# Appendix J Noise and Vibration Analysis



# **534 Struck Avenue**Noise and Vibration Analysis City of Orange

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13103-07 Noise Study



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#### **LIST OF ABBREVIATED TERMS**

(1) Reference

ANSI American National Standards Institute

Calveno California Vehicle Noise

CEQA California Environmental Quality Act
CNEL Community Noise Equivalent Level

dBA A-weighted decibels

EPA Environmental Protection Agency
FHWA Federal Highway Administration
FTA Federal Transit Administration

INCE Institute of Noise Control Engineering

L<sub>eq</sub> Equivalent continuous (average) sound level
L<sub>max</sub> Maximum level measured over the time interval

mph Miles per hour

PPV Peak Particle Velocity
Project 534 Struck Avenue

REMEL Reference Energy Mean Emission Level

RMS Root-mean-square VdB Vibration Decibels



#### **EXECUTIVE SUMMARY**

Urban Crossroads, Inc. has prepared this noise study to determine the noise exposure and the necessary noise mitigation measures for the proposed 534 Struck Avenue ("Project"). The Project site is located south of Struck Avenue and east of Batavia in the City of Orange. The Project is proposing to redevelop the site with a 57,900-square foot, 45-foot-tall truck terminal, including 52,900-square feet of warehouse space and 5,000-square feet of office uses. This noise study has been prepared to satisfy applicable City of Orange noise standards and significance criteria based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1)

The results of this Noise and Vibration Analysis are summarized below based on the significance criteria in Section 4 of this report consistent with Appendix G of the 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** 

Amalusia	Report	Significance Findings		
Analysis	Section	Unmitigated	Mitigated	
Off-Site Traffic Noise	7	Less Than Significant	-	
Operational Noise	9	Less Than Significant	-	
Construction Noise	10	Less Than Significant	-	
Construction Vibration	10	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 534 Struck Avenue ("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 534 Struck Avenue Project is located south of Struck Avenue and east of Batavia Street in the City of Orange, as shown on Exhibit 1-A. Existing uses that surround the Project site includes mostly manufacturing industrial land uses to the west and east, with public-institutional uses to the north and the nearest multi-family residential land uses located northeast of the Project site.

#### 1.2 BACKGROUND

The site is currently occupied by Nursery Supplies, Inc., a manufacturer of plastic nursery planting pots. Site improvements consist of an approximate 40,000 square-foot concrete tilt-up building, 5 open canopy storage areas, 14 silos for plastic granule storage, open storage areas, and parking. The Project site is designated Light Industrial in the City of Orange General Plan and zoned under City of Orange Zoning Map as Industrial Manufacturing (M-2).

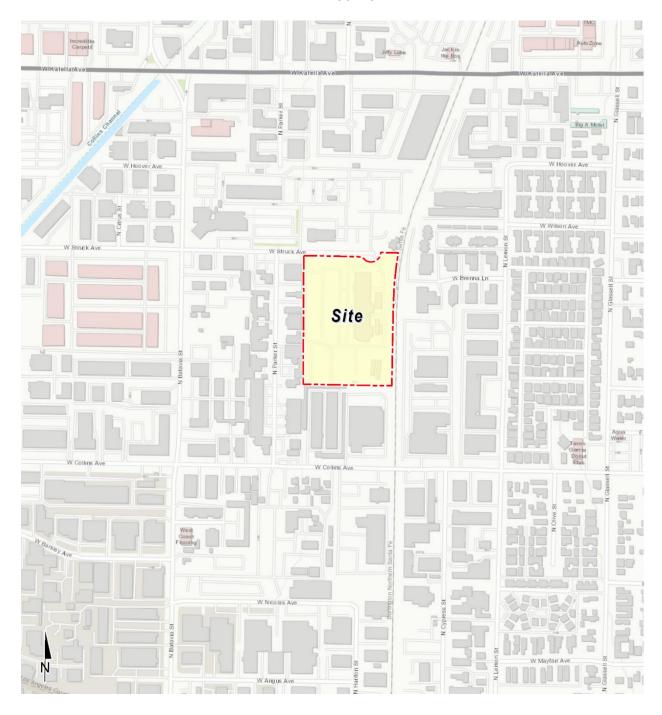
#### 1.3 PROJECT DESCRIPTION

The Project is proposing to redevelop the site with a 57,900-square foot, 45-foot-tall truck terminal, including 52,900-square feet of warehouse space and 5,000-square feet of office uses (see Exhibit 1-B). The site also includes a 5,400 square foot maintenance building. The Project would construct 62 passenger car parking stalls (including 3 accessible parking spaces) and 188 trailer parking stalls (for a total of 250 parking stalls) on-site. The building is proposed to include 84 dock doors (cross-dock configuration). The Project is proposed to operate 24-hours a day, 7 days a week with 3 shifts. The anticipated Opening Year for the proposed Project is 2024.

At the time this noise analysis was prepared, the future tenants of the proposed Project were unknown. The on-site Project-related noise sources are expected to include loading dock activity, truck terminal activity, roof-top air conditioning units trash enclosure activity, parking lot vehicle movements and truck movements.

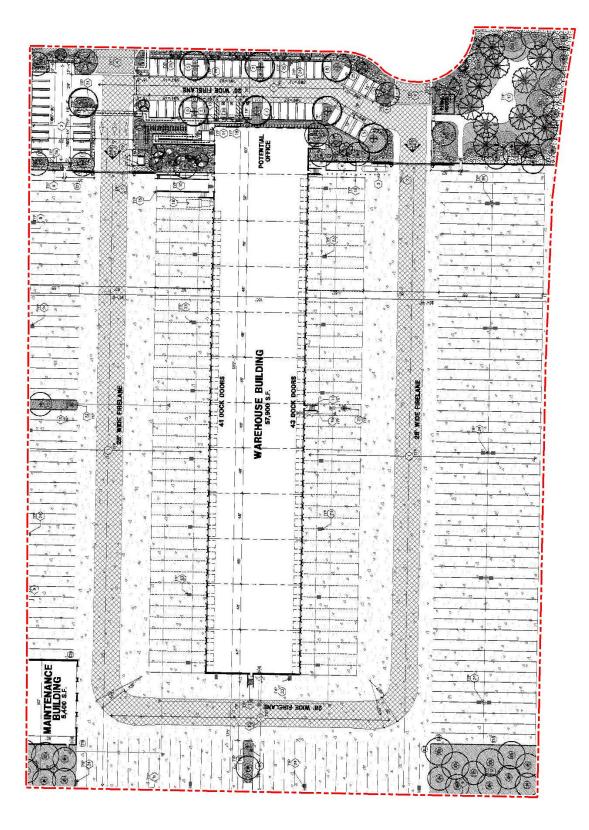


**EXHIBIT 1-A: LOCATION MAP** 





**EXHIBIT 1-B: SITE PLAN** 







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#### 2 FUNDAMENTALS

Noise is simply defined as "unwanted sound." Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Noise is measured on a logarithmic scale of sound pressure level known as a decibel (dB). Aweighted 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			
NEAR JET ENGINE		130	INTOLERABLE OR		
		120	DEAFENING	HEARING LOSS	
JET FLY-OVER AT 300m (1000 ft)	ROCK BAND	110			
LOUD AUTO HORN		100			
GAS LAWN MOWER AT 1m (3 ft)		90	VERY NOISY		
DIESEL TRUCK AT 15m (50 ft), at 80 km/hr (50 mph)	FOOD BLENDER AT 1m (3 ft)	80	VERT HOLST		
NOISY URBAN AREA, DAYTIME	VACUUM CLEANER AT 3m (10 ft)	70	LOUD	SPEECH INTERFERENCE	
HEAVY TRAFFIC AT 90m (300 ft)	NORMAL SPEECH AT 1m (3 ft)	60	1000	INTERI ERENCE	
QUIET URBAN DAYTIME	LARGE BUSINESS OFFICE	50	MODERATE	CLEED	
QUIET URBAN NIGHTTIME	THEATER, LARGE CONFERENCE ROOM (BACKGROUND)	40		SLEEP DISTURBANCE	
QUIET SUBURBAN NIGHTTIME	LIBRARY	30			
QUIET RURAL NIGHTTIME	BEDROOM AT NIGHT, CONCERT HALL (BACKGROUND)	20	FAINT		
	BROADCAST/RECORDING STUDIO	10	VERY FAINT	NO EFFECT	
LOWEST THRESHOLD OF HUMAN HEARING	LOWEST THRESHOLD OF HUMAN HEARING	0	VERT FAINT		

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<sub>eq</sub> sound levels in the evening from 7:00 p.m. to 10:00 p.m., and the addition of 10 decibels to dBA L<sub>eq</sub> 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 Orange 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.



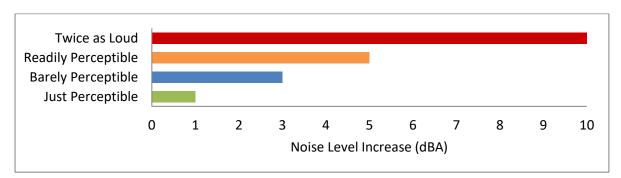
#### 2.6 LAND USE COMPATIBILITY WITH NOISE

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 rOYCtions can be expected from people exposed to any given noise environment.

Surveys have shown that community response to noise varies from no rOYCtion 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.



Velocity Typical Sources Level\* (50 ft from source) Human/Structural Response 100 Threshold, minor cosmetic damage Blasting from construction projects fragile buildings Bulldozers and other heavy tracked construction equipment Difficulty with tasks such as 90 reading a VDT screen Commuter rail, upper range 80 Residential annoyance, infrequent Rapid transit, upper range events (e.g. commuter rail) Commuter rail, typical Residential annoyance, frequent Bus or truck over bump events (e.g. rapid transit) Rapid transit, typical Limit for vibration sensitive equipment. Approx. threshold for Bus or truck, typical human perception of vibration 60 Typical background vibration 50

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

\* RMS Vibration Velocity Level in VdB relative to 10-6 inches/second

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



#### 3 REGULATORY SETTING

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

#### 3.1 STATE OF CALIFORNIA NOISE REQUIREMENTS

The State of California regulates freeway noise, sets standards for sound transmission, provides occupational noise control criteria, identifies noise standards, and provides guidance for local land use compatibility. State law requires that each county and city adopt a General Plan that includes a Noise Element which is to be prepared per guidelines adopted by the Governor's Office of Planning and Research (OPR). (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 ORANGE GENERAL PLAN NOISE ELEMENT

The City of Orange has adopted a Noise Element of the General Plan to control and abate environmental noise, and to protect the citizens of the City of Orange from excessive exposure to noise. (10) The Noise Element specifies the maximum allowable exterior noise levels for new developments impacted by transportation noise sources such as arterial roads, freeways, airports and railroads. In addition, the Noise Element identifies several polices to minimize the impacts of excessive noise levels throughout the community and establishes noise level requirements for all land uses. To protect City of Orange residents from excessive noise, the Noise Element contains the following policies related to the Project:

- Policy 1.1: Consider potential excessive noise levels when making land use planning decisions.
- Policy 1.2: Encourage new development projects to provide sufficient spatial buffers to separate excessive noise generating land uses and noise-sensitive land uses.
- Policy 1.4: Ensure that acceptable noise levels are maintained near noise-sensitive uses.
- Policy 1.5: Reduce impacts of high-noise activity centers located near residential areas.
- Policy 6.1: Encourage the design and construction of industrial uses to minimize excessive noise through project design features that include noise control.
- Policy 6.2: Encourage industrial uses to locate vehicular traffic and operations away from abutting residential zones as much as possible.
- Policy 7.2: Require developers and contractors to employ noise minimizing techniques during construction and maintenance operations.



Policy 7.3: Limit the hours of construction and maintenance operations located adjacent to noisesensitive land uses.

To ensure noise-sensitive land uses are protected from high levels of noise the City of Orange has developed its own land use compatibility standards, based on recommended parameters from the Governor's Office of Planning and Research (OPR). (9) The City's Land Use Compatibility standards use the CNEL noise descriptor, are intended to be applicable for land use designations exposed to noise levels generated by transportation related sources. Land use compatibility noise exposure limits are generally established as 65 dBA CNEL for most land use designations throughout the City. Higher exterior noise levels are permitted for multiple-family housing and housing in mixed-use contexts than for single-family houses. This is because multiple-family complexes are generally located in transitional areas between single-family and commercial districts or in proximity to major arterials served by transit, and a more integrated mix of residential and commercial activity (accompanied by higher noise levels) is often desired in mixed-use areas close to transit routes. The City of Orange does not identify any transportation related noise exposure standards for industrial land uses.

#### 3.3 CITY OF ORANGE MUNICIPAL CODE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property such as the 534 Struck Avenue Project, stationary-source (operational) noise levels and noise from construction activities are typically evaluated against standards established under the City's Municipal Code.

#### 3.3.1 OPERATIONAL NOISE STANDARDS

For noise-sensitive residential property, the City of Orange Municipal Code, Section 8.24.040, identifies exterior noise levels standards of 55 dBA L<sub>eq</sub> for the daytime hours (7:00 a.m. to 10:00 p.m.) and 50 dBA L<sub>eq</sub> during the nighttime (10:00 p.m. to 7:00 a.m.) hours for all residential property. The City of Orange Municipal Code Noise Standards are included in Appendix 3.1. Per Section 8.24.040[B] for multi-family residential or mixed-use developments located within the City's Urban Mixed Use, Neighborhood Mixed Use, Old Towne Mixed Use or Medium Density Residential General Plan land use districts, exterior noise standards shall apply to common recreation areas only and shall not apply to private exterior space (such as a private yard, patio, or balcony). The City of Orange Municipal Code does not identify any exterior noise level standards for non-residential land uses.

#### 3.3.2 CONSTRUCTION NOISE STANDARDS

The City of Orange has set restrictions to control noise impacts associated with the construction of the proposed Project. Section 8.24.050[E] of the City's Municipal Code states: *Noise sources associated with construction, repair, remodeling, or grading of any real property, provided said activities take place between the hours of 7:00 a.m. and 8:00 p.m. on any day except for Sunday or a Federal holiday, or between the hours of 9:00 a.m. and 8:00 p.m. on Sunday or a Federal holiday.* Neither the City's 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 Leg as a reasonable threshold for noise sensitive residential land use. (8 p. 179)

#### 3.4 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 534 Struck Avenue, vibration-generating activities are appropriately evaluated against standards established under a City's Municipal Code, if such standards exist. However, the City of Orange does not identify specific vibration level limits. Therefore, for analysis purposes, the Caltrans *Transportation and Construction Vibration Guidance Manual*, (12 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).



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#### 4 SIGNIFICANCE CRITERIA

The following significance criteria are based on currently adopted guidance provided by Appendix G of the Guidelines for Implementation 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 described above at the closest sensitive receiver locations. Under CEQA, consideration must be given to the magnitude of the increase, the existing baseline ambient noise levels, and the location of noise-sensitive receivers to determine if a noise increase represents a significant adverse environmental impact. This approach recognizes that there is no single noise increase that renders 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 exceeds the previously existing ambient noise level, the less acceptable the new noise will typically be judged.

To describe the amount to which a given noise level increase is considered acceptable, the City Orange General Plan has adopted criteria for determining appropriate mitigation under the California Environmental Quality Act (CEQA). An increase in ambient noise levels is assumed to be a significant noise impact if a project causes ambient noise levels to exceed the following:

- Where the existing ambient noise level is less than 65 dBA, a project related permanent increase in ambient noise levels of 5 dBA CNEL or greater.
- Where the existing ambient noise level is greater than 65 dBA, a project related permanent increase in ambient noise levels of 3 dBA CNEL or greater.

#### 4.2 VIBRATION (THRESHOLD B)

As described in Section 3.4, the vibration impacts originating from the construction of 534 Struck Avenue, 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 Project site is not located within two miles of a public airport or within an airport land use plan; nor is the Project within the vicinity of a private airstrip. As such, the Project site would not be exposed to excessive noise levels from airport operations, and therefore, impacts are considered *less than significant*, and no further noise analysis is conducted in relation to Guideline C.

#### 4.4 SIGNIFICANCE CRITERIA SUMMARY

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

**TABLE 4-1: SIGNIFICANCE CRITERIA SUMMARY** 

Analysis	Condition(s)	Significance Criteria		
Analysis	Condition(s)	Daytime	Nighttime	
Off-Site	If ambient is < 65 dBA CNEL <sup>1</sup>	≥ 5 dBA CNEL Proje	ect increase	
Traffic	If ambient is > 65 dBA CNEL <sup>1</sup>	≥ 3 dBA CNEL Project increase		
	Exterior Noise Level Standards <sup>2</sup>	55 dBA L <sub>eq</sub>	50 dBA L <sub>eq</sub>	
Operational	If ambient is < 65 dBA Leq <sup>1</sup>	≥ 5 dBA L <sub>eq</sub> Project increase		
	If ambient is > 65 dBA Leq <sup>1</sup>	≥ 3 dBA L <sub>eq</sub> Project increase		
:	Permitted between 7:00 a.m except for Sunday or	•	day	
Construction	Noise Level Threshold <sup>4</sup>	80 dBA L <sub>eq</sub>	n/a	
	Vibration Level Threshold⁵	0.3 PPV (in/sec)	n/a	

<sup>&</sup>lt;sup>1</sup> City Orange General Plan Noise Element, Table N-3.



<sup>&</sup>lt;sup>2</sup> City Orange Municipal Code Section 8.24.040.

<sup>&</sup>lt;sup>3</sup> City Orange Municipal Code Section 8.24.050[E].

<sup>&</sup>lt;sup>4</sup> Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual.

 $<sup>^{\</sup>rm 5}$  Caltrans Transportation and Construction Vibration Manual, April 2020 Table 19.

<sup>&</sup>quot;Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

#### 5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, 24-hour noise level measurements were taken at five locations in the Project study area. The receiver locations were selected to describe and document the existing noise environment within the Project study area. Exhibit 5-A provides the boundaries of the Project study area and the noise level measurement locations. To fully describe the existing noise conditions, noise level measurements were collected by Urban Crossroads, Inc. on Monday, April 18<sup>th</sup>, 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. (14)

#### **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, that it is not necessary nor recommended that existing noise exposure be determined by measuring at every noise-sensitive location in the project area. Rather, the recommended approach is to characterize the noise environment for clusters of sites based on measurements or estimates at representative locations in the community. (8)

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



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

#### 5.3 Noise Measurement Results

The noise measurements presented below focus on the equivalent or the hourly energy average 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: AMBIENT NOISE LEVEL MEASUREMENTS** 

Location <sup>1</sup>	Description	Energy Average Noise Level (dBA L <sub>eq</sub> ) <sup>2</sup>		
		Daytime	Nighttime	
L1	Located northwest of the Project site near the Department of Public Works at 637 West Struck Avenue.	54.3	50.5	
L2	Located northeast of the Project site near proposed residential development north of West Struck Avenue.	51.2	47.2	
L3	Located northeast of the Project site near The HUB OC (Mary's Kitchen) at 517 West Struck Avenue.		49.3	
L4	Located northeast of the Project site near the Citrus Grove Apartments at 1120 North Lemon Street.		46.8	
L5	Located south of the Project site near the Top Dog Inn at 606 West Collins Avenue.	68.0	63.0	

 $<sup>^{\</sup>mbox{\scriptsize 1}}$  See Exhibit 5-A for the noise level measurement locations.

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 of the daytime and nighttime hours.



<sup>&</sup>lt;sup>2</sup> Energy (logarithmic) average levels. The long-term 24-hour measurement worksheets are included in Appendix 5.2.

<sup>&</sup>quot;Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

HOOVER AVE ALLIEN AMEN STRUCKAVE ALLEY BRENNA LIN **CARROLAST** Site COLLINSAVE LS COLUMN ST GRATESSET.

**EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS** 



**LEGEND:** 

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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 City of Orange Noise and Land Use Compatibility Guidelines (10), 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. (15) 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. (16) 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. (17)

#### 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 13 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 Orange General Plan Circulation Element, and the vehicle speeds. The ADT volumes used in this study area presented on Table 6-2 are based on the 534 Struck Avenue Traffic Analysis, prepared by Urban Crossroads, Inc. for the following traffic scenarios. (18)

- Existing (E)
- Existing plus Project (E+P)
- Opening Year Cumulative without Project Conditions (OYC)
- Opening Year Cumulative with Project Conditions (OYC+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 396 two-way trips per day (actual vehicles) that include 176 truck trips.



**TABLE 6-1: OFF-SITE ROADWAY PARAMETERS** 

ID	Roadway	lway Segment Classification <sup>1</sup>		Distance from Centerline to Receiving Land Use (Feet) <sup>2</sup>	Vehicle Speed (mph) <sup>3</sup>
1	Main St.	n/o Struck Av.	n/o Struck Av. Primary Arterial		40
2	Main St.	s/o Struck Av.	Primary Arterial	50'	40
3	Batavia St. n/o Katella Av. Primary		Primary Arterial	50'	40
4	Batavia St.	s/o Katella Av.	Primary Arterial	50'	40
5	Batavia St.	s/o Struck Av.	Primary Arterial	50'	40
6	Katella Av.	w/o Main St.	Smart Street	67'	40
7	Katella Av.	e/o Main St.	Smart Street	67'	40
8	Katella Av.	e/o Batavia Av.	Smart Street	67'	40
9	Katella Av.	w/o SR-57 SB Ramps	Smart Street	67'	40
10	O Katella Av. e/o SR-57 NB Ramps		Smart Street	67'	40
11	Struck Av.	w/o Main St.	Collector	33'	40
12	Struck Av.	e/o Main St.	Collector	33'	40
13	Struck Av.	e/o Batavia Av.	Collector	33'	40

 $<sup>^{1}</sup>$  City of Orange General Plan Circulation Element functional roadway classification.

**TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES** 

			Ave	erage Daily T	raffic Volume	es <sup>1</sup>
ID	Roadway	Segment	Existing		OYC (2024)	
			Without Project	With Project	Without Project	With Project
1	Main St.	n/o Struck Av.	15,522	15,533	16,205	16,216
2	Main St.	s/o Struck Av.	18,156	18,167	19,026	19,037
3	Batavia St.	n/o Katella Av.	12,119	12,149	13,174	13,205
4	Batavia St.	s/o Katella Av.	9,676	9,975	10,417	10,716
5	Batavia St.	s/o Struck Av.	10,892	10,923	11,648	11,679
6	Katella Av.	w/o Main St.	24,088	24,268	25,269	25,449
7	Katella Av.	e/o Main St.	28,483	28,663	29,870	30,050
8	Katella Av.	e/o Batavia Av.	31,672	31,760	33,328	33,416
9	Katella Av.	w/o SR-57 SB Ramps	36,377	36,388	38,027	38,038
10	Katella Av.	e/o SR-57 NB Ramps	35,065	35,289	37,009	37,234
11	Struck Av.	w/o Main St.	5,142	5,186	5,668	5,712
12	Struck Av.	e/o Main St.	1,525	1,591	1,823	1,889
13	Struck Av.	e/o Batavia Av.	1,477	1,873	1,875	2,271

<sup>&</sup>lt;sup>1</sup> 534 Struck Avenue Traffic Analysis, Urban Crossroads, Inc.



<sup>&</sup>lt;sup>2</sup> Distance to receiving land use is based upon the right-of-way distances.

<sup>&</sup>lt;sup>3</sup> 534 Struck Avenue Traffic Analysis, Urban Crossroads, Inc.

To quantify the off-site noise levels, the Project related truck trips were added to the heavy truck category in the FHWA noise prediction model. The addition of the Project related truck trips increases the percentage of heavy trucks in the vehicle mix. This approach recognizes that the FHWA noise prediction model is significantly influenced by the number of heavy trucks in the vehicle mix. Table 6-3 provides the time of day (daytime, evening, and nighttime) vehicle splits. The daily Project truck trip-ends were assigned to the individual off-site study area roadway segments based on the Project truck trip distribution percentages documented in the 534 Struck Avenue Traffic Analysis. Using the Project truck trips in combination with the Project trip distribution, Urban Crossroads, Inc. calculated the number of additional Project truck trips and vehicle mix percentages for each of the study area roadway segments. Table 6-4 shows the traffic flow by vehicle type (vehicle mix) used for all without Project traffic scenarios, and Tables 6-5 to 6-6 show the vehicle mixes used for the with Project traffic scenarios.

**TABLE 6-3: TIME OF DAY VEHICLE SPLITS** 

Vahiela Tuna		Total of Time of		
Vehicle Type	Daytime	Evening	Nighttime	Day Splits
Autos	75.46%	12.53%	12.02%	100.00%
Medium Trucks	81.62%	5.32%	13.06%	100.00%
Heavy Trucks	79.88%	6.17%	13.95%	100.00%

<sup>&</sup>lt;sup>1</sup> Based on the August 31, 2022, 24-hour directional vehicle classification count collected on Katella Avenue west of Struck Avenue (534 Struck Avenue Traffic Analysis, Urban Crossroads, Inc.) "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 <sup>1</sup>			
Classification	Autos	Medium Trucks	Heavy Trucks	Total
All Segments	91.47%	6.36%	2.17%	100.00%

<sup>&</sup>lt;sup>1</sup> Based on the August 31, 2022, 24-hour directional vehicle classification count collected on Katella Avenue west of Struck Avenue (534 Struck Avenue Traffic Analysis, Urban Crossroads, 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** 

				With P	roject <sup>1</sup>	
ID	Roadway	Segment	Autos	Medium Trucks	Heavy Trucks	Total <sup>2</sup>
1	Main St.	n/o Struck Av.	91.48%	6.35%	2.17%	100.00%
2	Main St.	s/o Struck Av.	91.48%	6.35%	2.17%	100.00%
3	Batavia St.	n/o Katella Av.	91.42%	6.35%	2.23%	100.00%
4	Batavia St.	St. s/o Katella Av.		6.42%	3.53%	100.00%
5	Batavia St.	s/o Struck Av.	91.41%	6.35%	2.24%	100.00%
6	Katella Av.	w/o Main St.	91.06%	6.38%	2.56%	100.00%
7	Katella Av.	e/o Main St.	91.12%	6.38%	2.50%	100.00%
8	Katella Av.	e/o Batavia Av.	91.36%	6.36%	2.29%	100.00%
9	Katella Av.	w/o SR-57 SB Ramps	91.47%	6.35%	2.17%	100.00%
10	Katella Av.	e/o SR-57 NB Ramps	91.20%	6.36%	2.44%	100.00%
11	Struck Av.	w/o Main St.	91.54%	6.30%	2.16%	100.00%
12	Struck Av.	e/o Main St.	91.82%	6.09%	2.08%	100.00%
13	Struck Av.	e/o Batavia Av.	83.88%	6.42%	9.70%	100.00%

<sup>&</sup>lt;sup>1</sup>534 Struck Avenue Traffic Analysis, Urban Crossroads, Inc.

**TABLE 6-6: OYC WITH PROJECT VEHICLE MIX** 

	Roadway	Segment	With Project <sup>1</sup>			
ID			Autos	Medium Trucks	Heavy Trucks	Total <sup>2</sup>
1	Main St.	n/o Struck Av.	91.48%	6.35%	2.17%	100.00%
2	Main St.	s/o Struck Av.	91.47%	6.35%	2.17%	100.00%
3	Batavia St.	n/o Katella Av.	91.42%	6.35%	2.23%	100.00%
4	Batavia St.	s/o Katella Av.	90.15%	6.41%	3.44%	100.00%
5	Batavia St.	s/o Struck Av.	91.42%	6.35%	2.23%	100.00%
6	Katella Av.	w/o Main St.	91.08%	6.38%	2.54%	100.00%
7	Katella Av.	e/o Main St.	91.14%	6.37%	2.48%	100.00%
8	Katella Av.	e/o Batavia Av.	91.36%	6.36%	2.28%	100.00%
9	Katella Av.	w/o SR-57 SB Ramps	91.47%	6.35%	2.17%	100.00%
10	Katella Av.	e/o SR-57 NB Ramps	91.21%	6.36%	2.42%	100.00%
11	Struck Av.	w/o Main St.	91.54%	6.31%	2.16%	100.00%
12	Struck Av.	e/o Main St.	91.77%	6.13%	2.10%	100.00%
13	Struck Av.	e/o Batavia Av.	85.21%	6.41%	8.38%	100.00%

 $<sup>^{\</sup>rm 1}$  534 Struck Avenue Traffic Analysis, Urban Crossroads, Inc.



 $<sup>^{\</sup>rm 2}\,\text{Total}$  of vehicle mix percentage values rounded to the nearest one-hundredth.

 $<sup>^{\</sup>rm 2}\,\text{Total}$  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 534 Struck Avenue Traffic Analysis* prepared by Urban Crossroads, Inc. (19) 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 7-5 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	CNEL at Nearest	Distance to Contour from Centerline (Feet)		
			Receiving Land Use (dBA) <sup>1</sup>	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Main St.	n/o Struck Av.	71.0	58	125	269
2	Main St.	s/o Struck Av.	71.6	64	138	298
3	Batavia St.	n/o Katella Av.	69.9	RW	106	228
4	Batavia St.	s/o Katella Av.	68.9	RW	91	196
5	Batavia St.	s/o Struck Av.	69.4	RW	98	212
6	Katella Av.	w/o Main St.	71.2	81	174	375
7	Katella Av.	e/o Main St.	71.9	90	194	419
8	Katella Av.	e/o Batavia Av.	72.4	97	209	450
9	Katella Av.	w/o SR-57 SB Ramps	73.0	106	229	493
10	Katella Av.	e/o SR-57 NB Ramps	72.8	104	223	481
11	Struck Av.	w/o Main St.	68.0	RW	52	113
12	Struck Av.	e/o Main St.	62.7	RW	RW	50
13	Struck Av.	e/o Batavia Av.	62.6	RW	RW	49

<sup>&</sup>lt;sup>1</sup> The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving 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	CNEL at Nearest	Distance to Contour from Centerline (Feet)		
			Receiving Land Use (dBA) <sup>1</sup>	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Main St.	n/o Struck Av.	71.0	58	125	269
2	Main St.	s/o Struck Av.	71.6	64	138	298
3	Batavia St.	n/o Katella Av.	69.9	RW	107	230
4	Batavia St.	s/o Katella Av.	69.9	RW	106	229
5	Batavia St.	s/o Struck Av.	69.5	RW	99	214
6	Katella Av.	w/o Main St.	71.5	85	182	392
7	Katella Av.	e/o Main St.	72.2	94	202	436
8	Katella Av.	e/o Batavia Av.	72.5	98	212	456
9	Katella Av.	w/o SR-57 SB Ramps	73.0	106	229	493
10	Katella Av.	e/o SR-57 NB Ramps	73.1	107	231	497
11	Struck Av.	w/o Main St.	68.0	RW	53	113
12	Struck Av.	e/o Main St.	62.8	RW	RW	51
13	Struck Av.	e/o Batavia Av.	67.1	RW	46	98

<sup>&</sup>lt;sup>1</sup> The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving land use. "RW" = Location of the respective noise contour falls within the right-of-way of the road.

**TABLE 7-3: OYC WITHOUT PROJECT CONTOURS** 

ID	Road	Segment	CNEL at Nearest	Distance to Contour from Centerline (Feet)		
ID			Receiving Land Use (dBA) <sup>1</sup>	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Main St.	n/o Struck Av.	71.1	60	128	276
2	Main St.	s/o Struck Av.	71.8	66	143	308
3	Batavia St.	n/o Katella Av.	70.2	52	112	241
4	Batavia St.	s/o Katella Av.	69.2	RW	96	206
5	Batavia St.	s/o Struck Av.	69.7	RW	103	222
6	Katella Av.	w/o Main St.	71.4	83	180	387
7	Katella Av.	e/o Main St.	72.1	93	201	432
8	Katella Av.	e/o Batavia Av.	72.6	100	216	465
9	Katella Av.	w/o SR-57 SB Ramps	73.2	109	236	508
10	Katella Av.	e/o SR-57 NB Ramps	73.1	107	232	499
11	Struck Av.	w/o Main St.	68.4	RW	56	121
12	Struck Av.	e/o Main St.	63.5	RW	RW	57
13	Struck Av.	e/o Batavia Av.	63.6	RW	RW	58

<sup>&</sup>lt;sup>1</sup> The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving land use. "RW" = Location of the respective noise contour falls within the right-of-way of the road.



**TABLE 7-4: OYC WITH PROJECT CONTOURS** 

ID	Road	Segment	CNEL at Nearest	Distance to Contour from Centerline (Feet)		
טו			Receiving Land Use (dBA) <sup>1</sup>	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Main St.	n/o Struck Av.	71.1	60	128	276
2	Main St.	s/o Struck Av.	71.8	66	143	308
3	Batavia St.	n/o Katella Av.	70.3	52	113	243
4	Batavia St.	s/o Katella Av.	70.2	51	111	238
5	Batavia St.	s/o Struck Av.	69.8	RW	104	224
6	Katella Av.	w/o Main St.	71.7	87	188	404
7	Katella Av.	e/o Main St.	72.4	97	208	449
8	Katella Av.	e/o Batavia Av.	72.7	102	219	471
9	Katella Av.	w/o SR-57 SB Ramps	73.2	109	236	508
10	Katella Av.	e/o SR-57 NB Ramps	73.3	111	239	514
11	Struck Av.	w/o Main St.	68.5	RW	56	121
12	Struck Av.	e/o Main St.	63.6	RW	RW	57
13	Struck Av.	e/o Batavia Av.	67.5	RW	49	105

<sup>&</sup>lt;sup>1</sup> The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving 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 Analysis prepared by Urban Crossroads, 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 2024 conditions. Table 7-1 shows the Existing without Project conditions CNEL noise levels. The Existing without Project exterior noise levels range from 62.6 to 73.0 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 62.8 to 73.1 dBA CNEL. Table 7-5 shows that the Project off-site traffic noise level increases range from 0.0 to 4.5 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.



TABLE 7-5: EXISTING WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment		IEL at Receiv and Use (dB <i>F</i>	Incremental Noise Level Increase Threshold <sup>2</sup>		
					Project Increment	Limit	Exceeded?
1	Main St.	n/o Struck Av.	71.0	71.0	0.0	3.0	No
2	Main St.	s/o Struck Av.	71.6	71.6	0.0	3.0	No
3	Batavia St.	n/o Katella Av.	69.9	69.9	0.0	3.0	No
4	Batavia St.	s/o Katella Av.	68.9	69.9	1.0	3.0	No
5	Batavia St.	s/o Struck Av.	69.4	69.5	0.1	3.0	No
6	Katella Av.	w/o Main St.	71.2	71.5	0.3	3.0	No
7	Katella Av.	e/o Main St.	71.9	72.2	0.3	3.0	No
8	Katella Av.	e/o Batavia Av.	72.4	72.5	0.1	3.0	No
9	Katella Av.	w/o SR-57 SB Ramps	73.0	73.0	0.0	3.0	No
10	Katella Av.	e/o SR-57 NB Ramps	72.8	73.1	0.3	3.0	No
11	Struck Av.	w/o Main St.	68.0	68.0	0.0	3.0	No
12	Struck Av.	e/o Main St.	62.7	62.8	0.1	5.0	No
13	Struck Av.	e/o Batavia Av.	62.6	67.1	4.5	5.0	No

<sup>&</sup>lt;sup>1</sup> The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the receiving land use.

## 7.3 OYC TRAFFIC NOISE LEVEL INCREASES

Table 7-3 presents the Opening Year Cumulative (OYC) without Project conditions CNEL noise levels. The OYC without Project exterior noise levels range from 63.5 to 73.2 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-4 shows that the OYC with Project conditions will range from 63.6 to 73.3 dBA CNEL. Table 7-6 shows that the Project off-site traffic noise level increases range from 0.0 to 3.9 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Table 4-1, land uses adjacent to the study area roadway segments would experience *less than significant* noise level increases on receiving land uses due to the Project-related traffic under OYC traffic conditions.



<sup>&</sup>lt;sup>2</sup> Does the Project create an incremental noise level increase exceeding the significance criteria (Table 4-1)?

TABLE 7-6: OYC WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment		NEL at Receiv and Use (dB <i>F</i>	Incremental Noise Level Increase Threshold <sup>2</sup>		
			No Project	With Project	Project Increment	Limit	Exceeded?
1	Main St.	n/o Struck Av.	71.1	71.1	0.0	3.0	No
2	Main St.	s/o Struck Av.	71.8	71.8	0.0	3.0	No
3	Batavia St.	n/o Katella Av.	70.2	70.3	0.1	3.0	No
4	Batavia St.	s/o Katella Av.	69.2	70.2	1.0	3.0	No
5	Batavia St.	s/o Struck Av.	69.7	69.8	0.1	3.0	No
6	Katella Av.	w/o Main St.	71.4	71.7	0.3	3.0	No
7	Katella Av.	e/o Main St.	72.1	72.4	0.3	3.0	No
8	Katella Av.	e/o Batavia Av.	72.6	72.7	0.1	3.0	No
9	Katella Av.	w/o SR-57 SB Ramps	73.2	73.2	0.0	3.0	No
10	Katella Av.	e/o SR-57 NB Ramps	73.1	73.3	0.2	3.0	No
11	Struck Av.	w/o Main St.	68.4	68.5	0.1	3.0	No
12	Struck Av.	e/o Main St.	63.5	63.6	0.1	5.0	No
13	Struck Av.	e/o Batavia Av.	63.6	67.5	3.9	5.0	No

<sup>&</sup>lt;sup>1</sup> The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the receiving land use.

## 7.4 CUMULATIVE OFF-SITE TRAFFIC NOISE IMPACTS

Table 7-7 presents a summary of the cumulative noise level increases for each of the study area roadway segments. The cumulative traffic noise level increase increment describes the difference between the OYC with Project conditions and the Existing (baseline) conditions. Cumulative impacts are caused by Project traffic in combination with traffic from other closely related past, present, and reasonably foreseeable future projects rather than Project-only traffic.

The cumulative off-site traffic noise level increases presented on Table 7-7 are expected to range from 0.1 to 4.9 dBA CNEL and will not exceed the cumulative off-site traffic noise level increase thresholds on any of the study area roadway segments due to the cumulative and Project-related traffic. Therefore, the cumulative noise impacts are not *cumulatively considerable*, and the off-site traffic noise impacts are *less than significant*.



<sup>&</sup>lt;sup>2</sup> Does the Project create an incremental noise level increase exceeding the significance criteria (Table 4-1)?

**TABLE 7-7: CUMULATIVE NOISE LEVEL INCREASES** 

				IEL at Recei and Use (dE		Noise Level Increase Threshold <sup>2</sup>	
ID	Road	Segment	Existing No Project	OYC With Project	Cumulative Increase	Limit	Cumulative Impact?
1	Main St.	n/o Struck Av.	71.0	71.1	0.1	3.0	No
2	Main St.	s/o Struck Av.	71.6	71.8	0.2	3.0	No
3	Batavia St.	n/o Katella Av.	69.9	70.3	0.4	3.0	No
4	Batavia St.	s/o Katella Av.	68.9	70.2	1.3	3.0	No
5	Batavia St.	s/o Struck Av.	69.4	69.8	0.4	3.0	No
6	Katella Av.	w/o Main St.	71.2	71.7	0.5	3.0	No
7	Katella Av.	e/o Main St.	71.9	72.4	0.5	3.0	No
8	Katella Av.	e/o Batavia Av.	72.4	72.7	0.3	3.0	No
9	Katella Av.	w/o SR-57 SB Ramps	73.0	73.2	0.2	3.0	No
10	Katella Av.	e/o SR-57 NB Ramps	72.8	73.3	0.5	3.0	No
11	Struck Av.	w/o Main St.	68.0	68.5	0.5	3.0	No
12	Struck Av.	e/o Main St.	62.7	63.6	0.9	5.0	No
13	Struck Av.	e/o Batavia Av.	62.6	67.5	4.9	5.0	No

<sup>&</sup>lt;sup>1</sup>The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the receiving land use.



<sup>&</sup>lt;sup>2</sup> Does the Project create an incremental noise level increase exceeding the significance criteria (Table 4-1)?

## 8 SENSITIVE RECEIVER LOCATIONS

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

To describe the potential off-site Project noise levels, four receiver locations in the vicinity of the Project site were identified. 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 City of Orange Department of Public Works at 637 West Struck Avenue, approximately 96 feet north of the Project site. Receiver R1 is placed at the building façade. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.
- R2: Location R2 represents the proposed noise sensitive multi-family residential project north of West Struck Avenue, approximately 245 feet north of the Project site. Receiver R2 is placed at the planned future residential building façade. A 24-hour noise measurement was taken near this location, L2, to describe the existing ambient noise environment.
- R3: Location R3 represents The HUB OC (previously Mary's Kitchen) at 517 West Struck Avenue, approximately 31 feet north of the Project site. The HUB OC provides food, showers, rest rooms and laundry facilities for the homeless community during the daytime hours between 9:00 a.m. and 3:00 p.m. with no services provide during the nighttime hours. Receiver R3 is placed at the future building façade. A 24-hour noise measurement was taken near this location, L3, to describe the existing ambient noise environment.
- R4: Location R4 represents the Citrus Grove Apartments at 1120 North Lemon Street, approximately 126 feet northeast of the Project site. Since there are no private outdoor living areas (backyards) facing the Project site, receiver R4 is placed at the building façade. A 24-hour noise measurement was taken near this location, L4, to describe the existing ambient noise environment.



R5: Location R5 represents the existing noise sensitive residence at 618 West Collins Avenue, approximately 563 feet south of the Project site. Since there are no private outdoor living areas (backyards) facing the Project site, receiver R5 is placed at the building façade. A 24-hour noise measurement was taken near this location, L5, to describe the existing ambient noise environment.

R6: Location R6 represents the adjacent industrial land uses located on N Parker Street approximately 59 feet west of the Project site near the planned maintenance building. The City of Orange Municipal Code does not identify any exterior noise level standards for non-residential land uses. Noise level measurement location L1 is used to describe the ambient conditions at this location.







Distance from receiver to Project site boundary (in feet)

Construction Activity Receiver Locations

## 9 OPERATIONAL NOISE IMPACTS

This section analyzes the potential stationary-source operational noise impacts at the nearest receiver locations, identified in Section 8, resulting from the operation of the proposed 534 Struck Avenue Project. Exhibit 9-A identifies the noise source locations used to assess the operational noise levels.

#### 9.1 OPERATIONAL NOISE SOURCES

At the time this noise analysis was prepared the future tenants of the proposed Project were unknown. Therefore, this operational noise analysis is intended to describe noise level impacts associated with the expected typical of warehouse use activities at the Project site. To present the potential worst-case noise conditions, this analysis assumes the Project would be operational 24 hours per day, seven days per week. The on-site Project-related noise sources are expected to include: loading dock activity, truck terminal 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, truck terminal 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. (14)



STRUGKAVE **LEGEND:** Site Boundary ■ Roof-Top Air Conditioning Unit Trash Enclosure Activity Loading Dock & Truck Terminal Activity Truck Movements Parking Lot Vehicle Movements Planned Noise Barrier 8' Planned Noise Barrier Height (in feet)

**EXHIBIT 9-A: OPERATIONAL NOISE SOURCE LOCATIONS** 



**TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS** 

Noise Source <sup>1</sup>	Noise Mir Source Hou		•	Reference Noise Level	Sound Power
Noise Source-	Height (Feet)	Day	Night	(dBA L <sub>eq</sub> ) @ 50 Feet	Level (dBA)³
Loading Dock and Truck Terminal Activity	8'	60	60	62.8	103.4
Roof-Top Air Conditioning Units	5'	39	28	57.2	88.9
Trash Enclosure Activity	5'	10	10	57.3	89.0
Parking Lot Vehicle Movements	5'	60	60	56.1	87.8
Truck Movements	8'	60	60	59.8	93.2

<sup>&</sup>lt;sup>1</sup> As measured by Urban Crossroads, Inc.

#### 9.2.2 LOADING DOCK AND TRUCK TERMINAL ACTIVITY

The reference loading dock and truck terminal activities are intended to describe the typical operational noise source levels associated with the Project. This includes truck idling, deliveries, backup alarms, trailer movements, 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 Leq. 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 a semi-truck with trailer pass-by event, background switcher cab trailer towing, drop-off, idling, backup alarm events, 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. 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. Noise associated with loading dock and truck trailer activity is expected to operate for the entire hour (60 minutes).

#### 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  $L_{\rm eq}$ . 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



<sup>&</sup>lt;sup>2</sup> Anticipated duration (minutes within the hour) of noise activity during typical hourly conditions expected at the Project site.

<sup>&</sup>quot;Daytime" = 7:00 a.m. - 10:00 p.m.; "Nighttime" = 10:00 p.m. - 7:00 a.m.

<sup>&</sup>lt;sup>3</sup> 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.

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.

#### 9.2.4 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<sub>eq</sub> for the trash enclosure activity. The reference noise level describes the expected noise source activities associated with the trash enclosures for the Project's proposed building. Typical trash enclosure activities are estimated to occur for 10 minutes per hour.

#### 9.2.5 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  $56.1 \, dBA \, L_{eq}$ . 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 (Lw) 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 including the planned 8-foot-high screen wall 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, truck terminal 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 40.6 to 52.2 dBA Leq.

**TABLE 9-2: DAYTIME PROJECT OPERATIONAL NOISE LEVELS** 

Naisa Cauras 1	Operational Noise Levels by Receiver Location (dBA Leq)						
Noise Source <sup>1</sup>	R1	R2	R3	R4	R5	R6	
Loading Dock and Truck Terminal Activity	42.8	41.2	44.2	43.7	42.5	37.2	
Roof-Top Air Conditioning Units	39.3	33.2	37.1	34.8	27.7	37.5	
Trash Enclosure Activity	32.0	24.4	21.6	13.5	11.1	9.7	
Parking Lot Vehicle Movements	48.4	41.5	45.9	40.3	24.3	23.1	
Truck Movements	48.4	42.2	48.8	42.2	29.9	24.7	
Total (All Noise Sources)	52.2	46.7	51.7	47.3	42.9	40.6	

<sup>&</sup>lt;sup>1</sup> 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  $10:00 \, \text{p.m.}$  to  $7:00 \, \text{a.m.}$  The nighttime hourly noise levels at the off-site receiver locations are expected to range from  $40.6 \, \text{to} \, 52.2 \, \text{dBA} \, L_{\text{eq}}$ . 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 <sup>1</sup>	Operational Noise Levels by Receiver Location (dBA Leq)						
Noise Source-	R1	R2	R3	R4	R5	R6	
Loading Dock and Truck Terminal Activity	42.8	41.2	44.2	43.7	42.5	37.2	
Roof-Top Air Conditioning Units	39.3	33.2	37.1	34.8	27.7	37.5	
Trash Enclosure Activity	32.0	24.4	21.6	13.5	11.1	9.7	
Parking Lot Vehicle Movements	48.4	41.5	45.9	40.3	24.3	23.1	
Truck Movements	48.4	42.2	48.8	42.2	29.9	24.7	
Total (All Noise Sources)	52.2	46.7	51.7	47.3	42.9	40.6	

<sup>&</sup>lt;sup>1</sup> 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 Orange exterior noise level standards at nearby noise-sensitive receiver locations. Table 9-4 shows the operational noise levels associated with 534 Struck Avenue Project will satisfy the City of Orange daytime and nighttime 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 <sup>1</sup>	Land Use	Project Operational Noise Levels (dBA Leq) <sup>2</sup>			l Standards Leq) <sup>3</sup>	Noise Level Standards Exceeded? <sup>4</sup>	
Location	O3E	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime
R1	Public-Institutional	52.2	52.2	n/a	n/a	No	No
R2	Proposed Residential	46.7	46.7	55	50	No	No
R3	The HUB OC	51.7	51.7	n/a	n/a	No	No
R4	Residential	47.3	47.3	55	50	No	No
R5	Residential	42.9	42.9	55	50	No	No
R6	Industrial	40.6	40.6	n/a	n/a	No	No

 $<sup>^{\</sup>mbox{\tiny 1}}$  See Exhibit 8-A for the receiver locations.

## 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



<sup>&</sup>lt;sup>2</sup> Proposed Project operational noise levels as shown on Tables 9-2 and 9-3.

<sup>&</sup>lt;sup>3</sup> Exterior noise level standards, as shown on Table 4-1.

<sup>&</sup>lt;sup>4</sup> Do the estimated Project operational noise source activities exceed the noise level standards?

<sup>&</sup>lt;sup>5</sup> The City of Orange Municipal Code does not identify any exterior noise level standards for non-residential land uses.

<sup>&</sup>quot;Daytime" = 7:00 a.m. - 10:00 p.m.; "Nighttime" = 10:00 p.m. - 7:00 a.m.

cannot be combined using standard arithmetic equations. (2) Instead, they must be logarithmically added using the following base equation:

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

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 Tables 9-5, the Project will generate a daytime operational noise level increases ranging from 0.0 to 2.6 dBA L<sub>eq</sub> 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 4.3 dBA L<sub>eq</sub> at the nearest receiver locations. Project-related operational noise level increases will satisfy the operational noise level increase significance criteria presented in Table 4-1, and the increases at the sensitive receiver locations will be *less than significant*.

**TABLE 9-5: DAYTIME PROJECT OPERATIONAL NOISE LEVEL INCREASES** 

Receiver Location <sup>1</sup>	Total Project Operational Noise Level <sup>2</sup>	Measurement Location <sup>3</sup>	Reference Ambient Noise Levels <sup>4</sup>	Combined Project and Ambient <sup>5</sup>	Project Increase <sup>6</sup>	Increase Criteria <sup>7</sup>	Increase Criteria Exceeded?
R1	52.2	L1	54.3	56.4	2.1	5.0	No
R2	46.7	L2	51.2	52.5	1.3	5.0	No
R3	51.7	L3	52.6	55.2	2.6	5.0	No
R4	47.3	L4	51.0	52.5	1.5	5.0	No
R5	42.9	L5	68.0	68.0	0.0	1.5	No
R6	40.6	L1	54.3	54.5	0.2	5.0	No

<sup>&</sup>lt;sup>1</sup> See Exhibit 9-A for the receiver locations.



<sup>&</sup>lt;sup>2</sup> Total Project daytime operational noise levels as shown on Table 9-2.

<sup>&</sup>lt;sup>3</sup> Reference noise level measurement locations as shown on Exhibit 5-A.

<sup>&</sup>lt;sup>4</sup> Observed daytime ambient noise levels as shown on Table 5-1.

<sup>&</sup>lt;sup>5</sup> Represents the combined ambient conditions plus the Project activities.

 $<sup>^{\</sup>rm 6}$  The noise level increase expected with the addition of the proposed Project activities.

<sup>&</sup>lt;sup>7</sup> Significance increase criteria as shown on Table 4-1.

**TABLE 9-6: NIGHTTIME OPERATIONAL NOISE LEVEL INCREASES** 

Receiver Location <sup>1</sup>	Total Project Operational Noise Level <sup>2</sup>	Measurement Location <sup>3</sup>	Reference Ambient Noise Levels <sup>4</sup>	Combined Project and Ambient <sup>5</sup>	Project Increase <sup>6</sup>	Increase Criteria <sup>7</sup>	Increase Criteria Exceeded?
R1	52.2	L1	50.5	54.5	4.0	5.0	No
R2	46.7	L2	47.2	49.9	2.7	5.0	No
R3	51.7	L3	49.3	53.6	4.3	5.0	No
R4	47.3	L4	46.8	50.1	3.3	5.0	No
R5	42.9	L5	63.0	63.0	0.0	5.0	No
R6	40.6	L1	50.5	50.9	0.4	5.0	No

<sup>&</sup>lt;sup>1</sup> See Exhibit 9-A for the receiver locations.



 $<sup>^{\</sup>rm 2}$  Total Project nighttime operational noise levels as shown on Table 9-3.

<sup>&</sup>lt;sup>3</sup> Reference noise level measurement locations as shown on Exhibit 5-A.

<sup>&</sup>lt;sup>4</sup> Observed nighttime ambient noise levels as shown on Table 5-1.

<sup>&</sup>lt;sup>5</sup> Represents the combined ambient conditions plus the Project activities.

<sup>&</sup>lt;sup>6</sup> The noise level increase expected with the addition of the proposed Project activities.

<sup>&</sup>lt;sup>7</sup> Significance increase criteria as shown on Table 4-1.

## 10 CONSTRUCTION IMPACTS

This section analyzes potential impacts resulting from the short-term construction activities associated with the development of the Project. Exhibit 8-A shows the construction activity boundaries in relation to the nearest sensitive receiver locations previously described in Section 6. According to Section 8.24.050[E] of the City's Municipal Code, noise sources associated with construction, repair, remodeling, or grading of any real property, provided said activities take place between the hours of 7:00 a.m. and 8:00 p.m. on any day except for Sunday or a Federal holiday, or between the hours of 9:00 a.m. and 8:00 p.m. on Sunday or a Federal holiday. (20)

In addition, since neither the City of Orange General Plan or 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 Leq as a reasonable threshold for noise sensitive residential land use. (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:

- 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. (21) 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.



HOOVER AVE ALLIEN ALLEY 126' P R3 (F SURVEKAVE ALLEY BRENNA LIN **EXECUTES COLLINS AVE** GARLOND ST GRANTESSET **LEGEND:** Construction Activity • Receiver Locations

**EXHIBIT 10-A: CONSTRUCTION NOISE SOURCE LOCATIONS** 



Distance from receiver to Project site boundary (in feet)

#### **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 noise levels for the loudest construction equipment, assuming they operate at the same time. As shown on Table 10-2, the construction noise levels when operating at the property line are expected to range from 51.1 to 78.7 dBA  $L_{\rm eq}$  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 <sub>eq</sub> ) <sup>1</sup>	Combined Noise Level (dBA L <sub>eq</sub> ) <sup>2</sup>	Combined Sound Power Level (PWL) <sup>3</sup>	
	Crawler Tractors	78			
Site Preparation	Hauling Trucks	72	80	112	
rreparation	Rubber Tired Dozers	75			
	Graders	81			
Grading	Excavators	77	83	115	
	Compactors	76			
	Cranes	73		113	
Building Construction	Tractors	80	81		
Construction	Welders	70			
	Pavers	74			
Paving	Paving Equipment	82	83	115	
	Rollers	73			
	Cranes 73				
Architectural	Air Compressors	74	77	109	
Coating	Generator Sets	70			

<sup>&</sup>lt;sup>1</sup> FHWA Roadway Construction Noise Model (RCNM).



<sup>&</sup>lt;sup>2</sup> 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.

<sup>&</sup>lt;sup>3</sup> 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

		Construction Noise Levels (dBA L <sub>eq</sub> ) <sup>2</sup>								
Receiver Location <sup>1</sup>	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Levels				
R1	70.8	73.8	71.8	73.8	67.8	73.8				
R2	63.2	66.2	64.2	66.2	60.2	66.2				
R3	75.7	78.7	76.7	78.7	72.7	78.7				
R4	67.3	70.3	68.3	70.3	64.3	70.3				
R5	56.0	59.0	57.0	59.0	53.0	59.0				
R6	54.1	57.1	55.1	57.1	51.1	57.1				

<sup>&</sup>lt;sup>1</sup> Noise receiver locations are shown on Exhibit 10-A.

## 10.4 CONSTRUCTION NOISE LEVEL COMPLIANCE

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

**TABLE 10-3: CONSTRUCTION NOISE LEVEL COMPLIANCE** 

	Construction Noise Levels (dBA L <sub>eq</sub> )							
Receiver Location <sup>1</sup>	Highest Construction Noise Levels <sup>2</sup> Threshold <sup>3</sup>		Threshold Exceeded? <sup>4</sup>					
R1	73.8	80	No					
R2	66.2	80	No					
R3	78.7	80	No					
R4	70.3	80	No					
R5	59.0	81	No					
R6	57.1	82	No					

<sup>&</sup>lt;sup>1</sup> Noise receiver locations are shown on Exhibit 10-A.



<sup>&</sup>lt;sup>2</sup> CadnaA construction noise model inputs are included in Appendix 10.1.

<sup>&</sup>lt;sup>2</sup> 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.

<sup>&</sup>lt;sup>3</sup> Construction noise level thresholds as shown on Table 4-1.

<sup>&</sup>lt;sup>4</sup> 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 10-4. 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 10-4: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT** 

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

Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual

Table 10-5 presents the expected Project related vibration levels at the nearby receiver locations. At distances ranging from 31 to 563 feet from Project construction activities, construction vibration velocity levels are estimated to range from 0.001 to 0.064 PPV (in/sec). 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.

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.



**TABLE 10-5: PROJECT CONSTRUCTION VIBRATION LEVELS** 

	Distance to	Typical Construction Vibration Levels PPV (in/sec) <sup>3</sup>				Thresholds	Thresholds	
Location <sup>1</sup>	Const. Activity (Feet) <sup>2</sup>	Small bulldozer	Jackhammer	Loaded Trucks	Large bulldozer	Highest Vibration Level	PPV (in/sec) <sup>4</sup>	Exceeded? <sup>5</sup>
R1	96'	0.000	0.005	0.010	0.012	0.012	0.3	No
R2	245'	0.000	0.001	0.002	0.003	0.003	0.3	No
R3	31'	0.002	0.025	0.055	0.064	0.064	0.3	No
R4	126'	0.000	0.003	0.007	0.008	0.008	0.3	No
R5	563'	0.000	0.000	0.001	0.001	0.001	0.3	No
R6	59'	0.001	0.010	0.021	0.025	0.025	0.3	No

<sup>&</sup>lt;sup>1</sup> Receiver locations are shown on Exhibit 10-A.



 $<sup>^{\</sup>rm 2}\,\mbox{Distance}$  from receiver to Project construction boundary.

 $<sup>^{\</sup>rm 3}$  Based on the Vibration Source Levels of Construction Equipment (Table 10-4).

<sup>&</sup>lt;sup>4</sup> Caltrans Transportation and Construction Vibration Guidance Manual, April 2020, Table 19, p. 38.

<sup>&</sup>lt;sup>5</sup> Does the peak vibration exceed the acceptable vibration thresholds?

<sup>&</sup>quot;PPV" = Peak Particle Velocity

## 11 REFERENCES

- 1. **State of California.** *California Environmental Quality Act, Appendix G.* 2018.
- 2. California Department of Transportation Environmental Program. *Technical Noise Supplement A Technical Supplement to the Traffic Noise Analysis Protocol.* Sacramento, CA: s.n., September 2013.
- 3. Environmental Protection Agency Office of Noise Abatement and Control. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. March 1974. EPA/ONAC 550/9/74-004.
- 4. U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning, Noise and Air Quality Branch. Highway Traffic Noise Analysis and Abatement Policy and Guidance. December 2011.
- 5. **U.S. Department of Transportation Federal Highway Administration.** *Highway 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 Guidelines. 2019.
- 10. City of Orange. General Plan Noise Element. March 2010.
- 11. **California Department of Transportation.** *Transportation and Construction Vibration Guidance Manual.* April 2020.
- 12. California Court of Appeal. *Gray v. County of Madera, F053661.* 167 Cal.App.4th 1099; Cal.Rptr.3d, October 2008.
- 13. American National Standards Institute (ANSI). Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.
- 14. **U.S. Department of Transportation, Federal Highway Administration.** *FHWA Highway Traffic Noise Prediction Model.* December 1978. FHWA-RD-77-108.
- 15. California Department of Transportation Environmental Program, Office of Environmental Engineering. Use of California Vehicle Noise Reference Energy Mean Emission Levels (Calveno REMELs) in FHWA Highway Traffic Noise Prediction. September 1995. TAN 95-03.
- 16. **California Department of Transportation.** *Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report.* June 1995. FHWA/CA/TL-95/23.
- 17. **Urban Crossroads, Inc.** *534 Struck Avenue Traffic Analysis*. October 2022.
- 18. . Patterson & Harvill Warehouse Traffic Analysis. September 2022.
- 19. City of Orange. Municipal Code, Chapter 8.24 Noise Control.
- 20. U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning. FHWA Roadway Construction Noise Model. January, 2006.



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## 12 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed 534 Struck Avenue 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.

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Principal
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#### **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 ORANGE MUNICIPAL CODE** 



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Chapter 8.24 - NOISE CONTROL 2

Sections:

Footnotes:

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**Editor's note—** Ord. No. 1-14, § I, adopted August 12, 2014, repealed the former Ch. 8.24, §§ 8.24.010—8.24.110 and enacted a new Ch. 8.24 as set out herein. The former Ch. 8.24 pertained to similar subject matter and derived from Prior Code 9500.1—9500.16; Ord. Nos. 49-74, 17-74, 1-80, and 26-96.

8.24.010 - Policy.

- A. In order to control unnecessary, excessive and annoying sounds emanating from the City, it is the policy of the City to regulate such sounds generated from all sources as specified in this chapter. The intent of this chapter is to protect residential land uses from unnecessary, excessive and annoying sounds.
- B. It is determined that certain sound levels are detrimental to the public health, welfare and safety, and contrary to public interest.

(Ord. No. 1-14, § I, 8-12-14)

8.24.020 - Definitions.

The following words, phrases and terms as used in this chapter shall have the meaning as indicated below:

- A. "Ambient noise level" means the all-encompassing noise level associated with a given environment, being a composite of sounds from all sources, excluding the alleged offensive noise, at the location and approximate time at which a comparison with the alleged offensive noise is to be made.
- B. "Adjusted ambient noise level" means the measured ambient noise level plus 3 dB (A). Three (3) dB(A) is the industry-accepted threshold of human perceptibility for a change in the noise environment.
- C. "Decibel (dB)" means a unit which denotes the ratio between two quantities which are proportional to power: the number of decibels corresponding to the ratio of two amounts of power is ten times the logarithm to the base ten of this ratio.
- D. "Emergency machinery, vehicle or work" means any machinery, vehicle or work used, employed or performed in an effort to protect, provide or restore safe conditions in the community or for the citizenry, or work by private or public utilities when restoring utility service.
- E. "Fixed noise source" means a stationary noise source which creates sounds while fixed or motionless, including but not limited to construction equipment, industrial and commercial machinery and equipment, pumps, fans, compressors, generators, air conditioners and refrigeration equipment.
- F. "Grading" means any excavating or filling of earth material or any combination thereof conducted to prepare a site for construction or other improvements thereon.
- G. "Hourly Average" (L eq ) means the energy mean or average sound level over a one (1) hour period of time.
- H. "Impact noise" means the noise produced by the collision of one mass in motion with a second mass which may be either in motion or at rest.

- I. "Mobile noise source" means any noise source other than a fixed noise source.
- J. "Noise level" means the "A" weighted sound pressure level in decibels obtained by using a sound level meter at slow response with a reference pressure of twenty (20) micronewtons per square meter. The unit of measurement shall be designated as dB(A).
- K. "Person" means a person, firm, association, co-partnership, joint venture, corporation or any entity, public or private in nature.
- L. "Recurring impulsive noise" means a noise of short duration, usually less than one (1) second, with an abrupt onset and rapid decay, which occurs repeatedly or in a cyclical manner. Examples include jack hammering, pile driving, or operational noise from a generator or other mechanical equipment that is cyclical in nature.
- M. "Residential property" means a parcel of real property which is developed and used either in part or in whole for residential purposes, other than transient uses such as hotels and motels.
- N. "Simple tone noise" means a noise characterized by a predominant frequency or frequencies so that other frequencies cannot be readily distinguished.
- O. "Sound level meter" means an instrument meeting American National Standard Institute's Standard SI.4- 1983 for Type 1 sound level meters or an instrument and the associated recording and analyzing equipment which will provide equivalent data.
- P. "Sound pressure level" of a sound, in decibels, means twenty times the logarithm to the base ten of the ratio of the pressure of the sound to a reference pressure, which reference pressure shall be explicitly stated.

(Ord. No. 1-14, § I, 8-12-14)

8.24.030 - Noise Level Measurement Criteria.

Any noise level measurements made pursuant to the provisions of this chapter shall be performed using a sound level meter as defined in Section 8.24.020P.

(Ord. No. 1-14, § I, 8-12-14)

#### 8.24.040 - Exterior Standards.

A. The following noise standards for fixed noise sources, unless otherwise specifically indicated, shall apply to all residential property:

Table 8.24.040 Exterior Noise Standards

	Noise Level	Time Period
(Hourly Average (L <sub>eq</sub> )	55 dB (A)	7:00 a.m.—10:00 p.m.)
	50 dB (A)	(10:00 p.m.—7:00 a.m.)
Maximum Level	70 dB (A)	7:00 a.m.—10:00 p.m.
	65 dB (A)	10:00 p.m.—7:00 a.m.

- B. It is unlawful for any person at any location within the City to create any noise, or to allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person, which causes the noise level when measured on any other residential property to exceed the noise standards identified in Table 8.24.040. For multi-family residential or mixed use developments located within the City's Urban Mixed Use, Neighborhood Mixed Use, Old Towne Mixed Use or Medium Density Residential General Plan land use districts, exterior noise standards shall apply to common recreation areas only and shall not apply to private exterior space (such as a private yard, patio, or balcony).
- C. In the event the ambient noise level exceeds the noise standards identified in Table 8.24.040 of this section, the "adjusted ambient noise level" shall be applied as the noise standard. In cases where the noise standard is adjusted due to a high ambient noise level, the noise standard shall not exceed the "adjusted ambient noise level", or 70 dB (A), whichever is less. In cases where the ambient noise level is already greater than 70 dB (A), the ambient noise level shall be applied as the noise standard.
- D. Each of the noise limits specified in Table 8.24.040 shall be reduced by 5 dB(A) for impact or simple tone noises, recurring impulsive noises, or for noises consisting of speech or music.

(Ord. No. 1-14, § I, 8-12-14)

8.24.050 - Exemptions from Chapter Provisions.

The following activities shall be exempted from the provisions of this chapter:

- A. School bands, school athletic and school entertainment events;
- B. Outdoor gatherings, public dances, shows, and sporting and entertainment events provided such events are conducted pursuant to any permit requirements established by the City;
- C. Activities conducted on public parks, public playgrounds, and public or private school grounds;
- D. Any mechanical device, apparatus or equipment used, related to or connected with emergency machinery, vehicle or work;
- E. Noise sources associated with construction, repair, remodeling, or grading of any real property, provided said activities take place between the hours of 7:00 a.m. and 8:00 p.m. on any day except for Sunday or a Federal holiday, or between the hours of 9:00 a.m. and 8:00 p.m. on Sunday or a Federal holiday. Noise generated outside of the hours specified are subject to the noise standards identified in Table 8.24.040;
- F. All mechanical devices, apparatus or equipment which are utilized for the protection or salvage of agricultural crops during periods of potential or actual frost damage or other adverse weather conditions;
- G. Noise sources associated with agricultural operations provided such operations take place between the hours of 7:00 a.m. and 8:00 p.m. on any day except Sunday or a Federal holiday, or between the hours of 9:00 a.m. and 8:00 p.m. on Sunday or a Federal holiday;
- H. Noise sources associated with agricultural pest control through pesticide application, provided that the application is made in accordance with restricted material permits issued by or regulations enforced by the Agricultural Commissioner;
- I. Noise sources associated with the maintenance of real property, provided such activities take place between the hours of 7:00 a.m. and 8:00 p.m. on any day except Sunday or a Federal holiday, or between the hours of 9:00 a.m. and 8:00 p.m. on Sunday or a Federal holiday. Operation of leaf blowers are regulated under OMC Chapter 8.26;

- J. Industrial or commercial noise affecting residential units, when the residential unit is associated with said industrial or commercial use (e.g. caretaker's dwellings);
- K. Any maintenance or construction activity undertaken by a public agency or utility within street right of way;
- L. Mobile noise sources including but not limited to operational noise from trains, or automobiles or trucks traveling on roadways. Transportation noise as related to noise/land use compatibility is subject to the City's General Plan Noise Element;
- M. Any activity to the extent regulation thereof has been preempted by State or Federal Law.

(Ord. No. 1-14, § I, 8-12-14)

8.24.060 - Special Provisions for Schools, Hospitals and Churches.

It is unlawful for any person to create any noise which causes the noise level at any school, hospital or church, while the same is in use, to exceed the noise limits as specified in Section 8.24.040, or which noise level unreasonably interferes with the use of such institutions.

(Ord. No. 1-14, § I, 8-12-14)

8.24.070 - Measurement of Noise Levels.

The location selected for measuring exterior noise levels shall be the point closest to the noise source along the perimeter of the outdoor activity area (such as a private yard, patio, balcony, or common recreation area, as applicable pursuant to Section 8.24.040B. of this chapter) of the affected residential receiving property. If the location of the outdoor activity area is unknown or unclear, the noise standard shall be applied at the point closest to the noise source along the property line of the affected residential receiving property.

(Ord. No. 1-14, § I, 8-12-14)

8.24.080 - Enforcement Authority.

- A. The Chief Building Official or his/her designee are directed to enforce the provisions of this chapter. The Chief Building Official or his/her designee are authorized, pursuant to Penal Code Section 836.5, to arrest any person without a warrant when they have reasonable cause to believe that such person has committed a misdemeanor in their presence.
- B. No person shall interfere with, oppose or resist any authorized person charged with the enforcement of this chapter while such person is engaged in the performance of his duty.

(Ord. No. 1-14, § I, 8-12-14)

8.24.090 - Violation—Public Nuisance.

Any violation of this chapter is a public nuisance and may be abated in accordance with law. The expense of such abatement may, by resolution of the City Council, be declared to be a lien against the property on which such nuisance is maintained, and such lien shall be made a personal obligation of the property owner.

(Ord. No. 1-14, § I, 8-12-14)

#### 8.24.100 - Alternative Noise Prohibition.

Notwithstanding any other provisions of this chapter and in addition thereto, it is unlawful for any person to willfully make, continue, maintain, permit or cause to be made, continued, maintained, or permitted, any loud, unnecessary and unusual noise which disturbs the peace or quiet of any residential property or which causes discomfort or annoyance to any reasonable person of normal sensitivity residing in the area. It shall be a prima facie violation of this section if any power tool, radio, receiving set, television, music amplifier, tape player, record player, compact disc player, musical instrument or similar device is played, used or permitted to be played or used between the hours of 10:00 p.m. and 7:00 a.m. when audible from a distance of one hundred (100) feet from the property line of the noise source or from a distance of one hundred fifty (150) feet from any non-stationary noise source. For the purpose of this chapter, these prohibitions shall also be applied to stationary vehicles parked on the street or on private property. The determination may be made by a peace officer or may be proven by the testimony of any other person. Furthermore, and in addition to the provisions of this chapter, noise prohibitions pursuant to Penal Code Section 415 and Orange Municipal Code Chapter 9.39 may also be applied.

(Ord. No. 1-14, § I, 8-12-14)

8.24.110 - Violation—Misdemeanor.

Any person violating any of the provisions of this chapter shall be deemed guilty of a misdemeanor. Each day such violation is committed or permitted to continue shall constitute a separate offense and shall be punishable as such. The provisions of this chapter shall not be construed as permitting conduct not prescribed herein and shall not affect the enforceability of any other applicable provisions of law.

(Ord. No. 1-14, § I, 8-12-14)

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## **APPENDIX 5.1:**

**STUDY AREA PHOTOS** 



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# JN: 13101 Study Area Photos



L1\_E 33, 48' 23.140000"117, 51' 34.000000"



L1\_N 33, 48' 23.100000"117, 51' 34.080000"



L1\_S 33, 48' 23.050000"117, 51' 34.050000"



L1\_W 33, 48' 23.160000"117, 51' 33.970000"



L2\_E 33, 48' 25.420000"117, 51' 25.590000"



L2\_N 33, 48' 25.430000"117, 51' 25.570000"

## JN: 13101 Study Area Photos



L2\_S 33, 48' 25.420000"117, 51' 25.590000"



L2\_W 33, 48' 25.430000"117, 51' 25.590000"



L3\_E 33, 48' 21.380000"117, 51' 26.770000"



L3\_N 33, 48' 21.390000"117, 51' 26.750000"



L3\_S 33, 48' 21.390000"117, 51' 26.750000"



L3\_W 33, 48' 21.280000"117, 51' 26.830000"

# JN: 13101 Study Area Photos



L4\_E 33, 48' 23.360000"117, 51' 25.700000"



L4\_N 33, 48' 23.370000"117, 51' 25.700000"



L4\_S 33, 48' 23.370000"117, 51' 25.700000"



L4\_W 33, 48' 23.340000"117, 51' 25.780000"



L5\_E 33, 48' 8.090000"117, 51' 30.760000"



L5\_N 33, 48' 8.040000"117, 51' 30.730000"

# JN: 13101 Study Area Photos



L5\_S 33, 48' 8.060000"117, 51' 30.780000"



L5\_W 33, 48' 8.170000"117, 51' 30.780000"

# APPENDIX 5.2:

**NOISE LEVEL MEASUREMENT WORKSHEETS** 





Date: Monday, April 18, 2022 Location: L1 - Located northwest of the Project site near Department of Meter: Piccolo II

JN: 13101 Project: 534 Struck Avenue Source: Public Works at 637 West Struck Avenue. Analyst: A. Khan

#### Hourly L ea dBA Readings (unadjusted) Honrly Leg (dBA) 45.0 (48A) 45.0 455.0 45.0 45.0 45.0 35.0 56.0 56.2 **Hour Beginning**

Timeframe	Hour	$L_{eq}$	L max	L <sub>min</sub>	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	$L_{eq}$	Adj.	Adj. L <sub>eq</sub>
	0	46.2	54.1	42.4	53.6	52.7	50.5	49.1	46.5	44.7	42.9	42.7	42.5	46.2	10.0	56.2
	1	47.9	55.0	41.5	54.4	53.6	52.2	51.4	49.3	45.3	42.6	41.9	41.6	47.9	10.0	57.9
	2	43.7	48.5	41.0	48.2	47.8	47.1	46.5	44.1	42.9	41.5	41.3	41.1	43.7	10.0	53.7
Night	3	43.3	49.1	41.1	48.8	48.2	46.5	45.4	43.5	42.5	41.5	41.4	41.2	43.3	10.0	53.3
	4	46.0	54.3	42.0	53.8	53.3	51.6	49.9	45.6	44.0	42.4	42.2	42.1	46.0	10.0	56.0
	5	53.9	64.2	46.8	63.5	62.5	59.9	58.6	53.9	50.0	47.4	47.2	46.9	53.9	10.0	63.9
	6	56.7	66.2	49.2	65.7	64.9	62.5	61.4	56.4	53.2	50.3	49.9	49.3	56.7	10.0	66.7
	7	53.4	62.5	47.6	61.9	61.2	59.1	57.4	52.9	50.8	48.4	48.1	47.8	53.4	0.0	53.4
	8	51.0	58.7	46.2	58.1	57.4	55.6	54.3	51.4	49.3	47.1	46.7	46.3	51.0	0.0	51.0
	9	56.2	66.1	48.1	65.6	64.9	62.8	60.9	55.9	52.1	49.3	48.8	48.2	56.2	0.0	56.2
	10	52.6	60.8	46.5	60.3	59.6	57.9	56.6	53.1	50.4	47.4	46.9	46.6	52.6	0.0	52.6
	11	56.0	66.8	48.7	66.2	65.4	63.2	60.6	54.5	51.9	49.7	49.2	48.8	56.0	0.0	56.0
	12	56.2	66.4	48.9	65.6	64.2	61.1	59.9	56.6	53.6	49.8	49.4	49.0	56.2	0.0	56.2
	13	58.6	70.1	47.9	69.8	69.3	67.2	64.8	53.9	51.1	48.7	48.4	48.1	58.6	0.0	58.6
Day	14	54.8	64.4	47.2	63.7	62.7	61.0	59.1	54.7	52.4	48.2	47.8	47.3	54.8	0.0	54.8
	15	55.3	65.6	47.8	64.9	63.8	61.2	59.3	55.5	51.8	48.6	48.3	47.9	55.3	0.0	55.3
	16	53.4	61.6	47.6	60.8	60.2	58.2	57.3	54.3	50.7	48.3	48.0	47.7	53.4	0.0	53.4
	17	52.5	61.0	46.7	60.5	60.1	58.3	57.1	52.6	49.8	47.4	47.2	46.9	52.5	0.0	52.5
	18	55.0	67.8	45.8	66.2	65.0	62.2	60.1	51.6	49.2	46.6	46.3	45.9	55.0	0.0	55.0
	19	49.2	57.7	44.4	57.0	55.7	53.2	52.0	49.9	47.4	45.2	44.9	44.6	49.2	5.0	54.2
	20	45.7	51.2	43.1	50.8	50.1	48.7	47.9	46.2	45.0	43.7	43.5	43.2	45.7	5.0	50.7
	21	48.8	56.1	42.9	55.8	55.5	54.7	53.5	49.5	45.7	43.5	43.2	43.0	48.8	5.0	53.8
Night	22	47.0	52.1	43.9	51.7	51.2	50.0	49.3	47.6	46.2	44.4	44.2	44.0	47.0	10.0	57.0
	23	46.6	61.3	40.9	60.1	58.1	47.9	45.5	43.0	42.2	41.4	41.2	41.0	46.6	10.0	56.6
Timeframe	Hour	L <sub>eq</sub>	L max	L min	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%		L <sub>eq</sub> (dBA)	
Day	Min	45.7	51.2	42.9	50.8	50.1	48.7	47.9	46.2	45.0	43.5	43.2	43.0	24-Hour	Daytime	Nighttime
F	Max	58.6	70.1	48.9	69.8	69.3	67.2	64.8	56.6	53.6	49.8	49.4	49.0		(7am-10pm)	(10pm-7am)
Energy	Average	54.3	Aver		61.8	61.0	59.0	57.4	52.8	50.1	47.5	47.1	46.8	F2 2	F4 2	FA F
Night	Min	43.3	48.5	40.9	48.2	47.8	46.5	45.4	43.0	42.2	41.4	41.2	41.0	53.2	54.3	50.5
F	Max	56.7	66.2	49.2	65.7	64.9	62.5	61.4	56.4	53.2	50.3	49.9	49.3			
Energy	Average	50.5	Aver	age:	55.5	54.7	52.0	50.8	47.8	45.7	43.8	43.6	43.3			



#### 24-Hour Noise Level Measurement Summary Location: L2 - Located northeast of the Project site near future Date: Monday, April 18, 2022 Meter: Piccolo II JN: 13101 Source: residential development north of West Struck Avenue. Project: 534 Struck Avenue Analyst: A. Khan Hourly L ea dBA Readings (unadjusted) 80.0 (dBA) 75.0 70.0 65.0 -**6** 65.0 55.0 50.0 45.0 40.0 46.8 44 40.0 35.0 0 2 4 5 6 7 8 9 10 12 13 14 15 17 18 19 20 21 22 23 1 3 11 16 **Hour Beginning** Adj. L eq Timeframe Hour $L_{eq}$ $L_{max}$ L min L1% L2% L5% L8% L25% L50% L90% L95% L99% $L_{eq}$ Adj. 0 42.5 69.7 41.5 69.3 68.6 65.5 62.7 54.8 44.7 42.0 41.8 41.6 42.5 10.0 52.5 1 46.7 64.0 50.2 62.6 60.9 58.6 57.7 56.2 54.5 51.7 51.2 50.4 46.7 10.0 56.7 41.9 51.0 41.9 71.0 50.7 70.7 70.4 69.6 67.7 60.8 57.9 51.9 51.3 10.0 51.9 Night 3 43.0 45.9 41.4 45.4 44.7 44.4 43.4 42.7 41.9 41.7 41.6 43.0 10.0 53.0 45.6 42.0 42.1 43.1 4 43.1 45.2 44.9 44.7 44.3 44.0 43.3 42.9 42.4 42.3 10.0 53.1 5 48.4 60.4 47.3 60.0 59.5 57.4 56.3 49.2 48.3 47.7 47.6 47.4 48.4 10.0 58.4 6 52.6 62.9 48.6 62.5 61.6 59.2 57.2 50.1 49.5 49.0 48.9 48.7 52.6 10.0 62.6 49.7 67.5 48.4 67.0 65.9 62.1 59.9 50.6 49.4 48.8 48.7 48.5 49.7 0.0 49.7 8 50.1 46.5 60.4 59.0 46.6 50.1 0.0 62.9 62.5 61.8 50.9 48.7 47.1 46.9 50.1 9 49.3 59.4 46.5 58.9 58.6 57.5 56.8 49.6 48.1 47.0 46.8 46.6 49.3 0.0 49.3 10 51.2 58.0 47.5 57.4 56.8 55.5 54.5 52.0 49.6 48.0 47.8 47.6 51.2 0.0 51.2 11 51.3 56.7 48.8 56.0 55.3 54.2 53.5 51.9 50.6 49.3 49.1 48.9 51.3 0.0 51.3 12 53.4 59.8 48.6 59.3 58.8 57.8 57.2 54.5 51.5 49.3 49.0 48.7 53.4 0.0 53.4 13 51.2 57.3 47.9 56.7 56.0 54.7 54.1 52.1 50.0 48.4 48.3 48.0 51.2 0.0 51.2 Day 14 50.2 58.1 46.7 57.5 55.4 54.9 49.2 47.3 47.1 46.8 50.2 0.0 50.2 56.9 48.2 15 55.2 66.2 48.3 65.2 63.8 61.4 60.4 54.2 50.6 48.9 48.7 48.4 55.2 0.0 55.2 16 52.4 60.7 47.7 60.2 59.6 57.9 57.2 52.0 49.9 48.3 48.1 47.8 52.4 0.0 52.4 17 72.1 47.5 50.4 71.6 70.7 67.0 62.8 52.9 49.7 48.1 47.9 47.6 50.4 0.0 50.4 18 49.8 55.3 46.4 54.7 54.1 53.2 52.6 50.7 48.8 46.9 46.7 46.5 49.8 0.0 49.8 19 50.1 58.4 45.3 58.1 57.5 56.1 55.1 49.3 47.3 45.7 45.6 45.4 50.1 5.0 55.1 20 44.5 50.2 49.9 49.2 48.8 47.4 44.7 5.0 46.8 50.5 46.1 45.0 44.9 46.8 51.8 50.1 56.2 55.9 55.7 55.3 55.0 50.8 44.6 5.0 55.1 48.6 52.6 45.9 51.4 51.0 47.9 46.4 46.2 46.0 48.6 10.0 58.6 22 52.4 52.1 49.2 Night 23 44.3 48.4 42.5 48.0 47.4 46.6 46.1 44.7 43.0 42.8 42.6 44.3 10.0 54.3 43.8 L<sub>eq</sub> (dBA) L5% L25% L50% L90% L95% L99% Timeframe Hour $L_{eq}$ L max L1% L2% L8% 50.2 49.2 Daytime 46.8 50.5 44.1 49.9 48.8 47.4 46.1 44.5 44.2 Nighttime Min 44.6 24-Hour (7am-10pm) (10pm-7am) Max 55.2 72.1 48.8 71.6 70.7 67.0 62.8 54.5 51.5 49.3 49.1 48.9 51.2 59.4 58.8 57.2 51.2 49.0 47.5 47.3 47.1 **Energy Average** Average: 56.1 **51.2** 47.2 50.1 Min 41.9 45.2 41.4 44.9 44.7 44.3 44.0 43.3 42.7 41.9 41.7 41.6 Night Max 52.6 71.0 50.7 70.7 70.4 69.6 67.7 60.8 57.9 51.9 51.3 51.0



54.1

50.2

48.0

46.2

46.0

45.7

Average:

57.3

56.7

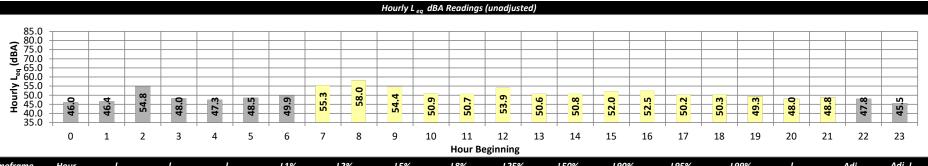
55.2

**Energy Average** 

47.2

Date: Monday, April 18, 2022 Location: L3 - Located northeast of the Project site near Mary's Kitchen Meter: Piccolo II

JN: 13101 Project: 534 Struck Avenue Source: at 517 West Struck Avenue. Analyst: A. Khan



Timeframe	Hour	$L_{eq}$	L max	L min	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	$L_{eq}$	Adj.	Adj. L <sub>eq</sub>
	0	46.0	74.2	45.2	74.1	73.7	70.7	68.2	61.4	50.2	45.6	45.5	45.3	46.0	10.0	56.0
	1	46.4	67.5	45.7	67.1	66.3	64.4	63.4	59.8	57.0	46.2	46.0	45.8	46.4	10.0	56.4
	2	54.8	75.2	57.5	75.0	74.8	73.7	72.3	68.0	64.8	58.8	58.4	57.9	54.8	10.0	64.8
Night	3	48.0	49.5	47.0	49.2	49.0	48.8	48.7	48.4	47.9	47.3	47.2	47.1	48.0	10.0	58.0
	4	47.3	49.9	45.8	49.6	49.3	48.7	48.4	47.6	47.2	46.3	46.1	45.9	47.3	10.0	57.3
	5	48.5	66.6	47.2	66.4	65.6	62.8	61.5	49.8	48.4	47.7	47.6	47.4	48.5	10.0	58.5
	6	49.9	69.2	48.2	68.7	67.7	65.0	63.4	52.5	49.7	48.8	48.6	48.4	49.9	10.0	59.9
	7	55.3	72.9	48.2	72.5	71.4	67.4	63.2	51.7	49.7	48.8	48.6	48.3	55.3	0.0	55.3
	8	58.0	69.7	47.7	69.3	68.7	66.8	64.9	51.6	49.5	48.2	48.1	47.8	58.0	0.0	58.0
	9	54.4	64.2	48.6	63.9	63.5	62.1	61.1	51.2	49.9	49.1	48.9	48.7	54.4	0.0	54.4
	10	50.9	55.4	48.3	55.0	54.6	53.9	53.3	51.6	50.1	48.9	48.7	48.4	50.9	0.0	50.9
	11	50.7	54.9	48.7	54.5	54.0	53.0	52.4	51.1	50.2	49.1	49.0	48.8	50.7	0.0	50.7
	12	53.9	59.2	49.2	58.7	58.2	57.4	56.9	55.1	52.9	50.3	49.9	49.4	53.9	0.0	53.9
	13	50.6	55.2	48.2	54.7	54.2	53.3	52.8	51.1	49.9	48.8	48.6	48.3	50.6	0.0	50.6
Day	14	50.8	63.4	47.8	63.2	62.4	61.0	60.4	51.6	50.1	48.5	48.3	48.0	50.8	0.0	50.8
	15	52.0	69.2	48.9	68.7	67.7	65.7	64.4	54.4	52.2	50.0	49.6	49.1	52.0	0.0	52.0
	16	52.5	65.0	48.4	64.5	63.9	62.6	62.2	53.5	51.1	49.1	48.8	48.6	52.5	0.0	52.5
	17	50.2	76.7	47.7	76.4	75.4	71.1	67.5	56.7	49.7	48.2	48.0	47.8	50.2	0.0	50.2
	18	50.3	55.5	47.5	54.9	54.2	53.0	52.4	51.0	49.7	48.1	47.9	47.7	50.3	0.0	50.3
	19	49.3	65.8	47.1	65.2	64.0	61.6	61.0	50.4	48.7	47.6	47.4	47.2	49.3	5.0	54.3
	20	48.0	52.7	46.5	52.1	51.3	49.7	49.1	48.1	47.6	47.0	46.8	46.6	48.0	5.0	53.0
	21	48.8	53.7	46.1	53.4	53.0	52.3	51.9	49.5	47.4	46.5	46.4	46.2	48.8	5.0	53.8
Night	22	47.8	51.0	46.1	50.6	50.3	49.7	49.4	48.4	47.5	46.6	46.4	46.2	47.8	10.0	57.8
- •	23	45.5	46.7	44.9	46.4	46.2	45.9	45.8	45.6	45.4	45.1	45.1	45.0	45.5	10.0	55.5
Timeframe	Hour	L <sub>eq</sub>	L max	L min	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%		L <sub>eq</sub> (dBA)	
Day	Min	48.0	52.7	46.1	52.1	51.3	49.7	49.1	48.1	47.4	46.5	46.4	46.2	24-Hour	Daytime	Nighttime
	Max	58.0	76.7	49.2	76.4	75.4	71.1	67.5	56.7	52.9	50.3	49.9	49.4		(7am-10pm)	(10pm-7am)
Energy	_	52.6	Aver		61.8	61.1	59.4	58.2	51.9	49.9	48.5	48.3	48.1	F4 7	F2 C	40.2
Night	Min	45.5	46.7	44.9	46.4	46.2	45.9	45.8	45.6	45.4	45.1	45.1	45.0	51.7	<b>52.6</b>	49.3
- France :	Max	54.8	75.2	57.5	75.0	74.8	73.7	72.3	68.0	64.8	58.8	58.4	57.9			
Energy	Average	49.3	Aver	age:	60.8	60.3	58.9	57.9	53.5	50.9	48.0	47.9	47.7			



Date: Monday, April 18, 2022 Location: L4 - Located northeast of the Project site near Citrus Grove Meter: Piccolo II

JN: 13101 Source: Apartments at 1120 North Lemon Street. Project: 534 Struck Avenue Analyst: A. Khan

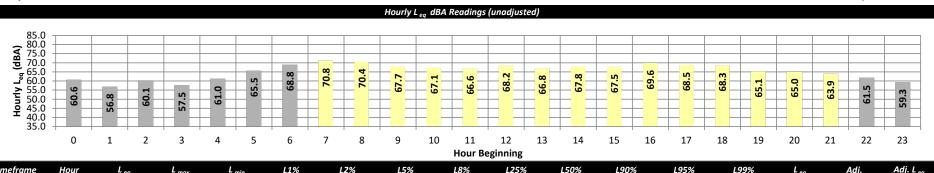
#### Hourly L ea dBA Readings (unadjusted) Honrly Leg (dBA) 45.0 (48A) 45.0 455.0 45.0 45.0 45.0 35.0 **Hour Beginning**

Timeframe	Hour	$L_{eq}$	L <sub>max</sub>	L <sub>min</sub>	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	$L_{eq}$	Adj.	Adj. L <sub>eq</sub>
	0	44.5	79.3	43.5	78.8	78.2	76.7	75.0	69.5	48.0	43.9	43.8	43.6	44.5	10.0	54.5
	1	45.8	74.5	45.8	74.3	74.1	72.4	71.3	68.1	64.9	48.6	47.0	46.0	45.8	10.0	55.8
	2	45.2	83.3	66.5	83.1	82.8	81.7	80.5	75.9	73.8	68.2	67.8	66.8	45.2	10.0	55.2
Night	3	45.5	46.9	44.5	46.7	46.6	46.4	46.2	45.8	45.4	44.9	44.8	44.7	45.5	10.0	55.5
	4	45.1	46.3	44.2	46.1	46.0	45.7	45.6	45.2	45.0	44.6	44.5	44.3	45.1	10.0	55.1
	5	47.5	74.8	46.5	74.5	73.8	72.0	69.9	48.8	47.4	46.9	46.8	46.6	47.5	10.0	57.5
	6	49.4	76.2	48.1	75.6	74.6	72.6	71.0	50.4	49.1	48.6	48.5	48.3	49.4	10.0	59.4
	7	49.2	81.4	47.9	80.6	79.4	73.2	69.8	50.6	49.0	48.4	48.2	48.0	49.2	0.0	49.2
	8	52.5	77.3	47.4	77.1	76.1	74.2	73.1	54.0	50.7	48.3	48.0	47.6	52.5	0.0	52.5
	9	50.8	73.4	47.0	72.7	72.1	70.8	69.8	51.2	48.9	47.6	47.4	47.2	50.8	0.0	50.8
	10	53.1	61.8	47.3	61.1	60.3	58.1	56.9	53.8	50.4	48.0	47.7	47.4	53.1	0.0	53.1
	11	51.3	57.5	47.6	57.1	56.5	55.2	54.4	52.1	50.0	48.1	47.9	47.7	51.3	0.0	51.3
	12	54.2	63.0	47.5	62.6	62.1	61.2	60.1	55.8	51.3	48.3	48.0	47.7	54.2	0.0	54.2
_	13	48.8	61.1	46.8	60.6	59.8	58.1	57.0	53.7	49.2	47.3	47.1	46.9	48.8	0.0	48.8
Day	14	48.7	70.3	46.3	70.0	69.2	68.6	68.4	49.8	48.0	46.8	46.7	46.4	48.7	0.0	48.7
	15	51.5	78.2	47.5	77.7	76.9	72.4	70.8	53.7	49.9	48.1	47.9	47.6	51.5	0.0	51.5
	16	50.8	71.8	47.4	71.2	70.8	69.5	68.8	52.4	49.5	47.9	47.7	47.5	50.8	0.0	50.8
	17	51.4	82.3	47.8	81.7	80.7	76.6	74.4	59.5	50.8	48.5	48.2	47.9	51.4	0.0	51.4
	18	51.5	56.8	47.0	56.4	56.1	55.5	55.0	52.8	49.9	47.7	47.5	47.2	51.5	0.0	51.5
	19	48.9	72.3	45.0	71.7	70.7	69.0	67.7	50.7	47.5	45.4	45.3	45.1	48.9	5.0	53.9
	20	47.9	51.2	45.9	50.8	50.6	50.0	49.7	48.7	47.5	46.4	46.2	46.0	47.9	5.0	52.9
	21	47.5	57.6	45.4	57.3	57.1	56.7	56.4	53.2	47.2	46.0	45.8	45.6	47.5	5.0	52.5
Night	22	49.4	53.6	46.0	53.3	53.1	52.4	51.9	50.5	48.6	46.5	46.3	46.1	49.4	10.0	59.4
<b>T</b> '	23	45.0	47.8	43.9	47.3	46.9	46.0	45.8	45.2	44.9	44.3	44.2	44.1	45.0	10.0	55.0
Timeframe	<i>Hour</i> Min	L <sub>eq</sub> 47.5	L <sub>max</sub> 51.2	L <sub>min</sub> 45.0	<b>L1%</b> 50.8	<b>L2%</b> 50.6	<b>L5%</b> 50.0	<b>L8%</b>	<b>L25%</b> 48.7	<b>L50%</b> 47.2	<b>L90%</b> 45.4	<b>L95</b> % 45.3	<i>L99</i> % 45.1		L <sub>eq</sub> (dBA) Daytime	Nighttime
Day	Max	47.5 54.2	82.3	45.0 47.9	81.7	80.7	76.6	74.4	48.7 59.5	51.3	45.4 48.5	45.3 48.2	45.1	24-Hour	(7am-10pm)	(10pm-7am)
Energy	Average	54.2	82.3 Aver		67.3	66.6	64.6	63.5	59.5	49.3	48.5	48.2	48.0		(7am-10pm)	(10pm-7am)
Effergy	Min	44.5	46.3	43.5	46.1	46.0	45.7	45.6	45.2	44.9	43.9	43.8	43.6	49.8	51.0	46.8
Night	Max	44.5	83.3	43.5 66.5	83.1	82.8	45.7 81.7	45.6 80.5	75.9	73.8	68.2	45.8 67.8	66.8	47.0	21.0	40.0
Fnergy	Average	46.8	83.3 Aver		64.4	64.0	62.9	61.9	55.5	51.9	48.5	48.2	47.8			
Lifergy	Weruge .	40.0	AVEI	чьс.	04.4	04.0	02.3	01.3	33.3	31.3	40.3	40.2	47.0			



Date: Monday, April 18, 2022 Location: L5 - Located south of the Project site near Top Dog Inn at 606 Meter: Piccolo II

JN: 13101 Project: 534 Struck Avenue Source: West Collins Avenue. Analyst: A. Khan



Timejrame	Hour	L eq	L max	L min	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L eq	Aaj.	Aaj. L <sub>eq</sub>
	0	60.6	72.2	45.0	72.0	71.3	68.4	66.3	57.5	51.0	45.6	45.3	45.1	60.6	10.0	70.6
	1	56.8	69.0	45.8	68.5	67.5	64.0	61.4	54.2	50.3	46.3	46.1	45.9	56.8	10.0	66.8
	2	60.1	68.3	56.1	68.0	67.4	65.3	64.0	59.8	57.9	56.4	56.3	56.1	60.1	10.0	70.1
Night	3	57.5	69.2	47.6	68.9	68.0	65.1	62.9	54.3	49.7	48.1	47.9	47.7	57.5	10.0	67.5
	4	61.0	71.7	48.8	71.3	70.5	68.3	66.7	59.8	54.1	49.4	49.2	48.9	61.0	10.0	71.0
	5	65.5	74.2	53.0	73.8	73.2	71.5	70.5	66.3	61.8	54.6	53.9	53.1	65.5	10.0	75.5
	6	68.8	77.0	56.7	76.5	75.8	74.2	73.3	70.1	66.1	58.8	57.8	56.9	68.8	10.0	78.8
	7	70.8	78.9	59.0	78.4	77.8	76.2	75.0	71.9	68.7	61.4	60.3	59.2	70.8	0.0	70.8
	8	70.4	78.3	58.2	77.7	77.0	75.3	74.5	71.6	68.7	61.2	59.6	58.5	70.4	0.0	70.4
	9	67.7	76.5	54.8	76.1	75.3	73.1	71.9	68.8	65.1	57.8	56.3	55.0	67.7	0.0	67.7
	10	67.1	76.2	54.6	75.5	74.6	72.3	71.2	68.2	64.6	57.4	56.1	54.8	67.1	0.0	67.1
	11	66.6	74.5	54.9	74.1	73.5	71.9	70.8	67.8	64.4	57.5	56.2	55.1	66.6	0.0	66.6
	12	68.2	79.2	55.6	78.7	77.7	74.6	72.2	67.9	64.5	58.1	56.9	55.8	68.2	0.0	68.2
	13	66.8	75.3	54.9	74.9	74.2	72.4	71.0	67.7	64.4	57.7	56.4	55.2	66.8	0.0	66.8
Day	14	67.8	76.7	54.6	76.4	75.7	74.0	72.7	68.4	64.9	57.5	56.1	54.9	67.8	0.0	67.8
	15	67.5	76.9	55.1	76.3	75.4	72.7	71.4	68.4	65.1	57.9	56.7	55.3	67.5	0.0	67.5
	16	69.6	80.9	56.2	80.3	79.2	75.7	73.3	69.3	66.1	59.1	57.7	56.4	69.6	0.0	69.6
	17	68.5	76.4	56.4	76.0	75.5	73.9	72.7	69.7	66.5	59.5	57.9	56.6	68.5	0.0	68.5
	18	68.3	79.4	52.4	78.8	77.9	74.6	72.7	68.3	63.7	55.2	53.9	52.7	68.3	0.0	68.3
	19	65.1	73.7	50.9	73.4	72.6	71.2	70.3	66.2	61.1	53.0	51.9	51.1	65.1	5.0	70.1
	20	65.0	75.2	49.6	74.9	74.1	72.0	70.5	65.1	58.9	51.3	50.5	49.8	65.0	5.0	70.0
	21	63.9	74.0	49.2	73.5	72.6	70.5	69.1	64.3	58.8	50.8	50.0	49.4	63.9	5.0	68.9
Night	22	61.5	71.9	47.9	71.5	70.8	68.8	67.2	61.1	54.9	49.0	48.4	48.0	61.5	10.0	71.5
	23	59.3	70.8	45.2	70.4	69.6	67.2	65.2	56.7	49.2	45.7	45.5	45.3	59.3	10.0	69.3
Timeframe	Hour	L <sub>eq</sub>	L <sub>max</sub>	L min	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%		$L_{eq}$ (dBA)	
Day	Min	63.9	73.7	49.2	73.4	72.6	70.5	69.1	64.3	58.8	50.8	50.0	49.4	24-Hour	Daytime	Nighttime
,	Max	70.8	80.9	59.0	80.3	79.2	76.2	75.0	71.9	68.7	61.4	60.3	59.2		(7am-10pm)	(10pm-7am)
Energy /	Average	68.0	Aver		76.3	75.5	73.4	71.9	68.2	64.4	57.0	55.8	54.7	cc =	CO C	62.6
Night	Min	56.8	68.3	45.0	68.0	67.4	64.0	61.4	54.2	49.2	45.6	45.3	45.1	66.7	68.0	63.0
	Max	68.8	77.0	56.7	76.5	75.8	74.2	73.3	70.1	66.1	58.8	57.8	56.9			
Energy /	Average	63.0	Aver	age:	71.2	70.5	68.1	66.4	60.0	55.0	50.4	50.0	49.7			





# APPENDIX 7.1:

**OFF-SITE TRAFFIC NOISE LEVEL CALCULATIONS** 





	FHWA-RI	D-77-108 HIGH	HWAY	NOISE	PREDIC	CTION M	ODEL (	9/12/20	21)		
	rio: E ne: Main St. ent: n/o Struck	Av.				Project Job N	Name: umber:		uck		
	SPECIFIC IN	IPUT DATA							LINPUT	s	
Highway Data				8	Site Con	ditions (					
Average Daily	. ,	15,522 vehicl	es					Autos:	15		
	Percentage:	9.40%				edium Tru		,	15		
	Hour Volume:	1,459 vehicle	!S		He	eavy Truc	KS (3+.	Axies):	15		
	ehicle Speed:	40 mph		١	/ehicle	Mix					
Near/Far La	ane Distance:	50 feet			Veh	icleType		Day	Evening	Night	Daily
Site Data						A	utos:	75.5%	12.5%	12.0%	91.47%
Ва	rrier Heiaht:	0.0 feet			М	edium Tr	ucks:	81.6%	5.3%	13.1%	6.36%
Barrier Type (0-V	Vall, 1-Berm):	0.0				Heavy Tr	ucks:	79.9%	6.2%	14.0%	2.17%
Centerline D	ist. to Barrier:	50.0 feet			laica S	ource Ele	ovation	c (in fo	of)		
Centerline Dist.	to Observer:	50.0 feet		,	ioise si	Autos		000	eij		
Barrier Distance	to Observer:	0.0 feet			Modiu	m Trucks		297			
Observer Height	(Above Pad):	5.0 feet				vy Trucks	-		Grade Ad	iustment	÷ 0.0
P	ad Elevation:	0.0 feet			1100	ry Truche	, O.	004	07440714	doumoni	. 0.0
Ro	ad Elevation:	0.0 feet		L	ane Eq	uivalent	Distan	ce (in f	eet)		
	Road Grade:	0.0%				Autos		.589			
	Left View:	-90.0 degre	es		Mediu	m Trucks	3: 43	.386			
	Right View:	90.0 degre	es		Hea	vy Trucks	3: 43	405			
FHWA Noise Mod	lel Calculation	s									-
VehicleType	REMEL	Traffic Flow	Dis	stance		Road	Fresi	_	Barrier Att	en Bei	rm Atten
Autos:	66.51	-0.07		0.79	9	-1.20		-4.65	0.0	000	0.000
Medium Trucks:	77.72	-11.65		0.82	2	-1.20		-4.87	0.0	000	0.000
Heavy Trucks:	82.99	-16.31		0.82	2	-1.20		-5.43	0.0	000	0.000
Unmitigated Nois			barri	er atten	uation)						
VehicleType	Leq Peak Hou			Leq Ev		Leq			Ldn		NEL
Autos:		3.0	64.3		62.5		57.	-	65.		66.2
Medium Trucks:		5.7	64.3		58.4		57.	-	65.		65.7
Heavy Trucks: Vehicle Noise:		3.3	64.8		59.7 65.3		58. 62.		66.3 70.0		66.5 71.0
					00.0		02.	,	70.0	,	71.0
Centerline Distan	ce to Noise Co	ontour (in fee	1)	70 o	IRA	65 (	IRA	6	0 dBA	55	i dBA
			Ldn:	,,,,	55	1 55 0	118		255		550
		c	NEL:		58		125		269		579
					50		120	,	203		313

F	HWA-RD	0-77-108 HIGH	łWAY	NOISE	PREDIC	TION N	IODEL	(9/12/20	021)		
Scenario: OY Road Name: Ma							t Name: Jumber:		ruck		
Road Name: Ma Road Segment: n/o		Δν				JOD I	vumber:	13101			
				- 1							
SITE SPEC Highway Data	IFIC IN	PUT DATA		-	Site Cor				L INPUT	5	
Average Daily Traffic	(A alt):	16.205 vehicle			one con	unions	(mara -	Autos:	15		
Peak Hour Perce	. ,	9.40%	es		Me	dium Ti	ucks (2				
Peak Hour Vo		1.523 vehicle	e				icks (3+	,			
Vehicle S		40 mph		L							
Near/Far Lane Dis	,	50 feet		Ľ	Vehicle			_	I= . I	*** **	
		00			Veh	icleType		Day	Evening	Night	Daily
Site Data						edium 7	Autos:	75.5% 81.6%		12.0%	91.47%
Barrier H		0.0 feet				eaium i Heavv 1		79.9%		14.0%	
Barrier Type (0-Wall, 1-	,	0.0				neavy i	rucks.	19.970	0.270	14.0%	2.177
Centerline Dist. to E		50.0 feet		1	Noise S	ource E	levatio	ns (in fe	eet)		
Centerline Dist. to Obs		50.0 feet 0.0 feet				Auto	s: O	.000			
Barrier Distance to Obs Observer Height (Above					Mediu	m Truck	(s: 2	.297			
Observer Height (Above Pad Fle	,	5.0 feet 0.0 feet			Hea	y Truck	rs: 8	.004	Grade Adj	iustment	0.0
Road Ele		0.0 feet		1	Lane Eq	uivalen	t Distar	nce (in t	feet)		
Road I		0.0%		ľ		Auto		589	,		
	View:	-90.0 degre	es		Mediu	m Truck	(s: 43	386			
Right	View:	90.0 degre			Hea	y Truck	(s: 43	3.405			
FHWA Noise Model Cald	culations	S									
VehicleType RE	MEL	Traffic Flow	Dis	stance	Finite	Road	Fres	nel	Barrier Att		m Atten
Autos:	66.51	0.11		0.7	-	-1.20		-4.65		000	0.00
Medium Trucks:	77.72	-11.47		0.8	_	-1.20		-4.87		000	0.00
Heavy Trucks:	82.99	-16.13		8.0		-1.20		-5.43	0.0	000	0.00
Unmitigated Noise Leve								_			
	eak Hou			Leq E	vening	Leq	Night		Ldn		VEL
Autos: Medium Trucks:	66 65		64.5		62.7 58.6		57 57		65.9 65.7		66.4 65.1
Heavy Trucks:	66		65.0		59.9		58		66.5		66.
Vehicle Noise:	71		69.4		65.5		62		70.8		71.
Centerline Distance to N					00.0		- 52	-	. 0.0	-	
Contentine Distance to P	OISE CO	anour (iii leet	,	70 (	dBA	65	dBA	6	60 dBA	55	dBA
			L	, , ,		0					
			Ldn:		57		12	2	263		566

Scenari	. F.D					Proiect N	lama: E	A Cto	uek		
Scenari Road Nam						Job Nui			uck		
Road Segmen		Δv				JOD IVUI	nuer. I	5101			
	SPECIFIC IN					NC	ISE M	ODE	L INPUT	s	
Highway Data				S	ite Con	ditions (F	lard = 1	0, So	ft = 15)		
Average Daily	Traffic (Adt):	15.533 vehicle	es				А	utos:	15		
Peak Hour	Percentage:	9.40%			Me	dium Truc	ks (2 A)	des):	15		
Peak H	our Volume:	1,460 vehicle	S		He	avy Truck	s (3+ A)	des):	15		
Vel	nicle Speed:	40 mph		V	ehicle I	Miv					
Near/Far Lar	ne Distance:	50 feet		-		cleType	L	)av	Evening	Niaht	Daily
Site Data							itos: 7	5.5%	12.5%	12.0%	91.48
Rar	rier Heiaht:	0.0 feet			Me	edium Tru	cks: 8	1.6%	5.3%	13.1%	6.35
Barrier Type (0-W		0.0			F	leavy Tru	cks: 7	9.9%	6.2%	14.0%	2.17
Centerline Dis	. ,	50.0 feet			laiaa Ca	urce Elev	rationa	(in fo	n#l		
Centerline Dist.	o Observer:	50.0 feet		,	10/36/30	Autos:			eij		
Barrier Distance t	o Observer:	0.0 feet			Mediu	n Trucks:					
Observer Height (	Above Pad):	5.0 feet				v Trucks:			Grade Ad	ustment	0.0
	d Elevation:	0.0 feet				,					
	d Elevation:	0.0 feet		L	ane Equ	uivalent E		•	eet)		
F	Road Grade:	0.0%				Autos:					
	Left View:	-90.0 degree				n Trucks:					
	Right View:	90.0 degree	es		Heav	y Trucks:	43.4	J5			
FHWA Noise Mode	I Calculations	5									
VehicleType	REMEL	Traffic Flow	Dista		Finite		Fresne	_	Barrier Att		m Atter
Autos:	66.51	-0.07		0.79		-1.20		4.65		000	0.0
Medium Trucks:	77.72	-11.65		0.82		-1.20		4.87		000	0.0
Heavy Trucks:	82.99	-16.31		0.82		-1.20		5.43	0.0	000	0.0
Unmitigated Noise	•										
VehicleType Autos:	Leq Peak Hou 66		64.3	Leq Ev	ening 62.5	Leq N	1ght 57.6		Ldn 65.7		NEL 66
Medium Trucks:	65		64.3		58.4		57.6		65.5		65
Heavy Trucks:	66		64.8		59.7		58.5		66.3		66
Vehicle Noise:	70		69.2		65.3		62.7		70.6		71
Centerline Distanc	e to Noise Co	ntour (in feet	,	70 d	BA	65 dE	3 <i>A</i>	6	0 dBA	55	dBA
			1	, o u		JU UL	1		- 30,,	1 30	
			Ldn:		55		118		255		55

Friday, October 21, 2022

	FHWA-RD	-77-108 HIGH\	WAY NOIS	E PREDIC	TION M	ODEL (9/1	2/2021)	
Road Nam	io: OYC+P ne: Main St. nt: n/o Struck /	٩v.				Name: 534 umber: 131		
	SPECIFIC IN	PUT DATA					DEL INPUTS	;
Average Daily Peak Hour	Traffic (Adt): Percentage:	16,216 vehicle:	S			Hard = 10, Aut icks (2 Axle	os: 15	
Ve	hicle Speed:	1,524 vehicles 40 mph		Vehicle		ks (3+ Axle	es): 15	
Near/Far La	ne Distance:	50 feet		Veh	icleType	Da	,	Night Daily
Site Data  Bai  Barrier Type (0-W	rrier Height: /all, 1-Berm):	0.0 feet 0.0			A edium Tr Heavy Tr	ucks: 81.	5% 12.5% 6% 5.3% 9% 6.2%	12.0% 91.48% 13.1% 6.35% 14.0% 2.17%
Centerline Dist.	st. to Barrier:	50.0 feet 50.0 feet		Noise S		evations (ii		
Barrier Distance Observer Height (	to Observer:	0.0 feet 5.0 feet 0.0 feet			Autos m Trucks y Trucks	2.297		ustment: 0.0
	ad Elevation: Road Grade: Left View: Right View:	0.0 feet 0.0% -90.0 degree 90.0 degree		Mediu	Autos M Trucks Y Trucks	43.386	)	
FHWA Noise Mode	el Calculations	ı						
VehicleType	REMEL	Traffic Flow	Distance		Road	Fresnel	Barrier Atte	
Autos: Medium Trucks: Heavy Trucks:	66.51 77.72 82.99	0.12 -11.47 -16.13	0	.79 .82 .82	-1.20 -1.20 -1.20	-4.i -4.i	87 0.00	0.000
Unmitigated Noise								
VehicleType	Leq Peak Hou			Evening	Leq I	Vight	Ldn	CNEL
Autos: Medium Trucks:	66. 65.		64.5 64.5	62.7 58.6		57.7 57.8	65.9 65.7	66.4 65.9
Heavy Trucks: Vehicle Noise:	66. 71.		65.0 69.4	59.9 65.5		58.7 62.8	66.5 70.8	66.7 71.1
Centerline Distance	ce to Noise Co	ntour (in feet)						
				) dBA	65 (		60 dBA	55 dBA
		_	.dn: IEL:	57 60		122 128	263 276	566 596

	FHWA-RI	D-77-108 HIGH	IWAY	NOISE	PREDIC	TION N	IODEL (	9/12/2	021)		
	io: E ne: Main St. nt: s/o Struck	Av.					Name: lumber:		ruck		
	SPECIFIC IN	NPUT DATA							L INPUT	S	
Highway Data					Site Con	ditions	(Hard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	18,156 vehicle	es					Autos:	15		
Peak Hour	Percentage:	9.40%			Me	dium Tr	ucks (2 )	Axles):	15		
Peak H	lour Volume:	1,707 vehicle	S		He	avy Tru	cks (3+ )	Axles):	15		
Ve	hicle Speed:	40 mph		F	Vehicle i	Miv					
Near/Far La	ne Distance:	50 feet		ŀ		icleType		Dav	Evening	Night	Dailv
Site Data							Autos:	75.5%		12.0%	
Ra	rrier Height:	0.0 feet			М	edium T	rucks:	81.6%	5.3%	13.1%	6.36%
Barrier Type (0-W		0.0				Heavy T	rucks:	79.9%	6.2%	14.0%	2.17%
Centerline Di		50.0 feet		-	Noise So	urco E	lovation	c (in f	not)		
Centerline Dist.	to Observer:	50.0 feet		F	140/36 00	Auto		000	,		
Barrier Distance	to Observer:	0.0 feet			Modiu	m Truck		297			
Observer Height	(Above Pad):	5.0 feet				ry Truck		004	Grade Ad	iuetman	t- 0.0
P	ad Elevation:	0.0 feet		L						140411011	0.0
Ro	ad Elevation:	0.0 feet		L	Lane Eq	uivalen	t Distan	ce (in i	feet)		
	Road Grade:	0.0%				Auto		589			
	Left View:	-90.0 degre	es		Mediu	m Truck	s: 43.	386			
	Right View:	90.0 degre	es		Heav	ry Truck	s: 43.	405			
FHWA Noise Mod	el Calculation	s									
VehicleType	REMEL	Traffic Flow		stance		Road	Fresr	_	Barrier Att		rm Atten
Autos:	66.51			0.7	-	-1.20		-4.65		000	0.000
Medium Trucks:				3.0		-1.20		-4.87		000	0.000
Heavy Trucks:	82.99	-15.63		3.0	2	-1.20		-5.43	0.0	000	0.000
Unmitigated Noise			barri	er atter	nuation)					,	
VehicleType	Leq Peak Hou			Leq E	vening		Night		Ldn	_	NEL
Autos:		6.7	65.0		63.2		58.2		66.4		66.9
Medium Trucks:		3.4	65.0		59.1		58.2	_	66.2	_	66.4
Heavy Trucks:		7.0	65.5		60.4		59.2		67.0		67.2
Vehicle Noise:	71	1.5	69.9		66.0		63.3	3	71.3	3	71.6
Centerline Distand	ce to Noise Co	ontour (in feet	)							_	-
			L	70	dBA	65	dBA	4 - 7	60 dBA		dBA
		_	Ldn:		61		132		283		610
		C	NEL:		64		138		298		643

	FHWA-RD	-77-108 HIGH	WAY	NOISE	PREDIC	TION N	ODEL	(9/12/2	021)		
Scenario Road Name Road Segment	: Main St.	v				Project Job N		: 534 St : 13101			
	PECIFIC IN						IOISE	MODE	L INPUT	s	
Highway Data	r LOII IO III	TOT DATA			Site Con					•	
Average Daily To	raffic (Adt):	19.026 vehicle	es					Autos	15		
Peak Hour P	. ,	9.40%			Me	dium Tr	ucks (2	Axles).	15		
Peak Ho	ur Volume:	1,788 vehicles	S		He	avy Tru	cks (3+	Axles).	15		
Vehi	icle Speed:	40 mph			Vehicle i	Miv					
Near/Far Lane	e Distance:	50 feet		H		icleType		Day	Evening	Night	Daily
Site Data							Autos:	75.5%	-	12.0%	
Parr	ier Height:	0.0 feet			М	edium T	rucks:	81.6%		13.1%	
Barrier Type (0-Wa		0.0 feet				Heavy T	rucks:	79.9%	6.2%	14.0%	2.179
Centerline Dist		50.0 feet		-	M-: 0	5		(:- 6	41		
Centerline Dist. to	Observer:	50.0 feet			Noise So	Auto			eet)		
Barrier Distance to	Observer:	0.0 feet					. ,	0.000 2.297			
Observer Height (A	bove Pad):	5.0 feet				m Truck			Grade Ad	livotmont	. 0.0
Pad	Elevation:	0.0 feet			Heal	y Truck	5. (	3.004	Grade Ad	jusunen	. 0.0
Road	Elevation:	0.0 feet			Lane Eq	uivalent	Dista	nce (in	feet)		
Re	oad Grade:	0.0%				Auto	s: 4	3.589			
	Left View:	-90.0 degree	es		Mediu	m Truck	s: 4	3.386			
	Right View:	90.0 degree	es		Heav	y Truck	s: 4:	3.405			
FHWA Noise Model	Calculations	1									
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite	Road	Fre	snel	Barrier At	ten Ber	m Atten
Autos:	66.51	0.81		0.7	'9	-1.20		-4.65	0.	000	0.00
Medium Trucks:	77.72	-10.77		0.8	-	-1.20		-4.87		000	0.00
Heavy Trucks:	82.99	-15.43		3.0	32	-1.20		-5.43	0.	000	0.00
Unmitigated Noise		<del></del>									
	eq Peak Hou			Leq E	vening		Night		Ldn		NEL
Autos:	66.	-	65.2		63.4		58		66.		67.
Medium Trucks:	66.	-	65.2		59.3		58		66.		66.0
Heavy Trucks:	67. 71.		65.7 70.1		60.6		59		67. 71.		67.4 71.4
Vehicle Noise:					66.2		63	0.0	/1.	5	/1.
Centerline Distance	to Noise Co.	ntour (in feet)	1	70	dBA	65	dBA	1 .	60 dBA	55	dBA
			Ldn:	70	63	00	13		292		630

	FHWA-RI	D-77-108 HIGH	WAY	NOISE	PREDIC	CTION MO	DDEL (	9/12/2	021)		
Scenario Road Name	: Main St.					Project I Job Nu	Name: ! Imber:		ruck		
Road Segment	s/o Struck	Av.									
SITE S	PECIFIC IN	IPUT DATA							L INPUT	s	
Highway Data				S	Site Con	ditions (	Hard =	10, S	oft = 15)		
Average Daily T	raffic (Adt):	18,167 vehicl	es					Autos:	15		
Peak Hour P	ercentage:	9.40%			Me	dium Tru	cks (2 A	(xles	15		
Peak Ho	ur Volume:	1,708 vehicle	:S		He	avy Truci	ks (3+ A	(xles	15		
Vehi	icle Speed:	40 mph		ν	/ehicle l	Mix					
Near/Far Land	e Distance:	50 feet			Veh	icleType		Day	Evening	Night	Daily
Site Data						A	utos:	75.5%	12.5%	12.09	91.48
Barr	ier Heiaht:	0.0 feet			M	edium Tru	ıcks:	81.6%	5.3%	13.19	6.35
Barrier Type (0-Wa		0.0			1	Heavy Tru	ıcks:	79.9%	6.2%	14.09	6 2.17
Centerline Dist	to Barrier:	50.0 feet		^	loise So	ource Ele	vation	s (in f	eet)		
Centerline Dist. to	Observer:	50.0 feet				Autos		000	,		
Barrier Distance to		0.0 feet			Mediu	m Trucks		297			
Observer Height (A	,	5.0 feet			Heav	y Trucks	: 8.0	004	Grade Ad	iustmen	t: 0.0
	d Elevation:	0.0 feet		-			<b>.</b>				
	d Elevation:	0.0 feet			ane Eq	uivalent		_ •	reet)		
R	oad Grade:	0.0%			A decesion	Autos m Trucks					
	Left View:	-90.0 degre				m Trucks vy Trucks					
	Right View:	90.0 degre	es		ricas	ry Trucks	. 40.	403			
FHWA Noise Model											
VehicleType	REMEL	Traffic Flow		tance		Road	Fresn		Barrier Att	_	rm Atten
Autos:	66.51			0.79		-1.20		-4.65		000	0.00
Medium Trucks:	77.72			0.82	-	-1.20		-4.87		000	0.00
Heavy Trucks:	82.99			0.82	-	-1.20		-5.43	0.0	000	0.00
VehicleType L	<b>Levels (with</b> .eq Peak Hol		_	er attenu Leg Ev		Leg N	liaht	1	Ldn		NFL.
Autos:	•	37 Leg Da	65.0	Ley Lv	63.2		11911t 58.2	)	66.4		66
Medium Trucks:		3.4	65.0		59.1		58.2	-	66.2		66
Heavy Trucks:		7.0	65.5		60.4		59.2	-	67.0	-	67
Vehicle Noise:	71	1.5	69.9		66.0		63.3	3	71.3	3	71
Centerline Distance	to Noise Co	ontour (in feet	t)								
				70 d	BA	65 d	BA	- (	60 dBA	5	5 dBA
			Ldn:		61		132		283		61

Friday, October 21, 2022

FHWA-F	RD-77-108 HIG	HWAY	NOISE	E PREDIC	TION M	ODEL	(9/12/2	021)		
Scenario: OYC+P Road Name: Main St. Road Segment: s/o Struck	¢Αν.				Project i Job Nu			ruck		
SITE SPECIFIC	INPUT DATA	١		Site Con				L INPUT	s	
Average Daily Traffic (Adt):  Peak Hour Percentage:  Peak Hour Volume:  Vehicle Speed:	9.40% 1,789 vehic			Ме	dium Tru avy Truc	cks (2	Autos: Axles):	15 15		
Near/Far Lane Distance:				Vehicle I				1=		
Site Data	00			Veh	icleType	utos:	Day 75.5%	Evening 12.5%	Night 12.0%	Daily 91.47%
Barrier Height: Barrier Type (0-Wall, 1-Berm):					A edium Tro Heavy Tro	ucks:	75.5% 81.6% 79.9%	5.3%	13.1% 14.0%	6.35%
Centerline Dist. to Barrier:	50.0 feet		ŀ	Noise Sc	urce Fle	vation	s (in f	eet)		
Centerline Dist. to Observer: Barrier Distance to Observer: Observer Height (Above Pad): Pad Elevation:	0.0 feet 5.0 feet		÷	Mediui	Autos m Trucks ry Trucks	: 0 : 2	.000 .297 .004	Grade Ad	ljustment	: 0.0
Road Elevation:				Lane Eq	uivalent	Distan	ce (in	feet)		
Road Grade: Left View: Right View:	-90.0 degr				Autos m Trucks ry Trucks	: 43	.589 .386 .405			
FHWA Noise Model Calculatio	ns									
VehicleType REMEL	Traffic Flow	Dis	stance	Finite	Road	Fres	nel	Barrier Att	en Ber	m Atten
Autos: 66.5	1 0.8	1	0.7	79	-1.20		-4.65	0.	000	0.000
Medium Trucks: 77.7	2 -10.7	7	0.8	32	-1.20		-4.87	0.	000	0.000
Heavy Trucks: 82.9	9 -15.4	3	3.0	32	-1.20		-5.43	0.	000	0.000
Inmitigated Noise Levels (wit	hout Topo an	d barri	er attei	nuation)						
VehicleType Leq Peak H			Leq E	vening	Leq N			Ldn		NEL
	66.9	65.2		63.4		58.		66.	-	67.1
	6.6	65.2		59.3		58.	-	66.		66.6
	71.7	65.7 70.1		60.6 66.2		59. 63.		67. 71.		67.4 71.8
Centerline Distance to Noise							-		-	
Jentennie Distance to NOISE (	Jonitour (III Tel	=()	70	dBA	65 a	ΙΒΑ	1	60 dBA	55	dBA
		Ldn:		63		136	-	292	,	630
		Luii.		03		136	)	292	2	030

	FHWA-RD	)-77-108 HIGH	WAY	NOISE	PREDIC	CTION N	IODEL	(9/12/2	021)		
	io: E ne: Batavia St. nt: n/o Katella	Av.				.,	t Name. Iumber	534 St 13101	ruck		
SITE Highway Data	SPECIFIC IN	PUT DATA			Site Con				L INPUT	S	
					Site Con	iaitions	(Hara				
Average Daily	. ,	12,119 vehicle	es					Autos:	15		
	Percentage:	9.40%				edium Tr					
	lour Volume:	1,139 vehicle	8		He	eavy Tru	cks (3+	Axles):	15		
	hicle Speed:	40 mph			Vehicle	Mix					
Near/Far La	ne Distance:	50 feet		Ī	Veh	icleType	9	Day	Evening	Night	Daily
Site Data							Autos:	75.5%	12.5%	12.0%	91.47%
Ra	rrier Height:	0.0 feet			М	edium T	rucks:	81.6%	5.3%	13.1%	6.36%
Barrier Type (0-W		0.0				Heavy T	rucks:	79.9%	6.2%	14.0%	2.17%
Centerline Di	st. to Barrier:	50.0 feet		ŀ	Noise S	nurce F	levatio	ns (in fe	oet)		
Centerline Dist.	to Observer:	50.0 feet		ŀ		Auto		0.000	,,,,		
Barrier Distance	to Observer:	0.0 feet			Mediu	m Truck		297			
Observer Height	(Above Pad):	5.0 feet				vy Truck		3.004	Grade Ad	liustmen	t: 0.0
Pi	ad Elevation:	0.0 feet		L						,	
Ro	ad Elevation:	0.0 feet		L	Lane Eq	uivalen	t Distai	nce (in i	feet)		
	Road Grade:	0.0%				Auto	s: 40	3.589			
	Left View:	-90.0 degree	es		Mediu	m Truck	s: 40	3.386			
	Right View:	90.0 degree	es		Hea	vy Truck	s: 40	3.405			
FHWA Noise Mode	el Calculations	S									
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite	Road	Fres	inel	Barrier Att	en Be	rm Atten
Autos:	66.51	-1.15		0.7	9	-1.20		-4.65	0.0	000	0.000
Medium Trucks:	77.72	-12.73		8.0	2	-1.20		-4.87	0.0	000	0.000
Heavy Trucks:	82.99	-17.39		8.0	2	-1.20		-5.43	0.0	000	0.000
<b>Unmitigated Noise</b>	e Levels (with	out Topo and	barrie	er atter	nuation)						
VehicleType	Leq Peak Hou	r Leq Day	,	Leq E	vening	Leq	Night		Ldn	C	NEL
Autos:	65	.0	63.2		61.4		56	.5	64.6	6	65.1
Medium Trucks:	64	.6	63.2		57.4		56	.5	64.4	4	64.7
Heavy Trucks:	65	.2	63.7		58.6		57	.4	65.2	2	65.5
Vehicle Noise:	69	.7	68.2		64.3		61	.6	69.	5	69.9
Centerline Distance	ce to Noise Co	ntour (in feet	)								
			T	70	dBA	65	dBA	6	60 dBA	55	5 dBA
			Ldn:		47		10	0	216	3	466
		C	VEL:		49		10	6	228	3	491

FF	IWA-RD	-77-108 HIGH	IWAY	NOISE	PREDIC	TION N	MODEL (	9/12/2	021)		
Scenario: OY( Road Name: Bata Road Segment: n/o	avia St.	Av.					t Name: Number:		truck		
SITE SPEC	IFIC IN	PUT DATA							L INPUT	S	
Average Daily Traffic Peak Hour Percer Peak Hour Vo	ntage:	13,174 vehicle 9.40% 1,238 vehicle		3	Ме	edium Tı	rucks (2 incks (3+ incks (	Autos: Axles):	15		
Vehicle S Near/Far Lane Dist		40 mph 50 feet		١	<b>ehicle</b> Veh	Mix icleType	e	Day	Evening	Night	Daily
Site Data  Barrier He Barrier Type (0-Wall, 1-E		0.0 feet			М		Autos: rucks:	75.5% 81.6% 79.9%	12.5% 5.3%	12.0% 13.1% 14.0%	91.47%
Centerline Dist. to B. Centerline Dist. to Obs Barrier Distance to Obs Observer Height (Above	arrier: erver: erver:	50.0 feet 50.0 feet 0.0 feet 5.0 feet		^		ource E Auto m Truck		<b>s (in f</b> 000 297	,		
Pad Elev Road Elev Road G	ration: ration:	0.0 feet 0.0 feet 0.0% -90.0 degree	ec.	L	ane Eq	vy Truck uivalen Auto m Truck	t Distan	004 ce (in .589 .386	Grade Adj	ustmen	t: 0.0
Right	View:	90.0 degree			Hea	vy Truck	ks: 43	405			
FHWA Noise Model Calc VehicleType REM	ulations MEL	Traffic Flow	Dis	stance	Finite	Road	Fresi	nel	Barrier Atte	en Be	rm Atten
Autos: Medium Trucks: Heavy Trucks:	66.51 77.72 82.99	-0.78 -12.37 -17.02		0.79 0.82 0.82	2	-1.20 -1.20 -1.20		-4.65 -4.87 -5.43	0.0	000 000 000	0.000 0.000 0.000
Unmitigated Noise Level			_								
	eak Hou			Leq Ev			Night		Ldn		NEL
Autos: Medium Trucks: Heavy Trucks:	65. 65.	0	63.6 63.6 64.1		61.8 57.7 59.0		56. 56.	9	65.0 64.8 65.6	3	65.5 65.6
Vehicle Noise:	70.		68.5		64.6		61.		69.9		70.2
Centerline Distance to N	oise Co	ntour (in feet	)							1	
			Ldn:	70 a	49	65	dBA 106	i	60 dBA 229		dBA 493
		C	NEL:		52		112	!	241		519

		D-77-108 HIGH									
Scenario						Project i			ruck		
	: Batavia St.					Job Ni	ımber:	13101			
Road Segment	. n/o Katelia	I AV.									
	PECIFIC IN	IPUT DATA							L INPUT	S	
Highway Data					Site Con	ditions (	Hard =	10, So	ft = 15)		
Average Daily T	raffic (Adt):	12,149 vehicle	es					Autos:	15		
Peak Hour P		9.40%				dium Tru			15		
	ur Volume:	1,142 vehicle	s		He	avy Truc	ks (3+ /	Axles):	15		
	icle Speed:	40 mph		1	Vehicle I	Wix					
Near/Far Lane	e Distance:	50 feet			Veh	icleType		Day	Evening	Night	Daily
Site Data						Α	utos:	75.5%	12.5%	12.0%	91.429
Barr	ier Height:	0.0 feet			M	edium Tri	ucks:	81.6%	5.3%	13.1%	6.359
Barrier Type (0-Wa	-	0.0			1	Heavy Tri	ucks:	79.9%	6.2%	14.0%	2.239
Centerline Dist		50.0 feet		1	Noise So	ource Ele	vation	s (in fe	et)		
Centerline Dist. to		50.0 feet		Ī		Autos		000	,		
Barrier Distance to		0.0 feet			Mediu	m Trucks	: 2.	297			
Observer Height (A	,	5.0 feet			Heav	y Trucks	: 8.	004	Grade Adj	iustment.	0.0
	d Elevation:	0.0 feet		H-			<b>D</b> : 4				
	l Elevation:	0.0 feet			Lane Eq	uivalent			eet)		
R	oad Grade:	0.0%				Autos		589			
	Left View:	-90.0 degre				m Trucks		386			
	Right View:	90.0 degre	es		Heav	y Trucks	: 43.	405			
FHWA Noise Model					1						
VehicleType	REMEL	Traffic Flow		stance		Road	Fresr		Barrier Att		m Atten
Autos:	66.51			0.7		-1.20		-4.65	0.0		0.00
Medium Trucks:	77.72			0.8		-1.20		-4.87		000	0.00
Heavy Trucks:	82.99			0.8		-1.20		-5.43	0.0	000	0.00
VehicleType L	<b>Levels (with</b> .ea Peak Hoi			er atten Leg E		Leg N	limbt		Ldn	-	NEL
Autos:	. ,	ii Leq Daj	63.2	Ley E	61.4	_	vigrit 56.5		64.6		VEL 65
Medium Trucks:		1.6	63.2		57.4		56.5		64.6		64
Heavy Trucks:	-	5.3	63.8		58.7		57.5	-	65.3		65.
Vehicle Noise:		9.8	68.2		64.3		61.6		69.6		69.
Centerline Distance	to Noise Co	ontour (in feet	)								
				70 0	iBA	65 a	ΙBΑ	6	0 dBA	55	dBA
			Ldn:				404		040	-	47
			Lan:		47		101		218		4/1

Friday, October 21, 2022

	FHWA-RI	D-77-108 HIGH\	VAY NO	DISE	PREDIC	TION M	ODEL	(9/12/2	021)		
Road Na	ario: OYC+P me: Batavia St. nent: n/o Katella					Project Job N		534 S 13101			
SITI Highway Data	SPECIFIC IN	IPUT DATA			ite Con	N ditions			L INPUT	s	
Average Dail Peak Hot Peak	y Traffic (Adt): ur Percentage: Hour Volume: /ehicle Speed:	13,205 vehicles 9.40% 1,241 vehicles 40 mph	5		Ме	dium Tru avy Truc	ucks (2	Autos Axles)	15 15		
Near/Far L	.ane Distance:	50 feet		F		icleType	T	Dav	Evening	Night	Dailv
Site Data  B Barrier Type (0-	arrier Height: Wall. 1-Berm):	0.0 feet 0.0				edium Tr Heavy Tr		75.5% 81.6% 79.9%	5.3%		6.35%
	Dist. to Barrier:	50.0 feet			laica Sa	ource Ele	ovatio	ne (in f	oot)		
Barrier Distanc Observer Heigh		50.0 feet 0.0 feet 5.0 feet 0.0 feet			Mediu	Autos m Trucks ry Trucks	s: ( s: 2	0.000 2.297 3.004	Grade Ad	ljustment	t: 0.0
R	oad Elevation:	0.0 feet			ane Eq	uivalent	Dista	nce (in	feet)		
	Road Grade: Left View: Right View:	0.0% -90.0 degree 90.0 degree				Autos m Trucks y Trucks	s: 40	3.589 3.386 3.405			
FHWA Noise Mo	del Calculation	s									
VehicleType	REMEL	Traffic Flow	Distar	псе	Finite	Road	Fres	snel	Barrier Att	ten Bei	rm Atten
Autos	s: 66.51	-0.78		0.79	)	-1.20		-4.65	0.	000	0.000
Medium Trucks Heavy Trucks				0.82		-1.20 -1.20		-4.87 -5.43		000 000	0.000
Unmitigated Noi	ea I avale (with	out Topo and h	arrior a	ottoni	(ation)						
VehicleType	Leg Peak Hou				ening	Lea	Night		Ldn	С	NEL
Autos			3.6		61.8		56	.8	65.		65.5
Medium Trucks	s: 65	5.0 6	3.6		57.7		56	.9	64.	8	65.0
Heavy Trucks	s: 65	5.7	i4.2		59.1		57	.9	65.	7	65.9
Vehicle Noise	e: 70	).1 6	8.6		64.7		62	.0	70.	0	70.3
Centerline Dista	nce to Noise C	ontour (in feet)									
				70 d		65 (	dBA		60 dBA		dBA
		_	.dn:		50		10		230		496
		CN	EL:		52		11	3	243	3	522

	FHWA-RI	D-77-108 HIGH	IWAY	NOISE	PREDIC	TION N	IODEL (	9/12/2	021)		
	io: E ne: Batavia St. nt: s/o Katella						Name: lumber:		ruck		
	SPECIFIC IN	IPUT DATA							L INPUT	S	
Highway Data					Site Con	ditions	(Hard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	9,676 vehicl	es					Autos:			
Peak Hour	Percentage:	9.40%					ucks (2 )	,			
Peak H	lour Volume:	910 vehicle	S		He	avy Tru	cks (3+ )	4xles):	15		
Ve	hicle Speed:	40 mph		l l	Vehicle i	Mix					
Near/Far La	ne Distance:	50 feet		ŀ	Veh	icleType		Day	Evening	Night	Daily
Site Data							Autos:	75.5%	12.5%	12.0%	91.47%
Ra	rrier Height:	0.0 feet			М	edium T	rucks:	81.6%	5.3%	13.1%	6.36%
Barrier Type (0-W		0.0			1	Heavy T	rucks:	79.9%	6.2%	14.0%	2.17%
Centerline Di		50.0 feet		-	Noise So	urco E	lovation	c (in f	not)		
Centerline Dist.	to Observer:	50.0 feet		H	NOISE SC	Auto		000	ei)		
Barrier Distance	to Observer:	0.0 feet			Modiu	m Truck		297			
Observer Height	(Above Pad):	5.0 feet				ry Truck		004	Grade Ad	iustman	- 00
P	ad Elevation:	0.0 feet		L						doumom	0.0
Ro	ad Elevation:	0.0 feet			Lane Eq	uivalen	t Distan	ce (in :	feet)		
	Road Grade:	0.0%				Auto		589			
	Left View:	-90.0 degre	es		Mediu	m Truck	s: 43.	386			
	Right View:	90.0 degre	es		Heav	ry Truck	s: 43.	405			
FHWA Noise Mod											
VehicleType	REMEL	Traffic Flow		stance		Road	Fresr	_	Barrier Att		rm Atten
Autos:	66.51			0.7	-	-1.20		-4.65		000	0.000
Medium Trucks:				0.8		-1.20		-4.87		000	0.000
Heavy Trucks:	82.99	-18.37		3.0	32	-1.20		-5.43	0.0	000	0.000
Unmitigated Noise											
VehicleType	Leq Peak Hou			Leq E	vening		Night		Ldn	_	NEL
Autos:	-	1.0	62.2		60.5		55.5	-	63.6	-	64.2
Medium Trucks:		3.6	62.2		56.4		55.5	-	63.	-	63.7
Heavy Trucks: Vehicle Noise:		1.2	62.7		57.6 63.3		56.4		64.1		64.5
					03.3		60.6	)	08.6	)	68.9
Centerline Distance	ce to Noise Co	ontour (in fee	)	70	dBA	65	dBA		50 dBA		dBA
			Ldn:	70	40	00	ава 86	4 - 7	186		401
		_	NEL:		40 42		91		186		401 422
		C	IVEL.		42		91		196		422

Road Nam	io: OYC ne: Batavia St. nt: s/o Katella	Av.				.,	t Name: lumber:		ruck		
	SPECIFIC IN	PUT DATA							L INPUT	S	
Highway Data					Site Con	ditions	(Hard =				
Average Daily	Traffic (Adt):	10,417 vehic	cles					Autos:	15		
Peak Hour	Percentage:	9.40%					ucks (2	,			
Peak H	lour Volume:	979 vehicl	es		He	avy Tru	cks (3+ )	Axles):	15		
Ve	hicle Speed:	40 mph		1	/ehicle	Mix					
Near/Far La	ne Distance:	50 feet			Veh	icleType		Day	Evening	Night	Daily
Site Data							Autos:	75.5%	12.5%	12.0%	91.47%
Rai	rrier Heiaht:	0.0 feet			М	edium T	rucks:	81.6%	5.3%	13.1%	6.36%
Barrier Type (0-W		0.0			- 1	Heavy T	rucks:	79.9%	6.2%	14.0%	2.17%
Centerline Dis		50.0 feet		١.	/-: O		4 !	- 0- 4-	-41		
Centerline Dist.	to Observer:	50.0 feet		- /	voise So		levation		et)		
Barrier Distance	to Observer:	0.0 feet				Auto	0.	.000			
Observer Height (	Above Pad):	5.0 feet				m Truck		.297	0	4 4	
Pa	ad Elevation:	0.0 feet			Heav	y Truck	s: 8.	.004	Grade Adj	ustment	0.0
Roa	ad Elevation:	0.0 feet		L	ane Eq	uivalen	t Distan	ce (in i	feet)		
1	Road Grade:	0.0%				Auto	s: 43	.589			
	Left View:	-90.0 degr	ees		Mediu	m Truck	s: 43	.386			
	Right View:	90.0 degr	ees		Heav	y Truck	s: 43	.405			
FHWA Noise Mode	el Calculations	s									
VehicleType	REMEL	Traffic Flow	Di	stance	Finite	Road	Fresi	nel	Barrier Atte	en Ber	m Atten
Autos:	66.51	-1.8	-	0.79	-	-1.20		-4.65	0.0		0.000
Medium Trucks:	77.72	-13.3	-	0.82	_	-1.20		-4.87	0.0		0.000
Heavy Trucks:	82.99	-18.0	4	0.82	2	-1.20		-5.43	0.0	000	0.000
Unmitigated Noise	Levels (with	out Topo an	d barri	er atten	uation)						
	Leq Peak Hou		,	Leg Ev			Night		Ldn		VEL
Autos:	64		62.6		60.8		55.	-	63.9		64.5
Medium Trucks:	64		62.5		56.7		55.	-	63.8		64.0
Heavy Trucks:	64		63.1		58.0		56.		64.6		64.8
Vehicle Noise:	69	.1	67.5		63.6		60.	9	68.9	)	69.2
Centerline Distanc	ce to Noise Co	ontour (in fee	et)								
				70 c	iBA	65	dBA		i0 dBA	55	dBA
			Ldn:		42		91		196		421
			Ldn: CNEL:		42 44		91 96		196 206		421 444

Scenario Road Name Road Segmen	e: Batavia St.						Name: lumber:	534 Str 13101	ruck		
SITE S	SPECIFIC IN	IPUT DATA					IOISE	MODE	L INPUT	S	
Highway Data					Site Con	ditions	(Hard :	= 10, So	ft = 15)		
Average Daily	Traffic (Adt):	9,975 vehicle	es					Autos:	15		
Peak Hour I	Percentage:	9.40%			Me	dium Tr	ucks (2	Axles):	15		
Peak Ho	our Volume:	938 vehicle	s		He	avy Tru	cks (3+	Axles):	15		
Vel	hicle Speed:	40 mph		١,	/ehicle	Miss					
Near/Far Lar	ne Distance:	50 feet		Ε'		icleType		Dav	Evening	Night	Dailv
Site Data					¥ C//		Autos:	75.5%		12.0%	. ,
		0.0 feet			М	edium T		81.6%		13.1%	
Barrier Type (0-Wi	rier Height:	0.0 feet				Heavy T	rucks:	79.9%	6.2%	14.0%	
Centerline Dis	. ,	50.0 feet		L							
Centerline Dist. 1		50.0 feet		1	Voise S	ource El		ns (in fe	et)		
Barrier Distance t		0.0 feet				Auto		.000			
Observer Height (		5.0 feet				m Truck		.297			
	d Elevation:	0.0 feet			Hear	y Truck	s: 8	1.004	Grade Ad	iustment.	0.0
	d Elevation:	0.0 feet		1	ane Eq	uivalen	t Distar	ice (in f	eet)		
F	Road Grade:	0.0%				Auto	s: 43	3.589	,		
	Left View:	-90.0 degre	es		Mediu	m Truck	s: 43	3.386			
	Right View:	90.0 degre			Heav	y Truck	s: 43	3.405			
FHWA Noise Mode	l Calculation	s									
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite	Road	Fres	nel	Barrier Att	en Ber	m Atten
Autos:	66.51	-2.06		0.79	9	-1.20		-4.65	0.0	000	0.00
Medium Trucks:	77.72	-13.53		0.8	2	-1.20		-4.87	0.0	000	0.00
Heavy Trucks:	82.99	-16.12		0.82	2	-1.20		-5.43	0.0	000	0.00
Unmitigated Noise	Levels (with	out Topo and	barri	er atten	uation)						
VehicleType	Leq Peak Ho	ur Leq Day	/	Leg E	ening/	Leq	Night		Ldn	CI	VEL
Autos:	-	1.0	62.3		60.5		55		63.7		64.
Medium Trucks:		3.8	62.4		56.6		55		63.6	-	63
Heavy Trucks:		3.5	65.0		59.9		58		66.5		66
Vehicle Noise:	69	9.7	68.2		64.1		61	.7	69.6	6	69
Centerline Distanc	e to Noise C	ontour (in feet	)	70	1D.4		-/D.4		-O -ID 4		-/0.4
			, L	70 c		65	dBA		i0 dBA		dBA
		_	Ldn:		47		10		218		47
			NEL:		49		10	b	229		49:

Friday, October 21, 2022

FHWA-R	D-77-108 HIGH	IWAY N	IOISE	PREDIC	TION MO	DDEL (	/12/2	021)		
Scenario: OYC+P Road Name: Batavia St Road Segment: s/o Katella					Project I Job Nu			ruck		
SITE SPECIFIC I	NPUT DATA							L INPUTS	}	
Highway Data				Site Con	ditions (	Hard =	10, Sc	oft = 15)		
Average Daily Traffic (Adt):	10,716 vehicl	es				,	Autos:	15		
Peak Hour Percentage:	9.40%			Me	dium Tru	cks (2 A	xles):	15		
Peak Hour Volume:	1,007 vehicle	s		He	avy Truci	ks (3+ A	xles):	15		
Vehicle Speed:	40 mph		,	/ehicle l	Miv					
Near/Far Lane Distance:	50 feet				icleType		Dav	Evening	Night	Daily
Site Data							75.5%	-	12.0%	
Barrier Height:	0.0 feet			Me	edium Tru	icks:	81.6%	5.3%	13.1%	6.41%
Barrier Type (0-Wall, 1-Berm):	0.0 feet			F	leavy Tru	icks:	79.9%	6.2%	14.0%	3,44%
Centerline Dist. to Barrier:	50.0 feet		-							
Centerline Dist. to Observer:	50.0 feet		,	Voise Sc	ource Ele			eet)		
Barrier Distance to Observer:	0.0 feet				Autos	0.0	000			
Observer Height (Above Pad):	5.0 feet				m Trucks		297			
Pad Flevation:	0.0 feet			Heav	y Trucks	8.0	004	Grade Adju	ustment	0.0
Road Elevation:	0.0 feet		L	ane Eq	uivalent	Distanc	e (in	feet)		
Road Grade:	0.0%				Autos			,		
Left View:	-90.0 deare	00		Mediu	m Trucks	43.	386			
Right View:	90.0 degre			Heav	y Trucks					
THWA Noise Model Calculation VehicleType REMEL	Traffic Flow	Dista		Finite	Dood	Fresn	0/	Barrier Atte	n Bor	m Atten
VehicleType REMEL  Autos: 66.5			0.79		-1.20		-4.65	0.0		0.000
Medium Trucks: 77.72			0.73	-	-1.20		-4.87	0.0		0.000
Heavy Trucks: 82.99			0.82	_	-1.20		-5.43	0.0		0.000
					1.20		0.70	0.0		0.00
Inmitigated Noise Levels (with VehicleType Leg Peak Ho			Leg Ev		Leg N	liaht		Ldn	0	VFL
	4.4	62.6	LCY LV	60.8	Logi	55.9		64.0	0,	64.5
	4.1	62.7		56.9		56.0		64.0		64.3
	6.7	65.2		60.1		58.9		66.7		66.9
	0.0	68.4		64.3		61.9		69.8		70.2
Centerline Distance to Noise C	ontour (in fee	1)								
contormed Distance to Noise C	(III 166)	,		1						
			70 a	iBA	65 d	BA	. 6	60 dBA	55	dBA
		Ldn:	70 d	<i>IBA</i> 49	65 d	<i>BA</i> 105		50 dBA 227	55	<i>dBA</i> 489

	FHWA-RI	D-77-108 HIGH	WAY	NOISI	E PREDIC	TION M	ODEL (9	9/12/20	021)		
	rio: E ne: Batavia St. ent: s/o Struck						Name: 5 umber: 1		uck		
	SPECIFIC IN	IPUT DATA							L INPUT	s	
Highway Data					Site Con	ditions	(Hard =	10, So	ft = 15)		
Average Daily	Traffic (Adt):	10,892 vehicle	es				,	Autos:	15		
Peak Hour	Percentage:	9.40%					ucks (2 A	,	15		
Peak F	Hour Volume:	1,024 vehicle	S		He	avy Truc	cks (3+ A	(xles	15		
Ve	ehicle Speed:	40 mph			Vehicle	Mix					
Near/Far La	ane Distance:	50 feet				icleType		Day	Evening	Night	Daily
Site Data							Autos:	75.5%	12.5%	12.09	6 91.47%
Ra	rrier Heiaht:	0.0 feet			М	edium Ti	rucks:	81.6%	5.3%	13.19	6.36%
Barrier Type (0-V		0.0			1	Heavy Ti	rucks:	79.9%	6.2%	14.09	6 2.17%
Centerline Di	ist. to Barrier:	50.0 feet			Noise So	ource Fl	evations	in fe	et)		
Centerline Dist.	to Observer:	50.0 feet				Auto:		000			
Barrier Distance	to Observer:	0.0 feet			Mediu	m Truck		97			
Observer Height	(Above Pad):	5.0 feet				vy Truck		004	Grade Ad	iustmar	t: 0.0
P	ad Elevation:	0.0 feet			rical	ry ITUCK	3. 0.0	J04	Orace Au	usunci	12. 0.0
Ro	ad Elevation:	0.0 feet			Lane Eq	uivalent	Distanc	e (in f	eet)		
	Road Grade:	0.0%				Auto	s: 43.5	589			
	Left View:	-90.0 degre	es		Mediu	m Truck	s: 43.0	386			
	Right View:	90.0 degre	es		Heav	y Truck	s: 43.4	405			
FHWA Noise Mod	lel Calculation	s									
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite	Road	Fresn	el	Barrier Att	en Be	erm Atten
Autos:	66.51	-1.61		0.	79	-1.20		-4.65	0.0	000	0.000
Medium Trucks:	77.72	-13.19		0.8	82	-1.20		-4.87	0.0	000	0.000
Heavy Trucks:	82.99	-17.85		0.	82	-1.20		-5.43	0.0	000	0.000
Unmitigated Nois	e Levels (with	out Topo and	barri	er atte	nuation)						
VehicleType	Leq Peak Hou	ur Leq Day	/	Leq E	vening	Leq	Night		Ldn	(	CNEL
Autos:	-	1.5	62.7		61.0		56.0		64.1		64.7
Medium Trucks:	-	l.1	62.7		56.9		56.0		64.0	-	64.2
Heavy Trucks:		1.8	63.3		58.2		56.9		64.8		65.0
Vehicle Noise:	69	0.2	67.7		63.8		61.1		69.1	1	69.4
Centerline Distan	ce to Noise Co	ontour (in feet	)								
			L	70	dBA	65	dBA	6	0 dBA	5	5 dBA
			Ldn:		43		94		202		434
	CNEL:				46 98 212				457		

		-77-108 HIGH	M/AII	NOISE	TREDIC			•			
	io: OYC						Name:		ruck		
	e: Batavia St.					JOD IN	lumber:	13101			
Road Segmen	nt: s/o Struck A	iV.									
	SPECIFIC IN	PUT DATA							L INPUT	S	
Highway Data					Site Con	ditions	(Hard =	= 10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	11,648 vehicle	es					Autos:	15		
Peak Hour	Percentage:	9.40%			Me	edium Tr	ucks (2	Axles):	15		
Peak H	lour Volume:	1,095 vehicle	s		He	eavy Tru	cks (3+	Axles):	15		
	hicle Speed:	40 mph		١	/ehicle	Mix					
Near/Far La	ne Distance:	50 feet		F	Veh	icleType	•	Day	Evening	Night	Daily
Site Data							Autos:	75.5%	12.5%	12.0%	91.47%
Bai	rrier Height:	0.0 feet			М	edium T	rucks:	81.6%	5.3%	13.1%	6.36%
Barrier Type (0-W		0.0				Heavy T	rucks:	79.9%	6.2%	14.0%	2.17%
Centerline Dis	st. to Barrier:	50.0 feet		,	Voise S	ource F	levation	ns (in fe	oet)		
Centerline Dist.	to Observer:	50.0 feet		ŕ	10/36 01	Auto		.000			
Barrier Distance	to Observer:	0.0 feet			Modiu	m Truck	0	.297			
Observer Height (	(Above Pad):	5.0 feet				vv Truck		.004	Grade Ad	iustment	. 0 0
Pá	ad Elevation:	0.0 feet		L		,					
Roa	ad Elevation:	0.0 feet		I	Lane Eq	uivalen	t Distan	ice (in i	feet)		
I	Road Grade:	0.0%				Auto		.589			
	Left View:	-90.0 degree	es			m Truck		.386			
	Right View:	90.0 degree	es		Hea	vy Truck	s: 43	.405			
FHWA Noise Mode	el Calculations	;									
VehicleType	REMEL	Traffic Flow	Di	stance	Finite	Road	Fres	nel	Barrier Att	en Bei	m Atten
Autos:	66.51	-1.32		0.79	9	-1.20		-4.65	0.0	000	0.00
Medium Trucks:	77.72	-12.90		0.82	2	-1.20		-4.87	0.0	000	0.00
Heavy Trucks:	82.99	-17.56		0.82	2	-1.20		-5.43	0.0	000	0.00
Unmitigated Noise	e Levels (witho	out Topo and	barri	er atten	uation)						
VehicleType	Leq Peak Hou	r Leq Day	/	Leq Ev	/ening	Leq	Night		Ldn	C	NEL
Autos:	64.	8	63.0		61.3		56.	.3	64.4	1	65.0
Medium Trucks:	64.	4	63.0		57.2		56.	.3	64.3	3	64.
Heavy Trucks:	65.	-	63.6		58.5		57.		65.1		65.3
Vehicle Noise:	69.	5	68.0		64.1		61.	4	69.4	1	69.
Centerline Distanc	ce to Noise Co	ntour (in feet	)					_			
			Į	70 c		65	dBA		60 dBA		dBA
			Ldn:		45		98	-	211		454
		C	NEL:		48		103	3	222		478

0 :	E-D					<b>a</b> : ,		504.01			
Scenario	o: E+P e: Batavia St.						Name: : umber:		ruck		
Road Name Road Segmen						JOD N	umber:	13101			
	SPECIFIC IN	IPUT DATA			ite Con				L INPUT	S	
Highway Data				3	ite Con	aitions					
Average Daily	. ,	10,923 vehicle	es					Autos:	15		
	Percentage:	9.40%					ıcks (2 /	,	15		
Peak He	our Volume:	1,027 vehicle	s		He	avy Truc	ks (3+ )	(xles	15		
	hicle Speed:	40 mph		V	ehicle N	/lix					
Near/Far Lar	ne Distance:	50 feet			Vehi	cleType		Day	Evening	Night	Daily
Site Data						- A	lutos:	75.5%		12.0%	91.41
Bar	rier Heiaht:	0.0 feet			Ме	edium Ti	ucks:	81.6%	5.3%	13.1%	6.35
Barrier Type (0-Wa		0.0			F	leavy Ti	ucks:	79.9%	6.2%	14.0%	2.24
Centerline Dis	t. to Barrier:	50.0 feet		M	oise So	urco El	ovation	c (in fe	not)		
Centerline Dist. t	to Observer:	50.0 feet		/*	oise so	Auto:		000	ei)		
Barrier Distance t	o Observer:	0.0 feet			Madius	n Truck:		297			
Observer Height (A	Above Pad):	5.0 feet				v Truck:		004	Grade Ad	iustmant	. 0 0
Pa	d Elevation:	0.0 feet		L	ricav	y IIIUCK	s. o.	JU4	Orauc Au	ustriciit	0.0
Roa	d Elevation:	0.0 feet		Li	ane Equ	ıivalent	Distan	ce (in i	eet)		
F	Road Grade:	0.0%				Auto	3: 43.	589			
	Left View:	-90.0 degree	es		Mediur	n Trucks	3: 43.	386			
	Right View:	90.0 degree	es		Heav	y Trucks	3: 43.	405			
FHWA Noise Mode	l Calculation	s									
Vehicle Type	REMEL	Traffic Flow	Distar	псе	Finite	Road	Fresr	el	Barrier Att	en Bei	m Atter
Autos:	66.51	-1.60		0.79		-1.20		-4.65	0.0	000	0.00
Medium Trucks:	77.72	-13.18		0.82		-1.20		-4.87	0.0	000	0.00
Heavy Trucks:	82.99	-17.72		0.82		-1.20		-5.43	0.0	000	0.00
Unmitigated Noise	Levels (with	out Topo and	barrier a	attenu	ation)						
VehicleType	Leq Peak Hou	ır Leq Day	/ L	eq Eve	ening	Leq	Night		Ldn	C	NEL
Autos:	64	.5	62.8		61.0		56.0	)	64.2	2	64
Medium Trucks:	64	.2	62.7		56.9		56.0	)	64.0	)	64
Heavy Trucks:	64	.9	63.4		58.3		57.		64.9	9	65
Vehicle Noise:	69	.3	67.7		63.8		61.2	2	69.	1	69
	e to Noise Co	ontour (in feet	)								
Centerline Distanc				70 dl	24	65	1BA	6	i0 dBA	55	dBA
Centerline Distanc			L	70 01	JA	- 00					
Centerline Distanc			Ldn:	70 01	44	001	94		203		43

Friday, October 21, 2022

	FHWA-RD	-77-108 HIGH	WAY	NOISE	PREDIC	TION M	DDEL (	9/12/2	021)		
Road Name	o: OYC+P e: Batavia St. nt: s/o Struck A	v.				Project i Job Nu			ruck		
	SPECIFIC IN	PUT DATA							L INPUT	s	
Highway Data					Site Con	ditions (	Hard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	11,679 vehicle	es					Autos:	15		
Peak Hour I	Percentage:	9.40%				dium Tru					
Peak Ho	our Volume:	1,098 vehicles	3		He	avy Truc	ks (3+ .	Axles):	15		
Vel	hicle Speed:	40 mph		-	Vehicle I	Miv					
Near/Far Lar	ne Distance:	50 feet		-		cleType		Dav	Evening	Night	Daily
Site Data						A	utos:	75.5%	12.5%	12.0%	91.42%
Par	rier Heiaht:	0.0 feet			Me	edium Tr	ıcks:	81.6%	5.3%	13.1%	6.35%
Barrier Type (0-Wa		0.0			F	leavy Tri	ıcks:	79.9%	6.2%	14.0%	2.23%
Centerline Dis	. ,	50.0 feet					4.				
Centerline Dist. t		50.0 feet		1	Noise Sc				eet)		
Barrier Distance t		0.0 feet				Autos		000			
Observer Height (	Above Pad):	5.0 feet				n Trucks		297			
	d Elevation:	0.0 feet			Heav	y Trucks	: 8.	004	Grade Ad	justmeni	. 0.0
Roa	d Elevation:	0.0 feet		1	Lane Eq	uivalent	Distan	ce (in	feet)		
F	Road Grade:	0.0%				Autos	: 43	589			
	Left View:	-90.0 degree	es		Mediui	n Trucks	43	386			
	Right View:	90.0 degree	es		Heav	y Trucks	43	405			
FHWA Noise Mode	l Calculations	1									
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite	Road	Fresi	nel	Barrier Att	en Bei	m Atten
Autos:	66.51	-1.31		0.7	-	-1.20		-4.65		000	0.000
Medium Trucks:	77.72	-12.89		0.8	-	-1.20		-4.87		000	0.000
Heavy Trucks:	82.99	-17.43		0.8	2	-1.20		-5.43	0.0	000	0.000
Unmitigated Noise	Levels (witho	ut Topo and	barrie	r atten	uation)						
VehicleType	Leq Peak Hou	r Leq Day		Leq E	vening	Leq N	light		Ldn	С	NEL
Autos:	64.	8	63.0		61.3		56.	3	64.4	4	65.0
Medium Trucks:	64.	-	63.0		57.2		56.	-	64.3	-	64.
Heavy Trucks:	65.		63.7		58.6		57.		65.2		65.4
Vehicle Noise:	69.	6	68.0		64.1		61.	5	69.4	4	69.8
Centerline Distanc	e to Noise Co	ntour (in feet)	)								
				70	dBA	65 a			60 dBA		dBA
			Ldn:		46		99		212	!	458
		CI	VEL:		48		104		224		482

	FHWA-RI	D-77-108 HIGH	IWAY	NOISE	PREDIC	TION N	IODEL (	9/12/2	021)		
	io: E ne: Katella Av. nt: w/o Main S	t.					Name: : lumber:		ruck		
	SPECIFIC IN	IPUT DATA							L INPUT	s	
Highway Data					Site Con	ditions	(Hard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	24,088 vehicl	es					Autos:	15		
Peak Hour	Percentage:	9.40%			Me	dium Tr	ucks (2 /	Axles):	15		
Peak H	lour Volume:	2,264 vehicle	s		He	avy Tru	cks (3+ A	Axles):	15		
Ve	hicle Speed:	40 mph		F	Vehicle i	Miv					
Near/Far La	ne Distance:	74 feet		ŀ		icleType		Day	Evening	Night	Daily
Site Data							Autos:	75.5%		12.0%	91.47%
Ra	rrier Height:	0.0 feet			М	edium T	rucks:	81.6%	5.3%	13.1%	6.36%
Barrier Type (0-W		0.0				Heavy T	rucks:	79.9%	6.2%	14.0%	2.17%
Centerline Di	st. to Barrier:	67.0 feet		ŀ	Noise So	urce F	evation	e (in fa	not)		
Centerline Dist.	to Observer:	67.0 feet		F	110/36 00	Auto		000			
Barrier Distance	to Observer:	0.0 feet			Mediu	m Truck		297			
Observer Height	(Above Pad):	5.0 feet				ry Truck		004	Grade Ad	iustmen	t· 0.0
P	ad Elevation:	0.0 feet		L						140411011	0.0
Ro	ad Elevation:	0.0 feet		L	Lane Eq	uivalen	Distant	ce (in i	feet)		
	Road Grade:	0.0%				Auto		080			
	Left View:	-90.0 degre	es		Mediu	m Truck	s: 55.	922			
	Right View:	90.0 degre	es		Heav	ry Truck	s: 55.	938			
FHWA Noise Mod	el Calculation	s									
VehicleType	REMEL	Traffic Flow		stance		Road	Fresn	_	Barrier Att		rm Atten
Autos:	66.51			-0.8	-	-1.20		-4.71		000	0.000
Medium Trucks:				-0.8		-1.20		-4.88		000	0.000
Heavy Trucks:	82.99	-14.40	1	-0.8	33	-1.20		-5.29	0.0	000	0.000
Unmitigated Noise			barri	er atter	nuation)			,		,	
VehicleType	Leq Peak Hou			Leq E	vening		Night		Ldn	_	NEL
Autos:		3.3	64.6		62.8		57.8	-	65.9	-	66.5
Medium Trucks:		5.9	64.5		58.7		57.8	-	65.8	-	66.0
Heavy Trucks:		3.6	65.1		60.0		58.7		66.6		66.8
Vehicle Noise:	71	.0	69.5		65.6		62.9	9	70.9	9	71.2
Centerline Distand	ce to Noise Co	ontour (in fee	t)							,	
			Ţ	70	dBA	65	dBA		60 dBA		dBA
			Ldn:		77		165		356		767
		С	NEL:		81		174		375		807

<u> </u>	01/0							5045			
Scenario								534 St			
Road Name Road Segmen	e: Katella Av.					JOD IN	umber:	13101			
Road Seymen	t. W/O IVIAIII S	t.									
	PECIFIC IN	IPUT D	ATA		0:4- 0				L INPUT	5	
Highway Data					Site Con	aitions	(Hara				
Average Daily 1	. ,	.,	vehicles					Autos:			
Peak Hour F		9.40%				dium Tr		,			
	our Volume:	2,375 v	ehicles		He	avy Tru	cks (3+	Axles).	15		
	icle Speed:	40 n		t	Vehicle	Mix					
Near/Far Lan	e Distance:	74 f	eet	f	Veh	icleType	,	Day	Evening	Night	Daily
Site Data							Autos:	75.5%	6 12.5%	12.0%	91.479
Barı	rier Heiaht:	0.0	feet		М	edium T	rucks:	81.6%	5.3%	13.1%	6.36%
Barrier Type (0-Wa		0.0				Heavy T	rucks:	79.9%	6.2%	14.0%	2.179
Centerline Dis	t. to Barrier:	67.0	feet	ŀ	Noise S	ource E	evatio	ns (in f	eet)		
Centerline Dist. t	o Observer:	67.0	feet	İ		Auto		0.000	,		
Barrier Distance t	o Observer:	0.0	feet		Mediu	m Truck		2.297			
Observer Height (A	Above Pad):	5.0	feet			vy Truck	· -	3.004	Grade Ad	ustment	0.0
Pa	d Elevation:	0.0	feet	L		•					
Roa	d Elevation:	0.0	feet		Lane Eq				feet)		
R	Road Grade:	0.0%				Auto		080.8			
	Left View:	-90.0	degrees			m Truck	00	5.922			
	Right View:	90.0	degrees		Hea	y Truck	s: 55	5.938			
FHWA Noise Mode	l Calculation	s									
VehicleType	REMEL	Traffic	Flow D	Distance	Finite	Road	Fres	inel	Barrier Att	en Ber	m Atten
Autos:	66.51		2.04	-0.8	35	-1.20		-4.71	0.0	000	0.00
Medium Trucks:	77.72		-9.54	-0.8	33	-1.20		-4.88	0.0	000	0.00
Heavy Trucks:	82.99		-14.20	-0.8	33	-1.20		-5.29	0.0	000	0.00
Unmitigated Noise	Levels (with	out Top	o and bar	rier attei	nuation)						
VehicleType I	Leq Peak Hou	ır Le	eq Day	Leq E	vening	Leq	Night		Ldn	C	NEL
Autos:	66	6.5	64.8	3	63.0		58	.0	66.2	2	66.
Medium Trucks:	66	5.1	64.7	7	58.9		58	.0	66.0	)	66.
Heavy Trucks:		8.8	65.3		60.2		58		66.8		67.
Vehicle Noise:	71	.2	69.7	7	65.8		63	.1	71.1		71.
Centerline Distanc	e to Noise C	ontour (i	in feet)								
					dBA	65	dBA		60 dBA	55	dBA
			Ldn	1.	79		17	1	367		792
			CNEL		83		18		387		833

		D-77-108 HIGH		HOIOL I							
Scenari						Project			ruck		
	e: Katella Av.					Job Ni	umber:	13101			
Road Segmer	n: w/o Main S	t.									
	SPECIFIC IN	IPUT DATA							L INPUT	S	
Highway Data				3	nte Con	ditions (	_				
Average Daily		24,268 vehicl	es					Autos:	15		
	Percentage:	9.40%				dium Tru		,			
	our Volume:	2,281 vehicle	S		He	avy Truc	ks (3+ )	Axles):	15		
	hicle Speed:	40 mph		ν	ehicle	Mix					
Near/Far Lai	ne Distance:	74 feet			Veh	icleType		Day	Evening	Night	Daily
Site Data						A	utos:	75.5%	12.5%	12.0%	91.069
Rar	rier Height:	0.0 feet			М	edium Tr	ucks:	81.6%	5.3%	13.1%	6.38%
Barrier Type (0-W	-	0.0				Heavy Tr	ucks:	79.9%	6.2%	14.0%	2.569
Centerline Dis	. ,	67.0 feet		-							
Centerline Dist.		67.0 feet		N	oise S	ource Ele			eet)		
Barrier Distance	to Observer:	0.0 feet				Autos		000			
Observer Height (		5.0 feet				m Trucks		297			
	ad Elevation:	0.0 feet			Heav	y Trucks	: 8.	004	Grade Ad	justment	0.0
Roa	ad Elevation:	0.0 feet		L	ane Eq	uivalent	Distan	ce (in i	feet)		
F	Road Grade:	0.0%				Autos	: 56.	080			
	Left View:	-90.0 degre	es		Mediu	m Trucks	: 55.	922			
	Right View:	90.0 degre	es		Hear	y Trucks	: 55.	938			
FHWA Noise Mode	el Calculation	s									
VehicleType	REMEL	Traffic Flow	Dist	tance	Finite	Road	Fresr	nel	Barrier Att	en Ber	m Atten
Autos:	66.51	1.85		-0.85		-1.20		-4.71	0.0	000	0.00
Medium Trucks:	77.72	-9.70		-0.83		-1.20		-4.88	0.0	000	0.00
Heavy Trucks:	82.99	-13.66		-0.83		-1.20		-5.29	0.0	000	0.00
Unmitigated Noise			barrie	r attenu	ıation)						
	Leq Peak Hot			Leq Ev		Leq I	_		Ldn		NEL
Autos:		3.3	64.6		62.8		57.8	-	66.0	-	66.
Medium Trucks:		3.0	64.6		58.7		57.9	-	65.	-	66.
Heavy Trucks:		7.3	65.8		60.7		59.5		67.3	-	67.
Vehicle Noise:	71	1.3	69.8		65.8		63.2	2	71.:	2	71.
		ontour (in fee	t)						-		
Centerline Distanc	e to Noise C	ontour (mr root		70 "	D 4						
Centerline Distanc	e to Noise C	omour (mroo		70 di		65 (			0 dBA		dBA
Centerline Distanc	e to Noise C		Ldn:	70 di	80 85	65 (	1BA 173 182		373 392	1	dBA 804 845

Friday, October 21, 2022

	FHWA-RE	0-77-108 HIGH	WAY	NOISE	PREDIC	TION M	ODEL	(9/12/2	(021)		
Road Nam	io: OYC+P ne: Katella Av. nt: w/o Main Si	t.				Project Job N		534 S 13101			
SITE Highway Data	SPECIFIC IN	PUT DATA			Site Con				L INPUT	s	
	T # - (A-#).	05 440	_		Site Con	uilions	(паги	Autos			
Average Daily	Percentage:	25,449 vehicle 9.40%	!S		Mo	dium Tru	icks (2				
	four Volume:	2.392 vehicles				avy Truc					
	hicle Speed:	40 mph	,				, ro	ANICO	. 10		
	ne Distance:	74 feet			Vehicle I						
	ne Distance.	74 1001			Veh	icleType		Day	Evening	Night	Daily
Site Data							lutos:	75.59		12.0%	
Bai	rrier Height:	0.0 feet				edium Ti		81.69		13.1%	
Barrier Type (0-W	/all, 1-Berm):	0.0			F	Heavy Ti	rucks:	79.99	6.2%	14.0%	2.54%
Centerline Di		67.0 feet		ı	Noise Sc	ource El	evatio	ns (in t	eet)		
Centerline Dist.		67.0 feet		ı		Auto		0.000	,		
Barrier Distance				Medium Trucks: 2.297							
Observer Height (	,	5.0 feet			Heav	y Trucks	s: 8	3.004	Grade Ad	justment	0.0
	ad Elevation:	0.0 feet				•					
	ad Elevation:	0.0 feet		- 1	Lane Eq				feet)		
	Road Grade:	0.0%				Auto		080.6			
	Left View:	-90.0 degree				m Trucks	- 00	5.922			
	Right View:	90.0 degree	:S		Heav	y Truck:	s: 55	5.938			
FHWA Noise Mode											
VehicleType	REMEL	Traffic Flow	Dist	ance	Finite		Fres		Barrier Att		m Atten
Autos:	66.51	2.06		-0.8		-1.20		-4.71		000	0.000
Medium Trucks:	77.72	-9.49		-0.8		-1.20		-4.88		000	0.000
Heavy Trucks:	82.99	-13.49		-0.8		-1.20		-5.29	0.0	000	0.000
Unmitigated Noise VehicleType	Leg Peak Hou					100	Night	_	Ldn		NFL.
Venicie i ype Autos:	Leq Peak Hou		64.8	Ley E	Evening 63.0	Leq	ivignt 58	0	Lan 66.1		NEL 66.7
Medium Trucks:	66		64.8		59.0		58		66.		66.3
Heavy Trucks:	67		66.0		60.9		59		67.	-	67.7
Vehicle Noise:	71		70.0		66.0		63		71.4		71.7
Centerline Distanc	ce to Noise Co	ntour (in feet)									
			T	70	dBA	65	dBA		60 dBA		dBA
			Ldn:		83		17	8	384	1	828
		CI	VEL:		87		18	8	404		871

	FHWA-R	D-77-108 HIGH	WAY N	IOISE	PREDIC	TION N	IODEL	(9/12/2	021)		
	io: E ne: Katella Av. nt: e/o Main S						! Name: lumber:		ruck		
SITE :	SPECIFIC II	NPUT DATA			Site Con				L INPUT	S	
	Troffic (Adt):	28,483 vehicle			one con	unions	(mara	Autos:			
Average Daily	Percentage:	9.40%	35		Ma	dium Tr	ucks (2				
	lour Volume:	2.677 vehicle				avy Tru					
	hicle Speed:	40 mph	5		110	avy IIu	CAS (ST	Axies).	10		
	ne Distance:	74 feet		Ľ	Vehicle I	Vlix					
Near/Far La	ne Distance:	74 feet			Veh	icleType	9	Day	Evening	Night	
Site Data							Autos:	75.5%	12.5%	12.0	% 91.47%
Bai	rrier Height:	0.0 feet			М	edium T	rucks:	81.6%	5.3%	13.1	% 6.36%
Barrier Type (0-W	/all, 1-Berm):	0.0				Heavy T	rucks:	79.9%	6.2%	14.0	% 2.17%
Centerline Di	st. to Barrier:	67.0 feet			Noise So	E	loventio	na (in f	2041		
Centerline Dist.	to Observer:	67.0 feet		Ľ	worse so	Auto		0.000	et)		
Barrier Distance	to Observer:	0.0 feet			Modiu	m Truck		2.297			
Observer Height (	(Above Pad):	5.0 feet				y Truck		3.004	Grade Ad	liuctma	nt: 0.0
Pa	ad Elevation:	0.0 feet			пеан	ry IIIUCK	.s. c	5.004	Grade At	ijusune	т. 0.0
Roa	ad Elevation:	0.0 feet		1	Lane Eq	uivalen	t Distar	nce (in	feet)		
	Road Grade:	0.0%				Auto	s: 56	080.6			
	Left View:	-90.0 degree	es		Mediu	m Truck	s: 55	5.922			
	Right View:	90.0 degree	es		Heav	ry Truck	s: 55	5.938			
FHWA Noise Mode	el Calculation	ıs									
VehicleType	REMEL	Traffic Flow	Dista	ance		Road	Fres	inel	Barrier At	ten B	erm Atten
Autos:	66.51			-0.8	5	-1.20		-4.71	0.	000	0.000
Medium Trucks:	77.72	-9.02		-0.8	3	-1.20		-4.88	0.	000	0.000
Heavy Trucks:	82.99	-13.68		-0.8	3	-1.20		-5.29	0.	000	0.000
<b>Unmitigated Noise</b>	e Levels (with	out Topo and	barrier	atten	uation)						
VehicleType	Leq Peak Ho	ur Leq Day		Leq E	vening	Leq	Night		Ldn		CNEL
Autos:	67	7.0	65.3		63.5		58	.5	66.	7	67.2
Medium Trucks:	66	5.7	65.3		59.4		58	.6	66.	5	66.7
Heavy Trucks:	67	7.3	65.8		60.7		59	.5	67.	3	67.5
Vehicle Noise:	71	1.8	70.2		66.3		63	.6	71.	6	71.9
Centerline Distance	ce to Noise C	ontour (in feet	)								
				70 0	dBA	65	dBA	(	60 dBA	5	55 dBA
			Ldn:		86		18	5	398	3	857
		C	VEL:		90		19	4	419	9	902

FHV	VA-RD-7	77-108 HIGH	WAY	NOISE	PREDIC	CTION	MODEL (	9/12/20	)21)						
Scenario: OYC Road Name: Katell Road Segment: e/o M							t Name: lumber:		uck						
SITE SPECIF	IC INP	UT DATA							L INPUTS	3					
Average Daily Traffic (A Peak Hour Percent	,	9,870 vehicle 9.40%	es				(Hard =	Autos:	15 15 15						
Peak Hour Volu		,808 vehicles	3		He	eavy Tru	icks (3+ A	Axles):	15						
Vehicle Spe Near/Far Lane Dista		40 mph 74 feet			Vehicle Veh	Mix icleTvp	۵ .	Dav	Evening	Night	Daily				
Site Data							Autos:	75.5%	12.5%	12.0%	91.47%				
Barrier Hei Barrier Type (0-Wall, 1-Be	rm):	0.0 feet 0.0				edium 1 Heavy 1		81.6% 79.9%		13.1% 14.0%					
Centerline Dist. to Bar		67.0 feet		1	Voise S	ource E	levation	s (in fe	et)						
Barrier Distance to Obser Observer Height (Above F Pad Eleva	Centerline Dist. to Observer: 67.0 feet Barrier Distance to Observer: 0.0 feet bserver Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet						Autos: 0,000 Medium Trucks: 2.297 Heavy Trucks: 8,004 Grade Adjustment: 0.0  Lane Equivalent Distance (in feet)								
				Ľ.	_arre Eq	Auto		080	eei)						
Road Gri Left V Right V	iew:	0.0% -90.0 degree 90.0 degree				m Truck vy Truck	s: 55.	922 938							
FHWA Noise Model Calcul															
VehicleType REMI	EL 7 66.51	raffic Flow	Dis	tance -0.8		Road -1.20	Fresr	-4.71	Barrier Atte		m Atten				
	77.72	-8.81		-0.8	-	-1.20		-4.71 -4.88	0.0		0.000				
Heavy Trucks:	82.99	-13.47		-0.8	3	-1.20		-5.29	0.0	00	0.000				
Unmitigated Noise Levels	<u> </u>														
VehicleType Leq Pea		Leq Day	_	Leq E			Night		Ldn		NEL				
Autos:	67.2		65.5		63.7		58.8		66.9		67.4				
Medium Trucks:	66.9		65.5		59.6		58.8		66.7		66.9				
Heavy Trucks: Vehicle Noise:	67.5 72.0		66.0 70.4		60.9		59.7 63.9		67.5 71.8		67.7 72.1				
Centerline Distance to No.								-							
		,		70 (	iBA	65	dBA	6	0 dBA	55	dBA				
			Ldn:		88		191		411		885				
		CI	VEL:		93		201		432		931				

		D-77-108 HIG	/		TALDIC			`			
Scenario Road Name	o: E+P e: Katella Av.					Project	Name: umber:		ruck		
Road Segmen						00071	u	10101			
	PECIFIC II	NPUT DATA			0:: 0				L INPUT	s	
Highway Data					Site Con	aitions	(Hard =	= 10, Sc	ort = 15)		
Average Daily 1	raffic (Adt):	28,663 vehic	les					Autos:			
Peak Hour I	Percentage:	9.40%				dium Tru		,			
Peak Ho	our Volume:	2,694 vehicle	es		He	avy Truc	cks (3+	Axles):	15		
	icle Speed:	40 mph		1	Vehicle I	Wix					
Near/Far Lar	e Distance:	74 feet			Veh	icleType		Day	Evening	Night	Daily
Site Data						A	lutos:	75.5%	12.5%	12.0%	91.129
Bar	rier Heiaht:	0.0 feet			M	edium Ti	rucks:	81.6%	5.3%	13.1%	6.389
Barrier Type (0-Wa		0.0			I	Heavy Ti	rucks:	79.9%	6.2%	14.0%	2.50
Centerline Dis	t. to Barrier:	67.0 feet		-	Noise So	ource El	evation	ns (in fe	eet)		
Centerline Dist. t	o Observer:	67.0 feet		F		Auto		.000	,		
Barrier Distance t	o Observer:	0.0 feet			Mediu	m Truck:		297			
Observer Height (A	Above Pad):	5.0 feet				v Truck	-	.004	Grade Ad	liustment	0.0
Pa	d Elevation:	0.0 feet				,				,	
	d Elevation:	0.0 feet		1	Lane Eq				feet)		
F	Road Grade:	0.0%				Auto		.080			
	Left View:	-90.0 degre	ees			m Trucks		.922			
	Right View:	90.0 degre	ees		Heav	y Truck	s: 55	.938			
FHWA Noise Mode		-									
VehicleType	REMEL	Traffic Flow		stance		Road	Fres		Barrier Att	_	m Atten
Autos:	66.51			-0.8	-	-1.20		-4.71		000	0.00
Medium Trucks:	77.72		-	-0.8	-	-1.20		-4.88		000	0.00
Heavy Trucks:	82.99			-0.8		-1.20		-5.29	0.	000	0.00
Unmitigated Noise		-	_					-			
-,-	Leq Peak Ho			Leg E	vening	Leq	Night		Ldn		NEL
Autos:	-	7.0	65.3		63.5		58.	-	66.		67
Medium Trucks:	-	6.7	65.3		59.5		58.	-	66.	-	66.
Heavy Trucks:_ Vehicle Noise:		7.9	70.5		61.3		60.		67. 71.	-	68. 72.
					00.5		63.	.9	71.	9	12.
Centerline Distance	e to Noise C	ontour (in fee	t)	70 (	HRA	65	dBA	-	SO dBA	55	dBA
			Ldn:		89	00.	19:	2	414	1	89:

Friday, October 21, 2022

	FHWA-RI	D-77-108 HIGH\	WAY N	IOISE	PREDIC	TION M	ODEL	(9/12/2	021)		
Road Na	ario: OYC+P nme: Katella Av. nent: e/o Main S	t.				Project I Job No		534 Si 13101			
SITI Highway Data	E SPECIFIC IN	IPUT DATA			Site Con	N ditions (			L INPUT	s	
Average Dail Peak Hot Peak	ly Traffic (Adt): ur Percentage: Hour Volume: /ehicle Speed:	30,050 vehicle 9.40% 2,825 vehicles 40 mph			Me He	dium Tru avy Truc	icks (2	Autos. Axles).	15 15		
	Lane Distance:	74 feet		١	/ehicle l				T= . T	AP 11	
Site Data					Veh	icleType	utos:	75.5%	Evening 12.5%	Night 12.0%	Daily 91.14%
	Barrier Height: Wall, 1-Berm):	0.0 feet 0.0				edium Tr Heavy Tr	ucks:	73.57 81.69 79.99	5.3%	13.1% 14.0%	6.37%
Centerline I	Dist. to Barrier:	67.0 feet		,	loise So	ource Ele	evatio	ns (in f	eet)		
Barrier Distance Observer Heigh		67.0 feet 0.0 feet 5.0 feet 0.0 feet			Mediu	Autos m Trucks vy Trucks	i: (	0.000 2.297 3.004	Grade Ad	ljustment	0.0
R	Road Elevation:	0.0 feet		L	ane Eq	uivalent	Dista	nce (in	feet)		
						Autos m Trucks ry Trucks	: 5	5.080 5.922 5.938			
FHWA Noise Mo	del Calculation	s									
VehicleType	REMEL	Traffic Flow	Dista	ance	Finite	Road	Fres	inel	Barrier Att	en Ber	m Atten
Autos				-0.85	-	-1.20		-4.71		000	0.000
Medium Trucks Heavy Trucks				-0.83 -0.83	-	-1.20 -1.20		-4.88 -5.29		000 000	0.000
Unmitigated Noi	se Levels (with	out Topo and I	arrier	atten	uation)						
VehicleType	Leq Peak Hot	ur Leq Day	L	Leq Ev	rening	Leq I	Vight		Ldn	C	VEL
Auto			5.5		63.7		58		66.	-	67.4
Medium Trucks			5.5		59.7		58		66.	-	67.0
Heavy Trucks Vehicle Noise			6.6		61.5		60		68. 72.		68.3 72.4
Centerline Dista	nco to Noico C	antour (in foot)									
Centernile Dista	ince to Noise Ci	ontour (III leet)		70 a	IBA	65 0	iBA		60 dBA	55	dBA
		-	dn:		92		19	-	427		919
		CN	EL:		97		20	8	449	)	967

	FHWA-RD	)-77-108 HIGH	WAY	NOISE	PREDIC	CTION N	IODEL	(9/12/20	021)		
Scenario: Road Name: Road Segment:	Katella Av.	Av.				.,	Name: lumber:		ruck		
SITE SI Highway Data	PECIFIC IN	PUT DATA			Site Con				L INPUT	S	
	ee:				Site Con	iditions	(naru -				
Average Daily Tr	. ,	31,672 vehicle	es				! (0	Autos:	15 15		
Peak Hour Pe	-	9.40%				dium Tr	,	,			
	ır Volume:	2,977 vehicles	8		HE	eavy Tru	CKS (3+	Axies):	15		
	cle Speed:	40 mph		ĺ	Vehicle I	Mix					
Near/Far Lane	Distance:	74 feet		ĺ	Veh	icleType	,	Day	Evening	Night	Daily
Site Data						,	Autos:	75.5%	12.5%	12.0%	91.47%
Barri	er Height:	0.0 feet			М	edium T	rucks:	81.6%	5.3%	13.1%	6.36%
Barrier Type (0-Wal	-	0.0			- 1	Heavy T	rucks:	79.9%	6.2%	14.0%	2.17%
Centerline Dist.		67.0 feet									
Centerline Dist. to		67.0 feet			Noise So				eet)		
Barrier Distance to	Observer:	0.0 feet				Auto		.000			
Observer Height (Al	hove Pad):	5.0 feet				m Truck		.297			
	Elevation:		Heav	vy Truck	s: 8	.004	Grade Ad	justment	: 0.0		
Road	Elevation:	0.0 feet		İ	Lane Eq	uivalent	Distar	ce (in i	feet)		
Ro	ad Grade:	0.0%		İ		Auto	s: 56	.080			
	Left View:	-90.0 degree	es		Mediu	m Truck	s: 55	.922			
F	Right View:	90.0 degree			Heav	vy Truck	s: 55	.938			
FHWA Noise Model	Calculations	s									
VehicleType	REMEL	Traffic Flow	Dis	stance		Road	Fres		Barrier Att	en Ber	m Atten
Autos:	66.51	3.02		-0.8		-1.20		-4.71		000	0.000
Medium Trucks:	77.72	-8.56		-0.8		-1.20		-4.88		000	0.000
Heavy Trucks:	82.99	-13.22		-0.8		-1.20		-5.29	0.0	000	0.000
Unmitigated Noise L											
,,	eq Peak Hou			Leq E	vening		Night		Ldn	_	NEL
Autos:	67.		65.7		64.0		59.		67.1		67.7
Medium Trucks:	67		65.7		59.9		59.	-	67.0	)	67.2
Heavy Trucks: Vehicle Noise:	67. 72.		66.2 70.7		61.1		59. 64.		67.7 72.1		68.0 72.4
Centerline Distance					00.0		01.				
Jenterinie Distance	to Noise Co	incui (in ieet)	<u> </u>	70	dBA	65	dBA	6	0 dBA	55	dBA
			Ldn:		92		198	3	427	,	920
		CI	VEL:		97		209	-	450		969

		D-77-108 HIGH						<u> </u>			
Scenari							Name.				
	e: Katella Av.					Job N	lumber.	13101			
Road Segmen	nt: e/o Batavia	AV.									
	SPECIFIC IN	IPUT DATA							L INPUT	S	
Highway Data				5	Site Cor	ditions	(Hard	= 10, S	oft = 15)		
Average Daily	Traffic (Adt):	33,328 vehicl	es					Autos	15		
Peak Hour	Percentage:	9.40%			Me	dium Tr	ucks (2	Axles)	: 15		
Peak H	our Volume:	3,133 vehicle	:S		He	avy Tru	cks (3+	Axles)	: 15		
Vel	hicle Speed:	40 mph		,	/ehicle	Miv					
Near/Far Lar	ne Distance:	74 feet		F.		icleType		Day	Evening	Night	Daily
Site Data							Autos:	75.59	-	12.0%	,
	rier Height:	0.0 feet			М	edium T		81.69		13.1%	
Barrier Type (0-W	-	0.0 feet				Heavy T	rucks:	79.99	6.2%	14.0%	2.179
Centerline Dis	. ,	67.0 feet		h							
Centerline Dist. 1		67.0 feet		/	Voise S				eet)		
Barrier Distance t		0.0 feet				Auto	(	0.000			
Observer Height (		5.0 feet				m Truck		2.297			
	ad Flevation:	0.0 feet			Hear	y Truck	s: 8	3.004	Grade Ad	justment	: 0.0
Roa	ad Elevation:	0.0 feet		I	Lane Eq	uivalen	t Distai	nce (in	feet)		
F	Road Grade:	0.0%				Auto	s: 56	3.080			
	Left View:	-90.0 degre	es		Mediu	m Truck	s: 58	5.922			
	Right View:	90.0 degre	es		Hea	y Truck	s: 5	5.938			
FHWA Noise Mode	el Calculation	s									
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite	Road	Fres	snel	Barrier Att	en Bei	m Atten
Autos:	66.51	3.25	i	-0.8	5	-1.20		-4.71	0.0	000	0.00
Medium Trucks:	77.72	-8.33		-0.83	3	-1.20		-4.88	0.0	000	0.00
Heavy Trucks:	82.99	-12.99		-0.83	3	-1.20		-5.29	0.0	000	0.00
Unmitigated Noise	Levels (with	out Topo and	barri	er atten	uation)						
,,, .	Leq Peak Hou			Leq Ev			Night		Ldn	_	NEL
Autos:	67		66.0		64.2		59		67.4		67.
Medium Trucks:	67		65.9		60.1		59		67.2	_	67.
Heavy Trucks:	68		66.5		61.4		60	• •	68.0	-	68.
Vehicle Noise:	72	2.5	70.9		67.0		64	.3	72.	3	72.
Centerline Distanc	e to Noise C	ontour (in fee	t)								
			L	70 c		65	dBA		60 dBA		dBA
		_	Ldn:		95		20	-	442		952
		C	NEL:		100		21	б	465		1,002

		D-77-108 HIGH						`			
	io: E+P					Project			ruck		
	e: Katella Av.					Job N	umber:	13101			
Road Segme	nt: e/o Batavia	AV.									
	SPECIFIC IN	IPUT DATA							L INPUT	S	
Highway Data				S	ite Con	ditions	(Hard =	= 10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	31,760 vehicle	es					Autos:	15		
Peak Hour	Percentage:	9.40%			Med	dium Tr	ıcks (2	Axles):	15		
Peak H	lour Volume:	2,985 vehicle	s		He	avy Trud	cks (3+	Axles):	15		
Ve	hicle Speed:	40 mph		ν	ehicle N	Nix					
Near/Far La	ne Distance:	74 feet		Ė		cleType		Day	Evening	Night	Daily
Site Data							Autos:	75.5%	12.5%	12.0%	91.36
Bai	rrier Heiaht:	0.0 feet			Ме	edium T	rucks:	81.6%	5.3%	13.1%	6.36
Barrier Type (0-W		0.0			F	leavy T	rucks:	79.9%	6.2%	14.0%	2.29
Centerline Di	st. to Barrier:	67.0 feet		N	oise So	urco Fl	ovation	ne (in f	not)		
Centerline Dist.	to Observer:	67.0 feet			0136 00	Auto.		.000			
Barrier Distance	to Observer:	0.0 feet			Mediur	n Truck.		.297			
Observer Height (	'Above Pad):	5.0 feet				v Truck	-	.004	Grade Ad	iustment	0.0
Pa	ad Elevation:	0.0 feet			77007	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	J. 0	.001			
Roa	ad Elevation:	0.0 feet		L	ane Equ	ıivalent	Distar	ce (in	feet)		
	Road Grade:	0.0%				Auto		.080			
	Left View:	-90.0 degre	es			n Truck		.922			
	Right View:	90.0 degre	es		Heav	y Truck	s: 55	.938			
FHWA Noise Mode	el Calculation	s									
VehicleType	REMEL	Traffic Flow	Dista	ance	Finite	Road	Fres	nel	Barrier Att	en Bei	m Atter
Autos:	66.51	3.03		-0.85		-1.20		-4.71	0.0	000	0.00
Medium Trucks:	77.72	-8.54		-0.83		-1.20		-4.88	0.0	000	0.00
Heavy Trucks:	82.99	-12.99		-0.83		-1.20		-5.29	0.0	000	0.0
Unmitigated Noise	e Levels (with	out Topo and	barrier	attenu	ation)						
VehicleType	Leq Peak Hot			Leg Ev	ening	Leq	Night		Ldn		NEL
Autos:		7.5	65.7		64.0		59.	-	67.		67
Medium Trucks:		7.1	65.7		59.9		59.	-	67.0	-	67
Heavy Trucks:		3.0	66.5		61.4		60.	_	68.0		68
Vehicle Noise:	72	2.3	70.8		66.9		64.	2	72.	2	72
Centerline Distand	ce to Noise C	ontour (in feet	)								
			L	70 di		65	dBA		60 dBA		dBA
		_	Ldn:		93		20		433		93
			NEL:		98		21:	2	456		98

Friday, October 21, 2022

	FHWA-RI	D-77-108 HIGHV	VAY NO	ISE F	PREDIC	CTION M	ODEL	(9/12/2	2021)		
Road Nam	io: OYC+P ne: Katella Av. nt: e/o Batavia	Av.				Project Job N		534 S 13101			
	SPECIFIC IN	IPUT DATA			·4- O				EL INPUT	s	
Highway Data				3	ite Con	aitions	(Hara		oft = 15)		
Average Daily	. ,	33,416 vehicles	3					Autos			
	Percentage:	9.40%				dium Tru					
	lour Volume:	3,141 vehicles			не	avy Truc	KS (3+	Axies)	: 15		
	hicle Speed:	40 mph		V	ehicle l	Mix					
Near/Far La	ne Distance:	74 feet			Veh	icleType		Day	Evening	Night	Daily
Site Data						A	lutos:	75.59	6 12.5%	12.0%	91.36%
Ba	rrier Height:	0.0 feet			M	edium Ti	rucks:	81.69	6 5.3%	13.1%	6.36%
Barrier Type (0-W		0.0			1	Heavy Ti	ucks:	79.99	6.2%	14.0%	2.28%
Centerline Di	st. to Barrier:	67.0 feet		A/	oioo Ca	ource El	ovetio	na (in t	[not]		
Centerline Dist.	to Observer:	67.0 feet		/4	orse so	Auto:			eet)		
Barrier Distance	to Observer:	0.0 feet						2.297			
Observer Height	(Above Pad):	5.0 feet				m Truck	-	3.004	Grade Ad	livatmani	
P	ad Elevation:	0.0 feet			Heav	y Truck	5. 6	3.004	Grade Ad	justinent	. 0.0
Ro	ad Elevation:	0.0 feet		L	ane Eq	uivalent	Dista	nce (in	feet)		
	Road Grade:	0.0%				Auto	s: 56	080.6			
	Left View:	-90.0 degrees	3		Mediu	m Truck	s: 5	5.922			
	Right View:	90.0 degrees	3		Heav	y Truck	s: 5	5.938			
FHWA Noise Mod	el Calculation	s									
VehicleType	REMEL	Traffic Flow	Distan			Road	Fres		Barrier Att		rm Atten
Autos:	66.51	3.25		0.85		-1.20		-4.71		000	0.000
Medium Trucks:	77.72			0.83		-1.20		-4.88		000	0.000
Heavy Trucks:				0.83		-1.20		-5.29	0.	000	0.000
Unmitigated Noise VehicleType	Leg Peak Hou				ation) ening	100	Night		Ldn		NFL.
Venicie i ype Autos:	Leq Peak Hot		6.0	y ⊏V6	64.2		ivignt 59	2	Lan 67.	_	NEL 67.9
Medium Trucks:	67		6.0		60.1		59		67.		67.4
Heavy Trucks:	68		6.7		61.6		60		68.	_	68.4
Vehicle Noise:		-	1.0		67.1		64		72.		72.7
Centerline Distan	ce to Noise Co	ontour (in feet)									
				70 dl	BA	65	dBA		60 dBA	55	dBA
		L	dn:		96		20	8	448	3	965
		CN	FI ·		102		21	a	471		1.015

	FHWA-RD	-77-108 HIGH	WAY	NOISE	PREDIC	TION N	IODEL	(9/12/2	021)		
	o: E e: Katella Av. nt: w/o SR-57 \$	SB Ramps					Name: lumber:		ruck		
	SPECIFIC IN	PUT DATA			0				L INPUT	S	
Highway Data					Site Cor	aitions	(Hara =				
Average Daily	. ,	36,377 vehicle	es					Autos:			
	Percentage:	9.40%				dium Tr		,			
		3,419 vehicles	S		He	avy Tru	cks (3+	Axles).	15		
	hicle Speed:	40 mph			Vehicle	Mix					
Near/Far Lai	ne Distance:	74 feet			Veh	icleType		Day	Evening	Night	Daily
Site Data							Autos:	75.5%	12.5%	12.0%	91.47%
Rar	rier Height:	0.0 feet			М	edium T	rucks:	81.6%	5.3%	13.1%	6.36%
Barrier Type (0-W	all, 1-Berm):	0.0				Heavy T	rucks:	79.9%	6.2%	14.0%	2.17%
Centerline Dis		67.0 feet		Ī	Noise S	ource E	levation	s (in f	eet)		
Centerline Dist.		67.0 feet				Auto	s: 0	.000			
Barrier Distance		0.0 feet			Mediu	m Truck	s: 2	.297			
Observer Height (	,	5.0 feet			Hear	y Truck	s: 8	.004	Grade Ad	justment	: 0.0
	d Elevation:	0.0 feet		-							
	d Elevation:	0.0 feet		H	Lane Eq				reet)		
F	Road Grade:	0.0%				Auto		.080			
	Left View:	-90.0 degree				m Truck		.922			
	Right View:	90.0 degree	es		неа	y Truck	S: 55	.938			
FHWA Noise Mode											
Vehicle Type	REMEL	Traffic Flow	Dis	stance	_	Road	Fres		Barrier Att		m Atten
Autos:	66.51	3.63		-0.8	-	-1.20		-4.71		000	0.000
Medium Trucks:	77.72	-7.95		-0.8	-	-1.20		-4.88		000	0.000
Heavy Trucks:	82.99	-12.61		-0.8		-1.20		-5.29	0.0	000	0.000
Unmitigated Noise VehicleType	Levels (without Leg Peak Hou				vening	l ea	Night	Т	Ldn		NEL
Autos:	68.		66.3	LUYL	64.6		59.	6	67.		68.3
Medium Trucks:	67.		66.3		60.5		59	-	67.6		67.8
Heavy Trucks:	68.	-	66.8		61.7		60.	-	68.3	-	68.6
Vehicle Noise:	72.		71.3		67.4		64.		72.		73.0
Centerline Distanc	e to Noise Co	ntour (in feet)	)								
				70	dBA	65	dBA		60 dBA	55	dBA
			Ldn:		101		21		468		1,009
		CI	VEL:		106		229	9	493		1.062

OYC Katella Av.										
							534 Str	uck		
					Job N	lumber:	13101			
w/o SR-57	SB Ramps									
PECIFIC IN	IPUT DATA							LINPUT	S	
			5	Site Con	ditions	(Hard				
raffic (Adt):	38,027 vehic	les					Autos:	15		
ercentage:							,			
ur Volume:		es		He	eavy Tru	cks (3+	Axles):	15		
cle Speed:	40 mph		١	/ehicle	Mix					
Distance:	74 feet			Veh	icleType	•	Day	Evening	Night	Daily
						Autos:	75.5%	12.5%	12.0%	91.47%
er Heiaht:	0.0 feet			М	edium 7	rucks:	81.6%	5.3%	13.1%	6.36%
II, 1-Berm):	0.0				Heavy 7	rucks:	79.9%	6.2%	14.0%	2.17%
to Barrier:	67.0 feet			Voise S	ource F	levatio	ns (in fe	et)		
Observer:	67.0 feet		Ė	.0.00 0			•			
Observer:	0.0 feet			Modiu						
bove Pad):	5.0 feet							Grade Ad	iustment	0.0
Elevation:	0.0 feet									
Elevation:	0.0 feet		L	.ane Eq				eet)		
	0.0%									
						00				
Right View:	90.0 degre	ees		Hea	vy Truck	s: 55	5.938			
Calculation	s									
REMEL						Fres				m Atten
		-		-						0.00
				-						0.00
82.99	-12.42	2	-0.83	3	-1.20		-5.29	0.0	000	0.00
		,	Leq Ev			-				NEL
										68.
									-	68.
										68.8
				67.6		64	.9	72.9	4	73.
to Noise Co	ontour (in fee	t)	70 -	/D.4		-10.4		0.404		-104
		I do:	/// 0		05	-				1.039
	_									1,039
	ercentage: ur Volume: cle Speed: cle Speed: er Height: II, 1-Berm): to Barrier: o'Dsserver: o'Dsserver: o'Dsserver: cobserver: cobse	ercentage: 9.40% ur Volume: 3,574 vehicle cle Speed: 40 mph e Distance: 74 feet  fer Height: 0.0 feet II, 1-Berm): 67.0 feet Observer: 67.0 feet Observer: 0.0 feet Lelevation: 0.0 feet Lelevation: 0.0 feet Lelevation: 0.0 feet Lelevation: 0.0 feet Dougland: 0.0 feet Lelevation: 0.0 feet Dougland: 0.0 feet Lelevation: 0.0 feet Lelevation: 0.0 feet Left View: 90.0 degre Right View: 90.0 degre Right View: 90.0 degre Right View: 174 Fiow 66.51 73.72 Levels (without Topo and eg Peak Hour Leq Da 68.3 67.9 68.5 73.0  to Noise Contour (in fee	ercentage: 9.40% ur Volume: 3,574 vehicles cle Speed: 40 mph 20 Distance: 40 mph 20 Distance: 74 feet  For Height: 0.0 feet II, 1-Berm): 0.0 10 Barrier: 67.0 feet Observer: 67.0 feet Observer: 0.0 feet Belevation: 0.0 feet Elevation: 0.0 feet Elevation: 90.0 degrees Right View: 90.0 degrees Right View: 90.0 degrees Remel Traffic Flow Di 66.51 7.72 -7.76 82.99 -712.42 Levels (without Topo and barrier eq Peak Hour Leq Day 68.3 66.5 67.9 66.5 68.5 67.0 73.0 71.5	### Addition   ### Ad	### A ## A ## A ###  ### Additional Control of Part	### Autor	### Autos: Autos: Autos: Medium Trucks (2 Autes): Heavy Trucks (3+ Autes): Cele Speed: 40 mph	Medium Trucks (2 Axles): 15   Heavy Trucks (3+ Axles): 15   Heavy Trucks (3+ Axles): 15	### Autos: 15 ### Autos: 15 ### Autos: 15 ### Autos: 15 ### Autos: 3,574 vehicles cle Speed: 40 mph **Distance: 74 feet  ### Vehicle Mix    Vehicle Mix   Vehicle Type	

	FHWA-RI	D-77-108 HIGH	IWAY	NOISE F	REDIC	TION MC	JDEL (	9/12/20	021)		
Scenario	o: E+P					Project I	Vame:	534 Str	ruck		
	e: Katella Av.					Job Nu	mber:	13101			
Road Segmen	t: w/o SR-57	SB Ramps									
	SPECIFIC IN	IPUT DATA							L INPUT	S	
Highway Data				S	ite Con	ditions (i					
Average Daily	Traffic (Adt):	36,388 vehicle	es				-	Autos:	15		
Peak Hour I	Percentage:	9.40%				dium Tru		/			
	our Volume:	3,420 vehicle	S		He	avy Truck	ks (3+ A	(xles	15		
	nicle Speed:	40 mph		V	ehicle	Mix					
Near/Far Lar	ne Distance:	74 feet			Veh	icleType		Day	Evening	Night	Daily
Site Data						A	utos:	75.5%	12.5%	12.0%	91.479
Bar	rier Height:	0.0 feet			М	edium Tru	ıcks:	81.6%	5.3%	13.1%	6.359
Barrier Type (0-Wi	-	0.0				Heavy Tru	ıcks:	79.9%	6.2%	14.0%	2.179
Centerline Dis	t. to Barrier:	67.0 feet		N	oise S	ource Ele	vation	s (in fe	et)		
Centerline Dist. t	o Observer:	67.0 feet				Autos.		000			
Barrier Distance t	o Observer:	0.0 feet			Mediu	m Trucks.		297			
Observer Height (/	Above Pad):	5.0 feet				vy Trucks.		004	Grade Ad	iustment	0.0
Pa	d Elevation:	0.0 feet									
Roa	d Elevation:	0.0 feet		L	ane Eq	uivalent l			eet)		
F	Road Grade:	0.0%				Autos.		080			
	Left View:	-90.0 degre				m Trucks.		922			
	Right View:	90.0 degre	es		Heav	y Trucks.	55.	938			
FHWA Noise Mode		-								,	
VehicleType	REMEL	Traffic Flow		tance		Road	Fresn	_	Barrier Att		m Atten
Autos:	66.51	3.63		-0.85		-1.20		-4.71		000	0.00
Medium Trucks:	77.72			-0.83		-1.20		-4.88		000	0.00
Heavy Trucks:	82.99			-0.83		-1.20		-5.29	0.0	000	0.00
Unmitigated Noise VehicleType	<b>Levels (with</b> Leg Peak Hou			r attenu Leg Eve		Leg N	liaht	Г	Ldn		NEL
Autos:	68 68		66.3	Ley LV	64.6		11911t 59.6	1	67.7		VEL 68
Medium Trucks:	67		66.3		60.5		59.6		67.6		67
Heavy Trucks:		3.3	66.8		61.7		60.5		68.3		68
Vehicle Noise:		2.8	71.3		67.4		64.7		72.7		73.
Centerline Distanc	e to Noise Co	ontour (in feet	)								
				70 dl	BA	65 d	BA	6	i0 dBA	55	dBA
			Ldn: NFL:		101		217		468		1,00

Friday, October 21, 2022

	FHWA-RD-	77-108 HIGH	WAY N	NOISE	PREDIC	TION M	DDEL (	9/12/2	021)		
Scenario:	OYC+P					Project I	Vame:	534 St	ruck		
Road Name:	Katella Av.					Job Nu	mber:	13101			
Road Segment:	w/o SR-57 S	B Ramps									
	ECIFIC INF	UT DATA			24- 0				L INPUT	s	
Highway Data				3	site Con	ditions (					
Average Daily Tra	. ,	88,038 vehicle	S					Autos:			
Peak Hour Pe	-	9.40%				dium Tru					
		3,576 vehicles			He	avy Truc	ks (3+ )	Axles):	15		
Vehic	le Speed:	40 mph		1	/ehicle I	Mix					
Near/Far Lane	Distance:	74 feet		- 1		icleType		Day	Evening	Night	Daily
Site Data						Α	utos:	75.5%	12.5%	12.0%	91.47%
Rarrio	er Heiaht:	0.0 feet			Me	edium Tri	ıcks:	81.6%	5.3%	13.1%	6.35%
Barrier Type (0-Wall		0.0			F	leavy Tri	ıcks:	79.9%	6.2%	14.0%	2.17%
Centerline Dist.	,	67.0 feet			loico Sa	urce Ele	wation	c (in f	not)		
Centerline Dist. to	Observer:	67.0 feet		,	10/36/30	Autos			et)		
Barrier Distance to	Observer:	0.0 feet					. 0.	000 297			
Observer Height (Ab	ove Pad):	5.0 feet				m Trucks			Crosdo Ad	iuatmant	
Pad	Elevation:	0.0 feet			Heav	y Trucks	. 8.	004	Grade Ad	usimem	. 0.0
Road	Elevation:	0.0 feet		L	ane Equ	uivalent	Distan	ce (in	feet)		
Ro	ad Grade:	0.0%				Autos	: 56.	080			
	Left View:	-90.0 degree	s		Mediur	m Trucks	55.	922			
R	ight View:	90.0 degree	S		Heav	y Trucks	55.	938			
FHWA Noise Model (	Calculations										
, , ,		Traffic Flow	Dista	ance	Finite		Fresi	-	Barrier Att		m Atten
Autos:	66.51	3.82		-0.85	-	-1.20		-4.71		000	0.000
Medium Trucks:	77.72	-7.76		-0.83	-	-1.20		-4.88		000	0.000
Heavy Trucks:	82.99	-12.42		-0.83	3	-1.20		-5.29	0.0	000	0.000
Inmitigated Noise L	evels (witho	ut Topo and	barrier	r atteni	uation)						
VehicleType Le	eq Peak Hour	Leq Day		Leq Ev	rening	Leq N	light		Ldn	C	NEL
Autos:	68.3		36.5		64.8		59.	-	67.9	-	68.5
Medium Trucks:	67.9	9 (	6.5		60.7		59.	3	67.8	3	68.0
Heavy Trucks:	68.5		37.0		61.9		60.		68.5		68.8
Vehicle Noise:	73.0	)	71.5		67.6		64.9	9	72.9	9	73.2
Centerline Distance	to Noise Cor	ntour (in feet)									
				70 d		65 a		1 -	60 dBA		dBA
			Ldn:		104		224		482		1,040
		CI	IEL:		109		236		508		1,094

	FHWA-RE	0-77-108 HIGH	WAY	' NOISE	PREDIC	CTION M	ODEL	(9/12/2	021)		
	rio: E me: Katella Av. ent: e/o SR-57 l	NB Ramps				Project Job N	Name: umber:		ruck		
	SPECIFIC IN	IPUT DATA			0:: 0				L INPUT	S	
Highway Data					Site Cor	aitions	(Hard =				
Average Daily	Traffic (Adt):	35,065 vehicle	es					Autos:			
Peak Hou	r Percentage:	9.40%				edium Tru		,			
Peak	Hour Volume:	3,296 vehicle	S		He	eavy Truc	cks (3+	Axles):	15		
V	ehicle Speed:	40 mph		f	Vehicle	Mix					
Near/Far L	ane Distance:	74 feet		-	Veh	icleType		Day	Evening	Night	Dailv
Site Data							Autos:	75.5%		12.09	6 91.47%
	arrier Height:	0.0 feet			М	edium Ti	rucks:	81.6%	5.3%	13.19	6.36%
Barrier Type (0-V		0.0				Heavy Ti	rucks:	79.9%	6.2%	14.09	6 2.17%
Centerline D	ist. to Barrier:	67.0 feet		f	Noise S	ource El	evation	ıs (in fe	eet)		
Centerline Dist		67.0 feet				Autos	s: 0	.000			
Barrier Distance		0.0 feet			Mediu	m Trucks	s: 2	.297			
Observer Height		5.0 feet			Hear	vy Trucks	s: 8	.004	Grade Ad	iustmer	nt: 0.0
	Pad Elevation:	0.0 feet						-			
Ro	oad Elevation:	0.0 feet			Lane Eq				feet)		
	Road Grade:	0.0%				Autos		.080			
	Left View:	-90.0 degree				m Trucks		.922			
	Right View:	90.0 degree	es		Hea	vy Truck:	s: 55	.938			
FHWA Noise Mod	del Calculation	s									
VehicleType	REMEL	Traffic Flow	Di	stance	Finite	Road	Fres		Barrier Att	en Be	erm Atten
Autos	66.51	3.47		-0.8	35	-1.20		-4.71	0.0	000	0.000
Medium Trucks	77.72	-8.11		-0.8	33	-1.20		-4.88	0.0	000	0.000
Heavy Trucks	82.99	-12.77		-0.8	33	-1.20		-5.29	0.0	000	0.000
Unmitigated Nois			barri	er attei	nuation)						
VehicleType	Leq Peak Hou		_	Leq E	vening		Night		Ldn		CNEL
Autos			66.2		64.4		59.	-	67.6	-	68.1
Medium Trucks			66.2		60.3		59.	-	67.4		67.6
Heavy Trucks Vehicle Noise			71.1		61.6 67.2		60. 64.		68.2 72.5		68.4 72.8
Centerline Distan					07.2		J4.	-		-	. 2.0
Centernine Distan	10 10 140/3E CC	mour (m reet,		70	dBA	65 (	dBA	6	60 dBA	5	5 dBA
			Ldn:		98		212	2	457		985
		C	NEL:		104		223	3	481		1,037

Friday, October	21,	2022	
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F	HWA-RD	-77-108 HIGH	WAY	NOISE I	PREDIC	TION	MODEL (9/1	2/2021)		
Scenario: OY Road Name: Kat Road Segment: e/o	tella Av.	IB Ramps					t Name: 534 lumber: 13			
SITE SPEC	IFIC IN	PUT DATA					NOISE MO	DEL INPUT	s	
Highway Data				S	ite Con	ditions	(Hard = 10	, Soft = 15)		
Average Daily Traffic Peak Hour Perce Peak Hour Vo	ntage:	37,009 vehicle 9.40% 3,479 vehicle					Au rucks (2 Axl icks (3+ Axl	,		
Vehicle S	,	40 mph		ν	ehicle l	Vlix				
Near/Far Lane Dis	tance:	74 feet		Ė		icleType	e Da	y Evening	Night	Daily
Site Data								.5% 12.5%	12.0%	
Barrier H	loiaht.	0.0 feet			M	edium 7	rucks: 81	.6% 5.3%	13.1%	6.36%
Barrier Type (0-Wall, 1-L		0.0			ı	Heavy 7	rucks: 79	.9% 6.2%	14.0%	2.17%
Centerline Dist. to E	Barrier:	67.0 feet		N	loise Sc	ource E	levations (i	n feet)		
Centerline Dist. to Obs	server:	67.0 feet				Auto				
Barrier Distance to Obs	server:	0.0 feet			Mediu	m Truck				
Observer Height (Above	,	5.0 feet				y Truck			iustment	0.0
Pad Ele		0.0 feet		<u> </u>						
Road Ele		0.0 feet		L	ane Eq		t Distance	,		
Road (		0.0%				Auto				
	View:	-90.0 degree				m Truck vy Truck	00.02	=		
Rigiti	View:	90.0 degree	es		ricas	y IIuur	13. 33.93	•		
FHWA Noise Model Cald										
	MEL	Traffic Flow	Dis	tance	Finite		Fresnel	Barrier Att		m Atten
Autos:	66.51	3.70		-0.85		-1.20			000	0.000
Medium Trucks:	77.72	-7.88		-0.83		-1.20			000	0.000
Heavy Trucks:	82.99	-12.54		-0.83		-1.20	-5.	29 0.0	000	0.000
Unmitigated Noise Leve			_				* F / /		_	
VehicleType Leq P	eak Hou 68		66.4	Leq Ev	ening 64.6	Leq	Night 59.7	Ldn 67.1		NEL 68.3
Autos: Medium Trucks:	67.	_	66.4		60.6		59.7 59.7	67.6	-	67.9
медит Trucks: Heavy Trucks:	68.	-	66.9		61.8		60.6	68.4	-	68.7
Vehicle Noise:	72.		71.4		67.5		64.8	72.		73.1
O	loiso Co	ntour (in foot	1							
		mour (III leet	,							
Centerline Distance to N				70 d	BA	65	dBA	60 dBA	55	dBA
Centenine Distance to N			Ldn:	70 d	<i>BA</i> 102	65	dBA 220	60 dBA 474		dBA 1.021

	FHWA-RI	D-77-108 HIGH	WAY	NOISE	PREDIC	TION M	ODEL (	9/12/2	021)		
Scenario						.,	Name:		ruck		
	e: Katella Av.					Job N	umber:	13101			
Road Segmen	t: e/o SR-57	NB Ramps									
	PECIFIC IN	IPUT DATA							L INPUT	5	
Highway Data					Site Con	ditions	(Hard =	10, Sc	oft = 15)		
Average Daily	raffic (Adt):	35,289 vehicle	es					Autos:	15		
Peak Hour I	Percentage:	9.40%				dium Tr		,			
Peak He	our Volume:	3,317 vehicle	S		He	avy Tru	cks (3+ .	4xles):	15		
	icle Speed:	40 mph		- 1	Vehicle	Mix					
Near/Far Lar	e Distance:	74 feet			Veh	icleType		Day	Evening	Night	Daily
Site Data						-	Autos:	75.5%	12.5%	12.0%	91.209
Bar	rier Heiaht:	0.0 feet			М	edium T	rucks:	81.6%	5.3%	13.1%	6.369
Barrier Type (0-Wa		0.0				Heavy T	rucks:	79.9%	6.2%	14.0%	2.449
Centerline Dis	t. to Barrier:	67.0 feet		- 1	Noise So	ource El	evation	e (in f	not)		
Centerline Dist. t	o Observer:	67.0 feet		F.	10/36 01	Auto.		000			
Barrier Distance t	o Observer:	0.0 feet			Mediu	m Truck.		297			
Observer Height (	Above Pad):	5.0 feet				vy Truck		004	Grade Ad	iustment	. 0 0
Pa	d Elevation:	0.0 feet			77001	y much	3. 0.	004	0,000,10,	doumont	. 0.0
Roa	d Elevation:	0.0 feet		1	Lane Eq	uivalent	Distan	ce (in :	feet)		
F	Road Grade:	0.0%				Auto		080			
	Left View:	-90.0 degree	es			m Truck		922			
	Right View:	90.0 degree	es		Hear	y Truck	s: 55	938			
FHWA Noise Mode	l Calculation	s									
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite	Road	Fresi	nel	Barrier Atte	en Ber	m Atten
Autos:	66.51			-0.8	-	-1.20		-4.71		000	0.00
Medium Trucks:	77.72			-0.8	-	-1.20		-4.88		000	0.00
Heavy Trucks:	82.99	-12.25		-0.8	3	-1.20		-5.29	0.0	000	0.00
Unmitigated Noise	•										
	Leq Peak Ho		_	Leq E	vening		Night		Ldn		NEL
Autos:		7.9	66.2		64.4		59.	-	67.6		68
Medium Trucks:			66.2		60.4		59.	-	67.4		67
Heavy Trucks:			67.2		62.1		60.	-	68.7		69
Vehicle Noise:	72	2.9	71.3		67.4		64.	В	72.7	7	73
Centerline Distanc	e to Noise C	ontour (in feet	)					1			
			L	70 0	dBA	65	dBA		60 dBA		dBA
		_	Ldn:		102		219		472		1,01
			NEL:		107		231		497		1.07

	FHWA-RD-	77-108 HIGH	WAY N	OISE	PREDIC	TION MC	DDEL	(9/12/2	021)		
Scenario: C	YC+P					Project N	Vame:	534 St	ruck		
Road Name: K	atella Av.					Job Nu	mber:	13101			
Road Segment: e	/o SR-57 NI	B Ramps									
	CIFIC INF	UT DATA							L INPUT	s	
Highway Data				S	ite Con	ditions (l	Hard =				
Average Daily Traft	fic (Adt): 3	37,234 vehicle	:S					Autos:			
Peak Hour Perd	entage:	9.40%				dium Truc		,			
Peak Hour	Volume: 3	3,500 vehicles	5		He	avy Truck	ks (3+	Axles):	15		
Vehicle	Speed:	40 mph		ν	ehicle I	Mix					
Near/Far Lane D	istance:	74 feet		Ė		cleType		Day	Evening	Night	Daily
Site Data						A	utos:	75.5%	12.5%	12.09	6 91.21%
Rarrior	Height:	0.0 feet			Me	edium Tru	icks:	81.6%	5.3%	13.19	6.36%
Barrier Type (0-Wall, 1		0.0			F	leavy Tru	icks:	79.9%	6.2%	14.09	6 2.42%
Centerline Dist. to	,	67.0 feet			laisa Sa	urce Ele	vation	e (in f	not)		
Centerline Dist. to O	bserver:	67.0 feet		-	10/36/30	Autos:		.000	ei)		
Barrier Distance to O	bserver:	0.0 feet			A de eller	n Trucks:		.000			
Observer Height (Abo	ve Pad):	5.0 feet						.004	Grade Ad	iuetman	#: 0.0
Pad E	levation:	0.0 feet			пеач	y Trucks:	. 0	.004	Orace Au	justinei	1. 0.0
Road E	levation:	0.0 feet		L	ane Equ	ıivalent l	Distan	ce (in	feet)		
Road	d Grade:	0.0%				Autos:	56	.080			
Le	eft View:	-90.0 degree	es		Mediur	n Trucks:	55	.922			
Rig	ht View:	90.0 degree	es.		Heav	y Trucks:	55	.938			
FHWA Noise Model Ca											
		Traffic Flow	Dista		Finite		Fres	-	Barrier Att		rm Atten
Autos:	66.51	3.72		-0.85		-1.20		-4.71		000	0.000
Medium Trucks:	77.72	-7.85		-0.83		-1.20		-4.88		000	0.000
Heavy Trucks:	82.99	-12.04		-0.83	1	-1.20		-5.29	0.0	000	0.000
Inmitigated Noise Lev											
	Peak Hour			.eq Ev		Leq N	-		Ldn		CNEL
Autos:	68.2	-	66.4		64.7		59.		67.		68.4
Medium Trucks:	67.8		66.4		60.6		59.		67.		67.9
Heavy Trucks:	68.9		67.4		62.3		61.		68.		69.2
Vehicle Noise:	73.1		71.6		67.6		65.	0	72.	9	73.3
Centerline Distance to	Noise Cor	ntour (in feet)	_							_	
				70 d		65 di			60 dBA		5 dBA
			Ldn:		105		227		489		1,053
		CI	VEL:		111		239	9	514		1,108

	FHWA-RI	D-77-108 HIGH	WAY	NOISE	PREDIC	CTION N	IODEL	(9/12/2	021)		
	io: E ne: Struck Av. nt: w/o Main S	t.					Name: lumber:				
	SPECIFIC IN	IPUT DATA							L INPUT	s	
Highway Data					Site Cor	ditions	(Hard =	= 10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	5,142 vehicle	es					Autos:			
	Percentage:	9.40%				edium Tr					
Peak F	lour Volume:	483 vehicle	S		He	eavy Tru	cks (3+	Axles):	15		
Ve	hicle Speed:	40 mph		1	/ehicle	Mix					
Near/Far La	ne Distance:	12 feet		F		icleType	,	Dav	Evenina	Niaht	Daily
Site Data							Autos:	75.5%	6 12.5%	12.0	
Ra	rrier Height:	0.0 feet			М	edium T	rucks:	81.6%	5.3%	13.1	% 6.36%
Barrier Type (0-W		0.0				Heavy T	rucks:	79.9%	6.2%	14.0	% 2.17%
Centerline Di		33.0 feet		- 1	Voise S	ouroo E	lovetion	o (in f	nost)		
Centerline Dist.	to Observer:	33.0 feet		Ľ	voise 3	Auto		.000	eet)		
Barrier Distance	to Observer:	0.0 feet			Modiu	m Truck		.000			
Observer Height	(Above Pad):	5.0 feet				vy Truck		.004	Grade Ad	dicatma	nt: 0.0
P	ad Elevation:	0.0 feet			пеа	vy IIuck	S. 0	.004	Grade At	ijusune	n. 0.0
Ro	ad Elevation:	0.0 feet		1	Lane Eq	uivalen	t Distan	ce (in	feet)		
	Road Grade:	0.0%				Auto	s: 32	.833			
	Left View:	-90.0 degre	es		Mediu	m Truck	s: 32	.562			
	Right View:	90.0 degre	es		Hea	vy Truck	s: 32	.589			
FHWA Noise Mod	el Calculation	s									
VehicleType	REMEL	Traffic Flow	Dis	stance		Road	Fres		Barrier At	_	erm Atten
Autos:	66.51			2.6		-1.20		-4.52		000	0.000
Medium Trucks:				2.6	-	-1.20		-4.86		000	0.000
Heavy Trucks:	82.99	-21.11		2.6	9	-1.20		-5.69	0.	000	0.000
Unmitigated Noise	e Levels (with	out Topo and	barrie	er atten	uation)						
VehicleType	Leq Peak Hou	ur Leq Day	/	Leq E	/ening	Leq	Night		Ldn		CNEL
Autos:	63		61.3		59.6		54.	-	62.		63.3
Medium Trucks:		2.8	61.3		55.5		54.	.6	62.	6	62.8
Heavy Trucks:	63	3.4	61.9		56.8		55.	.5	63.	4	63.6
Vehicle Noise:	67	7.8	66.3		62.4		59.	.7	67.	7	68.0
Centerline Distant	ce to Noise C	ontour (in feet	)								
				70 (	iBA	65	dBA		60 dBA	5	55 dBA
			Ldn:		23		50	)	107	7	231
		C	NEL:		24		52	2	113	3	243

Scenario Road Name Road Segmen	e: Struck Av.	L.				.,	Name: lumber:		truck		
	PECIFIC IN	PUT DATA							L INPUT	S	
Highway Data				S	Site Cor	ditions	(Hard		oft = 15)		
Average Daily	Traffic (Adt):	5,668 vehicl	es					Autos:			
Peak Hour I		9.40%				dium Tr		,			
Peak Ho	our Volume:	533 vehicle	:S		He	avy Tru	cks (3+	Axles):	15		
Vel	nicle Speed:	40 mph		v	/ehicle	Mix					
Near/Far Lar	ne Distance:	12 feet		F	Veh	icleType	,	Day	Evening	Night	Daily
Site Data							Autos:	75.5%	-	12.0%	,
Par	rier Heiaht:	0.0 feet			М	edium T	rucks:	81.6%	5.3%	13.1%	6.36%
Barrier Type (0-Wa		0.0				Heavy T	rucks:	79.9%	6.2%	14.0%	2.17%
Centerline Dis		33.0 feet									
Centerline Dist. t		33.0 feet		٨	loise S	ource E			eet)		
Barrier Distance t		0.0 feet				Auto		.000			
Observer Height (/		5.0 feet				m Truck		.297			
	d Elevation:	0.0 feet			Hear	y Truck	s: 8	.004	Grade Ad	iustmen	: 0.0
	d Elevation:	0.0 feet		L	ane Eq	uivalen	t Distar	nce (in	feet)		
	Road Grade:	0.0%				Auto	s: 32	833	,		
•	Left View:	-90.0 degre	es		Mediu	m Truck	s: 32	562			
	Right View:	90.0 degre			Hea	y Truck	s: 32	2.589			
FHWA Noise Mode	I Calculation:	S									
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite	Road	Fres	nel	Barrier Att	en Be	m Atten
Autos:	66.51	-4.45		2.64	1	-1.20		-4.52	0.0	000	0.00
Medium Trucks:	77.72	-16.03		2.69	9	-1.20		-4.86	0.0	000	0.00
Heavy Trucks:	82.99	-20.69		2.69	9	-1.20		-5.69	0.0	000	0.00
Unmitigated Noise	Levels (with	out Topo and	barri	er atteni	uation)						
VehicleType	Leq Peak Hou	r Leq Da	у	Leq Ev	rening	Leq	Night		Ldn	С	NEL
Autos:	63	.5	61.8		60.0		55	.0	63.2	2	63.
Medium Trucks:	63	.2	61.8		55.9		55	.1	63.0	)	63.
Heavy Trucks:	63	.8	62.3		57.2		56	.0	63.8	3	64.0
Vehicle Noise:	68	.3	66.7		62.8		60	.1	68.1	1	68.4
Centerline Distanc	e to Noise Co	ntour (in fee	t)								
			Į	70 d		65	dBA		60 dBA		dBA
			Ldn:		25		5	-	114		247
			NEL:		26		5	c	121		260

		D-77-108 HIGH	HVAI	NOISE	TREDIC	TIOIV IV	PODEL	(3/12/2	VZ 1)		
Scenario Road Name Road Segmen	: Struck Av.	št.				Project Job N	Name: lumber:				
SITE S	PECIFIC II	NPUT DATA							L INPUT	s	
Highway Data					Site Con	ditions	(Hard =	10, S	oft = 15)		
Average Daily 1	raffic (Adt):	5,186 vehicl	es					Autos	15		
Peak Hour I	Percentage:	9.40%			Ме	dium Tr	ucks (2	Axles)	15		
Peak Ho	our Volume:	487 vehicle	s		He	avy Truc	cks (3+	Axles)	15		
Veh	icle Speed:	40 mph		-	Vehicle	Mix					
Near/Far Lar	e Distance:	12 feet		F		icleType	,	Day	Evening	Night	Daily
Site Data							Autos:	75.59		12.0%	
Ban	rier Heiaht:	0.0 feet			М	edium T	rucks:	81.69	5.3%	13.1%	6.30
Barrier Type (0-Wa		0.0				Heavy Ti	rucks:	79.99	6.2%	14.0%	2.16
Centerline Dis	t. to Barrier:	33.0 feet		- 1	Noise S	ource El	evation	s (in f	eet)		
Centerline Dist. t	o Observer:	33.0 feet		F		Auto		.000	,		
Barrier Distance t	o Observer:	0.0 feet			Mediu	m Truck		297			
Observer Height (A	,	5.0 feet			Hear	v Truck	s: 8	.004	Grade Ad	fjustmen	t: 0.0
	d Elevation:	0.0 feet									
	d Elevation:	0.0 feet		1	Lane Eq				feet)		
F	Road Grade:	0.0%				Auto		.833			
	Left View:	-90.0 degre				m Truck		.562			
	Right View:	90.0 degre	es		Heav	y Truck	s: 32	.589			
FHWA Noise Mode		-									
VehicleType	REMEL	Traffic Flow		stance		Road	Fres		Barrier At		rm Atter
Autos:	66.51			2.6		-1.20		-4.52		000	0.0
Medium Trucks:	77.72			2.6	-	-1.20		-4.86		000	0.00
Heavy Trucks:	82.99			2.6		-1.20		-5.69	0.	000	0.00
Unmitigated Noise	•							_			
VehicleType Autos:	Leq Peak Ho		61.4	Leq E	vening		Night 54	^	Ldn 62		NEL 63
Medium Trucks:		3.1 2.8	61.3		59.6 55.5		54. 54	-	62.	-	62
Heavy Trucks:		2.8 3.4	61.9		56.8		55.	-	63.	-	63
Vehicle Noise:		7.9	66.3		62.4		59.		67.		68
Centerline Distance	e to Noise C	ontour (in fee	t)								
		(		70 (	dBA	65	dBA		60 dBA	55	dBA
			Ldn:		23		5	)	108	3	23

Friday, October 21, 2022

Noise Source Elevations (in feet)   Source Elevations (in feet)		FHWA-RI	D-77-108 HIGH	WAY	NOISE	PREDIC	TION M	ODEL	(9/12/2	(021)		
Average Daily Traffic (Adt):   5,712 vehicles   Peak Hour Percentage:   9,40%   15   Medium Trucks (2 Axles):   15   Medium Trucks (3 Axles):   15   Medium Trucks (3 Axles):   15   Medium Trucks (3 Axles):   15   Medium Trucks (3 Axles):   15   Medium Trucks (3 Axles):   15   Medium Trucks (3 Axles):   15   Medium Trucks (3 Axles):   15   Medium Trucks (3 Axles):   15   Medium Trucks (3 Axles):   15   Medium Trucks (3 Axles):   15   Medium Trucks (3 Axles):   15   Medium Trucks:   16   Medium Trucks:   16   Medium Trucks:   17   Medium Trucks	Road Na	ne: Struck Av.	t.									
Average Daily Traffic (Adt): 5,712 vehicles Peak Hour Potencentage: 9,40% Peak Hour Potences Peak Hour Volume: 537 vehicles Vehicle Speed: 40 mph Near/Far Lane Distance: 12 feet    Vehicle Mix		SPECIFIC IN	IPUT DATA			0:4- 0					S	
Peak Hour Volume: Vehicle Speed: 40 mph   Near/Far Lane Distance: 12 feet   Vehicle Mix   Vehicle	Average Daily	. ,	- /	S					Autos	: 15		
		-	537 vehicles									
Site Data   Sarrier Height:   Day   Evering   Night   Day   Night				İ								
		une Distance.	12 1001			Veh				-		
Barrier Type (0-Well, 1-Berm): 0.0   Centerline Dist. to Observer: 33.0 feet   Centerline Dist. to Observer: 33.0 feet   Autos: 0.000   Medium Trucks: 0.000   Centerline Dist. to Observer: 0.0 feet   Autos: 0.000   Medium Trucks: 0.000   Centerline Dist. to Observer: 0.0 feet   Autos: 0.000   Medium Trucks: 0.000   Centerline Dist. Centerline Dist. Centerline Dist. Centerline Distance to Noise Noi												
Centerline Dist. to Observer:   33.0 feet   Autos: 0.000												
Centerline Dist. to Observer:   3.0 feet   Barrier Distance to Observer:   0.0 feet   Distance to Observer:   0.0 feet   Distance to Observer Height (Above Pad):   5.0 feet   Distance to Observer Height (Above Pad):   5.0 feet   Distance to Observer Height (Above Pad):   5.0 feet   Distance to Observer Height (Above Pad):   5.0 feet   Distance to Observer Height (Above Pad):   0.0 feet   Distance to Observer Heavy Trucks:   32.833   Distance to Observer Heavy Trucks:   32.562   Distance to Observer Distanc	Centerline D	ist. to Barrier:	33.0 feet		-	Noise So	urce Fl	evatio	ns (in f	eet)		
Distance   Height (Above Pad):   5.0 feet   Heavy Trucks:   8.004   Grade Adjustment: 0.0							Auto	s: (	0.000	000,		
Road Elevation:		. ,						· -		Grade Ad	ljustment	t: 0.0
Road Grade:	-				H	I ano Fa	uivalont	Dieta	nce (in	foot)		
Left View:	, A				-	Lane Lq				iccij		
Fight View: 90.0 degrees   Heavy Trucks: 32.589   Fight View: 90.0 degrees   Heavy Trucks: 32.589   Fight View: 90.0 degrees   Heavy Trucks: 32.589   Fight View: 90.0 degrees   Fight Road   Fresnel   Barrier Atten   Berm Atten   Autos: 66.51					Mediu							
VehicleType								0.				
Autos: 66.51	FHWA Noise Mod	del Calculation	s									
Medium Trucks:   77.72   -16.03   2.69   -1.20   -4.86   0.000   0.000     Heavy Trucks:   82.99   -20.69   2.69   -1.20   -5.69   0.000   0.000     Mimiligated Noise Levels (without Topo and barrier attenuation)   VehicleType	VehicleType	REMEL	Traffic Flow	Dis	tance	Finite	Road	Fres	snel	Barrier Att	en Bei	rm Atten
Heavy Trucks:   82.99   -20.69   2.69   -1.20   -5.69   0.000   0.000     Inmitigated Noise Levels (without Topo and barrier attenuation)   Vehicle Type   Leq Peak Hour   Leq Day   Leq Evening   Leq Night   Ldn   CNEL     Medium Trucks:   63.5   61.8   60.0   55.1   63.2   63.8     Medium Trucks:   63.2   61.8   55.9   55.1   63.0   63.8     Heavy Trucks:   63.8   62.3   57.2   56.0   63.8   64.     Vehicle Noise:   63.3   66.7   62.8   60.2   68.1   68.     Centerline Distance to Noise Contour (in feet)   70 dBA   65 dBA   60 dBA   55 dBA     Ldn:   25   53   115   245   245     Control Type   Leq Peak Hour   Ldn   Ldn   Ldn   Ldn   Ldn     Control Type   Leq Peak Hour   Ldn   Ldn   Ldn   Ldn   Ldn     Control Type   Leq Peak Hour   Ldn   Ldn   Ldn   Ldn     Control Type   Leq Peak Hour   Ldn   Ldn   Ldn   Ldn     Control Type   Leq Peak Hour   Ldn   Ldn   Ldn     Control Type   Ldn   Ldn   Ldn   Ldn   Ldn     Control Type   Ldn   Ldn   Ldn   Ldn     Control Type   Ldn   Ldn   Ldn   Ldn     Control Type   Ldn   Ldn   Ldn   Ldn     Control Type   Ldn   Ldn   Ldn   Ldn     Control Type   Ldn   Ldn   Ldn     Control Type   Ldn   Ldn   Ldn     Control Type   Ldn   Ldn   Ldn     Control Type   Ldn   Ldn   Ldn     Control Type   Ldn   Ldn   Ldn     Control Type   Ldn   Ldn   Ldn     Control Type   Ldn   Ldn   Ldn     Control Type   Ldn   Ldn   Ldn     Control Type   Ldn   Ldn   Ldn     Control Type   Ldn   Ldn   Ldn     Control Type   Ldn   Ldn   Ldn     Control Type   Ldn   Ldn   Ldn     Control Type   Ldn   Ldn   Ldn     Control Type   Ldn   Ldn   Ldn     Control Type   Ldn   Ldn   Ldn     Control Type   Ldn   Ldn     Control Type   Ldn   Ldn     Control Type   Ldn   Ldn     Control Type   Ldn   Ldn     Control Type   Ldn   Ldn     Control Type   Ldn   Ldn     Control Type   Ldn   Ldn     Control Type   Ldn   Ldn     Control Type   Ldn   Ldn     Control Type   Ldn   Ldn     Control Type   Ldn   Ldn     Control Type   Ldn   Ldn     Control Type   Ldn   Ldn     Control Type   Ldn   Ldn     Control Type   Ldn   Ldn	Autos	: 66.51	-4.41		2.6	4	-1.20		-4.52	0.	000	0.000
Inmitigated Noise   Levels (without Topo and barrier attenuation)   VehicleType   Leq Peak Hour   Leq Day   Leq Evening   Leq Night   Ldn   CNEL	Medium Trucks	77.72	-16.03		2.6	9	-1.20		-4.86	0.	000	0.000
VehicleType						-	-1.20		-5.69	0.	000	0.000
Autos:         63.5         61.8         60.0         55.1         63.2         63.           Medium Trucks:         63.2         61.8         55.9         55.1         63.0         63.           Heavy Trucks:         63.8         62.3         57.2         56.0         63.8         64.           Vehicle Noise:         68.3         66.7         62.8         60.2         68.1         68.           Centerline Distance to Noise Contour (in feet)         70 dBA         65 dBA         60 dBA         55 dBA           Ldn:         25         53         115         24				_								
Medium Trucks:         63.2         61.8         55.9         55.1         63.0         63.           Heavy Trucks:         63.8         62.3         57.2         56.0         63.8         64.           Vehicle Noise:         68.3         66.7         62.8         60.2         68.1         68.           Centerline Distance to Noise Contour (in feet)         70 dBA         65 dBA         60 dBA         55 dBA           Ldn:         25         53         115         24					Leq E				1		_	
Heavy Trucks:   63.8   62.3   57.2   56.0   63.8   64.												
Vehicle Noise:         68.3         66.7         62.8         60.2         68.1         68.           Centerline Distance to Noise Contour (in feet)         70 dBA         65 dBA         60 dBA         55 dBA           Ldn:         25         53         115         24											-	
70 dBA 65 dBA 60 dBA 55 dBA Ldn: 25 53 115 24:									68.5			
Ldn: 25 53 115 24	Centerline Distar	ce to Noise Co	ontour (in feet)									
					70	dBA	65	dBA		60 dBA	55	dBA
CNEL: 26 56 121 260	Ldn:					25 53 115			247			
			CN	IEL:		26 56 121				260		

	FHWA-RD	-77-108 HIGH	WAY	NOISE	PREDIC	CTION M	ODEL	(9/12/2	021)			
	rio: E ne: Struck Av. ent: e/o Main St.					Project Job N	Name: umber:		truck			
	SPECIFIC IN	PUT DATA							L INPUT	s		
Highway Data				2	site Cor	ditions	(Hard =					
Average Daily	. ,	1,525 vehicle	es					Autos:				
	Percentage:	9.40%				edium Tru		,				
	Hour Volume:	143 vehicles	S		He	eavy Truc	cks (3+	Axles):	15			
	ehicle Speed:	40 mph		١	/ehicle	Mix						
Near/Far La	ane Distance:	12 feet			Ver	icleType		Dav	Evening	Nial	t Dail	
Site Data							Autos:	75.5%	12.5%	12.	0% 91.47	
Rs	rrier Height:	0.0 feet			M	edium Ti	rucks:	81.6%	5.3%	13.	1% 6.36	
Barrier Type (0-V	Vall, 1-Berm):	0.0				Heavy Tr	rucks:	79.9%	6.2%	14.	0% 2.17	
	ist. to Barrier:	33.0 feet		1	loise S	ource El	evation	s (in f	eet)			
Centerline Dist.	to Observer:	33.0 feet			Autos: 0.000							
Barrier Distance		0.0 feet			Mediu	m Trucks	s: 2	.297				
Observer Height		5.0 feet			Hea	vy Trucks	s: 8	.004	Grade Ad	ljustm	ent: 0.0	
	ad Elevation:	0.0 feet										
	ad Elevation:	0.0 feet		L	ane Eq	uivalent			feet)			
	Road Grade:	0.0%				Autos		.833				
	Left View:	-90.0 degrees			Medium Trucks: 32.562 Heavy Trucks: 32.589							
	Right View:	90.0 degrees			Hea	vy Trucks	s: 32	.589				
FHWA Noise Mod					,							
VehicleType	REMEL	Traffic Flow	Dis	stance							Berm Atte	
Autos:		-10.15		2.64		-1.20		-4.52		000	0.0	
Medium Trucks:		-21.73		2.69		-1.20		-4.86		000	0.0	
Heavy Trucks:		-26.39		2.69		-1.20		-5.69	0.	000	0.0	
Unmitigated Nois VehicleType	Leg Peak Hou			er atteni Leg Ev		Lea	Night		Ldn	T	CNEL	
Autos:			56.1	. 4	54.3		49.	3	57.	5	5	
Medium Trucks:			56.1		50.2		49.	4	57.	3	5	
Heavy Trucks:	58.	1	56.6		51.5 50.3 58.1					58		
Vehicle Noise:		6	61.0		57.1		54.	4	62.	4	62	
Centerline Distan	ce to Noise Co	ntour (in feet,	)	70	70 /04			55 ID.				
				/U a				55 dBA				
			Ldn:		10 22 48			10				
		CI	VEL:		11 23 50			10				

Scenari Road Nam Road Segmen	e: Struck Av.	-				.,	t Name: lumber:		ruck				
	SPECIFIC IN	IPUT DATA							L INPUT	S			
Highway Data				S	Site Cor	ditions	(Hard :		oft = 15)				
Average Daily	Traffic (Adt):	1,823 vehicle	es					Autos:					
	Percentage:	9.40%				dium Tr	,	,					
Peak H	our Volume:	171 vehicle	S		He	avy Tru	cks (3+	Axles):	15				
Vel	hicle Speed:	40 mph		v	/ehicle	Mix							
Near/Far Lar	ne Distance:	12 feet		F	Veh	icleType	,	Day	Evening	Night	Daily		
Site Data							Autos:	75.5%	12.5%	12.0%	91.47%		
Par	rier Heiaht:	0.0 feet			М	edium T	rucks:	81.6%	5.3%	13.1%	6.36%		
Barrier Type (0-W		0.0				Heavy T	rucks:	79.9%	6.2%	14.0%	2.17%		
Centerline Dis	. ,	33.0 feet		-									
Centerline Dist. 1		33.0 feet		٨	loise S				eet)				
Barrier Distance t		0.0 feet				Auto		.000					
Observer Height (		5.0 feet				m Truck		.297					
	nd Elevation:	0.0 feet			Hear	y Truck	:s: 8	.004	Grade Ad	iustment	: 0.0		
	d Elevation:	0.0 feet		L	ane Eq	uivalen	t Distar	nce (in	feet)				
F	Road Grade:	0.0%				Auto	s: 32	2.833					
	Left View:	-90.0 degre	es		Mediu	m Truck	s: 32	562					
	Right View:	90.0 degre			Heavy Trucks: 32.589								
FHWA Noise Mode	l Calculation	s											
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite	Road	Fres	nel	Barrier Att	en Ber	m Atten		
Autos:	66.51	-9.37		2.64	1	-1.20		-4.52	0.0	000	0.000		
Medium Trucks:	77.72	-20.95		2.69	9	-1.20		-4.86	0.0	000	0.000		
Heavy Trucks:	82.99	-25.61		2.69	9	-1.20		-5.69	0.0	000	0.000		
Unmitigated Noise	Levels (with	out Topo and	barri	er atteni	uation)								
VehicleType	Leq Peak Hou	ır Leq Day	/	Leq Ev	rening	Leq	Night		Ldn		NEL		
Autos:	58		56.8		55.0		50	.1	58.2	-	58.8		
Medium Trucks:	58	.3	56.8		51.0		50	.1	58.1	1	58.3		
Heavy Trucks:	58	.9	57.4		52.3		51	.0	58.9	9	59.1		
Vehicle Noise:	63	.3	61.8		57.9		55	.2	63.2	2	63.5		
Centerline Distanc	e to Noise Co	ntour (in feet	)					1					
			L	70 d		65	dBA		60 dBA		dBA		
			Ldn:		12		2	-	54		116		
			NEL:		12		2	R	57		122		

Scenario: F+P						Project N	ame: F	34 St	ruck		
Road Name: Struck	kΔv					Job Nui			uck		
Road Segment: e/o M						000 1441	inder.	10101			
SITE SPECIF	IC INP	UT DATA							L INPUT	s	
Highway Data				Si	te Con	ditions (F	lard =	10, Sc	ft = 15)		
Average Daily Traffic (A	\dt):	1,591 vehicle	3				-	Autos:	15		
Peak Hour Percenta	age:	9.40%			Me	dium Truc	ks (2 A	xles):	15		
Peak Hour Volu	me:	150 vehicles			He	avy Truck	s (3+ A	xles):	15		
Vehicle Spe	eed:	40 mph		V	ehicle I	Nix					
Near/Far Lane Distar	nce:	12 feet				cleType		Day	Evening	Night	Daily
Site Data						Au	tos:	75.5%	12.5%	12.0%	91.82
Barrier Heid	aht:	0.0 feet			Me	edium Tru	cks:	81.6%	5.3%	13.1%	6.09
Barrier Type (0-Wall, 1-Bei		0.0			F	leavy Tru	cks:	79.9%	6.2%	14.0%	2.08
Centerline Dist. to Bar	rier:	33.0 feet		M	nien Sa	urce Elev	ations	· (in fo	not)		
Centerline Dist. to Obser	ver:	33.0 feet		/4	DISE SU	Autos:		000	ei)		
Barrier Distance to Obser	ver:	0.0 feet			Mediu	n Trucks:		97			
Observer Height (Above P	ad):	5.0 feet				v Trucks:		004	Grade Ad	iustment	0.0
Pad Elevat		0.0 feet				,					
Road Elevat		0.0 feet		La	ne Equ	ıivalent E			eet)		
Road Gra		0.0%				Autos:					
Left V		-90.0 degree				n Trucks:					
Right Vi	iew:	90.0 degree	5		Heav	y Trucks:	32.5	589			
FHWA Noise Model Calcul											
VehicleType REME		Traffic Flow	Dista		Finite		Fresn		Barrier Att		rm Atter
	66.51	-9.95		2.64		-1.20		-4.52		000	0.0
	77.72	-21.73		2.69		-1.20		-4.86		000	0.0
	82.99	-26.39		2.69		-1.20		-5.69	0.0	000	0.00
Unmitigated Noise Levels	•										
VehicleType Leq Pea	K Hour 58.0	Leq Day	i6.3	.eq Eve	ening 54.5	Leq N	gnt 49.5		Ldn 57.7		NEL 58
Autos: Medium Trucks:	57.5	-	i6.1		50.2		49.5		57.		57
Heavy Trucks:	58.1	-	i6.6		51.5		50.3		58.1	-	58
Vehicle Noise:	62.6		0.0 1.1		57.2		54.5		62.5		62
					01.2		0 1.0		02.0		
Centerline Distance to Noi	se Con	tour (in feet)		70 dF	24	65 dF	8.4	6	i0 dBA	55	dBA
		1	dn:	70 UL	10	00 01	22		48		10

Friday, October 21, 2022

	FHWA-RI	D-77-108 HIGH	WAY	NOIS	E PREDIC	TION M	ODEL	(9/12/2	2021)		
Road Na	ario: OYC+P me: Struck Av. ent: e/o Main St					Project Job N		534 S 13101			
SITE Highway Data	SPECIFIC IN	IPUT DATA			Site Con				EL INPUT	S	
Average Dail	y Traffic (Adt):	1,889 vehicle	es				-	Autos	: 15		
Peak	r Percentage: Hour Volume:	9.40% 178 vehicles	s			edium Tru eavy Truc					
	'ehicle Speed: ane Distance:	40 mph 12 feet			Vehicle I						
Site Data	and Biolamos.	12 1001			Veh	icleType	Autos:	75.59	Evening 12.5%	Night 12.0%	Daily 91.77%
	arrier Height: Wall. 1-Berm):	0.0 feet 0.0				edium Ti Heavy Ti	ucks:	81.69 79.99	6 5.3%	13.1%	6.13%
	Dist. to Barrier:	33.0 feet			Noise So	nurca El	ovatio	ne (in t	foot)		
Centerline Dist Barrier Distance Observer Height	e to Observer:	33.0 feet 0.0 feet 5.0 feet			Autos: 0.000 Medium Trucks: 2.297 Heavy Trucks: 8.004 Grade Adjustment:						٠.٥٥
- 1	Pad Elevation:	0.0 feet			Heat	y Truck	S. 6	3.004	Grade Ad	justinent	. 0.0
R	oad Elevation: Road Grade: Left View: Right View:	0.0 feet 0.0% -90.0 degree 90.0 degree				Autos M Trucks y Trucks	s: 32 s: 32	nce (in 2.833 2.562 2.589	feet)		
FHWA Noise Mo	del Calculation	s									
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite	Road	Fres	snel	Barrier Att	en Bei	rm Atten
Autos		-9.21		2.0		-1.20		-4.52		000	0.000
Medium Trucks Heavy Trucks		-20.95 -25.61		2.0		-1.20 -1.20		-4.86 -5.69		000 000	0.000
Unmitigated Nois	se Levels (with	out Topo and	barri	er atte	nuation)						
VehicleType	Leq Peak Hou			Leq E	vening		Night		Ldn	_	NEL
Autos			57.0		55.2		50		58.		58.9
Medium Trucks			56.8		51.0		50		58.		58.3
Heavy Trucks Vehicle Noise			57.4 61.8		52.3 58.0		51 55		58. 63.	-	59.1 63.6
Centerline Distar	nce to Noise Co	ontour (in feet	)								
				70	dBA	65	dBA		60 dBA	55	dBA
			Ldn:		12		2	-	54		117
		CI	NEL:		12		2	6	57	,	123

	FHWA-RI	D-77-108 HIGH	WAY	NOISE	PREDIC	TION N	IODEL	(9/12/2	021)		
	io: E ne: Struck Av. nt: e/o Batavia	Av.					Name: lumber:		ruck		
	SPECIFIC IN	IPUT DATA			0:4- 0				L INPUT	s	
Highway Data					Site Cor	aitions	(Hara =				
Average Daily	. ,	1,477 vehicle	es					Autos:			
	Percentage:	9.40%				dium Tr					
Peak F	lour Volume:	139 vehicle	S		He	avy Tru	cks (3+	Axles):	15		
Ve	hicle Speed:	40 mph		- 1	Vehicle	Mix					
Near/Far La	ne Distance:	12 feet		F		icleType	,	Dav	Evenina	Niaht	Daily
Site Data							Autos:	75.5%	12.5%	12.09	
Ra	rrier Height:	0.0 feet			М	edium T	rucks:	81.6%	5.3%	13.19	% 6.36%
Barrier Type (0-W		0.0				Heavy T	rucks:	79.9%	6.2%	14.09	% 2.17%
Centerline Di		33.0 feet			Noise S	······································	laveatian	o (in f	2061		
Centerline Dist.	to Observer:	33.0 feet		H.	worse 3	Auto		.000	et)		
Barrier Distance	to Observer:	0.0 feet			A de elle	m Truck		297			
Observer Height	(Above Pad):	5.0 feet						.004	Grade Ad	livetme	at: 0.0
P	ad Elevation:	0.0 feet			неа	y Truck	S: 8	.004	Grade At	ijusirrier	и. 0.0
Ro	ad Elevation:	0.0 feet			Lane Eq	uivalen	t Distan	ce (in	feet)		
	Road Grade:	0.0%		Ī		Auto	s: 32	.833			
	Left View:	-90.0 degree		Mediu	m Truck	s: 32	.562				
	Right View:	90.0 degree	es		Hea	y Truck	s: 32	.589			
FHWA Noise Mod	el Calculation	s									
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite	Road	Fres	nel	Barrier At	ten Be	erm Atten
Autos:	66.51			2.6	•	-1.20		-4.52	0.	000	0.000
Medium Trucks:	77.72	-21.87		2.6	9	-1.20		-4.86	0.	000	0.000
Heavy Trucks:	82.99	-26.53		2.6	9	-1.20		-5.69	0.	000	0.000
Unmitigated Noise	e Levels (with	out Topo and	barrie	er atten	uation)						
VehicleType	Leq Peak Hou	ır Leq Day	/	Leq E	vening	Leq	Night		Ldn	(	CNEL
Autos:	57	7.7	55.9		54.1		49.	2	57.	3	57.8
Medium Trucks:	57	7.3	55.9		50.1		49.	2	57.	2	57.4
Heavy Trucks:	58	3.0	56.5		51.3		50.	1	58.	0	58.2
Vehicle Noise:	62	2.4	60.9		57.0		54.	3	62.	3	62.6
Centerline Distan	ce to Noise Co	ontour (in feet	)								
				70	dBA	65	dBA	6	60 dBA	5	5 dBA
			Ldn:		10		22	2	47	7	101
	CNEL:						11 23 49				106

Scenario Road Namo Road Segmen	e: Struck Av.	ı Av.			Project Name: 534 Struck Job Number: 13101									
	SPECIFIC IN	IPUT DATA			ita Car				L INPUT	s				
Highway Data				٥	ite Cor	nditions	(Hara							
Average Daily	. ,	1,875 vehic	les					Autos:	15					
Peak Hour		9.40%				edium Ti		,						
	our Volume:	176 vehicle	es		He	eavy Tru	icks (3+	Axles):	15					
	nicle Speed:	40 mph		ν	'ehicle	Mix								
Near/Far Lar	ne Distance:	12 feet			Veh	icleType	е	Day	Evening	Night	Daily			
Site Data							Autos:	75.5%	12.5%	12.0%	91.47%			
Rar	rier Heiaht:	0.0 feet			M	ledium 7	rucks:	81.6%	5.3%	13.1%	6.36%			
Barrier Type (0-W		0.0				Heavy 7	rucks:	79.9%	6.2%	14.0%	2.17%			
Centerline Dis	t. to Barrier:	33.0 feet			Inica S	ource E	lovatio	ne (in fa	not)					
Centerline Dist. t	o Observer:	33.0 feet		- "	10/36 0	Auto		0.000	,					
Barrier Distance t	o Observer:	0.0 feet			Modiu	m Truck		2.297						
Observer Height (A	Above Pad):	5.0 feet				vy Truck		3.004	Grade Ad	iustmant	. 0.0			
Pa	d Elevation:	0.0 feet			пеа	vy IIucr	is. c	5.004	Orace Au	Justinent	0.0			
Roa	d Elevation:	0.0 feet		L	ane Eq	uivalen	t Distar	nce (in	feet)					
F	Road Grade:	0.0%				Auto	s: 32	2.833						
	Left View:	-90.0 degre	ees		Mediu	m Truck	(s: 32	2.562						
	Right View:	90.0 degre	ees		Heavy Trucks: 32.589									
FHWA Noise Mode	l Calculation	s												
VehicleType	REMEL	Traffic Flow	Di	stance	Finite	Road	Fres	inel	Barrier Att	en Ber	m Atten			
Autos:	66.51	-9.25	5	2.64	ĺ	-1.20		-4.52	0.0	000	0.00			
Medium Trucks:	77.72	-20.83	3	2.69	9	-1.20		-4.86	0.0	000	0.00			
Heavy Trucks:	82.99	-25.49	9	2.69	)	-1.20		-5.69	0.0	000	0.00			
Unmitigated Noise	Levels (with	out Topo and	l barri	er atteni	uation)									
	Leq Peak Hou		,	Leq Ev			Night		Ldn		VEL			
Autos:	58		56.9		55.2		50		58.3		58.9			
Medium Trucks:	58		57.0		51.1		50		58.2		58.4			
Heavy Trucks:	59		57.5		52.4		51	-	59.0	-	59.			
Vehicle Noise:	63	3.5	61.9		58.0	)	55	.3	63.3	3	63.			
Centerline Distanc	e to Noise Co	ontour (in fee	t)											
			L	70 d		65	dBA		60 dBA		dBA			
			Ldn:		12		2	-	55		118 124			
			NEL:		12		2		58					

Scenari	o. E.D					Proiect N	lama: T	24 64	wek		
	e: Struck Av.					Job Nur			UCK		
	t: e/o Batavia	Αv				JOD IVUI	iibei. I	3101			
	SPECIFIC IN					NO	ISE M	ODE	L INPUT	s	
Highway Data					Site Con	ditions (H					
Average Daily	Traffic (Adt):	1,873 vehicle	8				A	lutos:	15		
Peak Hour	Percentage:	9.40%			Ме	dium Truc	ks (2 A	xles):	15		
Peak H	our Volume:	176 vehicles			He	avy Truck	s (3+ A	xles):	15		
Vel	hicle Speed:	40 mph		,	Vehicle I	Miv					
Near/Far Lar	ne Distance:	12 feet		H'		cleType		Dav	Evening	Niaht	Dailv
Site Data						Au	tos:	75.5%	12.5%	12.0%	83.88
Bar	rier Heiaht:	0.0 feet			Me	edium Tru	cks: 8	31.6%	5.3%	13.1%	6.42
Barrier Type (0-W		0.0			F	leavy Tru	cks:	79.9%	6.2%	14.0%	9.70
Centerline Dis	st. to Barrier:	33.0 feet		,	Noiso Sc	urce Elev	ations	(in fo	of)		
Centerline Dist.	to Observer:	33.0 feet		ľ	<b>V</b> 0/36 30	Autos:	0.0	•	ei)		
Barrier Distance t	to Observer:	0.0 feet			Mediu	n Trucks:					
Observer Height (	,	5.0 feet				v Trucks:			Grade Ad	iustment	0.0
	ad Elevation:	0.0 feet		_ L		,					
	d Elevation:	0.0 feet		1	Lane Eq	uivalent D			eet)		
F	Road Grade:	0.0%				Autos:					
	Left View:	-90.0 degree				n Trucks:					
	Right View:	90.0 degree	3		неач	y Trucks:	32.5	189			
FHWA Noise Mode											
VehicleType	REMEL	Traffic Flow	Dist	tance	Finite		Fresne		Barrier Att		m Atter
Autos:	66.51	-9.63		2.6		-1.20		4.52		000	0.0
Medium Trucks:	77.72 82.99	-20.79 -19.00		2.69	-	-1.20 -1.20		4.86 5.69		000	0.00
Heavy Trucks:						-1.20		-5.09	0.0	100	0.00
Unmitigated Noise			arrie			/ N/			Ldn		NFL.
VehicleType Autos:	Leq Peak Hou 58.		6.6	Leq E	vening 54.8	Leq Ni	gnt 49.8		58.0		VEL 58
Medium Trucks:	58.		7.0		51.2		50.3		58.3		58
Heavy Trucks:	65.		4.0		58.9		57.7		65.5		65
Vehicle Noise:	66.		5.4		60.8		59.0		66.8		67
Centerline Distanc	e to Noise Co	ntour (in feet)									
Jonathine Distant		oar (m reet)	Т	70 c	iBA	65 dE	3A	6	0 dBA	55	dBA
		L	dn:		20		44		94		20

Friday, October 21, 2022

	FHWA-RI	D-77-108 HIGH	WAY	NOISE	PREDIC	TION M	ODEL	(9/12/2	(021)		
Road Na	ario: OYC+P me: Struck Av. ent: e/o Batavia	ı Av.				Project Job N		534 S 13101			
SITI Highway Data	SPECIFIC IN	IPUT DATA			Site Con				EL INPUT	s	
Average Dail Peak Hot	y Traffic (Adt): ur Percentage: Hour Volume:	2,271 vehicle 9.40% 213 vehicle			Ме	edium Tru	ıcks (2	Autos Axles)	: 15 : 15		
	ehicle Speed:	40 mph 12 feet			Vehicle I				1 1		Daily
Site Data		12			VehicleType         Day         Evening         Night           Autos:         75.5%         12.5%         12.0%						
	arrier Height: Wall, 1-Berm):	0.0 feet 0.0				edium Tr Heavy Tr	ucks:	79.99	6 5.3%	13.1% 14.0%	6.41%
Centerline L	Dist. to Barrier:	33.0 feet			Noise So	ource Flo	evatio	ns (in t	eet)		
Barrier Distance Observer Heigh	t (Above Pad):	33.0 feet 0.0 feet 5.0 feet		•	Mediu	Autos m Trucks	s: (	0.000 2.297 3.004	Grade Ad	ljustment	: 0.0
	Pad Elevation:	0.0 feet 0.0 feet				•			• •		
K	oad Elevation: Road Grade: Left View: Right View:	0.0 feet 0.0% -90.0 degree 90.0 degree				Autos m Trucks yy Trucks	s: 32 s: 32	2.833 2.562 2.589	reety		
FHWA Noise Mo	del Calculation	s									
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite	Road	Fres	snel	Barrier Att	en Bei	m Atten
Autos	66.51	-8.73		2.6	64	-1.20		-4.52	0.	000	0.000
Medium Trucks				2.6		-1.20		-4.86		000	0.000
Heavy Trucks	82.99	-18.80		2.6	69	-1.20		-5.69	0.	000	0.000
Unmitigated Noi			_					_			
VehicleType Auto:	Leq Peak Hou		57.5	Leq E	vening 55.7		Night 50	7	Ldn 58.	_	NEL 59.4
Medium Truck			57.8		52.0		50 51		59.		59.4
Heavy Trucks			64.2		59.1		57		65.		65.9
Vehicle Noise			65.8		61.3		59		67.		67.5
Centerline Dista	nce to Noise C	ontour (in feet,	)								
				70	dBA	65 (	dΒA		60 dBA	55	dBA
			Ldn:		22		4	6	100	)	216
		CI	VEL:		23		4	9	105	5	225



# APPENDIX 9.1:

CADNAA OPERATIONAL NOISE MODEL INPUTS





### 13101 - 534 Struck Ave.

CadnaA Noise Prediction Model: 13101-04.cna

Date: 23.10.22 Analyst: B. Lawson

**Calculation Configuration** 

Configurat	tion
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	М.	ID		Level Lr		Lir	nit. Valı	ue		Land	Use	Height		C	oordinates	
			Day	Night	CNEL	Day	Night	CNEL	Туре	Auto	Noise Type			Х	Υ	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
RECEIVERS		R1	52.3	52.2	58.8	55.0	50.0	0.0				5.00	а	6072857.41	2240757.59	5.00
RECEIVERS		R2	46.7	46.6	53.2	55.0	50.0	0.0				5.00	а	6073285.73	2240919.33	5.00
RECEIVERS		R3	51.7	51.6	58.3	55.0	50.0	0.0				5.00	а	6073312.99	2240705.79	5.00
RECEIVERS		R4	47.3	47.2	53.9	55.0	50.0	0.0				5.00	а	6073512.27	2240711.54	5.00
RECEIVERS		R5	42.9	42.8	49.5	55.0	50.0	0.0				5.00	а	6072900.12	2239309.94	5.00
RECEIVERS		R6	40.6	39.6	46.2	55.0	50.0	0.0				5.00	а	6072750.68	2239983.95	5.00

# Point Source(s)

Name	M.	ID	R	esult. PW	/L		Lw/L	i	Ope	erating Ti	ime	Heigh	t	Co	oordinates	
			Day	Evening	Night	Туре	Value	norm.	Day	Special	Night			Х	Υ	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	6073030.03	2240550.23	50.00
POINTSOURCE		AC02	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	5.00	g	6073093.90	2240549.08	50.00
POINTSOURCE		AC03	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	5.00	g	6072836.13	2239962.82	50.00
POINTSOURCE		TRASH01	89.0	89.0	89.0	Lw	89		150.00	0.00	90.00	5.00	а	6072930.80	2240538.82	5.00
POINTSOURCE		PARK01	87.8	87.8	87.8	Lw	87.8					5.00	а	6072848.68	2240617.52	5.00
POINTSOURCE		PARK02	87.8	87.8	87.8	Lw	87.8					5.00	а	6072848.68	2240582.16	5.00
POINTSOURCE		PARK03	87.8	87.8	87.8	Lw	87.8					5.00	а	6072849.25	2240547.37	5.00
POINTSOURCE		PARK04	87.8	87.8	87.8	Lw	87.8					5.00	а	6072950.76	2240614.10	5.00
POINTSOURCE		PARK05	87.8	87.8	87.8	Lw	87.8					5.00	а	6072999.81	2240614.10	5.00
POINTSOURCE		PARK06	87.8	87.8	87.8	Lw	87.8					5.00	а	6073056.83	2240614.10	5.00
POINTSOURCE		PARK07	87.8	87.8	87.8	Lw	87.8					5.00	а	6073112.15	2240612.39	5.00
POINTSOURCE		PARK08	87.8	87.8	87.8	Lw	87.8					5.00	а	6073155.50	2240599.27	5.00

Name	M.	ID	R	esult. PW	'L		Lw / L	i	Op	erating Ti	ime	Height	t	Co	oordinates	
			Day	Evening	Night	Туре	Value	norm.	Day	Special	Night			Х	Υ	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(ft)		(ft)	(ft)	(ft)
POINTSOURCE		PARK09	87.8	87.8	87.8	Lw	87.8					5.00	а	6073189.14	2240582.73	5.00

#### Line Source(s)

Name	M.	ID	R	esult. PW	'L	R	esult. PW	L'		Lw/L	i	Op	erating Ti	me		Moving	Pt. Src		Heigl	nt
			Day	Evening	Night	Day	Evening	Night	Туре	Value	norm.	Day	Special	Night		Number		Speed		П
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	Day	Evening	Night	(mph)	(ft)	
LINESOURCE		TRUCK01	93.2	93.2	93.2	77.2	77.2	77.2	Lw	93.2									8	а
LINESOURCE		TRUCK02	93.2	93.2	93.2	79.0	79.0	79.0	Lw	93.2									8	а

Name	Begin (ft) 8.00 a		ght		Coordinat	es	
	Begin		End	х	у	Z	Ground
	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
LINESOURCE	8.00	а		6072902.86	2240526.43	8.00	0.00
				6072904.52	2240658.08	8.00	0.00
LINESOURCE	8.00	а		6073219.96	2240535.02	8.00	0.00
				6073221.83	2240621.66	8.00	0.00

## Area Source(s)

Name	M.	ID	R	esult. PW	'L	Re	esult. PW	L"		Lw / L	i	Оре	erating Ti	me	Height	t
			Day	Evening	Night	Day	Evening	Night	Туре	Value	norm.	Day	Special	Night	(ft)	П
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)		
AREASOURCE		DOCK01	103.4	103.4	103.4	59.0	59.0	59.0	Lw	103.4					8	a

Name	H	lei	ght		Coordinat	es	
	Begin		End	х	у	Z	Ground
	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
AREASOURCE	8.00	а		6072815.60	2240527.98	8.00	0.00
				6073008.66	2240524.55	8.00	0.00
				6072999.81	2239997.04	8.00	0.00
				6073099.04	2239994.19	8.00	0.00
				6073108.11	2240536.55	8.00	0.00
				6073370.71	2240532.96	8.00	0.00
				6073366.50	2240497.52	8.00	0.00
				6073351.78	2239919.99	8.00	0.00
				6073238.19	2239921.76	8.00	0.00
				6073235.86	2239866.37	8.00	0.00
				6072861.73	2239873.39	8.00	0.00
				6072862.36	2239920.05	8.00	0.00
				6072864.65	2240009.59	8.00	0.00
				6072810.47	2240010.16	8.00	0.00

#### Barrier(s)

Dairiei (3)														
Name	M.	ID	Abso	rption	Z-Ext.	Cant	ilever		lei	ght		Coordinat	es	
			left	right		horz.	vert.	Begin		End	×	У	z	Ground
					(ft)	(ft)	(ft)	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
BARRIERPLANNED		0						8.00	а		6072921.93	2240526.09	8.00	0.00
											6073008.66	2240524.55	8.00	0.00
BARRIERPLANNED		0						8.00	а		6073108.11	2240536.55	8.00	0.00
											6073197.88	2240535.32	8.00	0.00
BARRIERPLANNED		0						8.00	а		6073239.21	2240534.76	8.00	0.00
											6073370.71	2240532.96	8.00	0.00
BARRIERPLANNED		0						8.00	а		6072812.71	2240528.67	8.00	0.00
-											6072879.86	2240526.84	8.00	0.00

# Building(s)

Name	M.	ID	RB	Residents	Absorption	Height	:		Coordinat	es	
						Begin		х	у	z	Ground
						(ft)		(ft)	(ft)	(ft)	(ft)
BUILDING		BUILDING00001	х	0		45.00	а	6073009.50	2240574.75	45.00	0.00
								6073108.73	2240573.61	45.00	0.00
								6073099.04	2239994.19	45.00	0.00
								6072999.81	2239997.04	45.00	0.00
BUILDING		BUILDING00002	х	0		45.00	а	6072810.47	2240010.16	45.00	0.00
								6072864.65	2240009.59	45.00	0.00
								6072862.36	2239920.05	45.00	0.00
								6072808.76	2239921.19	45.00	0.00
BUILDING		BUILDING00003	х	0		15.00	а	6072702.46	2240176.86	15.00	0.00
								6072802.62	2240174.39	15.00	0.00
								6072801.38	2240125.54	15.00	0.00
								6072702.46	2240124.92	15.00	0.00
BUILDING		BUILDING00004	х	0		15.00	a	6072696.28	2240113.79	15.00	0.00
								6072801.38	2240115.65	15.00	0.00
								6072801.38	2239906.67	15.00	0.00

Urban Crossroads, Inc.

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Name	M.	ID	RB	Residents	Absorption	Height			Coordinat	es	
						Begin	Τ	х	У	Z	Ground
						(ft)	Т	(ft)	(ft)	(ft)	(ft)
								6072745.74	2239907.90	15.00	0.00
							Т	6072743.88	2239968.50	15.00	0.00
							Т	6072777.27	2239968.50	15.00	0.00
								6072777.89	2240036.51	15.00	0.00
							Т	6072694.42	2240036.51	15.00	0.00



# **APPENDIX 10.1:**

**CADNAA CONSTRUCTION NOISE MODEL INPUTS** 





### 13101 - 534 Struck Ave.

CadnaA Noise Prediction Model: 13101-04\_Construction.cna

Date: 23.10.22 Analyst: B. Lawson

**Calculation Configuration** 

Configuration
Max. Error (dB)       0.00         Max. Search Radius (#{Unit,LEN})       2000.01         Min. Dist Src to Rcvr       0.00         Partition       0.50         Max. Length of Section (#{Unit,LEN})       999.99         Min. Length of Section (#{Unit,LEN})       1.01
Max. Search Radius (#(Unit,LEN))       2000.01         Min. Dist Src to Rcvr       0.00         Partition       0.50         Max. Length of Section (#(Unit,LEN))       999.99         Min. Length of Section (#(Unit,LEN))       1.01
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
Partition         0.50           Raster Factor         0.50           Max. Length of Section (#(Unit,LEN))         999.99           Min. Length of Section (#(Unit,LEN))         1.01
Raster Factor         0.50           Max. Length of Section (#(Unit,LEN))         999.99           Min. Length of Section (#(Unit,LEN))         1.01
Max. Length of Section (#(Unit,LEN)) 999.99 Min. Length of Section (#(Unit,LEN)) 1.01
Min. Length of Section (#(Unit,LEN)) 1.01
Min Length of Section (%) 0.00
Willia Length of Section (70)
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 Barrie
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		Lir	nit. Val	ue		Land	Use	Height	:	Ci	oordinates	
			Day	Night	CNEL	Day	Night	CNEL	Туре	Auto	Noise Type			Х	Υ	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
RECEIVERS		R1	73.8	73.8	80.4	80.0	0.0	0.0				5.00	а	6072857.41	2240757.59	5.00
RECEIVERS		R2	66.2	66.2	72.9	80.0	0.0	0.0				5.00	а	6073285.73	2240919.33	5.00
RECEIVERS		R3	78.7	78.7	85.4	80.0	0.0	0.0				5.00	а	6073312.99	2240705.79	5.00
RECEIVERS		R4	70.3	70.3	76.9	80.0	0.0	0.0				5.00	а	6073512.27	2240711.54	5.00
RECEIVERS		R5	59.0	59.0	65.6	80.0	0.0	0.0				5.00	а	6072900.12	2239309.94	5.00
RECEIVERS		R6	57.1	57.1	63.8	80.0	0.0	0.0				5.00	а	6072750.68	2239983.95	5.00

### Point Source(s)

Name	M.	ID	R	esult. PW	'L		Lw/L	i	Op	erating Ti	ime	Height	t	Co	oordinates	
			Day	Evening	Night	Туре	Value	norm.	Day	Special	Night			Х	Υ	Z
			(dBA) (dBA) (dBA)				dB(A)	(min)	(min)	(min)	(ft)		(ft)	(ft)	(ft)	
CONSTRUCTION		CONS01	115.0	115.0	115.0	Lw	115					8.00	а	6073360.24	2240661.10	8.00
CONSTRUCTION		CONS03	115.0	115.0	115.0	Lw	115					8.00	а	6072857.10	2240646.89	8.00
CONSTRUCTION		CONS04	115.0	115.0	115.0	Lw	115					8.00	а	6072873.19	2239955.06	8.00

## Area Source(s)

Name	M.	ID	R	esult. PW	L	Re	esult. PW	L"		Lw/L	i	Оре	erating Ti	ime	Height	1
			Day	Evening	Night	Day	Evening	Night	Туре	Value	norm.	Day	Special	Night	(ft)	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)		
SITEBOUNDARY		CONSTRUCTION	115.0	115.0	115.0	69.0	69.0	69.0	Lw	115					0	а

Name	Height				Coordinates					
	Begin		End		х	у	Z	Ground		
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)		
SITEBOUNDARY	0.00	а			6072813.36	2240659.79	0.00	0.00		
					6073148.26	2240653.51	0.00	0.00		
					6073157.59	2240652.23	0.00	0.00		
					6073166.57	2240649.40	0.00	0.00		
					6073174.95	2240645.10	0.00	0.00		
					6073182.49	2240639.46	0.00	0.00		
					6073188.98	2240632.64	0.00	0.00		
					6073197.52	2240627.52	0.00	0.00		
					6073206.78	2240623.90	0.00	0.00		
					6073216.52	2240621.86	0.00	0.00		
					6073226.47	2240621.47	0.00	0.00		
					6073236.34	2240622.75	0.00	0.00		
					6073245.86	2240625.64	0.00	0.00		
					6073254.77	2240630.07	0.00	0.00		
					6073262.82	2240635.93	0.00	0.00		
					6073269.78	2240643.04	0.00	0.00		
					6073275.46	2240651.21	0.00	0.00		
					6073279.71	2240660.21	0.00	0.00		
					6073282.40	2240669.79	0.00	0.00		
					6073283.47	2240679.68	0.00	0.00		
					6073390.72	2240677.55	0.00	0.00		
					6073380.77	2240617.80	0.00	0.00		
					6073366.50	2240497.52	0.00	0.00		
					6073359.26	2240316.02	0.00	0.00		
					6073355.86	2240136.14	0.00	0.00		
					6073350.72	2239864.22	0.00	0.00		
					6072809.47	2239874.37	0.00	0.00		

Building(s)

017											
Name	M.	ID	RB	Residents	Absorption	Height	t	Coordinates			
						Begin		х	у	Z	Ground
						(ft)		(ft)	(ft)	(ft)	(ft)
BUILDING		BUILDING00003	х	0		15.00	а	6072702.46	2240176.86	15.00	0.00
								6072802.62	2240174.39	15.00	0.00
								6072801.38	2240125.54	15.00	0.00
								6072702.46	2240124.92	15.00	0.00
BUILDING		BUILDING00004	х	0		15.00	а	6072696.28	2240113.79	15.00	0.00
								6072801.38	2240115.65	15.00	0.00
								6072801.38	2239906.67	15.00	0.00
								6072745.74	2239907.90	15.00	0.00
								6072743.88	2239968.50	15.00	0.00
								6072777.27	2239968.50	15.00	0.00
								6072777.89	2240036.51	15.00	0.00
								6072694.42	2240036.51	15.00	0.00