Highway Traffic Noise in the United States, Problem and Response.* April 2000. p. 3.
6. **U.S. Environmental Protection Agency Office of Noise Abatement and Control.** *Noise Effects Handbook-A Desk Reference to Health and Welfare Effects of Noise.* October 1979 (revised July 1981). EPA 550/9/82/106.
7. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment Manual.* September 2018.
8. **Office of Planning and Research.** *State of California General Plan Guidelines.* October 2017.
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10. **County of San Bernardino.** *General Plan Noise Element.* April 2007.
11. —. *Code of Ordinances, Title 8 Development Code, Chapter 83.01 General Performance Standards.*
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13. **American National Standards Institute (ANSI).** *Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.*
14. **U.S. Department of Transportation, Federal Highway Administration.** *FHWA Highway Traffic Noise Prediction Model.* December 1978. FHWA-RD-77-108.
15. **California Department of Transportation Environmental Program, Office of Environmental Engineering.** *Use of California Vehicle Noise Reference Energy Mean Emission Levels (Calveno REMELs) in FHWA Highway Traffic Noise Prediction.* September 1995. TAN 95-03.
16. **California Department of Transportation.** *Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report.* June 1995. FHWA/CA/TL-95/23.
17. **Ganddini Group, Inc.** *Phelan Community Park Traffic Impact Analysis.* January 31, 2022.
18. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning.** *FHWA Roadway Construction Noise Model.* January, 2006.

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12 CERTIFICATION

and impacts associated with the proposed Phelan Community Park. 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.

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EDUCATION

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

PROFESSIONAL AFFILIATIONS

ASA – Acoustical Society of America
APA – American Planning Association
AWMA – Air and Waste Management Association

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:

COUNTY OF SAN BERNARDINO MUNICIPAL CODE

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DIVISION 3: COUNTYWIDE DEVELOPMENT STANDARDS

CHAPTER 83.01: GENERAL PERFORMANCE STANDARDS

Section

83.01.010 Purpose.

83.01.020 Applicability.

83.01.030 Modification of Standards.

83.01.040 Air Quality.

83.01.050 Electrical Disturbances.

83.01.060 Fire Hazards.

83.01.070 Heat.

83.01.080 Noise.

83.01.090 Vibration.

83.01.100 Waste Disposal.

83.01.110 External Commercial or Industrial Activity on Private Property.

§ 83.01.010 Purpose.

The purpose of this Chapter is to establish uniform performance standards for development within the County that promotes compatibility with surrounding areas and land uses.

Performance standards are designed to mitigate the environmental impacts of existing and proposed land uses within a community. Environmental impacts include air quality, glare, heat, noise, runoff control, and waste disposal. These general performance standards are intended to protect the health and safety of businesses, nearby residents, and workers and to prevent damaging effects to surrounding properties.

(Ord. 4011, passed - -2007)

§ 83.01.020 Applicability.

(a) *New and Existing Uses in All Land Use Zoning Districts.* The provisions of this Chapter apply to all new and existing uses in all land use zoning districts. The standards of this Chapter elaborate upon and otherwise augment the development standards specified for individual land use zoning districts in Division 2 (Land Use Zoning Districts and Allowed Land Uses) and in Division 4 (Standards for Specific Land Uses and Activities).

(b) *Compliance of Alterations or Modifications.* Uses of the land that existed on the effective date of this Division shall not be altered or modified so as to conflict with, or further conflict with, these standards.

(c) *Evidence of Compliance with Standards.* If requested by the Director or the Review Authority, applicants shall provide evidence to the Director that the proposed development is in compliance with

the standards in this Division and other applicable standards in this Development Code before the issuance of a Building Permit or business license.

(Ord. 4011, passed - -2007)

§ 83.01.030 Modification of Standards.

(a) *Modification by Specific Reference.* The provisions of this Division shall prevail should they conflict with the provisions of a land use zoning district or specific plan, unless the land use zoning district or plan standard specifically overrides or modifies the provisions of this Division by specific reference.

(b) *Modification by Establishment of Overlay or Approval of Planned Development or Variance.* An overlay, approved Planned Development, or approved Variance may modify the provisions of this Division.

(Ord. 4011, passed - -2007)

§ 83.01.040 Air Quality.

(a) *Equipment Permit and Inspection Requirements.* Required permits shall be obtained from either the Mojave Air Pollution Management District or the South Coast Air Quality Management District depending on the location of the subject property and equipment for equipment that may cause air pollution. Before the equipment may be constructed, plans and specifications shall be submitted to the appropriate District for approval

(b) *Permits from Air Quality Management Districts.* Permits shall be obtained from either the Mojave Air Pollution Management District or the South Coast Air Quality Management District depending on the location of the subject property and equipment. If requested by the Director, uses, activities, or processes that require Air Quality Management District approval to operate shall file a copy of the permit with the Department within 30 days of its approval.

(c) *Diesel Exhaust Emissions Control Measures.* The following emissions control measures shall apply to all discretionary land use projects approved by the County on or after January 15, 2009:

(1) *On-Road Diesel Vehicles.* On-road diesel vehicles are regulated by the State of California Air Resources Board.

(2) *Off-Road Diesel Vehicle/Equipment Operations.* All business establishments and contractors that use off-road diesel vehicle/equipment as part of their normal business operations shall adhere to the following measures during their operations in order to reduce diesel particulate matter emissions from diesel-fueled engines:

(A) Off-road vehicles/equipment shall not be left idling on site for periods in excess of five minutes. The idling limit does not apply to:

(I) Idling when queuing;

(II) Idling to verify that the vehicle is in safe operating condition;

(III) Idling for testing, servicing, repairing or diagnostic purposes;

(IV) Idling necessary to accomplish work for which the vehicle was designed (such as operating a crane);

(V) Idling required to bring the machine system to operating temperature; and

(VI) Idling necessary to ensure safe operation of the vehicle.

(B) Use reformulated ultra low-sulfur diesel fuel in equipment and use equipment certified by the U.S. Environmental Protection Agency (EPA) or that pre-dates EPA regulations.

(C) Maintain engines in good working order to reduce emissions.

(D) Signs shall be posted requiring vehicle drivers to turn off engines when parked.

(E) Any requirements or standards subsequently adopted by the South Coast Air Quality Management District, the Mojave Desert Air Quality Management District or the California Air Resources Board.

(F) Provide temporary traffic control during all phases of construction.

(G) On-site electrical power connections shall be provided for electric construction tools to eliminate the need for diesel-powered electric generators, where feasible.

(H) Maintain construction equipment engines in good working order to reduce emissions. The developer shall have each contractor certify that all construction equipment is properly serviced and maintained in good operating condition.

(I) Contractors shall use ultra low sulfur diesel fuel for stationary construction equipment as required by Air Quality Management District (AQMD) Rules 431.1 and 431.2 to reduce the release of undesirable emissions.

(J) Substitute electric and gasoline-powered equipment for diesel-powered equipment, where feasible.

(3) *Project Design.* Distribution centers, warehouses, truck stops and other facilities with loading docks where diesel trucks may reside overnight or for periods in excess of three hours shall be designed to enable any vehicle using these facilities to utilize on-site electrical connections to power the heating and air conditioning of the cabs of such trucks, and any refrigeration unit(s) of any trailer being pulled by the trucks, instead of operating the diesel engines and diesel refrigeration units of such trucks and trailers for these purposes. This requirement shall also apply to Recreational Vehicle Parks (as defined in § 810.01.200(k) of this title) and other development projects where diesel engines may reasonably be expected to operate on other than an occasional basis.

(Ord. 4011, passed - -2007; Am. Ord. 4065, passed - -2008)

§ 83.01.050 Electrical Disturbances.

No activity, land use, or process shall cause electrical disturbance that adversely affects persons or the operation of equipment across lot lines and that does not conform to the regulations of the Federal Communications Commission. Existing or proposed uses that generate electrical disturbances that are be considered hazardous or a public nuisance shall be contained, modified, or shielded to prevent disturbances.

(Ord. 4011, passed - -2007)

§ 83.01.060 Fire Hazards.

This Section establishes standards for storage of solid materials susceptible to fire hazards and flammable liquids and gases where allowed in compliance with Division 2 (Land Use Zoning Districts and Allowed Land Uses).

(a) *Combustible Solids.* Land uses that include the storage of solid materials susceptible to fire hazards shall be subject to the following storage standards in the indicated land use zoning districts.

(1) *Regional Industrial (IR) Land Use Zoning District.*

(A) *Inside Storage.* A structure utilized for the storage, manufacture, or use of flammable solid materials shall be located no less than 40 feet from any lot line and any other on-site structures or shall adhere to standards specified in Subdivision (2) below.

(B) *Outdoor Storage.* Outdoor storage of flammable solid materials shall be no less than 50 feet from any lot line and any other on-site structures.

(2) *All Other Manufacturing or Industrial Uses Legally Established Within Any Other Land Use Zoning District.* The storage, manufacture, or use of highly flammable solid materials shall take place in enclosed spaces having fire resistance of no less than two hours and protected with an automatic fire extinguishing system.

(b) *Flammable Liquids and Gases.* Land uses that involve the storage of flammable liquids and gases shall be subject to the following standards when established within the land use zoning districts indicated.

(1) *Setbacks.* County Code Title 2, Division 3 (Fire Protection and Explosives and Hazardous Materials) shall establish setback requirements for flammable liquids and gases.

(2) *Storage capacity.* The total storage capacity of flammable liquids and gases on a parcel shall not exceed the quantities indicated in Table 83-1 (Storage Standards for Flammable Liquids and Gases).

Table 83-1		
Storage Standards for Flammable Liquids and Gases		
Stored Substance	***Land Use Zoning District***	***Maximum Capacity***
Table 83-1		
Storage Standards for Flammable Liquids and Gases		
Stored Substance	***Land Use Zoning District***	***Maximum Capacity***
SCF = Standard cubic feet at 60ºF and 29.92" Hg (i.e., mercury)		
Liquids	Regional Industrial District (IR)	120,000 gallons
	All other manufacturing or industrial uses legally established within any other land use zoning district	60,000 gallons
Liquefied Petroleum Gas (LPG)	All manufacturing or industrial uses established in any land zoning use district	Per County Code Title 2, Division 3 (Fire Protection and Explosives and Hazardous Materials)
	All commercial uses legally established in any land use zoning district	15,000 gal./tank 20,000 gallons maximum aggregate total
	All agricultural uses legally established in any land use zoning district and aggregate total	15,000 gal./tank and aggregate total
Gases other than liquefied petroleum gas	Regional Industrial District (IR)	300,000 SCF above ground 600,000 SCF below ground
	All other manufacturing or industrial uses legally	150,000 SCF above ground

	established within any other land use zoning district	300,000 SCF below ground

(c) *Liquefied Petroleum Gas (LPG).*

(1) *General Requirements.*

(A) *Agricultural, Commercial, Industrial, or Manufacturing Uses and Land Use Zoning Districts.* Liquefied petroleum gas (LPG) storage and distribution facilities for agricultural, commercial, industrial, or manufacturing uses shall be allowed subject to a Use Permit in compliance with Division 2 (Land Use Zoning Districts and Allowed Land Uses). The location, installation, operation, and maintenance of LPG storage and distribution facilities shall be subject to:

(I) The standards in this Subdivision.

(II) The conditions, requirements, and standards imposed by the Review Authority in compliance with this Chapter.

(B) *Residential Uses and Land Use Zoning Districts.* County Code Title 2, Division 3 (Fire Protection and Explosives and Hazardous Materials) shall establish standards for residential uses and residential land use zoning districts for LPG storage.

(C) *Conflict Between Land Use District and Use Permit Requirements.* In the event of a conflict between the provisions of this § 83.01.060(c) (Liquefied Petroleum Gas [LPG]) and the provisions of a land use zoning district, including the requirement for Use Permit, the provisions of this Section shall prevail and control.

(2) *Fire Protection Requirements for All Parcels.*

(A) Setbacks for LPG storage and distribution facilities from structures and property lines shall be those specified by County Code Title 2, Division 3 (Fire Protection and Explosives and Hazardous Materials).

(B) LPG storage tanks shall be centrally located on the parcel to the satisfaction of the Fire Department.

(3) *Additional Fire Protection Requirements for Specific Types of Parcels.* For parcels that have no more than one occupied structure less than 5,000 square feet in size and where the water system provides substandard flows per International Standards Organization (ISO) standards for structure protection, additional fire protection requirements shall be as follows:

(A) *Where Parcel Size Is Ten Acres or More.* Fire flow shall be calculated for exposures only in compliance with County Code Title 2, Division 3 (Fire Protection and Explosives and Hazardous Materials).

(B) *Where Parcel Size Is at Least Five Acres but less than Ten Acres.*

(I) A one hour approved protective coating shall be applied to the LPG storage tank.

(II) Fire flow shall be calculated for exposures only, in compliance with County Code Title 2, Division 3 (Fire Protection and Explosives and Hazardous Materials).

(C) *Where Parcel Size Is at Least Two and One-half Acres, but less than Five Acres.*

(I) A two hour approved protective coating shall be applied to the tank.

(II) Fire flow shall be calculated for exposures only, in compliance with County Code Title 2, Division 3 (Fire Protection and Explosives and Hazardous Materials).

(4) *Additional Fire Protection Requirements for Any Parcel with Adequate Fire Flow Available per ISO Standards.*

(A) Fire hydrant(s) shall serve the parcel in compliance with County Code Title 2, Division 3 (Fire Protection and Explosives and Hazardous Materials).

(B) Fire flow shall provide for exposure protection (ISO Calculation) and LPG storage tank protection/suppression.

(I) Sprinklers shall use calculations, as adopted by County Code Title 2, Division 3 (Fire Protection and Explosives and Hazardous Materials).

(II) Hose lines shall use the formula: GPM = five times the square root of the tank capacity.

(C) Additional protection.

(I) Where the Fire Chief determines that water can be applied to the tank or exposures by the Fire Department in required amounts in eight minutes or less, no additional protection shall be required.

(II) Where the Fire Chief determines that water cannot be applied to the tank or exposures by the Fire Department in required amounts in eight minutes or less, one of the following protection measures shall be required:

(i) One hour approved protective coating shall be applied to the LPG storage tank; or

(ii) A fixed spray water system shall be installed as approved by the Fire Department.

(5) Additional fire protection requirements for any parcel not included in either Subdivisions (C)(III) or (C)(IV), above:

(A) Either a one-hour or more protective coating shall be applied to the LPG storage tank, as required by the Fire Department, or a fixed spray water system shall be installed instead of coating the tank.

(B) Fire flow shall be calculated for exposure only, in compliance with the San Bernardino Code Title 2, Division 3 (Fire Protection and Explosives and Hazardous Materials).

(Ord. 4011, passed - -2007)

§ 83.01.070 Heat.

Land uses in industrial districts shall not emit heat that would cause a temperature increase on any adjacent property in excess of ten degrees Fahrenheit, whether the change is in the air, on the ground, or in a structure.

(Ord. 4011, passed - -2007)

§ 83.01.080 Noise.

This Section establishes standards concerning acceptable noise levels for both noise-sensitive land uses and for noise-generating land uses.

(a) *Noise Measurement.* Noise shall be measured:

(1) At the property line of the nearest site that is occupied by, and/or zoned or designated to allow the development of noise-sensitive land uses;

(2) With a sound level meter that meets the standards of the American National Standards Institute (ANSI § SI4 1979, Type 1 or Type 2);

(3) Using the “A” weighted sound pressure level scale in decibels (ref. pressure = 20 micronewtons per meter squared). The unit of measure shall be designated as dB(A).

(b) *Noise Impacted Areas.* Areas within the County shall be designated as “noise-impacted” if exposed to existing or projected future exterior noise levels from mobile or stationary sources exceeding the standards listed in Subdivision (d) (Noise Standards for Stationary Noise Sources) and Subdivision (e) (Noise Standards for Adjacent Mobile Noise Sources), below. New development of residential or other noise-sensitive land uses shall not be allowed in noise-impacted areas unless effective mitigation measures are incorporated into the project design to reduce noise levels to these standards. Noise-sensitive land uses shall include residential uses, schools, hospitals, nursing homes, religious institutions, libraries, and similar uses.

(c) *Noise Standards for Stationary Noise Sources.*

(1) *Noise Standards.* Table 83-2 (Noise Standards for Stationary Noise Sources) describes the noise standard for emanations from a stationary noise source, as it affects adjacent properties:

Table 83-2

Noise Standards for Stationary Noise Sources

Affected Land Uses (Receiving Noise)	***7:00 a.m. - 10:00 p.m. Leq***	***10:00 p.m. - 7:00 a.m. Leq***
Residential	55 dB(A)	45 dB(A)
Professional Services	55 dB(A)	55 dB(A)
Other Commercial	60 dB(A)	60 dB(A)
Industrial	70 dB(A)	70 dB(A)

Leq = (Equivalent Energy Level). The sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period, typically one, eight or 24 hours.

dB(A) = (A-weighted Sound Pressure Level). The sound pressure level, in decibels, as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound, placing greater emphasis on those frequencies within the sensitivity range of the human ear.

Ldn = (Day-Night Noise Level). The average equivalent A-weighted sound level during a 24-hour day obtained by adding 10 decibels to the hourly noise levels measured during the night (from 10:00 p.m. to 7:00 a.m.). In this way Ldn takes into account the lower tolerance of people for noise during nighttime periods.

(2) *Noise Limit Categories.* No person shall operate or cause to be operated a source of sound at a location or allow the creation of noise on property owned, leased, occupied, or otherwise controlled by the person, which causes the noise level, when measured on another property, either incorporated or unincorporated, to exceed any one of the following:

(A) The noise standard for the receiving land use as specified in Subdivision (b) (Noise-Impacted Areas), above, for a cumulative period of more than 30 minutes in any hour.

(B) The noise standard plus five dB(A) for a cumulative period of more than 15 minutes in any hour.

(C) The noise standard plus ten dB(A) for a cumulative period of more than five minutes in any hour.

(D) The noise standard plus 15 dB(A) for a cumulative period of more than one minute in any hour.

(E) The noise standard plus 20 dB(A) for any period of time.

(d) *Noise Standards for Adjacent Mobile Noise Sources.* Noise from mobile sources may affect adjacent properties adversely. When it does, the noise shall be mitigated for any new development to a level that shall not exceed the standards described in the following Table 83-3 (Noise Standards for Adjacent Mobile Noise Sources).

Table 83-3

Noise Standards for Adjacent Mobile Noise Sources

Land Use		***Ldn (or CNEL) dB(A)***	
Categories	***Uses***	***Interior*** (1)	***Exterior*** (2)

Table 83-3

Noise Standards for Adjacent Mobile Noise Sources

Land Use		***Ldn (or CNEL) dB(A)***	
Categories	***Uses***	***Interior*** (1)	***Exterior*** (2)
Residential	Single and multi-family, duplex, mobile homes	45	60(3)
Commercial	Hotel, motel, transient housing	45	60(3)
	Commercial retail, bank, restaurant	50	N/A
	Office building, research and development, professional offices	45	65
	Amphitheater, concert hall, auditorium, movie theater	45	N/A
Institutional/Public	Hospital, nursing home, school classroom, religious institution, library	45	65
Open Space	Park	N/A	65

Notes:

(1) The indoor environment shall exclude bathrooms, kitchens, toilets, closets and corridors.

(2) The outdoor environment shall be limited to:
- Hospital/office building patios
- Hotel and motel recreation areas
- Mobile home parks

· Multi-family private patios or balconies · Park picnic areas · Private yard of single-family dwellings · School playgrounds
(3) An exterior noise level of up to 65 dB(A) (or CNEL) shall be allowed provided exterior noise levels have been substantially mitigated through a reasonable application of the best available noise reduction technology, and interior noise exposure does not exceed 45 dB(A) (or CNEL) with windows and doors closed. Requiring that windows and doors remain closed to achieve an acceptable interior noise level shall necessitate the use of air conditioning or mechanical ventilation.
CNEL = (Community Noise Equivalent Level). The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of approximately five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and ten decibels to sound levels in the night from 10:00 p.m. to 7:00 a.m.

(e) *Increases in Allowable Noise Levels.* If the measured ambient level exceeds any of the first four noise limit categories in Subdivision (d)(2), above, the allowable noise exposure standard shall be increased to reflect the ambient noise level. If the ambient noise level exceeds the fifth noise limit category in Subdivision (d)(2), above, the maximum allowable noise level under this category shall be increased to reflect the maximum ambient noise level.

(f) *Reductions in Allowable Noise Levels.* If the alleged offense consists entirely of impact noise or simple tone noise, each of the noise levels in Table 83-2 (Noise Standards for Stationary Noise Sources) shall be reduced by five dB(A).

(g) *Exempt Noise.* The following sources of noise shall be exempt from the regulations of this Section:

(1) Motor vehicles not under the control of the commercial or industrial use.

(2) Emergency equipment, vehicles, and devices.

(3) Temporary construction, maintenance, repair, or demolition activities between 7:00 a.m. and 7:00 p.m., except Sundays and Federal holidays.

(h) *Noise Standards for Other Structures.* All other structures shall be sound attenuated against the combined input of all present and projected exterior noise to not exceed the criteria.

Table 83-4

Noise Standards for Other Structures

Typical Uses	***12-Hour Equivalent Sound Level (Interior) in dBA Ldn***
Educational, institutions, libraries, meeting facilities, etc.	45
General office, reception, etc.	50
Retail stores, restaurants, etc.	55
Other areas for manufacturing, assembly, testing, warehousing, etc.	65

In addition, the average of the maximum levels on the loudest of intrusive sounds occurring during a 24-hour period shall not exceed 65 dBA interior.

(Ord. 4011, passed - -2007; Am. Ord. 4245, passed - -2014)

§ 83.01.090 Vibration.

(a) *Vibration Standard.* No ground vibration shall be allowed that can be felt without the aid of instruments at or beyond the lot line, nor shall any vibration be allowed which produces a particle velocity greater than or equal to two-tenths inches per second measured at or beyond the lot line.

(b) *Vibration Measurement.* Vibration velocity shall be measured with a seismograph or other instrument capable of measuring and recording displacement and frequency, particle velocity, or acceleration. Readings shall be made at points of maximum vibration along any lot line next to a parcel within a residential, commercial and industrial land use zoning district.

(c) *Exempt Vibrations.* The following sources of vibration shall be exempt from the regulations of this Section.

(1) Motor vehicles not under the control of the subject use.

(2) Temporary construction, maintenance, repair, or demolition activities between 7:00 a.m. and 7:00 p.m., except Sundays and Federal holidays.

(Ord. 4011, passed - -2007)

§ 83.01.100 Waste Disposal.

(a) *Liquid Waste Disposal and Runoff Control.* No liquids of any kind shall be discharged into a public or private sewage or drainage system, watercourse, body of water, or into the ground, except in compliance with applicable regulations of the County Code, Title 23 (Waters) of the California Code of Regulations, the California Water Code, and related Federal regulations.

(b) *Hazardous Waste.* Refer to Chapter 84.11 (Hazardous Waste Facilities) for regulations relative to hazardous waste facilities.

(c) *Solid Waste Disposal.* Refer to Chapter 84.24 (Solid Waste/Recyclable Materials Storage) for regulations relative to solid waste disposal.

(Ord. 4011, passed - -2007)

§ 83.01.110 External Commercial or Industrial Activity on Private Property.

There shall be no unpermitted external or industrial activity on properties subject to the County’s jurisdiction between the hours of 9:00 p.m. and 7:00 a.m. that shall at any time impair the quiet enjoyment of neighboring property owners or residents or in any manner disturb the public peace.

(Ord. 4245, passed - -2014)

APPENDIX 5.1:

STUDY AREA PHOTOS

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JN: 14145 Study Area Photos

L1_E
34, 25' 27.720000"117, 34' 16.830000"

L1_N
34, 25' 27.760000"117, 34' 16.890000"

L1_S
34, 25' 27.770000"117, 34' 16.890000"

L1_W
34, 25' 27.750000"117, 34' 16.810000"

L2_E
34, 25' 27.290000"117, 34' 3.240000"

L2_N
34, 25' 27.290000"117, 34' 3.240000"

JN: 14145 Study Area Photos

L2_S
34, 25' 27.290000"117, 34' 3.240000"

L2_W
34, 25' 27.290000"117, 34' 3.240000"

L3_E
34, 25' 18.820000"117, 34' 12.520000"

L3_N
34, 25' 18.800000"117, 34' 12.470000"

L3_S
34, 25' 18.800000"117, 34' 12.470000"

L3_W
34, 25' 18.830000"117, 34' 12.580000"

JN: 14145 Study Area Photos

L4_E
34, 25' 28.780000"117, 34' 32.570000"

L4_N
34, 25' 28.780000"117, 34' 32.570000"

L4_S
34, 25' 28.780000"117, 34' 32.570000"

L4_W
34, 25' 28.780000"117, 34' 32.570000"

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APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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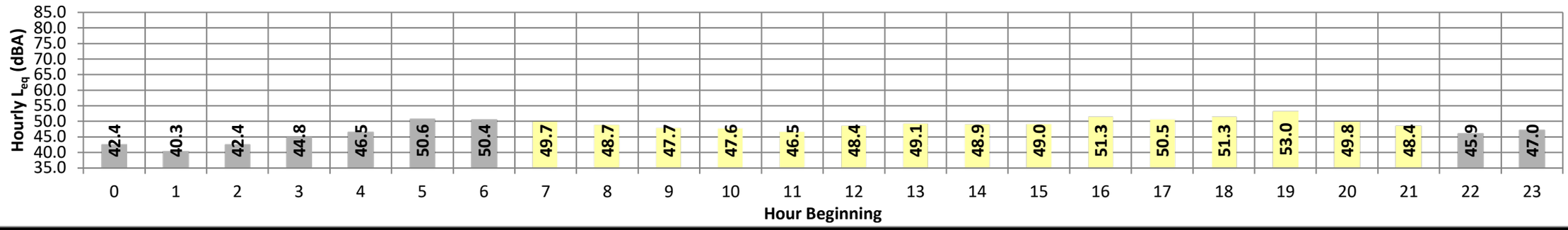
24-Hour Noise Level Measurement Summary

Date: Wednesday, June 30, 2021 *Location:* L1 - North of Project site and south of the Phelan Elementary *Meter:* Piccolo II *JN:* 14145
Project: Phelan Community Park *Source:* School. *Analyst:* A. Khan

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	42.4	46.4	40.1	46.1	45.8	45.1	44.5	42.8	41.8	40.6	40.4	40.2	42.4	10.0	52.4
	1	40.3	46.2	36.7	45.7	45.1	44.1	43.4	41.1	39.0	37.3	37.1	36.8	40.3	10.0	50.3
	2	42.4	48.3	37.4	47.8	47.5	46.5	45.9	43.3	41.2	38.1	37.8	37.5	42.4	10.0	52.4
	3	44.8	52.2	40.3	51.6	51.1	49.5	48.7	45.1	42.9	41.0	40.7	40.4	44.8	10.0	54.8
	4	46.5	51.4	43.3	51.0	50.6	49.7	49.2	47.1	45.8	44.0	43.7	43.4	46.5	10.0	56.5
	5	50.6	56.8	46.8	56.4	56.0	54.9	53.9	50.9	49.2	47.6	47.4	47.0	50.6	10.0	60.6
	6	50.4	57.2	47.3	56.2	55.2	53.4	52.7	50.8	49.5	48.2	47.9	47.5	50.4	10.0	60.4
Day	7	49.7	56.9	45.0	56.2	55.7	54.2	53.4	50.4	47.9	45.8	45.5	45.2	49.7	0.0	49.7
	8	48.7	54.9	45.2	54.3	53.7	52.3	51.6	49.2	47.5	45.9	45.7	45.3	48.7	0.0	48.7
	9	47.7	52.5	44.3	52.0	51.6	50.8	50.3	48.4	46.9	45.1	44.8	44.4	47.7	0.0	47.7
	10	47.6	52.0	44.8	51.6	51.2	50.3	49.7	48.2	47.0	45.6	45.3	44.9	47.6	0.0	47.6
	11	46.5	52.6	43.4	52.0	51.3	49.8	48.7	46.9	45.8	44.2	43.9	43.6	46.5	0.0	46.5
	12	48.4	54.4	44.9	53.4	52.9	51.6	51.0	49.1	47.6	45.7	45.4	45.1	48.4	0.0	48.4
	13	49.1	54.4	45.8	53.8	53.3	52.4	51.7	49.8	48.3	46.5	46.2	45.9	49.1	0.0	49.1
	14	48.9	53.4	45.6	53.1	52.7	51.9	51.4	49.6	48.3	46.4	46.0	45.7	48.9	0.0	48.9
	15	49.0	54.3	45.3	53.8	53.3	52.1	51.5	49.6	48.3	46.4	46.0	45.6	49.0	0.0	49.0
	16	51.3	56.8	47.6	56.4	55.9	54.7	54.0	51.8	50.4	48.8	48.4	47.9	51.3	0.0	51.3
	17	50.5	54.9	47.1	54.4	54.1	53.3	52.8	51.2	50.0	48.1	47.7	47.3	50.5	0.0	50.5
	18	51.3	58.0	47.5	57.3	56.9	55.5	54.5	51.6	50.0	48.3	48.0	47.7	51.3	0.0	51.3
	19	53.0	60.9	47.1	60.5	60.1	58.8	57.3	53.6	50.1	48.0	47.7	47.3	53.0	5.0	58.0
	20	49.8	54.9	46.5	54.5	54.2	53.3	52.7	50.5	48.6	47.1	46.9	46.6	49.8	5.0	54.8
	21	48.4	54.0	44.9	53.6	52.9	51.7	51.0	49.2	47.5	45.8	45.5	45.1	48.4	5.0	53.4
Night	22	45.9	51.3	42.5	50.9	50.4	49.2	48.5	46.5	45.1	43.3	43.0	42.6	45.9	10.0	55.9
	23	47.0	54.8	42.2	54.5	53.9	51.8	50.8	47.5	45.0	42.8	42.6	42.3	47.0	10.0	57.0

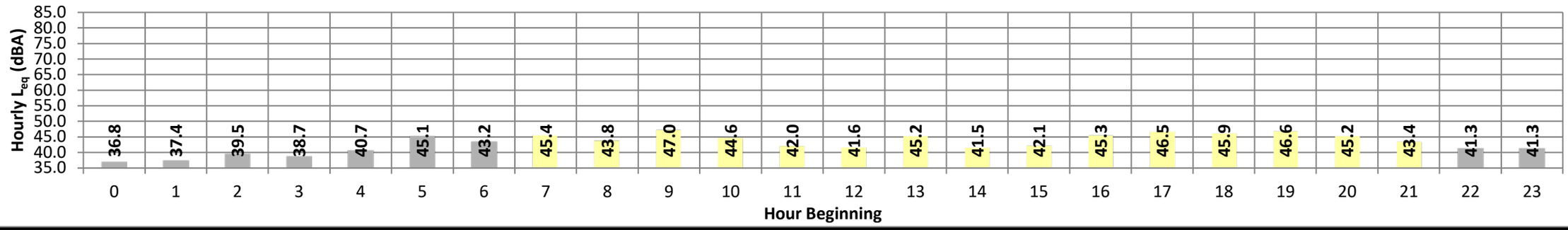
Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	46.5	52.0	43.4	51.6	51.2	49.8	48.7	46.9	45.8	44.2	43.9	43.6
	Max	53.0	60.9	47.6	60.5	60.1	58.8	57.3	53.6	50.4	48.8	48.4	47.9
Energy Average		49.7	Average:		54.4	54.0	52.9	52.1	49.9	48.3	46.5	46.2	45.8
Night	Min	40.3	46.2	36.7	45.7	45.1	44.1	43.4	41.1	39.0	37.3	37.1	36.8
	Max	50.6	57.2	47.3	56.4	56.0	54.9	53.9	50.9	49.5	48.2	47.9	47.5
Energy Average		46.8	Average:		51.1	50.6	49.3	48.6	46.1	44.4	42.5	42.3	42.0

24-Hour	L_{eq} (dBA) Daytime (7am-10pm)	Nighttime (10pm-7am)
48.8	49.7	46.8

24-Hour Noise Level Measurement Summary

Date: Wednesday, June 30, 2021
Project: Phelan Community Park
Location: L2 - Northeast of Project site near single-family residence at
Source: 9550 Riggins Road.
Meter: Piccolo II
JN: 14145
Analyst: A. Khan

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	36.8	40.7	34.3	40.4	40.0	39.4	39.0	37.6	36.2	34.9	34.7	34.4	36.8	10.0	46.8
	1	37.4	43.8	33.4	43.1	42.6	41.5	40.7	38.1	35.9	34.0	33.7	33.5	37.4	10.0	47.4
	2	39.5	45.6	33.6	44.9	44.3	43.4	42.8	40.7	38.8	34.4	34.0	33.7	39.5	10.0	49.5
	3	38.7	44.2	35.3	43.8	43.1	42.1	41.3	39.2	37.8	36.0	35.7	35.4	38.7	10.0	48.7
	4	40.7	45.8	37.2	45.4	45.0	44.1	43.6	41.3	39.9	38.0	37.7	37.4	40.7	10.0	50.7
	5	45.1	50.6	41.8	50.2	49.7	48.5	47.7	45.6	44.3	42.7	42.3	42.0	45.1	10.0	55.1
	6	43.2	47.6	40.4	47.1	46.7	45.9	45.3	43.9	42.7	41.2	40.9	40.6	43.2	10.0	53.2
Day	7	45.4	51.6	38.9	50.6	50.1	49.3	48.7	46.6	44.4	41.3	40.8	39.7	45.4	0.0	45.4
	8	43.8	49.8	36.8	49.1	48.7	47.8	47.1	44.8	42.9	38.9	38.0	37.0	43.8	0.0	43.8
	9	47.0	54.0	39.4	52.9	52.3	51.3	50.7	48.0	45.5	42.3	41.5	40.3	47.0	0.0	47.0
	10	44.6	54.2	39.0	53.1	51.9	49.5	48.4	44.7	42.4	40.1	39.6	39.2	44.6	0.0	44.6
	11	42.0	51.1	37.2	50.2	49.1	47.2	45.4	42.4	39.9	37.8	37.6	37.3	42.0	0.0	42.0
	12	41.6	48.8	37.8	48.1	46.9	44.7	44.2	42.1	40.6	38.5	38.3	37.9	41.6	0.0	41.6
	13	45.2	57.1	37.6	56.0	54.8	50.8	48.6	44.0	41.6	38.6	38.3	37.8	45.2	0.0	45.2
	14	41.5	48.3	37.2	47.5	46.9	45.4	44.7	42.2	40.3	38.0	37.7	37.3	41.5	0.0	41.5
	15	42.1	48.8	38.3	48.0	47.1	45.8	45.0	42.6	41.0	39.1	38.8	38.4	42.1	0.0	42.1
	16	45.3	51.9	41.1	51.3	50.7	49.1	48.3	45.9	44.1	42.1	41.7	41.3	45.3	0.0	45.3
	17	46.5	53.4	41.2	52.7	52.1	50.6	49.8	47.2	45.1	42.5	42.0	41.5	46.5	0.0	46.5
	18	45.9	58.9	41.4	58.2	57.4	55.6	54.8	52.6	49.7	43.0	42.1	41.6	45.9	0.0	45.9
	19	46.6	56.5	40.9	55.7	55.2	53.1	52.0	48.4	45.1	42.1	41.6	41.1	46.6	5.0	51.6
	20	45.2	51.8	39.9	51.0	50.3	49.0	48.3	46.1	44.1	41.0	40.6	40.1	45.2	5.0	50.2
	21	43.4	49.3	38.9	48.5	47.9	46.9	46.2	44.1	42.5	40.1	39.7	39.1	43.4	5.0	48.4
Night	22	41.3	46.3	37.7	45.8	45.2	44.4	43.9	42.2	40.6	38.5	38.2	37.8	41.3	10.0	51.3
	23	41.3	47.8	36.5	47.4	46.8	45.5	44.6	42.1	39.8	37.2	36.9	36.6	41.3	10.0	51.3

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	41.5	48.3	36.8	47.5	46.9	44.7	44.2	42.1	39.9	37.8	37.6	37.0
	Max	47.0	58.9	41.4	58.2	57.4	55.6	54.8	52.6	49.7	43.0	42.1	41.6
Energy Average		44.8	Average:		51.5	50.8	49.1	48.1	45.4	43.3	40.4	39.9	39.3
Night	Min	36.8	40.7	33.4	40.4	40.0	39.4	39.0	37.6	35.9	34.0	33.7	33.5
	Max	45.1	50.6	41.8	50.2	49.7	48.5	47.7	45.6	44.3	42.7	42.3	42.0
Energy Average		41.2	Average:		45.3	44.8	43.9	43.2	41.2	39.6	37.4	37.1	36.8

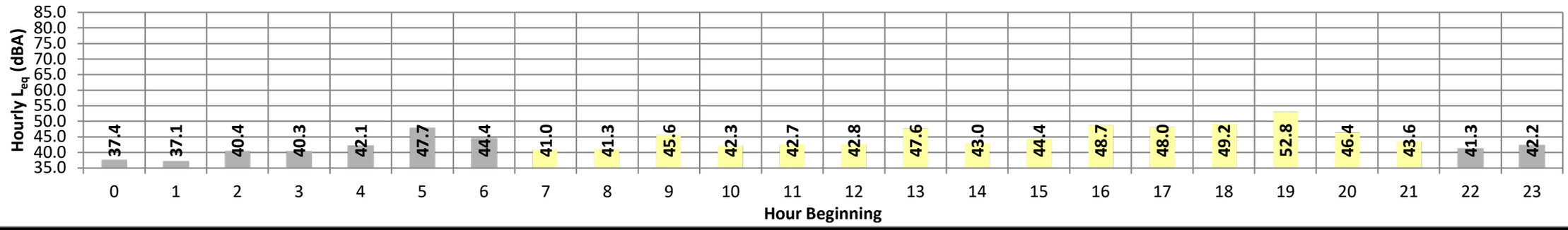
24-Hour	L_{eq} (dBA) Daytime (7am-10pm)	Nighttime (10pm-7am)
43.7	**44.8**	**41.2**

24-Hour Noise Level Measurement Summary

Date: Wednesday, June 30, 2021 *Location:* L3 - South of Project site on Sahara Road near single-family *Meter:* Piccolo II *JN:* 14145

Project: Phelan Community Park *Source:* residence at 4243 Warbler Road. *Analyst:* A. Khan

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	37.4	42.3	34.4	42.0	41.6	40.6	40.0	38.1	36.7	35.0	34.7	34.4	37.4	10.0	47.4
	1	37.1	42.0	34.0	41.6	41.2	40.1	39.5	37.7	36.4	34.6	34.4	34.1	37.1	10.0	47.1
	2	40.4	46.3	35.3	45.8	45.4	44.2	43.5	41.4	39.4	36.3	35.9	35.4	40.4	10.0	50.4
	3	40.3	45.8	36.5	45.4	44.9	43.6	43.1	41.1	39.4	37.4	37.0	36.7	40.3	10.0	50.3
	4	42.1	47.3	38.5	47.0	46.6	45.6	44.9	42.6	41.2	39.2	38.9	38.6	42.1	10.0	52.1
	5	47.7	52.3	44.7	51.9	51.5	50.6	50.1	48.3	47.0	45.5	45.2	44.8	47.7	10.0	57.7
	6	44.4	49.4	41.4	48.9	48.4	47.4	46.8	44.9	43.7	42.2	41.9	41.5	44.4	10.0	54.4
Day	7	41.0	46.6	37.6	45.9	45.5	44.3	43.7	41.7	40.1	38.3	38.0	37.7	41.0	0.0	41.0
	8	41.3	47.5	37.1	47.1	46.6	45.3	44.4	41.9	40.2	37.9	37.6	37.2	41.3	0.0	41.3
	9	45.6	52.8	38.2	52.6	52.3	51.9	51.3	45.5	41.9	39.1	38.7	38.4	45.6	0.0	45.6
	10	42.3	47.5	38.7	46.9	46.3	45.2	44.6	43.0	41.5	39.7	39.3	38.9	42.3	0.0	42.3
	11	42.7	47.9	39.7	47.3	46.7	45.7	45.0	43.2	42.2	40.6	40.2	39.9	42.7	0.0	42.7
	12	42.8	48.4	38.9	47.9	47.4	46.4	45.7	43.5	41.8	39.7	39.4	39.0	42.8	0.0	42.8
	13	47.6	61.2	39.3	59.2	57.5	54.1	51.0	45.1	43.1	40.2	39.8	39.4	47.6	0.0	47.6
	14	43.0	48.1	39.0	47.7	47.3	46.4	45.8	43.9	42.2	40.0	39.6	39.2	43.0	0.0	43.0
	15	44.4	50.7	40.4	50.2	49.5	48.3	47.6	44.8	43.2	41.3	40.9	40.6	44.4	0.0	44.4
	16	48.7	59.4	42.9	57.7	56.1	53.1	51.8	48.8	46.9	44.1	43.5	43.1	48.7	0.0	48.7
	17	48.0	53.1	43.5	52.8	52.5	51.7	51.0	48.9	47.2	44.5	44.1	43.6	48.0	0.0	48.0
	18	49.2	54.0	44.5	53.7	53.4	52.6	52.1	50.2	48.4	45.8	45.3	44.7	49.2	0.0	49.2
	19	52.8	62.2	43.7	61.5	61.1	60.4	59.6	49.5	47.2	44.8	44.4	43.8	52.8	5.0	57.8
	20	46.4	52.3	41.9	51.7	51.0	50.0	49.3	47.3	45.4	43.0	42.6	42.1	46.4	5.0	51.4
	21	43.6	49.6	39.4	48.9	48.3	47.1	46.5	44.4	42.7	40.3	39.9	39.5	43.6	5.0	48.6
Night	22	41.3	45.7	37.6	45.4	45.1	44.3	43.7	42.1	40.6	38.6	38.1	37.7	41.3	10.0	51.3
	23	42.2	48.9	36.5	48.5	48.0	46.8	45.9	43.2	40.6	37.5	37.1	36.7	42.2	10.0	52.2

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	41.0	46.6	37.1	45.9	45.5	44.3	43.7	41.7	40.1	37.9	37.6	37.2
	Max	52.8	62.2	44.5	61.5	61.1	60.4	59.6	50.2	48.4	45.8	45.3	44.7
Energy Average		46.7	Average:		51.4	50.8	49.5	48.6	45.4	43.6	41.3	40.9	40.5
Night	Min	37.1	42.0	34.0	41.6	41.2	40.1	39.5	37.7	36.4	34.6	34.4	34.1
	Max	47.7	52.3	44.7	51.9	51.5	50.6	50.1	48.3	47.0	45.5	45.2	44.8
Energy Average		42.6	Average:		46.3	45.8	44.8	44.2	42.2	40.6	38.5	38.1	37.8

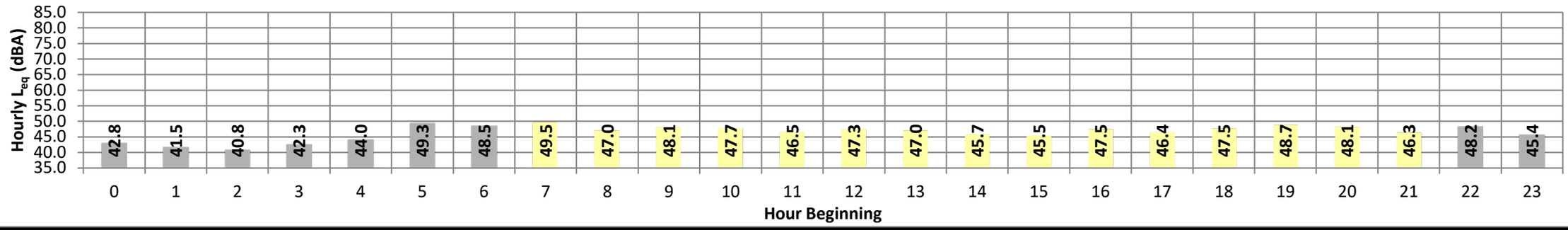
24-Hour	L_{eq} (dBA) Daytime (7am-10pm)	Nighttime (10pm-7am)
45.6	**46.7**	**42.6**

24-Hour Noise Level Measurement Summary

Date: Wednesday, June 30, 2021 *Location:* L4- West of the Project site on Brawnley Road near the RTC *Meter:* Piccolo II *JN:* 14145

Project: Phelan Community Park *Source:* Pure Water Filtration System at 9575 Malpaso Road. *Analyst:* A. Khan

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	42.8	49.1	38.4	48.8	48.4	47.3	46.6	43.6	40.8	39.2	38.9	38.6	42.8	10.0	52.8
	1	41.5	48.4	37.3	48.0	47.7	46.1	45.1	41.9	39.8	38.2	37.9	37.5	41.5	10.0	51.5
	2	40.8	47.1	35.9	46.7	46.2	45.2	44.5	41.5	39.7	36.7	36.4	36.0	40.8	10.0	50.8
	3	42.3	49.6	37.6	49.2	48.6	47.1	45.9	42.6	40.6	38.5	38.1	37.8	42.3	10.0	52.3
	4	44.0	50.1	40.9	49.6	48.8	47.4	46.5	44.6	43.0	41.5	41.3	41.0	44.0	10.0	54.0
	5	49.3	55.6	43.6	55.2	54.6	53.4	52.7	50.1	48.1	44.9	44.4	43.8	49.3	10.0	59.3
	6	48.5	55.5	42.9	54.9	54.2	52.7	51.9	49.5	47.1	43.9	43.5	43.0	48.5	10.0	58.5
Day	7	49.5	56.7	41.8	56.4	56.0	55.2	54.6	50.5	46.0	42.9	42.4	41.9	49.5	0.0	49.5
	8	47.0	53.5	42.4	53.1	52.6	51.4	50.6	47.6	45.6	43.3	42.9	42.5	47.0	0.0	47.0
	9	48.1	54.0	44.2	53.5	53.0	52.0	51.3	48.8	47.1	45.0	44.7	44.3	48.1	0.0	48.1
	10	47.7	55.9	43.3	55.2	54.3	52.2	51.1	47.9	45.9	44.0	43.8	43.4	47.7	0.0	47.7
	11	46.5	52.8	43.1	52.2	51.6	50.2	49.2	47.0	45.4	43.9	43.6	43.3	46.5	0.0	46.5
	12	47.3	53.8	44.2	53.4	52.8	51.4	50.1	47.5	46.2	44.8	44.6	44.3	47.3	0.0	47.3
	13	47.0	53.4	43.1	52.9	52.2	50.8	49.8	47.6	45.9	43.8	43.5	43.2	47.0	0.0	47.0
	14	45.7	52.7	41.5	52.1	51.5	49.9	49.0	46.3	44.5	42.2	41.9	41.6	45.7	0.0	45.7
	15	45.5	51.1	41.9	50.7	50.2	49.1	48.4	46.2	44.6	42.7	42.4	42.0	45.5	0.0	45.5
	16	47.5	54.4	42.3	53.8	53.4	52.1	51.1	48.0	46.0	43.4	43.0	42.5	47.5	0.0	47.5
	17	46.4	52.6	41.6	52.1	51.4	50.2	49.4	47.2	45.3	42.7	42.3	41.8	46.4	0.0	46.4
	18	47.5	54.6	42.2	54.2	53.6	52.3	51.5	48.0	45.9	43.3	42.8	42.3	47.5	0.0	47.5
	19	48.7	75.7	61.5	75.3	74.6	74.0	73.4	69.5	64.5	62.3	62.0	61.6	48.7	5.0	53.7
	20	48.1	77.6	65.1	77.5	76.9	76.4	75.8	71.1	69.1	65.8	65.6	65.2	48.1	5.0	53.1
	21	46.3	53.8	40.7	53.2	52.4	51.0	50.0	46.7	44.6	41.8	41.3	40.8	46.3	5.0	51.3
Night	22	48.2	56.0	40.7	55.8	55.4	54.5	53.7	48.4	44.9	41.6	41.2	40.9	48.2	10.0	58.2
	23	45.4	55.3	38.8	54.9	54.1	51.9	50.4	44.6	41.6	39.5	39.3	38.9	45.4	10.0	55.4

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	45.5	51.1	40.7	50.7	50.2	49.1	48.4	46.2	44.5	41.8	41.3	40.8
	Max	49.5	77.6	65.1	77.5	76.9	76.4	75.8	71.1	69.1	65.8	65.6	65.2
Energy Average		47.4	Average:		56.4	55.8	54.5	53.7	50.7	48.4	46.1	45.8	45.4
Night	Min	40.8	47.1	35.9	46.7	46.2	45.2	44.5	41.5	39.7	36.7	36.4	36.0
	Max	49.3	56.0	43.6	55.8	55.4	54.5	53.7	50.1	48.1	44.9	44.4	43.8
Energy Average		45.8	Average:		51.5	50.9	49.5	48.6	45.2	42.9	40.4	40.1	39.7

24-Hour	L_{eq} (dBA) Daytime (7am-10pm)	Nighttime (10pm-7am)
46.9	47.4	45.8

APPENDIX 7.1:

OFF-SITE TRAFFIC NOISE CONTOURS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Sheep Creek Rd.
Road Segment: n/o Phelan Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,360 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	836 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	70 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	52.0 feet
Centerline Dist. to Observer:	52.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	38.781
Medium Trucks:	38.553
Heavy Trucks:	38.575

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-2.22	1.55	-1.20	*-4.66*	0.000	0.000
Medium Trucks:	77.72	-19.46	1.59	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-23.41	1.59	-1.20	*-5.41*	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:	64.6	62.7	61.0	54.9	63.5	64.2
Medium Trucks:	58.6	57.1	50.8	49.2	57.7	57.9
Heavy Trucks:	60.0	58.5	49.5	50.8	59.1	59.2
Vehicle Noise:	66.7	64.9	61.7	57.1	65.6	66.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	27	57	124	266
CNEL:	29	61	132	285

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Sheep Creek Rd.
Road Segment: s/o Phelan Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,330 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	733 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	70 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	52.0 feet
Centerline Dist. to Observer:	52.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	38.781
Medium Trucks:	38.553
Heavy Trucks:	38.575

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-2.79	1.55	-1.20	*-4.66*	0.000	0.000
Medium Trucks:	77.72	-20.03	1.59	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-23.98	1.59	-1.20	*-5.41*	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:	64.1	62.2	60.4	54.4	63.0	63.6
Medium Trucks:	58.1	56.6	50.2	48.7	57.1	57.4
Heavy Trucks:	59.4	58.0	48.9	50.2	58.5	58.7
Vehicle Noise:	66.1	64.4	61.1	56.5	65.1	65.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	24	53	113	244
CNEL:	26	56	121	261

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Sheep Creek Rd.
Road Segment: n/o Nielson Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,870 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	687 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	70 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	52.0 feet
Centerline Dist. to Observer:	52.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	38.781
Medium Trucks:	38.553
Heavy Trucks:	38.575

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-3.07	1.55	-1.20	*-4.66*	0.000	0.000
Medium Trucks:	77.72	-20.31	1.59	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-24.26	1.59	-1.20	*-5.41*	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	61.9	60.1	54.1	62.7	63.3
Medium Trucks:	57.8	56.3	49.9	48.4	56.8	57.1
Heavy Trucks:	59.1	57.7	48.7	49.9	58.3	58.4
Vehicle Noise:	65.8	64.1	60.8	56.3	64.8	65.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	23	50	109	234
CNEL:	25	54	116	250

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Sheep Creek Rd.
Road Segment: s/o Nielson Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,310 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	731 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	70 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	52.0 feet
Centerline Dist. to Observer:	52.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	38.781
Medium Trucks:	38.553
Heavy Trucks:	38.575

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-2.80	1.55	-1.20	*-4.66*	0.000	0.000
Medium Trucks:	77.72	-20.04	1.59	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-23.99	1.59	-1.20	*-5.41*	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:	64.1	62.2	60.4	54.3	63.0	63.6
Medium Trucks:	58.1	56.6	50.2	48.7	57.1	57.3
Heavy Trucks:	59.4	58.0	48.9	50.2	58.5	58.7
Vehicle Noise:	66.1	64.4	61.1	56.5	65.1	65.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	24	52	113	244
CNEL:	26	56	121	261

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Phelan Rd.
Road Segment: w/o Sheep Creek Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,880	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,288	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	89	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	60.0	feet
Centerline Dist. to Observer:	60.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	40.556
Medium Trucks:	40.337
Heavy Trucks:	40.358

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	0.24	1.26	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	75.75	-17.00	1.30	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	81.57	-20.95	1.29	-1.20	*-5.34*	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:	64.6	62.7	60.9	54.9	63.5	64.1
Medium Trucks:	58.8	57.3	51.0	49.4	57.9	58.1
Heavy Trucks:	60.7	59.3	50.2	51.5	59.9	60.0
Vehicle Noise:	66.8	65.1	61.7	57.3	65.8	66.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	32	68	147	316
CNEL:	34	73	157	338

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Phelan Rd.
Road Segment: e/o Sheep Creek Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,950	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,395	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	89	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	60.0	feet
Centerline Dist. to Observer:	60.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	40.556
Medium Trucks:	40.337
Heavy Trucks:	40.358

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	0.59	1.26	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	75.75	-16.65	1.30	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	81.57	-20.61	1.29	-1.20	*-5.34*	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:	64.9	63.1	61.3	55.2	63.9	64.5
Medium Trucks:	59.2	57.7	51.3	49.8	58.2	58.5
Heavy Trucks:	61.1	59.6	50.6	51.8	60.2	60.3
Vehicle Noise:	67.2	65.5	62.0	57.6	66.2	66.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	33	72	155	333
CNEL:	36	77	165	356

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Warbler Rd.
Road Segment: e/o Sheep Creek Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	270 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	27 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	25.0 feet
Centerline Dist. to Observer:	25.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	22.494
Medium Trucks:	22.098
Heavy Trucks:	22.137

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-15.08	5.10	-1.20	*-4.41*	0.000	0.000
Medium Trucks:	70.80	-32.32	5.22	-1.20	*-4.85*	0.000	0.000
Heavy Trucks:	77.97	-36.28	5.20	-1.20	*-5.94*	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:	47.6	45.7	43.9	37.8	46.5	47.1
Medium Trucks:	42.5	41.0	34.6	33.1	41.5	41.8
Heavy Trucks:	45.7	44.3	35.2	36.5	44.8	45.0
Vehicle Noise:	50.5	48.8	44.9	41.0	49.5	49.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	1	2	5	11
CNEL:	1	2	5	11

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Nielson Rd.
Road Segment: w/o Sheep Creek Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,350 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	235 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	33 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	25.549
Medium Trucks:	25.200
Heavy Trucks:	25.235

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-5.69	4.27	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-22.93	4.36	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-26.88	4.35	-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:	56.1	54.2	52.5	46.4	55.0	55.6
Medium Trucks:	51.0	49.5	43.2	41.6	50.1	50.3
Heavy Trucks:	54.2	52.8	43.8	45.0	53.4	53.5
Vehicle Noise:	59.0	57.4	53.4	49.5	58.0	58.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	5	10	22	48
CNEL:	5	11	24	51

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Nielson Rd.
Road Segment: e/o Sheep Creek Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,230 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	323 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	33 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	25.549
Medium Trucks:	25.200
Heavy Trucks:	25.235

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-6.86	4.27	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	79.45	-24.10	4.36	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	84.25	-28.05	4.35	-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:	64.7	62.8	61.0	55.0	63.6	64.2
Medium Trucks:	58.5	57.0	50.6	49.1	57.6	57.8
Heavy Trucks:	59.4	57.9	48.9	50.1	58.5	58.6
Vehicle Noise:	66.5	64.8	61.6	57.0	65.5	66.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	15	32	70	151
CNEL:	16	35	75	161

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Sheep Creek Rd.
Road Segment: n/o Phelan Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,640 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	864 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	70 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	52.0 feet
Centerline Dist. to Observer:	52.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	38.781
Medium Trucks:	38.553
Heavy Trucks:	38.575

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-2.07	1.55	-1.20	*-4.66*	0.000	0.000
Medium Trucks:	77.72	-19.31	1.59	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-23.27	1.59	-1.20	*-5.41*	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	62.9	61.1	55.1	63.7	64.3
Medium Trucks:	58.8	57.3	50.9	49.4	57.8	58.1
Heavy Trucks:	60.1	58.7	49.7	50.9	59.3	59.4
Vehicle Noise:	66.8	65.1	61.8	57.3	65.8	66.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	27	59	126	272
CNEL:	29	63	135	292

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Sheep Creek Rd.
Road Segment: s/o Phelan Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,110 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	811 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	70 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	52.0 feet
Centerline Dist. to Observer:	52.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	38.781
Medium Trucks:	38.553
Heavy Trucks:	38.575

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-2.35	1.55	-1.20	*-4.66*	0.000	0.000
Medium Trucks:	77.72	-19.59	1.59	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-23.54	1.59	-1.20	*-5.41*	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:	64.5	62.6	60.8	54.8	63.4	64.0
Medium Trucks:	58.5	57.0	50.6	49.1	57.6	57.8
Heavy Trucks:	59.8	58.4	49.4	50.6	59.0	59.1
Vehicle Noise:	66.5	64.8	61.5	57.0	65.5	66.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	26	56	121	261
CNEL:	28	60	130	280

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Sheep Creek Rd.
Road Segment: n/o Nielson Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,520 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	752 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	70 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	52.0 feet
Centerline Dist. to Observer:	52.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	38.781
Medium Trucks:	38.553
Heavy Trucks:	38.575

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-2.68	1.55	-1.20	*-4.66*	0.000	0.000
Medium Trucks:	77.72	-19.92	1.59	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-23.87	1.59	-1.20	*-5.41*	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:	64.2	62.3	60.5	54.5	63.1	63.7
Medium Trucks:	58.2	56.7	50.3	48.8	57.2	57.5
Heavy Trucks:	59.5	58.1	49.1	50.3	58.7	58.8
Vehicle Noise:	66.2	64.5	61.2	56.6	65.2	65.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	25	53	115	248
CNEL:	27	57	123	266

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Sheep Creek Rd.
Road Segment: s/o Nielson Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,460 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	746 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	70 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	52.0 feet
Centerline Dist. to Observer:	52.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	38.781
Medium Trucks:	38.553
Heavy Trucks:	38.575

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-2.71	1.55	-1.20	*-4.66*	0.000	0.000
Medium Trucks:	77.72	-19.95	1.59	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-23.91	1.59	-1.20	*-5.41*	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:	64.2	62.3	60.5	54.4	63.1	63.7
Medium Trucks:	58.2	56.6	50.3	48.7	57.2	57.4
Heavy Trucks:	59.5	58.1	49.0	50.3	58.6	58.7
Vehicle Noise:	66.2	64.4	61.2	56.6	65.1	65.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	25	53	115	247
CNEL:	26	57	123	264

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Phelan Rd.
Road Segment: w/o Sheep Creek Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,100 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,310 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	89 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	60.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	40.556
Medium Trucks:	40.337
Heavy Trucks:	40.358

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	0.31	1.26	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	75.75	-16.93	1.30	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	81.57	-20.88	1.29	-1.20	*-5.34*	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:	64.7	62.8	61.0	55.0	63.6	64.2
Medium Trucks:	58.9	57.4	51.1	49.5	58.0	58.2
Heavy Trucks:	60.8	59.4	50.3	51.6	59.9	60.1
Vehicle Noise:	66.9	65.2	61.8	57.4	65.9	66.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	32	69	148	320
CNEL:	34	74	158	341

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Phelan Rd.
Road Segment: e/o Sheep Creek Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,230 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,423 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	89 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	60.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	40.556
Medium Trucks:	40.337
Heavy Trucks:	40.358

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	0.67	1.26	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	75.75	-16.57	1.30	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	81.57	-20.52	1.29	-1.20	*-5.34*	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:	65.0	63.1	61.4	55.3	63.9	64.5
Medium Trucks:	59.3	57.8	51.4	49.9	58.3	58.6
Heavy Trucks:	61.1	59.7	50.7	51.9	60.3	60.4
Vehicle Noise:	67.3	65.6	62.1	57.7	66.3	66.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	34	73	157	338
CNEL:	36	78	167	361

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Warbler Rd.
Road Segment: e/o Sheep Creek Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,200 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	120 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	25.0 feet
Centerline Dist. to Observer:	25.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	22.494
Medium Trucks:	22.098
Heavy Trucks:	22.137

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-8.61	5.10	-1.20	*-4.41*	0.000	0.000
Medium Trucks:	70.80	-25.84	5.22	-1.20	*-4.85*	0.000	0.000
Heavy Trucks:	77.97	-29.80	5.20	-1.20	*-5.94*	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:	54.0	52.1	50.4	44.3	52.9	53.5
Medium Trucks:	49.0	47.5	41.1	39.6	48.0	48.2
Heavy Trucks:	52.2	50.8	41.7	43.0	51.3	51.5
Vehicle Noise:	57.0	55.3	51.3	47.5	56.0	56.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	3	6	13	29
CNEL:	3	7	14	31

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Nielson Rd.
Road Segment: w/o Sheep Creek Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,630 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	263 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	33 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	25.549
Medium Trucks:	25.200
Heavy Trucks:	25.235

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-5.20	4.27	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-22.44	4.36	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-26.39	4.35	-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:	56.6	54.7	52.9	46.9	55.5	56.1
Medium Trucks:	51.5	50.0	43.6	42.1	50.6	50.8
Heavy Trucks:	54.7	53.3	44.3	45.5	53.9	54.0
Vehicle Noise:	59.5	57.9	53.9	50.0	58.5	58.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	5	11	24	52
CNEL:	5	12	25	55

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+P
Road Name: Nielson Rd.
Road Segment: e/o Sheep Creek Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,450 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	345 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	33 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	25.549
Medium Trucks:	25.200
Heavy Trucks:	25.235

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-6.57	4.27	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	79.45	-23.81	4.36	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	84.25	-27.77	4.35	-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:	65.0	63.1	61.3	55.2	63.9	64.5
Medium Trucks:	58.8	57.3	50.9	49.4	57.8	58.1
Heavy Trucks:	59.6	58.2	49.2	50.4	58.8	58.9
Vehicle Noise:	66.8	65.1	61.9	57.3	65.8	66.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	16	34	73	157
CNEL:	17	36	78	169

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY(2027)
Road Name: Sheep Creek Rd.
Road Segment: n/o Phelan Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,130 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,013 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	70 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	52.0 feet
Centerline Dist. to Observer:	52.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	38.781
Medium Trucks:	38.553
Heavy Trucks:	38.575

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-1.38	1.55	-1.20	*-4.66*	0.000	0.000
Medium Trucks:	77.72	-18.62	1.59	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-22.58	1.59	-1.20	*-5.41*	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:	65.5	63.6	61.8	55.8	64.4	65.0
Medium Trucks:	59.5	58.0	51.6	50.1	58.5	58.8
Heavy Trucks:	60.8	59.4	50.3	51.6	60.0	60.1
Vehicle Noise:	67.5	65.8	62.5	57.9	66.5	66.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	30	65	141	303
CNEL:	32	70	150	324

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY(2027)
Road Name: Sheep Creek Rd.
Road Segment: s/o Phelan Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,700 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	970 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	70 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	52.0 feet
Centerline Dist. to Observer:	52.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	38.781
Medium Trucks:	38.553
Heavy Trucks:	38.575

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-1.57	1.55	-1.20	*-4.66*	0.000	0.000
Medium Trucks:	77.72	-18.81	1.59	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-22.77	1.59	-1.20	*-5.41*	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:	65.3	63.4	61.6	55.6	64.2	64.8
Medium Trucks:	59.3	57.8	51.4	49.9	58.3	58.6
Heavy Trucks:	60.6	59.2	50.2	51.4	59.8	59.9
Vehicle Noise:	67.3	65.6	62.3	57.8	66.3	66.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	29	63	137	294
CNEL:	31	68	146	315

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY(2027)
Road Name: Sheep Creek Rd.
Road Segment: n/o Nielson Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,880 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	888 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	70 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	52.0 feet
Centerline Dist. to Observer:	52.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	38.781
Medium Trucks:	38.553
Heavy Trucks:	38.575

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-1.96	1.55	-1.20	*-4.66*	0.000	0.000
Medium Trucks:	77.72	-19.19	1.59	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-23.15	1.59	-1.20	*-5.41*	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:	64.9	63.0	61.2	55.2	63.8	64.4
Medium Trucks:	58.9	57.4	51.0	49.5	58.0	58.2
Heavy Trucks:	60.2	58.8	49.8	51.0	59.4	59.5
Vehicle Noise:	66.9	65.2	61.9	57.4	65.9	66.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	28	60	129	277
CNEL:	30	64	138	297

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY(2027)
Road Name: Sheep Creek Rd.
Road Segment: s/o Nielson Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,740 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	874 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	70 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	52.0 feet
Centerline Dist. to Observer:	52.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	38.781
Medium Trucks:	38.553
Heavy Trucks:	38.575

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-2.02	1.55	-1.20	*-4.66*	0.000	0.000
Medium Trucks:	77.72	-19.26	1.59	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-23.22	1.59	-1.20	*-5.41*	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	62.9	61.2	55.1	63.7	64.3
Medium Trucks:	58.8	57.3	51.0	49.4	57.9	58.1
Heavy Trucks:	60.2	58.7	49.7	51.0	59.3	59.4
Vehicle Noise:	66.9	65.1	61.8	57.3	65.8	66.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	27	59	127	274
CNEL:	29	63	136	294

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY(2027)
Road Name: Phelan Rd.
Road Segment: w/o Sheep Creek Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,720	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,572	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	89	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	60.0	feet
Centerline Dist. to Observer:	60.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	40.556
Medium Trucks:	40.337
Heavy Trucks:	40.358

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	1.10	1.26	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	75.75	-16.13	1.30	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	81.57	-20.09	1.29	-1.20	*-5.34*	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:	65.5	63.6	61.8	55.7	64.4	65.0
Medium Trucks:	59.7	58.2	51.8	50.3	58.8	59.0
Heavy Trucks:	61.6	60.1	51.1	52.4	60.7	60.8
Vehicle Noise:	67.7	66.0	62.5	58.2	66.7	67.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	36	78	168	361
CNEL:	39	83	179	386

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY(2027)
Road Name: Phelan Rd.
Road Segment: e/o Sheep Creek Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,490	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,749	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	89	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	60.0	feet
Centerline Dist. to Observer:	60.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	40.556
Medium Trucks:	40.337
Heavy Trucks:	40.358

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	1.57	1.26	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	75.75	-15.67	1.30	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	81.57	-19.63	1.29	-1.20	*-5.34*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.9	64.0	62.3	56.2	64.8	65.4
Medium Trucks:	60.2	58.7	52.3	50.8	59.2	59.5
Heavy Trucks:	62.0	60.6	51.6	52.8	61.2	61.3
Vehicle Noise:	68.2	66.5	63.0	58.6	67.2	67.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	39	84	180	388
CNEL:	41	89	192	414

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY(2027)
Road Name: Warbler Rd.
Road Segment: e/o Sheep Creek Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	360 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	36 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	25.0 feet
Centerline Dist. to Observer:	25.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	22.494
Medium Trucks:	22.098
Heavy Trucks:	22.137

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-13.84	5.10	-1.20	*-4.41*	0.000	0.000
Medium Trucks:	70.80	-31.07	5.22	-1.20	*-4.85*	0.000	0.000
Heavy Trucks:	77.97	-35.03	5.20	-1.20	*-5.94*	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:	48.8	46.9	45.1	39.1	47.7	48.3
Medium Trucks:	43.7	42.2	35.9	34.3	42.8	43.0
Heavy Trucks:	46.9	45.5	36.5	37.7	46.1	46.2
Vehicle Noise:	51.7	50.1	46.1	42.2	50.7	51.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	1	3	6	13
CNEL:	1	3	6	14

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY(2027)
Road Name: Nielson Rd.
Road Segment: w/o Sheep Creek Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,300 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	330 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	33 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	25.549
Medium Trucks:	25.200
Heavy Trucks:	25.235

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-4.21	4.27	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-21.45	4.36	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-25.41	4.35	-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:	57.6	55.7	53.9	47.9	56.5	57.1
Medium Trucks:	52.5	51.0	44.6	43.1	51.6	51.8
Heavy Trucks:	55.7	54.3	45.3	46.5	54.9	55.0
Vehicle Noise:	60.5	58.8	54.9	51.0	59.5	59.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	6	13	28	60
CNEL:	6	14	30	64

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY(2027)
Road Name: Nielson Rd.
Road Segment: e/o Sheep Creek Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,020 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	402 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	33 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	25.549
Medium Trucks:	25.200
Heavy Trucks:	25.235

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-5.91	4.27	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	79.45	-23.15	4.36	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	84.25	-27.10	4.35	-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:	65.6	63.7	62.0	55.9	64.5	65.1
Medium Trucks:	59.5	58.0	51.6	50.0	58.5	58.7
Heavy Trucks:	60.3	58.9	49.8	51.1	59.4	59.6
Vehicle Noise:	67.5	65.7	62.6	57.9	66.5	66.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	17	38	81	174
CNEL:	19	40	87	187

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY+P(2027)
Road Name: Sheep Creek Rd.
Road Segment: n/o Phelan Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,410 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,041 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	70 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	52.0 feet
Centerline Dist. to Observer:	52.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	38.781
Medium Trucks:	38.553
Heavy Trucks:	38.575

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-1.26	1.55	-1.20	*-4.66*	0.000	0.000
Medium Trucks:	77.72	-18.50	1.59	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-22.46	1.59	-1.20	*-5.41*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.6	63.7	61.9	55.9	64.5	65.1
Medium Trucks:	59.6	58.1	51.7	50.2	58.6	58.9
Heavy Trucks:	60.9	59.5	50.5	51.7	60.1	60.2
Vehicle Noise:	67.6	65.9	62.6	58.1	66.6	67.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	31	66	143	308
CNEL:	33	71	153	330

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY+P(2027)
Road Name: Sheep Creek Rd.
Road Segment: s/o Phelan Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,480	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,048	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	70	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	52.0	feet
Centerline Dist. to Observer:	52.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	38.781
Medium Trucks:	38.553
Heavy Trucks:	38.575

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-1.24	1.55	-1.20	*-4.66*	0.000	0.000
Medium Trucks:	77.72	-18.47	1.59	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-22.43	1.59	-1.20	*-5.41*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.6	63.7	62.0	55.9	64.5	65.1
Medium Trucks:	59.6	58.1	51.8	50.2	58.7	58.9
Heavy Trucks:	61.0	59.5	50.5	51.7	60.1	60.2
Vehicle Noise:	67.6	65.9	62.6	58.1	66.6	67.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	31	67	144	310
CNEL:	33	71	154	332

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY+P(2027)
Road Name: Sheep Creek Rd.
Road Segment: n/o Nielson Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,530 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	953 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	70 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	52.0 feet
Centerline Dist. to Observer:	52.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	38.781
Medium Trucks:	38.553
Heavy Trucks:	38.575

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-1.65	1.55	-1.20	*-4.66*	0.000	0.000
Medium Trucks:	77.72	-18.89	1.59	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-22.84	1.59	-1.20	*-5.41*	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	63.3	61.5	55.5	64.1	64.7
Medium Trucks:	59.2	57.7	51.3	49.8	58.3	58.5
Heavy Trucks:	60.5	59.1	50.1	51.3	59.7	59.8
Vehicle Noise:	67.2	65.5	62.2	57.7	66.2	66.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	29	63	135	291
CNEL:	31	67	144	311

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY+P(2027)
Road Name: Sheep Creek Rd.
Road Segment: s/o Nielson Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,890 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	889 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	70 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	52.0 feet
Centerline Dist. to Observer:	52.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	38.781
Medium Trucks:	38.553
Heavy Trucks:	38.575

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-1.95	1.55	-1.20	*-4.66*	0.000	0.000
Medium Trucks:	77.72	-19.19	1.59	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-23.14	1.59	-1.20	*-5.41*	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:	64.9	63.0	61.2	55.2	63.8	64.4
Medium Trucks:	58.9	57.4	51.0	49.5	58.0	58.2
Heavy Trucks:	60.2	58.8	49.8	51.0	59.4	59.5
Vehicle Noise:	66.9	65.2	61.9	57.4	65.9	66.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	28	60	129	278
CNEL:	30	64	138	297

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY+P(2027) *Project Name:* Phelan Community Park
Road Name: Phelan Rd. *Job Number:* 14145
Road Segment: w/o Sheep Creek Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,940	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,594	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	89	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	60.0	feet
Centerline Dist. to Observer:	60.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	40.556
Medium Trucks:	40.337
Heavy Trucks:	40.358

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	1.17	1.26	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	75.75	-16.07	1.30	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	81.57	-20.03	1.29	-1.20	*-5.34*	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:	65.5	63.6	61.9	55.8	64.4	65.0
Medium Trucks:	59.8	58.3	51.9	50.4	58.8	59.1
Heavy Trucks:	61.6	60.2	51.2	52.4	60.8	60.9
Vehicle Noise:	67.8	66.0	62.6	58.2	66.8	67.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	36	78	169	364
CNEL:	39	84	181	389

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY+P(2027)
Road Name: Phelan Rd.
Road Segment: e/o Sheep Creek Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,770 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,777 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	89 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	60.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	40.556
Medium Trucks:	40.337
Heavy Trucks:	40.358

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	1.64	1.26	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	75.75	-15.60	1.30	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	81.57	-19.56	1.29	-1.20	*-5.34*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.0	64.1	62.3	56.3	64.9	65.5
Medium Trucks:	60.2	58.7	52.4	50.8	59.3	59.5
Heavy Trucks:	62.1	60.7	51.6	52.9	61.2	61.4
Vehicle Noise:	68.2	66.5	63.1	58.7	67.2	67.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	39	84	182	392
CNEL:	42	90	194	418

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY+P(2027)
Road Name: Warbler Rd.
Road Segment: e/o Sheep Creek Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,290 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	129 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	25.0 feet
Centerline Dist. to Observer:	25.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	22.494
Medium Trucks:	22.098
Heavy Trucks:	22.137

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-8.29	5.10	-1.20	*-4.41*	0.000	0.000
Medium Trucks:	70.80	-25.53	5.22	-1.20	*-4.85*	0.000	0.000
Heavy Trucks:	77.97	-29.49	5.20	-1.20	*-5.94*	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:	54.3	52.4	50.7	44.6	53.2	53.9
Medium Trucks:	49.3	47.8	41.4	39.9	48.3	48.6
Heavy Trucks:	52.5	51.1	42.0	43.3	51.6	51.8
Vehicle Noise:	57.3	55.6	51.7	47.8	56.3	56.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	3	7	14	30
CNEL:	3	7	15	32

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY+P(2027)
Road Name: Nielson Rd.
Road Segment: w/o Sheep Creek Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,580 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	358 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	33 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	25.549
Medium Trucks:	25.200
Heavy Trucks:	25.235

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-3.86	4.27	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-21.10	4.36	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-25.05	4.35	-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:	57.9	56.0	54.3	48.2	56.8	57.5
Medium Trucks:	52.9	51.3	45.0	43.4	51.9	52.1
Heavy Trucks:	56.1	54.6	45.6	46.9	55.2	55.3
Vehicle Noise:	60.9	59.2	55.3	51.4	59.9	60.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	6	14	29	63
CNEL:	7	14	31	67

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY+P(2027)
Road Name: Nielson Rd.
Road Segment: e/o Sheep Creek Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,240 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	424 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	33 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	25.549
Medium Trucks:	25.200
Heavy Trucks:	25.235

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-5.68	4.27	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	79.45	-22.92	4.36	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	84.25	-26.87	4.35	-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:	65.9	64.0	62.2	56.1	64.8	65.4
Medium Trucks:	59.7	58.2	51.8	50.3	58.7	59.0
Heavy Trucks:	60.5	59.1	50.1	51.3	59.7	59.8
Vehicle Noise:	67.7	66.0	62.8	58.1	66.7	67.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	18	39	84	180
CNEL:	19	42	90	194

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: General Plan Buildout (2040)
Road Name: Sheep Creek Rd.
Road Segment: n/o Phelan Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,790 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,079 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	70 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	52.0 feet
Centerline Dist. to Observer:	52.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	38.781
Medium Trucks:	38.553
Heavy Trucks:	38.575

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-1.11	1.55	-1.20	*-4.66*	0.000	0.000
Medium Trucks:	77.72	-18.35	1.59	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-22.30	1.59	-1.20	*-5.41*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.8	63.9	62.1	56.0	64.7	65.3
Medium Trucks:	59.8	58.3	51.9	50.3	58.8	59.0
Heavy Trucks:	61.1	59.7	50.6	51.9	60.2	60.4
Vehicle Noise:	67.8	66.0	62.8	58.2	66.8	67.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	32	68	147	316
CNEL:	34	73	157	338

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: General Plan Buildout (2040)
Road Name: Sheep Creek Rd.
Road Segment: s/o Phelan Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,400 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,040 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	70 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	52.0 feet
Centerline Dist. to Observer:	52.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	38.781
Medium Trucks:	38.553
Heavy Trucks:	38.575

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-1.27	1.55	-1.20	*-4.66*	0.000	0.000
Medium Trucks:	77.72	-18.51	1.59	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-22.46	1.59	-1.20	*-5.41*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.6	63.7	61.9	55.9	64.5	65.1
Medium Trucks:	59.6	58.1	51.7	50.2	58.6	58.9
Heavy Trucks:	60.9	59.5	50.5	51.7	60.1	60.2
Vehicle Noise:	67.6	65.9	62.6	58.1	66.6	67.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	31	66	143	308
CNEL:	33	71	153	330

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: General Plan Buildout (2040) *Project Name:* Phelan Community Park
Road Name: Sheep Creek Rd. *Job Number:* 14145
Road Segment: n/o Nielson Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,750 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	975 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	70 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	52.0 feet
Centerline Dist. to Observer:	52.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	38.781
Medium Trucks:	38.553
Heavy Trucks:	38.575

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-1.55	1.55	-1.20	*-4.66*	0.000	0.000
Medium Trucks:	77.72	-18.79	1.59	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-22.74	1.59	-1.20	*-5.41*	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:	65.3	63.4	61.6	55.6	64.2	64.8
Medium Trucks:	59.3	57.8	51.4	49.9	58.4	58.6
Heavy Trucks:	60.6	59.2	50.2	51.4	59.8	59.9
Vehicle Noise:	67.3	65.6	62.3	57.8	66.3	66.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	30	64	137	295
CNEL:	32	68	147	316

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: General Plan Buildout (2040)
Road Name: Sheep Creek Rd.
Road Segment: s/o Nielson Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,650 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	965 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	70 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	52.0 feet
Centerline Dist. to Observer:	52.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	38.781
Medium Trucks:	38.553
Heavy Trucks:	38.575

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-1.59	1.55	-1.20	*-4.66*	0.000	0.000
Medium Trucks:	77.72	-18.83	1.59	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-22.79	1.59	-1.20	*-5.41*	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:	65.3	63.4	61.6	55.5	64.2	64.8
Medium Trucks:	59.3	57.8	51.4	49.9	58.3	58.6
Heavy Trucks:	60.6	59.2	50.1	51.4	59.7	59.9
Vehicle Noise:	67.3	65.6	62.3	57.7	66.3	66.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	29	63	136	293
CNEL:	31	68	146	314

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: General Plan Buildout (2040) *Project Name:* Phelan Community Park
Road Name: Phelan Rd. *Job Number:* 14145
Road Segment: w/o Sheep Creek Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,070 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,607 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	89 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	60.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	40.556
Medium Trucks:	40.337
Heavy Trucks:	40.358

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	1.20	1.26	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	75.75	-16.04	1.30	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	81.57	-19.99	1.29	-1.20	*-5.34*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.6	63.7	61.9	55.8	64.5	65.1
Medium Trucks:	59.8	58.3	51.9	50.4	58.9	59.1
Heavy Trucks:	61.7	60.2	51.2	52.5	60.8	60.9
Vehicle Noise:	67.8	66.1	62.6	58.3	66.8	67.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	37	79	170	366
CNEL:	39	84	182	391

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: General Plan Buildout (2040)
Road Name: Phelan Rd.
Road Segment: e/o Sheep Creek Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,840 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,784 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	89 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	60.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	40.556
Medium Trucks:	40.337
Heavy Trucks:	40.358

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	1.65	1.26	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	75.75	-15.58	1.30	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	81.57	-19.54	1.29	-1.20	*-5.34*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.0	64.1	62.4	56.3	64.9	65.5
Medium Trucks:	60.3	58.8	52.4	50.8	59.3	59.5
Heavy Trucks:	62.1	60.7	51.7	52.9	61.3	61.4
Vehicle Noise:	68.3	66.5	63.1	58.7	67.2	67.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	39	85	182	393
CNEL:	42	90	195	420

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: General Plan Buildout (2040) | *Project Name:* Phelan Community Park
Road Name: Warbler Rd. | *Job Number:* 14145
Road Segment: e/o Sheep Creek Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	360 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	36 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	25.0 feet
Centerline Dist. to Observer:	25.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	22.494
Medium Trucks:	22.098
Heavy Trucks:	22.137

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-13.84	5.10	-1.20	*-4.41*	0.000	0.000
Medium Trucks:	70.80	-31.07	5.22	-1.20	*-4.85*	0.000	0.000
Heavy Trucks:	77.97	-35.03	5.20	-1.20	*-5.94*	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:	48.8	46.9	45.1	39.1	47.7	48.3
Medium Trucks:	43.7	42.2	35.9	34.3	42.8	43.0
Heavy Trucks:	46.9	45.5	36.5	37.7	46.1	46.2
Vehicle Noise:	51.7	50.1	46.1	42.2	50.7	51.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	1	3	6	13
CNEL:	1	3	6	14

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: General Plan Buildout (2040) *Project Name:* Phelan Community Park
Road Name: Nielson Rd. *Job Number:* 14145
Road Segment: w/o Sheep Creek Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,460 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	346 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	33 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	25.549
Medium Trucks:	25.200
Heavy Trucks:	25.235

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-4.01	4.27	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-21.25	4.36	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-25.20	4.35	-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:	57.8	55.9	54.1	48.1	56.7	57.3
Medium Trucks:	52.7	51.2	44.8	43.3	51.8	52.0
Heavy Trucks:	55.9	54.5	45.5	46.7	55.1	55.2
Vehicle Noise:	60.7	59.0	55.1	51.2	59.7	60.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	6	13	29	62
CNEL:	7	14	31	66

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: General Plan Buildout (2040) *Project Name:* Phelan Community Park
Road Name: Nielson Rd. *Job Number:* 14145
Road Segment: e/o Sheep Creek Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,100 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	410 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	33 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	25.549
Medium Trucks:	25.200
Heavy Trucks:	25.235

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-5.82	4.27	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	79.45	-23.06	4.36	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	84.25	-27.02	4.35	-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:	65.7	63.8	62.0	56.0	64.6	65.2
Medium Trucks:	59.5	58.0	51.7	50.1	58.6	58.8
Heavy Trucks:	60.4	59.0	49.9	51.2	59.5	59.7
Vehicle Noise:	67.6	65.8	62.7	58.0	66.5	67.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	18	38	82	176
CNEL:	19	41	88	189

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: General Plan Buildout +P (2040)
Road Name: Sheep Creek Rd.
Road Segment: n/o Phelan Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,070 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,107 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	70 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	52.0 feet
Centerline Dist. to Observer:	52.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	38.781
Medium Trucks:	38.553
Heavy Trucks:	38.575

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-1.00	1.55	-1.20	*-4.66*	0.000	0.000
Medium Trucks:	77.72	-18.24	1.59	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-22.19	1.59	-1.20	*-5.41*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.9	64.0	62.2	56.1	64.8	65.4
Medium Trucks:	59.9	58.4	52.0	50.5	58.9	59.1
Heavy Trucks:	61.2	59.8	50.7	52.0	60.3	60.5
Vehicle Noise:	67.9	66.2	62.9	58.3	66.9	67.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	32	69	149	321
CNEL:	34	74	160	344

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: General Plan Buildout +P (2040)
Road Name: Sheep Creek Rd.
Road Segment: s/o Phelan Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,180 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,118 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	70 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	52.0 feet
Centerline Dist. to Observer:	52.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	38.781
Medium Trucks:	38.553
Heavy Trucks:	38.575

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-0.96	1.55	-1.20	*-4.66*	0.000	0.000
Medium Trucks:	77.72	-18.19	1.59	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-22.15	1.59	-1.20	*-5.41*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.9	64.0	62.2	56.2	64.8	65.4
Medium Trucks:	59.9	58.4	52.0	50.5	59.0	59.2
Heavy Trucks:	61.2	59.8	50.8	52.0	60.4	60.5
Vehicle Noise:	67.9	66.2	62.9	58.4	66.9	67.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	32	70	150	323
CNEL:	35	75	161	346

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: General Plan Buildout +P (2040)
Road Name: Sheep Creek Rd.
Road Segment: n/o Nielson Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,400 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,040 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	70 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	52.0 feet
Centerline Dist. to Observer:	52.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	38.781
Medium Trucks:	38.553
Heavy Trucks:	38.575

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-1.27	1.55	-1.20	*-4.66*	0.000	0.000
Medium Trucks:	77.72	-18.51	1.59	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-22.46	1.59	-1.20	*-5.41*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.6	63.7	61.9	55.9	64.5	65.1
Medium Trucks:	59.6	58.1	51.7	50.2	58.6	58.9
Heavy Trucks:	60.9	59.5	50.5	51.7	60.1	60.2
Vehicle Noise:	67.6	65.9	62.6	58.1	66.6	67.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	31	66	143	308
CNEL:	33	71	153	330

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: General Plan Buildout +P (2040)
Road Name: Sheep Creek Rd.
Road Segment: s/o Nielson Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,800 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	980 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	70 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	52.0 feet
Centerline Dist. to Observer:	52.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	38.781
Medium Trucks:	38.553
Heavy Trucks:	38.575

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-1.53	1.55	-1.20	*-4.66*	0.000	0.000
Medium Trucks:	77.72	-18.77	1.59	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-22.72	1.59	-1.20	*-5.41*	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:	65.3	63.4	61.7	55.6	64.2	64.8
Medium Trucks:	59.3	57.8	51.5	49.9	58.4	58.6
Heavy Trucks:	60.7	59.2	50.2	51.5	59.8	59.9
Vehicle Noise:	67.4	65.6	62.3	57.8	66.3	66.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	30	64	138	296
CNEL:	32	68	147	317

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: General Plan Buildout +P (2040) *Project Name:* Phelan Community Park
Road Name: Phelan Rd. *Job Number:* 14145
Road Segment: w/o Sheep Creek Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,290 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,629 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	89 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	60.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	40.556
Medium Trucks:	40.337
Heavy Trucks:	40.358

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	1.26	1.26	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	75.75	-15.98	1.30	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	81.57	-19.93	1.29	-1.20	*-5.34*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.6	63.7	62.0	55.9	64.5	65.1
Medium Trucks:	59.9	58.4	52.0	50.5	58.9	59.1
Heavy Trucks:	61.7	60.3	51.3	52.5	60.9	61.0
Vehicle Noise:	67.9	66.1	62.7	58.3	66.8	67.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	37	80	172	370
CNEL:	39	85	183	395

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: General Plan Buildout +P (2040) *Project Name:* Phelan Community Park
Road Name: Phelan Rd. *Job Number:* 14145
Road Segment: e/o Sheep Creek Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,120 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,812 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	89 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	60.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	40.556
Medium Trucks:	40.337
Heavy Trucks:	40.358

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	1.72	1.26	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	75.75	-15.52	1.30	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	81.57	-19.47	1.29	-1.20	*-5.34*	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	64.2	62.4	56.4	65.0	65.6
Medium Trucks:	60.3	58.8	52.5	50.9	59.4	59.6
Heavy Trucks:	62.2	60.8	51.7	53.0	61.3	61.5
Vehicle Noise:	68.3	66.6	63.2	58.8	67.3	67.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	40	85	184	397
CNEL:	42	91	197	424

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: General Plan Buildout +P (2040)
Road Name: Warbler Rd.
Road Segment: e/o Sheep Creek Rd.

Project Name: Phelan Community Park
Job Number: 14145

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,290 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	129 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	25.0 feet
Centerline Dist. to Observer:	25.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	22.494
Medium Trucks:	22.098
Heavy Trucks:	22.137

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-8.29	5.10	-1.20	*-4.41*	0.000	0.000
Medium Trucks:	70.80	-25.53	5.22	-1.20	*-4.85*	0.000	0.000
Heavy Trucks:	77.97	-29.49	5.20	-1.20	*-5.94*	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:	54.3	52.4	50.7	44.6	53.2	53.9
Medium Trucks:	49.3	47.8	41.4	39.9	48.3	48.6
Heavy Trucks:	52.5	51.1	42.0	43.3	51.6	51.8
Vehicle Noise:	57.3	55.6	51.7	47.8	56.3	56.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	3	7	14	30
CNEL:	3	7	15	32

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: General Plan Buildout +P (2040) *Project Name:* Phelan Community Park
Road Name: Nielson Rd. *Job Number:* 14145
Road Segment: w/o Sheep Creek Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,740 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	374 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	33 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	25.549
Medium Trucks:	25.200
Heavy Trucks:	25.235

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-3.67	4.27	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-20.91	4.36	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-24.86	4.35	-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:	58.1	56.2	54.5	48.4	57.0	57.6
Medium Trucks:	53.0	51.5	45.2	43.6	52.1	52.3
Heavy Trucks:	56.3	54.8	45.8	47.1	55.4	55.5
Vehicle Noise:	61.1	59.4	55.5	51.6	60.1	60.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	7	14	30	65
CNEL:	7	15	32	69

Friday, April 7, 2023

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: General Plan Buildout +P (2040) *Project Name:* Phelan Community Park
Road Name: Nielson Rd. *Job Number:* 14145
Road Segment: e/o Sheep Creek Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,320 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	432 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	33 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

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

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	25.549
Medium Trucks:	25.200
Heavy Trucks:	25.235

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-5.60	4.27	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	79.45	-22.83	4.36	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	84.25	-26.79	4.35	-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:	65.9	64.0	62.3	56.2	64.8	65.4
Medium Trucks:	59.8	58.3	51.9	50.4	58.8	59.1
Heavy Trucks:	60.6	59.2	50.2	51.4	59.8	59.9
Vehicle Noise:	67.8	66.1	62.9	58.2	66.8	67.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	18	39	85	183
CNEL:	20	42	91	196

Friday, April 7, 2023

APPENDIX 9.1:

CADNAA OPERATIONAL NOISE MODEL INPUTS

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14145 - Phalen Community Park - Operation

CadnaA Noise Prediction Model: 14145-02_Operation.cna
Date: 07.04.23
Analyst: B. Maddux

Calculation Configuration

Configuration	
Parameter	**Value**
General	
Max. Error (dB)	**0.00**
Max. Search Radius (#(Unit,LEN))	**2000.01**
Min. Dist Src to Rcvr	**0.00**
Partition	
Raster Factor	**0.50**
Max. Length of Section (#(Unit,LEN))	**999.99**
Min. Length of Section (#(Unit,LEN))	**1.01**
Min. Length of Section (%)	**0.00**
Proj. Line Sources	**On**
Proj. Area Sources	**On**
Ref. Time	
Reference Time Day (min)	**960.00**
Reference Time Night (min)	**480.00**
Daytime Penalty (dB)	**0.00**
Recr. Time Penalty (dB)	**5.00**
Night-time Penalty (dB)	**10.00**
DTM	
Standard Height (m)	**0.00**
Model of Terrain	**Triangulation**
Reflection	
max. Order of Reflection	**2**
Search Radius Src	**100.00**
Search Radius Rcvr	**100.00**
Max. Distance Source - Rcvr	**1000.00 1000.00**
Min. Distance Rvcr - Reflector	**1.00 1.00**
Min. Distance Source - Reflector	**0.10**
Industrial (ISO 9613)	
Lateral Diffraction	**some Obj**
Obst. within Area Src do not shield	**On**
Screening	**Incl. Ground Att. over Barrier**
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	**3.0 20.0 0.0**
Temperature (#(Unit,TEMP))	**10**
rel. Humidity (%)	**70**
Ground Absorption G	**0.75**
Wind Speed for Dir. (#(Unit,SPEED))	**3.0**
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	52.3	-80.2	49.3	0.0	0.0	0.0		x	Total	5.00	r	6163256.79	2464556.91	5.00
R2		R2	53.4	-80.2	50.3	0.0	0.0	0.0		x	Total	5.00	r	6164114.38	2464229.35	5.00
R3		R3	52.9	-80.2	49.9	0.0	0.0	0.0		x	Total	5.00	r	6163490.28	2463474.31	5.00
R4		R4	39.4	-80.2	36.4	0.0	0.0	0.0		x	Total	5.00	r	6161645.73	2464413.14	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	88.8	88.8	88.8	Lw	88.8		900.00	0.00	0.00	17.00	a	6163798.28	2464016.74	17.00

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Operating Time			Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	(ft)	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)		
Sports Field2		Sport2	106.3	106.3	106.3	71.0	71.0	71.0	Lw	106.3		900.00	0.00	0.00	5	a
Sports Field		SPORT1	106.3	106.3	106.3	69.8	69.8	69.8	Lw	106.3		900.00	0.00	0.00	5	a
Equestrian1		Equestrian1	99.6	99.6	99.6	68.1	68.1	68.1	Lw	99.6		900.00	0.00	0.00	5	a
Dogpark2		Dogpark2	102.6	102.6	102.6	74.4	74.4	74.4	Lw"	74.4		900.00	0.00	0.00	5	a
Dogpark1		Dogpark1	104.4	104.4	104.4	74.4	74.4	74.4	Lw"	74.4		900.00	0.00	0.00	5	a
PARK1		PARK1	72.0	72.0	72.0	40.7	40.7	40.7	Lw	72		900.00	0.00	0.00	5	a
PARK2		PARK2	72.0	72.0	72.0	45.0	45.0	45.0	Lw	72		900.00	0.00	0.00	5	a

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Operating Time			Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	(ft)	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)		
PARK3		PARK3	72.0	72.0	72.0	40.3	40.3	40.3	Lw	72		900.00	0.00	0.00	5	a
PARK4		PARK4	72.0	72.0	72.0	41.7	41.7	41.7	Lw	72		900.00	0.00	0.00	5	a
PARK5		PARK5	72.0	72.0	72.0	48.1	48.1	48.1	Lw	72		900.00	0.00	0.00	5	a
PARK6		PARK6	72.0	72.0	72.0	41.4	41.4	41.4	Lw	72		900.00	0.00	0.00	5	a
SKATE1		SKATE1	105.5	105.5	105.5	72.0	72.0	72.0	Lw	105.5		900.00	0.00	0.00	5	a

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
Sports Field2	Sport2	5.00	a			6163817.76	2463866.46	5.00	0.00
						6164012.97	2463866.63	5.00	0.00
						6164017.74	2463697.04	5.00	0.00
						6163822.23	2463679.52	5.00	0.00
						6163803.84	2463700.67	5.00	0.00
Sports Field	SPORT1	5.00	a			6163515.60	2463909.09	5.00	0.00
						6163716.38	2463909.86	5.00	0.00
						6163713.67	2463668.16	5.00	0.00
						6163515.05	2463671.52	5.00	0.00
Equestrian1	Equestrian1	5.00	a			6163952.60	2464268.60	5.00	0.00
						6163963.06	2464168.56	5.00	0.00
						6163923.05	2464164.90	5.00	0.00
						6163921.50	2464175.35	5.00	0.00
						6163848.41	2464167.03	5.00	0.00
						6163849.13	2464158.34	5.00	0.00
						6163801.30	2464153.94	5.00	0.00
						6163791.65	2464250.49	5.00	0.00
Dogpark2	Dogpark2	5.00	a			6163621.00	2464443.50	5.00	0.00
						6163708.49	2464441.50	5.00	0.00
						6163706.07	2464359.74	5.00	0.00
						6163619.59	2464360.68	5.00	0.00
Dogpark1	Dogpark1	5.00	a			6163491.81	2464444.65	5.00	0.00
						6163621.00	2464443.50	5.00	0.00
						6163619.59	2464360.68	5.00	0.00
						6163490.41	2464362.35	5.00	0.00
PARK1	PARK1	5.00	a			6163479.02	2464458.93	5.00	0.00
						6163478.44	2464516.77	5.00	0.00
						6163723.83	2464516.26	5.00	0.00
						6163723.32	2464455.83	5.00	0.00
PARK2	PARK2	5.00	a			6163479.02	2464458.93	5.00	0.00
						6163477.29	2464264.62	5.00	0.00
						6163450.72	2464264.55	5.00	0.00
						6163449.84	2464458.38	5.00	0.00
PARK3	PARK3	5.00	a			6163480.00	2463624.78	5.00	0.00
						6163732.19	2463625.71	5.00	0.00
						6163732.80	2463600.70	5.00	0.00
						6163718.72	2463599.89	5.00	0.00
						6163718.04	2463559.27	5.00	0.00
						6163479.45	2463561.74	5.00	0.00
PARK4	PARK4	5.00	a			6163812.37	2463622.79	5.00	0.00
						6164004.14	2463624.76	5.00	0.00
						6164003.06	2463561.21	5.00	0.00
						6163822.28	2463561.67	5.00	0.00
						6163824.37	2463592.89	5.00	0.00
						6163810.83	2463593.12	5.00	0.00
PARK5	PARK5	5.00	a			6163467.73	2463822.97	5.00	0.00
						6163466.71	2463701.07	5.00	0.00
						6163445.86	2463700.90	5.00	0.00
						6163445.86	2463823.86	5.00	0.00
PARK6	PARK6	5.00	a			6163805.23	2464413.39	5.00	0.00
						6163880.16	2464428.18	5.00	0.00
						6163921.41	2464377.55	5.00	0.00
						6163923.16	2464352.34	5.00	0.00
						6163902.23	2464295.82	5.00	0.00
						6163794.92	2464291.99	5.00	0.00
						6163822.88	2464353.17	5.00	0.00
						6163820.41	2464387.08	5.00	0.00
SKATE1	SKATE1	5.00	a			6163505.28	2464323.40	5.00	0.00
						6163701.09	2464325.84	5.00	0.00
						6163712.47	2464294.97	5.00	0.00
						6163702.72	2464230.78	5.00	0.00
						6163675.91	2464203.97	5.00	0.00
						6163507.72	2464201.53	5.00	0.00
						6163503.65	2464320.15	5.00	0.00

APPENDIX 10.1:

CADNAA CONSTRUCTION NOISE MODEL INPUTS

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14145 - Phalen Community Park - Construction

CadnaA Noise Prediction Model: 14145-02_Construction.cna
Date: 07.04.23
Analyst: B. Maddux

Calculation Configuration

Configuration	
Parameter	**Value**
General	
Max. Error (dB)	**0.00**
Max. Search Radius (#(Unit,LEN))	**2000.01**
Min. Dist Src to Rcvr	**0.00**
Partition	
Raster Factor	**0.50**
Max. Length of Section (#(Unit,LEN))	**999.99**
Min. Length of Section (#(Unit,LEN))	**1.01**
Min. Length of Section (%)	**0.00**
Proj. Line Sources	**On**
Proj. Area Sources	**On**
Ref. Time	
Reference Time Day (min)	**960.00**
Reference Time Night (min)	**480.00**
Daytime Penalty (dB)	**0.00**
Recr. Time Penalty (dB)	**5.00**
Night-time Penalty (dB)	**10.00**
DTM	
Standard Height (m)	**0.00**
Model of Terrain	**Triangulation**
Reflection	
max. Order of Reflection	**2**
Search Radius Src	**100.00**
Search Radius Rcvr	**100.00**
Max. Distance Source - Rcvr	**1000.00 1000.00**
Min. Distance Rvcr - Reflector	**1.00 1.00**
Min. Distance Source - Reflector	**0.10**
Industrial (ISO 9613)	
Lateral Diffraction	**some Obj**
Obst. within Area Src do not shield	**On**
Screening	**Incl. Ground Att. over Barrier**
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	**3.0 20.0 0.0**
Temperature (#(Unit,TEMP))	**10**
rel. Humidity (%)	**70**
Ground Absorption G	**0.75**
Wind Speed for Dir. (#(Unit,SPEED))	**3.0**
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	55.9	-44.1	52.9	0.0	0.0	0.0		x	Total	5.00	r	6163256.79	2464556.91	5.00
R2		R2	63.6	-36.4	60.6	0.0	0.0	0.0		x	Total	5.00	r	6164114.38	2464229.35	5.00
R3		R3	60.4	-39.6	57.4	0.0	0.0	0.0		x	Total	5.00	r	6163490.28	2463474.31	5.00
R4		R4	45.1	-54.9	42.1	0.0	0.0	0.0		x	Total	5.00	r	6161645.73	2464413.14	5.00

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Operating Time			Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	(ft)	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)		
CONSTRUCTION		CONSTRUCTION1	115.6	15.6	15.6	66.6	-33.4	-33.4	PWL-Pt	115.6					8	a

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
CONSTRUCTION	CONSTRUCTION1	8.00	a			6164098.49	2464521.20	8.00	0.00
						6164096.38	2463528.21	8.00	0.00
						6163816.07	2463528.91	8.00	0.00
						6163813.86	2463515.13	8.00	0.00
						6163435.72	2463517.54	8.00	0.00
						6163435.81	2463862.75	8.00	0.00
						6162826.35	2463865.81	8.00	0.00
						6162826.21	2464197.00	8.00	0.00
						6163436.05	2464193.94	8.00	0.00

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
				6163436.26	2464525.10	8.00	0.00