Cedar Avenue Trucking Storage (PROJ-2020-0035)

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	Cedar Avenue Trucking Storage
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 Cedar Avenue Trucking Storage development ("Project"). The proposed Project consists of up to 8.940 acres of truck terminal use. At the time this noise analysis was prepared, the future tenants of the proposed Project were unknown, and therefore, this noise study includes a conservative analysis of the proposed Project uses. 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 Cedar Avenue Trucking Storage 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 Cedar Avenue Trucking Storage ("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 for transportation related CNEL traffic noise analysis, and evaluates the future exterior noise environment. In addition, this study includes an analysis of the potential Project-related long-term stationary-source operational noise and short-term construction noise and vibration impacts.

1.1 SITE LOCATION

The Cedar Avenue Trucking Storage Project is located west of Cedar Avenue, between Slover Avenue and Santa Ana Avenue, in the 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 is proposed to consist of up to 8.940 acres of truck terminal use, which includes a 2,400 square foot (sf) office. It is anticipated that the Project would be developed in a single phase with an anticipated Opening Year of 2021. Access to the Project site will be provided to Cedar Avenue via a proposed full-access signalized driveway. Regional access to the Project site will be provided by the I-10 Freeway via Cedar Avenue.

The on-site Project-related noise sources are expected to include: truck terminal activity, entry gate & truck movements, roof-top air conditioning units, trash enclosure activity, and repair shop activity. This noise analysis is intended to describe noise level impacts associated with the expected typical operational activities at the Project site. To present a conservative approach, this report assumes the Project will operate 24-hours daily for seven days per week.

EXHIBIT 1-A: LOCATION MAP

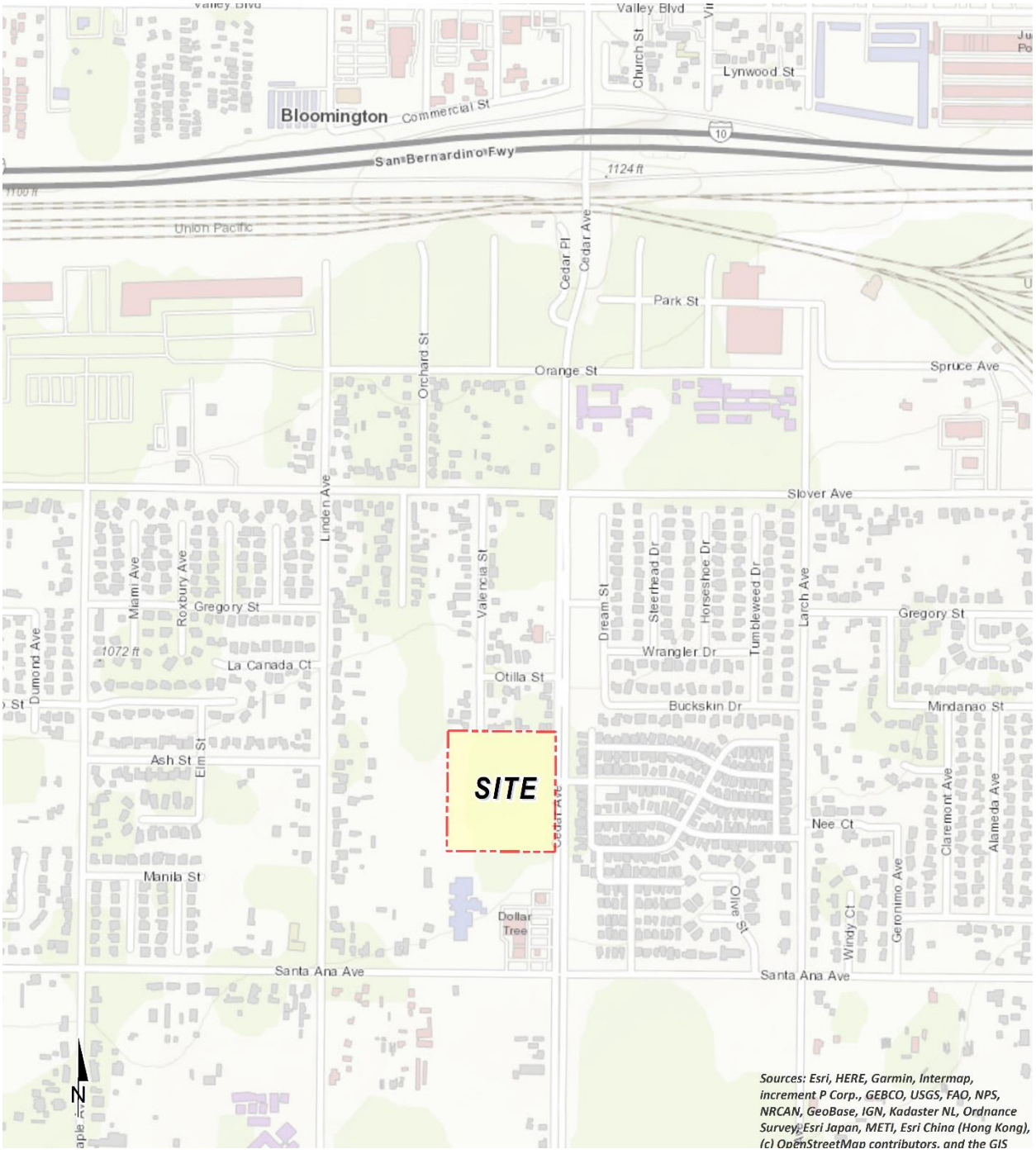
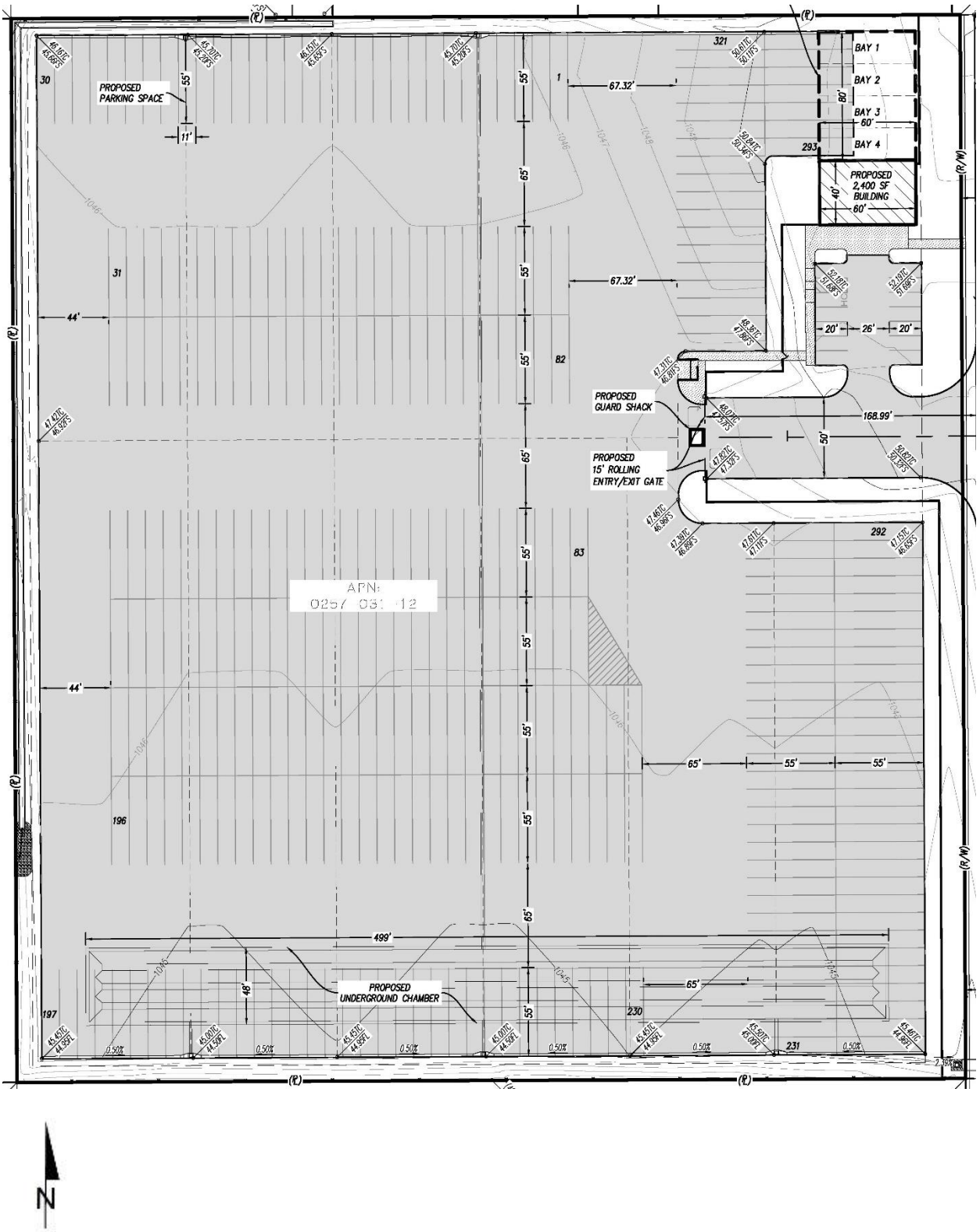


EXHIBIT 1-B: SITE PLAN



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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

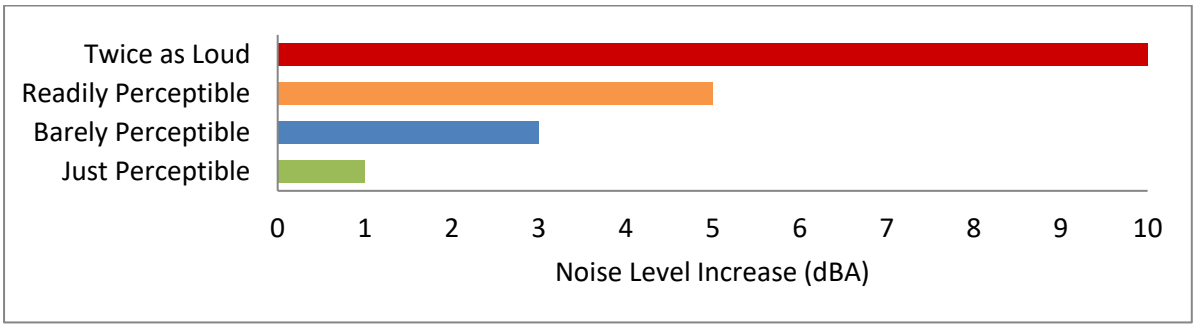
Community responses to noise may range from registering a complaint by telephone or letter, to initiating court action, depending upon everyone's susceptibility to noise and personal attitudes about noise. Several factors are related to the level of community annoyance including:

- 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



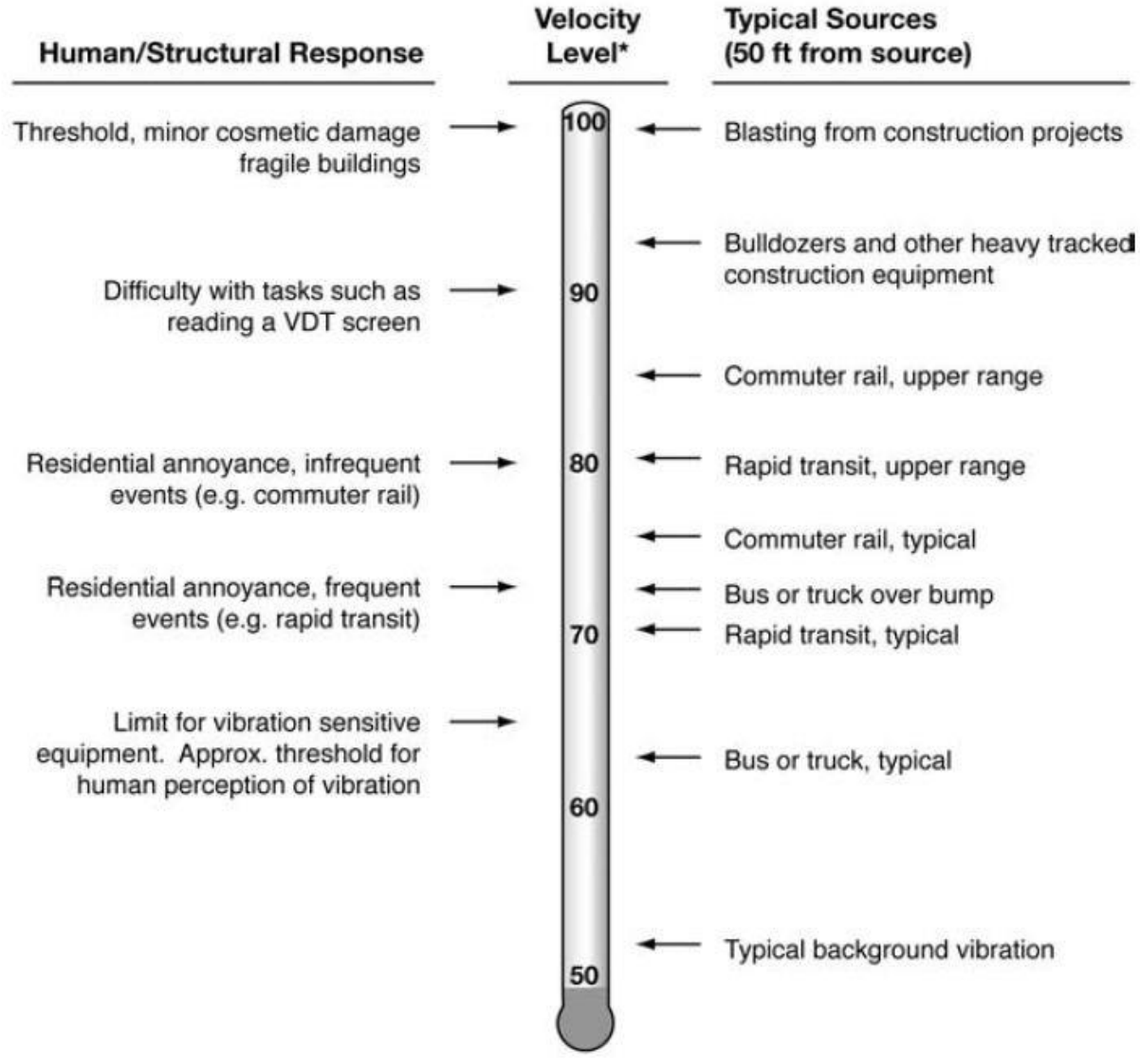
2.8 VIBRATION

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 Cedar Avenue Trucking Storage Project, stationary-source (operational) noise such as the expected truck terminal activity, entry gate & truck movements, roof-top air conditioning units, trash enclosure activity, and repair shop activity 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 truck terminal activity, entry gate & truck movements, roof-top air conditioning units, trash enclosure activity, and repair shop activity. 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, March 4th, 2020. 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 *Cedar Avenue Trucking Storage Traffic Analysis*, prepared by Urban Crossroads, Inc. for the following traffic scenarios under both Without and With Project conditions: Existing 2020, Opening Year Cumulative 2021 (OYC), 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	Cedar Av.	n/o I-19 WB Ramps	Sensitive	52'	40
2	Cedar Av.	s/o Slover Av.	Sensitive	52'	45
3	Cedar Av.	s/o Dwy. 1	Sensitive	52'	45
4	Slover Av.	w/o Cedar Av.	Sensitive	52'	50

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] Distance to receiving land use is based upon the right-of-way distances.
[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 (2020)		Opening Year Cumulative 2021		Horizon Year 2040	
			Without Project	With Project	Without Project	With Project	Without Project	With Project
1	Cedar Av.	n/o I-19 WB Ramps	52,758	52,773	59,190	59,204	65,963	65,978
2	Cedar Av.	s/o Slover Av.	25,752	26,432	41,734	42,414	45,156	45,836
3	Cedar Av.	s/o Dwy. 1	25,081	25,117	41,054	41,090	45,159	45,195
4	Slover Av.	w/o Cedar Av.	15,304	15,311	21,713	21,720	23,795	23,802

[1] Cedar Avenue Trucking Storage (PROJ-2020-00035) Traffic Analysis, Urban Crossroads, 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%

Based on an existing vehicle count taken at Cedar Avenue and Orange Street (Cedar Avenue Trucking Storage (PROJ-2020-00035) Traffic Analysis, Urban Crossroads, Inc.). Vehicle mix percentage values rounded to the nearest one-hundredth.

Due to the added Project truck trips, the increase in Project traffic volumes and the distributions of trucks on the study area road segments, the percentage of autos, medium trucks and heavy trucks will vary for each of the traffic scenarios. This explains why the existing and future traffic volumes and vehicle mixes vary between seemingly identical study area roadway segments.

TABLE 6-5: EXISTING (2020) WITH PROJECT VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total[2]
1	Cedar Av.	n/o I-19 WB Ramps	90.95%	3.51%	5.54%	100.00%
2	Cedar Av.	s/o Slover Av.	89.02%	3.42%	7.56%	100.00%
3	Cedar Av.	s/o Dwy. 1	90.96%	3.51%	5.53%	100.00%
4	Slover Av.	w/o Cedar Av.	90.95%	3.51%	5.54%	100.00%

[1] Cedar Avenue Trucking Storage (PROJ-2020-00035) Traffic Analysis, Urban Crossroads, Inc.
[2] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

TABLE 6-6: OYC (2021) WITH PROJECT VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total[2]
1	Cedar Av.	n/o I-19 WB Ramps	90.95%	3.51%	5.54%	100.00%
2	Cedar Av.	s/o Slover Av.	89.74%	3.46%	6.80%	100.00%
3	Cedar Av.	s/o Dwy. 1	90.96%	3.51%	5.53%	100.00%
4	Slover Av.	w/o Cedar Av.	90.95%	3.51%	5.54%	100.00%

[1] Cedar Avenue Trucking Storage (PROJ-2020-00035) Traffic Analysis, Urban Crossroads, Inc.
[2] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

TABLE 6-7: HY (2040) WITH PROJECT VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total[2]
1	Cedar Av.	n/o I-19 WB Ramps	90.95%	3.51%	5.54%	100.00%
2	Cedar Av.	s/o Slover Av.	89.83%	3.46%	6.70%	100.00%
3	Cedar Av.	s/o Dwy. 1	90.96%	3.51%	5.53%	100.00%
4	Slover Av.	w/o Cedar Av.	90.95%	3.51%	5.54%	100.00%

[1] Cedar Avenue Trucking Storage (PROJ-2020-00035) Traffic Analysis, Urban Crossroads, Inc.
[2] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

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 *Cedar Avenue Trucking Storage Traffic 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 2020, Opening Year Cumulative (2021), 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 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	Cedar Av.	n/o I-19 WB Ramps	Sensitive	76.8	147	317	684
2	Cedar Av.	s/o Slover Av.	Sensitive	74.7	106	229	493
3	Cedar Av.	s/o Dwy. 1	Sensitive	74.5	104	225	484
4	Slover Av.	w/o Cedar Av.	Sensitive	73.3	86	186	400

[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 2020 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	Cedar Av.	n/o I-19 WB Ramps	Sensitive	76.8	147	317	684
2	Cedar Av.	s/o Slover Av.	Sensitive	75.6	123	264	570
3	Cedar Av.	s/o Dwy. 1	Sensitive	74.5	104	225	484
4	Slover Av.	w/o Cedar Av.	Sensitive	73.3	86	186	400

[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: OYC (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	Cedar Av.	n/o I-19 WB Ramps	Sensitive	77.3	159	343	738
2	Cedar Av.	s/o Slover Av.	Sensitive	76.7	147	316	680
3	Cedar Av.	s/o Dwy. 1	Sensitive	76.7	145	312	673
4	Slover Av.	w/o Cedar Av.	Sensitive	74.8	109	234	505

[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: OYC (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	Cedar Av.	n/o I-19 WB Ramps	Sensitive	77.3	159	343	738
2	Cedar Av.	s/o Slover Av.	Sensitive	77.4	161	346	746
3	Cedar Av.	s/o Dwy. 1	Sensitive	76.7	145	312	673
4	Slover Av.	w/o Cedar Av.	Sensitive	74.8	109	234	505

[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	Cedar Av.	n/o I-19 WB Ramps	Sensitive	77.8	171	368	793
2	Cedar Av.	s/o Slover Av.	Sensitive	77.1	154	333	717
3	Cedar Av.	s/o Dwy. 1	Sensitive	77.1	154	333	717
4	Slover Av.	w/o Cedar Av.	Sensitive	75.2	116	249	537

[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	Cedar Av.	n/o I-19 WB Ramps	Sensitive	77.8	171	368	793
2	Cedar Av.	s/o Slover Av.	Sensitive	77.7	168	363	781
3	Cedar Av.	s/o Dwy. 1	Sensitive	77.1	154	333	717
4	Slover Av.	w/o Cedar Av.	Sensitive	75.2	116	249	537

[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 *Cedar Avenue Trucking Storage 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 73.3 to 76.8 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 73.3 to 76.8 dBA CNEL. Table 7-9 shows that the Project off-site traffic noise level impacts will range from 0.0 to 0.9 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 OYC (2021) WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

Table 7-3 presents the Opening Year Cumulative (2021) without Project conditions CNEL noise levels. The Opening Year Cumulative (2021) without Project exterior noise levels are expected to range from 74.8 to 77.3 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-4 shows the Opening Year Cumulative (2021) with Project conditions will range from 74.8 to 77.4 dBA CNEL. Table 7-10 shows that the Project off-site traffic noise level increases will range from 0.0 to 0.7 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 Cumulative (2021) 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 75.2 to 77.8 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 75.2 to 77.8 dBA CNEL. Table 7-11 shows that the Project off-site traffic noise level increases will range from 0.0 to 0.6 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	Cedar Av.	n/o I-19 WB Ramps	Sensitive	76.8	76.8	0.0	1	No
2	Cedar Av.	s/o Slover Av.	Sensitive	74.7	75.6	0.9	1	No
3	Cedar Av.	s/o Dwy. 1	Sensitive	74.5	74.5	0.0	1	No
4	Slover Av.	w/o Cedar Av.	Sensitive	73.3	73.3	0.0	1	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: OYC (2021) 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	Cedar Av.	n/o I-19 WB Ramps	Sensitive	77.3	77.3	0.0	1	No
2	Cedar Av.	s/o Slover Av.	Sensitive	76.7	77.4	0.7	1	No
3	Cedar Av.	s/o Dwy. 1	Sensitive	76.7	76.7	0.0	1	No
4	Slover Av.	w/o Cedar Av.	Sensitive	74.8	74.8	0.0	1	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	Cedar Av.	n/o I-19 WB Ramps	Sensitive	77.8	77.8	0.0	1	No
2	Cedar Av.	s/o Slover Av.	Sensitive	77.1	77.7	0.6	1	No
3	Cedar Av.	s/o Dwy. 1	Sensitive	77.1	77.1	0.0	1	No
4	Slover Av.	w/o Cedar Av.	Sensitive	75.2	75.2	0.0	1	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)?

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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, three 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 the existing noise sensitive residence at 10693 Valencia Street located approximately 19 feet north of the Project site. Since there are no private outdoor living areas (backyards) facing the Project site, receiver R1 is placed at the residential building façade. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

R2: Location R2 represents the existing noise sensitive residence at 10701 Cedar Avenue located approximately 122 feet east of the Project site across Cedar Avenue. Since there are no private outdoor living areas (backyards) facing the Project site, receiver R2 is placed at the residential building façade. A 24-hour noise measurement was taken near this location, L2, to describe the existing ambient noise environment.

R3: Location R3 represents the existing Cedar House Life Change Center at 18612 Santa Ana Avenue located approximately 149 feet south of the Project site. Since there are no private outdoor living areas (backyards) facing the Project site, receiver R3 is placed at the residential building façade. A 24-hour noise measurement was taken near this location, L3, to describe the existing ambient noise environment.

R4: Location R4 represents the existing noise sensitive residence at 10731 Linden Avenue located approximately 395 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

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

EXHIBIT 8-A: SENSITIVE RECEIVER LOCATIONS

9 OPERATIONAL NOISE IMPACTS

This section analyzes the potential stationary-source operational noise impacts at the nearest receiver locations, identified in Section 8, resulting from the operation of the Cedar Avenue Trucking Storage 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: truck terminal activity, entry gate & truck movements, roof-top air conditioning units, trash enclosure activity, and repair shop activity.

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 truck terminal activity, entry gate & truck movements, roof-top air conditioning units, trash enclosure activity, and repair shop activity 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

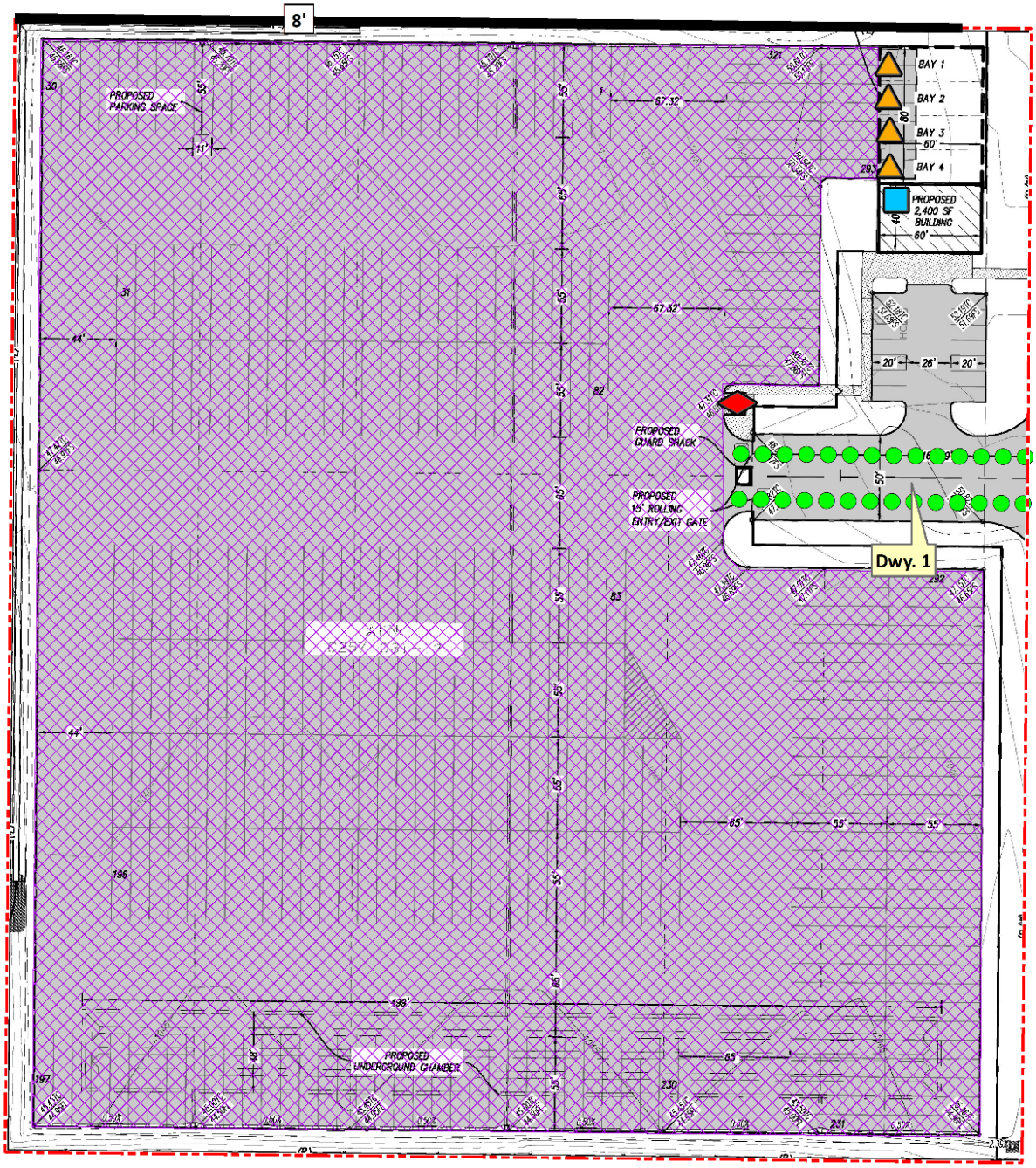

TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS

Noise Source[1]	Noise Source Height (Feet)	Min./Hour[2]		Reference Noise Level @ 50' (dBA L_{eq})	Sound Power Level (dBA)[3]
		Day	Night		
Truck Terminal Activity	8'	60	60	57.8	103.7
Entry Gate & Truck Movements	8'	-[4]	-[4]	58.0	89.7
Roof-Top Air Conditioning Units	5'	39	28	57.2	88.9
Trash Enclosure Activity	5'	10	10	56.8	88.5
Repair Shop Activity	5'	60	60	56.4	88.1

[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.
[4] Entry Gate & Truck Movements are calculate based on the number of events by time of day (See Table 9-2).

9.2.2 TRUCK TERMINAL ACTIVITY

To evaluate the noise levels associated with truck idling, backup alarms, trailer movements and storage activities, Urban Crossroads collected a reference noise level measurement at an existing parcel hub facility to describe the potential operational noise levels associated with Project operational activities. The measured reference noise level at 50 feet from activity was measured at 57.8 dBA L_{eq}. The reference noise level measurement includes a semi-truck with trailer pass-by event, background switcher cab trailer towing, drop-off, idling, and backup alarm events. Noise associated with trailer storage activity is expected to operate for the entire hour (60 minutes).

9.2.3 ENTRY GATE & TRUCK MOVEMENTS

An entry gate and truck movements reference noise level measurement were taken at the southern entry gate of the Motivational Fulfillment & Logistics Services distribution facility located at 6810 Bickmore Avenue in the City of Chino over a 15-minute period and represents multiple noise sources producing a reference noise level of 58.0 dBA L_{eq} at 50 feet. The noise sources included at this measurement location account for the rattling and squeaking during normal opening and closing operations, the gate closure equipment, truck engines idling outside the entry gate, truck movements through the entry gate, and background truck court activities and forklift backup alarm noise. Consistent with *Cedar Avenue Trucking Storage Traffic Analysis*, the Project is expected to generate a total of approximately 716 trip-ends per day (actual vehicles) and includes 572 truck trip-ends per day. (17) This noise study relies on the actual Project trips (as opposed to the passenger car equivalents) to accurately account for the effect of individual truck trips on the study area roadway network. Using the estimated number of truck trips in combination with time of day vehicle splits, the number of entry gate and truck movements by driveway location were calculated. As shown on Table 9-2, this information is then used to calculate the entry gate and truck movements operational noise source activity based on the number of events by time of day.

TABLE 9-2: ENTRY GATE & TRUCK MOVEMENTS BY LOCATION

Entry Gate & Truck Movement Location[1]	Total Project Truck Trips[2]	Trip Dist.[3]		Truck Trips by Location[4]	Time of Day Vehicle Splits[5]			Truck Movements[6]		
		In	Out		Day	Evening	Night	Day	Evening	Night
Dwy. 1	572	100%	100%	572	86.50%	2.70%	10.80%	495	15	62

[1] Driveway locations as shown on Exhibit 9-A.
[2] Total Project truck trips according to Table 4-2 Cedar Avenue Trucking Storage Traffic Analysis, Urban Crossroads, Inc.
[3] Project truck trip distribution according to Exhibit 4-1 of Cedar Avenue Trucking Storage Traffic Analysis, Urban Crossroads, Inc.
[4] Calculated trip trucks per location represents the product of the total (inbound and outbound) project truck trips and the trip distribution.
[5] Heavy truck time of day vehicle splits as shown on Table 6-3.
[6] Calculated time of day entry gate and truck movements by location.

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.

9.2.5 TRASH ENCLOSURE ACTIVITY

To describe the noise levels associated with a trash enclosure activity, Urban Crossroads collected a reference noise level measurement at an existing trash enclosure containing two dumpster bins. The trash enclosure noise levels describe metal gates opening and closing, metal scraping against concrete floor sounds, dumpster movement on metal wheels, and trash dropping into the metal dumpster. The reference noise levels describe trash enclosure noise activities when trash is dropped into an empty metal dumpster, as would occur at the Project site. The measured reference noise level at the uniform 50-foot reference distance is 56.8 dBA L_{eq} for the trash enclosure activity. The reference noise level describes the expected noise source activities associated with the trash enclosures for the Project's proposed building. Typical trash enclosure activities are estimated to occur for 5 minutes per hour.

9.2.6 REPAIR SHOP ACTIVITY

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}.

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 0.0 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 truck terminal activity, entry gate & truck movements, roof-top air conditioning units, trash enclosure activity, and repair shop activity, 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 9-3 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 51.1 to 56.3 dBA L_{eq}.

Table 9-4 shows the Project operational noise levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. The nighttime hourly noise levels at the off-site receiver locations are expected to range from 50.7 to 54.4 dBA L_{eq}. The differences between the daytime and nighttime noise levels is largely related to the duration of noise activity (Table 9-1) and the number of Entry Gate & Truck Movements (Table 9-2).

TABLE 9-3: DAYTIME PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1]	Operational Noise Levels by Receiver Location (dBA Leq)			
	R1	R2	R3	R4
Truck Terminal Activity	52.6	53.9	51.5	50.3
Entry Gate & Truck Movements	41.4	52.3	41.5	41.3
Roof-Top Air Conditioning Units	35.5	35.9	29.4	30.6
Trash Enclosure Activity	27.8	33.9	26.6	27.1
Repair Shop Activity	41.7	32.3	36.3	38.7
Total (All Noise Sources)	**53.3**	**56.3**	**52.1**	**51.1**

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

TABLE 9-4: NIGHTTIME PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1]	Operational Noise Levels by Receiver Location (dBA Leq)			
	R1	R2	R3	R4
Truck Terminal Activity	52.6	53.9	51.5	50.3
Entry Gate & Truck Movements	32.3	43.3	32.5	32.3
Roof-Top Air Conditioning Units	33.1	33.5	27.0	28.2
Trash Enclosure Activity	26.9	32.9	25.7	26.2
Repair Shop Activity	41.7	32.3	36.3	38.7
Total (All Noise Sources)	**53.0**	**54.4**	**51.7**	**50.7**

[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 9-5 shows the operational noise levels associated with Cedar Avenue Trucking Storage Project will satisfy the County of San Bernardino exterior noise level standards adjusted to reflect the ambient noise levels at all nearby receiver locations at all nearby receiver locations with the planned 8-foot high screen wall on the northern project boundary as shown on Exhibit 9-A. Therefore, the operational noise impacts are considered *less than significant* at the nearest noise-sensitive receiver locations.

TABLE 9-5: 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	53.3	53.0	57.2	54.5	No	No
R2	56.3	54.4	71.9	70.0	No	No
R3	52.1	51.7	53.8	52.9	No	No
R4	51.1	50.7	56.6	56.5	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 Tables 9-6 and 9-7, the Project will generate daytime and nighttime operational noise level increases ranging from 0.1 to 2.5 dBA L_{eq} at the nearest receiver locations. 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 9-6: 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	53.3	L1	57.2	58.7	1.5	Yes	3	No
R2	56.3	L2	71.9	72.0	0.1	Yes	1	No
R2	52.1	L3	53.8	56.0	2.2	Yes	5	No
R3	51.1	L4	56.6	57.7	1.1	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.

TABLE 9-7: NIGHTTIME OPERATIONAL NOISE LEVEL INCREASES

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Noise Sensitive Land Use?	Increase Criteria[7]	Increase Criteria Exceeded?[7]
R1	53.0	L1	54.5	56.8	2.3	Yes	5	No
R2	54.4	L2	70.0	70.1	0.1	Yes	1	No
R2	51.7	L3	52.9	55.4	2.5	Yes	5	No
R3	50.7	L3	52.9	54.9	2.0	Yes	5	No

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

10 CONSTRUCTION IMPACTS

This section analyzes potential 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

This construction noise analysis was prepared using reference noise level measurements taken by Urban Crossroads, Inc. to describe the typical construction activity noise levels for each stage of Project construction. The construction reference noise level measurements represent a list of typical construction activity noise levels. Noise levels generated by heavy construction equipment can range from approximately 68 dBA to more than 80 dBA when measured at 50 feet. However, these noise levels diminish with distance from the construction site at a rate of 6 dBA per doubling of distance. For example, a noise level of 80 dBA measured at 50 feet from the noise source to the receiver would be reduced to 74 dBA at 100 feet from the source to the receiver, and would be further reduced to 68 dBA at 200 feet from the source to the receiver.

10.2 TYPICAL CONSTRUCTION REFERENCE NOISE LEVELS

To describe the Project typical construction noise levels, measurements were collected for similar activities at several construction sites. Table 10-1 provides a summary of the construction reference noise level measurements. Since the reference noise levels were collected at varying distances of 30 feet and 50 feet, all construction noise level measurements presented on Table 10-1 have been adjusted for consistency to describe a uniform reference distance of 50 feet.

EXHIBIT 10-A: TYPICAL CONSTRUCTION NOISE SOURCE LOCATIONS

TABLE 10-1: TYPICAL CONSTRUCTION REFERENCE NOISE LEVELS

Construction Stage	Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})	Highest Reference Noise Level (dBA L_{eq})
Site Preparation	Scraper, Water Truck, & Dozer Activity	75.3	75.3
	Backhoe	64.2	
	Water Truck Pass-By & Backup Alarm	71.9	
Grading	Rough Grading Activities	73.5	73.5
	Water Truck Pass-By & Backup Alarm	71.9	
	Construction Vehicle Maintenance Activities	67.5	
Building Construction	Foundation Trenching	68.2	71.6
	Framing	62.3	
	Concrete Mixer Backup Alarms & Air Brakes	71.6	
Paving	Concrete Mixer Truck Movements	71.2	71.2
	Concrete Paver Activities	65.6	
	Concrete Mixer Pour & Paving Activities	65.9	
Architectural Coating	Air Compressors	65.2	65.2
	Generator	64.9	
	Crane	62.3	

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.

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 57.3 to 76.2 dBA L_{eq}, and the highest construction levels are expected to range from 67.4 to 76.2 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	76.2	74.4	72.5	72.1	66.1	76.2
R2	72.0	70.2	68.3	67.9	61.9	72.0
R3	70.6	68.8	66.9	66.5	60.5	70.6
R4	67.4	65.6	63.7	63.3	57.3	67.4

[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	76.2	80	No
R2	72.0	80	No
R3	70.6	80	No
R4	67.4	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 19 feet (at location R1) to 395 feet (at location R4) from Project construction activities (at the Project site boundary), construction vibration levels are estimated to range from 0.000 to 0.134 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	19'	0.005	0.053	0.115	0.134	0.134	0.2	No
R2	122'	0.000	0.003	0.007	0.008	0.008	0.2	No
R3	149'	0.000	0.002	0.005	0.006	0.006	0.2	No
R4	395'	0.000	0.001	0.001	0.001	0.001	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.
9. **State of California.** *2016 California Green Building Standards Code.* August 2019 Supplement.
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.*
12. **California Court of Appeal.** *King and Gardiner Farms, LLC v. County of Kern (2020) .* 45 Cal.App.5th 814, 893,
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. **Urban Crossroads, Inc.** *Cedar Avenue Trucking Storage (PROJ 2020-00035).* June 2020.

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12 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Cedar Avenue Trucking Storage Project. The information contained in this noise study report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 336-5979.

Bill Lawson, P.E., INCE
Principal
URBAN CROSSROADS, INC.
260 E. Baker Street, Suite 200
Costa Mesa, CA 92626
(949) 336-5979
blawson@urbanxroads.com

EDUCATION

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

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

PROFESSIONAL REGISTRATIONS

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

PROFESSIONAL AFFILIATIONS

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

PROFESSIONAL CERTIFICATIONS

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

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APPENDIX 3.1:

COUNTY OF SAN BERNARDINO MUNICIPAL CODE

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§ 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)
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)

APPENDIX 5.1:

STUDY AREA PHOTOS

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JN: 13097 Study Area Photos

L1_E
34, 3' 38.590000", 117, 23' 53.060000"

L1_N
34, 3' 38.230000", 117, 23' 53.060000"

L1_S
34, 3' 38.570000", 117, 23' 53.030000"

L1_W
34, 3' 38.630000", 117, 23' 53.060000"

L2_E
34, 3' 32.280000", 117, 23' 46.440000"

L2_N
34, 3' 32.260000", 117, 23' 46.490000"

L2_S
34, 3' 32.260000", 117, 23' 46.460000"

L2_W
34, 3' 32.280000", 117, 23' 46.440000"

L3_E
34, 3' 27.120000", 117, 23' 54.160000"

L3_N
34, 3' 27.160000", 117, 23' 54.160000"

L3_S
34, 3' 27.120000", 117, 23' 54.160000"

L3_W
34, 3' 27.150000", 117, 23' 54.180000"

JN: 13097 Study Area Photos

L4_E
34, 3' 32.810000", 117, 24' 1.870000"

L4_N
34, 3' 32.760000", 117, 24' 1.900000"

L4_S
34, 3' 32.810000", 117, 24' 1.900000"

L4_W
34, 3' 32.810000", 117, 24' 1.870000"

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APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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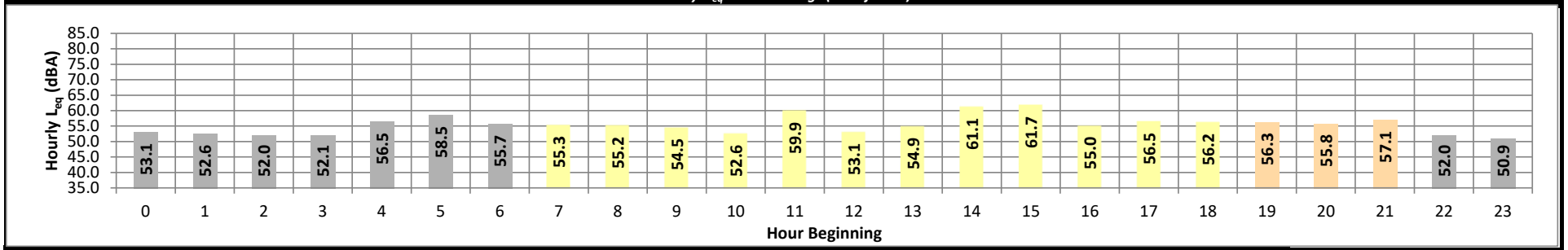
24-Hour Noise Level Measurement Summary

Date: Wednesday, March 4, 2020 *Location:* L1 - Located north of the Project site on Valencia Street near the existing single-family residential home at 10644 Valencia Street. *Meter:* Piccolo I *JN:* 13079

Project: Wiener Truck Terminal *Analyst:* P. Mara

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	53.1	74.5	44.7	64.0	61.0	56.0	54.0	51.0	49.0	47.0	46.0	45.0	53.1	10.0	63.1
	1	52.6	71.8	43.4	63.0	61.0	56.0	54.0	51.0	49.0	46.0	45.0	44.0	52.6	10.0	62.6
	2	52.0	72.5	44.6	63.0	61.0	55.0	53.0	50.0	48.0	46.0	46.0	45.0	52.0	10.0	62.0
	3	52.1	71.5	45.8	62.0	59.0	54.0	53.0	51.0	50.0	47.0	47.0	46.0	52.1	10.0	62.1
	4	56.5	74.7	49.8	65.0	63.0	60.0	58.0	56.0	54.0	51.0	51.0	50.0	56.5	10.0	66.5
	5	58.5	83.8	51.6	66.0	64.0	61.0	60.0	57.0	55.0	53.0	53.0	52.0	58.5	10.0	68.5
	6	55.7	72.7	44.9	66.0	65.0	61.0	59.0	53.0	51.0	47.0	47.0	45.0	55.7	10.0	65.7
Day	7	55.3	74.3	40.1	68.0	65.0	61.0	58.0	49.0	46.0	43.0	42.0	41.0	55.3	0.0	55.3
	8	55.2	74.6	39.4	67.0	65.0	61.0	59.0	49.0	44.0	41.0	41.0	40.0	55.2	0.0	55.2
	9	54.5	75.4	36.5	66.0	63.0	60.0	57.0	49.0	44.0	40.0	39.0	38.0	54.5	0.0	54.5
	10	52.6	74.1	37.4	65.0	63.0	59.0	55.0	46.0	42.0	40.0	39.0	38.0	52.6	0.0	52.6
	11	59.9	84.2	38.2	71.0	69.0	65.0	63.0	51.0	44.0	40.0	39.0	39.0	59.9	0.0	59.9
	12	53.1	74.3	38.8	66.0	63.0	58.0	53.0	47.0	45.0	41.0	41.0	40.0	53.1	0.0	53.1
	13	54.9	79.4	39.2	67.0	64.0	60.0	57.0	48.0	45.0	41.0	41.0	40.0	54.9	0.0	54.9
	14	61.1	89.4	42.4	71.0	67.0	61.0	58.0	52.0	47.0	44.0	44.0	43.0	61.1	0.0	61.1
	15	61.7	76.4	43.0	73.0	72.0	69.0	67.0	58.0	49.0	45.0	45.0	44.0	61.7	0.0	61.7
	16	55.0	73.9	44.6	66.0	64.0	61.0	59.0	52.0	48.0	46.0	46.0	45.0	55.0	0.0	55.0
	17	56.5	76.1	43.2	69.0	66.0	63.0	60.0	52.0	49.0	45.0	45.0	44.0	56.5	0.0	56.5
	18	56.2	76.2	41.3	66.0	65.0	63.0	61.0	53.0	46.0	43.0	42.0	42.0	56.2	0.0	56.2
Evening	19	56.3	75.2	41.1	68.0	66.0	63.0	61.0	51.0	46.0	42.0	42.0	41.0	56.3	5.0	61.3
	20	55.8	73.9	40.4	67.0	65.0	63.0	60.0	52.0	47.0	42.0	42.0	41.0	55.8	5.0	60.8
	21	57.1	73.4	41.6	68.0	67.0	64.0	62.0	53.0	48.0	44.0	43.0	42.0	57.1	5.0	62.1
Night	22	52.0	71.6	39.7	64.0	62.0	58.0	54.0	47.0	45.0	42.0	41.0	41.0	52.0	10.0	62.0
	23	50.9	69.1	41.8	62.0	60.0	56.0	53.0	48.0	46.0	43.0	43.0	42.0	50.9	10.0	60.9

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	52.6	73.9	36.5	65.0	63.0	58.0	53.0	46.0	42.0	40.0	39.0	38.0
	Max	61.7	89.4	44.6	73.0	72.0	69.0	67.0	58.0	49.0	46.0	46.0	45.0
Energy Average		57.4	Average:		67.9	65.5	61.8	58.9	50.5	45.8	42.4	42.0	41.2
Evening	Min	55.8	73.4	40.4	67.0	65.0	63.0	60.0	51.0	46.0	42.0	42.0	41.0
	Max	57.1	75.2	41.6	68.0	67.0	64.0	62.0	53.0	48.0	44.0	43.0	42.0
Energy Average		56.4	Average:		67.7	66.0	63.3	61.0	52.0	47.0	42.7	42.3	41.3
Night	Min	50.9	69.1	39.7	62.0	59.0	54.0	53.0	47.0	45.0	42.0	41.0	41.0
	Max	58.5	83.8	51.6	66.0	65.0	61.0	60.0	57.0	55.0	53.0	53.0	52.0
Energy Average		54.5	Average:		63.9	61.8	57.4	55.3	51.6	49.7	46.9	46.6	45.6

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
56.4	57.2	54.5

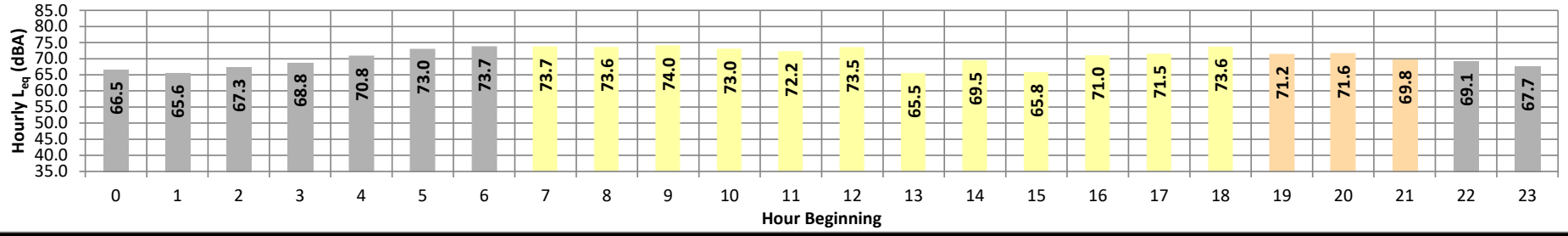
24-Hour CNEL (dBA)
61.7

24-Hour Noise Level Measurement Summary

Date: Wednesday, March 4, 2020 *Location:* L2 - Located east of the Project site across Cedar Avenue near the Cedar Village Mobile Home Park at 10701 Cedar Avenue. *Meter:* Piccolo II *JN:* 13079

Project: Wiener Truck Terminal *Analyst:* P. Mara

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	66.5	76.8	49.8	76.4	75.9	73.8	72.2	66.3	59.0	51.3	50.7	50.0	66.5	10.0	76.5
	1	65.6	76.7	49.6	76.3	75.8	73.2	71.2	64.1	56.5	50.6	50.1	49.7	65.6	10.0	75.6
	2	67.3	79.0	51.1	78.4	77.5	74.7	72.7	65.6	59.0	52.6	51.8	51.3	67.3	10.0	77.3
	3	68.8	79.1	50.9	78.7	78.1	76.1	74.4	68.3	62.7	52.7	51.7	51.0	68.8	10.0	78.8
	4	70.8	80.4	55.2	80.0	79.3	77.3	76.0	71.4	66.1	57.1	56.0	55.3	70.8	10.0	80.8
	5	73.0	81.6	57.8	81.2	80.6	78.8	77.7	74.0	70.1	60.5	58.9	58.0	73.0	10.0	83.0
	6	73.7	82.4	59.9	82.0	81.2	79.2	78.1	74.7	71.2	63.0	61.5	60.2	73.7	10.0	83.7
Day	7	73.7	81.2	63.8	80.9	80.3	78.7	77.7	74.5	72.0	66.8	65.6	64.2	73.7	0.0	73.7
	8	73.6	81.3	60.9	81.0	80.5	78.7	77.6	74.6	71.8	64.4	62.7	61.1	73.6	0.0	73.6
	9	74.0	82.8	62.7	82.4	81.8	79.3	77.8	74.7	71.6	65.4	64.0	62.9	74.0	0.0	74.0
	10	73.0	81.9	59.6	81.4	80.7	78.6	77.3	73.8	70.4	63.1	61.4	59.9	73.0	0.0	73.0
	11	72.2	81.2	57.6	80.8	80.1	78.0	76.7	73.0	69.3	61.4	59.4	57.8	72.2	0.0	72.2
	12	73.5	79.1	70.5	78.4	77.6	76.0	75.3	74.0	72.9	71.4	71.1	70.7	73.5	0.0	73.5
	13	65.5	73.0	60.4	71.9	70.6	69.0	68.3	66.2	64.3	61.9	61.4	60.7	65.5	0.0	65.5
	14	69.5	73.6	65.5	73.2	72.8	72.2	71.8	70.5	69.1	66.7	66.2	65.6	69.5	0.0	69.5
	15	65.8	74.2	61.3	72.9	71.3	69.0	68.1	66.1	64.8	63.0	62.4	61.7	65.8	0.0	65.8
	16	71.0	79.6	61.6	78.9	78.0	75.7	74.3	71.7	69.4	64.1	63.0	61.8	71.0	0.0	71.0
	17	71.5	79.1	61.3	78.7	78.2	76.6	75.2	72.3	69.9	64.7	63.1	61.5	71.5	0.0	71.5
	18	73.6	84.5	60.8	84.0	83.2	80.6	78.1	72.6	69.5	63.6	62.2	61.0	73.6	0.0	73.6
Evening	19	71.2	81.5	56.8	81.0	80.1	77.1	75.2	71.7	67.8	59.3	58.0	57.0	71.2	5.0	76.2
	20	71.6	82.4	55.3	82.0	81.0	77.7	75.7	71.7	67.7	58.1	56.7	55.5	71.6	5.0	76.6
	21	69.8	79.1	53.6	78.7	77.9	75.7	74.2	70.8	66.6	56.6	55.0	53.8	69.8	5.0	74.8
Night	22	69.1	78.7	52.0	78.3	77.6	75.5	74.0	69.9	64.9	54.4	53.0	52.2	69.1	10.0	79.1
	23	67.7	77.7	50.8	77.3	76.7	74.6	72.8	67.8	62.1	53.5	52.2	51.0	67.7	10.0	77.7

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	65.5	73.0	57.6	71.9	70.6	69.0	68.1	66.1	64.3	61.4	59.4	57.8
	Max	74.0	84.5	70.5	84.0	83.2	80.6	78.1	74.7	72.9	71.4	71.1	70.7
Energy Average		72.1	Average:		78.7	77.9	76.0	74.9	72.0	69.6	64.7	63.5	62.4
Evening	Min	69.8	79.1	53.6	78.7	77.9	75.7	74.2	70.8	66.6	56.6	55.0	53.8
	Max	71.6	82.4	56.8	82.0	81.0	77.7	75.7	71.7	67.8	59.3	58.0	57.0
Energy Average		71.0	Average:		80.6	79.7	76.9	75.0	71.4	67.4	58.0	56.6	55.4
Night	Min	65.6	76.7	49.6	76.3	75.8	73.2	71.2	64.1	56.5	50.6	50.1	49.7
	Max	73.7	82.4	59.9	82.0	81.2	79.2	78.1	74.7	71.2	63.0	61.5	60.2
Energy Average		70.0	Average:		78.7	78.1	75.9	74.3	69.1	63.5	55.1	54.0	53.2

L_{eq} (dBA)

24-Hour	*Daytime*	*Nighttime*
71.3	**71.9**	**70.0**

24-Hour CNEL (dBA)

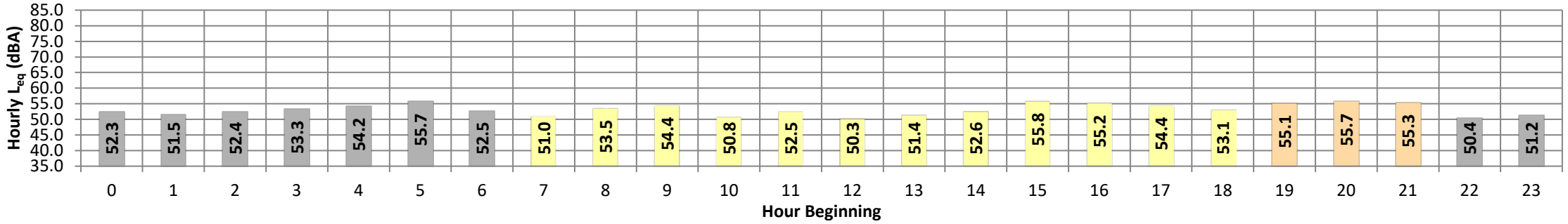
77.1

24-Hour Noise Level Measurement Summary

Date: Wednesday, March 04, 2020 *Location:* L3 - Located south of the Project site near the Cedar House Life Change Center. *Meter:* Piccolo I *JN:* 13079

Project: Wiener Truck Terminal *Analyst:* P. Mara

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	52.3	69.4	47.7	59.0	57.0	57.0	56.0	51.0	50.0	48.0	48.0	48.0	52.3	10.0	62.3
	1	51.5	68.2	47.4	58.0	56.0	54.0	54.0	51.0	50.0	48.0	48.0	47.0	51.5	10.0	61.5
	2	52.4	66.4	47.4	59.0	58.0	55.0	54.0	52.0	51.0	49.0	49.0	48.0	52.4	10.0	62.4
	3	53.3	75.3	48.3	60.0	58.0	56.0	55.0	53.0	51.0	49.0	49.0	48.0	53.3	10.0	63.3
	4	54.2	69.7	48.7	62.0	61.0	58.0	57.0	53.0	52.0	50.0	50.0	49.0	54.2	10.0	64.2
	5	55.7	76.2	48.4	69.0	64.0	56.0	55.0	53.0	51.0	50.0	50.0	49.0	55.7	10.0	65.7
	6	52.5	66.5	44.4	60.0	58.0	56.0	55.0	52.0	51.0	48.0	46.0	45.0	52.5	10.0	62.5
Day	7	51.0	68.2	42.3	62.0	60.0	54.0	52.0	49.0	47.0	45.0	44.0	44.0	51.0	0.0	51.0
	8	53.5	72.0	42.2	64.0	63.0	59.0	57.0	51.0	47.0	44.0	44.0	43.0	53.5	0.0	53.5
	9	54.4	81.4	41.0	63.0	62.0	56.0	54.0	49.0	46.0	43.0	42.0	42.0	54.4	0.0	54.4
	10	50.8	67.8	41.8	63.0	60.0	53.0	52.0	48.0	46.0	44.0	43.0	43.0	50.8	0.0	50.8
	11	52.5	74.5	41.9	64.0	62.0	57.0	54.0	48.0	46.0	44.0	44.0	43.0	52.5	0.0	52.5
	12	50.3	66.1	43.2	62.0	59.0	53.0	51.0	48.0	47.0	45.0	44.0	44.0	50.3	0.0	50.3
	13	51.4	66.6	42.3	63.0	61.0	56.0	54.0	49.0	47.0	45.0	45.0	44.0	51.4	0.0	51.4
	14	52.6	68.7	45.0	64.0	60.0	56.0	55.0	51.0	49.0	47.0	46.0	46.0	52.6	0.0	52.6
	15	55.8	70.6	45.1	68.0	65.0	62.0	58.0	53.0	50.0	48.0	47.0	46.0	55.8	0.0	55.8
	16	55.2	70.1	48.4	66.0	64.0	60.0	57.0	53.0	52.0	50.0	49.0	49.0	55.2	0.0	55.2
	17	54.4	71.4	45.4	65.0	63.0	58.0	56.0	52.0	50.0	48.0	47.0	46.0	54.4	0.0	54.4
	18	53.1	69.6	44.0	65.0	62.0	58.0	56.0	50.0	48.0	46.0	46.0	45.0	53.1	0.0	53.1
Evening	19	55.1	71.8	44.3	67.0	62.0	59.0	57.0	54.0	50.0	46.0	45.0	44.0	55.1	5.0	60.1
	20	55.7	69.9	44.0	66.0	65.0	62.0	60.0	53.0	49.0	46.0	45.0	45.0	55.7	5.0	60.7
	21	55.3	71.6	44.0	66.0	65.0	61.0	59.0	52.0	49.0	46.0	45.0	44.0	55.3	5.0	60.3
Night	22	50.4	69.2	43.8	61.0	58.0	55.0	54.0	49.0	47.0	45.0	45.0	44.0	50.4	10.0	60.4
	23	51.2	70.4	44.9	58.0	56.0	55.0	55.0	49.0	48.0	46.0	46.0	45.0	51.2	10.0	61.2

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	50.3	66.1	41.0	62.0	59.0	53.0	51.0	48.0	46.0	43.0	42.0	42.0
	Max	55.8	81.4	48.4	68.0	65.0	62.0	58.0	53.0	52.0	50.0	49.0	49.0
Energy Average		53.3	Average:		64.1	61.8	56.8	54.7	50.1	47.9	45.8	45.1	44.6
Evening	Min	55.1	69.9	44.0	66.0	62.0	59.0	57.0	52.0	49.0	46.0	45.0	44.0
	Max	55.7	71.8	44.3	67.0	65.0	62.0	60.0	54.0	50.0	46.0	45.0	45.0
Energy Average		55.4	Average:		66.3	64.0	60.7	58.7	53.0	49.3	46.0	45.0	44.3
Night	Min	50.4	66.4	43.8	58.0	56.0	54.0	54.0	49.0	47.0	45.0	45.0	44.0
	Max	55.7	76.2	48.7	69.0	64.0	58.0	57.0	53.0	52.0	50.0	50.0	49.0
Energy Average		52.9	Average:		60.7	58.4	55.8	55.0	51.4	50.1	48.1	47.9	47.0

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
53.5	53.8	52.9

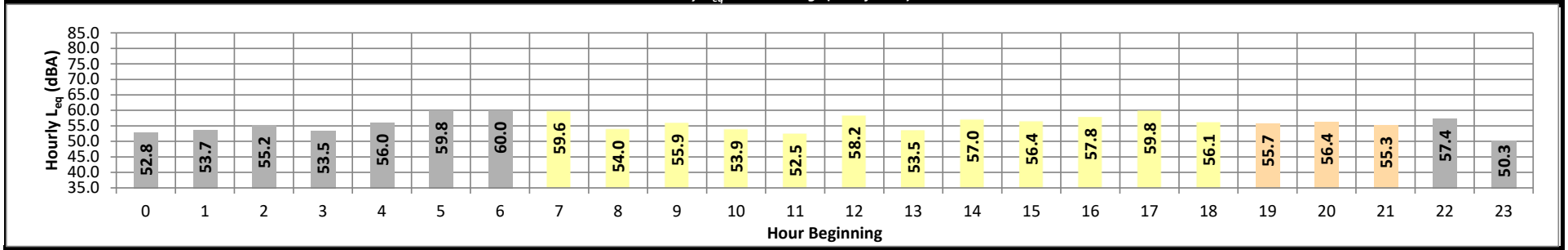
24-Hour CNEL (dBA)
59.9

24-Hour Noise Level Measurement Summary

Date: Wednesday, March 4, 2020 *Location:* L4 - Located west of the Project site near the existing single-family residential home at 10709 Linden Avenue. *Meter:* Piccolo II *JN:* 13079

Project: Wiener Truck Terminal *Analyst:* P. Mara

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	52.8	59.7	49.4	59.4	58.9	57.0	55.9	52.8	51.3	50.2	49.9	49.6	52.8	10.0	62.8
	1	53.7	59.6	50.9	59.1	58.6	56.8	55.9	54.0	53.0	51.5	51.3	51.0	53.7	10.0	63.7
	2	55.2	62.4	51.4	61.8	61.0	59.0	57.7	55.8	54.3	52.1	51.9	51.6	55.2	10.0	65.2
	3	53.5	60.3	50.2	59.9	59.3	57.7	56.7	53.6	52.1	50.7	50.5	50.3	53.5	10.0	63.5
	4	56.0	62.7	53.0	62.4	61.7	59.9	58.7	56.3	54.9	53.6	53.4	53.2	56.0	10.0	66.0
	5	59.8	70.8	54.8	70.3	69.1	65.3	63.5	58.4	56.7	55.3	55.1	54.9	59.8	10.0	69.8
	6	60.0	69.1	55.7	68.7	67.9	65.2	63.5	59.4	57.6	56.3	56.1	55.8	60.0	10.0	70.0
Day	7	59.6	69.2	53.4	68.9	68.3	66.0	63.7	59.0	56.7	54.3	53.9	53.6	59.6	0.0	59.6
	8	54.0	63.2	46.0	62.9	62.3	60.5	58.9	53.7	50.2	47.1	46.7	46.2	54.0	0.0	54.0
	9	55.9	64.6	45.5	64.2	63.6	61.9	60.8	56.6	52.6	47.3	46.5	45.8	55.9	0.0	55.9
	10	53.9	63.0	44.8	62.6	62.0	60.2	58.2	54.0	50.5	46.4	45.8	45.0	53.9	0.0	53.9
	11	52.5	63.5	43.9	63.0	61.6	58.3	56.5	52.2	48.8	45.1	44.6	44.1	52.5	0.0	52.5
	12	58.2	71.0	49.3	69.9	68.4	64.0	61.4	56.7	54.1	50.7	50.1	49.5	58.2	0.0	58.2
	13	53.5	64.0	43.3	63.6	62.9	60.7	58.7	52.4	48.0	44.2	43.9	43.4	53.5	0.0	53.5
	14	57.0	69.3	45.7	68.9	67.9	64.1	60.9	54.4	50.8	46.8	46.4	45.9	57.0	0.0	57.0
	15	56.4	67.0	47.3	66.5	65.5	62.5	60.4	56.2	52.3	48.7	48.1	47.5	56.4	0.0	56.4
	16	57.8	66.1	50.0	65.6	64.9	63.1	61.9	58.7	54.9	51.3	50.8	50.2	57.8	0.0	57.8
	17	59.8	70.4	50.8	69.9	69.3	67.0	64.6	58.5	55.0	51.8	51.4	51.0	59.8	0.0	59.8
	18	56.1	64.1	50.4	63.7	63.1	61.2	60.1	56.7	53.6	51.2	50.8	50.5	56.1	0.0	56.1
Evening	19	55.7	66.6	47.0	66.2	65.2	62.5	60.1	54.9	50.9	47.9	47.5	47.1	55.7	5.0	60.7
	20	56.4	65.2	48.3	64.9	64.3	62.5	61.1	56.5	53.2	49.2	48.8	48.5	56.4	5.0	61.4
	21	55.3	62.5	46.9	62.3	61.9	60.8	60.0	56.5	52.2	48.0	47.4	47.0	55.3	5.0	60.3
Night	22	57.4	67.3	47.4	66.8	66.0	63.6	62.2	57.5	52.8	48.2	47.9	47.5	57.4	10.0	67.4
	23	50.3	58.7	45.4	58.2	57.6	55.4	53.8	50.5	47.9	46.0	45.8	45.5	50.3	10.0	60.3

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	52.5	63.0	43.3	62.6	61.6	58.3	56.5	52.2	48.0	44.2	43.9	43.4
	Max	59.8	71.0	53.4	69.9	69.3	67.0	64.6	59.0	56.7	54.3	53.9	53.6
Energy Average		56.8	Average:		65.8	65.0	62.5	60.5	55.8	52.3	48.7	48.3	47.7
Evening	Min	55.3	62.5	46.9	62.3	61.9	60.8	60.0	54.9	50.9	47.9	47.4	47.0
	Max	56.4	66.6	48.3	66.2	65.2	62.5	61.1	56.5	53.2	49.2	48.8	48.5
Energy Average		55.8	Average:		64.4	63.8	61.9	60.4	56.0	52.1	48.4	47.9	47.5
Night	Min	50.3	58.7	45.4	58.2	57.6	55.4	53.8	50.5	47.9	46.0	45.8	45.5
	Max	60.0	70.8	55.7	70.3	69.1	65.3	63.5	59.4	57.6	56.3	56.1	55.8
Energy Average		56.5	Average:		63.0	62.2	60.0	58.7	55.4	53.4	51.5	51.3	51.0

L_{eq} (dBA)

24-Hour	*Daytime*	*Nighttime*
56.6	**56.6**	**56.5**

24-Hour CNEL (dBA)

63.1

APPENDIX 7.1:

OFF-SITE TRAFFIC NOISE CONTOURS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Cedar Av.
Road Segment: n/o I-19 WB Ramps
Project Name: Cedar Avenue Trucking St
Job Number: 13097

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	52,758	vehicles
Peak Hour Percentage:	7.00%	
Peak Hour Volume:	3,693	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	48	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%	90.95%
Medium Trucks:	84.8%	4.9%	10.3%	3.51%
Heavy Trucks:	86.5%	2.7%	10.8%	5.54%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.400
Medium Trucks:	46.209
Heavy Trucks:	46.228

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	3.94	0.38	-1.20	-4.66	0.000	0.000
Medium Trucks:	77.72	-10.19	0.41	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-8.22	0.41	-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:	69.6	69.3	67.5	61.5	70.1	70.7
Medium Trucks:	66.7	66.8	60.4	58.9	67.3	67.6
Heavy Trucks:	74.0	74.1	65.1	66.3	74.7	74.8
Vehicle Noise:	75.9	75.9	70.0	68.1	76.5	76.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	142	305	658	1,417
CNEL:	147	317	684	1,473

Wednesday, September 9, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Cedar Av.
Road Segment: s/o Dwy. 1
Project Name: Cedar Avenue Trucking St
Job Number: 13097

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,081	vehicles
Peak Hour Percentage:	7.00%	
Peak Hour Volume:	1,756	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	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%	90.95%
Medium Trucks:	84.8%	4.9%	10.3%	3.51%
Heavy Trucks:	86.5%	2.7%	10.8%	5.54%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.400
Medium Trucks:	46.209
Heavy Trucks:	46.228

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.19	0.38	-1.20	-4.66	0.000	0.000
Medium Trucks:	79.45	-13.93	0.41	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-11.96	0.41	-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:	67.8	67.5	65.7	59.7	68.3	68.9
Medium Trucks:	64.7	64.8	58.4	56.9	65.3	65.6
Heavy Trucks:	71.5	71.6	62.6	63.8	72.2	72.3
Vehicle Noise:	73.7	73.6	68.0	65.8	74.3	74.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	100	216	465	1,002
CNEL:	104	225	484	1,043

Wednesday, September 9, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Cedar Av.
Road Segment: s/o Slover Av.
Project Name: Cedar Avenue Trucking St
Job Number: 13097

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,752	vehicles
Peak Hour Percentage:	7.00%	
Peak Hour Volume:	1,803	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	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%	90.95%
Medium Trucks:	84.8%	4.9%	10.3%	3.51%
Heavy Trucks:	86.5%	2.7%	10.8%	5.54%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.400
Medium Trucks:	46.209
Heavy Trucks:	46.228

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.31	0.38	-1.20	-4.66	0.000	0.000
Medium Trucks:	79.45	-13.82	0.41	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-11.84	0.41	-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:	68.0	67.6	65.8	59.8	68.4	69.0
Medium Trucks:	64.8	64.9	58.5	57.0	65.4	65.7
Heavy Trucks:	71.6	71.7	62.7	64.0	72.3	72.4
Vehicle Noise:	73.8	73.8	68.1	66.0	74.4	74.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	102	220	473	1,019
CNEL:	106	229	493	1,062

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing Without Project
Road Name: Slover Av.
Road Segment: w/o Cedar Av.
Project Name: Cedar Avenue Trucking St
Job Number: 13097

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,304	vehicles
Peak Hour Percentage:	7.00%	
Peak Hour Volume:	1,071	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	48	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%	90.95%
Medium Trucks:	84.8%	4.9%	10.3%	3.51%
Heavy Trucks:	86.5%	2.7%	10.8%	5.54%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.400
Medium Trucks:	46.209
Heavy Trucks:	46.228

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-2.41	0.38	-1.20	-4.66	0.000	0.000
Medium Trucks:	81.00	-16.54	0.41	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-14.56	0.41	-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:	67.0	66.6	64.9	58.8	67.4	68.0
Medium Trucks:	63.7	63.7	57.4	55.8	64.3	64.5
Heavy Trucks:	70.0	70.2	61.1	62.4	70.7	70.8
Vehicle Noise:	72.4	72.4	66.9	64.6	73.0	73.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	83	178	383	826
CNEL:	86	186	400	862

Wednesday, September 9, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Cedar Av.
Road Segment: n/o I-19 WB Ramps

Project Name: Cedar Avenue Trucking St
Job Number: 13097

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	52,773	vehicles
Peak Hour Percentage:	7.00%	
Peak Hour Volume:	3,694	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	48	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%	90.95%
Medium Trucks:	84.8%	4.9%	10.3%	3.51%
Heavy Trucks:	86.5%	2.7%	10.8%	5.54%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	46.400
Medium Trucks:	46.209
Heavy Trucks:	46.228

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	3.94	0.38	-1.20	*-4.66*	0.000	0.000
Medium Trucks:	77.72	-10.19	0.41	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-8.22	0.41	-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:	69.6	69.3	67.5	61.5	70.1	70.7
Medium Trucks:	66.7	66.8	60.4	58.9	67.3	67.6
Heavy Trucks:	74.0	74.1	65.1	66.3	74.7	74.8
Vehicle Noise:	75.9	75.9	70.0	68.1	76.5	76.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	142	305	658	1,417
CNEL:	147	317	684	1,473

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Cedar Av.
Road Segment: s/o Dwy. 1

Project Name: Cedar Avenue Trucking St
Job Number: 13097

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,117	vehicles
Peak Hour Percentage:	7.00%	
Peak Hour Volume:	1,758	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	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%	90.96%
Medium Trucks:	84.8%	4.9%	10.3%	3.51%
Heavy Trucks:	86.5%	2.7%	10.8%	5.53%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	46.400
Medium Trucks:	46.209
Heavy Trucks:	46.228

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.20	0.38	-1.20	*-4.66*	0.000	0.000
Medium Trucks:	79.45	-13.93	0.41	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-11.96	0.41	-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:	67.8	67.5	65.7	59.7	68.3	68.9
Medium Trucks:	64.7	64.8	58.4	56.9	65.3	65.6
Heavy Trucks:	71.5	71.6	62.6	63.8	72.2	72.3
Vehicle Noise:	73.7	73.6	68.0	65.8	74.3	74.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	100	216	465	1,002
CNEL:	104	225	484	1,044

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Cedar Av.
Road Segment: s/o Slover Av.

Project Name: Cedar Avenue Trucking St
Job Number: 13097

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,432	vehicles
Peak Hour Percentage:	7.00%	
Peak Hour Volume:	1,850	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	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%	89.02%
Medium Trucks:	84.8%	4.9%	10.3%	3.42%
Heavy Trucks:	86.5%	2.7%	10.8%	7.56%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	46.400
Medium Trucks:	46.209
Heavy Trucks:	46.228

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.33	0.38	-1.20	*-4.66*	0.000	0.000
Medium Trucks:	79.45	-13.82	0.41	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-10.38	0.41	-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:	68.0	67.6	65.9	59.8	68.4	69.0
Medium Trucks:	64.8	64.9	58.5	57.0	65.4	65.7
Heavy Trucks:	73.1	73.2	64.2	65.4	73.8	73.9
Vehicle Noise:	74.7	74.7	68.6	66.9	75.4	75.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	118	255	549	1,183
CNEL:	123	264	570	1,227

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing + Project
Road Name: Slover Av.
Road Segment: w/o Cedar Av.

Project Name: Cedar Avenue Trucking St
Job Number: 13097

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,311	vehicles
Peak Hour Percentage:	7.00%	
Peak Hour Volume:	1,072	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	48	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%	90.95%
Medium Trucks:	84.8%	4.9%	10.3%	3.51%
Heavy Trucks:	86.5%	2.7%	10.8%	5.54%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	46.400
Medium Trucks:	46.209
Heavy Trucks:	46.228

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-2.41	0.38	-1.20	*-4.66*	0.000	0.000
Medium Trucks:	81.00	-16.54	0.41	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-14.56	0.41	-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:	67.0	66.6	64.9	58.8	67.4	68.0
Medium Trucks:	63.7	63.7	57.4	55.8	64.3	64.5
Heavy Trucks:	70.0	70.2	61.1	62.4	70.7	70.8
Vehicle Noise:	72.4	72.4	66.9	64.6	73.0	73.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	83	178	383	826
CNEL:	86	186	400	862

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OYC
Road Name: Cedar Av.
Road Segment: n/o I-19 WB Ramps
Project Name: Cedar Avenue Trucking St
Job Number: 13097

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	59,190 vehicles
Peak Hour Percentage:	7.00%
Peak Hour Volume:	4,143 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	48 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%	90.95%
Medium Trucks:	84.8%	4.9%	10.3%	3.51%
Heavy Trucks:	86.5%	2.7%	10.8%	5.54%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.400
Medium Trucks:	46.209
Heavy Trucks:	46.228

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	4.44	0.38	-1.20	-4.66	0.000	0.000
Medium Trucks:	77.72	-9.69	0.41	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-7.72	0.41	-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:	70.1	69.8	68.0	62.0	70.6	71.2
Medium Trucks:	67.2	67.3	60.9	59.4	67.8	68.1
Heavy Trucks:	74.5	74.6	65.6	66.8	75.2	75.3
Vehicle Noise:	76.4	76.4	70.5	68.6	77.0	77.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	153	330	710	1,530
CNEL:	159	343	738	1,590

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OYC
Road Name: Cedar Av.
Road Segment: s/o Dwy. 1
Project Name: Cedar Avenue Trucking St
Job Number: 13097

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	41,054 vehicles
Peak Hour Percentage:	7.00%
Peak Hour Volume:	2,874 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	48 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%	90.95%
Medium Trucks:	84.8%	4.9%	10.3%	3.51%
Heavy Trucks:	86.5%	2.7%	10.8%	5.54%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.400
Medium Trucks:	46.209
Heavy Trucks:	46.228

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.33	0.38	-1.20	-4.66	0.000	0.000
Medium Trucks:	79.45	-11.79	0.41	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-9.82	0.41	-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:	70.0	69.6	67.9	61.8	70.4	71.0
Medium Trucks:	66.9	66.9	60.5	59.0	67.5	67.7
Heavy Trucks:	73.6	73.8	64.7	66.0	74.3	74.5
Vehicle Noise:	75.8	75.8	70.1	68.0	76.4	76.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	139	300	646	1,391
CNEL:	145	312	673	1,449

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OYC
Road Name: Cedar Av.
Road Segment: s/o Slover Av.
Project Name: Cedar Avenue Trucking St
Job Number: 13097

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	41,734 vehicles
Peak Hour Percentage:	7.00%
Peak Hour Volume:	2,921 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	48 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%	90.95%
Medium Trucks:	84.8%	4.9%	10.3%	3.51%
Heavy Trucks:	86.5%	2.7%	10.8%	5.54%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.400
Medium Trucks:	46.209
Heavy Trucks:	46.228

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.41	0.38	-1.20	-4.66	0.000	0.000
Medium Trucks:	79.45	-11.72	0.41	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-9.75	0.41	-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:	70.1	69.7	67.9	61.9	70.5	71.1
Medium Trucks:	66.9	67.0	60.6	59.1	67.5	67.8
Heavy Trucks:	73.7	73.8	64.8	66.1	74.4	74.5
Vehicle Noise:	75.9	75.9	70.2	68.0	76.5	76.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	141	303	653	1,406
CNEL:	147	316	680	1,465

Wednesday, September 9, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OYC
Road Name: Slover Av.
Road Segment: w/o Cedar Av.
Project Name: Cedar Avenue Trucking St
Job Number: 13097

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,713 vehicles
Peak Hour Percentage:	7.00%
Peak Hour Volume:	1,520 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	48 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%	90.95%
Medium Trucks:	84.8%	4.9%	10.3%	3.51%
Heavy Trucks:	86.5%	2.7%	10.8%	5.54%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.400
Medium Trucks:	46.209
Heavy Trucks:	46.228

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.89	0.38	-1.20	-4.66	0.000	0.000
Medium Trucks:	81.00	-15.02	0.41	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-13.04	0.41	-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:	68.5	68.1	66.4	60.3	68.9	69.6
Medium Trucks:	65.2	65.2	58.9	57.3	65.8	66.0
Heavy Trucks:	71.5	71.7	62.6	63.9	72.2	72.4
Vehicle Noise:	73.9	73.9	68.4	66.1	74.5	74.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	104	225	484	1,042
CNEL:	109	234	505	1,088

Wednesday, September 9, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OYCP
Road Name: Cedar Av.
Road Segment: n/o I-19 WB Ramps
Project Name: Cedar Avenue Trucking St
Job Number: 13097

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	59,204	vehicles
Peak Hour Percentage:	7.00%	
Peak Hour Volume:	4,144	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	48	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%	90.95%
Medium Trucks:	84.8%	4.9%	10.3%	3.51%
Heavy Trucks:	86.5%	2.7%	10.8%	5.54%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.400
Medium Trucks:	46.209
Heavy Trucks:	46.228

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	4.44	0.38	-1.20	-4.66	0.000	0.000
Medium Trucks:	77.72	-9.69	0.41	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-7.72	0.41	-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:	70.1	69.8	68.0	62.0	70.6	71.2
Medium Trucks:	67.2	67.3	60.9	59.4	67.8	68.1
Heavy Trucks:	74.5	74.6	65.6	66.8	75.2	75.3
Vehicle Noise:	76.4	76.4	70.5	68.6	77.0	77.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	153	330	710	1,530
CNEL:	159	343	738	1,590

Wednesday, September 9, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OYCP
Road Name: Cedar Av.
Road Segment: s/o Dwy. 1
Project Name: Cedar Avenue Trucking St
Job Number: 13097

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	41,090	vehicles
Peak Hour Percentage:	7.00%	
Peak Hour Volume:	2,876	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	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%	90.96%
Medium Trucks:	84.8%	4.9%	10.3%	3.51%
Heavy Trucks:	86.5%	2.7%	10.8%	5.53%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.400
Medium Trucks:	46.209
Heavy Trucks:	46.228

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.34	0.38	-1.20	-4.66	0.000	0.000
Medium Trucks:	79.45	-11.79	0.41	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-9.82	0.41	-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:	70.0	69.6	67.9	61.8	70.4	71.0
Medium Trucks:	66.9	66.9	60.5	59.0	67.5	67.7
Heavy Trucks:	73.6	73.8	64.7	66.0	74.3	74.5
Vehicle Noise:	75.8	75.8	70.1	68.0	76.4	76.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	139	300	646	1,391
CNEL:	145	312	673	1,449

Wednesday, September 9, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OYCP
Road Name: Cedar Av.
Road Segment: s/o Slover Av.
Project Name: Cedar Avenue Trucking St
Job Number: 13097

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	42,414	vehicles
Peak Hour Percentage:	7.00%	
Peak Hour Volume:	2,969	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	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%	89.74%
Medium Trucks:	84.8%	4.9%	10.3%	3.46%
Heavy Trucks:	86.5%	2.7%	10.8%	6.80%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.400
Medium Trucks:	46.209
Heavy Trucks:	46.228

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.42	0.38	-1.20	-4.66	0.000	0.000
Medium Trucks:	79.45	-11.72	0.41	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-8.79	0.41	-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:	70.1	69.7	67.9	61.9	70.5	71.1
Medium Trucks:	66.9	67.0	60.6	59.1	67.5	67.8
Heavy Trucks:	74.7	74.8	65.8	67.0	75.4	75.5
Vehicle Noise:	76.5	76.5	70.5	68.7	77.1	77.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	155	333	718	1,548
CNEL:	161	346	746	1,608

Wednesday, September 9, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OYCP
Road Name: Slover Av.
Road Segment: w/o Cedar Av.
Project Name: Cedar Avenue Trucking St
Job Number: 13097

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,720	vehicles
Peak Hour Percentage:	7.00%	
Peak Hour Volume:	1,520	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	48	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%	90.95%
Medium Trucks:	84.8%	4.9%	10.3%	3.51%
Heavy Trucks:	86.5%	2.7%	10.8%	5.54%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.400
Medium Trucks:	46.209
Heavy Trucks:	46.228

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.89	0.38	-1.20	-4.66	0.000	0.000
Medium Trucks:	81.00	-15.02	0.41	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-13.04	0.41	-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:	68.5	68.2	66.4	60.3	69.0	69.6
Medium Trucks:	65.2	65.2	58.9	57.3	65.8	66.0
Heavy Trucks:	71.5	71.7	62.6	63.9	72.2	72.4
Vehicle Noise:	73.9	73.9	68.4	66.1	74.5	74.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	104	225	484	1,043
CNEL:	109	234	505	1,088

Wednesday, September 9, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY
Road Name: Cedar Av.
Road Segment: n/o I-19 WB Ramps
Project Name: Cedar Avenue Trucking St
Job Number: 13097

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	65,963 vehicles
Peak Hour Percentage:	7.00%
Peak Hour Volume:	4,617 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	48 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%	90.95%
Medium Trucks:	84.8%	4.9%	10.3%	3.51%
Heavy Trucks:	86.5%	2.7%	10.8%	5.54%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.400
Medium Trucks:	46.209
Heavy Trucks:	46.228

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	4.91	0.38	-1.20	-4.66	0.000	0.000
Medium Trucks:	77.72	-9.22	0.41	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-7.25	0.41	-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:	70.6	70.3	68.5	62.4	71.1	71.7
Medium Trucks:	67.7	67.7	61.4	59.8	68.3	68.5
Heavy Trucks:	75.0	75.1	66.0	67.3	75.6	75.8
Vehicle Noise:	76.9	76.9	71.0	69.1	77.5	77.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	164	354	763	1,644
CNEL:	171	368	793	1,709

Wednesday, September 9, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY
Road Name: Cedar Av.
Road Segment: s/o Dwy. 1
Project Name: Cedar Avenue Trucking St
Job Number: 13097

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	45,159 vehicles
Peak Hour Percentage:	7.00%
Peak Hour Volume:	3,161 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	48 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%	90.95%
Medium Trucks:	84.8%	4.9%	10.3%	3.51%
Heavy Trucks:	86.5%	2.7%	10.8%	5.54%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.400
Medium Trucks:	46.209
Heavy Trucks:	46.228

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.75	0.38	-1.20	-4.66	0.000	0.000
Medium Trucks:	79.45	-11.38	0.41	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-9.41	0.41	-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:	70.4	70.0	68.3	62.2	70.8	71.4
Medium Trucks:	67.3	67.3	61.0	59.4	67.9	68.1
Heavy Trucks:	74.1	74.2	65.1	66.4	74.8	74.9
Vehicle Noise:	76.2	76.2	70.5	68.4	76.8	77.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	148	319	688	1,482
CNEL:	154	333	717	1,544

Wednesday, September 9, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY
Road Name: Cedar Av.
Road Segment: s/o Slover Av.
Project Name: Cedar Avenue Trucking St
Job Number: 13097

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	45,156 vehicles
Peak Hour Percentage:	7.00%
Peak Hour Volume:	3,161 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	48 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%	90.95%
Medium Trucks:	84.8%	4.9%	10.3%	3.51%
Heavy Trucks:	86.5%	2.7%	10.8%	5.54%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.400
Medium Trucks:	46.209
Heavy Trucks:	46.228

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.75	0.38	-1.20	-4.66	0.000	0.000
Medium Trucks:	79.45	-11.38	0.41	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-9.41	0.41	-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:	70.4	70.0	68.3	62.2	70.8	71.4
Medium Trucks:	67.3	67.3	61.0	59.4	67.9	68.1
Heavy Trucks:	74.1	74.2	65.1	66.4	74.8	74.9
Vehicle Noise:	76.2	76.2	70.5	68.4	76.8	77.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	148	319	688	1,482
CNEL:	154	333	717	1,544

Wednesday, September 9, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY
Road Name: Slover Av.
Road Segment: w/o Cedar Av.
Project Name: Cedar Avenue Trucking St
Job Number: 13097

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,795 vehicles
Peak Hour Percentage:	7.00%
Peak Hour Volume:	1,666 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	48 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%	90.95%
Medium Trucks:	84.8%	4.9%	10.3%	3.51%
Heavy Trucks:	86.5%	2.7%	10.8%	5.54%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.400
Medium Trucks:	46.209
Heavy Trucks:	46.228

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.49	0.38	-1.20	-4.66	0.000	0.000
Medium Trucks:	81.00	-14.62	0.41	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.65	0.41	-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:	68.9	68.5	66.8	60.7	69.3	70.0
Medium Trucks:	65.6	65.6	59.3	57.7	66.2	66.4
Heavy Trucks:	71.9	72.1	63.0	64.3	72.6	72.8
Vehicle Noise:	74.3	74.3	68.8	66.5	74.9	75.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	111	239	514	1,108
CNEL:	116	249	537	1,156

Wednesday, September 9, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HYP
Road Name: Cedar Av.
Road Segment: n/o I-19 WB Ramps
Project Name: Cedar Avenue Trucking St
Job Number: 13097

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	65,978	vehicles
Peak Hour Percentage:	7.00%	
Peak Hour Volume:	4,618	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	48	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%	90.95%
Medium Trucks:	84.8%	4.9%	10.3%	3.51%
Heavy Trucks:	86.5%	2.7%	10.8%	5.54%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.400
Medium Trucks:	46.209
Heavy Trucks:	46.228

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	4.91	0.38	-1.20	-4.66	0.000	0.000
Medium Trucks:	77.72	-9.22	0.41	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-7.25	0.41	-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:	70.6	70.3	68.5	62.4	71.1	71.7
Medium Trucks:	67.7	67.7	61.4	59.8	68.3	68.5
Heavy Trucks:	75.0	75.1	66.0	67.3	75.6	75.8
Vehicle Noise:	76.9	76.9	71.0	69.1	77.5	77.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	164	354	763	1,644
CNEL:	171	368	793	1,709

Wednesday, September 9, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HYP
Road Name: Cedar Av.
Road Segment: s/o Dwy. 1
Project Name: Cedar Avenue Trucking St
Job Number: 13097

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	45,195	vehicles
Peak Hour Percentage:	7.00%	
Peak Hour Volume:	3,164	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	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%	90.96%
Medium Trucks:	84.8%	4.9%	10.3%	3.51%
Heavy Trucks:	86.5%	2.7%	10.8%	5.53%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.400
Medium Trucks:	46.209
Heavy Trucks:	46.228

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.75	0.38	-1.20	-4.66	0.000	0.000
Medium Trucks:	79.45	-11.38	0.41	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-9.41	0.41	-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:	70.4	70.0	68.3	62.2	70.8	71.5
Medium Trucks:	67.3	67.3	61.0	59.4	67.9	68.1
Heavy Trucks:	74.1	74.2	65.1	66.4	74.8	74.9
Vehicle Noise:	76.2	76.2	70.5	68.4	76.8	77.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	148	319	688	1,483
CNEL:	154	333	717	1,544

Wednesday, September 9, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HYP
Road Name: Cedar Av.
Road Segment: s/o Slover Av.
Project Name: Cedar Avenue Trucking St
Job Number: 13097

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	45,836	vehicles
Peak Hour Percentage:	7.00%	
Peak Hour Volume:	3,209	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	48	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%	89.83%
Medium Trucks:	84.8%	4.9%	10.3%	3.46%
Heavy Trucks:	86.5%	2.7%	10.8%	6.70%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.400
Medium Trucks:	46.209
Heavy Trucks:	46.228

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.76	0.38	-1.20	-4.66	0.000	0.000
Medium Trucks:	79.45	-11.38	0.41	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-8.51	0.41	-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:	70.4	70.1	68.3	62.2	70.9	71.5
Medium Trucks:	67.3	67.3	61.0	59.4	67.9	68.1
Heavy Trucks:	74.9	75.1	66.0	67.3	75.6	75.8
Vehicle Noise:	76.8	76.8	70.8	69.0	77.4	77.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	162	349	752	1,620
CNEL:	168	363	781	1,683

Wednesday, September 9, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HYP
Road Name: Slover Av.
Road Segment: w/o Cedar Av.
Project Name: Cedar Avenue Trucking St
Job Number: 13097

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,802	vehicles
Peak Hour Percentage:	7.00%	
Peak Hour Volume:	1,666	vehicles
Vehicle Speed:	50	mph
Near/Far Lane Distance:	48	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%	90.95%
Medium Trucks:	84.8%	4.9%	10.3%	3.51%
Heavy Trucks:	86.5%	2.7%	10.8%	5.54%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	46.400
Medium Trucks:	46.209
Heavy Trucks:	46.228

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-0.49	0.38	-1.20	-4.66	0.000	0.000
Medium Trucks:	81.00	-14.62	0.41	-1.20	-4.87	0.000	0.000
Heavy Trucks:	85.38	-12.65	0.41	-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:	68.9	68.5	66.8	60.7	69.3	70.0
Medium Trucks:	65.6	65.6	59.3	57.7	66.2	66.4
Heavy Trucks:	71.9	72.1	63.0	64.3	72.6	72.8
Vehicle Noise:	74.3	74.3	68.8	66.5	74.9	75.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	111	239	514	1,108
CNEL:	116	249	537	1,157

Wednesday, September 9, 2020

APPENDIX 9.1:

CADNAA OPERATIONAL NOISE MODEL INPUTS

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13097 - Cedar Avenue Trucking Storage

CadnaA Noise Prediction Model: 13097.cna
Date: 10.09.20
Analyst: B. Lawson

Calculation Configuration

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

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
RECEIVERS		R1	53.3	53.1	59.8	57.2	54.5	0.0				5.00	a	6214014.08	2331105.32	5.00
RECEIVERS		R2	56.2	54.3	61.2	71.9	70.0	0.0				5.00	a	6214502.40	2330725.17	5.00
RECEIVERS		R3	52.0	51.7	58.4	53.8	52.9	0.0				5.00	a	6213873.73	2330278.57	5.00
RECEIVERS		R4	51.1	50.7	57.4	56.6	56.5	0.0				5.00	a	6213395.50	2330941.97	5.00

Point Source(s)

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			K0	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night				X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(dB)	(ft)		(ft)	(ft)	(ft)
POINTSOURCE		AC01	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	0.0	5.00	g	6214304.98	2330982.61	30.00
POINTSOURCE		REPAIR01	88.1	88.1	88.1	Lw	88.1					0.0	5.00	a	6214300.60	2331061.67	5.00
POINTSOURCE		REPAIR02	88.1	88.1	88.1	Lw	88.1					0.0	5.00	a	6214300.36	2331042.52	5.00
POINTSOURCE		REPAIR03	88.1	88.1	88.1	Lw	88.1					0.0	5.00	a	6214301.17	2331023.20	5.00
POINTSOURCE		REPAIR04	88.1	88.1	88.1	Lw	88.1					0.0	5.00	a	6214301.20	2331002.46	5.00
POINTSOURCE		TRASH01	88.5	88.5	88.5	Lw	88.5		150.00	0.00	90.00	0.0	5.00	a	6214212.37	2330864.41	5.00

Line Source(s)

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Operating Time			Moving Pt. Src				Height
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	Number			Speed	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	Day	Evening	Night	(mph)	(ft)
LINESOURCE		DWY01	94.0	78.8	84.9	76.7	61.5	67.6	PWL-Pt	89.7					495.0	15.0	62.0	6.2	8
LINESOURCE		DWY02	94.0	78.8	84.9	76.7	61.5	67.6	PWL-Pt	89.7					495.0	15.0	62.0	6.2	8

Name	Height			Coordinates			
	Begin		End	x	y	z	Ground
	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
LINESOURCE	8.00	a		6214380.74	2330833.01	8.00	0.00
				6214203.98	2330835.04	8.00	0.00
LINESOURCE	8.00	a		6214380.95	2330805.83	8.00	0.00
				6214204.18	2330808.48	8.00	0.00

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)	
AREASOURCE		TERMINAL01	103.7	103.7	103.7	59.0	59.0	59.0	Lw	103.7					8

Name	Height			Coordinates			
	Begin		End	x	y	z	Ground
	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
AREASOURCE	8.00	a		6213806.74	2331075.78	8.00	0.00
				6214294.26	2331071.36	8.00	0.00
				6214293.52	2330994.77	8.00	0.00
				6214261.12	2330996.24	8.00	0.00
				6214260.38	2330874.00	8.00	0.00
				6214203.68	2330875.47	8.00	0.00
				6214204.41	2330777.52	8.00	0.00
				6214213.99	2330767.21	8.00	0.00
				6214355.38	2330766.48	8.00	0.00
				6214353.91	2330437.29	8.00	0.00
				6213801.58	2330443.18	8.00	0.00

Building(s)

Name	M.	ID	RB	Residents	Absorption	Height		Coordinates			
						Begin		x	y	z	Ground
						(ft)		(ft)	(ft)	(ft)	(ft)
BUILDING		BUILDING00001	x	0		25.00	a	6214294.89	2330991.93	25.00	0.00
								6214354.72	2330991.81	25.00	0.00
								6214354.72	2330951.41	25.00	0.00
								6214294.53	2330952.37	25.00	0.00

Ground Absorption(s)

Name	M.	ID	G	Coordinates	
				x	y
				(ft)	(ft)
GROUND		0	0.5	6213787.77	2330419.18
				6214378.38	2330414.55
				6214379.92	2330262.27
				6214141.73	2330203.62
				6213949.83	2330259.18
				6213948.80	2330324.00
				6213785.71	2330324.52

APPENDIX 10.1:

CADNAA CONSTRUCTION NOISE MODEL INPUTS

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13097 - Cedar Avenue Trucking Storage

CadnaA Noise Prediction Model: 13097_Construction.cna
Date: 10.09.20
Analyst: B. Lawson

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)
RECEIVERS		R1	76.1	76.1	82.8	57.2	54.5	0.0				5.00	a	6214014.08	2331105.32	5.00
RECEIVERS		R2	72.0	72.0	78.7	71.9	70.0	0.0				5.00	a	6214502.40	2330725.17	5.00
RECEIVERS		R3	70.6	70.6	77.3	53.8	52.9	0.0				5.00	a	6213873.73	2330278.57	5.00
RECEIVERS		R4	67.3	67.3	74.0	56.6	56.5	0.0				5.00	a	6213395.50	2330941.97	5.00

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Operating Time			Height
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	(ft)
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	
SITEBOUNDARY		CONSTRUCTION	120.9	120.9	120.9	75.3	75.3	75.3	Lw''	75.3					8

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
SITEBOUNDARY	8.00	a			6213791.54	2331088.41	8.00	0.00
					6213941.54	2331086.88	8.00	0.00
					6213991.54	2331086.37	8.00	0.00
					6214144.04	2331084.82	8.00	0.00
					6214383.61	2331082.38	8.00	0.00
					6214378.19	2330422.38	8.00	0.00
					6213785.80	2330428.32	8.00	0.00

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