Gateway South 9 Warehouse

NOISE AND VIBRATION ANALYSIS

CITY OF SAN BERNARDINO

PREPARED BY:

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

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
ANSI	American National Standards Institute
Calveno	California Vehicle Noise
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dBA	A-weighted decibels
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
Hz	Hertz
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	Gateway South 9 Warehouse
REMEL	Reference Energy Mean Emission Level
RMS	Root-mean-square
VdB	Vibration Decibels

EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the potential noise impacts and the necessary noise mitigation measures, if any, for the proposed Gateway South 9 Warehouse development ("Project"). The proposed Project includes the development of a 397,400 square foot (sf) high-cube transload and short-term warehouse building. This study has been prepared to satisfy applicable City of San Bernardino noise standards and significance criteria based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines (1).

The results of this Gateway South 9 Warehouse Noise and Vibration Analysis are summarized below based on the significance criteria in Section 4 of this report consistent with Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1) Table ES-1 shows the findings of significance for each potential noise and/or vibration impact under CEQA 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*	-
Nighttime Concrete Pour Noise		*Less Than Significant*	-
Construction Vibration		*Less Than Significant*	-

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1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of the proposed Gateway South 9 Warehouse ("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.

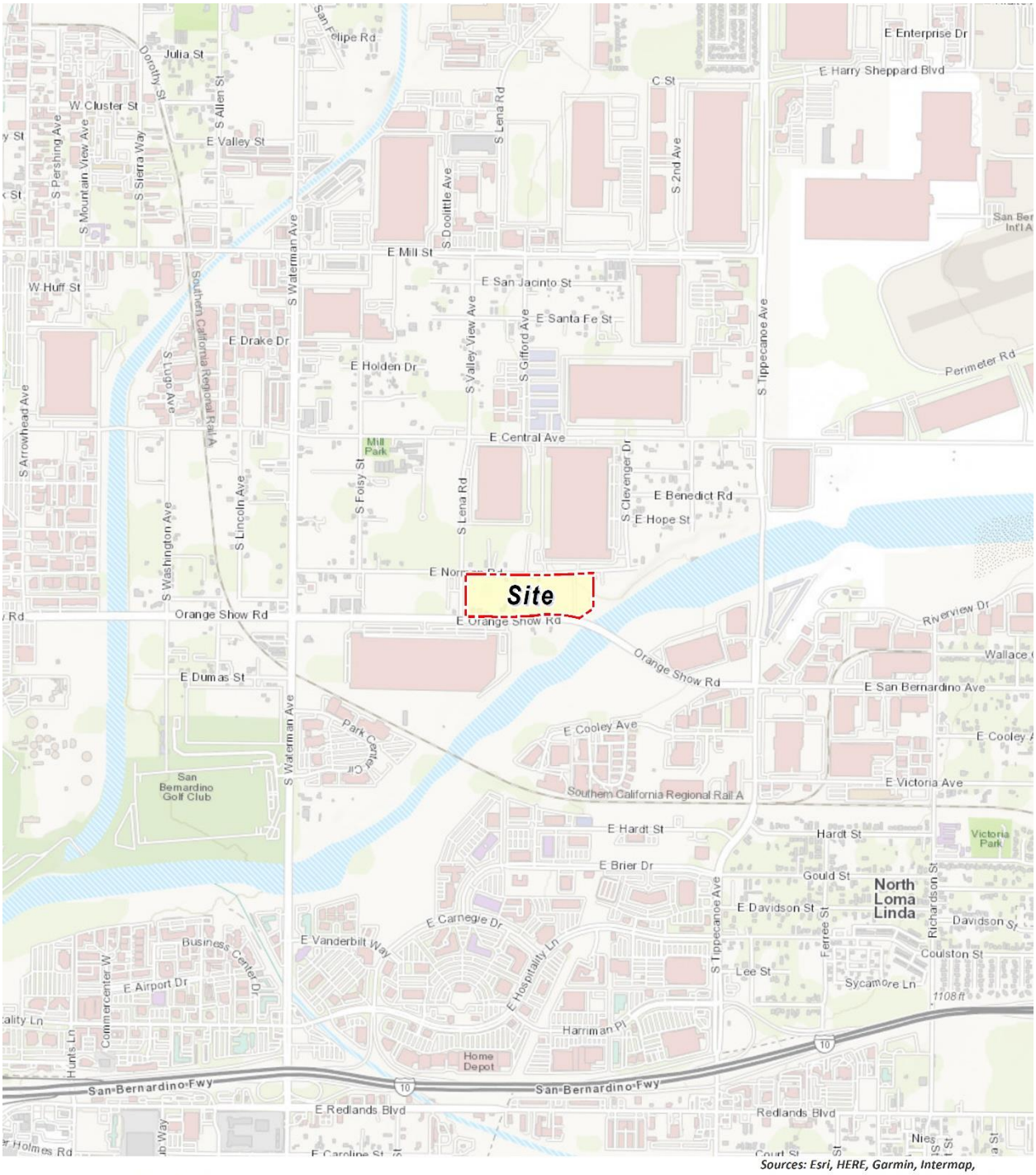
1.1 SITE LOCATION

The proposed Project is located at the southeast corner of Lena Road and Norman Road in the City of San Bernardino, as shown on Exhibit 1-A.

1.2 PROJECT DESCRIPTION

The proposed Project includes the development of a 397,400 square foot (sf) high-cube transload and short-term warehouse building, as shown on Exhibit 1-B. The anticipated Project opening year is 2024. The on-site Project-related noise sources are expected to include: loading dock activity, roof-top air conditioning units, trash enclosure activity, parking lot vehicle movements, and truck movements. This noise analysis is intended to describe the noise level impacts associated with the expected typical operational activities at the Project site.

EXHIBIT 1-A: LOCATION MAP

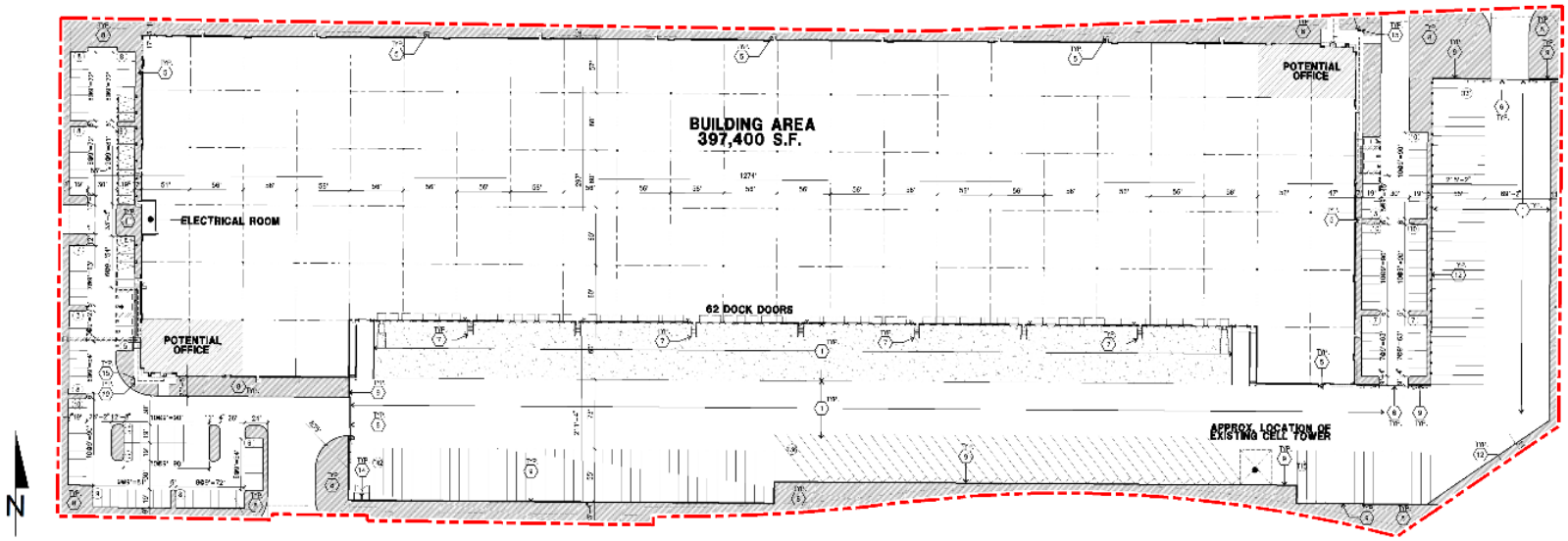


LEGEND:

Site Boundary

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS

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		

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

2.1 RANGE OF NOISE

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

at approximately 1,000 feet, which can cause serious discomfort (3). Another important aspect of noise is the duration of the sound and the way it is described and distributed in time.

2.2 NOISE DESCRIPTORS

Environmental noise descriptors are generally based on averages, rather than instantaneous, noise levels. The most used metric 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 and is commonly used to describe the "average" noise levels within the environment.

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

2.4 NOISE CONTROL

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

2.5 NOISE BARRIER ATTENUATION

Effective noise barriers can reduce noise levels by 10 to 15 dBA, cutting the loudness of traffic noise in half. A noise barrier is most effective when placed close to the noise source or receiver. Noise barriers, however, do have limitations. For a noise barrier to work, it must block the line-of-sight path of sound from the noise source.

2.6 LAND USE COMPATIBILITY WITH NOISE

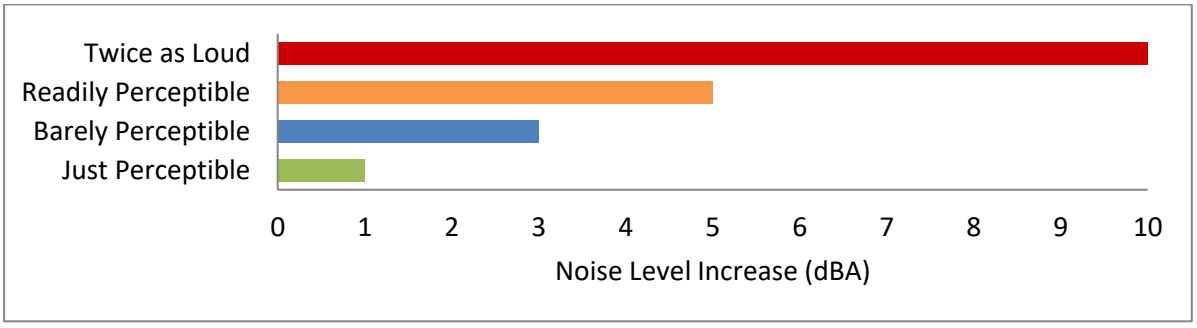
Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches, and residences are more sensitive to noise intrusion than are commercial or industrial developments and related activities. As ambient noise levels affect the perceived amenity or livability of a development,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

2.7 COMMUNITY RESPONSE TO NOISE

Approximately sixteen percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints may occur. Twenty to thirty percent of the population will not complain even in very severe noise environments. (7 pp. 8-6) Thus, a variety of reactions can be expected from people exposed to any given noise environment.

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

EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION



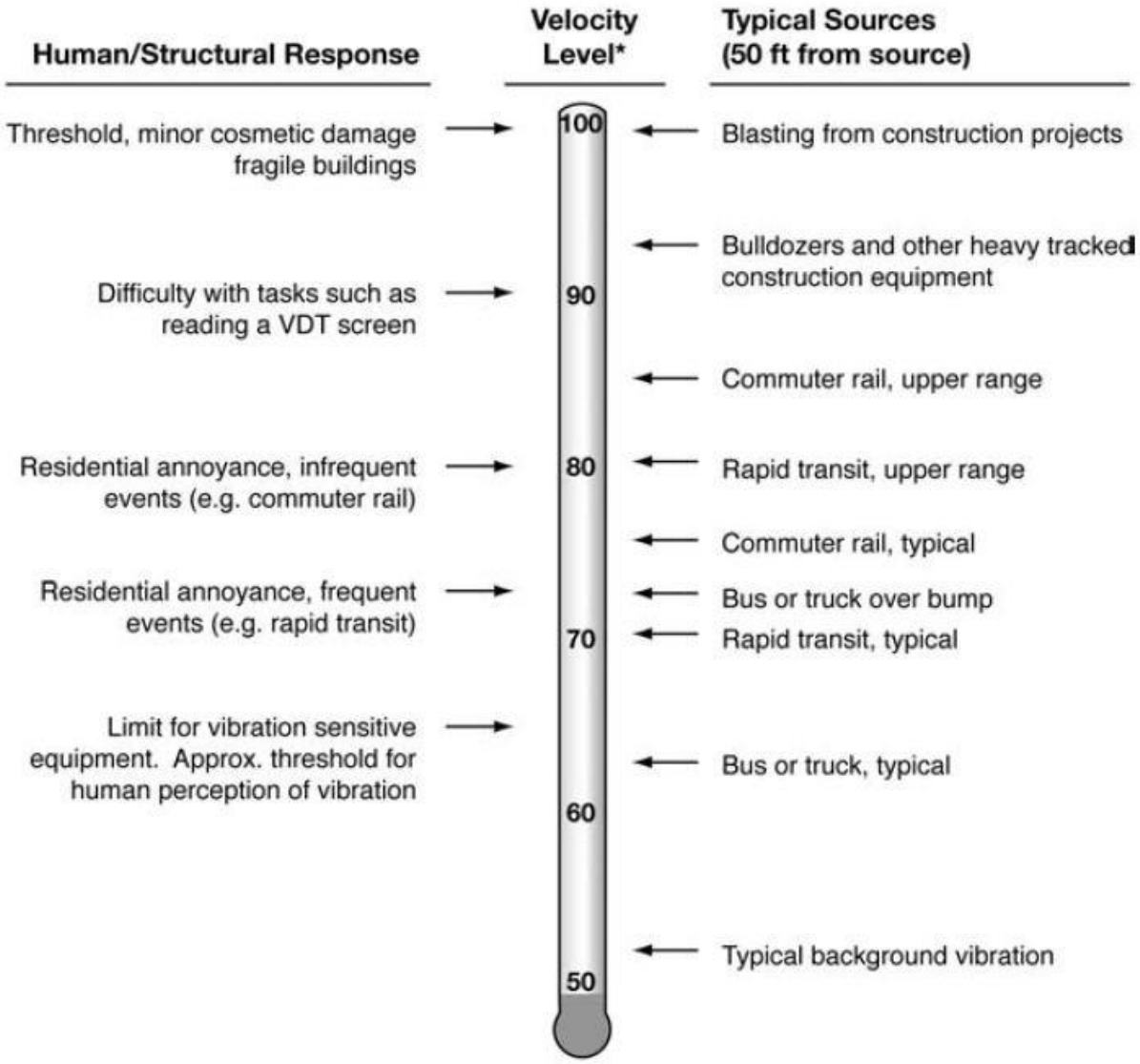
2.8 VIBRATION

Per the Federal Transit Administration (FTA) *Transit Noise Impact and Vibration Impact Assessment Manual* (8) , 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

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). (9) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*. In addition, the California Environmental Quality Act (CEQA) requires that all known environmental effects of a project be analyzed, including environmental noise impacts.

3.2 CITY OF SAN BERNARDINO GENERAL PLAN NOISE ELEMENT

The City of San Bernardino General Plan Noise Element identifies several policies to minimize the impacts of excessive noise levels throughout the community. (10) The Noise Element provides policy guidance which addresses the generation, mitigation, avoidance, and the control of excessive noise. To protect City of San Bernardino residents from excessive noise levels, the Noise Element contains the following three goals:

14.1 *Ensure that residents are protected from excessive noise through careful land planning.*

14.2 *Encourage the reduction of noise from transportation-related noise sources such as motor vehicles, aircraft operations, and railroad movements.*

14.3 *Protect residents from the negative effects of "spill over" or nuisance noise.*

The noise policies specified in the City of San Bernardino Noise Element provide the guidelines necessary to satisfy these goals. To ensure that residents are not exposed to excessive noise levels (Goal 14.1), Policies 14.1.1 to 14.1.4 indicate that sensitive land uses such as housing, health care facilities, schools, libraries, and religious facilities should not experience exterior noise levels greater than 65 dBA LDN for exterior areas and 45 dBA LDN for interior areas. As discussed in Section 2.2 the more conservative CNEL descriptor is used in this analysis, and therefore, the exterior noise level criteria of 65 dBA CNEL and interior noise level criteria of 45 dBA CNEL shall apply to sensitive land uses. Policies 14.2.1 to 14.2.19 outline the transportation-related guidelines and mitigation strategies the City uses to satisfy Goal 14.2. To protect residents from sources of operational and construction noise (Goal 14.3), the Noise Element

includes Policies 14.3.1 to 14.3.8 to adopt a Noise Ordinance and ensure noise issues between land uses are reduced. (10)

3.2.1 LAND USE COMPATIBILITY

The noise criteria identified in the City of San Bernardino Noise Element (Figure N-1) are guidelines to evaluate the land use compatibility of transportation-related noise. The compatibility criteria, shown on Exhibit 3-A, provides the city with a planning tool to gauge the compatibility of land uses relative to existing and future exterior noise levels. The *Land Use Compatibility for Community Noise Exposure* guidelines indicate that industrial land uses, such as the Project, are considered *normally acceptable* with noise levels below 75 dBA CNEL and *conditionally acceptable* with noise levels of less than 80 dBA CNEL.

3.2.2 TRANSPORTATION NOISE STANDARDS

To encourage the reduction of noise from transportation-related noise sources such as motor vehicles, aircraft operations and railroad movements (Goal 14.2), Table N-3 of the City of San Bernardino General Plan Noise Element, shown on Exhibit 3-B, identifies a maximum allowable exterior noise level of 65 dBA CNEL and an interior noise level limit of 45 dBA CNEL for new residential developments. While the City specifically identifies an exterior noise level limit for noise-sensitive residential land uses such as hotels, hospitals, schools, and parks, the City of San Bernardino does not maintain exterior noise standards for non-noise sensitive land uses such as manufacturing, warehousing, wholesale and utilities.

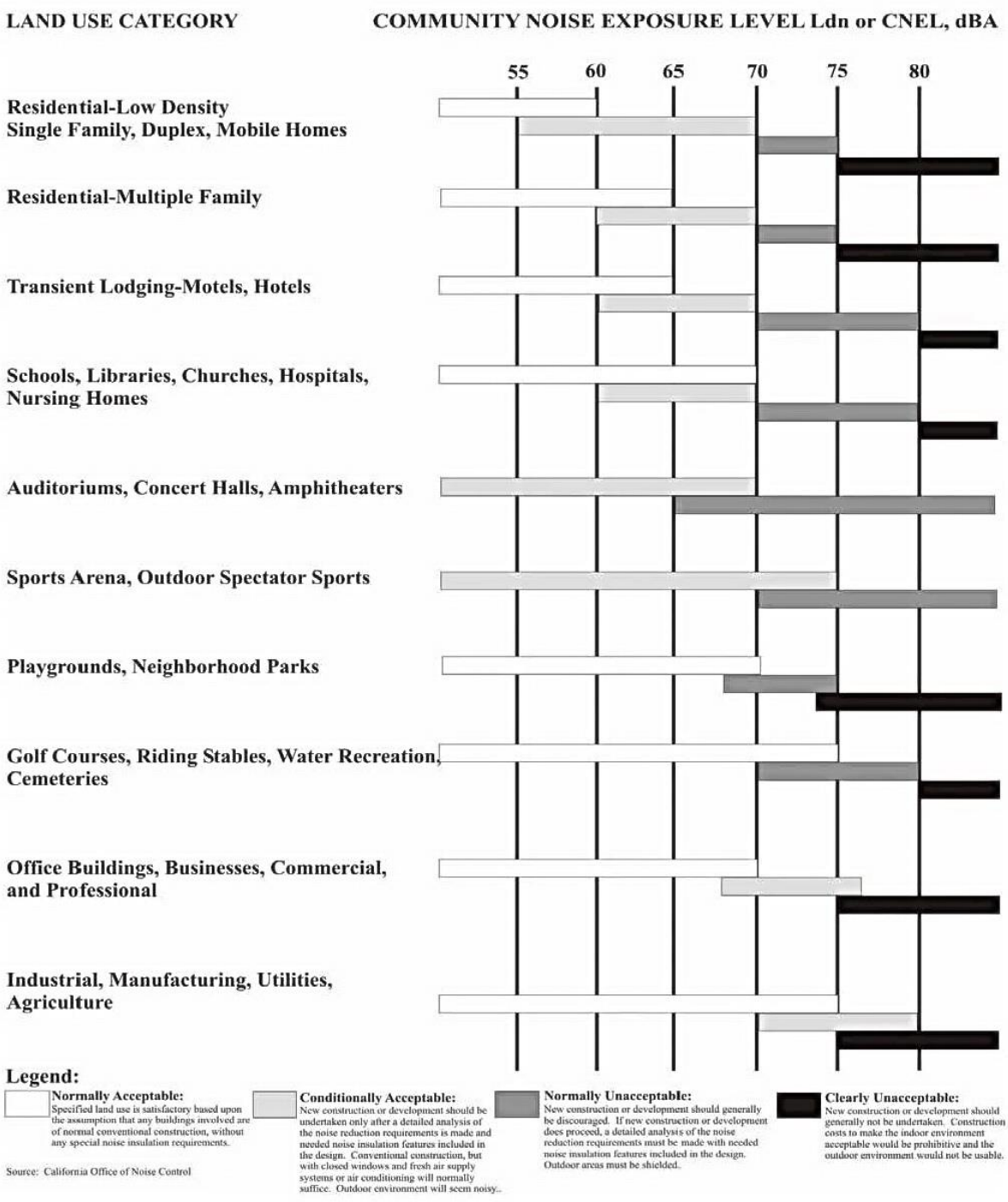
3.3 CONSTRUCTION NOISE STANDARDS

To control noise impacts associated with the construction of the proposed Project, the City of San Bernardino Municipal Code has established limits to the hours of operation. Section 8.54.070 the City of San Bernardino Municipal Code, provided in Appendix 3.1, indicates that construction activity is permitted between the hours within 7:00 a.m. and 8:00 p.m. However, neither the General Plan nor 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 with a nighttime exterior construction noise level of 70 dBA L_{eq} (8 p. 179).

EXHIBIT 3-A: LAND USE COMPATIBILITY FOR COMMUNITY NOISE EXPOSURE



Source: City of San Bernardino General Plan Noise Element, Figure N-1.

EXHIBIT 3-B: INTERIOR AND EXTERIOR NOISE STANDARDS

Land Use		*CNEL (dBA)*	
Categories	***Uses***	***Interior*** [1]	***Exterior*** [2]
Residential	Single and multi-family, duplex	45[3]	65
	Mobile homes	----	65[4]
Commercial	Hotel, motel, transient housing	45	---
	Commercial retail, bank, restaurant	55	---
	Office building, research and development, professional offices	50	---
	Amphitheater, concert hall, auditorium, movie theater	45	---
	Gymnasium (Multipurpose)	50	---
	Sports Club	55	---
	Manufacturing, warehousing, wholesale, utilities	65	---
	Movie Theaters	45	---
Institutional/ Public	Hospital, school classrooms/playgrounds	45	65
	Church, library	45	---
Open Space	Parks	---	65

[1] Indoor environment excluding: bathrooms, kitchens, toilets, closets, and corridors

[2] Outdoor environment limited to:

- Private yard of single-family dwellings
- Multi-family private patios or balconies accessed from within the dwelling (Balconies 6 feet deep or less are exempt)
- Mobile home parks
- Park picnic areas
- School playgrounds
- Hospital patios

[3] Noise level requirement with closed windows, mechanical ventilation or other means of natural ventilation shall be provided as per Chapter 12, Section 1205 of the Uniform Building Code.

[4] Exterior noise levels should be such that interior noise levels will not exceed 45 dBA CNEL.

Source: City of San Bernardino General Plan Noise Element, Table N-3.

3.4 CONSTRUCTION VIBRATION STANDARDS

Construction activity can result in varying degrees of ground-borne vibration, depending on the equipment and methods used, distance to the affected structures and soil type. Construction vibration is generally associated with pile driving and rock blasting. Other construction equipment such as air compressors, light trucks, hydraulic loaders, etc., generates little or no ground vibration (8).

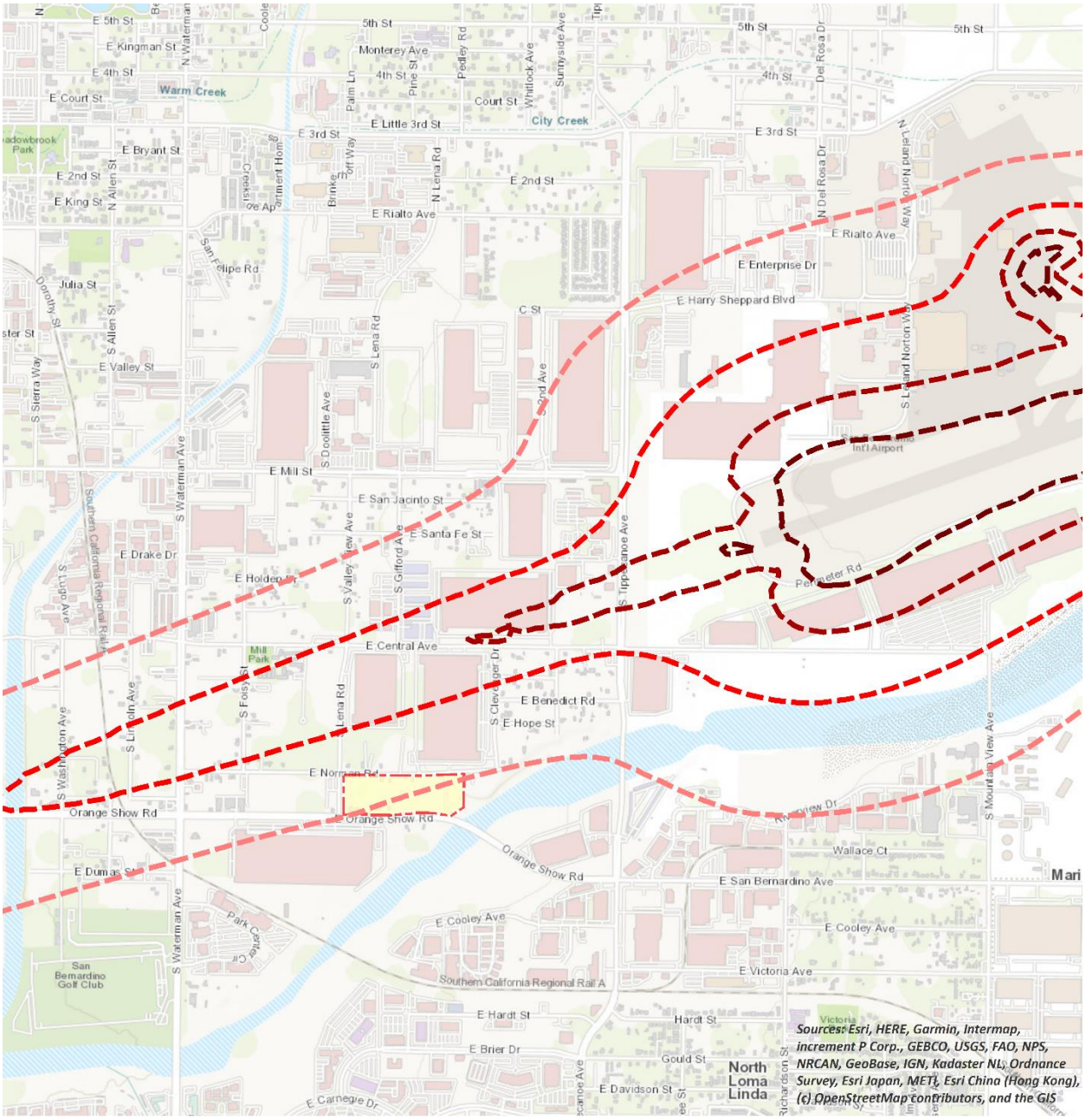
To analyze vibration impacts originating from the operation and construction of the Gateway South 9 Warehouse, vibration-generating activities are appropriately evaluated against standards established under a City's Municipal Code if such standards exist. However, the City of San Bernardino does not identify specific construction vibration level limits. Therefore, for analysis purposes, the Caltrans *Transportation and Construction Vibration Guidance Manual*, (11 p. 38) Table 19, vibration damage are used in this noise study to assess potential temporary construction-related impacts at adjacent building locations. The nearest noise sensitive buildings adjacent to the Project site can best be described as "older residential structures" with a maximum acceptable continuous vibration threshold of 0.3 PPV (in/sec).

3.5 SAN BERNARDINO INTERNATIONAL AIRPORT (SBIA)

The San Bernardino International Airport (SBIA) is located less than one mile northeast of the Project site. This places the Project site within the SBIA Influence Area. The SBIA was initially built as Norton Air Force Base by the United States Air Force (USAF). Under the Base Realignment and Closure Act of 1990, Norton Air Force base was closed and disposed of by the USAF for a civilian aviation reuse in 1994 and transferred to the San Bernardino International Airport Authority (SBIAA). The SBIAA operates the facility as a public-use general aviation airport that accommodates aircraft ranging from piston-powered propeller aircraft to multi-engine jet aircraft including large air cargo aircraft (12). The latest aircraft noise contour boundaries for the SBIA were published by the SBIAA on July 2, 2019, as part of the Eastgate Air Cargo Facility Final Environmental Assessment (12). Figure 4-6 of the Final Environmental Assessment describes the Proposed Project CNEL Contours for the SBIA. The future SBIA noise level contours boundaries representing approximately 87,500 annual aircraft operations are shown on Exhibit 3-C.

As shown on Exhibit 3-C the Project land uses are generally located outside the 65 dBA CNEL noise level contours of the SBIA. Therefore, the Project land use is considered *normally acceptable* according to the City of San Bernardino *Community Noise and Land Use Compatibility* guidelines as shown on Exhibit 3-A.

EXHIBIT 3-C: SAN BERNARDINO INTERNATIONAL AIRPORT (SBIA) NOISE CONTOURS



LEGEND: ***San Bernardino International (SBD) Airport Future Noise Level Contour Boundaries***

Site Boundary | 60 dBA CNEL | 65 dBA CNEL | 70 dBA CNEL | 75 dBA CNEL

N

Source: Figure 4-6 of the Eastgate Air Cargo Facility Final Environmental Assessment published by the SBIAA on July 2, 2019.

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?

4.1 NOISE LEVEL INCREASES (THRESHOLD A)

Noise level increases resulting from the Project are evaluated based on the Appendix G CEQA Guidelines. Under CEQA, consideration must be given to the magnitude of the increase, the existing baseline ambient noise levels, and the location of receivers to determine if a noise increase represents a significant adverse environmental impact. This approach recognizes *that there is no single noise increase that renders the noise impact significant.* (13) This is primarily because of the wide variation in individual thresholds of annoyance and differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted—the so-called *ambient* environment. In general, the more a new noise level exceeds the previously existing ambient noise level, the less acceptable the new noise level will typically be judged.

4.1.1 NOISE-SENSITIVE RECEIVERS

The Federal Interagency Committee on Noise (FICON) (14) developed guidance to be used for the assessment of project-generated increases in noise levels that consider the ambient noise level. The FICON recommendations are based on studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (CNEL) and equivalent continuous noise level (L_{eq}).

As previously stated, the approach used in this noise study recognizes *that there is no single noise increase that renders the noise impact significant*, based on a 2008 California Court of Appeal ruling on Gray v. County of Madera. (13) For example, if the ambient noise environment is quiet (<60 dBA) and the new noise source greatly increases the noise levels, an impact may occur if the noise criteria may be exceeded. Therefore, for this analysis, a *readily perceptible* 5 dBA or greater project-related noise level increase is considered a significant impact when the without project noise levels are below 60 dBA. Per the FICON, in areas where the without project noise levels range from 60 to 65 dBA, a 3 dBA *barely perceptible* noise level increase appears to be

appropriate for most people. When the without project noise levels already exceed 65 dBA, any increase in community noise louder than 1.5 dBA or greater is considered a significant impact if the noise criteria for a given land use is exceeded, since it likely contributes to an existing noise exposure exceedance. The FICON guidance provides an established source of criteria to assess the impacts of substantial temporary or permanent increase in baseline ambient noise levels. Based on the FICON criteria, the amount to which a given noise level increase is considered acceptable is reduced when the without Project (baseline) noise levels are already shown to exceed certain land-use specific exterior noise level criteria. The specific levels are based on typical responses to noise level increases of 5 dBA or *readily perceptible*, 3 dBA or *barely perceptible*, and 1.5 dBA depending on the underlying without Project noise levels for noise-sensitive uses. These levels of increases and their perceived acceptance are consistent with guidance provided by both the Federal Highway Administration (4 p. 9) and Caltrans (15 p. 2_48).

4.1.2 NON-NOISE-SENSITIVE RECEIVERS

The City of San Bernardino General Plan Noise Element, Table N-1, *Land Use Compatibility for Community Noise Exposure* was used to establish the satisfactory noise levels of significance for non-noise-sensitive land uses in the Project study area. As previously shown on Exhibit 3-A, the *normally acceptable* exterior noise level for non-noise-sensitive land uses is 70 dBA CNEL. Noise levels greater than 70 dBA CNEL are considered *conditionally acceptable* per the *Land Use Compatibility for Community Noise Exposure*. (10)

To determine if Project-related traffic noise level increases are significant at off-site non-noise-sensitive land uses, a *barely perceptible* 3 dBA criteria is used. When the without Project noise levels are greater than the *normally acceptable* 70 dBA CNEL land use compatibility criteria, a *barely perceptible* 3 dBA or greater noise level increase is considered a significant impact since the noise level criteria is already exceeded. The noise level increases used to determine significant impacts for non-noise-sensitive land uses is generally consistent with the FICON noise level increase thresholds for noise-sensitive land uses but instead rely on the City of San Bernardino General Plan Noise Element, Table N-1, *Land Use Compatibility for Community Noise Exposure normally acceptable* 70 dBA CNEL exterior noise level criteria.

4.2 VIBRATION (THRESHOLD B)

As described in Section 3.4, the vibration impacts originating from the construction of Gateway South 9 Warehouse, vibration-generating activities are appropriately evaluated using the Caltrans vibration damage thresholds to assess potential temporary construction-related impacts at adjacent building locations. The nearest noise sensitive buildings adjacent to the Project site can best be described as “older residential structures” with a maximum acceptable continuous vibration threshold of 0.3 PPV (in/sec).

4.3 CEQA GUIDELINES NOT FURTHER ANALYZED (THRESHOLD C)

The closest airport which would require additional noise analysis under CEQA Appendix G Guideline C is the SBIA. As previously indicated in Section 3.5, the noise contour boundaries of SBIA are presented on Exhibit 3-C of this report and shows that the Project's industrial land uses are considered *normally acceptable* since the development area is located outside the 65 dBA CNEL contour. Therefore, the Project impacts are considered *less than significant,* and no further noise analysis is provided under CEQA Significance Criteria C.

4.4 SIGNIFICANCE CRITERIA SUMMARY

Noise impacts shall be considered significant if any of the following occur as a direct result of the proposed Project. Table 4-1 shows the significance criteria summary matrix that includes the allowable criteria used to identify potentially significant incremental noise level increases.

TABLE 4-1: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Receiving Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
Off-Site	Noise-Sensitive[1]	If ambient is < 60 dBA CNEL	≥ 5 dBA CNEL Project increase	
		If ambient is 60 - 65 dBA CNEL	≥ 3 dBA CNEL Project increase	
		If ambient is > 65 dBA CNEL	≥ 1.5 dBA CNEL Project increase	
	Non-Noise-Sensitive[2]	if ambient is > 70 dBA CNEL	≥ 3 dBA CNEL Project increase	
Operational	Noise-Sensitive[1]	Exterior Noise Level Limit[3]	65 dBA L_{eq}	
		If ambient is < 60 dBA L_{eq}[1]	≥ 5 dBA L_{eq} Project increase	
		If ambient is 60 - 65 dBA L_{eq}[1]	≥ 3 dBA L_{eq} Project increase	
		If ambient is > 65 dBA L_{eq}[1]	≥ 1.5 dBA L_{eq} Project increase	
Construction	Noise-Sensitive[1]	Permitted between the hours within 7:00 a.m. and 8:00 p.m.[4]		
		Noise Level Threshold[5]	80 dBA L_{eq}	70 dBA L_{eq}
		Vibration Level Threshold[6]	0.3 PPV (in/sec)	n/a

[1] FICON, 1992.
[2] City of San Bernardino General Plan Noise Element, Figure N-1.
[3] City of San Bernardino Development Code, Section 19.20.030.15[A] (Appendix 3.1).
[4] Section 8.54.070 of the City of San Bernardino Municipal Code (Appendix 3.1).
[5] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual.
[6] Caltrans Transportation and Construction Vibration Manual, April 2020 Table 19.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

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5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, 24-hour noise level measurements were taken at four locations in the Project study area. The receiver locations were selected to describe and document the existing noise environment within the Project study area. Exhibit 5-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, November 30th, 2022. Appendix 5.1 includes study area photos.

5.1 MEASUREMENT PROCEDURE AND CRITERIA

To describe the existing noise environment, the hourly noise levels were measured during typical weekday conditions over a 24-hour period. By collecting individual hourly noise level measurements, it is possible to describe the equivalent daytime and nighttime hourly noise levels. The long-term noise readings were recorded using Piccolo Type 2 integrating sound level meter and dataloggers. The Piccolo sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 150. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (17)

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*. (8)

Based on recommendations of Caltrans and the FTA, it is not necessary to collect measurements at each individual building or residence, because each receiver measurement represents a group of buildings that share acoustical equivalence. (8) In other words, the area represented by the receiver shares similar shielding, terrain, and geometric relationship to the reference noise source. Receivers represent a location of noise sensitive areas and are used to estimate the future noise level impacts. Collecting reference ambient noise level measurements at the nearby sensitive receiver locations allows for a comparison of the before and after Project noise levels

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

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS

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.

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

Location[1]	Description	Energy Average Noise Level (dBA L_{eq})[2]	
		Daytime	Nighttime
L1	Located northeast of the project site near the single-family residence at 948 Norman Rd.	60.1	59.1
L2	Located northeast of the project site near the single-family residence at 984 Hope St.	57.8	57.6
L3	Located south of the project site near the single-family residence at 755 Orange Show Rd.	71.3	68.9
L4	Located west of the project site near the single-family residence at 434 Norman Rd.	63.8	62.4

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

Table 5-1 provides the equivalent noise levels used to describe the daytime, and nighttime ambient conditions. 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.

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6 TRAFFIC NOISE METHODS AND PROCEDURES

The following section outlines the methods and procedures used to estimate and analyze the future traffic noise environment. Consistent with the State of California Land Use Compatibility Plan (see Exhibit 3-A), all transportation related noise levels are presented in terms of the 24-hour CNEL's.

6.1 FHWA TRAFFIC NOISE PREDICTION MODEL

The expected roadway noise level increases from vehicular traffic were calculated by Urban Crossroads, Inc. using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. (18) 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. (19) 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. (20)

6.1.1 OFF-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

Table 6-1 presents the roadway parameters used to assess the Project's off-site transportation noise impacts. Table 6-1 identifies the six off-site study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications per the City of 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 *Gateway South 9 Warehouse Traffic Impact Analysis*, prepared by Translutions, Inc. (21)

- Existing Conditions 2022 (E)
- Existing Conditions plus Project (E+P)
- Opening Year (2024) Base Plus Other Projects (OY)
- Opening Year (2024) Base Plus Other Projects Plus Project (OY+P)

The ADT volumes vary for each roadway segment based on the existing traffic volumes and the combination of project traffic distributions. This analysis relies on a comparative evaluation of the off-site traffic noise impacts at the boundary of the right-of-way of the receiving adjacent land use, without and with project ADT traffic volumes from the Project traffic analysis. The Project is anticipated to generate a net total of 557 two-way trips per day (actual vehicles) that

includes 88 truck trips. However, the project site is currently occupied and includes various industrial land uses generating approximately 153 two-way trips per day (actual vehicles) that includes 133 truck trips. While the traffic impact analysis suggests that the Project will result in a reduction in the number of trips, the following off-site traffic noise analysis includes an additional 493 two-way trips per day (actual vehicles) that includes 44 truck trips.

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Classification[1]	Receiving Land Use[2]	Distance from Centerline to Receiving Land Use (Feet)[3]	Vehicle Speed (mph)
1	Lena Rd.	n/o Norman Rd.	Major Arterial	Non-Sensitive	50'	45
2	Lena Rd.	n/o Orange Show Rd.	Major Arterial	Non-Sensitive	50'	45
3	Norman Rd.	w/o Lena Rd.	Local	Sensitive	30'	25
4	Norman Rd.	e/o Lena Rd.	Local	Sensitive	30'	25
5	Orange Show Rd.	w/o Lena Rd.	Major Arterial	Sensitive	50'	50
6	Orange Show Rd.	e/o Lena Rd.	Major Arterial	Sensitive	50'	50

[1] City of San Bernardino General Plan Circulation Element.
[2] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[3] Distance to receiving land use is based upon the right-of-way distances.

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 *Gateway South 9 Warehouse Traffic Impact Analysis*. Using the Project truck trips in combination with the Project trip distribution, Urban Crossroads, Inc. calculated the number of additional Project truck trips and vehicle mix percentages for each of the study area roadway segments. Table 6-4 shows the traffic flow by vehicle type (vehicle mix) used for all without Project traffic scenarios, and Tables 6-5 to 6-8 show the vehicle mixes used for the with Project traffic scenarios.

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic Volumes[1]			
			Existing		Opening Year 2024	
			Without Project	With Project	Without Project	With Project
1	Lena Rd.	n/o Norman Rd.	1,790	1,857	1,940	2,007
2	Lena Rd.	n/o Orange Show Rd.	2,610	2,736	2,660	2,786
3	Norman Rd.	w/o Lena Rd.	430	475	480	525
4	Norman Rd.	e/o Lena Rd.	1,230	1,423	1,240	1,433
5	Orange Show Rd.	w/o Lena Rd.	430	721	480	771
6	Orange Show Rd.	e/o Lena Rd.	1,230	1,429	1,240	1,439

[1] Gateway South 9 Warehouse Traffic Impact Analysis, Translutions, 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 vehicle mix. Values rounded to the nearest one-hundredth.
"Daytime" = 7:00 a.m. to 7:00 p.m.; "Evening" = 7:00 p.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

TABLE 6-4: WITHOUT PROJECT VEHICLE MIX

Classification	Total % Traffic Flow			Total
	Autos	Medium Trucks	Heavy Trucks	
All Segments	93.28%	2.61%	4.10%	100.00%

[1] Based on the June 15, 2021, 24-hour directional vehicle classification count collected on north/south of Lena Rd. and east/west of Norman Rd. (Gateway South 9 Warehouse Traffic Impact Analysis, Translutions, Inc.)

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 WITH PROJECT VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total[2]
1	Lena Rd.	n/o Norman Rd.	93.53%	2.52%	3.96%	100.00%
2	Lena Rd.	n/o Orange Show Rd.	93.10%	2.57%	4.32%	100.00%
3	Norman Rd.	w/o Lena Rd.	93.92%	2.36%	3.72%	100.00%
4	Norman Rd.	e/o Lena Rd.	93.26%	2.42%	4.33%	100.00%
5	Orange Show Rd.	w/o Lena Rd.	89.84%	2.59%	7.57%	100.00%
6	Orange Show Rd.	e/o Lena Rd.	92.04%	2.61%	5.34%	100.00%

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

TABLE 6-6: OPENING YEAR (2024) WITH PROJECT VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total[2]
1	Lena Rd.	n/o Norman Rd.	93.51%	2.52%	3.97%	100.00%
2	Lena Rd.	n/o Orange Show Rd.	93.11%	2.57%	4.32%	100.00%
3	Norman Rd.	w/o Lena Rd.	93.86%	2.39%	3.75%	100.00%
4	Norman Rd.	e/o Lena Rd.	93.26%	2.42%	4.33%	100.00%
5	Orange Show Rd.	w/o Lena Rd.	90.06%	2.59%	7.35%	100.00%
6	Orange Show Rd.	e/o Lena Rd.	92.05%	2.61%	5.33%	100.00%

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

7 OFF-SITE TRAFFIC NOISE ANALYSIS

To assess the off-site transportation CNEL noise level impacts associated with development of the proposed Project, noise contours were developed based on the *Gateway South 9 Warehouse Traffic Impact Analysis* prepared by Translutions, Inc. (21) 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 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 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 to 7-4 present a summary of the exterior traffic noise levels for each traffic condition. Appendix 7.1 includes the traffic noise level contours worksheets for each traffic condition.

TABLE 7-1: EXISTING WITHOUT PROJECT CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Lena Rd.	n/o Norman Rd.	Non-Sensitive	63.8	RW	RW	90
2	Lena Rd.	n/o Orange Show Rd.	Non-Sensitive	65.5	RW	54	116
3	Norman Rd.	w/o Lena Rd.	Sensitive	54.5	RW	RW	RW
4	Norman Rd.	e/o Lena Rd.	Sensitive	59.0	RW	RW	RW
5	Orange Show Rd.	w/o Lena Rd.	Sensitive	58.6	RW	RW	RW
6	Orange Show Rd.	e/o Lena Rd.	Sensitive	63.1	RW	RW	81

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

TABLE 7-2: EXISTING WITH PROJECT 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	Lena Rd.	n/o Norman Rd.	Non-Sensitive	63.9	RW	RW	91
2	Lena Rd.	n/o Orange Show Rd.	Non-Sensitive	65.8	RW	57	122
3	Norman Rd.	w/o Lena Rd.	Sensitive	54.6	RW	RW	RW
4	Norman Rd.	e/o Lena Rd.	Sensitive	59.8	RW	RW	RW
5	Orange Show Rd.	w/o Lena Rd.	Sensitive	62.4	RW	RW	72
6	Orange Show Rd.	e/o Lena Rd.	Sensitive	64.4	RW	RW	98

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

TABLE 7-3: OPENING YEAR (2024) WITHOUT PROJECT CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Lena Rd.	n/o Norman Rd.	Non-Sensitive	64.2	RW	RW	95
2	Lena Rd.	n/o Orange Show Rd.	Non-Sensitive	65.6	RW	54	117
3	Norman Rd.	w/o Lena Rd.	Sensitive	54.9	RW	RW	RW
4	Norman Rd.	e/o Lena Rd.	Sensitive	59.1	RW	RW	RW
5	Orange Show Rd.	w/o Lena Rd.	Sensitive	59.1	RW	RW	RW
6	Orange Show Rd.	e/o Lena Rd.	Sensitive	63.2	RW	RW	81

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

TABLE 7-4: OPENING YEAR (2024) WITH PROJECT CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Lena Rd.	n/o Norman Rd.	Non-Sensitive	64.2	RW	RW	96
2	Lena Rd.	n/o Orange Show Rd.	Non-Sensitive	65.9	RW	57	123
3	Norman Rd.	w/o Lena Rd.	Sensitive	55.0	RW	RW	RW
4	Norman Rd.	e/o Lena Rd.	Sensitive	59.8	RW	RW	RW
5	Orange Show Rd.	w/o Lena Rd.	Sensitive	62.6	RW	RW	74
6	Orange Show Rd.	e/o Lena Rd.	Sensitive	64.4	RW	RW	99

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

7.2 EXISTING PROJECT TRAFFIC NOISE LEVEL INCREASES

An analysis of existing traffic noise levels plus traffic noise generated by the proposed Project has been included in this report for informational purposes and to fully analyze all the existing traffic scenarios identified in the Traffic Impact Analysis prepared by Translutions, Inc. However, the analysis of existing off-site traffic noise levels plus traffic noise generated by the proposed Project scenario will not actually occur since the Project would not be fully constructed and operational until Year 2023 conditions. Table 7-1 shows the Existing without Project conditions CNEL noise levels. The Existing without Project exterior noise levels range from 54.5 to 65.5 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-2 shows the Existing with Project conditions ranging from 54.6 to 65.8 dBA CNEL. Table 7-5 shows that the Project off-site traffic noise level increases range from 0.0 to 3.8 dBA CNEL on the study area roadway segments. Based on the significance criteria for off-site traffic noise presented in Table 4-1, land uses adjacent to the study area roadway segments would experience *less than significant* noise level increases on receiving land uses due to the Project-related traffic.

7.3 OPENING YEAR (2024) TRAFFIC NOISE LEVEL INCREASES

Table 7-3 presents the Opening Year (2024) without Project conditions CNEL noise levels. The OY (2024) without Project exterior noise levels range from 54.9 to 65.6 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-4 shows that the Opening Year (2024) with Project conditions will range from 55.0 to 65.9 dBA CNEL. Table 7-6 shows that the Project off-site traffic noise level increases range from 0.0 to 3.5 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Table 4-1, land uses adjacent to the study area roadway segments would experience *less than significant* noise level increases on receiving land uses due to the Project-related traffic.

TABLE 7-5: 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 Increment	Limit	Exceeded?
1	Lena Rd.	n/o Norman Rd.	Non-Sensitive	63.8	63.9	0.1	n/a	No
2	Lena Rd.	n/o Orange Show Rd.	Non-Sensitive	65.5	65.8	0.3	n/a	No
3	Norman Rd.	w/o Lena Rd.	Sensitive	54.5	54.6	0.1	5.0	No
4	Norman Rd.	e/o Lena Rd.	Sensitive	59.0	59.8	0.8	5.0	No
5	Orange Show Rd.	w/o Lena Rd.	Sensitive	58.6	62.4	3.8	5.0	No
6	Orange Show Rd.	e/o Lena Rd.	Sensitive	63.1	64.4	1.3	3.0	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)?
"n/a" Per the General Plan Noise Element Table N-1, a barely perceptible 3 dBA or greater noise level increase is considered a significant impact when the ambient non-noise sensitive noise level is greater than the normally acceptable 70 dBA CNEL land use compatibility criteria.

TABLE 7-6: OPENING YEAR (2024) 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 Increment	Limit	Exceeded?
1	Lena Rd.	n/o Norman Rd.	Non-Sensitive	64.2	64.2	0.0	n/a	No
2	Lena Rd.	n/o Orange Show Rd.	Non-Sensitive	65.6	65.9	0.3	n/a	No
3	Norman Rd.	w/o Lena Rd.	Sensitive	54.9	55.0	0.1	5.0	No
4	Norman Rd.	e/o Lena Rd.	Sensitive	59.1	59.8	0.7	5.0	No
5	Orange Show Rd.	w/o Lena Rd.	Sensitive	59.1	62.6	3.5	5.0	No
6	Orange Show Rd.	e/o Lena Rd.	Sensitive	63.2	64.4	1.2	3.0	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)?
"n/a" Per the General Plan Noise Element Table N-1, a barely perceptible 3 dBA or greater noise level increase is considered a significant impact when the ambient non-noise sensitive noise level is greater than the normally acceptable 70 dBA CNEL land use compatibility criteria.

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8 RECEIVER LOCATIONS

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

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

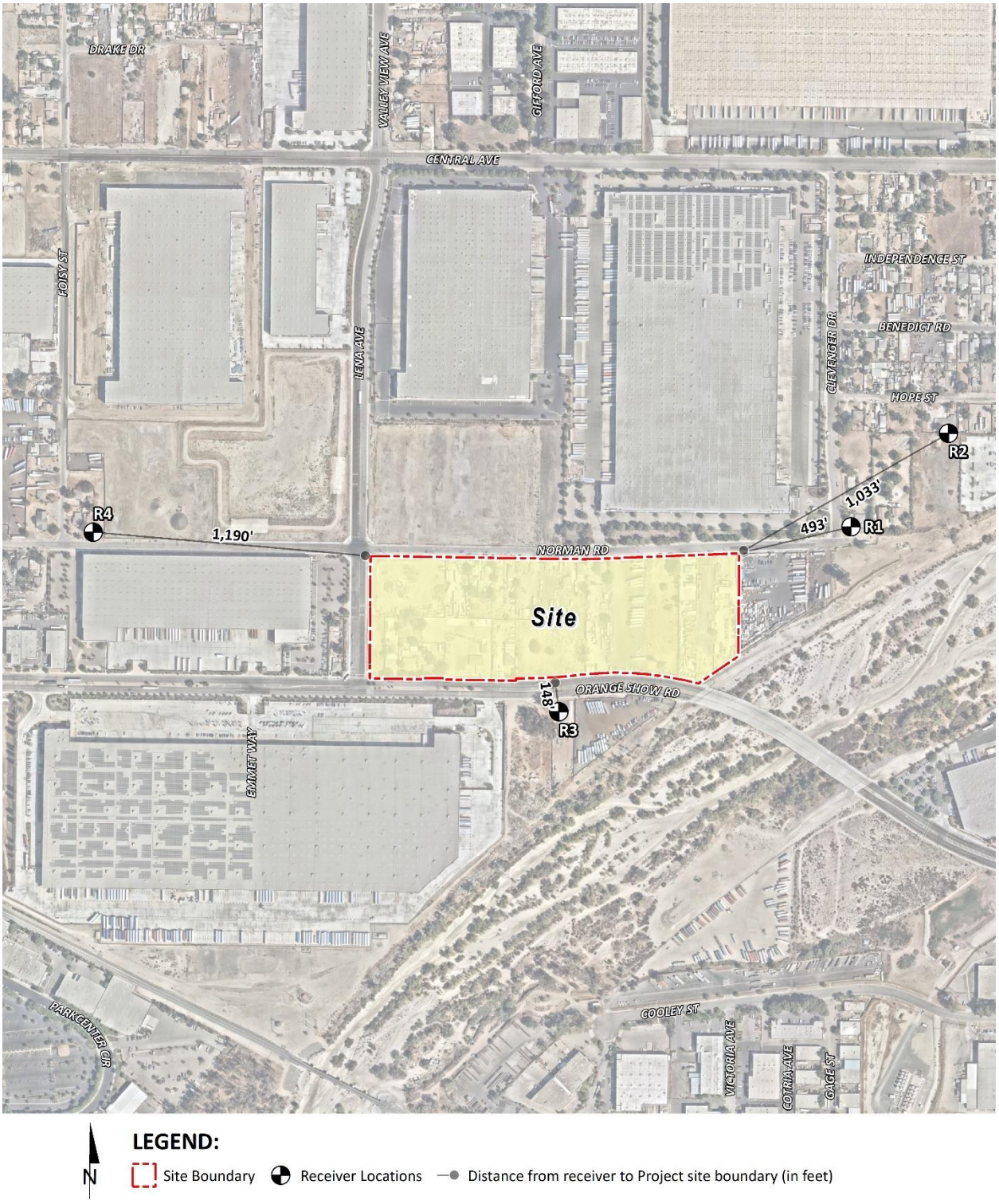
R1: Location R1 represents the existing residence at 948 East Norman Road, approximately 493 feet northeast of the Project site. R1 is placed in the private outdoor living areas (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

R2: Location R2 represents the existing residence at 1031 Hope Street, approximately 1,033 feet northeast of the Project site. R2 is placed in the private outdoor living areas (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L2, to describe the existing ambient noise environment.

R3: Location R3 represents the existing residence at 755 East Orange Show Road, approximately 148 feet south of the Project site. R3 is placed in the private outdoor living areas (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L3, to describe the existing ambient noise environment.

R4: Location R4 represents the existing residence at 514 East Norman Road, approximately 1,190 feet northwest of the Project site. R4 is placed in the private outdoor living areas (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L4, to describe the existing ambient noise environment.

EXHIBIT 8-A: RECEIVER LOCATIONS



9 OPERATIONAL NOISE ANALYSIS

This section analyzes the potential stationary-source operational noise impacts at the nearby receiver locations, identified in Section 8, resulting from the operation of the proposed Gateway South 9 Warehouse Project. Exhibit 9-A identifies the noise source locations used to assess the operational noise levels. The operational noise analysis includes the planned 14-foot-high screen walls. The screenwall shown on Exhibit 9-A is designed for screening, privacy, noise control, and security.

9.1 OPERATIONAL NOISE SOURCES

This operational noise analysis is intended to describe noise level impacts associated with the expected typical of daytime and nighttime activities at the Project site. To present the potential worst-case noise conditions, this analysis assumes the Project would be operational 24 hours per day, seven days per week. Consistent with similar warehouse and industrial uses, the Project business operations would primarily be conducted within the enclosed building, except for traffic movement, parking, as well as loading and unloading of trucks at designated loading bays. The on-site Project-related noise sources are expected to include: loading dock activity, roof-top air conditioning units, trash enclosure activity, parking lot vehicle movements, and truck movements.

9.2 REFERENCE NOISE LEVELS

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

9.2.1 MEASUREMENT PROCEDURES

The reference noise level measurements presented in this section were collected using a Larson Davis LxT Type 1 precision 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. (17)

EXHIBIT 9-A: OPERATIONAL NOISE SOURCE LOCATIONS

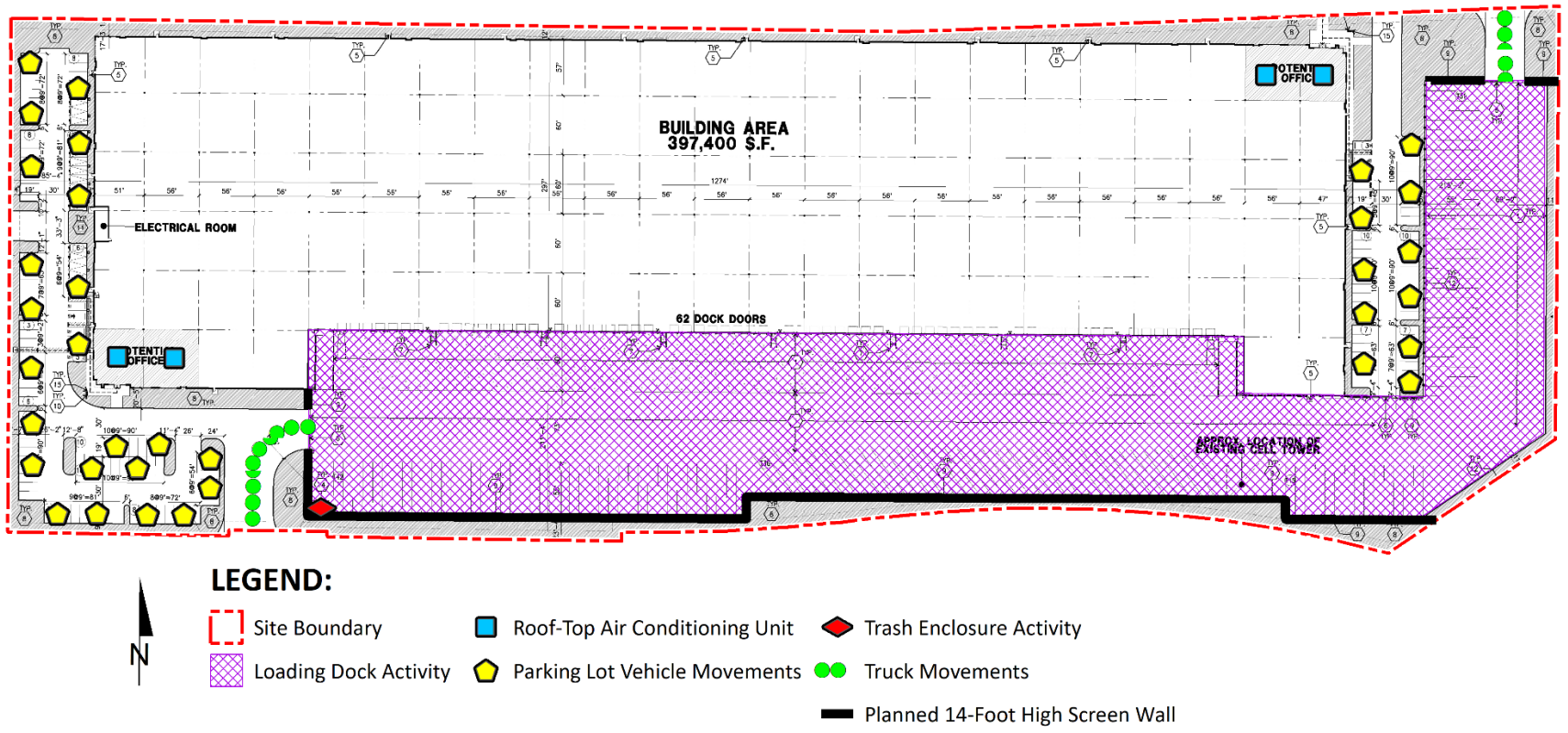


TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS

Noise Source[1]	Noise Source Height (Feet)	Min./ Hour[2]		Reference Noise Level (dBA L_{eq}) @ 50 Feet	Sound Power Level (dBA)[3]
		Day	Night		
Loading Dock Activity	8'	60	60	62.8	103.4
Roof-Top Air Conditioning Units	5'	39	28	57.2	88.9
Trash Enclosure Activity	5'	60	30	57.3	89.0
Parking Lot Vehicle Movements	5'	60	60	52.6	81.1
Truck Movements	8'	60	60	59.8	93.2

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

9.2.2 LOADING DOCK ACTIVITY

The reference loading dock activities are intended to describe the typical operational noise source levels associated with the Project. This includes truck idling, deliveries, backup alarms, unloading/loading, docking including a combination of tractor trailer semi-trucks, two-axle delivery trucks, and background forklift operations. At a uniform reference distance of 50 feet, Urban Crossroads collected a reference noise level of 62.8 dBA L_{eq}. The loading dock activity noise level measurement was taken over a fifteen-minute period and represents multiple noise sources taken from the center of activity. The reference noise level measurement includes employees unloading a docked truck container included the squeaking of the truck's shocks when weight was removed from the truck, employees playing music over a radio, as well as a forklift horn and backup alarm. In addition, during the noise level measurement a truck entered the loading dock area and proceeded to reverse and dock in a nearby loading bay, adding truck engine, idling, air brakes noise, in addition to on-going idling of an already docked truck. Loading dock activity is estimated during all the daytime, evening, and nighttime hours.

9.2.3 ROOF-TOP AIR CONDITIONING UNITS

The noise level measurements describe a single mechanical roof-top air conditioning unit. The reference noise level represents a Lennox SCA120 series 10-ton model packaged air conditioning unit. At the uniform reference distance of 50 feet, the reference noise 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 and average 39 minutes per hour during the daytime hours, and 28 minutes per hour during the nighttime hours. These operating conditions reflect peak summer cooling requirements with measured temperatures approaching 96 degrees Fahrenheit (°F) with average daytime temperatures of 82°F. For this noise analysis, the air conditioning units are expected to be located on the roof of the Project buildings.

9.2.5 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 57.3 dBA L_{eq} for the trash enclosure activity. The reference noise level describes the expected noise source activities associated with the trash enclosures for the Project's proposed building.

9.2.6 PARKING LOT VEHICLE MOVEMENTS

To describe the on-site parking lot activity, a long-term 29-hour reference noise level measurement was collected in the center of activity within the staff parking lot of an Amazon warehouse distribution center. At 50 feet from the center of activity, the parking lot produced a reference noise level of 52.6 dBA L_{eq}. Parking activities are expected to take place during the full hour (60 minutes) throughout the daytime and evening hours. The parking lot noise levels are mainly due cars pulling in and out of parking spaces in combination with car doors opening and closing.

9.2.6 TRUCK MOVEMENTS

The truck movements reference noise level measurement was collected over a period of 1 hour and 28 minutes and represents multiple heavy trucks entering and exiting the outdoor loading dock area producing a reference noise level of 59.8 dBA L_{eq} at 50 feet. The noise sources included at this measurement location account for trucks entering and existing the Project driveways and maneuvering in and out of the outdoor loading dock activity area.

9.3 CADNAA NOISE PREDICTION MODEL

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

Using the ISO 9613-2 protocol, CadnaA will calculate the distance from each noise source to the noise receiver locations, using the ground absorption, distance, and barrier/building attenuation inputs to provide a summary of noise level at each receiver and the partial noise level contributions by noise source. Consistent with the ISO 9613-2 protocol, the CadnaA noise prediction model relies on the reference sound power level (L_w) to describe individual noise sources. While sound pressure levels (e.g., L_{eq}) quantify in decibels the intensity of given sound sources at a reference distance, sound power levels (L_w) are connected to the sound source and are independent of distance. Sound pressure levels vary substantially with distance from the source and diminish because of intervening obstacles and barriers, air absorption, wind, and

other factors. Sound power is the acoustical energy emitted by the sound source and is an absolute value that is not affected by the environment. The operational noise level calculations provided in this noise study account for the distance attenuation provided due to geometric spreading, when sound from a localized stationary source (i.e., a point source) propagates uniformly outward in a spherical pattern. A default ground attenuation factor of 0.5 was used in the CadnaA noise analysis to account for mixed ground representing a combination of hard and soft surfaces. Appendix 9.1 includes the detailed noise model inputs used to estimate the Project operational noise levels presented in this section.

9.4 PROJECT OPERATIONAL NOISE LEVELS

Using the reference noise levels to represent the proposed Project operations that include loading dock activity, roof-top air conditioning units, trash enclosure activity, parking lot vehicle movements, and truck movements, Urban Crossroads, Inc. calculated the operational source noise levels that are expected to be generated at the Project site and the Project-related noise level increases that would be experienced at each of the sensitive receiver locations. Table 9-2 shows the Project operational noise levels during the daytime hours of 7:00 a.m. to 10:00 p.m. The daytime hourly noise levels at the off-site receiver locations are expected to range from 31.9 to 47.5 dBA L_{eq}.

TABLE 9-2: DAYTIME PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1]	Operational Noise Levels by Receiver Location (dBA Leq)			
	R1	R2	R3	R4
Loading Dock Activity	39.0	32.3	42.7	18.7
Roof-Top Air Conditioning Units	30.0	26.0	29.2	21.1
Trash Enclosure Activity	9.8	6.4	20.5	0.9
Parking Lot Vehicle Movements	30.5	25.5	30.6	15.4
Truck Movements	46.7	40.9	42.1	31.2
Total (All Noise Sources)	**47.5**	**41.7**	**45.7**	**31.9**

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

Tables 9-3 shows the Project operational noise levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. The nighttime hourly noise levels at the off-site receiver locations are expected to range from 31.8 to 47.5 dBA L_{eq}. The differences between the daytime and nighttime noise levels are largely related to the estimated duration of noise activity as outlined in Table 9-1 and Appendix 9.1.

TABLE 9-3: NIGHTTIME PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1]	Operational Noise Levels by Receiver Location (dBA Leq)			
	R1	R2	R3	R4
Loading Dock Activity	39.0	32.3	42.7	18.7
Roof-Top Air Conditioning Units	27.6	23.6	26.8	18.7
Trash Enclosure Activity	5.8	2.4	16.6	0.0
Parking Lot Vehicle Movements	30.5	25.5	30.6	15.4
Truck Movements	46.7	40.9	42.1	31.2
Total (All Noise Sources)	**47.5**	**41.6**	**45.6**	**31.8**

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

9.5 PROJECT OPERATIONAL NOISE LEVEL COMPLIANCE

To demonstrate compliance with local noise regulations, the Project-only operational noise levels are evaluated against exterior noise level thresholds based on the City of San Bernardino exterior noise level standards at nearby noise-sensitive receiver locations. Table 9-4 shows the operational noise levels associated with Gateway South 9 Warehouse Project will satisfy the City of San Bernardino exterior noise level standards. Therefore, the operational noise impacts are considered *less than significant* at the nearby noise-sensitive receiver locations.

TABLE 9-4: OPERATIONAL NOISE LEVEL COMPLIANCE

Receiver Location[1]	Project Operational Noise Levels (dBA Leq)[2]		Noise Level Standards (dBA Leq)[3]		Noise Level Standards Exceeded?[4]	
	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime
R1	47.5	47.5	65	65	No	No
R2	41.7	41.6	65	65	No	No
R3	45.7	45.6	65	65	No	No
R4	31.9	31.8	65	65	No	No

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

9.5 PROJECT OPERATIONAL NOISE LEVEL INCREASES

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

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

Where "SPL1," "SPL2," etc. are equal to the sound pressure levels being combined, or in this case, the Project-operational and existing ambient noise levels. The difference between the combined Project and ambient noise levels describes the Project noise level increases to the existing ambient noise environment. Noise levels that would be experienced at receiver locations when Project-source noise is added to the daytime and nighttime ambient conditions are presented on Tables 9-5 and 9-6, respectively. As indicated on Table 9-5, the Project will generate a daytime operational noise level increases ranging from 0.0 to 0.2 dBA L_{eq} at the nearest receiver locations. Table 9-6 shows that the Project will generate a nighttime operational noise level increases ranging from 0.0 to 0.3 dBA L_{eq} at the nearest receiver locations. Project-related operational noise level increases will not exceed the operational noise level increase significance criteria presented in Table 4-1, and, therefore, the increases at the sensitive receiver locations will be *less than significant.*

TABLE 9-5: DAYTIME PROJECT OPERATIONAL NOISE LEVEL INCREASES

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Increase Criteria[7]	Increase Criteria Exceeded?
R1	47.5	L1	60.1	60.3	0.2	5.0	No
R2	41.7	L2	57.8	57.9	0.1	5.0	No
R3	45.7	L3	71.3	71.3	0.0	1.5	No
R4	31.9	L4	63.8	63.8	0.0	5.0	No

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

TABLE 9-6: NIGHTTIME OPERATIONAL NOISE LEVEL INCREASES

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Increase Criteria[7]	Increase Criteria Exceeded?
R1	47.5	L1	59.1	59.4	0.3	5.0	No
R2	41.6	L2	57.6	57.7	0.1	5.0	No
R3	45.6	L3	68.9	68.9	0.0	1.5	No
R4	31.8	L4	62.4	62.4	0.0	5.0	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 ANALYSIS

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 activity boundaries in relation to the nearest sensitive receiver locations previously described in Section 10.

Section 8.54.070 the City of San Bernardino Municipal Code, provided in Appendix 3.1, indicates that construction activity is permitted between the hours within 7:00 a.m. and 8:00 p.m. However, neither the General Plan nor the Municipal Code establish numeric maximum acceptable construction source noise levels at potentially affected receivers for CEQA analysis purposes. 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. The FTA considers a daytime exterior construction noise level of 80 dBA L_{eq} as a reasonable threshold for noise sensitive residential land use with a nighttime exterior construction noise level of 70 dBA L_{eq} (8 p. 179).

10.1 CONSTRUCTION NOISE LEVELS

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

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

10.2 CONSTRUCTION REFERENCE NOISE LEVELS

To describe construction noise activities, this construction noise analysis was prepared using reference construction equipment noise levels from the Federal Highway Administration (FHWA) published the Roadway Construction Noise Model (RCNM), which includes a national database of construction equipment reference noise emission levels. (22) The RCNM equipment database, provides a comprehensive list of the noise generating characteristics for specific types of construction equipment. In addition, the database provides an acoustical usage factor to estimate the fraction of time each piece of construction equipment is operating at full power (i.e., its loudest condition) during a construction operation.

EXHIBIT 10-A: CONSTRUCTION NOISE SOURCE LOCATIONS

10.3 CONSTRUCTION NOISE ANALYSIS

Using the reference construction equipment noise levels and the CadnaA noise prediction model, calculations of the Project construction noise level impacts at the nearby sensitive receiver locations were completed. Consistent with FTA guidance for general construction noise assessment, Table 10-1 presents the combined construction reference noise levels for the loudest construction equipment, assuming they operate at the same time. As shown on Table 10-2, the construction noise levels are expected to range from 43.3 to 66.6 dBA L_{eq} at the nearby receiver locations. Appendix 10.1 includes the detailed CadnaA construction noise model inputs.

TABLE 10-1: CONSTRUCTION REFERENCE NOISE LEVELS

Construction Stage	Reference Construction Activity	Reference Noise Level @ 50 Feet (dBA L_{eq})[1]	Combined Noise Level (dBA L_{eq})[2]	Combined Sound Power Level (PWL)[3]
Demolition	Demolition Equipment	82	83	115
	Backhoes	74		
	Hauling Trucks	72		
Site Preparation	Crawler Tractors	78	80	112
	Hauling Trucks	72		
	Rubber Tired Dozers	75		
Grading	Graders	81	83	115
	Excavators	77		
	Compactors	76		
Building Construction	Cranes	73	81	113
	Tractors	80		
	Welders	70		
Paving	Pavers	74	83	115
	Paving Equipment	82		
	Rollers	73		
Architectural Coating	Cranes	73	77	109
	Air Compressors	74		
	Generator Sets	70		

[1] FHWA Roadway Construction Noise Model (RCNM).
[2] Represents the combined noise level for all equipment assuming they operate at the same time consistent with FTA Transit Noise and Vibration Impact Assessment guidance.
[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 calibrated using the CadnaA noise model at the reference distance to the noise source.

TABLE 10-2: CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})						
	Demolition	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Levels[2]
R1	59.2	56.2	59.2	57.2	59.2	53.2	59.2
R2	53.5	50.5	53.5	51.5	53.5	47.5	53.5
R3	66.6	63.6	66.6	64.6	66.6	60.6	66.6
R4	49.3	46.3	49.3	47.3	49.3	43.3	49.3

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

10.4 CONSTRUCTION NOISE LEVEL COMPLIANCE

To evaluate whether the Project will generate potentially significant short-term noise levels at nearest receiver locations, a construction-related daytime noise level threshold of 80 dBA L_{eq} is used as a reasonable threshold to assess the daytime construction noise level impacts. The construction noise analysis shows that the nearest receiver locations will not exceed the reasonable daytime 80 dBA L_{eq} significance threshold during Project construction activities as shown on Table 10-3. Therefore, the noise impacts due to Project construction noise are considered *less than significant* at all receiver locations.

TABLE 10-3: CONSTRUCTION NOISE LEVEL COMPLIANCE

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})		
	Highest Construction Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
R1	59.2	80	No
R2	53.5	80	No
R3	66.6	80	No
R4	49.3	80	No

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

10.5 NIGHTTIME CONCRETE POUR NOISE ANALYSIS

It is our understanding that nighttime concrete pouring activities will occur as a part of Project building construction activities. Nighttime concrete pouring activities are often used to support reduced concrete mixer truck transit times and lower air temperatures than during the daytime hours and are generally limited to the actual building pad area. Since the nighttime concrete pours will take place outside the permitted City of San Bernardino Municipal Code, Section 8.54.070 the City of San Bernardino Municipal Code, indicates that construction activity is restricted to the hours within 7:00 a.m. and 8:00 p.m. The Project Applicant will be required to obtain authorization for nighttime work from the City of San Bernardino. Any nighttime construction noise activities are evaluated against the FTA nighttime exterior construction noise level threshold of 70 dBA L_{eq} for noise sensitive residential land use (8 p. 179).

10.5.1 NIGHTTIME CONCRETE POUR REFERENCE NOISE LEVEL MEASUREMENTS

To estimate the noise levels due to nighttime concrete pour activities, sample reference noise level measurements were taken during a nighttime concrete pour at a construction site. Urban Crossroads, Inc. collected short-term nighttime concrete pour reference noise level measurements during the noise-sensitive nighttime hours between 1:00 a.m. to 2:00 a.m. at 27334 San Bernardino Avenue in the City of Redlands. The reference noise levels describe the expected concrete pour noise sources that may include concrete mixer truck movements and pouring activities, concrete paving equipment, rear mounted concrete mixer truck backup alarms, engine idling, air brakes, generators, and workers communicating/whistling.

To describe the nighttime concrete pour noise levels associated with the construction of the Gateway South 9 Warehouse, this analysis relies on reference sound pressure level of 67.7 dBA L_{eq} at 50 feet representing a sound power level of 100.3 dBA L_w. While the Project noise levels will depend on the actual duration of activities and specific equipment fleet in use at the time of construction, the reference sound power level of 100.3 dBA L_w is used to describe the expected Project nighttime concrete pour noise activities.

10.5.2 NIGHTTIME CONCRETE POUR NOISE LEVEL COMPLIANCE

As shown on Table 10-4, the noise levels associated with the nighttime concrete pour activities are estimated to range from 34.6 to 51.9 dBA $L_{eq.}$ The analysis shows that the unmitigated nighttime concrete pour activities will not exceed the FTA 70 dBA L_{eq} nighttime residential noise level threshold at all the nearest noise sensitive receiver locations. Therefore, the noise impacts due to Project construction nighttime concrete pour noise activity are considered *less than significant* at all receiver locations with prior authorization for nighttime work from the City of San Bernardino. Appendix 10.2 includes the CadnaA nighttime concrete pour noise model inputs.

TABLE 10-4: NIGHTTIME CONCRETE POUR NOISE LEVEL COMPLIANCE

Receiver Location[1]	Concrete Pour Construction Noise Levels (dBA L_{eq})		
	Exterior Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
R1	44.5	70	No
R2	38.8	70	No
R3	51.9	70	No
R4	34.6	70	No

[1] Construction noise source and receiver locations are shown on Exhibit 10-A.
[2] Nighttime Concrete Pour noise model inputs are included in Appendix 10.2.
[3] Construction noise level thresholds as shown on Table 4-1.
[4] Do the estimated Project construction noise levels exceed the construction noise level threshold?

10.6 CONSTRUCTION VIBRATION ANALYSIS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods employed. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Ground vibration levels associated with various types of construction equipment are summarized on Table 10-5. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the potential for human response (annoyance) and building damage using the following vibration assessment methods defined by the FTA. To describe the vibration impacts the FTA provides the following equation: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$

TABLE 10-5: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	PPV (in/sec) at 25 feet
Small bulldozer	0.003
Jackhammer	0.035
Loaded Trucks	0.076
Large bulldozer	0.089
Vibratory Roller	0.210

Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual

Table 10-6 presents the expected Project related vibration levels at the nearby receiver locations. At distances ranging from 148 to 1,190 feet from Project construction activities, construction vibration velocity levels are estimated to range from 0.001 to 0.015 in/sec PPV. Based on maximum acceptable continuous vibration threshold of 0.3 PPV (in/sec), the typical Project construction vibration levels will fall below the building damage thresholds at all the noise sensitive receiver locations. Therefore, the Project-related vibration impacts are considered *less than significant* during typical construction activities at the Project site.

TABLE 10-6: PROJECT CONSTRUCTION VIBRATION LEVELS

Location[1]	Distance to Const. Activity (Feet)[2]	Typical Construction Vibration Levels PPV (in/sec)[3]						Thresholds PPV (in/sec)[4]	Thresholds Exceeded?[5]
		Small bulldozer	Jackhammer	Loaded Trucks	Large bulldozer	Vibratory Roller	Highest Vibration Level		
R1	493'	0.000	0.000	0.001	0.001	0.002	0.002	0.3	No
R2	1,033'	0.000	0.000	0.000	0.000	0.001	0.001	0.3	No
R3	148'	0.000	0.002	0.005	0.006	0.015	0.015	0.3	No
R4	1,190'	0.000	0.000	0.000	0.000	0.001	0.001	0.3	No

[1] Construction noise source and receiver locations are shown on Exhibit 10-A.
[2] Distance from receiver building facade to Project construction boundary (Project site boundary).
[3] Based on the Vibration Source Levels of Construction Equipment (Table 10-5).
[4] Caltrans Transportation and Construction Vibration Guidance Manual, April 2020, Table 19, p. 38.
[5] Does the peak vibration exceed the acceptable vibration thresholds?
"PPV" = Peak Particle Velocity

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

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11 REFERENCES

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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 Noise Barrier Design Handbook.* 2001.
6. **U.S. Department of Transportation, Federal Highway Administration.** *Highway Traffic Noise in the United States, Problem and Response.* April 2000. p. 3.
7. **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.
8. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment Manual.* September 2018.
9. **Office of Planning and Research.** *State of California General Plan Guidlines.* October 2019.
10. **City of San Bernardino.** *General Plan, Noise Element.* November 2005.
11. **California Department of Transportation.** *Transportation and Construction Vibration Guidance Manual.* April 2020.
12. **San Bernardino International Airport Authority.** *Final Environmental Assessment - Eastgate Air Cargo Facility.* December 2019.
13. **California Court of Appeal.** *Gray v. County of Madera, F053661.* 167 Cal.App.4th 1099; - Cal.Rptr.3d, October 2008.
14. **Federal Interagency Committee on Noise.** *Federal Agency Review of Selected Airport Noise Analysis Issues.* August 1992.
15. **California Department of Transportation.** *Technical Noise Supplement.* November 2009.
16. **American National Standards Institute (ANSI).** *Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.*
17. **U.S. Department of Transportation, Federal Highway Administration.** *FHWA Highway Traffic Noise Prediction Model.* December 1978. FHWA-RD-77-108.
18. **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.
19. **California Department of Transportation.** *Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report.* June 1995. FHWA/CA/TL-95/23.
20. **Translutions, Inc.** *Gateway South 9 Warehouse Traffic Impact Analysis.* December 2022.

21. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning.** *FHWA Roadway Construction Noise Model.* January, 2006.

12 CERTIFICATIONS

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Gateway South 9 Warehouse Project. The information contained in this noise study report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 584-3148.

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

EDUCATION

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

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

PROFESSIONAL REGISTRATIONS

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

PROFESSIONAL AFFILIATIONS

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

PROFESSIONAL CERTIFICATIONS

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

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APPENDIX 3.1:

CITY OF SAN BERNARDINO MUNICIPAL CODE

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Chapter 8.54
NOISE CONTROL

Sections:

8.54.010 Purpose and Intent

A. It is the purpose and intent of these regulations to establish community-wide noise standards. It is further the purpose of these regulations to recognize that the existence of excessive noise within the City is a condition which is detrimental to the health, safety, welfare, and quality of life of the citizens and shall be regulated in the public interest.

B. In furtherance of the foregoing purpose, it is found and declared as follows:

1. The making, creation, or maintenance of such loud, unnecessary, unnatural, or unusual noises that are prolonged, unusual, annoying, disturbing and unnatural in their time, place, and use are a detriment to public health, comfort, convenience, safety, general welfare, and the peace and quiet of the City and its inhabitants; and

2. The public interest and necessity of the provisions and prohibitions hereinafter contained and enacted is declared as a matter of legislative determination and public policy, and it is further declared that the provisions and prohibitions hereinafter contained and enacted are in pursuance of, and for thepurpose of, securing and promoting the public health, comfort, convenience, safety, general welfare and property, and the peace and quiet of the City and its inhabitants.

(Ord. MC-1246, 5-23-07; Ord. 1925, 11-06-51)

8.54.020 Prohibited Acts

It shall be unlawful for any person to engage in the following activities:

A. Sounding any horn or signal device on any automobile, motorcycle, bus, or other motor vehicle in any other manner or circumstances or for any other purpose than required or permitted by the California Vehicle Code, or other laws, for an unnecessary or unreasonable period of time;

B. Racing the engine of any motor vehicle while the vehicle is not in motion, except when necessary to do so in the course of repairing, adjusting, or testing the same.

C. Operating or permitting the use of any motor vehicle on any public right-of-way or public place or on private property within a residential zone for which the exhaust muffler, intake muffler, or any other noise abatement device has been modified or changed in a manner such that the noise emitted by the motor vehicle is increased above that emitted by the vehicle as originally manufactured.

D. Using, operating, or permitting to be played, used or operated any radio receiving set, musical instrument, phonograph, or other sound amplification or production equipment for producing or reproducing sound in such a manner as to disturb the peace, quiet, or comfort of neighboring persons, or at any time with louder volume than is necessary for the convenient hearing of the person or persons who are in the room, vehicle, or other enclosure in which such machine or device is operated, and who are voluntary listeners thereto and that is:

   1. Plainly audible across property boundaries;

   2. Plainly audible through partitions common to two residences within a building;

   3. Plainly audible at a distance of 50 feet in any direction from the source of the music or sound between the hours of 8:00 a.m. and 10:00 p.m.; or

   4. Plainly audible at a distance of 25 feet in any direction from the source of the music or sound between the hours of 10:00 p.m. and 8:00 a.m.

E. The intentional sounding or permitting the sounding outdoors of any fire, burglar, or civil defense alarm, siren, whistle, or any motor vehicle burglar alarm, except for emergency purposes or for testing, unless such alarm is terminated within fifteen minutes of activation.

F. Yelling, shouting, whistling, or singing in a loud and boisterous manner on the public streets so as to disturb the quiet, comfort, or repose of persons in any office, dwelling, hotel, or other type of residence, or neighborhood.

G. The keeping of any animal, fowl, or bird which by causing frequent or long continued noise disturbs the comfort, quiet, or repose of any person or neighborhood.

H. The unnecessary or excessive blowing of whistles, sounding of horns, ringing of bells, or use of signaling devices by operators of trains, motor trucks, and other transportation equipment.

I. The creation of loud and excessive noise in connection with the loading or unloading of motor trucks and other vehicles.

J. The shouting and crying of peddlers, hawkers, and vendors which disturbs the peace and quiet of any considerable number of persons or neighborhood.

K. The doing of automobile, automotive body or fender repair work, or other work on metal objects and metal parts in a residential district so as to cause loud and excessive noise which disturbs the peace, quiet, and repose of any person occupying adjoining or closely situated property or neighborhood.

L. The operation or use between the hours of 10:00 p.m. and 8:00 a.m. of any pile driver, steam shovel, pneumatic hammers, derrick, steam or electric hoist, power driven saw, or any other tool or apparatus, the use of which is attended by loud and excessive noise, except with the approval of the City.

M. Creating excessive noise adjacent to any school, church, court, or library while the same is in use, or adjacent to any hospital or care facility, which unreasonably interferes with the workings of such institution, or which disturbs or unduly annoys patients in the hospital, provided conspicuous signs are displayed in such streets indicating the presence of a school, institution of learning, church, court, or hospital.

N. Making or knowingly and unreasonably permitting to be made any unreasonably loud, unnecessary, or unusual noise that disturbs the comfort, repose, health, peace and quiet, or which causes discomfort or annoyance to any reasonable person of normal sensitivity. The characteristics and conditions that may be considered in determining whether this section has been violated include, but are not limited to, the following:

1. The level of noise;

2. The level of background noise;

3. The proximity of the noise to sleeping facilities;

4. The nature and zoning of the areas within which the noise emanates;

5. The density of the inhabitation of the area within which the noise emanates;

6. The time of day or night the noise occurs;

7. The duration of the noise;

8. Whether the noise is recurrent, intermittent, or constant; and

9. Whether the noise is produced by a commercial or noncommercial activity.

(Ord. MC-1246, 5-23-07; Ord. 2102, 4-03-56; Ord. 1925, 11-06-51)

8.54.030 Issuance of Written Notice and Impoundment

A. Any officer who encounters a violation of this section may issue a written notice to the Responsible Person demanding immediate abatement of the violation. The written notice shall inform the recipient that a second violation of the same provision within a seventy two (72) hour period may result in the issuance of a criminal citation, the imposition of criminal and civil penalties, and confiscation and impoundment, as evidence, of the components that are amplifying or transmitting the prohibited noise.

1. Responsible Person means (a) any person who owns, leases, or is lawfully in charge of the property or motor vehicle where the noise violation takes place, or (b) any person who owns or controls the source of the noise or violation. If the Responsible Person is a minor, then the parent or guardian who has custody of the child at the time of the violation shall be the Responsible Person who is liable under this chapter.

B. Any officer who encounters a second violation of this chapter within a seventy two (72) hour period following the issuance of a written notice is empowered to confiscate and impound, as evidence, any or all of the components amplifying or transmitting the sound. The immediate confiscation of a motor vehicle to which a component is attached may be made if the same may not be removed without causing harm to the vehicle or component.

C. Any person claiming legal ownership of the items confiscated and impounded under this chapter may request the return of the item by filing a written request with the police department within seven (7) calendar days of the confiscation. Such requests shall be processed in accordance with the procedures adopted by the department.

(Ord. MC-1246, 5-23-07; Ord. MC-649, 1-04-89; Ord. 1925, 11-06-51)

8.54.040 Cost Recovery for Second Response

A. Whenever any officer issues a written notice to a responsible person to discontinue a noise violation, the Responsible Person shall be liable for the actual cost of each subsequent response required to abate the violation within seventy two (72) hours of the issuance of the written warning.

B. The bill for the response charge shall be served upon the Responsible Person within thirty (30) days after the violation. If the Responsible Person has no last known business or residence address, the location of the violation shall be deemed to be the proper address for service. The bill shall include a notice of the right of the person being charged to request a hearing to dispute the imposition of the response charge or the amount of the charge.

C. The response charge shall be deemed to be a civil debt to the City.

(Ord. MC-1246, 5-23-07; Ord. MC-460, 5-15-85; Ord. 1925, 11-06-51)

8.54.050 Controlled Hours of Operation

It shall be unlawful for any person to engage in the following activities other than between the hours of 8:00 a.m. and 8:00 p.m. in residential zones and other than between the hours of 7:00 a.m. and 8:00 p.m. in all other zones:

A. Operate or permit the use of powered model vehicles and planes.

B. Load or unload any vehicle, or operate or permit the use of dollies, carts, forklifts, or other wheeled equipment that causes any impulsive sound, raucous, or unnecessary noise within one thousand (1,000) feet of a residence.

C. Operate or permit the use of domestic power tools, or machinery or any other equipment or tool in any garage, workshop, house, or any other structure.

D. Operate or permit the use of gasoline or electric powered leaf blowers, such as commonly used by gardeners and other persons for cleaning lawns, yards, driveways, gutters, and other property.

E. Operate or permit the use of privately operated street/parking lot sweepers or vacuums, except that emergency work and/or work necessitated by unusual conditions may be performed with the written consent of the City Manager.

F. Operate or permit the use of electrically operated compressor, fan, and other similar devices.

G. Operate or permit the use of any motor vehicle with a gross vehicle weight rating in excess of ten thousand (10,000) pounds, or of any auxiliary equipment attached to such a vehicle, including, but not limited to, refrigerated truck compressors for a period longer than fifteen (15) minutes in any hour while the vehicle is stationary and on a public right-of-way or public space except when movement of said vehicle is restricted by other traffic.

H. Repair, rebuild, reconstruct, or dismantle any motor vehicle or other mechanical equipment or devices in a manner so as to be plainly audible across property lines.

(Ord. MC-1246, 5-23-07)

8.54.060 Exemptions

The following activities and noise sources shall be exempt from the provisions of this chapter:

A. The use of horns, sirens, or other signaling or warning devices by persons vested with legal authority to use the same, and in pursuit of their lawful duties, such as on ambulances, fire, police, or other governmental or official equipment.

B. Such noises as are an accompaniment and effect of a lawful business, commercial or industrial enterprise carried on in an area zoned for that purpose, except where there is evidence that such noise is a nuisance and that such a nuisance is a result of the employment of unnecessary and injurious methods of operation.

C. Activities conducted on the grounds of any public or private school during regular hours of operation.

D. Outdoor gatherings, public dances, shows, and sporting and entertainment events provided said events are authorized by the City.

E. Activities conducted at public spaces during regular hours of operation.

F. Any mechanical devices, apparatus, or equipment used, related to, or connected with emergency machinery, vehicle, or work.

G. Construction, repair, or excavation necessary for the immediate preservation of life or property.

H. Construction, operation, maintenance, and repairs of equipment, apparatus, or facilities of park and recreation departments, public work projects, or essential public services and facilities, including, but not limited to, trash collection and those of public utilities subject to the regulatory jurisdiction of the California Public Utilities Commission.

I. Construction, repair, or excavation work performed pursuant to a valid written agreement with the City, or any of its political subdivisions, which provides for noise mitigation measures.

J. Any activity to the extent that regulation thereof has been preempted by State or Federal law.

K. Sounds generated in connection with speech or communication protected by the United States Constitution or the California Constitution, except to the extent such sounds are subject to permissible time, place, and manner restrictions.

(Ord. MC-1246, 5-23-07)

8.54.070 Disturbances from Construction Activity

No person shall be engaged or employed, or cause any other person to be engaged or employed, in any work of construction, erection, alteration, repair, addition, movement, demolition, or improvement to any building or structure except within the hours of 7:00 a.m. and 8:00 p.m.

(Ord. MC-1246, 5-23-07)

8.54.080 Violation - Penalty

Any person violating any of the provisions of this Chapter is guilty of an infraction or a misdemeanor, which upon conviction thereof is punishable in accordance with the provisions of Section 1.12.010 of this code.

(Ord. MC-1246, 5-23-07)

8.54.090 Severability

The provisions of this Chapter are severable, and, if any sentence, section or other part of this Chapter should be found to be invalid, such invalidity shall not affect the remaining provisions, and the remaining provisions shall continue in full force and effect.

(Ord. MC-1246, 5-23-07)

[Return to Municipal Code Contents]

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APPENDIX 5.1:

STUDY AREA PHOTOS

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JN:14882

14882_L1_A 1.North
34, 4' 53.930000"117, 15' 54.000000"

14882_L1_A 2.South
34, 4' 53.770000"117, 15' 53.970000"

14882_L1_A 3.East
34, 4' 53.790000"117, 15' 54.160000"

14882_L1_A 4.West
34, 4' 53.790000"117, 15' 54.220000"

JN:14882

14882_L2_B 1.North
34, 4' 59.420000"117, 15' 50.230000"

14882_L2_B 2.South
34, 4' 59.390000"117, 15' 50.290000"

14882_L2_B 3.East
34, 4' 59.360000"117, 15' 50.210000"

14882_L2_B 4.West
34, 4' 59.390000"117, 15' 50.450000"

14882_L3_C 1.North
34, 4' 46.550000"117, 16' 8.940000"

14882_L3_C 2.South
34, 4' 46.540000"117, 16' 8.910000"

14882_L3_C 3.East
34, 4' 46.560000"117, 16' 8.800000"

14882_L3_C 4.West
34, 4' 46.560000"117, 16' 8.880000"

14882_L4_D 1.North
34, 4' 53.490000"117, 16' 33.800000"

14882_L4_D 2.South
34, 4' 53.420000"117, 16' 33.740000"

14882_L4_D 3.East
34, 4' 53.420000"117, 16' 33.690000"

14882_L4_D 4.West
34, 4' 53.400000"117, 16' 33.690000"

APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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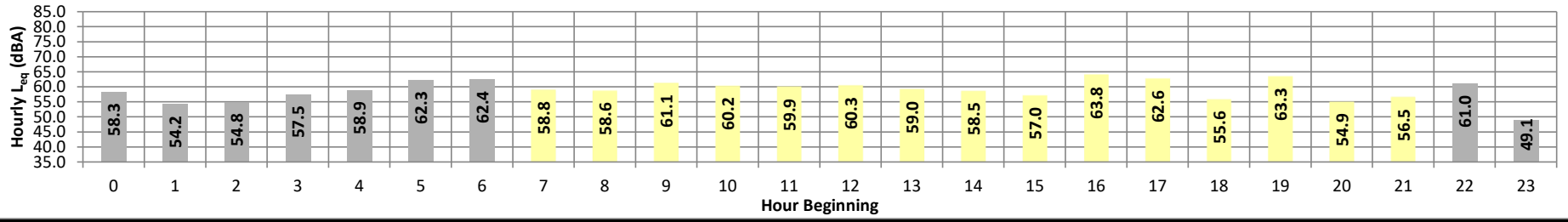
24-Hour Noise Level Measurement Summary

Date: Wednesday, November 30, 2022 | *Location:* L1 - Located northeast of the project site near the single- | *Meter:* Piccolo II | *JN:* 14882

Project: Gateway South Building 9 | *Source:* family residence at 948 Norman Rd. | *Analyst:* Z. Ibrahim

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	58.3	67.3	50.9	67.1	66.6	65.0	63.2	58.2	54.6	51.3	51.2	51.0	58.3	10.0	68.3
	1	54.2	63.2	49.2	62.9	62.3	60.3	58.2	53.8	51.1	49.8	49.6	49.3	54.2	10.0	64.2
	2	54.8	62.7	49.8	62.3	61.7	60.4	59.3	54.7	51.9	50.3	50.1	49.8	54.8	10.0	64.8
	3	57.5	66.0	51.4	65.6	65.2	63.8	62.4	57.2	54.0	52.0	51.7	51.5	57.5	10.0	67.5
	4	58.9	66.9	53.8	66.3	65.4	63.4	62.5	59.5	57.1	54.5	54.2	53.9	58.9	10.0	68.9
	5	62.3	71.1	53.8	70.6	69.9	68.2	67.1	62.8	57.9	54.8	54.4	54.0	62.3	10.0	72.3
	6	62.4	71.2	54.8	70.7	70.1	68.8	67.8	62.0	58.0	55.4	55.1	54.9	62.4	10.0	72.4
Day	7	58.8	67.7	54.3	67.1	66.3	64.0	62.9	58.6	56.0	54.7	54.6	54.4	58.8	0.0	58.8
	8	58.6	66.6	51.0	66.1	65.7	64.6	63.7	59.8	54.2	51.6	51.3	51.1	58.6	0.0	58.6
	9	61.1	71.3	46.8	71.0	70.6	69.4	67.9	58.3	52.3	47.6	47.3	46.9	61.1	0.0	61.1
	10	60.2	70.0	47.1	69.7	69.0	67.4	65.6	60.5	52.7	48.1	47.6	47.2	60.2	0.0	60.2
	11	59.9	69.2	49.6	68.6	67.8	66.6	65.1	59.8	55.9	51.4	50.7	49.9	59.9	0.0	59.9
	12	60.3	72.5	48.9	71.9	70.9	67.5	64.6	58.3	54.6	50.4	49.8	49.1	60.3	0.0	60.3
	13	59.0	69.0	47.2	68.5	67.9	66.1	64.8	58.5	53.0	48.1	47.6	47.3	59.0	0.0	59.0
	14	58.5	71.8	47.1	70.4	68.6	65.4	62.2	56.6	52.9	48.2	47.7	47.2	58.5	0.0	58.5
	15	57.0	66.3	49.5	65.5	64.8	62.8	61.3	56.9	54.3	51.1	50.4	49.6	57.0	0.0	57.0
	16	63.8	71.9	52.6	71.5	71.0	69.7	69.1	64.9	59.9	55.1	54.3	52.9	63.8	0.0	63.8
	17	62.6	72.5	51.0	71.8	71.2	69.5	67.9	63.1	56.2	52.4	51.8	51.2	62.6	0.0	62.6
	18	55.6	64.2	49.2	63.7	63.3	62.0	60.3	55.4	53.1	50.2	49.8	49.4	55.6	0.0	55.6
	19	63.3	72.2	49.2	71.6	71.2	69.9	69.0	63.9	57.7	50.6	50.0	49.5	63.3	5.0	68.3
	20	54.9	63.8	49.3	63.3	62.5	60.2	58.7	54.9	52.4	50.1	49.8	49.4	54.9	5.0	59.9
	21	56.5	65.9	46.8	65.5	64.9	62.8	61.2	56.7	52.4	47.8	47.4	46.9	56.5	5.0	61.5
Night	22	61.0	69.8	43.2	69.5	69.3	68.5	67.1	61.2	50.2	43.7	43.5	43.2	61.0	10.0	71.0
	23	49.1	56.7	42.7	56.3	55.7	54.4	53.6	50.1	46.2	43.2	43.0	42.7	49.1	10.0	59.1

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	54.9	63.8	46.8	63.3	62.5	60.2	58.7	54.9	52.3	47.6	47.3	46.9
	Max	63.8	72.5	54.3	71.9	71.2	69.9	69.1	64.9	59.9	55.1	54.6	54.4
Energy Average		60.1	Average:		68.4	67.7	65.9	64.3	59.1	54.5	50.5	50.0	49.5
Night	Min	49.1	56.7	42.7	56.3	55.7	54.4	53.6	50.1	46.2	43.2	43.0	42.7
	Max	62.4	71.2	54.8	70.7	70.1	68.8	67.8	62.8	58.0	55.4	55.1	54.9
Energy Average		59.1	Average:		65.7	65.1	63.6	62.4	57.7	53.4	50.6	50.3	50.0

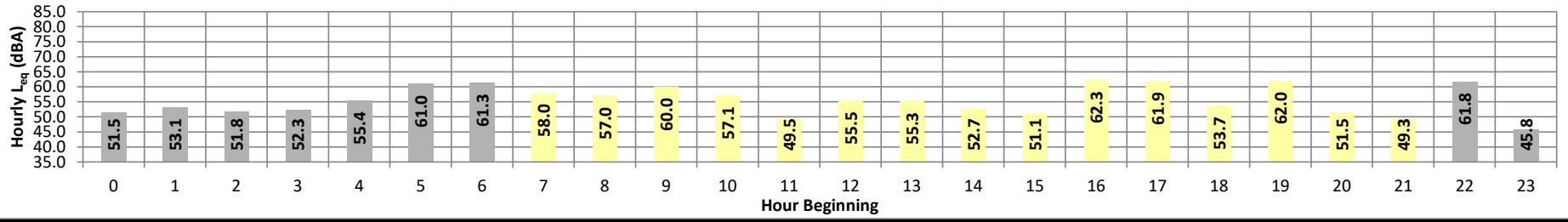
24-Hour	L_{eq} (dBA) Daytime (7am-10pm)	Nighttime (10pm-7am)
59.8	**60.1**	**59.1**

24-Hour Noise Level Measurement Summary

Date: Wednesday, November 30, 2022 *Location:* L2 - Located northeast of the project site near the single- *Meter:* Piccolo II *JN:* 14882

Project: Gateway South Building 9 *Source:* family residence at 984 Hope St. *Analyst:* Z. Ibrahim

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	51.5	56.0	48.7	55.7	55.4	54.4	54.0	52.1	50.6	49.2	49.0	48.7	51.5	10.0	61.5
	1	53.1	59.6	49.1	59.3	59.1	58.2	57.0	52.9	51.1	49.7	49.4	49.2	53.1	10.0	63.1
	2	51.8	54.9	49.8	54.6	54.3	53.7	53.4	52.4	51.5	50.3	50.1	49.9	51.8	10.0	61.8
	3	52.3	54.9	50.7	54.7	54.4	53.9	53.6	52.6	52.0	51.2	51.0	50.8	52.3	10.0	62.3
	4	55.4	60.3	52.7	60.0	59.6	58.8	58.3	56.3	54.2	53.1	53.0	52.8	55.4	10.0	65.4
	5	61.0	68.8	53.7	68.5	68.2	67.4	66.5	61.3	55.5	54.2	54.0	53.7	61.0	10.0	71.0
	6	61.3	69.8	54.6	69.4	69.0	67.8	66.7	60.9	57.1	55.0	54.9	54.7	61.3	10.0	71.3
Day	7	58.0	64.4	54.1	64.2	63.9	63.2	62.7	57.8	55.5	54.5	54.4	54.2	58.0	0.0	58.0
	8	57.0	64.4	49.9	64.1	63.9	62.8	62.1	58.1	52.1	50.3	50.1	50.0	57.0	0.0	57.0
	9	60.0	71.0	44.8	70.8	70.2	69.2	66.5	55.9	47.2	45.3	45.1	44.8	60.0	0.0	60.0
	10	57.1	67.3	43.4	67.0	66.8	65.8	64.5	51.6	47.9	44.1	43.9	43.5	57.1	0.0	57.1
	11	49.5	54.7	45.0	54.2	53.6	52.7	52.2	50.4	48.9	46.2	45.8	45.2	49.5	0.0	49.5
	12	55.5	62.8	45.6	62.5	62.1	61.1	60.4	56.8	51.9	46.9	46.3	45.8	55.5	0.0	55.5
	13	55.3	64.2	45.0	63.9	63.6	62.7	61.5	54.0	48.0	45.7	45.4	45.1	55.3	0.0	55.3
	14	52.7	60.3	43.3	59.9	59.5	58.7	58.1	53.5	48.6	44.3	43.9	43.5	52.7	0.0	52.7
	15	51.1	57.6	44.3	57.3	56.8	56.1	55.6	52.3	48.7	45.3	44.9	44.4	51.1	0.0	51.1
	16	62.3	70.6	46.7	70.4	70.3	69.7	69.0	62.5	53.7	47.8	47.3	46.8	62.3	0.0	62.3
	17	61.9	70.8	49.8	70.6	70.3	69.5	68.6	60.8	53.4	50.5	50.2	49.9	61.9	0.0	61.9
	18	53.7	61.1	48.4	60.6	60.0	58.6	58.0	54.5	51.1	49.0	48.8	48.5	53.7	0.0	53.7
	19	62.0	70.4	46.4	70.2	69.9	69.4	68.4	62.3	53.5	47.6	47.1	46.6	62.0	5.0	67.0
	20	51.5	59.6	45.7	59.0	58.4	57.2	56.2	50.9	48.7	46.5	46.2	45.8	51.5	5.0	56.5
	21	49.3	55.4	42.7	55.1	54.7	54.0	53.5	51.2	46.6	43.4	43.2	42.9	49.3	5.0	54.3
Night	22	61.8	71.1	39.4	70.8	70.4	69.7	68.7	61.0	45.4	40.1	39.8	39.5	61.8	10.0	71.8
	23	45.8	53.1	38.3	52.8	52.4	52.0	51.3	46.6	42.2	38.8	38.6	38.4	45.8	10.0	55.8

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	49.3	54.7	42.7	54.2	53.6	52.7	52.2	50.4	46.6	43.4	43.2	42.9
	Max	62.3	71.0	54.1	70.8	70.3	69.7	69.0	62.5	55.5	54.5	54.4	54.2
Energy Average		57.8	Average:		63.3	62.9	62.1	61.2	55.5	50.4	47.2	46.8	46.5
Night	Min	45.8	53.1	38.3	52.8	52.4	52.0	51.3	46.6	42.2	38.8	38.6	38.4
	Max	61.8	71.1	54.6	70.8	70.4	69.7	68.7	61.3	57.1	55.0	54.9	54.7
Energy Average		57.6	Average:		60.6	60.3	59.5	58.8	55.1	51.1	49.1	48.9	48.6

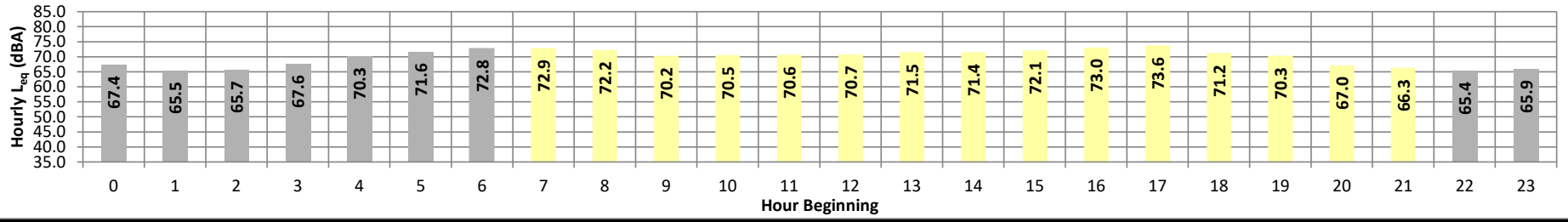
24-Hour	L_{eq} (dBA) Daytime (7am-10pm)	Nighttime (10pm-7am)
57.7	**57.8**	**57.6**

24-Hour Noise Level Measurement Summary

Date: Wednesday, November 30, 2022 *Location:* L3 - Located south of the project site near the single-family *Meter:* Piccolo II *JN:* 14882

Project: Gateway South Building 9 *Source:* residence at 755 Orange Show Rd. *Analyst:* Z. Ibrahim

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	67.4	78.3	54.6	77.8	76.9	74.1	72.1	67.0	62.0	56.1	55.4	54.8	67.4	10.0	77.4
	1	65.5	74.8	54.4	74.5	74.0	72.3	70.9	65.7	59.8	55.1	54.7	54.4	65.5	10.0	75.5
	2	65.7	74.7	53.8	74.4	74.1	72.7	71.3	65.8	61.0	54.8	54.3	53.9	65.7	10.0	75.7
	3	67.6	76.6	54.9	76.3	76.0	74.5	73.3	68.0	62.0	55.8	55.3	55.0	67.6	10.0	77.6
	4	70.3	79.1	56.6	78.8	78.4	76.3	75.2	71.3	66.0	58.2	57.3	56.7	70.3	10.0	80.3
	5	71.6	79.6	58.3	79.3	79.0	77.7	76.7	72.6	67.8	60.4	59.3	58.5	71.6	10.0	81.6
	6	72.8	81.1	60.4	80.8	80.4	78.7	77.7	73.7	69.4	62.3	61.4	60.6	72.8	10.0	82.8
Day	7	72.9	80.5	59.9	80.3	79.9	78.5	77.6	74.3	69.6	62.4	61.1	60.1	72.9	0.0	72.9
	8	72.2	80.2	58.3	79.8	79.3	77.7	76.7	73.4	69.4	61.0	59.6	58.5	72.2	0.0	72.2
	9	70.2	78.6	55.9	78.3	77.8	76.2	75.2	71.3	66.7	58.4	57.3	56.2	70.2	0.0	70.2
	10	70.5	79.7	54.4	79.4	79.0	76.9	75.6	71.2	66.1	56.9	55.7	54.6	70.5	0.0	70.5
	11	70.6	78.6	55.8	78.2	77.8	76.5	75.6	71.8	67.4	58.8	57.3	56.1	70.6	0.0	70.6
	12	70.7	78.4	57.8	78.1	77.7	76.3	75.3	72.0	68.1	60.5	59.3	58.0	70.7	0.0	70.7
	13	71.5	78.5	59.4	78.2	77.9	76.6	75.8	72.7	69.5	62.5	61.0	59.8	71.5	0.0	71.5
	14	71.4	78.6	58.9	78.3	78.0	76.7	75.7	72.7	69.3	62.4	60.5	59.2	71.4	0.0	71.4
	15	72.1	78.2	61.4	78.0	77.6	76.6	75.9	73.6	70.7	64.0	62.8	61.5	72.1	0.0	72.1
	16	73.0	79.4	62.7	79.1	78.6	77.5	76.8	74.3	71.5	65.6	64.2	62.9	73.0	0.0	73.0
	17	73.6	79.3	64.3	79.1	78.7	77.8	77.1	75.1	72.6	67.0	65.8	64.6	73.6	0.0	73.6
	18	71.2	78.7	57.3	78.4	78.0	76.5	75.7	72.6	68.8	60.3	58.9	57.4	71.2	0.0	71.2
	19	70.3	79.2	55.5	78.9	78.4	76.4	75.3	71.0	66.6	58.6	57.0	55.8	70.3	5.0	75.3
	20	67.0	76.0	52.2	75.7	75.3	73.8	72.6	67.6	62.0	53.6	52.8	52.3	67.0	5.0	72.0
	21	66.3	75.7	51.5	75.4	74.8	73.3	71.9	66.6	60.7	53.3	52.1	51.6	66.3	5.0	71.3
Night	22	65.4	75.4	50.0	75.1	74.7	72.7	70.8	65.3	59.2	51.1	50.6	50.1	65.4	10.0	75.4
	23	65.9	75.3	51.5	75.0	74.5	72.8	71.4	66.2	60.5	53.0	52.3	51.6	65.9	10.0	75.9

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	66.3	75.7	51.5	75.4	74.8	73.3	71.9	66.6	60.7	53.3	52.1	51.6
	Max	73.6	80.5	64.3	80.3	79.9	78.5	77.6	75.1	72.6	67.0	65.8	64.6
Energy Average		71.3	Average:		78.3	77.9	76.5	75.5	72.0	67.9	60.3	59.0	57.9
Night	Min	65.4	74.7	50.0	74.4	74.0	72.3	70.8	65.3	59.2	51.1	50.6	50.1
	Max	72.8	81.1	60.4	80.8	80.4	78.7	77.7	73.7	69.4	62.3	61.4	60.6
Energy Average		68.9	Average:		76.9	76.4	74.7	73.3	68.4	63.1	56.3	55.6	55.1

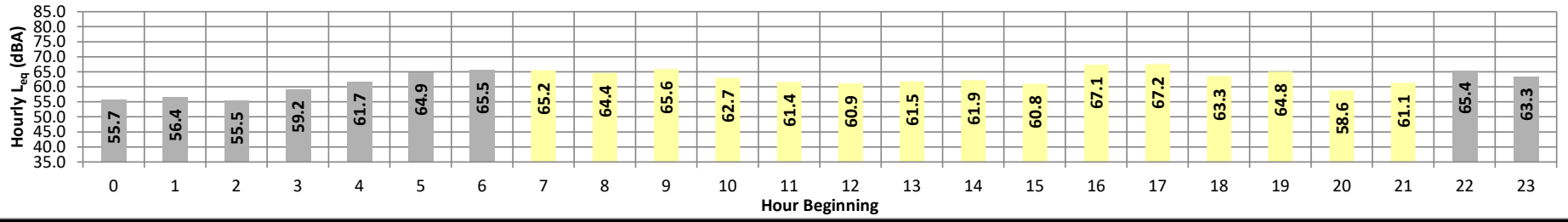
24-Hour	L_{eq} (dBA) Daytime (7am-10pm)	Nighttime (10pm-7am)
70.5	**71.3**	**68.9**

24-Hour Noise Level Measurement Summary

Date: Wednesday, November 30, 2022 *Location:* L4 - Located west of the project site near the single-family *Meter:* Piccolo II *JN:* 14882

Project: Gateway South Building 9 *Source:* residence at 434 Norman Rd. *Analyst:* Z. Ibrahim

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	55.7	62.3	52.0	62.0	61.7	60.9	60.0	56.0	53.5	52.5	52.3	52.1	55.7	10.0	65.7
	1	56.4	63.6	52.0	63.2	62.8	61.8	60.7	56.6	54.0	52.5	52.3	52.1	56.4	10.0	66.4
	2	55.5	62.7	52.4	62.5	62.0	60.3	58.7	55.1	53.8	52.8	52.6	52.5	55.5	10.0	65.5
	3	59.2	67.0	54.6	66.6	65.9	64.6	63.3	59.6	56.9	55.0	54.8	54.7	59.2	10.0	69.2
	4	61.7	68.8	57.2	68.5	68.1	67.0	65.9	61.7	59.1	57.7	57.5	57.3	61.7	10.0	71.7
	5	64.9	73.9	58.5	73.5	72.9	71.1	70.0	64.7	60.5	58.9	58.8	58.6	64.9	10.0	74.9
	6	65.5	72.1	61.6	71.9	71.7	70.6	69.7	65.9	63.1	62.0	61.8	61.7	65.5	10.0	75.5
Day	7	65.2	73.0	61.7	72.5	71.9	70.4	69.2	64.7	63.1	62.0	61.9	61.8	65.2	0.0	65.2
	8	64.4	72.2	58.5	71.5	71.1	69.8	69.1	64.8	61.6	59.1	58.8	58.6	64.4	0.0	64.4
	9	65.6	75.1	55.4	74.6	74.1	72.6	71.5	65.2	58.8	56.0	55.7	55.5	65.6	0.0	65.6
	10	62.7	71.5	52.3	71.0	70.6	69.5	68.4	63.3	56.5	53.2	52.8	52.4	62.7	0.0	62.7
	11	61.4	70.4	51.5	70.1	69.7	68.5	67.7	60.6	55.5	52.4	52.0	51.5	61.4	0.0	61.4
	12	60.9	70.4	50.4	70.1	69.6	68.2	66.9	60.2	54.3	51.0	50.8	50.5	60.9	0.0	60.9
	13	61.5	70.6	50.6	70.3	70.0	68.4	66.8	61.5	57.0	51.7	51.3	50.8	61.5	0.0	61.5
	14	61.9	71.9	50.6	71.6	70.9	69.3	67.8	60.8	55.3	51.5	51.1	50.7	61.9	0.0	61.9
	15	60.8	70.8	50.4	69.7	69.0	67.2	66.1	61.1	55.9	51.9	51.5	50.6	60.8	0.0	60.8
	16	67.1	76.0	53.2	75.7	75.3	74.0	72.8	67.4	61.0	54.8	54.1	53.4	67.1	0.0	67.1
	17	67.2	74.8	60.6	74.4	73.9	72.7	71.9	68.3	63.1	61.1	60.9	60.7	67.2	0.0	67.2
	18	63.3	71.8	55.0	71.3	70.9	69.8	68.6	64.0	58.6	55.7	55.4	55.1	63.3	0.0	63.3
	19	64.8	73.4	52.5	73.1	72.7	71.8	71.2	65.1	58.5	53.5	53.1	52.6	64.8	5.0	69.8
	20	58.6	67.1	50.3	66.8	66.4	65.0	63.7	58.9	54.5	50.9	50.7	50.4	58.6	5.0	63.6
	21	61.1	71.0	49.1	70.7	70.0	68.0	66.5	61.4	54.4	49.7	49.5	49.2	61.1	5.0	66.1
Night	22	65.4	73.8	51.3	73.4	73.0	72.2	71.4	66.2	58.7	52.5	51.9	51.4	65.4	10.0	75.4
	23	63.3	69.2	59.5	68.5	68.0	67.2	66.5	64.1	62.0	60.1	59.8	59.6	63.3	10.0	73.3

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	58.6	67.1	49.1	66.8	66.4	65.0	63.7	58.9	54.3	49.7	49.5	49.2
	Max	67.2	76.0	61.7	75.7	75.3	74.0	72.8	68.3	63.1	62.0	61.9	61.8
Energy Average		63.8	Average:		71.6	71.1	69.7	68.6	63.2	57.9	54.3	54.0	53.6
Night	Min	55.5	62.3	51.3	62.0	61.7	60.3	58.7	55.1	53.5	52.5	51.9	51.4
	Max	65.5	73.9	61.6	73.5	73.0	72.2	71.4	66.2	63.1	62.0	61.8	61.7
Energy Average		62.4	Average:		67.8	67.4	66.2	65.1	61.1	57.9	56.0	55.8	55.5

24-Hour	L_{eq} (dBA) Daytime (7am-10pm)	Nighttime (10pm-7am)
63.3	**63.8**	**62.4**

APPENDIX 7.1:

OFF-SITE TRAFFIC NOISE LEVEL CALCULATIONS

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

Scenario: E | Project Name: Gateway South 9
Road Name: Lena Rd. | Job Number: 14882
Road Segment: n/o Norman Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,790 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	179 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	68 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	80.8%	8.3%	10.9%	93.28%
Medium Trucks:	85.8%	4.0%	10.2%	2.61%
Heavy Trucks:	84.1%	3.9%	12.0%	4.10%

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:	37.000
Medium Trucks:	36.760
Heavy Trucks:	36.783

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-9.61	1.86	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-25.14	1.90	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.18	1.90	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.5	57.8	53.9	50.3	58.7	59.0
Medium Trucks:	55.0	53.6	46.3	45.5	54.0	54.2
Heavy Trucks:	61.8	60.2	52.9	53.0	61.1	61.3
Vehicle Noise:	64.3	62.7	56.9	55.4	63.6	63.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	40	87	187
CNEL:	19	42	90	194

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

Scenario: E+P | Project Name: Gateway South 9
Road Name: Lena Rd. | Job Number: 14882
Road Segment: n/o Norman Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,860 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	186 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	68 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	80.8%	8.3%	10.9%	93.54%
Medium Trucks:	85.8%	4.0%	10.2%	2.51%
Heavy Trucks:	84.1%	3.9%	12.0%	3.95%

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:	37.000
Medium Trucks:	36.760
Heavy Trucks:	36.783

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-9.43	1.86	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-25.14	1.90	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.18	1.90	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.7	58.0	54.1	50.5	58.8	59.2
Medium Trucks:	55.0	53.6	46.3	45.5	54.0	54.2
Heavy Trucks:	61.8	60.2	52.9	53.0	61.1	61.3
Vehicle Noise:	64.4	62.8	56.9	55.4	63.7	63.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	41	88	189
CNEL:	20	42	91	196

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

Scenario: OYBC | Project Name: Gateway South 9
Road Name: Lena Rd. | Job Number: 14882
Road Segment: n/o Norman Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,940 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	194 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	68 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	80.8%	8.3%	10.9%	93.28%
Medium Trucks:	85.8%	4.0%	10.2%	2.61%
Heavy Trucks:	84.1%	3.9%	12.0%	4.10%

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:	37.000
Medium Trucks:	36.760
Heavy Trucks:	36.783

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-9.26	1.86	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-24.79	1.90	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-22.83	1.90	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.9	58.1	54.3	50.7	59.0	59.4
Medium Trucks:	55.4	53.9	46.6	45.9	54.4	54.6
Heavy Trucks:	62.1	60.6	53.3	53.4	61.5	61.7
Vehicle Noise:	64.7	63.1	57.2	55.7	63.9	64.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	43	92	197
CNEL:	20	44	95	205

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

Scenario: OYBC+P | Project Name: Gateway South 9
Road Name: Lena Rd. | Job Number: 14882
Road Segment: n/o Norman Rd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,010 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	201 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	68 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	80.8%	8.3%	10.9%	93.52%
Medium Trucks:	85.8%	4.0%	10.2%	2.52%
Heavy Trucks:	84.1%	3.9%	12.0%	3.96%

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:	37.000
Medium Trucks:	36.760
Heavy Trucks:	36.783

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-9.10	1.86	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-24.79	1.90	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-22.83	1.90	-1.20	-5.43	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.0	58.3	54.4	50.8	59.2	59.6
Medium Trucks:	55.4	53.9	46.6	45.9	54.4	54.6
Heavy Trucks:	62.1	60.6	53.3	53.4	61.5	61.7
Vehicle Noise:	64.7	63.2	57.3	55.8	64.0	64.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	43	92	199
CNEL:	21	45	96	207

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

Scenario: E
Road Name: Lena Rd.
Road Segment: n/o Orange Show Rd.
Project Name: Gateway South 9
Job Number: 14882

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,610 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	261 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	68 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	80.8%	8.3%	10.9%	93.28%
Medium Trucks:	85.8%	4.0%	10.2%	2.61%
Heavy Trucks:	84.1%	3.9%	12.0%	4.10%

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:	37.000
Medium Trucks:	36.760
Heavy Trucks:	36.783

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-7.97	1.86	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-23.50	1.90	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-21.54	1.90	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	61.1	59.4	55.6	52.0	60.3	60.7
Medium Trucks:	56.6	55.2	47.9	47.2	55.7	55.9
Heavy Trucks:	63.4	61.9	54.5	54.6	62.8	63.0
Vehicle Noise:	66.0	64.4	58.5	57.0	65.2	65.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	24	52	112	241
CNEL:	25	54	116	250

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

Scenario: E+P
Road Name: Lena Rd.
Road Segment: n/o Orange Show Rd.
Project Name: Gateway South 9
Job Number: 14882

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,754 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	275 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	68 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	80.8%	8.3%	10.9%	92.68%
Medium Trucks:	85.8%	4.0%	10.2%	2.64%
Heavy Trucks:	84.1%	3.9%	12.0%	4.69%

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:	37.000
Medium Trucks:	36.760
Heavy Trucks:	36.783

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-7.77	1.86	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-23.22	1.90	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-20.73	1.90	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	61.4	59.6	55.8	52.2	60.5	60.9
Medium Trucks:	56.9	55.5	48.2	47.5	55.9	56.1
Heavy Trucks:	64.2	62.7	55.4	55.5	63.6	63.8
Vehicle Noise:	66.5	64.9	59.0	57.6	65.8	66.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	26	57	122	262
CNEL:	27	59	126	272

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

Scenario: OYBC
Road Name: Lena Rd.
Road Segment: n/o Orange Show Rd.
Project Name: Gateway South 9
Job Number: 14882

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,660 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	266 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	68 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	80.8%	8.3%	10.9%	93.28%
Medium Trucks:	85.8%	4.0%	10.2%	2.61%
Heavy Trucks:	84.1%	3.9%	12.0%	4.10%

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:	37.000
Medium Trucks:	36.760
Heavy Trucks:	36.783

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-7.89	1.86	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-23.42	1.90	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-21.46	1.90	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	61.2	59.5	55.7	52.0	60.4	60.8
Medium Trucks:	56.7	55.3	48.0	47.3	55.7	55.9
Heavy Trucks:	63.5	62.0	54.6	54.7	62.9	63.0
Vehicle Noise:	66.1	64.5	58.6	57.1	65.3	65.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	24	53	113	244
CNEL:	25	54	117	253

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

Scenario: OYBC+P
Road Name: Lena Rd.
Road Segment: n/o Orange Show Rd.
Project Name: Gateway South 9
Job Number: 14882

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,804 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	280 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	68 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	80.8%	8.3%	10.9%	92.69%
Medium Trucks:	85.8%	4.0%	10.2%	2.64%
Heavy Trucks:	84.1%	3.9%	12.0%	4.68%

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:	37.000
Medium Trucks:	36.760
Heavy Trucks:	36.783

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-7.69	1.86	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-23.15	1.90	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-20.66	1.90	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	61.4	59.7	55.9	52.2	60.6	61.0
Medium Trucks:	57.0	55.5	48.3	47.5	56.0	56.2
Heavy Trucks:	64.3	62.7	55.4	55.5	63.7	63.8
Vehicle Noise:	66.6	65.0	59.0	57.6	65.9	66.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	27	57	123	265
CNEL:	28	59	128	275

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

Scenario: E
Road Name: Norman Rd.
Road Segment: w/o Lena Rd.
Project Name: Gateway South 9
Job Number: 14882

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	430 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	43 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	80.8%	8.3%	10.9%	93.28%
Medium Trucks:	85.8%	4.0%	10.2%	2.61%
Heavy Trucks:	84.1%	3.9%	12.0%	4.10%

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:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.443

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-13.25	3.51	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-28.78	3.58	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-26.82	3.57	-1.20	*-5.77*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	47.8	46.1	42.2	38.6	46.9	47.3
Medium Trucks:	44.4	42.9	35.7	34.9	43.4	43.6
Heavy Trucks:	53.5	52.0	44.7	44.8	52.9	53.1
Vehicle Noise:	55.0	53.4	47.0	46.1	54.3	54.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	3	6	12	27
CNEL:	3	6	13	28

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

Scenario: E+P
Road Name: Norman Rd.
Road Segment: w/o Lena Rd.
Project Name: Gateway South 9
Job Number: 14882

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	477 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	48 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	80.8%	8.3%	10.9%	93.94%
Medium Trucks:	85.8%	4.0%	10.2%	2.36%
Heavy Trucks:	84.1%	3.9%	12.0%	3.70%

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:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.443

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-12.77	3.51	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-28.78	3.58	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-26.82	3.57	-1.20	*-5.77*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	48.3	46.6	42.7	39.1	47.4	47.8
Medium Trucks:	44.4	42.9	35.7	34.9	43.4	43.6
Heavy Trucks:	53.5	52.0	44.7	44.8	52.9	53.1
Vehicle Noise:	55.1	53.5	47.1	46.1	54.3	54.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	3	6	13	27
CNEL:	3	6	13	28

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

Scenario: OYBC
Road Name: Norman Rd.
Road Segment: w/o Lena Rd.
Project Name: Gateway South 9
Job Number: 14882

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	480 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	48 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	80.8%	8.3%	10.9%	93.28%
Medium Trucks:	85.8%	4.0%	10.2%	2.61%
Heavy Trucks:	84.1%	3.9%	12.0%	4.10%

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:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.443

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-12.77	3.51	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-28.30	3.58	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-26.34	3.57	-1.20	*-5.77*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	48.3	46.6	42.7	39.1	47.4	47.8
Medium Trucks:	44.9	43.4	36.2	35.4	43.9	44.1
Heavy Trucks:	54.0	52.5	45.1	45.2	53.4	53.5
Vehicle Noise:	55.4	53.9	47.4	46.5	54.7	54.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	3	6	13	29
CNEL:	3	6	14	30

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

Scenario: OYBC+P
Road Name: Norman Rd.
Road Segment: w/o Lena Rd.
Project Name: Gateway South 9
Job Number: 14882

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	527 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	53 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	80.8%	8.3%	10.9%	93.88%
Medium Trucks:	85.8%	4.0%	10.2%	2.38%
Heavy Trucks:	84.1%	3.9%	12.0%	3.74%

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:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.443

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-12.34	3.51	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-28.30	3.58	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-26.34	3.57	-1.20	*-5.77*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	48.7	47.0	43.1	39.5	47.9	48.2
Medium Trucks:	44.9	43.4	36.2	35.4	43.9	44.1
Heavy Trucks:	54.0	52.5	45.1	45.2	53.4	53.5
Vehicle Noise:	55.5	53.9	47.6	46.6	54.8	55.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	3	6	14	29
CNEL:	3	6	14	30

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

Scenario: E
Road Name: Norman Rd.
Road Segment: e/o Lena Rd.
Project Name: Gateway South 9
Job Number: 14882

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,230 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	123 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	80.8%	8.3%	10.9%	93.28%
Medium Trucks:	85.8%	4.0%	10.2%	2.61%
Heavy Trucks:	84.1%	3.9%	12.0%	4.10%

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:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.443

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-8.69	3.51	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-24.22	3.58	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-22.25	3.57	-1.20	*-5.77*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	52.4	50.6	46.8	43.2	51.5	51.9
Medium Trucks:	49.0	47.5	40.2	39.5	48.0	48.2
Heavy Trucks:	58.1	56.5	49.2	49.3	57.5	57.6
Vehicle Noise:	59.5	58.0	51.5	50.6	58.8	59.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	5	12	25	54
CNEL:	6	12	26	56

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

Scenario: E+P
Road Name: Norman Rd.
Road Segment: e/o Lena Rd.
Project Name: Gateway South 9
Job Number: 14882

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,444 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	144 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	80.8%	8.3%	10.9%	92.45%
Medium Trucks:	85.8%	4.0%	10.2%	2.54%
Heavy Trucks:	84.1%	3.9%	12.0%	5.01%

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:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.443

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-8.03	3.51	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-23.65	3.58	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-20.69	3.57	-1.20	*-5.77*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	53.0	51.3	47.4	43.8	52.2	52.5
Medium Trucks:	49.5	48.1	40.8	40.1	48.5	48.7
Heavy Trucks:	59.7	58.1	50.8	50.9	59.0	59.2
Vehicle Noise:	60.8	59.3	52.7	52.0	60.2	60.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	7	14	31	66
CNEL:	7	15	32	68

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

Scenario: OYBC
Road Name: Norman Rd.
Road Segment: e/o Lena Rd.
Project Name: Gateway South 9
Job Number: 14882

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,240 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	124 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	80.8%	8.3%	10.9%	93.28%
Medium Trucks:	85.8%	4.0%	10.2%	2.61%
Heavy Trucks:	84.1%	3.9%	12.0%	4.10%

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:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.443

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-8.65	3.51	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-24.18	3.58	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-22.22	3.57	-1.20	*-5.77*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	52.4	50.7	46.8	43.2	51.5	51.9
Medium Trucks:	49.0	47.5	40.3	39.5	48.0	48.2
Heavy Trucks:	58.1	56.6	49.3	49.4	57.5	57.7
Vehicle Noise:	59.6	58.0	51.6	50.7	58.9	59.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	5	12	25	54
CNEL:	6	12	26	56

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

Scenario: OYBC+P
Road Name: Norman Rd.
Road Segment: e/o Lena Rd.
Project Name: Gateway South 9
Job Number: 14882

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,454 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	145 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	80.8%	8.3%	10.9%	92.46%
Medium Trucks:	85.8%	4.0%	10.2%	2.54%
Heavy Trucks:	84.1%	3.9%	12.0%	5.01%

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:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.443

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	58.73	-8.00	3.51	-1.20	*-4.49*	0.000	0.000
Medium Trucks:	70.80	-23.62	3.58	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	77.97	-20.66	3.57	-1.20	*-5.77*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	53.0	51.3	47.5	43.9	52.2	52.6
Medium Trucks:	49.6	48.1	40.8	40.1	48.6	48.8
Heavy Trucks:	59.7	58.1	50.8	50.9	59.1	59.2
Vehicle Noise:	60.9	59.3	52.8	52.0	60.2	60.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	7	14	31	66
CNEL:	7	15	32	69

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

Scenario: E
Road Name: Orange Show Rd.
Road Segment: w/o Lena Rd.
Project Name: Gateway South 9
Job Number: 14882

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	430 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	43 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	68 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	80.8%	8.3%	10.9%	93.28%
Medium Trucks:	85.8%	4.0%	10.2%	2.61%
Heavy Trucks:	84.1%	3.9%	12.0%	4.10%

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:	37.000
Medium Trucks:	36.760
Heavy Trucks:	36.783

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-16.26	1.86	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	81.00	-31.79	1.90	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-29.83	1.90	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	54.6	52.9	49.0	45.4	53.8	54.1
Medium Trucks:	49.9	48.5	41.2	40.4	48.9	49.1
Heavy Trucks:	56.2	54.7	47.4	47.5	55.6	55.8
Vehicle Noise:	59.1	57.5	51.7	50.1	58.3	58.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	8	18	39	83
CNEL:	9	19	40	87

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

Scenario: E+P
Road Name: Orange Show Rd.
Road Segment: w/o Lena Rd.
Project Name: Gateway South 9
Job Number: 14882

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	776 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	78 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	68 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	80.8%	8.3%	10.9%	84.94%
Medium Trucks:	85.8%	4.0%	10.2%	3.38%
Heavy Trucks:	84.1%	3.9%	12.0%	11.69%

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:	37.000
Medium Trucks:	36.760
Heavy Trucks:	36.783

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-14.11	1.86	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	81.00	-28.11	1.90	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-22.72	1.90	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	56.8	55.0	51.2	47.6	55.9	56.3
Medium Trucks:	53.6	52.1	44.9	44.1	52.6	52.8
Heavy Trucks:	63.4	61.8	54.5	54.6	62.7	62.9
Vehicle Noise:	64.6	63.0	56.5	55.7	63.9	64.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	20	42	91	196
CNEL:	20	43	94	202

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

Scenario: OYBC
Road Name: Orange Show Rd.
Road Segment: w/o Lena Rd.
Project Name: Gateway South 9
Job Number: 14882

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	480 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	48 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	68 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	80.8%	8.3%	10.9%	93.28%
Medium Trucks:	85.8%	4.0%	10.2%	2.61%
Heavy Trucks:	84.1%	3.9%	12.0%	4.10%

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:	37.000
Medium Trucks:	36.760
Heavy Trucks:	36.783

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-15.78	1.86	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	81.00	-31.31	1.90	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-29.35	1.90	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	55.1	53.4	49.5	45.9	54.2	54.6
Medium Trucks:	50.4	48.9	41.7	40.9	49.4	49.6
Heavy Trucks:	56.7	55.2	47.9	48.0	56.1	56.3
Vehicle Noise:	59.6	58.0	52.2	50.6	58.8	59.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	9	19	42	90
CNEL:	9	20	43	93

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

Scenario: OYBC+P
Road Name: Orange Show Rd.
Road Segment: w/o Lena Rd.
Project Name: Gateway South 9
Job Number: 14882

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	826 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	83 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	68 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	80.8%	8.3%	10.9%	85.44%
Medium Trucks:	85.8%	4.0%	10.2%	3.33%
Heavy Trucks:	84.1%	3.9%	12.0%	11.23%

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:	37.000
Medium Trucks:	36.760
Heavy Trucks:	36.783

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-13.81	1.86	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	81.00	-27.90	1.90	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-22.62	1.90	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	57.1	55.3	51.5	47.9	56.2	56.6
Medium Trucks:	53.8	52.3	45.1	44.3	52.8	53.0
Heavy Trucks:	63.5	61.9	54.6	54.7	62.8	63.0
Vehicle Noise:	64.7	63.2	56.6	55.8	64.0	64.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	20	43	93	200
CNEL:	21	44	96	206

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

Scenario: E
Road Name: Orange Show Rd.
Road Segment: e/o Lena Rd.
Project Name: Gateway South 9
Job Number: 14882

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,230 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	123 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	68 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	80.8%	8.3%	10.9%	93.28%
Medium Trucks:	85.8%	4.0%	10.2%	2.61%
Heavy Trucks:	84.1%	3.9%	12.0%	4.10%

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:	37.000
Medium Trucks:	36.760
Heavy Trucks:	36.783

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-11.70	1.86	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	81.00	-27.23	1.90	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-25.26	1.90	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	59.2	57.4	53.6	50.0	58.3	58.7
Medium Trucks:	54.5	53.0	45.8	45.0	53.5	53.7
Heavy Trucks:	60.8	59.3	51.9	52.0	60.2	60.4
Vehicle Noise:	63.6	62.0	56.3	54.6	62.9	63.1

Centerline Distance to Noise Contour (in feet)

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

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

Scenario: E+P
Road Name: Orange Show Rd.
Road Segment: e/o Lena Rd.
Project Name: Gateway South 9
Job Number: 14882

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,467 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	147 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	68 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	80.8%	8.3%	10.9%	90.17%
Medium Trucks:	85.8%	4.0%	10.2%	2.90%
Heavy Trucks:	84.1%	3.9%	12.0%	6.92%

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:	37.000
Medium Trucks:	36.760
Heavy Trucks:	36.783

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-11.08	1.86	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	81.00	-26.00	1.90	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-22.23	1.90	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	59.8	58.1	54.2	50.6	58.9	59.3
Medium Trucks:	55.7	54.2	47.0	46.2	54.7	54.9
Heavy Trucks:	63.8	62.3	55.0	55.1	63.2	63.4
Vehicle Noise:	65.7	64.2	58.0	56.8	65.0	65.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	23	50	108	233
CNEL:	24	52	112	241

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

Scenario: OYBC
Road Name: Orange Show Rd.
Road Segment: e/o Lena Rd.
Project Name: Gateway South 9
Job Number: 14882

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,240 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	124 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	68 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	80.8%	8.3%	10.9%	93.28%
Medium Trucks:	85.8%	4.0%	10.2%	2.61%
Heavy Trucks:	84.1%	3.9%	12.0%	4.10%

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:	37.000
Medium Trucks:	36.760
Heavy Trucks:	36.783

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-11.66	1.86	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	81.00	-27.19	1.90	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-25.23	1.90	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	59.2	57.5	53.6	50.0	58.4	58.7
Medium Trucks:	54.5	53.1	45.8	45.0	53.5	53.7
Heavy Trucks:	60.8	59.3	52.0	52.1	60.2	60.4
Vehicle Noise:	63.7	62.1	56.3	54.7	62.9	63.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	17	36	78	169
CNEL:	18	38	81	175

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

Scenario: OYBC+P
Road Name: Orange Show Rd.
Road Segment: e/o Lena Rd.
Project Name: Gateway South 9
Job Number: 14882

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,477 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	148 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	68 feet

Site Data

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

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	80.8%	8.3%	10.9%	90.19%
Medium Trucks:	85.8%	4.0%	10.2%	2.90%
Heavy Trucks:	84.1%	3.9%	12.0%	6.91%

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:	37.000
Medium Trucks:	36.760
Heavy Trucks:	36.783

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	70.20	-11.05	1.86	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	81.00	-25.97	1.90	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	85.38	-22.21	1.90	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	59.8	58.1	54.2	50.6	59.0	59.4
Medium Trucks:	55.7	54.3	47.0	46.3	54.7	54.9
Heavy Trucks:	63.9	62.3	55.0	55.1	63.2	63.4
Vehicle Noise:	65.8	64.2	58.0	56.8	65.0	65.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	23	50	108	234
CNEL:	24	52	112	242

APPENDIX 9.1:

CADNAA OPERATIONAL NOISE MODEL INPUTS

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14882 - Gateway South 9 Warehouse

CadnaA Noise Prediction Model: 14882-02.cna
Date: 12.12.22
Analyst: B. Lawson

Calculation Configuration

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

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
RECEIVERS		R1	47.5	47.5	54.2	65.0	65.0	0.0				5.00	a	6254357.81	2338712.42	5.00
RECEIVERS		R2	41.7	41.6	48.3	65.0	65.0	0.0				5.00	a	6254774.25	2339112.05	5.00
RECEIVERS		R3	45.7	45.6	52.3	65.0	65.0	0.0				5.00	a	6253107.79	2337920.81	5.00
RECEIVERS		R4	32.0	31.8	38.5	65.0	65.0	0.0				5.00	a	6251115.59	2338688.60	5.00
RECEIVERS		R5	60.5	60.5	67.2	65.0	65.0	0.0				5.00	a	6253877.42	2338515.59	5.00

Point Source(s)

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night			X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(ft)		(ft)	(ft)	(ft)
POINTSOURCE		AC01	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	5.00	g	6253637.77	2338529.09	50.00
POINTSOURCE		AC02	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	5.00	g	6253579.86	2338529.09	50.00
POINTSOURCE		AC03	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	5.00	g	6252468.01	2338240.71	50.00
POINTSOURCE		AC04	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	5.00	g	6252410.10	2338241.87	50.00
POINTSOURCE		CAR01	81.1	81.1	81.1	Lw	81.1					5.00	a	6253726.05	2338216.47	5.00
POINTSOURCE		CAR02	81.1	81.1	81.1	Lw	81.1					5.00	a	6253679.41	2338235.23	5.00
POINTSOURCE		CAR03	81.1	81.1	81.1	Lw	81.1					5.00	a	6253726.05	2338252.54	5.00
POINTSOURCE		CAR04	81.1	81.1	81.1	Lw	81.1					5.00	a	6253680.37	2338286.68	5.00
POINTSOURCE		CAR05	81.1	81.1	81.1	Lw	81.1					5.00	a	6253726.05	2338303.99	5.00
POINTSOURCE		CAR06	81.1	81.1	81.1	Lw	81.1					5.00	a	6253679.41	2338330.92	5.00
POINTSOURCE		CAR07	81.1	81.1	81.1	Lw	81.1					5.00	a	6253726.05	2338349.67	5.00
POINTSOURCE		CAR08	81.1	81.1	81.1	Lw	81.1					5.00	a	6253677.00	2338383.82	5.00
POINTSOURCE		CAR09	81.1	81.1	81.1	Lw	81.1					5.00	a	6253727.01	2338410.26	5.00

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night			X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(ft)		(ft)	(ft)	(ft)
POINTSOURCE		CAR10	81.1	81.1	81.1	Lw	81.1					5.00	a	6253677.00	2338431.90	5.00
POINTSOURCE		CAR11	81.1	81.1	81.1	Lw	81.1					5.00	a	6253727.98	2338458.35	5.00
POINTSOURCE		CAR12	81.1	81.1	81.1	Lw	81.1					5.00	a	6252384.00	2338128.64	5.00
POINTSOURCE		CAR13	81.1	81.1	81.1	Lw	81.1					5.00	a	6252408.56	2338151.45	5.00
POINTSOURCE		CAR14	81.1	81.1	81.1	Lw	81.1					5.00	a	6252430.05	2338129.07	5.00
POINTSOURCE		CAR15	81.1	81.1	81.1	Lw	81.1					5.00	a	6252452.43	2338153.20	5.00
POINTSOURCE		CAR16	81.1	81.1	81.1	Lw	81.1					5.00	a	6252504.63	2338138.73	5.00
POINTSOURCE		CAR17	81.1	81.1	81.1	Lw	81.1					5.00	a	6252504.19	2338108.90	5.00
POINTSOURCE		CAR18	81.1	81.1	81.1	Lw	81.1					5.00	a	6252477.43	2338081.26	5.00
POINTSOURCE		CAR19	81.1	81.1	81.1	Lw	81.1					5.00	a	6252440.14	2338081.26	5.00
POINTSOURCE		CAR20	81.1	81.1	81.1	Lw	81.1					5.00	a	6252389.26	2338082.58	5.00
POINTSOURCE		CAR21	81.1	81.1	81.1	Lw	81.1					5.00	a	6252348.90	2338082.14	5.00
POINTSOURCE		CAR22	81.1	81.1	81.1	Lw	81.1					5.00	a	6252323.46	2338132.15	5.00
POINTSOURCE		CAR23	81.1	81.1	81.1	Lw	81.1					5.00	a	6252323.46	2338174.70	5.00
POINTSOURCE		CAR24	81.1	81.1	81.1	Lw	81.1					5.00	a	6252322.14	2338231.28	5.00
POINTSOURCE		CAR25	81.1	81.1	81.1	Lw	81.1					5.00	a	6252370.40	2338255.41	5.00
POINTSOURCE		CAR26	81.1	81.1	81.1	Lw	81.1					5.00	a	6252322.58	2338290.94	5.00
POINTSOURCE		CAR27	81.1	81.1	81.1	Lw	81.1					5.00	a	6252369.96	2338313.75	5.00
POINTSOURCE		CAR28	81.1	81.1	81.1	Lw	81.1					5.00	a	6252322.14	2338336.56	5.00
POINTSOURCE		CAR29	81.1	81.1	81.1	Lw	81.1					5.00	a	6252370.84	2338406.31	5.00
POINTSOURCE		CAR30	81.1	81.1	81.1	Lw	81.1					5.00	a	6252322.58	2338436.14	5.00
POINTSOURCE		CAR31	81.1	81.1	81.1	Lw	81.1					5.00	a	6252371.27	2338459.82	5.00
POINTSOURCE		CAR32	81.1	81.1	81.1	Lw	81.1					5.00	a	6252322.14	2338490.53	5.00
POINTSOURCE		CAR33	81.1	81.1	81.1	Lw	81.1					5.00	a	6252369.96	2338515.97	5.00
POINTSOURCE		CAR34	81.1	81.1	81.1	Lw	81.1					5.00	a	6252320.83	2338541.85	5.00
POINTSOURCE		TRASH01	89.0	89.0	89.0	Lw	89		900.00	0.00	270.00	5.00	a	6252617.37	2338087.90	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		TRUCK01	103.4	103.4	103.4	87.0	87.0	87.0	Lw	103.4									8	a
LINESOURCE		TRUCK02	103.4	103.4	103.4	89.9	89.9	89.9	Lw	103.4									8	a

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
LINESOURCE	TRUCK01	8.00	a			6252604.85	2338170.69	8.00	0.00
						6252595.94	2338171.08	8.00	0.00
						6252587.10	2338169.97	8.00	0.00
						6252578.56	2338167.39	8.00	0.00
						6252570.59	2338163.41	8.00	0.00
						6252563.39	2338158.15	8.00	0.00
						6252557.18	2338151.76	8.00	0.00
						6252552.13	2338144.41	8.00	0.00
						6252548.38	2338136.32	8.00	0.00
						6252547.20	2338065.34	8.00	0.00
LINESOURCE	TRUCK02	8.00	a			6253823.07	2338523.30	8.00	0.00
						6253822.73	2338596.97	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		DOCK01	103.4	103.4	103.4	60.0	60.0	60.0	Lw	103.4					8	a

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
AREASOURCE	DOCK01	8.00	a			6252604.68	2338269.66	8.00	0.00
						6253556.69	2338262.71	8.00	0.00
						6253556.69	2338204.80	8.00	0.00
						6253742.00	2338201.33	8.00	0.00
						6253743.16	2338523.30	8.00	0.00
						6253863.61	2338523.30	8.00	0.00
						6253862.45	2338164.27	8.00	0.00
						6253736.21	2338077.52	8.00	0.00
						6253600.79	2338077.87	8.00	0.00
						6253600.10	2338097.66	8.00	0.00
						6253045.63	2338102.00	8.00	0.00
						6253047.14	2338079.74	8.00	0.00
						6252605.00	2338083.56	8.00	0.00

Barrier(s)

Name	Sel.	M.	ID	Absorption		Z-Ext.	Cantilever		Height			Coordinates			
				left	right		horz.	vert.	Begin		End	x	y	z	Ground
						(ft)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
BARRIERPLANNED			0						14.00	a		6252604.28	2338209.22	14.00	0.00
												6252604.22	2338188.18	14.00	0.00
BARRIERPLANNED			0						14.00	a		6252604.22	2338147.80	14.00	0.00
												6252603.51	2338080.04	14.00	0.00
												6253050.56	2338076.98	14.00	0.00
												6253050.56	2338099.55	14.00	0.00
												6253599.38	2338095.86	14.00	0.00
												6253599.38	2338076.76	14.00	0.00
												6253753.39	2338075.51	14.00	0.00
BARRIERPLANNED			0						14.00	a		6253741.78	2338523.66	14.00	0.00
												6253802.55	2338523.23	14.00	0.00
BARRIERPLANNED			0						14.00	a		6253843.34	2338522.58	14.00	0.00
												6253877.47	2338522.14	14.00	0.00
BARRIERPLANNED			0						14.00	a		6254172.16	2338883.30	14.00	0.00
												6254222.08	2338883.30	14.00	0.00
												6254232.93	2339970.54	14.00	0.00

Building(s)

Name	Sel.	M.	ID	RB	Residents	Absorption	Height		Coordinates			
							Begin		x	y	z	Ground
							(ft)		(ft)	(ft)	(ft)	(ft)
BUILDING			BUILDING00001	x	0		45.00	a	6252388.10	2338568.47	45.00	0.00
									6253660.93	2338558.05	45.00	0.00
									6253660.93	2338202.49	45.00	0.00
									6253556.69	2338204.80	45.00	0.00
									6253556.69	2338262.71	45.00	0.00
									6252604.68	2338269.66	45.00	0.00
									6252604.28	2338209.22	45.00	0.00
									6252382.31	2338211.75	45.00	0.00
BUILDING			BUILDING00002	x	0		45.00	a	6251073.20	2338592.50	45.00	0.00
									6252041.09	2338577.31	45.00	0.00
									6252036.75	2338212.73	45.00	0.00
									6251887.01	2338214.90	45.00	0.00
									6251887.01	2338271.32	45.00	0.00
									6251214.26	2338280.00	45.00	0.00
									6251218.60	2338223.58	45.00	0.00
									6251071.03	2338221.41	45.00	0.00
BUILDING			BUILDING00003	x	0		45.00	a	6251014.61	2337793.89	45.00	0.00
									6252574.94	2337770.02	45.00	0.00
									6252579.28	2337826.45	45.00	0.00
									6252685.62	2337824.28	45.00	0.00
									6252674.77	2337301.27	45.00	0.00
									6252509.84	2337145.02	45.00	0.00
									6250895.25	2337164.55	45.00	0.00
									6250903.93	2337843.81	45.00	0.00
									6251012.44	2337839.47	45.00	0.00
BUILDING			BUILDING00004	x	0		45.00	a	6253299.77	2340148.49	45.00	0.00
									6254100.55	2340141.98	45.00	0.00
									6254102.72	2340022.63	45.00	0.00
									6254048.47	2340024.80	45.00	0.00
									6254033.27	2338889.81	45.00	0.00
									6254100.55	2338885.47	45.00	0.00
									6254094.04	2338774.80	45.00	0.00
									6253284.58	2338781.31	45.00	0.00
									6253286.75	2338896.32	45.00	0.00
									6253345.34	2338896.32	45.00	0.00
									6253362.70	2340033.48	45.00	0.00
									6253306.28	2340037.82	45.00	0.00
BUILDING			BUILDING00005	x	0		45.00	a	6254374.31	2338765.02	45.00	0.00
									6254417.72	2338766.74	45.00	0.00
									6254418.29	2338721.04	45.00	0.00
									6254374.88	2338727.32	45.00	0.00
BUILDING			BUILDING00006	x	0		45.00	a	6254475.98	2338797.58	45.00	0.00
									6254505.68	2338797.58	45.00	0.00
									6254506.26	2338708.48	45.00	0.00
									6254471.41	2338706.76	45.00	0.00

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APPENDIX 10.1:

CADNAA CONSTRUCTION NOISE MODEL INPUTS

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14882 - Gateway South 9 Warehouse

CadnaA Noise Prediction Model: 14882-02_Construction.cna
Date: 12.12.22
Analyst: B. Lawson

Calculation Configuration

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

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
RECEIVERS		R1	59.2	-47.7	56.2	65.0	65.0	0.0				5.00	a	6254357.81	2338712.42	5.00
RECEIVERS		R2	53.5	-53.5	50.5	65.0	65.0	0.0				5.00	a	6254774.25	2339112.05	5.00
RECEIVERS		R3	66.6	-40.4	63.6	65.0	65.0	0.0				5.00	a	6253107.79	2337920.81	5.00
RECEIVERS		R4	49.3	-57.7	46.3	65.0	65.0	0.0				5.00	a	6251115.59	2338688.60	5.00
RECEIVERS		R5	74.6	-32.4	71.6	65.0	65.0	0.0				5.00	a	6253877.42	2338515.59	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	122.0	15.0	15.0	73.2	-33.7	-33.7	PWL-Pt	115					8	a

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
SITEBOUNDARY	CONSTRUCTION	8.00	a			6252301.59	2338586.94	8.00	0.00
						6253207.20	2338572.87	8.00	0.00
						6253227.49	2338573.66	8.00	0.00
						6253878.13	2338599.14	8.00	0.00
						6253874.38	2338158.10	8.00	0.00
						6253704.44	2338042.10	8.00	0.00
						6253649.66	2338055.43	8.00	0.00
						6253594.37	2338066.50	8.00	0.00

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
				6253538.67	2338075.27	8.00	0.00
				6253482.66	2338081.74	8.00	0.00
				6253426.43	2338085.90	8.00	0.00
				6253370.08	2338087.74	8.00	0.00
				6253313.70	2338087.26	8.00	0.00
				6253257.38	2338084.45	8.00	0.00
				6253181.00	2338077.50	8.00	0.00
				6253146.62	2338073.34	8.00	0.00
				6253089.33	2338068.14	8.00	0.00
				6253031.90	2338064.78	8.00	0.00
				6252974.40	2338063.27	8.00	0.00
				6252923.70	2338062.92	8.00	0.00
				6252923.44	2338054.27	8.00	0.00
				6252623.46	2338058.81	8.00	0.00
				6252623.50	2338064.23	8.00	0.00
				6252523.51	2338065.69	8.00	0.00
				6252523.30	2338059.74	8.00	0.00
				6252298.30	2338063.56	8.00	0.00

Barrier(s)

Name	Sel.	M.	ID	Absorption		Z-Ext.	Cantilever		Height			Coordinates			
				left	right		horz.	vert.	Begin		End	x	y	z	Ground
						(ft)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
BARRIERPLANNED			0						14.00	a		6254172.16	2338883.30	14.00	0.00
												6254222.08	2338883.30	14.00	0.00
												6254232.93	2339970.54	14.00	0.00

Building(s)

Name	Sel.	M.	ID	RB	Residents	Absorption	Height		Coordinates			
							Begin		x	y	z	Ground
							(ft)		(ft)	(ft)	(ft)	(ft)
BUILDING			BUILDING00002	x	0		45.00	a	6251073.20	2338592.50	45.00	0.00
									6252041.09	2338577.31	45.00	0.00
									6252036.75	2338212.73	45.00	0.00
									6251887.01	2338214.90	45.00	0.00
									6251887.01	2338271.32	45.00	0.00
									6251214.26	2338280.00	45.00	0.00
									6251218.60	2338223.58	45.00	0.00
									6251071.03	2338221.41	45.00	0.00
BUILDING			BUILDING00003	x	0		45.00	a	6251014.61	2337793.89	45.00	0.00
									6252574.94	2337770.02	45.00	0.00
									6252579.28	2337826.45	45.00	0.00
									6252685.62	2337824.28	45.00	0.00
									6252674.77	2337301.27	45.00	0.00
									6252509.84	2337145.02	45.00	0.00
									6250895.25	2337164.55	45.00	0.00
									6250903.93	2337843.81	45.00	0.00
									6251012.44	2337839.47	45.00	0.00
BUILDING			BUILDING00004	x	0		45.00	a	6253299.77	2340148.49	45.00	0.00
									6254100.55	2340141.98	45.00	0.00
									6254102.72	2340022.63	45.00	0.00
									6254048.47	2340024.80	45.00	0.00
									6254033.27	2338889.81	45.00	0.00
									6254100.55	2338885.47	45.00	0.00
									6254094.04	2338774.80	45.00	0.00
									6253284.58	2338781.31	45.00	0.00
									6253286.75	2338896.32	45.00	0.00
									6253345.34	2338896.32	45.00	0.00
									6253362.70	2340033.48	45.00	0.00
									6253306.28	2340037.82	45.00	0.00
BUILDING			BUILDING00005	x	0		45.00	a	6254374.31	2338765.02	45.00	0.00
									6254417.72	2338766.74	45.00	0.00
									6254418.29	2338721.04	45.00	0.00
									6254374.88	2338727.32	45.00	0.00
BUILDING			BUILDING00006	x	0		45.00	a	6254475.98	2338797.58	45.00	0.00
									6254505.68	2338797.58	45.00	0.00
									6254506.26	2338708.48	45.00	0.00
									6254471.41	2338706.76	45.00	0.00

APPENDIX 10.2:

CADNAA CONCRETE POUR NOISE MODEL INPUTS

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14882 - Gateway South 9 Warehouse

CadnaA Noise Prediction Model: 14882-02_Concrete.cna
Date: 12.12.22
Analyst: B. Lawson

Calculation Configuration

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

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
RECEIVERS		R1	44.5	-62.4	41.5	65.0	65.0	0.0				5.00	a	6254357.81	2338712.42	5.00
RECEIVERS		R2	38.8	-67.9	35.8	65.0	65.0	0.0				5.00	a	6254774.25	2339112.05	5.00
RECEIVERS		R3	51.9	-55.1	48.9	65.0	65.0	0.0				5.00	a	6253107.79	2337920.81	5.00
RECEIVERS		R4	34.6	-71.7	31.6	65.0	65.0	0.0				5.00	a	6251115.59	2338688.60	5.00
RECEIVERS		R5	59.9	-47.1	56.9	65.0	65.0	0.0				5.00	a	6253877.42	2338515.59	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		CONCRETE	107.3	0.3	0.3	58.5	-48.4	-48.4	PWL-Pt	100.3					8	a

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
SITEBOUNDARY	CONCRETE	8.00	a			6252301.59	2338586.94	8.00	0.00
						6253207.20	2338572.87	8.00	0.00
						6253227.49	2338573.66	8.00	0.00
						6253878.13	2338599.14	8.00	0.00
						6253874.38	2338158.10	8.00	0.00
						6253704.44	2338042.10	8.00	0.00
						6253649.66	2338055.43	8.00	0.00
						6253594.37	2338066.50	8.00	0.00

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
						6253538.67	2338075.27	8.00	0.00
						6253482.66	2338081.74	8.00	0.00
						6253426.43	2338085.90	8.00	0.00
						6253370.08	2338087.74	8.00	0.00
						6253313.70	2338087.26	8.00	0.00
						6253257.38	2338084.45	8.00	0.00
						6253181.00	2338077.50	8.00	0.00
						6253146.62	2338073.34	8.00	0.00
						6253089.33	2338068.14	8.00	0.00
						6253031.90	2338064.78	8.00	0.00
						6252974.40	2338063.27	8.00	0.00
						6252923.70	2338062.92	8.00	0.00
						6252923.44	2338054.27	8.00	0.00
						6252623.46	2338058.81	8.00	0.00
						6252623.50	2338064.23	8.00	0.00
						6252523.51	2338065.69	8.00	0.00
						6252523.30	2338059.74	8.00	0.00
						6252298.30	2338063.56	8.00	0.00

Barrier(s)

Name	Sel.	M.	ID	Absorption		Z-Ext.	Cantilever		Height			Coordinates			
				left	right		horz.	vert.	Begin		End	x	y	z	Ground
						(ft)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
BARRIERPLANNED			0						14.00	a		6254172.16	2338883.30	14.00	0.00
												6254222.08	2338883.30	14.00	0.00
												6254232.93	2339970.54	14.00	0.00

Building(s)

Name	Sel.	M.	ID	RB	Residents	Absorption	Height		Coordinates			
							Begin		x	y	z	Ground
							(ft)		(ft)	(ft)	(ft)	(ft)
BUILDING			BUILDING00002	x	0		45.00	a	6251073.20	2338592.50	45.00	0.00
									6252041.09	2338577.31	45.00	0.00
									6252036.75	2338212.73	45.00	0.00
									6251887.01	2338214.90	45.00	0.00
									6251887.01	2338271.32	45.00	0.00
									6251214.26	2338280.00	45.00	0.00
									6251218.60	2338223.58	45.00	0.00
									6251071.03	2338221.41	45.00	0.00
BUILDING			BUILDING00003	x	0		45.00	a	6251014.61	2337793.89	45.00	0.00
									6252574.94	2337770.02	45.00	0.00
									6252579.28	2337826.45	45.00	0.00
									6252685.62	2337824.28	45.00	0.00
									6252674.77	2337301.27	45.00	0.00
									6252509.84	2337145.02	45.00	0.00
									6250895.25	2337164.55	45.00	0.00
									6250903.93	2337843.81	45.00	0.00
									6251012.44	2337839.47	45.00	0.00
BUILDING			BUILDING00004	x	0		45.00	a	6253299.77	2340148.49	45.00	0.00
									6254100.55	2340141.98	45.00	0.00
									6254102.72	2340022.63	45.00	0.00
									6254048.47	2340024.80	45.00	0.00
									6254033.27	2338889.81	45.00	0.00
									6254100.55	2338885.47	45.00	0.00
									6254094.04	2338774.80	45.00	0.00
									6253284.58	2338781.31	45.00	0.00
									6253286.75	2338896.32	45.00	0.00
									6253345.34	2338896.32	45.00	0.00
									6253362.70	2340033.48	45.00	0.00
									6253306.28	2340037.82	45.00	0.00
BUILDING			BUILDING00005	x	0		45.00	a	6254374.31	2338765.02	45.00	0.00
									6254417.72	2338766.74	45.00	0.00
									6254418.29	2338721.04	45.00	0.00
									6254374.88	2338727.32	45.00	0.00
BUILDING			BUILDING00006	x	0		45.00	a	6254475.98	2338797.58	45.00	0.00
									6254505.68	2338797.58	45.00	0.00
									6254506.26	2338708.48	45.00	0.00
									6254471.41	2338706.76	45.00	0.00