

Cedar Avenue Technology Park Noise Impact Analysis County of San Bernardino

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11139-04 Noise Study



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LIST OF ABBREVIATED TERMS

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

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EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the noise exposure and the necessary noise mitigation measures for the proposed Cedar Avenue Technology Park development ("Project"). The Project site is located on the northeast corner of the intersection of Cedar Avenue and Orange Street in the unincorporated Bloomington community in the County of San Bernardino. The Project proposes the construction and operation of a 184,770-square-foot concrete tilt-up warehouse center, which includes 10,000 square feet of office/administrative uses. At the time this noise analysis was prepared, the future tenants of the proposed Project were unknown, and therefore, this noise study includes a conservative analysis of the proposed Project uses. This study has been prepared to satisfy applicable County of San Bernardino standards and thresholds of significance based on guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1)

OFF-SITE TRAFFIC NOISE ANALYSIS

Traffic generated by the operation of the proposed Project will influence the traffic noise levels in surrounding off-site areas. To quantify the off-site traffic noise increases on the surrounding off-site areas, the changes in traffic noise levels on 10 study-area roadway segments were calculated based on the change in the average daily traffic (ADT) volumes. The traffic noise levels provided in this analysis are based on the traffic forecasts found in the *Cedar Avenue Technology Park Traffic Impact Analysis* prepared by Urban Crossroads, Inc. (2) To assess the off-site noise level impacts associated with the proposed Project, noise contour boundaries were developed for Existing, Opening Year 2019, and Horizon Year 2035 traffic conditions. The analysis shows that the Project-related traffic noise level increases under all traffic scenarios will be *less than significant*.

OPERATIONAL NOISE AND VIBRATION ANALYSIS

Using reference noise levels to represent the expected noise sources from the Cedar Avenue Technology Park site, this analysis estimates the Project-related stationary-source noise levels at nearby sensitive receiver locations. The normal activities associated with the proposed Cedar Avenue Technology Park are anticipated to include idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, parking lot vehicle movements, and roof-top air conditioning units. The operational noise analysis shows that the Project-related stationary-source noise levels will satisfy the County of San Bernardino Development Code daytime and nighttime exterior noise level standards at all nearby receiver locations with the planned 12-foot high screen wall. (3)

Further, this analysis demonstrates that the Project will not contribute a long-term operational noise level impact to the existing ambient noise environment at any of the sensitive receiver locations. Therefore, the operational noise level impacts associated with the proposed 24-hour seven days per week Project activities, such as the idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, parking lot vehicle movements, and roof-top air conditioning units, are considered *less than significant*.



The operation of the Project site will include heavy trucks moving on site to and from the loading dock areas. Truck vibration levels are dependent on vehicle characteristics, load, speed, and pavement conditions. Typical vibration levels for the Cedar Avenue Technology Park heavy truck activity at normal traffic speeds will approach 0.001 in/sec PPV, based on the Federal Transit Administration (FTA) *Transit Noise Impact and Vibration Assessment*. (4) Truck deliveries transiting on site will be travelling at very low speeds so it is expected that delivery truck vibration impacts at nearby homes will satisfy the peak particle velocity (PPV) vibration threshold of 0.2 in/sec, and therefore, will be *less than significant*.

CONSTRUCTION NOISE AND VIBRATION ANALYSIS

Construction noise represents a short-term increase on the ambient noise levels. Constructionrelated noise impacts are expected to create temporary and intermittent high-level noise conditions at receivers surrounding the Project site. Using sample reference noise levels to represent the planned construction activities of the Cedar Avenue Technology Park site, this analysis estimates the Project-related construction noise levels at nearby sensitive receiver locations. The Project-related short-term construction noise levels are expected to approach 75.7 dBA Leq and will satisfy the 85 dBA Leq threshold identified by the National Institute for Occupational Safety and Health (NIOSH) at all receiver locations. Therefore, based on the results of this analysis, all nearby sensitive receiver locations will experience *less than significant* impacts due to Project construction noise levels.

Further, to describe the temporary Project construction noise level contributions to the existing ambient noise environment, the Project construction noise levels were combined with the existing ambient noise levels measurements at the off-site receiver locations. A temporary noise level increase of 12 dBA Leq is considered a potentially significant impact based on the Caltrans substantial noise level increase criteria which is used to assess the Project-construction noise level increases. (5) The analysis shows that the Project will contribute unmitigated, worst-case construction noise level increases approaching 15.4 dBA Leq during the daytime construction hours at receiver location R4. Since the worst-case temporary noise level increase of up to 15.4 dBA Leq during Project construction will exceed the 12 dBA Leq significance threshold, the unmitigated construction noise level increases are considered *potentially significant* temporary noise impacts at receiver location R4.

Therefore, construction noise mitigation is required to reduce the short-term noise level increases at receiver location R4. With the mitigation measures identified in this noise study, all nearby sensitive receiver locations will experience *less than significant* impacts due to temporary Project construction noise levels. The construction noise analysis presents a conservative approach with the highest noise-level-producing equipment for each stage of Project construction operating at the closest point from construction activity to the nearby sensitive receiver locations. This scenario is unlikely to occur during typical construction activities and likely overstates the construction noise levels which will be experienced at each receiver location.



Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from Project construction activities would cause only intermittent, localized intrusion. This analysis shows the highest construction vibration levels are expected to approach a peak particle velocity (PPV) of 0.02 in/sec at the nearby receiver locations which is below the vibration standard of 0.2 in/sec PPV at all receiver locations during Project construction. Therefore, the Project-related vibration impacts are considered *less than significant* during the construction activities at the Project site.

Further, the Project-related construction vibration levels do not represent levels capable of causing building damage to nearby residential homes. The FTA identifies construction vibration levels capable of building damage ranging from 0.12 to 0.5 in/sec PPV. (4) The peak Project-construction vibration levels will approach 0.02 in/sec PPV, and are below the FTA vibration levels for building damage at the residential homes near the Project site. Further, the impacts at the site of the closest sensitive receivers 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 nearest the closest sensitive receiver. Construction at the Project site will be restricted to daytime hours consistent with City requirements thereby eliminating potential vibration impact during the sensitive nighttime hours.

CONSTRUCTION NOISE MITIGATION MEASURES

Though construction noise is temporary, intermittent and of short duration, and will not present any long-term impacts, the following mitigation measures would reduce noise level increases produced by the construction equipment to the nearby noise-sensitive residential land uses:

- Install minimum 6-foot high temporary construction noise barriers at the Project's southern site boundary adjacent to sensitive receivers on Orange Street, as shown on Exhibit 10-A, for the duration of Project construction. The noise control barriers must have a solid face from top to bottom. The noise control barriers must meet the minimum height and be constructed as follows:
 - The temporary noise barriers shall provide a minimum transmission loss of 20 dBA (Federal Highway Administration, Noise Barrier Design Handbook). The noise barrier shall be constructed using an acoustical blanket (e.g. vinyl acoustic curtains or quilted blankets) attached to the construction site perimeter fence or equivalent temporary fence posts;
 - The noise barrier must be maintained and any damage promptly repaired. Gaps, holes, or weaknesses in the barrier or openings between the barrier and the ground shall be promptly repaired;
 - The noise control barrier and associated elements shall be completely removed and the site appropriately restored upon the conclusion of the construction activity.
- During all Project site construction, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. The construction contractor shall place all stationary construction



equipment so that emitted noise is directed away from the noise sensitive receptors nearest the Project site.

• The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and noise-sensitive receivers nearest the Project site during all Project construction (i.e., to the north).

SUMMARY OF SIGNIFICANCE FINDINGS

The results of this Cedar Avenue Technology Park Noise Impact Analysis are summarized below based on the significance criteria in Section 4 of this report. Table ES-1 shows the findings of significance for each potential noise and/or vibration impact before and after any required mitigation measures.

Analysia	Report	Significance Findings		
Analysis	Section	Unmitigated	Mitigated	
Off-Site Traffic Noise Level Increases	7	Less Than Significant	n/a	
Operational Noise Levels		Less Than Significant	n/a	
Long-Term Operational Noise Level Increases	9	Less Than Significant	n/a	
Operational Vibration Levels		Less Than Significant	n/a	
Construction Noise Levels		Less Than Significant	n/a	
Temporary Construction Noise Level Increases	10	Potentially Significant	Less Than Significant	
Construction Vibration Levels		Less Than Significant	n/a	

TABLE ES-1: SUMMARY OF SIGNIFICANCE FINDINGS

BLOOMINGTON JUNIOR HIGH SCHOOL

The closest noise-sensitive land use to the Project site is Bloomington Junior High School, as represented by receiver locations R3 and R4, south of the Project site across Orange Street. Receiver location R3 represents an outdoor basketball court and location R4 represents the closest outdoor area and classroom buildings of Bloomington Junior High School at roughly 60 feet from the property line to the Project site, consistent with the *Cedar Avenue Technology Park Air Quality Impact Analysis* prepared by Michael Baker International. (6) As described previously, the potential off-site traffic, operational, and construction noise and vibration levels were analyzed in this noise study at Bloomington Junior High School to evaluate potential Project-related impacts.

Project-related truck and automobile traffic will contribute to existing and future traffic noise levels on Orange Street adjacent to Bloomington Junior High School. Based on the off-site traffic noise analysis, which accounts for individual truck trips on the Project study area roadway segments, the Project-related increases on Orange Street will be *less than significant*. Further, Horizon Year 2035 with Project traffic noise levels on Orange Street are shown to remain below the 65 dBA CNEL noise level standard for school land uses, based on Section 83.01.080(d), Table 83-3, of the County of San Bernardino, Title 8 Development Code. (3)

Using the reference noise levels to represent the proposed Project operations that include idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, parking lot vehicle movements, and roof-top air conditioning units, the operational source noise levels were calculated at Bloomington Junior High School. The operational noise analysis shows that the Project-related stationary-source noise levels at Bloomington Junior High School will satisfy the County of San Bernardino Development Code daytime and nighttime exterior noise level standards at all nearby receiver locations with the planned 12-foot high screen wall at the Project site. (3) Further, Project operational noise level contributions to the existing ambient noise levels at Bloomington Junior High School are shown to approach 0.1 dBA Leq, which result in a *less than significant* long-term noise impact.

Temporary, worst-case Project construction noise levels will approach 75.7 dBA Leq at receiver location R4 which is shown to satisfy the NIOSH 85 dBA Leq threshold used in this analysis. However, the Project will contribute unmitigated, worst-case construction noise level increases approaching 15.4 dBA Leq during the daytime construction hours at receiver location R4 which will exceed the 12 dBA Leq Caltrans significance threshold, and therefore, are considered *potentially significant* temporary noise impacts at receiver location R4. As a result, construction noise mitigation is required to reduce the short-term noise level increases at Bloomington Junior High School. With the temporary construction noise barrier and mitigation measures identified in this noise study, the construction noise level increases will be reduced to *less than significant* impacts at Bloomington Junior High School.



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1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of the proposed Cedar Avenue Technology Park ("Project"). This noise study briefly describes the proposed Project, provides information regarding noise fundamentals, describes the local regulatory setting, provides the study methods and procedures for traffic noise analysis, and evaluates the future exterior noise environment. In addition, this study includes an analysis of the potential Project-related long-term operational and short-term construction noise impacts.

1.1 SITE LOCATION

The proposed Cedar Avenue Technology Park site is located on the northeast corner of the intersection of Cedar Avenue and Orange Street in the unincorporated Bloomington community in the County of San Bernardino, as shown on Exhibit 1-A. Existing land uses near the site include a vacant lot to the west of Cedar Avenue, Colton Joint Unified School administrative buildings and Bloomington Junior High School to the south of Orange Street, an existing office/warehouse building east of Vine Street, and a Union Pacific Railroad yard to the northeast.

1.2 PROJECT DESCRIPTION

The Project proposes the construction and operation of a 184,770-square-foot concrete tilt-up warehouse center, which includes 10,000 square feet of office/administrative uses, as shown on Exhibit 1-B. 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: idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, parking lot vehicle movements, and roof-top air conditioning units. This noise analysis is intended to describe noise level impacts associated with the expected typical warehouse use activities at the Project site.

Per the *Cedar Avenue Technology Park Traffic Impact Analysis* prepared by Michael Baker International the Project is expected to generate a net total of approximately 658 trip-ends per day (actual vehicles) with 56 AM peak hour trips and 59 PM peak hour trips. (2) The net Project trip generation includes 135 truck trip-ends per day from the proposed buildings within the Project site. This noise study relies on the net Project trips (as opposed to the passenger car equivalents) to accurately account for the effect of individual truck trips on the study area roadway network.







EXHIBIT 1-B: SITE PLAN





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2 FUNDAMENTALS

Noise has been simply defined as "unwanted sound." Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Noise is measured on a logarithmic scale of sound pressure level known as a decibel (dB). A-weighted decibels (dBA) approximate the subjective response of the human ear to broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies which are audible to the human ear. Exhibit 2-A presents a summary of the typical noise levels and their subjective loudness and effects that are described in more detail below.

COMMON OUTDOOR ACTIVITIES	COMMON INDOOR ACTIVITIES	A - WEIGHTED SOUND LEVEL dBA	SUBJECTIVE LOUDNESS	EFFECTS OF NOISE
THRESHOLD OF PAIN		140	\mathbf{X}	
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		
DIESEL TRUCK AT 15m (50 ft), at 80 km/hr (50 mph)	FOOD BLENDER AT 1m (3 ft)	80		
NOISY URBAN AREA, DAYTIME	VACUUM CLEANER AT 3m (10 ft)	70	LOUD	SPEECH INTERFERENCE
HEAVY TRAFFIC AT 90m (300 ft)	NORMAL SPEECH AT 1m (3 ft)	60		
QUIET URBAN DAYTIME	LARGE BUSINESS OFFICE	50	MODERATE	SLEEP
QUIET URBAN NIGHTTIME	THEATER, LARGE CONFERENCE ROOM (BACKGROUND)	40		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		

EXHIBIT 2-A: TYPICAL NOISE LEVELS

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. (7) The most common sounds vary between 40 dBA (very quiet) to 100 dBA (very loud). Normal conversation at three feet is roughly at 60 dBA, while loud jet engine noises equate to 110 dBA



at approximately 100 feet, which can cause serious discomfort. (8) 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 commonly used figure is the equivalent level (Leq). Equivalent sound levels are not measured directly but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level (Leq) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period and is commonly used to describe the "average" noise levels within the environment.

To describe the time-varying character of environmental noise, the statistical or percentile noise descriptors L_{50} , L_{25} , L_8 and L_2 , are commonly used. The percentile noise descriptors are the noise levels equaled or exceeded during 50 percent, 25 percent, 8 percent, and 2 percent of a stated time. Sound levels associated with the L_2 and L_8 typically describe transient or short-term events, while levels associated with the L_{50} describe the steady state (or median) noise conditions. While the L_{50} describes the median noise levels occurring 50 percent of the time, the Leq accounts for the total energy (average) observed for the entire hour. Therefore, the Leq noise descriptor is generally 1-2 dBA higher than the L_{50} noise level.

Peak hour or average noise levels, while useful, do not completely describe a given noise environment. Noise levels lower than peak hour may be disturbing if they occur during times when quiet is most desirable, namely evening and nighttime (sleeping) hours. To account for this, the Community Noise Equivalent Level (CNEL), representing a composite 24-hour noise level is utilized. The CNEL is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time of day corrections require the addition of 5 decibels to dBA Leq sound levels in the evening from 7:00 p.m. to 10:00 p.m., and the additions are made to account for the noise sensitive time periods during the evening and night hours when sound appears louder. CNEL does not represent the actual sound level heard at any time, but rather represents the total sound exposure. The County of San Bernardino relies on the 24-hour CNEL level to assess land use compatibility with transportation related noise sources.

2.3 SOUND PROPAGATION

When sound propagates over a distance, it changes in level and frequency content. The way noise reduces with distance depends on the following factors.

2.3.1 GEOMETRIC SPREADING

Sound from a localized source (i.e., a stationary point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to



as cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source. (7)

2.3.2 GROUND ABSORPTION

The propagation path of noise from a highway to a receptor 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 receptor, 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 receptor 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. (9)

2.3.3 ATMOSPHERIC EFFECTS

Receptors 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. (7)

2.3.4 SHIELDING

A large object or barrier in the path between a noise source and a receptor can substantially attenuate noise levels at the receptor. 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 resident. 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 FHWA does not consider the planting of vegetation to be a noise abatement measure. (9)

2.4 NOISE CONTROL

Noise control is the process of obtaining an acceptable noise environment for an observation point or receptor by controlling the noise source, transmission path, receptor, or all three. This concept is known as the source-path-receptor 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 receptor. Noise barriers, however, do have limitations. For a noise barrier to work, it must be high enough and long enough to block the path of the noise source. (9)

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. (10)

2.7 COMMUNITY RESPONSE TO NOISE

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

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

Approximately ten percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints will occur. Another twenty-five percent of the population will not complain even in very severe noise environments. Thus, a variety of reactions can be expected from people exposed to any given noise environment. (11) Surveys have shown that about ten percent of the people exposed to traffic noise of 60 dBA will report being highly annoyed with the noise, and each increase of one dBA is associated with approximately two percent more people being highly annoyed. When traffic noise exceeds 60 dBA or aircraft noise exceeds 55 dBA, people may begin to complain. (11) 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. An increase or decrease of 1 dBA cannot be perceived except in carefully controlled laboratory experiments, a change of 3 dBA are considered *barely perceptible*, and changes of 5 dBA are considered *readily perceptible*. (9)



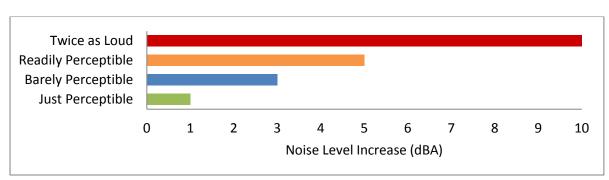


EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION

2.8 EXPOSURE TO HIGH NOISE LEVELS

The Occupational Safety and Health Administration (OSHA) sets legal limits on noise exposure in the workplace. The permissible exposure limit (PEL) for a worker over an eight-hour day is 90 dBA. The OSHA standard uses a 5 dBA exchange rate. This means that when the noise level is increased by 5 dBA, the amount of time a person can be exposed to a certain noise level to receive the same dose is cut in half. The National Institute for Occupational Safety and Health (NIOSH) has recommended that all worker exposures to noise should be controlled below a level equivalent to 85 dBA for eight hours to minimize occupational noise induced hearing loss. NIOSH also recommends a 3 dBA exchange rate so that every increase by 3 dBA doubles the amount of the noise and halves the recommended amount of exposure time. (12)

OSHA has implemented requirements to protect all workers in general industry (e.g. the manufacturing and the service sectors) for employers to implement a Hearing Conservation Program where workers are exposed to a time weighted average noise level of 85 dBA or higher over an eight-hour work shift. Hearing Conservation Programs require employers to measure noise levels, provide free annual hearing exams and free hearing protection, provide training, and conduct evaluations of the adequacy of the hearing protectors in use unless changes to tools, equipment and schedules are made so that they are less noisy and worker exposure to noise is less than the 85 dBA. This noise study does not evaluate the noise exposure of workers within a project or construction site based on CEQA requirements, and instead, evaluates Project-related operational and construction noise levels at the nearby sensitive receiver locations in the Project study area. Further, periodic exposure to high noise levels in short duration, such as Project construction, is typically considered an annoyance and not impactful to human health. It would take several years of exposure to high noise levels to result in hearing impairment. (13)

2.9 VIBRATION

Per the Federal Transit Administration (FTA) *Transit Noise Impact and Vibration Assessment* (4), 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.

The background vibration-velocity level in residential areas is generally 50 VdB. Ground-borne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground-borne vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Exhibit 2-C illustrates common vibration sources and the human and structural response to ground-borne vibration.

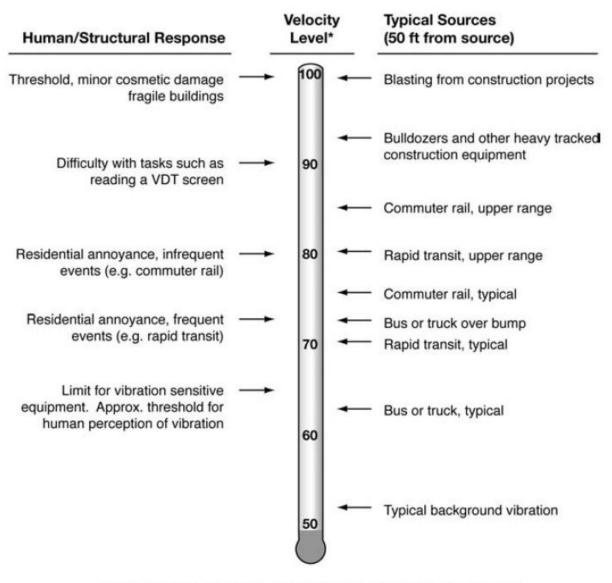


EXHIBIT 2-C: TYPICAL LEVELS OF GROUND-BORNE VIBRATION

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

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



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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). (14) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*.

3.2 STATE OF CALIFORNIA GREEN BUILDING STANDARDS CODE

The 2014 State of California's Green Building Standards Code contains mandatory measures for non-residential building construction in Section 5.507 on Environmental Comfort. (15) These noise standards are applied to new construction in California for controlling interior noise levels resulting from exterior noise sources. The regulations specify that acoustical studies must be prepared when non-residential structures are developed in areas where the exterior noise levels exceed 65 dBA CNEL, such as within a noise contour of an airport, freeway, railroad, and other areas where noise contours are not readily available. If the development falls within an airport or freeway 65 dBA CNEL noise contour, the combined sound transmission class (STC) rating of the wall and roof-ceiling assemblies must be at least 50. For those developments in areas where noise contours are not readily available and the noise level exceeds 65 dBA Leq for any hour of operation, a wall and roof-ceiling combined STC rating of 45, and exterior windows with a minimum STC rating of 40 are required (Section 5.507.4.1).

3.3 COUNTY OF SAN BERNARDINO GENERAL PLAN NOISE ELEMENT

The County of San Bernardino has adopted a Noise Element of the General Plan to limit the exposure of the community to excessive noise levels. (16) The most common sources of environmental noise in San Bernardino County are associated with roads, airports, railroad operations, and industrial activities. The facilities are used to transport residents, consumer products and provide basic infrastructure for the community. (16) To address these noise sources found in the County of San Bernardino, the following goals have been identified in the General Plan Noise Element:



- N 1 The County will abate and avoid excessive noise exposures through noise mitigation measures incorporated into the design of new noise-generating and new noise-sensitive land uses, while protecting areas within the County where the present noise environment is within acceptable limits.
- N 1.5 Limit truck traffic in residential and commercial areas to designated truck routes; limit construction, delivery, and through-truck traffic to designated routes; and distribute maps of approved truck routes to County traffic officers.
- *N 2* The County will strive to preserve and maintain the quiet environment of mountain, desert and other rural areas.

3.4 COUNTY OF SAN BERNARDINO DEVELOPMENT CODE

While the County of San Bernardino General Plan Noise Element provides guidelines and criteria to assess transportation noise on sensitive land uses, the County Code, Title 8 Development Code contains the noise level limits for mobile, stationary, and construction-related noise sources. (3)

3.4.1 TRANSPORTATION NOISE STANDARDS

Section 83.01.080(d), Table 83-3, contains the County of San Bernardino's mobile noise sourcerelated standards, shown on Exhibit 3-A. Based on the County's mobile noise source standards, there are no exterior or interior noise level standards for the manufacturing or warehouse buildings of the Project. Exterior transportation (mobile) noise level standards for residential land uses in the Project study area are shown to be 60 dBA CNEL.



	Noise Standards for Adjacent Mobile Noise Sources					
Land Use Ldn (or CNEL) dB(A)						
Categories	Uses	Interior (1)	Exterior (2			
Residential	Single and multi-family, duplex, mobile homes	45	60(3)			
Commercial	Hotel, motel, transient housing	45	60(3)			
	Commercial retail, bank, restaurant	50	N/A			
	Office building, research and development, professional offices	45	65			
	Amphitheater, concert hall, auditorium, movie theater	45	N/A			
Institutional/Public	Hospital, nursing home, school classroom, religious institution, library	45	65			
Open Space	Park	N/A	65			
 Hospital/office built Hotel and motel rect Mobile home parks Multi-family private Park picnic areas 	 Multi-family private patios or balconies Park picnic areas Private yard of single-family dwellings 					
mitigated through a rea exceed 45 dB(A) (or CN	evel of up to 65 dB(A) (or CNEL) shall be allowed provided exterior noise levels have asonable application of the best available noise reduction technology, and interior EL) with windows and doors closed. Requiring that windows and doors remain clos se level shall necessitate the use of air conditioning or mechanical ventilation.	r noise exposu	re does not			
	se Equivalent Level). The average equivalent A-weighted sound level during a 24-ho tely five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and te p.m. to 7:00 a.m.					

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

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

3.4.2 OPERATIONAL NOISE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property such as the Cedar Avenue Technology Park Project, stationary-source (operational) noise such as the expected idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, parking lot vehicle movements, and roof-top air conditioning units are typically evaluated against standards established under a jurisdiction's Municipal Code. Therefore, to accurately describe the potential Project-related operational noise levels, this analysis presents the appropriate stationary-source noise level standards from the County of San Bernardino County Code, Title 8 Development Code.

The County of San Bernardino County Code, Title 8 Development Code, Section 83.01.080(c) establishes the noise level standards for stationary noise sources. Since the Project's industrial land use will potentially impact adjacent noise-sensitive uses in the Project study are, this noise study relies on the more conservative residential noise level standards to describe potential operational noise impacts. For residential properties, the exterior noise level shall not exceed 55 dBA Leq during the daytime hours (7:00 a.m. to 10:00 p.m.) and 45 dBA Leq during the nighttime



hours (10:00 p.m. to 7:00 a.m.) for both the whole hour, and for not more than 30 minutes in any hour. (3)

The exterior noise level standards shall apply for a cumulative period of 30 minutes in any hour, as well as plus 5 dBA cannot be exceeded for a cumulative period of more than 15 minutes in any hour, or the standard plus 10 dBA for a cumulative period of more than 5 minutes in any hour, or the standard plus 15 dBA for a cumulative period of more than 1 minute in any hour, or the standard plus 20 dBA for any period of time. The County of San Bernardino operational noise level standards are shown on Table 3-1 and included in Appendix 3.1.

		Daytime Exterior Noise Level Standards (dBA) ²					
Land Use ¹	Time Period	Leq (E. Avg.)	L₅₀ (30 mins)	L ₂₅ (15 mins)	L ₈ (5 mins)	L₂ (1 min)	L _{max} (Anytime)
Decidential	Daytime	55	55	60	65	70	75
Residential	Nighttime	45	45	50	55	60	65
Professional Services	Anytime	55	55	60	65	70	75
Other Commercial	Anytime	60	60	65	70	75	80
Industrial	Anytime	70	70	75	80	85	90

TABLE 3-1: OPERATIONAL NOISE STANDARDS

¹ Source: Section 83.01.080(c) of the County of San Bernardino County Code, Title 8 Development Code (Appendix 3.1).

² Leq represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. The percent noise level is the level exceeded "n" percent of the time during the measurement period. L_{25} is the noise level exceeded 25% of the time. "Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.; "E. Avg." = logarithmic (energy) average

3.4.3 CONSTRUCTION NOISE STANDARDS

To analyze noise impacts originating from the construction of the Cedar Avenue Technology Park Project, noise from construction activities are typically limited to the hours of operation established under a jurisdiction's Municipal Code. Section 83.01.080(g)(3) of the County of San Bernardino Development Code, provided in Appendix 3.1, indicates that construction activity is considered exempt from the noise level standards between the hours of 7:00a.m. to 7:00 p.m. except on Sundays and Federal holidays, as shown on Table 3-1. (3) However, neither the County of San Bernardino General Plan or County 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, the following construction noise level threshold is used in this noise study.

To evaluate whether the Project will generate potentially significant construction noise levels at off-site sensitive receiver locations, a construction-related noise level threshold is adopted from the *Criteria for Recommended Standard: Occupational Noise Exposure* prepared by the National Institute for Occupational Safety and Health (NIOSH). (17) A division of the U.S. Department of Health and Human Services, NIOSH identifies a noise level threshold based on the duration of exposure to the source. The construction related noise level threshold starts at 85 dBA for more than eight hours per day, and for every 3 dBA increase, the exposure time is cut in half. This results in noise level thresholds of 88 dBA for more than four hours per day, 92 dBA for more



than one hour per day, 96 dBA for more than 30 minutes per day, and up to 100 dBA for more than 15 minutes per day. (17) For the purposes of this analysis, the lowest, more conservative construction noise level threshold of 85 dBA Leq is used as an acceptable threshold for construction noise at the nearby sensitive receiver locations. Since this construction-related noise level threshold represents the energy average of the noise source over a given time, they are expressed as Leq noise levels. Therefore, the noise level threshold of 85 dBA Leq over a period of eight hours or more is used to evaluate the potential Project-related construction noise level impacts at the nearby sensitive receiver locations.

The Occupational Safety and Health Administration (OSHA) requires hearing protection be provided by employers in workplaces where the noise levels may, over long periods of exposure to high noise levels, endanger the hearing of their employees. Standard 29 CFR, Part 1910 indicates the noise levels under which a hearing conservation program is required to be provided to workers exposed to high noise levels. (12) This analysis does not evaluate the noise exposure of construction workers within the Project site based on CEQA requirements, and instead, evaluates the Project-related construction noise levels at the nearby sensitive receiver locations in the Project study area. Further, periodic exposure to high noise levels in short duration, such as Project construction, is typically considered an annoyance and not impactful to human health. It would take several years of exposure to high noise levels to result in hearing impairment. (13)

Jurisdiction	diction Permitted Hours of Construct Construction Activity Level Sta	
County of San Bernardino ¹	Exempt between 7:00 a.m. to 7:00 p.m.; except Sundays and Federal holidays.	n/a

TABLE 3-2: CONSTRUCTION NOISE STANDARDS

¹ Source: Section 83.01.080(g)(3) of the County of San Bernardino County Code, Title 8 Development Code (Appendix 3.1). "n/a" = County Code does not identify maximum acceptable construction source noise levels.

3.4.4 CONSTRUCTION VIBRATION STANDARDS

To analyze vibration impacts originating from the operation and construction of the Cedar Avenue Technology Park, vibration-generating activities are typically evaluated against standards established under a jurisdiction's Municipal Code. Therefore, the County of San Bernardino Development Code vibration level standards are used in this analysis to assess potential impacts at nearby sensitive receiver locations. The vibration standards are summarized on Table 3-3.



The County of San Bernardino Development Code, Section 83.01.090(a) states that vibration shall be no *greater than or equal to two-tenths inches per second measured at or beyond the lot line.* (3) Therefore, to determine if the vibration levels due to the operation and construction of the Project, the peak particle velocity (PPV) vibration level standard of 0.2 inches per second is used.

Jurisdiction	Peak Particle Velocity (PPV) (inches/second)
County of San Bernardino ¹	0.2 in/sec

TABLE 3-3: VIBRATION STANDARDS

¹Source: Section 83.01.090(a) of the County of San Bernardino County Code, Title 8 Development Code (Appendix 3.1).



4 SIGNIFICANCE CRITERIA

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

- A. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- B. Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels.
- C. A substantial permanent increase in ambient noise levels in the Project vicinity above existing levels without the proposed Project; or
- D. A substantial temporary or periodic increase in ambient noise levels in the Project vicinity above noise levels existing without the proposed Project.
- E. For a project located within 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, expose people residing or working in the Project area to excessive noise levels.
- F. For a project within the vicinity of a private airstrip, expose people residing or working in the Project area to excessive noise levels.

While the CEQA Guidelines and the County of San Bernardino General Plan Guidelines provide direction on noise compatibility and establish noise standards by land use type that are sufficient to assess the significance of noise impacts under CEQA Guideline A, they do not define the levels at which increases are considered substantial for use under Guidelines B, C, and D. CEQA Guidelines E and F apply to nearby public and private airports, if any, and the Project's land use compatibility. The Project site is not located within two miles of a nearby airport or airport land use plan, nor located near a private airstrip. Therefore, the potential impacts under CEQA guidelines E and F are considered *less than significant*, and no further noise analysis is required for aircraft-related noise levels.

4.1 NOISE-SENSITIVE RECEIVERS

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 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.* (18)



4.1.1 SUBSTANTIAL PERMANENT NOISE LEVEL INCREASES

Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or of the corresponding human reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted—the so-called *ambient* environment.

In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will typically be judged. The Federal Interagency Committee on Noise (FICON) (19) developed guidance to be used for the assessment of project-generated increases in noise levels that consider the ambient noise level. The FICON recommendations are based on studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (CNEL) and equivalent continuous noise level (Leq).

As previously stated, the approach used in this noise study recognizes *that there is no single noise increase that renders the noise impact significant*, based on a 2008 California Court of Appeal ruling on Gray v. County of Madera. (18) For example, if the ambient noise environment is quiet (<60 dBA) and the new noise source greatly increases the noise levels, an impact may occur if the noise criteria may be exceeded. Therefore, for this analysis, FICON identifies a *readily perceptible* 5 dBA or greater project-related noise level increase is considered a significant impact when the noise criteria for a given land use is exceeded. Per the FICON, in areas where the without project noise levels range from 60 to 65 dBA, a 3 dBA *barely perceptible* noise level increase appears to be appropriate for most people. When the without project noise levels already exceed 65 dBA, any increase in community noise louder than 1.5 dBA or greater is considered a significant impact if the noise criteria for a given land use is exceeded, since it likely contributes to an existing noise exposure exceedance. Table 4-1 below provides a summary of the potential noise impact significance criteria, based on guidance from FICON.

Without Project Noise Level	Potential Significant Impact
< 60 dBA	5 dBA or more
60 - 65 dBA	3 dBA or more
> 65 dBA	1.5 dBA or more

TABLE 4-1: SIGNIFICANCE OF NOISE IMPACTS AT NOISE-SENSITIVE RECEIVERS

Federal Interagency Committee on Noise (FICON), 1992.



4.1.2 SUBSTANTIAL TEMPORARY OF PERIODIC NOISE LEVEL INCREASES

Due to the temporary, short-term nature of noise-generating construction activities, the temporary or periodic noise level increases over the existing ambient conditions must be considered under CEQA Guideline D. Therefore, the Caltrans *Traffic Noise Analysis Protocol* 12 dBA Leq *substantial* noise level increase threshold is used in this analysis to assess temporary noise level increases. (5) If the Project-related construction noise levels generate a temporary noise level increase above the existing ambient noise levels of up to 12 dBA Leq, then the Project construction noise level increases will be considered a potentially significant impact. Although the Caltrans recommendations were specifically developed to assess traffic noise impacts, the 12 dBA Leq substantial noise level increase threshold is used in California to address noise level increases with the potential to exceed existing conditions. (5)

4.2 NON-NOISE-SENSITIVE RECEIVERS

The County of San Bernardino Development Code, Section 83.01.080(d), Table 83-3 identifies transportation-related noise level standards. As previously shown on Exhibit 3-A, non-noise-sensitive land uses such as commercial and office uses, require exterior noise levels of 65 dBA CNEL per the County's Table 83-3 mobile noise source standards.

To determine if Project-related traffic noise level increases are significant at off-site non-noisesensitive land uses, a *readily perceptible* 5 dBA and *barely perceptible* 3 dBA criteria are used. When the without Project noise levels at the non-noise-sensitive land uses are below the 65 dBA CNEL exterior noise level standard, a *readily perceptible* 5 dBA or greater noise level increase is considered a significant impact. When the without Project noise levels are greater than the 65 dBA CNEL exterior noise level standard, a *barely perceptible* 3 dBA or greater noise level increase is considered a significant impact. When the noise level criteria is already exceeded. The noise level increases used to determine significant impacts for non-noise-sensitive land uses is generally consistent with the FICON noise level increase thresholds for noise-sensitive land uses but instead rely on the County of San Bernardino Development Code, Section 83.01.080(d), Table 83-3 exterior noise level standards.

4.3 SIGNIFICANCE CRITERIA SUMMARY

Noise impacts shall be considered significant if any of the following occur as a direct result of the proposed development. Table 4-2 shows the significance criteria summary matrix.

OFF-SITE TRAFFIC NOISE

- When the noise levels at existing and future noise-sensitive land uses (e.g. residential, etc.):
 - are less than 60 dBA CNEL and the Project creates a *readily perceptible* 5 dBA CNEL or greater Project-related noise level increase; or
 - range from 60 to 65 dBA CNEL and the Project creates a *barely perceptible* 3 dBA CNEL or greater Project-related noise level increase; or
 - already exceed 65 dBA CNEL, and the Project creates a community noise level impact of greater than 1.5 dBA CNEL (FICON, 1992).



- When the noise levels at existing and future non-noise-sensitive land uses (e.g. industrial, etc.):
 - are less than the County of San Bernardino Development Code, Section 83.01.080(d),
 Table 83-3 65 dBA CNEL noise level standard and the Project creates a *readily perceptible* 5 dBA CNEL or greater Project-related noise level increase; or
 - are greater than the County of San Bernardino Development Code, Section 83.01.080(d), Table 83-3 65 dBA CNEL noise level standard and the Project creates a *barely perceptible* 3 dBA CNEL or greater Project-related noise level increase.

OPERATIONAL NOISE

- If Project-related operational (stationary-source) noise levels exceed the exterior 55 dBA Leq daytime or 45 dBA Leq nighttime noise level standards for sensitive land uses. These standards shall not be exceeded for a cumulative period of 30 minutes (L₅₀), or plus 5 dBA cannot be exceeded for a cumulative period of more than 15 minutes (L₂₅) in any hour, or the standard plus 10 dBA for a cumulative period of more than 5 minutes (L₈) in any hour, or the standard plus 15 dBA for a cumulative period of more than 1 minute (L₂) in any hour, or the standard plus 20 dBA at any time (Lmax) (Section 83.01.080(c) of the County of San Bernardino County Code, Title 8 Development Code); or
- If the existing ambient noise levels at the nearby noise-sensitive receivers near the Project site:
 - are less than 60 dBA Leq and the Project creates a *readily perceptible* 5 dBA Leq or greater Project-related noise level increase; or
 - range from 60 to 65 dBA Leq and the Project creates a *barely perceptible* 3 dBA Leq or greater Project-related noise level increase; or
 - already exceed 65 dBA, Leq and the Project creates a community noise level impact of greater than 1.5 dBA Leq (FICON, 1992).
- If long-term Project generated operational vibration levels exceed the County of San Bernardino vibration standard of 0.2 in/sec PPV at sensitive receiver locations (Section 83.01.090(a) of the County of San Bernardino County Code, Title 8 Development Code).

CONSTRUCTION NOISE AND VIBRATION

- If Project-related construction activities:
 - o cocur at any time other than the permitted hours of 7:00 a.m. to 7:00 p.m.; with no activity allowed on Sundays and Federal holidays (Section 83.01.080(g)(3) of the County of San Bernardino County Code, Title 8 Development Code); or
 - create noise levels which exceed the 85 dBA Leq acceptable noise level threshold at the nearby sensitive receiver locations (NIOSH, Criteria for Recommended Standard: Occupational Noise Exposure);
 - generate temporary Project construction-related noise level increases which exceed the 12 dBA Leq substantial noise level increase threshold at noise-sensitive receiver locations (Caltrans, Traffic Noise Analysis Protocol).
- If short-term Project construction vibration levels exceed the County of San Bernardino vibration standard of 0.2 in/sec PPV at sensitive receiver locations (Section 83.01.090(a) of the County of San Bernardino County Code, Title 8 Development Code).



A sea basis	Receiving		Significan	ce Criteria
Analysis	Land Use	Condition(s)	Daytime	Nighttime
		If ambient is < 60 dBA CNEL	≥ 5 dBA CNEL F	Project increase
	Noise- Sensitive ¹	If ambient is 60 - 65 dBA CNEL	≥ 3 dBA CNEL F	Project increase
Off-Site Traffic	Sensitive	If ambient is > 65 dBA CNEL	≥ 1.5 dBA CNEL	Project increase
Tunic	Non-Noise-	if ambient is < 65 dBA CNEL	≥ 5 dBA CNEL F	Project increase
	Sensitive ²	if ambient is > 65 dBA CNEL	≥ 3 dBA CNEL P	Project increase
		Hourly Leq	55	45
		≥ 30 Minutes L ₅₀	55	45
	Residential ²	≥ 15 Minutes L ₂₅	60	50
		≥ 5 Minutes L ₈	65	55
Operational		≥ 1 Minute L ₂	70	60
		Anytime L _{max}	75	65
		if ambient is < 60 dBA	≥ 5 dBA Project increase	
	Noise- Sensitive ¹	if ambient is 60 - 65 dBA	≥ 3 dBA Proj	ject increase
	bensitive	if ambient is > 65 dBA	≥ 1.5 dBA Pro	oject increase
	Noise-	Permitted between 7:00 a.m and Federa	. to 7:00 p.m.; exce al holidays. ³	pt Sundays
Construction	Sensitive	Noise Level Threshold ⁴	85 dBA Leq	n/a
		Noise Level Increase ⁵	12 dBA Leq	n/a
		Vibration Level Threshold ⁶	0.2 in/sec PPV	n/a

TABLE 4-2: SIGNIFICANCE CRITERIA SUMMARY

¹ Source: FICON, 1992.

² Source: Section 83.01.080 of the County of San Bernardino County Code, Title 8 Development Code (Appendix 3.1).

³ Source: Section 83.01.080(g)(3) of the County of San Bernardino County Code, Title 8 Development Code (Appendix 3.1).

⁴ Source: NIOSH, Criteria for Recommended Standard: Occupational Noise Exposure, June 1998.

⁵ Source: Caltrans Traffic Noise Analysis Protocol, May 2011.

⁶ Source: Section 83.01.090(a) of the County of San Bernardino County Code, Title 8 Development Code (Appendix 3.1). "Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.; "n/a" = Project operation limited to the hours of 7:00 a.m. to 7:00 p.m. and construction activities are not permitted during the daytime hours; "PPV" = Peak Particle Velocity. This page intentionally left blank



5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, five 24-hour noise level measurements were taken at sensitive receiver locations in the Project study area. The receiver locations were selected to describe and document the existing noise environment within the Project study area. Exhibit 5-A provides the boundaries of the Project study area and the noise level measurement locations. To fully describe the existing noise conditions, noise level measurements were collected by Urban Crossroads, Inc. on Wednesday, July 12th, 2017. Appendix 5.1 includes study area photos.

5.1 MEASUREMENT PROCEDURE AND CRITERIA

To describe the existing noise environment, the hourly noise levels were measured during typical weekday conditions over a 24-hour period. By collecting individual hourly noise level measurements, it is possible to describe the daytime and nighttime hourly noise levels and calculate the 24-hour CNEL. The long-term noise readings were recorded using Piccolo Type 2 integrating sound level meter and dataloggers. The Piccolo sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 150. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (20)

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. (7) 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. (4)*

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

- Location L1 represents the noise levels north of the Project site across Interstate 10 near existing residential homes south of Valley Boulevard. The noise level measurements collected show an overall 24-hour exterior noise level of 69.1 dBA CNEL. The hourly noise levels measured at location L1 ranged from 59.9 to 64.2 dBA Leq during the daytime hours and from 58.2 to 64.3 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 63.2 dBA Leq with an average nighttime noise level of 62.2 dBA Leq.
- Location L2 represents the west of the Project site on Orange Street adjacent to existing residential homes. The noise level measurements collected show an overall 24-hour exterior noise level of 71.7 dBA CNEL. The hourly noise levels measured at location L2 ranged from 64.4 to 67.6 dBA Leq during the daytime hours and from 61.2 to 67.5 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 66.3 dBA Leq with an average nighttime noise level of 64.6 dBA Leq.
- Location L3 represents the noise levels at the southern Project site boundary on Orange Street near Bloomington Junior High School. The 24-hour CNEL indicates that the overall exterior noise level is 66.3 dBA CNEL. At location L3 the background ambient noise levels ranged from 57.2 to 62.7 dBA Leq during the daytime hours to levels of 54.9 to 62.7 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 60.4 dBA Leq with an average nighttime noise level of 59.2 dBA Leq.
- Located east of the Project site, location L4 represents the noise levels on Larch Avenue near existing industrial and residential uses. The noise level measurements collected show an overall 24-hour exterior noise level of 66.4 dBA CNEL. The hourly noise levels measured at location L4 ranged from 58.3 to 62.5 dBA Leq during the daytime hours and from 56.7 to 62.4 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 60.4 dBA Leq with an average nighttime noise level of 59.5 dBA Leq.
- Location L5 represents the noise levels south of the Project site on Slover Avenue near existing
 residential homes. The 24-hour CNEL indicates that the overall exterior noise level is 68.7 dBA
 CNEL. At location L5 the background ambient noise levels ranged from 63.3 to 65.9 dBA Leq
 during the daytime hours to levels of 58.5 to 64.2 dBA Leq during the nighttime hours. The
 energy (logarithmic) average daytime noise level was calculated at 64.9 dBA Leq with an
 average nighttime noise level of 61.0 dBA Leq.



Table 5-1 provides the (energy average) noise levels used to describe the daytime and nighttime ambient conditions. These daytime and nighttime energy average noise levels represent the average of all hourly noise levels observed during these time periods expressed as a single number. Appendix 5.2 provides summary worksheets of the noise levels for each hour as well as the minimum, maximum, L₁, L₂, L₅, L₈, L₂₅, L₅₀, L₉₀, L₉₅, and L₉₉ percentile noise levels observed during the daytime and nighttime periods.

The background ambient noise levels in the Project study area are dominated by the transportation-related noise associated with the arterial transportation network, such as I-10 and the Union Pacific Railroad lines, and background industrial land use activities. This includes the auto and heavy truck activities on study area roadway segments near the noise level measurement locations. The 24-hour existing noise level measurement results are shown on Table 5-1.

Location ¹	Distance to Project	Description	Hourly N	Average oise Level Leq) ²	CNEL
	Boundary (Feet)		Daytime	Nighttime	
L1	1,145'	Located north of the Project site across Interstate 10 near existing residential homes south of Valley Boulevard.	63.2	62.2	69.1
L2	700'	Located west of the Project site on Orange Street adjacent to existing residential homes.	66.3	64.6	71.7
L3	0'	Located at the southern Project site boundary on Orange Street near Bloomington Junior High School.	60.4	59.2	66.3
L4	545'	Located east of the Project site on Larch Avenue near existing industrial and residential uses.	60.4	59.5	66.4
L5	735'	Located south of the Project site on Slover Avenue near existing residential homes.	64.9	61.0	68.7

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

¹ See Exhibit 5-A for the noise level measurement locations.

² Energy (logarithmic) average hourly levels. The long-term 24-hour measurement worksheets are included in Appendix 5.2.

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







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6 METHODS AND PROCEDURES

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

6.1 FHWA TRAFFIC NOISE PREDICTION MODEL

The expected roadway noise level increases from vehicular traffic were calculated by Urban Crossroads, Inc. using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. (21) 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. (22) 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. (23)

6.2 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 ten study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications per the County of San Bernardino General Plan Circulation Element, and the posted vehicle speeds. The ADT volumes used in this study are presented on Table 6-1 are based on the *Cedar Avenue Technology Park Traffic Impact Analysis* prepared by Michael Baker International, for the following traffic scenarios: Existing, Opening Year 2019, and Horizon Year 2035 conditions. (2) Table 6-3 provides the time of day (daytime, evening, and nighttime) vehicle splits.



ID	Roadway	Segment	AdjacentDistance fromPlanned (Existing)Centerline toLand Use1Nearest AdjacentLand Use1Land Use (Feet)2		Posted Vehicle Speed (mph)
1	Cedar Av.	n/o Valley Bl.	Commercial/Residential	59'	40
2	Cedar Av.	s/o Valley Bl.	Commercial/Residential	59'	40
3	Cedar Av.	s/o I-10 Fwy.	Industrial	59'	40
4	Cedar Av.	s/o Orange St.	Commercial/Inst. Office (Residential)	59'	40
5	Cedar Av.	s/o Slover Av.	Commercial	59'	40
6	Valley Bl.	w/o Cedar Av.	Commercial	59'	40
7	Valley Bl.	e/o Cedar Av.	Commercial	59'	40
8	Orange St.	e/o Cedar Av.	Industrial/Inst. Office (Parking Lot)	30'	25
9	Orange St.	w/o Vine St.	Industrial/Inst. School (Classrooms)	30'	25
10	Orange St.	e/o Vine St.	Industrial/Inst. School (Classrooms)	30'	25

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

¹ Source: County of San Bernardino General Plan, Bloomington Community Plan, Figure 2-1.

² Distance to adjacent land use is based upon the right-of-way distances for each functional roadway classification provided in the General Plan Circulation Element of the County of San Bernardino.

"Inst." = Institutional

				Aver	age Daily T	raffic Volur	nes ¹	
ID	Boodway		Existing		Opening \	Opening Year 2019		ear 2035
	Roadway	Segment	Without Project	With Project	Without Project	With Project	Without Project	With Project
1	Cedar Av.	n/o Valley Bl.	26,700	26,765	28,240	28,305	31,810	31,875
2	Cedar Av.	s/o Valley Bl.	37,150	37,282	39,100	39,232	44,660	44,792
3	Cedar Av.	s/o I-10 Fwy.	27,300	27,793	32,070	32,563	33,010	33,503
4	Cedar Av.	s/o Orange St.	21,410	21,542	25,330	25,462	25,910	26,042
5	Cedar Av.	s/o Slover Av.	19,840	19,938	23,830	23,928	26,580	26,678
6	Valley Bl.	w/o Cedar Av.	19,680	19,713	20,370	20,403	25,210	25,243
7	Valley Bl.	e/o Cedar Av.	13,210	13,243	13,690	13,723	16,880	16,913
8	Orange St.	e/o Cedar Av.	2,210	2,835	2,280	2,905	2,740	3,365
9	Orange St.	w/o Vine St.	1,800	1,954	1,850	2,004	2,270	2,424
10	Orange St.	e/o Vine St.	1,780	1,813	1,830	1,863	2,240	2,273

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES

¹ Source: Cedar Avenue Technology Center Traffic Impact Analysis, Urban Crossroads, Inc., July 2017.



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

TABLE 6-3: TIME OF DAY VEHICLE SPLITS

"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.

Per the *Cedar Avenue Technology Park Traffic Impact Analysis* prepared by Michael Baker International the Project is expected to generate a net total of approximately 658 trip-ends per day (actual vehicles) with 56 AM peak hour trips and 59 PM peak hour trips. (2) The net Project trip generation includes 135 truck trip-ends per day from the proposed buildings within the Project site. This noise study relies on the net Project trips (as opposed to the passenger car equivalents) to accurately account for the effect of individual truck trips on the study area roadway network. 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 heavy trucks in the vehicle mix.

The 135 daily Project truck trip-ends were assigned to the individual off-site study area roadway segments based on the Project truck trip distribution percentages documented in the *Traffic Impact Analysis*. Using the Project truck trips in combination with the Project trip distribution, Urban Crossroads, Inc. calculated the number of additional Project truck trips and vehicle mix percentages for each of the study area roadway segments. Table 6-4 shows the traffic flow by vehicle type (vehicle mix) used for all without Project traffic scenarios, and Tables 6-5 to 6-7 show the vehicle mixes used for the with Project traffic scenarios.

Classification		Total % Traffic Flow ¹				
Classification	Autos	Medium Trucks	Heavy Trucks	Total		
All Segments	95.93%	1.69%	2.38%	100.00%		

TABLE 6-4: WITHOUT PROJECT CONDITIONS VEHICLE MIX

¹ Based on existing PM peak hour counts taken at Cedar Avenue and Valley Boulevard (Cedar Avenue Technology Center Traffic Impact Analysis, Urban Crossroads, Inc., July 2017). Vehicle mix percentage values rounded to the nearest one-hundredth.



			With Project ¹				
ID	Roadway	Segment	Autos	Medium Trucks	Heavy Trucks	Total ²	
1	Cedar Av.	n/o Valley Bl.	95.89%	1.69%	2.41%	100.00%	
2	Cedar Av.	s/o Valley Bl.	95.87%	1.70%	2.43%	100.00%	
3	Cedar Av.	s/o I-10 Fwy.	95.64%	1.72%	2.64%	100.00%	
4	Cedar Av.	s/o Orange St.	95.83%	1.70%	2.47%	100.00%	
5	Cedar Av.	s/o Slover Av.	95.85%	1.70%	2.45%	100.00%	
6	Valley Bl.	w/o Cedar Av.	95.90%	1.69%	2.41%	100.00%	
7	Valley Bl.	e/o Cedar Av.	95.89%	1.69%	2.42%	100.00%	
8	Orange St.	e/o Cedar Av.	92.31%	2.09%	5.59%	100.00%	
9	Orange St.	w/o Vine St.	89.70%	2.68%	7.62%	100.00%	
10	Orange St.	e/o Vine St.	95.62%	1.71%	2.67%	100.00%	

TABLE 6-5: EXISTING WITH PROJECT CONDITIONS VEHICLE MIX

¹ Source: Cedar Avenue Technology Center Traffic Impact Analysis, Urban Crossroads, Inc., July 2017.

² Total of vehicle mix percentage values rounded to the nearest one-hundredth.

			With Project ¹				
ID	Roadway	Segment	Autos	Medium Trucks	Heavy Trucks	Total ²	
1	Cedar Av.	n/o Valley Bl.	95.89%	1.69%	2.41%	100.00%	
2	Cedar Av.	s/o Valley Bl.	95.88%	1.70%	2.43%	100.00%	
3	Cedar Av.	s/o I-10 Fwy.	95.68%	1.72%	2.60%	100.00%	
4	Cedar Av.	s/o Orange St.	95.85%	1.70%	2.45%	100.00%	
5	Cedar Av.	s/o Slover Av.	95.86%	1.70%	2.44%	100.00%	
6	Valley Bl.	w/o Cedar Av.	95.90%	1.69%	2.40%	100.00%	
7	Valley Bl.	e/o Cedar Av.	95.89%	1.69%	2.42%	100.00%	
8	Orange St.	e/o Cedar Av.	92.40%	2.08%	5.52%	100.00%	
9	Orange St.	w/o Vine St.	89.86%	2.66%	7.49%	100.00%	
10	Orange St.	e/o Vine St.	95.63%	1.71%	2.66%	100.00%	

TABLE 6-6: OPENING YEAR 2019 WITH PROJECT CONDITIONS VEHICLE MIX

¹ Source: Cedar Avenue Technology Center Traffic Impact Analysis, Urban Crossroads, Inc., July 2017.

² Total of vehicle mix percentage values rounded to the nearest one-hundredth.



				With P	roject ¹	
ID	Roadway	Segment	Autos	Medium Trucks	Heavy Trucks	Total ²
1	Cedar Av.	n/o Valley Bl.	95.90%	1.69%	2.41%	100.00%
2	Cedar Av.	s/o Valley Bl.	95.88%	1.70%	2.42%	100.00%
3	Cedar Av.	s/o I-10 Fwy.	95.69%	1.72%	2.60%	100.00%
4	Cedar Av.	s/o Orange St.	95.85%	1.70%	2.45%	100.00%
5	Cedar Av.	s/o Slover Av.	95.87%	1.69%	2.43%	100.00%
6	Valley Bl.	w/o Cedar Av.	95.91%	1.69%	2.40%	100.00%
7	Valley Bl.	e/o Cedar Av.	95.90%	1.69%	2.41%	100.00%
8	Orange St.	e/o Cedar Av.	92.88%	2.03%	5.09%	100.00%
9	Orange St.	w/o Vine St.	90.91%	2.49%	6.60%	100.00%
10	Orange St.	e/o Vine St.	95.68%	1.71%	2.61%	100.00%

TABLE 6-7: HORIZON YEAR 2035 WITH PROJECT CONDITIONS VEHICLE MIX

¹ Source: Cedar Avenue Technology Center Traffic Impact Analysis, Urban Crossroads, Inc., July 2017. ² Total of vehicle mix percentage values rounded to the nearest one-hundredth.

6.3 VIBRATION ASSESSMENT

This analysis focuses on the potential ground-borne vibration associated with vehicular traffic and construction activities. Ground-borne vibration levels from automobile traffic are generally overshadowed by vibration generated by heavy trucks that roll over the same uneven roadway surfaces. However, due to the rapid drop-off rate of ground-borne vibration and the short duration of the associated events, vehicular traffic-induced ground-borne vibration is rarely perceptible beyond the roadway right-of-way, and rarely results in vibration levels that cause damage to buildings in the vicinity.

However, while vehicular traffic is rarely perceptible, construction has the potential to result in varying degrees of temporary ground vibration, depending on the specific construction activities and equipment used. Ground vibration levels associated with various types of construction equipment are summarized on Table 6-8. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the human response (annoyance) using the following vibration assessment methods defined by the FTA. To describe the human response (annoyance) associated with vibration impacts the FTA provides the following equation: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$



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

TABLE 6-8: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006.



7 OFF-SITE TRANSPORTATION NOISE IMPACTS

To assess the off-site transportation CNEL noise level impacts associated with the proposed Project, noise contours were developed based on the *Cedar Avenue Technology Park Traffic Impact Analysis*. (2) Noise contour boundaries represent the equal levels of noise exposure and are measured in CNEL from the center of the roadway. Noise contours were developed for the following traffic scenarios:

- <u>Existing Without / With Project</u>: This scenario refers to the existing present-day noise conditions, without and with the proposed Project.
- <u>Opening Year 2019 Without / With Project</u>: This scenario below refers to the background noise conditions at future Year 2019 without and with the proposed Project plus ambient growth. This scenario corresponds to Year 2019 conditions, and includes all cumulative projects identified in the *Traffic Impact Analysis*.
- <u>Horizon Year 2035 Without / With Project</u>: This scenario below refers to the background noise conditions at future Year 2035 without and with the proposed Project plus ambient growth. This scenario corresponds to Year 2035 conditions, and includes all cumulative projects identified in the *Traffic Impact Analysis*.

7.1 TRAFFIC NOISE CONTOURS

To quantify the Project's operational traffic noise impacts on the surrounding areas, the changes in traffic noise levels on roadway segments surrounding the Project were calculated based on the changes in the average daily traffic volumes. Based on the noise impact significance criteria described in Section 4 and shown on Table 4-2, a significant off-site traffic noise level impact occurs:

- When the noise levels at existing and future noise-sensitive land uses (e.g. residential, etc.):
 - are less than 60 dBA CNEL and the Project creates a readily perceptible 5 dBA CNEL or greater Project-related noise level increase; or
 - range from 60 to 65 dBA CNEL and the Project creates a barely perceptible 3 dBA CNEL or greater Project-related noise level increase; or
 - already exceed 65 dBA CNEL, and the Project creates a community noise level impact of greater than 1.5 dBA CNEL (FICON, 1992).
- When the noise levels at existing and future non-noise-sensitive land uses (e.g. commercial, office, etc.):
 - are less than the County of San Bernardino Development Code, Section 83.01.080(d), Table 83-3 65 dBA CNEL noise level standard and the Project creates a readily perceptible 5 dBA CNEL or greater Project-related noise level increase; or
 - are greater than the County of San Bernardino Development Code, Section 83.01.080(d), Table 83-3 65 dBA CNEL noise level standard and the Project creates a barely perceptible 3 dBA CNEL or greater Project-related noise level increase.

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 through 7-6 present a summary of the exterior traffic noise levels, without barrier attenuation, for the 10 study area roadway segments analyzed from the without Project to the with Project conditions in each of the three timeframes: Existing, Opening Year 2018, and Horizon Year 2040 conditions. Appendix 7.1 includes a summary of the traffic noise level contours for each of the six traffic scenarios.

			Adjacent	CNEL at Nearest	Distance to Contour from Centerline (Feet)		
ID	Road	Segment	Planned (Existing) Land Use ¹	Adjacent Land Use (dBA) ²	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Cedar Av.	n/o Valley Bl.	Commercial/Residential	70.5	64	138	297
2	Cedar Av.	s/o Valley Bl.	Commercial/Residential	72.0	80	172	370
3	Cedar Av.	s/o I-10 Fwy.	Industrial	70.6	65	140	301
4	Cedar Av.	s/o Orange St.	Commercial/Inst. Office (Residential)	69.6	RW	119	256
5	Cedar Av.	s/o Slover Av.	Commercial	69.2	RW	113	243
6	Valley Bl.	w/o Cedar Av.	Commercial	69.2	RW	112	242
7	Valley Bl.	e/o Cedar Av.	Commercial	67.5	RW	86	186
8	Orange St.	e/o Cedar Av.	Industrial/Inst. Office (Parking Lot)	59.4	RW	RW	RW
9	Orange St.	w/o Vine St.	Industrial/Inst. School (Classrooms)	58.5	RW	RW	RW
10	Orange St.	e/o Vine St.	Industrial/Inst. School (Classrooms)	58.5	RW	RW	RW

TABLE 7-1: EXISTING WITHOUT PROJECT CONDITIONS NOISE CONTOURS

¹ Source: County of San Bernardino General Plan, Bloomington Community Plan, Figure 2-1.

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

"RW" = Location of the respective noise contour falls within the right-of-way of the road.



			Adjacent Segment Planned (Existing) Land Use ¹			nce to Co enterline	
ID	Road	Segment			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Cedar Av.	n/o Valley Bl.	Commercial/Residential	70.6	64	139	298
2	Cedar Av.	s/o Valley Bl.	Commercial/Residential	72.0	80	173	373
3	Cedar Av.	s/o I-10 Fwy.	Industrial	70.9	68	146	315
4	Cedar Av.	s/o Orange St.	Commercial/Inst. Office (Residential)	69.7	RW	121	260
5	Cedar Av.	s/o Slover Av.	Commercial	69.3	RW	114	246
6	Valley Bl.	w/o Cedar Av.	Commercial	69.2	RW	113	243
7	Valley Bl.	e/o Cedar Av.	Commercial	67.5	RW	87	187
8	Orange St.	e/o Cedar Av.	Industrial/Inst. Office (Parking Lot)	63.1	RW	RW	49
9	Orange St.	w/o Vine St.	Industrial/Inst. School (Classrooms)	62.7	RW	RW	45
10	Orange St.	e/o Vine St.	Industrial/Inst. School (Classrooms)	58.9	RW	RW	RW

TABLE 7-2: EXISTING WITH PROJECT CONDITIONS NOISE CONTOURS

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

"RW" = Location of the respective noise contour falls within the right-of-way of the road.

	Adjacent		•		Adjacent			nce to Co enterline	
ID	Road			Adjacent Land Use (dBA) ²	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL		
1	Cedar Av.	n/o Valley Bl.	Commercial/Residential	70.8	66	143	308		
2	Cedar Av.	s/o Valley Bl.	Commercial/Residential	72.2	82	178	383		
3	Cedar Av.	s/o I-10 Fwy.	Industrial	71.3	72	156	335		
4	Cedar Av.	s/o Orange St.	Commercial/Inst. Office (Residential)	70.3	62	133	286		
5	Cedar Av.	s/o Slover Av.	Commercial	70.0	59	128	275		
6	Valley Bl.	w/o Cedar Av.	Commercial	69.3	RW	115	248		
7	Valley Bl.	e/o Cedar Av.	Commercial	67.6	RW	88	190		
8	Orange St.	e/o Cedar Av.	Industrial/Inst. Office (Parking Lot)	59.6	RW	RW	RW		
9	Orange St.	w/o Vine St.	Industrial/Inst. School (Classrooms)	58.7	RW	RW	RW		
10	Orange St.	e/o Vine St.	Industrial/Inst. School (Classrooms)	58.6	RW	RW	RW		

¹ Source: County of San Bernardino General Plan, Bloomington Community Plan, Figure 2-1.

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

 $"\mathsf{RW}"$ = Location of the respective noise contour falls within the right-of-way of the road.



			Adjacent gment Planned (Existing) Land Use ¹		Distance to Contour from Centerline (Feet)		
ID	Road	Segment			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Cedar Av.	n/o Valley Bl.	Commercial/Residential	70.8	67	144	310
2	Cedar Av.	s/o Valley Bl.	Commercial/Residential	72.2	83	179	386
3	Cedar Av.	s/o I-10 Fwy.	Industrial	71.6	75	162	348
4	Cedar Av.	s/o Orange St.	Commercial/Inst. Office (Residential)	70.4	63	135	290
5	Cedar Av.	s/o Slover Av.	Commercial	70.1	60	129	278
6	Valley Bl.	w/o Cedar Av.	Commercial	69.4	RW	115	249
7	Valley Bl.	e/o Cedar Av.	Commercial	67.7	RW	89	191
8	Orange St.	e/o Cedar Av.	Industrial/Inst. Office (Parking Lot)	63.2	RW	RW	49
9	Orange St.	w/o Vine St.	Industrial/Inst. School (Classrooms)	62.7	RW	RW	45
10	Orange St.	e/o Vine St.	Industrial/Inst. School (Classrooms)	59.0	RW	RW	RW

TABLE 7-4: OPENING YEAR 2019 WITH PROJECT CONDITIONS NOISE CONTOURS

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-5: HORIZON YEAR 2035 WITHOUT PROJECT CONDITIONS NOISE CONTOURS
TABLE 7-5. HORIZON TEAN 2055 WITHOUT TROJECT CONDITIONS NOISE CONTOONS

			Adjacent		Distance to Contour from Centerline (Feet)			
ID	Road			Adjacent Land Use (dBA) ²	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	
1	Cedar Av.	n/o Valley Bl.	Commercial/Residential	71.3	72	155	333	
2	Cedar Av.	s/o Valley Bl.	Commercial/Residential	72.8	90	194	418	
3	Cedar Av.	s/o I-10 Fwy.	Industrial	71.4	74	159	342	
4	Cedar Av.	s/o Orange St.	Commercial/Inst. Office (Residential)	70.4	63	135	291	
5	Cedar Av.	s/o Slover Av.	Commercial	70.5	64	137	296	
6	Valley Bl.	w/o Cedar Av.	Commercial	70.3	62	133	285	
7	Valley Bl.	e/o Cedar Av.	Commercial	68.5	RW	101	219	
8	Orange St.	e/o Cedar Av.	Industrial/Inst. Office (Parking Lot)	60.4	RW	RW	32	
9	Orange St.	w/o Vine St.	Industrial/Inst. School (Classrooms)	59.5	RW	RW	RW	
10	Orange St.	e/o Vine St.	Industrial/Inst. School (Classrooms)	59.5	RW	RW	RW	

¹ Source: County of San Bernardino General Plan, Bloomington Community Plan, Figure 2-1.

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

"RW" = Location of the respective noise contour falls within the right-of-way of the road.



			Adjacent	CNEL at Nearest	Distance to Contour from Centerline (Feet)		
ID			Adjacent Land Use (dBA) ²	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	
1	Cedar Av.	n/o Valley Bl.	Commercial/Residential	71.3	72	156	335
2	Cedar Av.	s/o Valley Bl.	Commercial/Residential	72.8	91	195	421
3	Cedar Av.	s/o I-10 Fwy.	Industrial	71.7	76	165	355
4	Cedar Av.	s/o Orange St.	Commercial/Inst. Office (Residential)	70.5	63	137	295
5	Cedar Av.	s/o Slover Av.	Commercial	70.6	64	139	299
6	Valley Bl.	w/o Cedar Av.	Commercial	70.3	62	133	287
7	Valley Bl.	e/o Cedar Av.	Commercial	68.6	RW	102	220
8	Orange St.	e/o Cedar Av.	Industrial/Inst. Office (Parking Lot)	63.6	RW	RW	52
9	Orange St.	w/o Vine St.	Industrial/Inst. School (Classrooms)	63.1	RW	RW	48
10	Orange St.	e/o Vine St.	Industrial/Inst. School (Classrooms)	59.8	RW	RW	RW

TABLE 7-6: HORIZON YEAR 2035 WITH PROJECT CONDITIONS NOISE CONTOURS

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

"RW" = Location of the respective noise contour falls within the right-of-way of the road.

7.2 EXISTING CONDITIONS PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-1 presents the Existing without Project conditions CNEL noise levels. The Exiting without Project exterior noise levels are expected to range from 58.5 to 72.0 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-2 shows the Existing with Project conditions will range from 58.9 to 72.0 dBA CNEL. As shown on Table 7-7 the Project will generate noise level increases of up to 4.1 dBA CNEL on the study area roadway segments. Based on the significance criteria in Section 4, Project-related traffic noise level increases of up to 4.1 dBA CNEL represent a *less than significant* impact under Existing plus Project conditions.



ID	Road	Road Segment	Adjacent Planned (Existing)	CNEL at Adjacent Land Use (dBA) ²			Noise- Sensitive Land	Threshold Exceeded? ³
			Land Use ¹		With Project	Project Addition	Use?	LACEEded:
1	Cedar Av.	n/o Valley Bl.	Comm./Residential	70.5	70.6	0.0	Yes	No
2	Cedar Av.	s/o Valley Bl.	Comm./Residential	72.0	72.0	0.1	Yes	No
3	Cedar Av.	s/o I-10 Fwy.	Industrial	70.6	70.9	0.3	No	No
4	Cedar Av.	s/o Orange St.	Comm./Inst. Office (Residential)	69.6	69.7	0.1	Yes	No
5	Cedar Av.	s/o Slover Av.	Commercial	69.2	69.3	0.1	No	No
6	Valley Bl.	w/o Cedar Av.	Commercial	69.2	69.2	0.0	No	No
7	Valley Bl.	e/o Cedar Av.	Commercial	67.5	67.5	0.0	No	No
8	Orange St.	e/o Cedar Av.	Industrial/Inst. Office (Parking Lot)	59.4	63.1	3.7	No	No
9	Orange St.	w/o Vine St.	Industrial/Inst. School (Classrooms)	58.5	62.7	4.1	Yes	No
10	Orange St.	e/o Vine St.	Industrial/Inst. School (Classrooms)	58.5	58.9	0.4	Yes	No

TABLE 7-7: UNMITIGATED EXISTING OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

³ Significance Criteria (Section 4).

7.3 OPENING YEAR 2019 PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-8 presents a comparison of the Opening Year 2019 without and with Project conditions CNEL noise levels. Table 7-3 shows that the exterior noise levels without accounting for any noise attenuation features are expected to range from 58.6 to 72.2 dBA CNEL without the Project. Table 7-4 presents the Opening Year 2019 with Project conditions noise level contours that are expected to range from 59.0 to 72.2 dBA CNEL. Based on the significance criteria in Section 4, Project-related traffic noise level increases of up to 4.0 dBA CNEL represent a *less than significant* impact under Opening Year 2019 with Project conditions.



ID	Road	Road Segment	Adjacent Planned (Existing)	CNEL at Adjacent Land Use (dBA) ²			Noise- Sensitive Land	Threshold Exceeded? ³
			Land Use ¹	No Project	With Project	Project Addition	Use?	Exceded:
1	Cedar Av.	n/o Valley Bl.	Comm./Residential	70.8	70.8	0.0	Yes	No
2	Cedar Av.	s/o Valley Bl.	Comm./Residential	72.2	72.2	0.1	Yes	No
3	Cedar Av.	s/o I-10 Fwy.	Industrial	71.3	71.6	0.3	No	No
4	Cedar Av.	s/o Orange St.	Comm./Inst. Office (Residential)	70.3	70.4	0.1	Yes	No
5	Cedar Av.	s/o Slover Av.	Commercial	70.0	70.1	0.1	No	No
6	Valley Bl.	w/o Cedar Av.	Commercial	69.3	69.4	0.0	No	No
7	Valley Bl.	e/o Cedar Av.	Commercial	67.6	67.7	0.0	No	No
8	Orange St.	e/o Cedar Av.	Industrial/Inst. Office (Parking Lot)	59.6	63.2	3.6	No	No
9	Orange St.	w/o Vine St.	Industrial/Inst. School (Classrooms)	58.7	62.7	4.0	Yes	No
10	Orange St.	e/o Vine St.	Industrial/Inst. School (Classrooms)	58.6	59.0	0.4	Yes	No

TABLE 7-8: UNMITIGATED YEAR 2019 OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

³ Significance Criteria (Section 4).

7.4 HORIZON YEAR 2035 PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-9 presents a comparison of the Horizon Year 2035 without and with Project conditions CNEL noise levels. Table 7-5 shows that the exterior noise levels without accounting for any noise attenuation features are expected to range from 59.5 to 72.8 dBA CNEL without the Project. Table 7-6 presents the Horizon Year 2035 with Project conditions noise level contours that are expected to range from 59.8 to 72.8 dBA CNEL. Based on the significance criteria in Section 4, Project-related traffic noise level increases of up to 3.5 dBA CNEL represent a *less than significant* impact under Horizon Year 2035 conditions.

ID	Road Segment	Adjacent Planned (Existing)	CNEL at Adjacent Land Use (dBA) ²			Noise- Sensitive Land	Threshold Exceeded? ³	
			Land Use ¹	No Project	With Project	Project Addition	Use?	LACCEUEU:
1	Cedar Av.	n/o Valley Bl.	Comm./Residential	71.3	71.3	0.0	Yes	No
2	Cedar Av.	s/o Valley Bl.	Comm./Residential	72.8	72.8	0.0	Yes	No
3	Cedar Av.	s/o I-10 Fwy.	Industrial	71.4	71.7	0.2	No	No
4	Cedar Av.	s/o Orange St.	Comm./Inst. Office (Residential)	70.4	70.5	0.1	Yes	No
5	Cedar Av.	s/o Slover Av.	Commercial	70.5	70.6	0.1	No	No
6	Valley Bl.	w/o Cedar Av.	Commercial	70.3	70.3	0.0	No	No
7	Valley Bl.	e/o Cedar Av.	Commercial	68.5	68.6	0.0	No	No
8	Orange St.	e/o Cedar Av.	Industrial/Inst. Office (Parking Lot)	60.4	63.6	3.2	No	No
9	Orange St.	w/o Vine St.	Industrial/Inst. School (Classrooms)	59.5	63.1	3.5	Yes	No
10	Orange St.	e/o Vine St.	Industrial/Inst. School (Classrooms)	59.5	59.8	0.3	Yes	No

TABLE 7-9: UNMITIGATED YEAR 2035 OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

³ Significance Criteria (Section 4).



8 **RECEIVER LOCATIONS**

To assess the potential for long-term operational and short-term construction noise impacts, the following five 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, outpatient 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, natural open space, undeveloped land, parking lots, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals.

Representative sensitive receivers near the Project site include single-family residential homes at locations R1, R2, and R5, and the Colton Joint Unified School District offices (R3) and Bloomington Junior High School (R4). The closest sensitive receiver is represented by location R4 where Bloomington Junior High School is located approximately 60 feet from the Project site boundaries on Orange Street. 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.

- R1: Located approximately 739 feet north of the Project site, R1 represents existing residential home across I-10 on Church Street. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.
- R2: Location R2 represents an existing residential home southwest of the Project site at roughly 322 feet on Orange Street. A 24-hour noise measurement was taken near this location, L2, to describe the existing ambient noise environment.
- R3: Location R3 represents the existing outdoor basketball court at Bloomington Junior High School situated south of the Project site at approximately 111 feet across Orange Street. A 24-hour noise measurement was taken near this location, L3, to describe the existing ambient noise environment.
- R4: Location R4 represents the existing classroom buildings of Bloomington Junior High School located south of the Project site at approximately 60 feet on Orange Street.
- R5: Location R5 represents the existing residential homes located south of the Project site at approximately 763 feet, south of Slover Avenue. A 24-hour noise measurement was taken near this location, L4, to describe the existing ambient noise environment.





EXHIBIT 8-A: RECEIVER LOCATIONS

Distance from receiver to Project site boundary (in feet)
 Existing Barrier



9 OPERATIONAL NOISE IMPACTS

This section analyzes the potential stationary-source operational noise impacts at the nearby receiver locations, identified in Section 8, resulting from operation of the proposed Cedar Avenue Technology Park Project. Exhibit 9-A identifies the representative receiver locations and noise source locations used to assess the operational noise levels.

9.1 OPERATIONAL NOISE STANDARDS

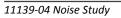
To analyze noise impacts originating from a designated fixed location or private property such as the Cedar Avenue Technology Park Project, stationary-source (operational) noise such as the expected idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, parking lot vehicle movements, and roof-top air conditioning units are typically evaluated against standards established under a jurisdiction's Municipal Code. Therefore, to accurately describe the potential Project-related operational noise levels, this analysis presents the appropriate stationary-source noise level standards from the County of San Bernardino County Code, Title 8 Development Code.

The County of San Bernardino County Code, Title 8 Development Code, Section 83.01.080(c) establishes the noise level standards for stationary noise sources. Since the Project's industrial land use will potentially impact adjacent noise-sensitive uses in the Project study are, this noise study relies on the more conservative residential noise level standards to describe potential operational noise impacts. For residential properties, the exterior noise level shall not exceed 55 dBA Leq during the daytime hours (7:00 a.m. to 10:00 p.m.) and 45 dBA Leq during the nighttime hours (10:00 p.m. to 7:00 a.m.) for both the whole hour, and for not more than 30 minutes in any hour. (3)

The exterior noise level standards shall apply for a cumulative period of 30 minutes in any hour, as well as plus 5 dBA cannot be exceeded for a cumulative period of more than 15 minutes in any hour, or the standard plus 10 dBA for a cumulative period of more than 5 minutes in any hour, or the standard plus 15 dBA for a cumulative period of more than 1 minute in any hour, or the standard plus 20 dBA for any period of time. The County of San Bernardino operational noise level standards are shown on Table 3-1 and included in Appendix 3.1.

9.2 OPERATIONAL NOISE SOURCES

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: idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, parking lot vehicle movements, and roof-top air conditioning units. This noise analysis is intended to describe noise level impacts associated with the expected typical warehouse use activities at the Project site.





9.3 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 idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, parking lot vehicle movements, and roof-top air conditioning units all operating simultaneously. These noise level impacts will likely vary throughout the day.

9.3.1 UNLOADING/DOCKING ACTIVITY

Short-term reference noise level measurements were collected on Wednesday, January 7th, 2015, by Urban Crossroads, Inc. at the Motivational Fulfillment & Logistics Services distribution facility located at 6810 Bickmore Avenue in the City of Chino. The noise level measurements represent the typical weekday dry goods logistics warehouse operation in a single building, of roughly 285,000 square feet, with a loading dock area on the western side of the building façade. Up to ten trucks were observed in the loading dock area including a combination of track trailer semi-trucks, two-axle delivery trucks, and background forklift operations.

The unloading/docking activity noise level measurement was taken over a fifteen-minute period and represents multiple noise sources taken from the center of loading dock activities generating a reference noise level of 62.8 dBA Leq at a uniform reference distance of 50 feet. At this measurement location, the noise sources associated with employees unloading a docked truck container included the squeaking of the truck's shocks when weight was removed from the truck, employees playing music over a radio, as well as a forklift horn and backup alarm. In addition, during the noise level measurement a truck entered the loading dock area and proceeded to reverse and dock in a nearby loading bay, adding truck engine and air brakes noise.

9.3.2 ROOF-TOP AIR CONDITIONING UNITS

To assess the impacts created by the roof-top air conditioning units at the Project buildings, reference noise levels measurements were taken at the Santee Walmart on July 27th, 2015. Located at 170 Town Center Parkway in the City of Santee, the noise level measurements describe a single mechanical roof-top air conditioning unit on the roof of an existing Walmart store. The reference noise level represents a Lennox SCA120 series 10-ton model packaged air conditioning unit. At 5 feet from the roof-top air conditioning unit, the exterior noise levels were measured at 77.2 dBA Leq. Using the uniform reference distance of 50 feet, the noise level is 57.2 dBA Leq. The operating conditions of the reference noise level measurement reflect peak summer cooling requirements with measured temperatures approaching 96 degrees Fahrenheit (°F) with average daytime temperatures of 82°F. The roof-top air condition units were observed to operate the most during the daytime hours for a total of 39 minutes per hour. The noise attenuation provided by a parapet wall is not reflected in this reference noise level measurement.



9.3.3 PARKING LOT VEHICLE MOVEMENTS (AUTOS)

To determine the noise levels associated with parking lot vehicle movements, Urban Crossroads collected reference noise level measurements over a 24-hour period on May 17th, 2017 at the parking lot for the Panasonic Avionics Corporation adjacent to the Project site in the City of Lake Forest. The peak hour of activity measured over the 24-hour noise level measurement period occurred between 12:00 p.m. to 1:00 p.m., or the typical lunch hour for employees working in the area. The measured reference noise level at 50 feet from parking lot vehicle movements was measured at 41.7 dBA Leq. The parking lot noise levels are mainly due to cars pulling in and out of spaces during peak lunch hour activity and employees talking. Noise associated with parking lot vehicle movements is expected to operate for the entire hour (60 minutes).

	.	Dist.	Noise	Hourly	Hourly (dBA Leq)
Noise Source	Duration (hh:mm:ss)	From Source (Feet)	Source Height (Feet)	Activity (Mins) ¹	Reference Noise Level	@ 50'
Unloading/Docking Activity ²	00:15:00	30'	8'	60	67.2	62.8
Roof-Top Air Conditioning Unit ³	96:00:00	5'	5'	39	77.2	57.2
Parking Lot Vehicle Movements ⁴	01:00:00	10'	5'	60	52.2	41.7

TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS

¹Anticipated duration (minutes within the hour) of noise activity during typical hourly conditions expected at the Project site based on the reference noise level measurement activity.

² Reference noise level measurements were collected from the existing operations of the Motivational Fulfillment & Logistics Services distribution facility located at 6810 Bickmore Avenue in the City of Chino on 1/7/2015.

³ As measured by Urban Crossroads, Inc. on 7/27/2015 at the Santee Walmart located at 170 Town Center Parkway.

⁴ As measured by Urban Crossroads, Inc. on 5/17/2017 at the Panasonic Avionics Corporation parking lot in the City of Lake Forest at typical lunch hour (12:00 p.m. to 1:00 p.m.).



9.4 PROJECT OPERATIONAL NOISE LEVELS

Using the reference noise levels to represent the proposed Project operations that include idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, parking lot vehicle movements, and roof-top air conditioning units, Urban Crossroads, Inc. calculated the operational source noise levels that are expected to be generated at the Project site and the Project-related noise level increases that would be experienced at each of the sensitive receiver locations. The operational noise level calculations, shown on Table 9-2, 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. Hard site conditions are used in the operational noise analysis which result in noise levels that attenuate (or decrease) at a rate of 6 dBA for each doubling of distance from a point source. The basic noise attenuation equation shown below is used to calculate the distance attenuation based on a reference noise level (SPL₁):

$$SPL_2 = SPL_1 - 20log(D_2/D_1)$$

Where SPL₂ is the resulting noise level after attenuation, SPL₁ is the source noise level, D₂ is the distance to the reference sound pressure level (SPL₁), and D₁ is the distance to the receiver location. Table 9-2 shows the individual operational noise levels of each noise source at each of the nearby sensitive receiver locations. As indicated on Table 9-2, the Project-only operational noise levels will range from 29.1 to 41.3 dBA Leq, 26.1 to 38.3 dBA L₅₀, 28.6 to 41.2 dBA L₂₅, 32.7 to 45.8 dBA L₈, 36.9 to 49.7 dBA L₂, and 42.5 to 54.8 dBA Lmax at the sensitive receiver locations. This analysis includes the barrier attenuation provided by the planned 12-foot high screen wall (noise barrier) and Project building, as shown on Exhibit 9-A.





EXHIBIT 9-A: OPERATIONAL NOISE SOURCE LOCATIONS



			Project (Operational	Noise Leve	els (dBA) ³	
Receiver Location ¹	Noise Source ²	Leq (E. Avg.)	L₅₀ (30 mins)	L ₂₅ (15 mins)	L ₈ (5 mins)	L2 (1 min)	L _{max} (Anytime)
	Unloading/Docking Activity	36.8	33.8	36.8	41.4	45.2	49.6
R1	Roof-Top Air Conditioning Unit	19.6	16.8	18.5	19.8	20.1	20.6
KI	Parking Lot Vehicle Movements	24.0	20.8	21.8	26.8	32.8	43.7
	Combined Noise Level:	37.1	34.1	37.0	41.6	45.5	50.6
	Unloading/Docking Activity	19.3	16.3	19.3	23.9	27.7	32.1
	Roof-Top Air Conditioning Unit	24.4	21.6	23.3	24.6	24.9	25.4
R2	Parking Lot Vehicle Movements	28.5	25.3	26.3	31.3	37.3	48.2
	Combined Noise Level:	30.3	27.2	28.6	32.7	38.0	48.3
	Unloading/Docking Activity	27.4	24.4	27.4	32.0	35.8	40.2
50	Roof-Top Air Conditioning Unit	37.6	34.8	36.5	37.8	38.1	38.6
R3	Parking Lot Vehicle Movements	33.0	29.8	30.8	35.8	41.8	52.7
	Combined Noise Level:	39.2	36.3	37.9	40.6	44.0	53.1
	Unloading/Docking Activity	41.1	38.1	41.1	45.7	49.5	53.9
D.4	Roof-Top Air Conditioning Unit	18.7	15.9	17.6	18.9	19.2	19.7
R4	Parking Lot Vehicle Movements	27.8	24.6	25.6	30.6	36.6	47.5
	Combined Noise Level:	41.3	38.3	41.2	45.8	49.7	54.8
	Unloading/Docking Activity	27.9	24.9	27.9	32.5	36.3	40.7
DE	Roof-Top Air Conditioning Unit	21.0	18.2	19.9	21.2	21.5	22.0
R5	Parking Lot Vehicle Movements	18.1	14.9	15.9	20.9	26.9	37.8
	Combined Noise Level:	29.1	26.1	28.8	33.1	36.9	42.5

² Reference noise sources as shown on Table 9-1.

³ Operational noise level calculations are provided in Appendix 9.1.

Table 9-3 presents a summary of the combined total Project-only operational noise level projections at the nearby sensitive receiver locations for a comparison with local jurisdiction exterior noise level standards. The Project operational noise levels at the nearby sensitive receiver locations are shown to range from 29.1 to 41.3 dBA Leq, 26.1 to 38.3 dBA L₅₀, 28.6 to 41.2 dBA L₂₅, 32.7 to 45.8 dBA L₈, 36.9 to 49.7 dBA L₂, and 42.5 to 54.8 dBA Lmax. Based on the results of this analysis, the operational noise levels associated with the Cedar Avenue Technology Park will satisfy the County of San Bernardino Development Code daytime and nighttime exterior noise level standards at all receiver locations. The operational noise level calculations are included in Appendix 9.1.



Receiver Location ¹	Leq (E. Avg.)	L ₅₀ (30 mins)	L ₂₅ (15 mins)	L ₈ (5 mins)	L₂ (1 min)	L _{max} (Anytime)	Threshold Exceeded? ³
Daytime	55	55	60	65	70	75	-
Nighttime	45	45	50	55	60	65	-
R1	37.1	34.1	37.0	41.6	45.5	50.6	No
R2	30.3	27.2	28.6	32.7	38.0	48.3	No
R3	39.2	36.3	37.9	40.6	44.0	53.1	No
R4	41.3	38.3	41.2	45.8	49.7	54.8	No
R5	29.1	26.1	28.8	33.1	36.9	42.5	No

TABLE 9-3: UNMITIGATED OPERATIONAL NOISE LEVEL COMPLIANCE

² Estimated Project operational noise levels as shown on Table 9-2.

³ Do the estimated Project operational noise levels meet the operational noise level standards (Table 3-1)?

"E. Avg." = Logarithmic (energy) average

9.5 PROJECT OPERATIONAL NOISE LEVEL CONTRIBUTIONS

To describe the Project operational noise level contributions, the Project operational noise levels are combined with the existing ambient noise levels measurements for the nearby receiver locations potentially impacted by Project operational noise sources. Since the units used to measure noise, decibels (dB), are logarithmic units, the Project-operational and existing ambient noise levels cannot be combined using standard arithmetic equations. (7) Instead, they must be logarithmically added using the following base equation:

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

Where "SPL1," "SPL2," etc. are equal to the sound pressure levels being combined, or in this case, the Project-operational and existing ambient noise levels. The difference between the combined Project and ambient noise levels describe the Project noise level contributions 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 9-4 and 9-5, respectively.

As indicated on Tables 9-4 and 9-5, the Project will generate daytime and nighttime operational noise level increases at the nearby receiver locations of up to 0.1 dBA Leq. Since the Project-related operational noise level contributions will satisfy the significance criteria discussed in Section 4, the increases at the sensitive receiver locations will be *less than significant*. On this basis, Project operational stationary-source noise would not result in a substantial temporary/periodic, or permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project, and impacts in these regards will be *less than significant*.



Location			Noise Levels (dBA)						
Rec. ¹	Meas. ²	Type of Noise	Leq (E. Avg.)	L₅₀ (30 mins)	L25 (15 mins)	L₃ (5 mins)	L₂ (1 min)	L _{max} (Anytime)	Threshold Exceeded? ⁷
R1	L1 -	Project Noise Level ³	37.1	34.1	37.0	41.6	45.5	50.6	No
		Ambient Noise Level ⁴	63.2	60.3	62.3	65.2	69.0	87.2	
	LI	Combined ⁵	63.2	60.3	62.3	65.2	69.0	87.2	
		Project Contribution ⁶	0.0	0.0	0.0	0.0	0.0	0.0	
		Project Noise Level ³	30.3	27.2	28.6	32.7	38.0	48.3	No
20	1.2	Ambient Noise Level ⁴	66.3	59.5	65.1	70.3	74.3	90.1	
R2	L2	Combined ⁵	66.3	59.5	65.1	70.3	74.3	90.1	
		Project Contribution ⁶	0.0	0.0	0.0	0.0	0.0	0.0	
	L3	Project Noise Level ³	39.2	36.3	37.9	40.6	44.0	53.1	No
		Ambient Noise Level ⁴	60.4	56.9	59.3	62.9	66.1	88.4	
R3		Combined ⁵	60.4	56.9	59.3	62.9	66.1	88.4	
		Project Contribution ⁶	0.0	0.0	0.0	0.0	0.0	0.0	
	L3	Project Noise Level ³	41.3	38.3	41.2	45.8	49.7	54.8	No
R4		Ambient Noise Level ⁴	60.4	56.9	59.3	62.9	66.1	88.4	
		Combined ⁵	60.5	57.0	59.4	63.0	66.2	88.4	
		Project Contribution ⁶	0.1	0.1	0.1	0.1	0.1	0.0	
R5	- L5 -	Project Noise Level ³	29.1	26.1	28.8	33.1	36.9	42.5	
		Ambient Noise Level ⁴	64.9	56.6	61.7	67.6	73.5	91.2	Na
		Combined ⁵	64.9	56.6	61.7	67.6	73.5	91.2	No -
		Project Contribution ⁶	0.0	0.0	0.0	0.0	0.0	0.0	

TABLE 9-4: PROJECT DAYTIME NOISE LEVEL CONTRIBUTIONS

² Measurement locations as shown on Exhibit 5-A.

³ Project operational noise levels as shown on Table 9-3.

⁴ Existing ambient noise level measurements provided in Appendix 5.2.

⁵ Represents the combined ambient conditions plus the Project activities.

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

⁷ Significance of Noise Impacts (Section 4).



Location									
Rec. ¹	Meas. ²	Type of Noise	Leq (E. Avg.)	L₅₀ (30 mins)	L ₂₅ (15 mins)	L₃ (5 mins)	L₂ (1 min)	L _{max} (Anytime)	Threshold Exceeded? ⁷
R1	L1 -	Project Noise Level ³	37.1	34.1	37.0	41.6	45.5	50.6	No
		Ambient Noise Level ⁴	62.2	56.6	58.6	62.4	68.0	93.8	
N1	LI	Combined ⁵	62.2	56.6	58.6	62.4	68.0	93.8	
		Project Contribution ⁶	0.0	0.0	0.0	0.0	0.0	0.0	
		Project Noise Level ³	30.3	27.2	28.6	32.7	38.0	48.3	No
R2	1.2	Ambient Noise Level ⁴	64.6	56.4	61.3	68.0	73.2	85.5	
KZ	L2	Combined ⁵	64.6	56.4	61.3	68.0	73.2	85.5	
		Project Contribution ⁶	0.0	0.0	0.0	0.0	0.0	0.0	
	L3	Project Noise Level ³	39.2	36.3	37.9	40.6	44.0	53.1	No
20		Ambient Noise Level ⁴	59.2	54.8	57.2	61.1	65.1	84.6	
R3		Combined ⁵	59.2	54.9	57.3	61.1	65.1	84.6	
		Project Contribution ⁶	0.0	0.1	0.1	0.0	0.0	0.0	
	L3	Project Noise Level ³	41.3	38.3	41.2	45.8	49.7	54.8	No
R4		Ambient Noise Level ⁴	59.2	54.8	57.2	61.1	65.1	84.6	
		Combined ⁵	59.3	54.9	57.3	61.2	65.2	84.6	
		Project Contribution ⁶	0.1	0.1	0.1	0.1	0.1	0.0	
25	L5 -	Project Noise Level ³	29.1	26.1	28.8	33.1	36.9	42.5	- No
		Ambient Noise Level ⁴	61.0	51.9	55.8	62.7	69.4	85.0	
R5		Combined ⁵	61.0	51.9	55.8	62.7	69.4	85.0	
		Project Contribution ⁶	0.0	0.0	0.0	0.0	0.0	0.0	

TABLE 9-5: PROJECT NIGHTTIME NOISE LEVEL CONTRIBUTIONS

² Measurement locations as shown on Exhibit 5-A.

³ Project operational noise levels as shown on Table 9-3.

⁴ Existing ambient noise level measurements provided in Appendix 5.2.

⁵ Represents the combined ambient conditions plus the Project activities.

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

⁷ Significance of Noise Impacts (Section 4).



9.6 OPERATIONAL VIBRATION IMPACTS

To assess the potential vibration impacts from truck haul trips associated with operational activities the threshold for vibration of 0.2 in/sec PPV is used, as previously shown on Table 3-3. Truck vibration levels are dependent on vehicle characteristics, load, speed, and pavement conditions. Typical vibration levels for the Cedar Avenue Technology Park heavy truck activity at normal traffic speeds will approach 0.001 in/sec PPV, based on the FTA *Transit Noise Impact and Vibration Assessment*. (4) Trucks transiting on site will be travelling at very low speeds so it is expected that delivery truck vibration impacts at nearby homes will satisfy the vibration threshold of 0.2 in/sec PPV, and therefore, will be *less than significant*.



10 CONSTRUCTION IMPACTS

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

10.1 CONSTRUCTION NOISE STANDARDS

To analyze noise impacts originating from the construction of the Cedar Avenue Technology Park Project, noise from construction activities are typically limited to the hours of operation established under a jurisdiction's Municipal Code. Section 83.01.080(g)(3) of the County of San Bernardino Development Code, provided in Appendix 3.1, indicates that construction activity is considered exempt from the noise level standards between the hours of 7:00a.m. to 7:00 p.m. except on Sundays and Federal holidays, as shown on Table 3-1. (3) However, neither the County of San Bernardino General Plan or County 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, the following construction noise level threshold is used in this noise study.

To evaluate whether the Project will generate potentially significant construction noise levels at off-site sensitive receiver locations, a construction-related noise level threshold is adopted from the Criteria for Recommended Standard: Occupational Noise Exposure prepared by the National Institute for Occupational Safety and Health (NIOSH). (17) A division of the U.S. Department of Health and Human Services, NIOSH identifies a noise level threshold based on the duration of exposure to the source. The construction related noise level threshold starts at 85 dBA for more than eight hours per day, and for every 3 dBA increase, the exposure time is cut in half. This results in noise level thresholds of 88 dBA for more than four hours per day, 92 dBA for more than one hour per day, 96 dBA for more than 30 minutes per day, and up to 100 dBA for more than 15 minutes per day. (17) For the purposes of this analysis, the lowest, more conservative construction noise level threshold of 85 dBA Leg is used as an acceptable threshold for construction noise at the nearby sensitive receiver locations. Since this construction-related noise level threshold represents the energy average of the noise source over a given time, they are expressed as Leq noise levels. Therefore, the noise level threshold of 85 dBA Leq over a period of eight hours or more is used to evaluate the potential Project-related construction noise level impacts at the nearby sensitive receiver locations.



10.2 CONSTRUCTION NOISE LEVELS

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

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

This construction noise analysis was prepared using reference noise level measurements taken by Urban Crossroads, Inc. to describe the typical construction activity noise levels for each stage of Project construction. The construction reference noise level measurements represent a list of typical construction activity noise levels. Noise levels generated by heavy construction equipment can range from approximately 68 dBA to more than 80 dBA when measured at 50 feet. However, these noise levels diminish with distance from the construction site at a rate of 6 dBA per doubling of distance. For example, a noise level of 80 dBA measured at 50 feet from the noise source to the receiver would be reduced to 74 dBA at 100 feet from the source to the receiver, and would be further reduced to 68 dBA at 200 feet from the source to the receiver. The construction stages used in this analysis are consistent with the *Cedar Avenue Technology Park Air Quality Impact Analysis* prepared by Michael Baker International. (6)

10.3 CONSTRUCTION REFERENCE NOISE LEVELS

To describe the Project construction noise levels, measurements were collected for similar activities at several construction sites. Table 10-1 provides a summary of the 17-construction reference noise level measurements. Since the reference noise levels were collected at varying distances of 30 feet and 50 feet, all construction noise level measurements presented on Table 10-1 have been adjusted for consistency to describe a uniform reference distance of 50 feet.





EXHIBIT 10-A: CONSTRUCTION NOISE SOURCE LOCATIONS AND MITIGATION MEASURES

Temporary Noise Barrier

Existing Barrier



ID	Noise Source	Reference Distance From Source (Feet)	Reference Noise Levels @ Reference Distance (dBA Leq)	Reference Noise Levels @ 50 Feet (dBA Leq) ⁷
1	Truck Pass-Bys & Dozer Activity ¹	30'	63.6	59.2
2	Dozer Activity ¹	30'	68.6	64.2
3	Construction Vehicle Maintenance Activities ²	30'	71.9	67.5
4	Foundation Trenching ²	30'	72.6	68.2
5	Rough Grading Activities ²	30'	77.9	73.5
6	Framing ³	30'	66.7	62.3
7	Water Truck Pass-By & Backup Alarm ⁴	30'	76.3	71.9
8	Dozer Pass-By ⁴	30'	84.0	79.6
9	Two Scrapers & Water Truck Pass-By ⁴	30'	83.4	79.0
10	Two Scrapers Pass-By ⁴	30'	83.7	79.3
11	Scraper, Water Truck, & Dozer Activity ⁴	30'	79.7	75.3
12	Concrete Mixer Truck Movements ⁵	50'	71.2	71.2
13	Concrete Paver Activities ⁵	30'	70.0	65.6
14	Concrete Mixer Pour & Paving Activities ⁵	30'	70.3	65.9
15	Concrete Mixer Backup Alarms & Air Brakes⁵	50'	71.6	71.6
16	Concrete Mixer Pour Activities ⁵	50'	67.7	67.7
17	Forklift, Jackhammer, & Metal Truck Bed Loading	50'	67.9	67.9

TABLE 10-1: CONSTRUCTION REFERENCE NOISE LEVELS

¹ As measured by Urban Crossroads, Inc. on 10/14/15 at a business park construction site located at the northwest corner of Barranca Parkway and Alton Parkway in the City of Irvine.

² As measured by Urban Crossroads, Inc. on 10/20/15 at a construction site located in Rancho Mission Viejo.

³As measured by Urban Crossroads, Inc. on 10/20/15 at a residential construction site located in Rancho Mission Viejo.

⁴ As measured by Urban Crossroads, Inc. on 10/30/15 during grading operations within an industrial construction site located in the City of Ontario.

⁵ Reference noise level measurements were collected from a nighttime concrete pour at an industrial construction site, located at 27334 San Bernardino Avenue in the City of Redlands, between 1:00 a.m. to 2:00 a.m. on 7/1/15.

⁶ As measured by Urban Crossroads, Inc. on 9/9/16 during the demolition of an existing paved parking lot at 41 Corporate Park in Irvine.

⁷ Reference noise levels are calculated at 50 feet using a drop off rate of 6 dBA per doubling of distance (point source).



10.4 CONSTRUCTION NOISE ANALYSIS

Using the reference construction equipment noise levels, calculations of the Project construction noise level impacts at the nearby sensitive receiver locations were completed. Tables 10-2 to 10-6 present the short-term construction noise levels for each stage of construction. Table 10-7 provides a summary of the construction noise levels by stage at the nearby noise-sensitive receiver locations. Based on the stages of construction, the noise impacts associated with the proposed Project are expected to create temporarily high noise levels at the nearby receiver locations. To assess the peak construction noise levels, this analysis shows the highest noise impacts when the equipment with the highest reference noise level is operating at the closest point from the center of primary construction activity to each receiver location.

Reference Construction Activity ¹	Reference Noise Level @ 50 Feet (dBA Leq)
Truck Pass-Bys & Dozer Activity	59.2
Dozer Activity	64.2
Dozer Pass-By	79.6
Peak Reference Noise Level at 50 Feet (dBA Leq):	79.6

TABLE 10-2: SITE PREPARATION EQUIPMENT NOISE LEVELS

Receiver Location	Distance to Construction Activity (Feet) ²	Distance Attenuation (dBA Leq) ³	Calculated Noise Barrier Attenuation (dBA Leq) ⁴	Construction Noise Level (dBA Leq)
R1	760'	-23.6	0.0	55.9
R2	350'	-16.9	0.0	62.7
R3	130'	-8.3	0.0	71.3
R4	78'	-3.9	0.0	75.7
R5	790'	-24.0	-5.5	50.1

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

² Distance from the nearest point of construction activity to the nearest receiver.

³ Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.



Reference Construction Activity ¹	Reference Noise Level @ 50 Feet (dBA Leq)
Truck Pass-Bys & Dozer Activity	59.2
Dozer Activity	64.2
Rough Grading Activities	73.5
Dozer Pass-By	79.6
Peak Reference Noise Level at 50 Feet (dBA Leq):	79.6

TABLE 10-3: GRADING EQUIPMENT NOISE LEVELS

Receiver Location	Distance to Construction Activity (Feet) ²	Distance Attenuation (dBA Leq) ³	Calculated Noise Barrier Attenuation (dBA Leq) ⁴	Construction Noise Level (dBA Leq)
R1	760'	-23.6	0.0	55.9
R2	350'	-16.9	0.0	62.7
R3	130'	-8.3	0.0	71.3
R4	78'	-3.9	0.0	75.7
R5	790'	-24.0	-5.5	50.1

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

 $^{\rm 2}$ Distance from the nearest point of construction activity to the nearest receiver.

³ Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Reference Construction Activity ¹	Reference Noise Level @ 50 Feet (dBA Leq)
Construction Vehicle Maintenance Activities	67.5
Foundation Trenching	68.2
Framing	62.3
Peak Reference Noise Level at 50 Feet (dBA Leq):	68.2

TABLE 10-4: BUILDING CONSTRUCTION EQUIPMENT NOISE LEVELS

Receiver Location	Distance to Construction Activity (Feet) ²	Distance Attenuation (dBA Leq) ³	Calculated Noise Barrier Attenuation (dBA Leq) ⁴	Construction Noise Level (dBA Leq)
R1	760'	-23.6	0.0	44.5
R2	350'	-16.9	0.0	51.3
R3	130'	-8.3	0.0	59.9
R4	78'	-3.9	0.0	64.3
R5	790'	-24.0	-5.5	38.7

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

 $^{\rm 2}$ Distance from the nearest point of construction activity to the nearest receiver.

³ Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Reference Construction Activity ¹	Reference Noise Level @ 50 Feet (dBA Leq)
Concrete Mixer Truck Movements	71.2
Concrete Paver Activities	65.6
Concrete Mixer Pour & Paving Activities	65.9
Concrete Mixer Backup Alarms & Air Brakes	71.6
Concrete Mixer Pour Activities	67.7
Peak Reference Noise Level at 50 Feet (dBA Leq):	71.6

TABLE 10-5: PAVING EQUIPMENT NOISE LEVELS

Receiver Location	Distance to Construction Activity (Feet) ²	Distance Attenuation (dBA Leq) ³	Calculated Noise Barrier Attenuation (dBA Leq) ⁴	Construction Noise Level (dBA Leq)
R1	760'	-23.6	0.0	48.0
R2	350'	-16.9	0.0	54.7
R3	130'	-8.3	0.0	63.3
R4	78'	-3.9	0.0	67.7
R5	790'	-24.0	-5.5	42.1

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

² Distance from the nearest point of construction activity to the nearest receiver.

³ Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.



Reference Construction Activity ¹	Reference Noise Level @ 50 Feet (dBA Leq)
Construction Vehicle Maintenance Activities	67.5
Framing	62.3
Peak Reference Noise Level at 50 Feet (dBA Leq):	67.5

TABLE 10-6: ARCHITECTURAL COATING EQUIPMENT NOISE LEVELS

Receiver Location	Distance to Construction Activity (Feet) ²	Distance Attenuation (dBA Leq) ³	Calculated Noise Barrier Attenuation (dBA Leq) ⁴	Construction Noise Level (dBA Leq)
R1	760'	-23.6	0.0	43.8
R2	350'	-16.9	0.0	50.6
R3	130'	-8.3	0.0	59.2
R4	78'	-3.9	0.0	63.6
R5	790'	-24.0	-5.5	38.0

 $^{\rm 1}\,{\rm Reference}$ construction noise level measurements taken by Urban Crossroads, Inc.

² Distance from the nearest point of construction activity to the nearest receiver.

³ Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

⁴ Calculated barrier attenuation from existing barriers in the Project study area (Appendix 9.1).

10.5 CONSTRUCTION NOISE THRESHOLDS OF SIGNIFICANCE

The construction noise analysis shows that the highest construction noise levels will occur when construction activities take place at the closest point from the center of Project construction activity to each of the nearby receiver locations. As shown on Table 10-7, the unmitigated construction noise levels are expected to range from 50.1 to 75.7 dBA Leq at the nearby receiver locations. To evaluate whether the Project will generate potentially significant short-term noise levels at off-site sensitive receiver locations a construction-related the NIOSH noise level threshold of 85 dBA Leq is used as acceptable thresholds for construction noise at the nearby sensitive receiver locations.



		Construction Phase Hourly Noise Level (dBA Leq)					
Receiver Location ¹	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Peak Activity ²	
R1	55.9	55.9	44.5	48.0	43.8	55.9	
R2	62.7	62.7	51.3	54.7	50.6	62.7	
R3	71.3	71.3	59.9	63.3	59.2	71.3	
R4	75.7	75.7	64.3	67.7	63.6	75.7	
R5	50.1	50.1	38.7	42.1	38.0	50.1	

TABLE 10-7: UNMITIGATED CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY (DBA LEQ)

¹Noise receiver locations are shown on Exhibit 10-A.

² Estimated construction noise levels during peak operating conditions.

Table 10-8 shows the peak construction noise levels at the potentially impacted receiver locations are expected to approach 75.7 dBA Leq and will satisfy the NIOSH 85 dBA Leq significance threshold during temporary Project construction activities. The noise impact due to unmitigated Project construction noise levels is, therefore, considered a *less than significant* impact at all nearby sensitive receiver locations.

TABLE 10-8: CONSTRUCTION EQUIPMENT NOISE LEVEL COMPLIANCE (DBA LEQ)

_	Construction Noise Levels (dBA Leq)				
Receiver Location ¹	Peak Activity ²	Threshold ³	Threshold Exceeded? ⁴		
R1	55.9	85	No		
R2	62.7	85	No		
R3	71.3	85	No		
R4	75.7	85	No		
R5	50.1	85	No		

¹Noise receiver locations are shown on Exhibit 10-A.

² Estimated construction noise levels during peak operating conditions, as shown on Table 10-7.

³ Construction noise level threshold as shown on Table 4-2.

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



10.6 CONSTRUCTION NOISE LEVEL CONTRIBUTIONS

To describe the temporary Project construction noise level contributions to the existing ambient noise environment, the Project construction noise levels were combined with the existing ambient noise levels measurements at the off-site receiver locations. The difference between the combined Project-construction and ambient noise levels are used to describe the construction noise level contributions. Temporary noise level increases that would be experienced at sensitive receiver locations when Project construction-source noise is added to the ambient daytime conditions are presented on Table 10-9. A temporary noise level increase of 12 dBA is considered a potentially significant impact based on the Caltrans substantial noise level increase criteria which is used to assess the Project-construction noise level increases. (5) No nighttime construction activity is permitted in the County of San Bernardino Development Code, and therefore, nighttime noise level increases are not analyzed in this noise study.

As indicated in Table 10-9, the Project will contribute unmitigated, worst-case construction noise level increases approaching 15.4 dBA Leq during the daytime hours at the closest sensitive receiver location, R4. Since the worst-case temporary noise level increases at receiver location R4 during Project construction will exceed the 12 dBA Leq significance threshold, the unmitigated construction noise level increases are considered *potentially significant* temporary noise impacts at receiver location R4.

Receiver Location ¹	Peak Project Construction Noise Level ²	Measurement Location ³	Reference Ambient Noise Levels⁴	Combined Project and Ambient ⁵	Temporary Worst-Case Project Contribution ⁶	Threshold Exceeded? ⁷
R1	55.9	L1	63.2	63.9	0.7	No
R2	62.7	L2	66.3	67.9	1.6	No
R3	71.3	L3	60.4	71.6	11.2	No
R4	75.7	L3	60.4	75.8	15.4	Yes
R5	50.1	L5	64.9	65.0	0.1	No

TABLE 10-9: UNMITIGATED CONSTRUCTION-RELATED TEMPORARY NOISE LEVEL INCREASES

¹ Noise receiver locations are shown on Exhibit 10-A.

² Peak unmitigated Project construction noise levels as shown on Table 10-8.

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

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

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

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

⁷ Based on the 12 dBA Leq temporary increase significance criteria as defined in Section 4.



Therefore, temporary construction noise mitigation measures are required to reduce these impacts at receiver location R4. This includes the use of temporary construction noise mitigation barriers at the construction boundaries near the impacted receiver locations where Project construction noise levels could potentially exceed the noise level thresholds, as previously shown on Exhibit 10-A. The construction noise analysis presents a conservative approach with the highest noise-level-producing equipment for each stage of Project construction operating at the closest point from construction activity to the nearby sensitive receiver locations. This scenario is unlikely to occur during typical construction activities and likely overstates the construction noise levels which will be experienced at each receiver location. With the construction noise mitigation measures identified in this noise study, shown on Exhibit 10-A, the worst-case construction noise level increases at the nearby residential receivers would be reduced.

The noise attenuation provided through temporary noise barriers depends on many factors including cost, wind loading, the location of the receiver, and the ability to place barriers such that the line-of-sight of the receiver is blocked to the noise source, among others. This analysis assumes a temporary noise barrier constructed using frame-mounted materials such as vinyl acoustic curtains or quilted blankets attached to the construction site perimeter fence.

Table 10-10 shows the peak construction noise level increases at the potentially impacted receiver locations will be reduced to 11.7 dBA Leq with the attenuation provided by the temporary construction noise barrier. As shown on Table 10-10, the temporary construction noise mitigation measures will reduce the construction noise levels at the impacted receiver locations to satisfy the 12 dBA Leq significant increase threshold during temporary Project construction activities. Therefore, the noise impact due to Project construction is considered a *less than significant* impact after mitigation. The temporary construction noise barrier attenuation calculations are provided in Appendix 10.1. Appendix 10.2 includes example photographs of temporary noise barrier installations for reference.

Receiver Location ¹	Mitigated Peak Project Construction Noise Level ²	Measurement Location ³	Reference Ambient Noise Levels⁴	Combined Project and Ambient ⁵	Temporary Worst-Case Project Contribution ⁶	Threshold Exceeded? ⁷
R4	71.8	L3	60.4	72.1	11.7	No

TABLE 10-10: MITIGATED TEMPORARY CONSTRUCTION NOISE LEVEL INCREASES AT R4

¹ Noise receiver locations are shown on Exhibit 10-A.

² Peak Project construction noise levels with temporary noise barrier attenuation (Appendix 10.1).

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

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

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

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

⁷ Based on the 12 dBA Leq temporary increase significance criteria as defined in Section 4.



10.7 CONSTRUCTION VIBRATION IMPACTS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from Project construction activities would cause only intermittent, localized intrusion. The proposed Project's construction activities most likely to cause vibration impacts are:

- Heavy Construction Equipment: Although all heavy mobile construction equipment has the potential of causing at least some perceptible vibration while operating close to building, the vibration is usually short-term and is not of sufficient magnitude to cause building damage. It is not expected that heavy equipment such as large bulldozers would operate close enough to any residences to cause a vibration impact.
- Trucks: Trucks hauling building materials to construction sites can be sources of vibration intrusion if the haul routes pass through residential neighborhoods on streets with bumps or potholes. Repairing the bumps and potholes generally eliminates the problem.

Ground-borne vibration levels resulting from construction activities occurring within the Project site were estimated by data published by the Federal Transit Administration. Construction activities that would have the potential to generate low levels of ground-borne vibration within the Project site include grading. Using the vibration source level of construction equipment provided on Table 6-8 and the construction vibration assessment methodology published by the FTA, it is possible to estimate the Project vibration impacts. Table 10-11 presents the expected Project related vibration levels at the nearby receiver locations.

Based on the reference vibration levels provided by the FTA, a large bulldozer represents the peak source of vibration with a reference velocity of 0.089 in/sec PPV at 25 feet. At distances ranging from 78 to 790 feet from Project construction activities, construction vibration velocity levels are expected to approach 0.02 in/sec PPV, which is below the vibration standard of 0.2 in/sec PPV at all receiver locations during Project construction. Therefore, the Project-related vibration impacts are considered *less than significant* during the construction activities at the Project site.

Further, the Project-related construction vibration levels do not represent levels capable of causing building damage to nearby residential homes. The FTA identifies construction vibration levels capable of building damage ranging from 0.12 to 0.5 in/sec PPV. (4) The peak Project-construction vibration levels shown on Table 10-11, approaching 0.02 in/sec PPV, are below the FTA vibration levels for building damage at the residential homes near the Project site. Further, the impacts at the site of the closest sensitive receivers 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. Construction at the Project site will be restricted to daytime hours consistent with City requirements thereby eliminating potential vibration impact during the sensitive nighttime hours.



	Distance to							
Receiver ¹	Const. Activity (Feet)	Small Bulldozer	Jack- hammer	Loaded Trucks	Large Bulldozer	Peak Vibration	Threshold Exceeded? ⁴	
R1	760'	0.00	0.00	0.00	0.00	0.00	No	
R2	350'	0.00	0.00	0.00	0.00	0.00	No	
R3	130'	0.00	0.00	0.01	0.01	0.01	No	
R4	78'	0.00	0.01	0.01	0.02	0.02	No	
R5	790'	0.00	0.00	0.00	0.00	0.00	No	

TABLE 10-11: CONSTRUCTION EQUIPMENT VIBRATION LEVELS

¹Receiver locations are shown on Exhibit 10-A.

² Based on the Vibration Source Levels of Construction Equipment included on Table 6-8.

³ Vibration levels in PPV are converted to RMS velocity using a 0.71 conversion factor identified in the Caltrans Transportation and Construction Vibration Guidance Manual, September 2013.

⁴ Does the peak vibration exceed the County of San Bernardino maximum acceptable vibration threshold shown on Table 3-3?

10.8 CONSTRUCTION NOISE MITIGATION MEASURES

Though construction noise is temporary, intermittent and of short duration, and will not present any long-term impacts, the following mitigation measures would reduce noise level increases produced by the construction equipment to the nearby noise-sensitive residential land uses:

- Install minimum 6-foot high temporary construction noise barriers at the Project's southern site boundary adjacent to sensitive receivers on Orange Street, as shown on Exhibit 10-A, for the duration of Project construction. The noise control barriers must have a solid face from top to bottom. The noise control barriers must meet the minimum height and be constructed as follows:
 - The temporary noise barriers shall provide a minimum transmission loss of 20 dBA (Federal Highway Administration, Noise Barrier Design Handbook). The noise barrier shall be constructed using an acoustical blanket (e.g. vinyl acoustic curtains or quilted blankets) attached to the construction site perimeter fence or equivalent temporary fence posts;
 - The noise barrier must be maintained and any damage promptly repaired. Gaps, holes, or weaknesses in the barrier or openings between the barrier and the ground shall be promptly repaired;
 - The noise control barrier and associated elements shall be completely removed and the site appropriately restored upon the conclusion of the construction activity.
- During all Project site construction, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the Project site.



• The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and noise-sensitive receivers nearest the Project site during all Project construction (i.e., to the north).



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11 REFERENCES

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- 21. U.S. Department of Transportation, Federal Highway Administration. FHWA Highway Traffic Noise Prediction Model. December 1978. FHWA-RD-77-108.



- 22. 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.
- 23. **California Department of Transportation.** *Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report.* June 1995. FHWA/CA/TL-95/23.



12 CERTIFICATION

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

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



EDUCATION

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

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

PROFESSIONAL REGISTRATIONS

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

PROFESSIONAL AFFILIATIONS

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

PROFESSIONAL CERTIFICATIONS

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



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APPENDIX 3.1:

COUNTY OF SAN BERNARDINO DEVELOPMENT CODE



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San Bernardino County, CA Code of Ordinances

DIVISION 3: COUNTYWIDE DEVELOPMENT STANDARDS

CHAPTER 83.01: GENERAL PERFORMANCE STANDARDS

Section

83.01.010 Purpose.
83.01.020 Applicability.
83.01.030 Modification of Standards.
83.01.040 Air Quality.
83.01.050 Electrical Disturbances.
83.01.060 Fire Hazards.
83.01.070 Heat.
83.01.080 Noise.
83.01.090 Vibration.
83.01.100 Waste Disposal.
83.01.110 External Commercial or Industrial Activity on Private Property.

§ 83.01.010 Purpose.

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

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

(Ord. 4011, passed - -2007)

§ 83.01.020 Applicability.

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

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

(c) *Evidence of Compliance with Standards*. If requested by the Director or the Review Authority, applicants shall provide evidence to the Director that the proposed development is in compliance with the standards in this Division and other applicable standards in this Development Code before the issuance of a Building Permit or business license.

(Ord. 4011, passed - -2007)

§ 83.01.030 Modification of Standards.

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

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

(Ord. 4011, passed - -2007)

§ 83.01.040 Air Quality.

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

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

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

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

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

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

- (I) Idling when queuing;
- (II) Idling to verify that the vehicle is in safe operating condition;
- (III) Idling for testing, servicing, repairing or diagnostic purposes;

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

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

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

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

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

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

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

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

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

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

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

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

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

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

§ 83.01.050 Electrical Disturbances.

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

(Ord. 4011, passed - -2007)

§ 83.01.060 Fire Hazards.

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

Land Uses).

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

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

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

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

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

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

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

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

Table 83-1Storage Standards for Flammable Liquids and Gases						
SCF = Standard cubic feet at	60°F and 29.92" Hg (i.e., mercury)					
Liquids	Regional Industrial District (IR)	120,000 gallons				
	All other manufacturing or industrial uses legally established within any other land use zoning district	60,000 gallons				
Liquefied Petroleum Gas (LPG)	All manufacturing or industrial uses established in any land zoning use district	Per County Code Title 2, Division 3 (Fire Protection and Explosives and Hazardous Materials)				
	All commercial uses legally established in any land use zoning district	15,000 gal./tank 20,000 gallons maximum aggregate total				
	All agricultural uses legally established in any land use zoning district and aggregate total	15,000 gal./tank and aggregate total				
Gases other than liquefied petroleum gas	Regional Industrial District (IR)	300,000 SCF above ground 600,000 SCF below ground				
	All other manufacturing or industrial uses legally 86	150,000 SCF above ground 300,000 SCF below ground				

- (c) Liquefied Petroleum Gas (LPG).
 - (1) General Requirements.

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

(I) The standards in this Subdivision.

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

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

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

(2) Fire Protection Requirements for All Parcels.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(C) Additional protection.

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

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

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

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

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

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

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

(Ord. 4011, passed - -2007)

§ 83.01.070 Heat.

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

(Ord. 4011, passed - -2007)

§ 83.01.080 Noise.

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

(a) Noise Measurement. Noise shall be measured:

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

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

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

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

(c) Noise Standards for Stationary Noise Sources.

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

Table 83-2							
Noise Standards for Stationary Noise Sources							
Affected Land Uses (Receiving Noise)	7:00 a.m 10:00 p.m. Leq	10:00 p.m 7:00 a.m. Leq					
Residential	55 dB(A)	45 dB(A)					
Professional Services55 dB(A)55 dB(A)							
Other Commercial $60 \text{ dB}(A)$ $60 \text{ dB}(A)$							
Industrial	70 dB(A)	70 dB(A)					
	Level). The sound level correspondence total energy as a time-vary e, eight or 24 hours.						
dB(A) = (A-weighted Sound Pressure Level). The sound pressure level, in decibels, as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound, placing greater emphasis on those frequencies within the sensitivity range of the human ear.							
during a 24-hour day obtain measured during the night (evel). The average equivalent A ned by adding 10 decibels to the from 10:00 p.m. to 7:00 a.m.). of people for noise during nigh	e hourly noise levels In this way Ldn takes into					

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

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

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

hour.

- (D) The noise standard plus 15 dB(A) for a cumulative period of more than one minute in any hour.
- (E) The noise standard plus 20 dB(A) for any period of time.

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

		<i>Table 83-3</i>					
	No	ise Standards for Adjacent Mobile Nois	se Soi	urces			
Land Use Ldn (or CNEL) dB(A)						B (A)	
Categories		Uses Inte			rior ⁽¹⁾ Exterior ⁽²⁾		
Residential		Single and multi-family, duplex, mobil homes	ile 45		60 ⁽³⁾		
Commercial		Hotel, motel, transient housing		45		60 ⁽³⁾	
		Commercial retail, bank, restaurant		50)	N/A	
		Office building, research and development, professional offices	Office building, research and		45		
		Amphitheater, concert hall, auditorium, movie theater		45		N/A	
Institutional/Public		Hospital, nursing home, school classroom, religious institution, library		45		65	
Open Space Par		Park			N/A		
Notes:							
		ronment shall exclude bathrooms, kitche	ens, to	oilets, clo	osets ar	nd corridor	
 Hospital/ Hotel and Mobile h Multi-far Park picn 	office d mote ome pa nily pr nic area ard of	ivate patios or balconies as single-family dwellings					
noise levels h available nois (or CNEL) wi to achieve an mechanical ve	ave be e redu- th win accept entilati	se level of up to 65 dB(A) (or CNEL) sh en substantially mitigated through a reas ction technology, and interior noise expo dows and doors closed. Requiring that v able interior noise level shall necessitate on. ty Noise Equivalent Level). The average	sonab osure windo e the u	le applic does not ws and c ise of air	ation o exceed loors re- condit	f the best d 45 dB(A emain clos tioning or	

CNEL = (Community Noise Equivalent Level). The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of approximately five decibels to sound **90**

levels in the evening from 7:00 p.m. to 10:00 p.m. and ten decibels to sound levels in the night from 10:00 p.m. to 7:00 a.m.

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

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

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

- (1) Motor vehicles not under the control of the commercial or industrial use.
- (2) Emergency equipment, vehicles, and devices.

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

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

Table 83-4					
Noise Standards for Other Structures					
Typical Uses	12-Hour Equivalent Sound Level (Interior) in dBA Ldn				
Educational, institutions, libraries, meeting facilities, etc.	45				
General office, reception, etc.	50				
Retail stores, restaurants, etc.	55				
Other areas for manufacturing, assembly, testing, warehousing, etc.	65				

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

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

§ 83.01.090 Vibration.

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

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

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

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

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

(Ord. 4011, passed - -2007)

§ 83.01.100 Waste Disposal.

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

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

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

(Ord. 4011, passed - -2007)

§ 83.01.110 External Commercial or Industrial Activity on Private Property.

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

(Ord. 4245, passed - -2014)

APPENDIX 5.1:

STUDY AREA PHOTOS



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JN:11139 Cedar Avenue



L1_E 34, 4' 12.360000", 117, 23' 38.500000"



L1_N 34, 4' 12.410000", 117, 23' 38.470000"



L1_S 34, 4' 12.360000", 117, 23' 38.500000"



L1_W 34, 4' 12.360000", 117, 23' 38.500000"



L2_E 34, 3' 54.050000", 117, 23' 54.290000"



L2_N 34, 3' 54.050000", 117, 23' 54.270000"

JN:11139 Cedar Avenue



L2_W 34, 3' 54.050000", 117, 23' 54.350000"



L3_E 34, 3' 54.590000", 117, 23' 42.780000"



L3_N 34, 3' 54.560000", 117, 23' 42.760000"



34, 3' 54.630000", 117, 23' 42.870000"



L3_SW 34, 3' 54.640000", 117, 23' 42.870000"



L4_N 34, 3' 55.550000", 117, 23' 31.190000"

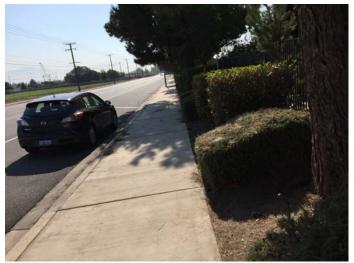
JN:11139 Cedar Avenue



L4_S 34, 3' 55.530000", 117, 23' 31.190000"



L4_W 34, 3' 55.450000", 117, 23' 31.220000"



L5_E 34, 3' 46.840000", 117, 23' 41.330000"



L5_N 34, 3' 46.840000", 117, 23' 41.330000"



25_3 34, 3' 46.790000", 117, 23' 41.300000"



L5_W 34, 3' 46.840000", 117, 23' 41.330000"

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APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS



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24-Hour		CNEL	69.1		-		2.29	2 23		%667	53.0	58.0 EE 4	51.0	54.0	52.1		51.0	51.0	52.0	53.0	53.0 54.0	54.0	54.0	54.0	53.0 53.0	55.0	56.0	30.0 56.0	57.0	57.0 	57.0	56.0	55.0	53.0 51.0	URBAN Crossroads
rage Lea	Alixh+	Nignt 22.2	62.2		s)		8 [.] 79	21 22		195%	54.0	59.0 E6 4	52.0	55.0	53.1		52.0	52.0	53.0 53.0	54.0	54.0 55.0	55.0	55.0	55.0	54.0 54.0	56.0	57.0	57.0	58.0	58.0	58.0 58.0	57.0	55.0	54.U 52.0	
Enerav Averaae Lea		Day 22.2	63.2		L50% (30 Minutes)		8.£ð	19 20		%067	55.0	59.0 57.1	52.0	56.0	53.8		53.0	52.0	53.0 53.0	54.0	55.0 56.0	56.0	56.0	55.0	55.0	57.0	58.0	57.0	58.0	59.0	0.93	57.0	56.0	53.0 53.0	
1139		. worre	Date: 7/12/2017				62.5	17 18		L50%	58.0	62.0 60.2	55.0	59.0	56.6		56.0	55.0 rr 0	0.cc 55.0	57.0	57.0 59.0	60.0	60.0	60.0	58.0	60.0	61.0	07.0 60.0	61.0	61.0	62.0	61.0	59.0	56.0	
У JN: 11139	Anchict: A	Analyst: A. Wolfe	Date: 7		-		0.63	15 16		L25%	59.0	64.0 62.2	56.0	62.0	58.6		58.0	57.0	57.0	59.0	59.0 62.0	62.0	63.0	63.0	0.66	63.0	64.0	62.0	62.0	62.0	63.0 63.0	63.0	62.0	61.U 58.0	
24-Hour Noise Level Measurement Summary					L2% (1 Minute)		£.£ð	13 14		78%	62.0	67.0 65.2	60.0	66.0	62.4		64.0	61.0	60.0 62.0	61.0	62.0 66.0	66.0	66.0	65.0	02.0 64.0	66.0	67.0 67.0	65.0	65.0	64.0	0.00 66.0	66.0	65.0	64.0 62.0	
asuremen		residential					7. £ð		Hour Beginning	L5%	63.0 22.0	68.U 66 E	62.0 62.0	69.0	64.4	nmary	0.69	62.0	66.0	62.0	63.0 67.0	67.0	68.0	67.0	03.U 66.0	67.0	68.0	67.0	66.0	65.0	66.0	68.0	66.0	66.U 63.0	
e Level Me		near existing I			-		6.62	10 11	Hour	L2%	65.0 	71.0	65.0	75.0	68.0	Hourly Summary	75.0	65.0 Gr 0	0.60	66.0	65.0 71.0	70.0	70.0	71.0	0.co	70.0	70.0	00.0 68.0	69.0	67.0	/1.0 68.0	70.0	69.0	65.0	101
Hour Nois		lnterstate 10			-		6.23	8		L1%	66.0 	71 1	67.0	76.0	71.0		76.0	70.0	68.U 75.0	70.0	67.0 75.0	73.0	72.0	73.0	71.0	74.0	72.0	70.0	70.0	68.0 <u>-</u> 200	70.0	72.0	72.0	/0.0 68.0	
24-		ect site across	aru.				64.2	6 7		Lmin	51.9		49.1	53.6	e:		49.1	49.8	51.4	52.5	52.3 53.6	53.3	53.2	53.1	52.1 52.1	53.9	55.1	54.9	55.7	55.6	56.5	53.9	54.3	49.6	
		th of the Proj	valley boulev		-	-	6.62 4.62	4 5		Гтах	76.0	87.2 Average	71.7	93.8	Average:		81.9	93.8 70.2	/8.2 80.0	78.9	71.7 84.6	81.8	76.2	83.6 63.6	86.2	81.5	85.7 81 F	81.1	79.7	76.0	84.8 82.8	84.5	87.2	/8.9 88.4	
adar Avenue		L1 - Located north of the Project site across Interstate 10 near existing residential	nomes sourn of valiey bourevaru.	adjusted)	-		8.23	2 3		ped	59.9	64.2 62 7	58.2	64.3	62.2		63.6	64.3	58.2 61.8	59.9	59.4 64.2	63.2	62.9	63.7	53.3 62.3	63.7	64.1 52.2	62.5	63.0	62.5	64.2 63.8	64.1	62.9	61.8 62.2	
<i>Proiect Name</i> : Cedar Avenue		Location: L1	É	Readings (un			64.3 63.6	0 1		Hour	Min	Max Brage:	Min	Max	erage:		0	₽ (νm	4	5	2	∞	о (11	12	13	15	16	17	19	20	21	23	
Pro	-			Hourly Leq dBA Readings (unadjusted)	85.0		urly Leq			Time Period	Day	Energy Average:		Night Max	Energy Av				Night									Cay						Night	

24-Hour	CNEL	71.7				L. 13		23		%667	49.0 53.0	51.1	47.0	51.0	40./		47.0 47.0	47.0	47.0	49.0 51.0	50.0	51.0	50.0 40.0	49.0	50.0	50.0	51.0	52.0	53.0 53.0	52.0	52.0	52.0 52.0	51.0 49.0	2:2
24						2.43		22		7																								
bəq əbu	Night	64.6				8.99		21		L95%	50.0 54.0	52.1	48.0	53.0	5.UC	0.04	49.0 49.0	48.0	49.0	53.0	52.0	52.0	52.0	50.0	51.0	51.0	52.0	53.0	54.0 54.0	53.0	53.0	53.0 53.0	52.0 51.0	
Energy Average Leq	`			L50% (30 Minutes)		7.2 3		20		%		1				_					C	0		<u> </u>	0		<u> </u>							
Ener	Day	66.3		0% (30 I		2 .29		19		%067	50.0 55.0	53.1	48.0	53.0)'TC		0.1c 49.0	48.0	49.0	53.0	53.0	53.0	53.0	50.0	52.0	52.0	54.0	54.0	55.0	54.0	54.0	54.0 54.0	53.0 52.0	
6	olfe	/2017		5		8 .73		18		L50%	57.0 62.0	59.5	53.0	61.0 rc 4	00.4		53.0	53.0	55.0 FC 0	58.0	61.0	62.0	60.0 58 0	57.0	57.0	58.0	0.00 60.0	60.0	62.0 62.0	61.0	59.0	59.0 59.0	58.0 58.0	2.27
<i>JN:</i> 11139	<i>Analyst:</i> A. Wolfe	Date: 7/12/2017				9 .98		16 17				2,									•			, ,,									5, 5	
	Analys	Dat				7.2 3		15 1		L25%	63.0 68.0	65.1	56.0	68.0	5.10	001	56.0	59.0	59.0	62.0 65.0	68.0	68.0	66.0 64.0	64.0	63.0	64.0 65 0	65.0	65.0	66.0 67.0	66.0	65.0	64.0	62.0 62.0	~
our Noise Level Measurement Summary				inute)		S. 98		14		%87	69.0 72.0	70.3	64.0	72.0	00.0		64.0	66.0	68.0	69.U 71.0	72.0	72.0	71.0	70.0	69.0	70.0	71.0	69.0	71.0	71.0	70.0	70.0	68.0 68.0	200
ment				L2% (1 Minute)		τ.73		13	ing					+																				
leasure	sting	0		Ī		9'59		11 12	Hour Beginning	r5%	70.0 73.0	71.7	67.0	74.0	7.07		69.U 67.0	68.0	70.0	73.0	74.0	73.0	72.0	71.0	70.0	71.0	72.0	71.0	72.0	73.0	71.0	/1.0 72.0	70.0)
Level N	Street adiacent to existing					t:59		10	HOI	L2%	73.0 76.0	74.3	71.0	75.0	Valuelly Summary		71.0 71.0	72.0	74.0	74.0 74.0	75.0	75.0	74.0	74.0	73.0	73.0 75.0	75.0	74.0	75.0 75.0	76.0	74.0	75.0	73.0 74.0	2
Noise	set adiac					8.29		6						+																				
24-Hour	range Stre	0				6. .33		7 8		L1%	74.0 78.0	76.3	73.0	74.0	14.9		73.0	75.0	76.0	0.c/ 76.0	76.0	0.77	76.0	75.0	74.0	76.0	77.0	75.0	77.0	78.0	76.0	78.0 78.0	74.0	
2	ct site on O					5.73		9		Lmin	47.5 52.1		46.6	50.6	Ū.	10.0	40.9 46.7	46.7	46.6	48.2 50.6	49.7	49.4	47.9 47.5	47.8	49.5	48.3	4 <i>3.</i> 1 50.1	50.5	52.1 51 7	50.5	51.0	52.U 51.9	49.9 48.7	
	the Proje					£ .99		ъ		Lmax	80.2 90.1	Average	80.2 25 r	2	AVEI age.		81.9 80.2	82.6	83.5	85.5 85.5	L.3	84.7	81.6	80.7	80.5	86.7 •0.4	85.4	85.0	81.6 86.2	85.1	80.2	80.9 90.1	82.4 83 1	
ər	west of	omes.				9.49		4		TΜ	<u> </u>		₩ ₩	85.		ò	× ×	8	80 G	000	81.	8	òo òo		8	× ×	0 00	80	<u></u> 80 8	5 80	₩ 8	<u>x</u> 0	× ×)
Cedar Avenu	12 - Located west of the Project site on Orange	residential homes.	nadjusted)			0.Ea		2 3		bə1	64.4 67.6	66.3	61.2 22 2	67.5 CAC	04.0	0 5 7	62.8 61.2	63.0	64.1 64.5	04.0 66.3	67.5	67.6	66.3 65 e	65.1	64.4	65.6 67 1	07.1 66.5	65.7	66.6 67 2	67.3	65.7	7.co 66.8	64.2 64.7	;
<i>Project Name:</i> Cedar Avenue		Location: -	eadings (u			2.13		1		Hour	Min Max	ige:	Min	Max 200	age.	4	о г	2	m ₹	4 U	6	2	× 0	10	11	12	14	15	16 17	18	19	21 21	22 73	2
Projec		70	Hourly Leq dBA Readings (unadjusted)	RE O		62.8 0.0.0.0 0.0.0.0 0.0.0 0.0 0.0 0.0 0.0	45.0 35.0 35.0	0		Time Period	Day	Energy Average:	Night	Enormy Allows	citer gy Average.				Night								Day						Night	

24-Hour		CINEL	66.3					£.1			2 23		%661	48 U	57.0	50.8	44.0	55.0	48.1		44.0	45.0 45.0	45.0	48.0	51.0 50.0	50.0	48.0	48.0	48.0	40.U 48 D	50.0	51.0	52.0	52.0	0.53.U	53.0 53.0	52.0	37.0 EE 0	50.0 50.0	URBAN CROSSROADS
rage Lea		Night	59.2		s)		Н	7.2			21 22		195%	49.U	57.0	52.5	46.0	56.0	49.7		47.0	46.0 46.0	47.0	49.0	52.0 52.0	51.0	50.0	49.0	51.0	0.0c	52.0	52.0	53.0	54.0	0.00	55.0	54.0	0.10	52.0	
Enerav Average Lea		Day	60.4		L50% (30 Minutes)			9.1 0.2			19 20		%061	20.02	58.0	53.3	47.0	57.0	50.7		48.0	47.0	48.0	50.0	53.0	52.0	51.0	50.0	52.0	0.12	52.0	53.0	54.0	55.0	0.00	56.0	54.0	00.0 57 0	54.0	
139		Wolfe	Date: 7/12/2017		5051 			4 .1 7.1			17 18		150%	54.0	60.0	56.9	51.0	59.0	54.8		54.0	51.0	53.0	55.0	56.0 56.0	56.0	55.0	54.0	56.0 rr 0	0.00	56.0	57.0	57.0	59.0	0.85	59.0	58.0	60.0	58.0	
V JN: 11139		Analyst: A. Wolfe	Date: 7/					£.(15 16		125%	57.0	61.0	59.3	53.0	61.0	57.2		56.0	53.0	56.0	57.0	59.0 59.0	59.0	58.0	57.0	58.0	0.72	59.0	60.0	60.0	61.0	61.0	61.0	60.0	01.0	0.09	
t Summar					L2% (1 Minute)			Z. (09		13 14		18%	61.0	65.0	62.9	58.0	65.0	61.1		60.0	58.0	59.0	61.0	63.0 62.0	63.0	62.0	61.0	61.0	0.10 61 D	63.0	63.0	63.0	65.0	0.60	63.0	63.0	6E 0	63.0 63	
our Noise Level Measurement Summary		ar			— L2% (1			Z	:'ZS		12	Beginning	15%	62.0	66.0	64.0	59.0	66.0	62.6	nmary	61.0	59.0	61.0	63.0	64.0 64.0	64.0	63.0	62.0	62.0 53.0	62 U	65.0	64.0	64.0	66.0	00.U	65.0	64.0	0.60	65.0	
: Level Me		nge Street nea						H	82		10 11		12%	63.0	68.0	66.1	62.0	69.0	65.1	Hourly Summary	63.0	62.0 62.0	64.0	65.0	67.0 66.0	66.0	65.0	64.0	64.0	03.U	68.0	66.0	67.0	68.0	68.0	67.0	65.0	0.10	68.0	103
Hour Noise		undary on Ora							85		6 - 8		11%	64.0	71.0	67.9	64.0 	/2.0	67.2		66.0	64.0 64.0	66.0	66.0	69.0 67.0	67.0	66.0	66.0	65.0 63.0	64.0 64.0	70.0	68.0	69.0	69.0	0.07	70.0	67.0 71.0	0.1	71.0	
24-H0		roject site bou	ol.					E	6S 6S		6 7		Lmin	46.7	55.7		43.3	53.8			43.3	44.1 42.0	43.2	47.1	49.3 49.1	48.9	47.3	47.1	46.7	40.0 46.8	48.8	50.3	51.1	51.0	7.26 50 0	51.6	50.9	00.1	48.0	
		ne southern P	iior High Scho					8	09 .72		4 - -		Lmax	73.1	88.4	Average	71.4	84.6	Average		80.9	77.0	79.5	72.4	80.5 76 7	75.0	73.1	81.7	73.1	22.7 74 6	82.4	80.9	74.9	75.8	78.8	87.1	88.4 2 C	C.20	04.0 83.0	
dar Avenue		L3 - Located at the southern Project site boundary on Orange Street near	Bloomington Junior High School.	adjusted)					6.4 ₈		- - - -		Геа	57.2	62.7	60.4	54.9	62.7	59.2		58.0	55.1 E4 0	57.0	57.8	60.4 50.3	59.7	58.3	58.2	58.2	57.2	60.7	60.2	60.3	61.4	61.4 61.7	62.0	61.6 52.7	1.20	02.7 61.3	
<i>Proiect Name</i> : Cedar Avenue		Location: L3		Readings (un				-7	τ·59 ·85	5	0		Hour	Min	Max	rage:	Min	Max	rage:		0	c	νm	4	v u	0 ~	~ 00	6	10	11	13	14	15	16	12	19	20	17	22 23	
Proi) - -	-		Hourly Leq dBA Readings (unadjusted)	01.0			1 /1)		Time Period		Day	Energy Average:	Night	, ı	Energy Average:				Night)								Day							Night	

24-Hour	CNFL	66.4	t.00					4.23		2 23		<i>7667</i>	53.0	56.0	54.5 52.0	54.0 54.0	52.4		52.0	52.0	52.0 52.0	52.0	52.0 54.0	54.0	53.0	53.0	54.0	54.0	55.0 EE 0	56.0	55.0	55.0 25	55.0	55.0	54.0	53.0 53.0	URBAN Crossroads
rage Leg	Niaht	59.5	<i>L</i>		s)			9.19 8.03		21 22		195%	54.0	57.0	55.3	55.0 55.0	53.0		52.0	53.0	53.0 52.0	52.0	53.0 55.0	55.0	54.0	54.0	54.0	55.0	56.0 E E O	57.0	56.0	56.0	56.0	56.0	55.U	54.U 53.0	
Energy Average Leg	νυα	60.4	1.00		L50% (30 Minutes)			2.28 2.28		19 20		%067	54.0	57.0	55.5	56.0	53.6		53.0	53.0	53.0 53.0	52.0	53.0 56.0	55.0	54.0	54.0	55.0	55.0	56.0	57.0	56.0	57.0	57.0	56.0	55.U	54.0	
1139	Wolfe	Date: 7/12/2017	1102/21/		- F20			9.63 9.63		17 18		L50%	56.0	60.0	57.5 54 0	58.0 58.0	55.8		56.0	55.0	55.0	54.0	55.0 57.0	57.0	56.0	56.0	56.0	57.0	58.0	59.0	59.0	60.0	58.0	58.0	57.0	56.0	
.V JN: 11139	Analvst: A. Wolfe	Date: 7	סמובי ז		-			4.13 0.13		15 16		L25%	57.0	61.0	59.1 56 0	0.06	57.7		58.0	57.0	58.0 57.0	56.0	56.0 59.0	60.0	57.0	57.0	58.0	59.0	60.0	61.0	61.0	61.0 -0.0	59.0 59.0	59.0	0.95	6U.U 58.0	
our Noise Level Measurement Summary					L2% (1 Minute)			0'T9		13 14		78%	59.0	64.0	62.1 50.0	63.0	60.8		61.0	61.0	60.0 59.0	59.0	61.0 62.0	64.0	61.0	60.0	62.0	62.0	63.0	64.0	63.0	64.0	62.0 61.0	61.0	63.0	63.U 61.0	
easuremer	-	strial and					_	2. 6	S	11 12	Beginning	L5%	61.0	65.0	63.4	65.0	62.2	mmary	62.0	63.0	61.0 60.0	61.0	62.0 63.0	65.0	63.0	62.0	01.0 63.0	63.0	64.0	65.0	64.0	65.0 22.0	63.0 63.0	62.0	64.U	0.co 63.0	
e Level Me		r existing indu			-			E.8	S	10 1		L2%	63.0	67.0	65.7	02.0 67.0	64.8	Hourly Summary	63.0	66.0 66.0	63.U 62.0	64.0	67.0 66.0	67.0	66.0	64.0	65.0	65.0	67.0 66.0	67.0	67.0	66.0	0.co 66.0	65.0	67.0	67.U 65.0	104
Hour Nois-		ch Avenue nea			-			7.8		б - - -		11%	65.0	72.0	68.3	70.0	66.8		65.0	67.0	63.0 63.0	65.0	70.0 68.0	70.0	68.0	68.0 CT 0	67.0	67.0	72.0	0.00	69.0	68.0	66.U 71.0	67.0	0.69	/U.U 68.0	
24-H0	:	ct site on Larc			-			0.08		6 7		Lmin	53.2		ge: 51 6	54.1			51.6	51.8	52.2 52.0	51.9	52.2 54 1	54.0	53.2	53.3	53.8	53.5	54.1	54.2 54.8	54.6	54.5	55.2	54.9	54.0	53.U 52.9	
		st of the Proje			-			۲.ea		4		Lmax	72.9	90.4	Average:	88.4	Average		78.1	82.0	68.1 78.6	73.8	81.9 78 8	77.5	72.9	82.3	81.6	73.7	79.5	2.67	74.4	77.3	90.4	73.5	C.//	83.7 88.4	
edar Avenue	-	L4 - Located east of the Project site on Larch Avenue near existing industrial and residential uses.		nadjusted)	-			9.7 2.7		5 - -		Leq	58.3	62.5	60.4 56.7	50.7 62.4	59.5		58.3	58.7	57.1 57.1	56.7	59.7 60.0	60.8	58.7	59.4	59.3 59.3	59.2	61.3 61.0	61.4	61.0	61.4 -0.6	59.6 62.5	59.7	60.3 61.6	61.6 62.4	
<i>Proiect Name:</i> Cedar Avenue		Location: L		A Readings (ur	-			£.8 7.8		- 1		Hour	Min	Max	/erage:	Max	erage:		0	.⊢ (7 00	4	ۍ د ا	2	∞	o (11	12	13	15 15	16	17	19	20	17	22 23	
Pro				Hourly Leq dBA Readings (unadjusted)	85.0			البلا 20:00 20:00 مرابع	Hor 45.0 40.0 37.0	-		Time Period	Dav	ί το μ	Energy Average:	Night	Energy Average:				Night	5							Ne ^C	Cay						Night	

24-Hour	CNEL	68.7				7.65	23		%667	47.0 51.0	49.3	44.0	48.0	46.2		45.0	44.0	45.0 45.0	43.0	47.0	48.0	47.0	48.0	48.0	49.0	48.0	50.0 50.0	51.0	51.0	51.0	50.0	50.0	50.0	48.0 46.0	
erage Leq	Night	61.0		(sa		64.2	 21 22		<i>195%</i>	48.0 52.0	50.6	45.0	50.0	47.3		46.0	45.0	45.0	40.0 49.0	49.0	50.0	49.0	50.0	50.0	50.0	0.02	51.0	52.0	53.0	0.23	51.0	51.0	51.0	49.0 47.0	
Energy Average Leg	Day	64.9		– L50% (30 Minutes)		£.4.3	19 20		%061	49.0 54.0	51.5	46.0	50.0	48.0		47.0	46.0	46.0	40.0 49.0	50.0	50.0	50.0	51.0	51.0	51.0	50.0	52.0	53.0	54.0	53.0	52.0	52.0	52.0	50.0 48.0	
JN: 11139	A. Wolfe	Date: 7/12/2017				6' <u>5</u> 9	17 18		L50%	55.0 50.0	56.6	48.0	56.0	51.9		51.0	48.0	49.0 F0.0	53.0	54.0	55.0	55.0 EE 0	59.0	56.0	56.0 	56.U	57.0	58.0	59.0	53.U	56.0	56.0	55.0	56.0 51.0	
	Analyst: A. Wolfe	Date:				2.23	15 16		L25%	60.0 6.0	61.7	51.0	61.0	55.8		54.0	51.0	52.0	57.0 57.0	59.0	61.0	61.0 61.0	64.0	61.0	61.0 21 2	61.0 61.0	0.1.0 62.0	63.0	64.0	64.U	60.0	60.0	60.0	61.0 55.0	
ent summa				-L2% (1 Minute)		6.23 £.23	13 14		78%	65.0 60.0	67.6	59.0	67.0	62.7		61.0	59.0	60.0	63.0	65.0	67.0	68.0 68.0	68.0 68.0	67.0	67.0	67.U 68.0	0.00	69.0	69.0 0.00	69.U	67.0	65.0	65.0	67.0 62.0	
24-Hour Noise Level Measurement Summary	residential	5		— L2%		6.53	11 12	Hour Beginning	L5%	67.0 72.0	6.69	62.0	69.0	65.0	Hourly Summary	63.0	62.0	63.0 62.0	0.20 65.0	67.0	69.0	70.0	70.0	70.0	70.0	69.0 71.0	71.0	72.0	71.0	70.0	69.0	68.0	67.0	69.0 64.0	
iise Level I	Avenue near existing residential	0				8.4.9	9 10	Н	L2%	71.0 75.0	73.5	67.0	73.0	69.4	Hourly S	68.0	68.0	69.0	0.70	70.0	73.0	73.0	73.0	73.0	75.0	74.0	75.0	74.0	75.0	74.0	74.0	72.0	71.0	73.0 68.0	
4-Hour No						8.E3	7 8		11%	74.0 78.0	75.9	71.0	76.0	72.4		71.0	71.0	72.0	72.0	73.0	75.0	76.0	75.0	75.0	78.0	0.27 0.27	78.0	76.0	77.0	0.67	75.0	75.0	74.0	76.0 71.0	
2	15 - Located south of the Project site on Slover					9.£9	9		Lmin	44.5 50.3	Average:		47.4	Average:		44.8	43.5	44.4	47.4	46.8	47.4	47.2 44 E	45.5	45.9	47.3	47.4	49.1	49.1	50.3	50.1 18 2	48.7	48.9	49.5	46.7 46.1	
e	south of the P					8'T9 6'65	4 5		Гтах	81.5 01 2			85.0	Ave		81.0	82.2	80.8 2 C C 0	c.20 79.9	84.6	82.9	81.5	83.2	91.1	87.4	86.6 07 4	85.0 85.0	86.9	83.5	83.4 20 5	87.1	91.2	89.6	85.0 80.3	
Cedar Avenu	L5 - Located	homes.	(unadjusted)			0.62	 2 3		ped	63.3 65 0	64.9	58.5	64.2	61.0		58.8	58.5	59.0	0.8c 59.9	61.8	63.6	63.8 65 2	64.9	64.8	65.2 22	63.9 65 1	62.9	65.5	65.7	1.60 0.73	64.3	64.1	63.3	64.2 59.4	
Project Name: Cedar Avenue		Location:	Hourly Leq dBA Readings (unadjusted)			8.82	0 1		Hour	Min	Energy Average:	Min	gnt Max	Average:		0	1	0 0	0 4	S	9	► °	0 თ	10	11	12	14	15	16	1/	19	20	21	22 23	
			Hourly Leg a	OE O		۵.0.0.0 ۵.0.00 ۵.0.00 ۵.00 ۵.00 ۵.00 ۵.			Time Period	Day	Energy	Niah+	INIBILI	Energy				Mirch+	าเมลิเท								Dav							Night	

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APPENDIX 7.1:

OFF-SITE TRAFFIC NOISE CONTOURS



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	FHW/	A-RD-77-108 HIC	GHWAY I	NOISE PI	REDICTIO	N MOD	EL			
Scenario: Exis Road Name: Ceo Road Segment: n/o	lar Av.	,			Project Na Job Nun			venue		
SITE SPEC	FIC INP	UT DATA	1		NO	ISE M	ODEL	INPUT	S	
Highway Data				Site Con	ditions (H	ard = 1	0, Soi	ft = 15)		
Average Daily Traffic	(Adt): 2	6,700 vehicles				A	utos:	15		
Peak Hour Percer	ntage:	10%		Me	dium Truck	(2 A)	des):	15		
Peak Hour Vo	lume: 2	,670 vehicles		He	avy Trucks	; (3+ A)	des):	15		
Vehicle S	peed:	40 mph	H	Vehicle	Mise					
Near/Far Lane Dist	ance:	48 feet	-		icleType	ſ	Dav	Evening	Night	Dailv
Site Data				VCII	Aut		7.5%	12.9%	9.6%	
	- lasta ta	0.0 feet		M	edium Truc		4.8%	4.9%	10.3%	
Barrier He	•	0.0 feet			Heavy Truc		6.5%	2.7%	10.8%	
Barrier Type (0-Wall, 1-E Centerline Dist, to B		0.0 59.0 feet							10.070	2.007
Centerline Dist. to Obs		59.0 feet		Noise So	ource Elev			et)		
Barrier Distance to Obs		0.0 feet			Autos:	0.0				
Observer Height (Above		5.0 feet			m Trucks:	2.2				
Pad Flev		0.0 feet		Heav	y Trucks:	8.0	04 (Grade Adj	ustment	: 0.0
Road Elev		0.0 feet		Lane Eq	uivalent D	istanc	e (in fe	et)		
Road G		0.0%			Autos:	54.1				
		-90.0 degrees		Mediu	m Trucks:	53.9	56			
Right		90.0 degrees			y Trucks:	53.9	32			
FHWA Noise Model Calc	ulations									
VehicleType REI	MEL 1	Traffic Flow D	Distance	Finite	Road	Fresne	el E	Barrier Atte	en Ber	rm Atten
Autos:	66.51	2.76	-0.6	2	-1.20	,	4.69	0.0	00	0.00
Medium Trucks:	77.72	-14.78	-0.6	0	-1.20	-	4.88	0.0	00	0.00
Heavy Trucks:	82.99	-13.30	-0.6	0	-1.20	-	5.35	0.0	00	0.00
Unmitigated Noise Level										
	eak Hour	Leq Day		vening	Leq Nig	,		Ldn		NEL
Autos:	67.5			63.8		57.7		66.4		67.
Medium Trucks:	61.1		-	53.3		51.7		60.2		60.
Heavy Trucks:	67.9		-	57.4		58.7		67.0		67.:
Vehicle Noise:	71.1		5	65.0		61.7		70.2	2	70.
Centerline Distance to N	oise Con	tour (in feet)	70	dBA	65 dB	<u>a</u>	6/) dBA	55	dBA
		l dr		иви 51	131	~		281		06 06
		CNEL		34	131			201 297		39 39
		CNEL			130			231	c	102

		A-RD-77-108 HIG	HWAY	NOISE PR	EDICT	ION MO	DEL			
	b: Existing With	out Project				Name:		Avenue		
Road Name	e: Cedar Av.				Job N	umber:	11139			
Road Segmen	t: s/o Valley Bl.									
	SPECIFIC INP	UT DATA	-					L INPUT	s	
Highway Data				Site Con	ditions	(Hard =	10, So	oft = 15)		
Average Daily	Traffic (Adt): 3	7,150 vehicles					Autos:	15		
Peak Hour I	Percentage:	10%		Mee	dium Tri	ucks (2 A	(xles)	15		
Peak He	our Volume: 3	,715 vehicles		Hea	avy Truo	cks (3+ A	(xles)	15		
	nicle Speed:	40 mph	ŀ	Vehicle I	Nix					
Near/Far Lar	e Distance:	48 feet	Ē	Vehi	cleType		Day	Evening	Night	Daily
Site Data						Autos:	77.5%	12.9%	9.6%	95.93
Bar	rier Height:	0.0 feet		Me	edium T	rucks:	84.8%	4.9%	10.3%	1.69
Barrier Type (0-Wa	•	0.0		H	leavy Ti	rucks:	86.5%	2.7%	10.8%	2.38
Centerline Dis		59.0 feet	-	Noise So	uree E	lovetion	o lin fi	no.41		
Centerline Dist. t	o Observer:	59.0 feet	ŀ	NUISE 30	Auto			el)		
Barrier Distance t	o Observer:	0.0 feet		Modium	Auto n Truck		200 297			
Observer Height (/	Above Pad):	5.0 feet			y Truck		297	Grade Ad	iustmont	. 0.0
Pa	d Elevation:	0.0 feet		neav	y much	5. 0.0	504	Olduc Au	usunoni	. 0.0
Roa	d Elevation:	0.0 feet		Lane Equ	uivalen	t Distan	ce (in :	feet)		
F	Road Grade:	0.0%			Auto	s: 54.	129			
	Left View:	-90.0 degrees			n Truck					
	Right View:	90.0 degrees		Heav	y Truck	s: 53.	982			
FHWA Noise Mode	l Calculations									
VehicleType	REMEL	Traffic Flow Di	istance	Finite	Road	Fresh	el	Barrier Att	en Ber	m Atter
Autos:	66.51	4.19	-0.6		-1.20		-4.69		000	0.00
Medium Trucks:	77.72	-13.35	-0.6		-1.20		-4.88		000	0.00
Heavy Trucks:	82.99	-11.86	-0.6	30	-1.20		-5.35	0.0	000	0.00
Unmitigated Noise				,						
	Leq Peak Hour	Leq Day		vening	Leq	Night		Ldn		NEL
Autos:	68.9			65.2		59.2		67.8		68
Medium Trucks: Heavy Trucks:	62.6 69.3			54.7 58.9		53.2 60.1		61.6 68.5		61 68
Vehicle Noise:	69.3 72.6			58.9 66.4		63.1		68.t		72
				00.4		03.1		71.0	,	72
Centerline Distanc	e to Noise Con	tour (in teet)	70	dBA	65	dBA	F	0 dBA	55	dBA
		Ldn:		76		63	<u>ــــــــــــــــــــــــــــــــــــ</u>	351		56
		2011.								

	e: Existing Wi e: Cedar Av. t: s/o I-10 Fw						Name: lumber:		Avenue		
	PECIFIC IN	IPUT DATA		01						S	
Highway Data				Sn	e con	antions	(Hard =		,		
Average Daily T	, ,	27,300 vehicle	es					Autos:	15		
Peak Hour F		10%					ucks (2)		15 15		
	our Volume:	2,730 vehicle	S		не	avy mu	cks (3+)	axies):	15		
	icle Speed:	40 mph		Ve	hicle l	Mix					
Near/Far Lan	e Distance:	48 feet			Veh	icleType	9	Day	Evening	Night	Daily
Site Data							Autos:	77.5%	12.9%	9.6%	95.93%
Barr	ier Height:	0.0 feet		1	Me	edium T	rucks:	84.8%	4.9%	10.3%	1.69%
Barrier Type (0-Wa	all, 1-Berm):	0.0			ŀ	Heavy T	rucks:	86.5%	2.7%	10.8%	2.38%
Centerline Dist	t. to Barrier:	59.0 feet		No	vico Se		levation	e (in f	nof)		
Centerline Dist. to	o Observer:	59.0 feet		740	136 30	Auto			æi)		
Barrier Distance to	o Observer:	0.0 feet			Madiuu	m Truck		000 297			
Observer Height (A	bove Pad):	5.0 feet				v Truck	u	257	Grade Ad	iustment	· 0.0
Pad	d Elevation:	0.0 feet								dourion	0.0
Road	d Elevation:	0.0 feet		La	ne Eq	uivalen	t Distan	ce (in i	feet)		
R	oad Grade:	0.0%				Auto		129			
	Left View:	-90.0 degre	es			m Truck		966			
	Right View:	90.0 degre	es		Heav	ry Truck	s: 53.	982			
FHWA Noise Mode	l Calculation	s									
VehicleType	REMEL	Traffic Flow	Dista		Finite		Fresi		Barrier Att		m Atten
Autos:	66.51	2.86		-0.62		-1.20		-4.69		000	0.00
Medium Trucks:	77.72	-14.69		-0.60		-1.20		-4.88		000	0.00
Heavy Trucks:	82.99	-13.20		-0.60		-1.20		-5.35	0.0	000	0.00
Unmitigated Noise											
VehicleType I Autos:	Leq Peak Hou 67		65.6	.eq Eve	ning 63.9	Leq	Night 57.1		Ldn 66.4	-	NEL 67.
Autos: Medium Trucks:	61		59.7		53.9		57.0 51.8	-	60.3		67. 60.
	68		59.7 66.6		53.4 57.5		58.8	-	67.1		
Heavy Trucks: Vehicle Noise:	71	-	69.6		57.5 65.1		58.0	-	70.3		67. 70.
venicie noise.					65.1		61.6	5	70.3	5	70.
Contorlino Diot		unour un feet	/					1			
Centerline Distance				70 dB	A	65	dBA	F	60 dBA	.55	dBA
Centerline Distance			I dn:	70 dB 62	A		dBA 33	6	0 dBA 286		dBA 515

	FH	WA-RD-77-108	B HIGH	WAY NO	OISE PI	REDICTIO	ON MO	DEL			
	e: Cedar Av.	lithout Project				Project I Job Nu	Name: Imber:		Avenue		
SITE	SPECIFIC I	VPUT DATA							L INPUT	s	
Highway Data				s	Site Cor	nditions ('Hard =	10, So	oft = 15)		
Average Daily	Traffic (Adt):	21,410 vehic	es					Autos:	15		
Peak Hour	Percentage:	10%			Me	dium Tru	cks (2 A	xles):	15		
Peak H	our Volume:	2,141 vehicle	s		He	avy Truci	ks (3+ A	xles):	15		
Vei	hicle Speed:	40 mph		V	ehicle	Miv					
Near/Far La	ne Distance:	48 feet				icleType	1	Dav	Evening	Night	Daily
Site Data					1011			77.5%	•	9.6%	
	rier Heiaht:	0.0 feet			М	edium Tru		84.8%		10.3%	
Barrier Type (0-W		0.0 1001			1	Heavy Tru	ucks:	86.5%	2.7%	10.8%	
Centerline Dis	. ,	59.0 feet		A	loise S	ource Ele	vation	s (in fo	of)		
Centerline Dist.	to Observer:	59.0 feet			0/30 0	Autos.		000			
Barrier Distance	to Observer:	0.0 feet			Madiu	m Trucks		297			
Observer Height (Above Pad):	5.0 feet				/v Trucks		004	Grade Ad	iustmon	H 0.0
Pa	d Elevation:	0.0 feet			near	y mucks.	. 0.0	04	endde maj	uoumoni	. 0.0
Roa	d Elevation:	0.0 feet		L	ane Eq	uivalent	Distan	ce (in f	feet)		
F	Road Grade:	0.0%				Autos.	: 54.	129			
	Left View:	-90.0 degre	es		Mediu	m Trucks	53.	966			
	Right View:	90.0 degre	es		Heav	/y Trucks	53.	982			
FHWA Noise Mode	el Calculation	ıs									
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite	Road	Fresr	el	Barrier Att	en Bei	rm Atten
Autos:	66.51	1.80		-0.62	1	-1.20		-4.69	0.0	000	0.000
Medium Trucks:	77.72	-15.74		-0.60		-1.20		-4.88	0.0	000	0.000
Heavy Trucks:	82.99	-14.26		-0.60		-1.20		-5.35	0.0	000	0.000
Unmitigated Noise	Levels (with	nout Topo and	barrie	er attenu	uation)						
VehicleType	Leq Peak Ho	ur Leq Da	V	Leq Ev	ening	Leq N	light		Ldn	С	NEL
Autos:	66	6.5	64.6		62.8		56.8		65.4	1	66.0
Medium Trucks:		0.2	58.7		52.3		50.8		59.2		59.5
Heavy Trucks:	66	5.9	65.5		56.5		57.7		66.1		66.2
Vehicle Noise:	70	0.2	68.6		64.0		60.7		69.2	2	69.6
Centerline Distance	e to Noise C	ontour (in fee	t)								
				70 di	BA	65 d	IBA	6	i0 dBA	55	dBA
			Ldn:	52		11			243		523
		C	NEL:	55	5	11	9		256	ŧ	552

Tuesday, July 18, 2017

Tuesday, July 18, 2017

	FH\	WA-RD-77-108	HIGHW	AY NO	DISE PF	REDICTIO		EL			
Scenari	o: Existing Wi	ithout Project				Project Na	ame: C	edar .	Avenue		
	e: Cedar Av.					Job Nun	nber: 1	1139			
Road Segmen	nt: s/o Slover /	Av.									
	SPECIFIC IN	IPUT DATA							L INPUT	S	
Highway Data				S	ite Con	ditions (H	ard = 1	10, So	oft = 15)		
Average Daily	Traffic (Adt):	19,840 vehicle	s				A	utos:	15		
Peak Hour	Percentage:	10%			Me	dium Truck	(2 A	xles):	15		
Peak H	our Volume:	1,984 vehicles			He	avy Trucks	s (3+ A	xles):	15		
Vel	hicle Speed:	40 mph		V	ehicle I	Mix					-
Near/Far Lar	ne Distance:	48 feet		-	Vehi	icleType	[Dav	Evening	Night	Dailv
Site Data						Aut	os: 7	7.5%	12.9%	9.6%	95.93%
Bar	rier Height:	0.0 feet			Me	edium Truc	ks: 8	34.8%	4.9%	10.3%	1.69%
Barrier Type (0-W	•	0.0			ŀ	leavy Truc	sks: E	86.5%	2.7%	10.8%	2.38%
Centerline Dis	at. to Barrier:	59.0 feet		N	oise Sc	ource Elev	ations	(in fe	et)		
Centerline Dist. t	to Observer:	59.0 feet				Autos:	0.0		.,		
Barrier Distance t	to Observer:	0.0 feet			Mediur	n Trucks:	2.2	97			
Observer Height (J	Above Pad):	5.0 feet				v Trucks:	8.0	04	Grade Ad	iustment	: 0.0
	d Elevation:	0.0 feet									
	d Elevation:	0.0 feet		L	ane Eq	uivalent D			eet)		
F	Road Grade:	0.0%				Autos:	54.1				
	Left View:	-90.0 degree				n Trucks:	53.9				
	Right View:	90.0 degree	s		Heav	y Trucks:	53.9	82			
FHWA Noise Mode		-									
VehicleType	REMEL	Traffic Flow	Dista		Finite		Fresne		Barrier Att		rm Atten
Autos:	66.51	1.47		-0.62		-1.20		4.69		000	0.00
Medium Trucks:	77.72			-0.60		-1.20		4.88		000	0.00
Heavy Trucks:	82.99	-14.59		-0.60		-1.20	-	5.35	0.0	000	0.00
Unmitigated Noise					<u> </u>						
VehicleType Autos:	Leq Peak Hou 66			.eq Eve	•	Leq Ni			Ldn 65.1		NEL 65.
Medium Trucks:	59		54.3 58.3		62.5 52.0		56.4 50.4		58.9		65. 59.
Heavy Trucks:	59 66		8.3 5.2		52.0 56.1		50.4 57.4		58.5		59. 65.
Vehicle Noise:	69		5.2 8.2		63.7		57.4 60.4		68.9		69.
Centerline Distanc					00.7		00.4		00.3	-	05.
Centennie Distanc	e lo NOISE C	ontour (in teet)		70 dł	BA	65 dB	A	6	0 dBA	55	dBA
		1	dn:	50		107		-	231	4	198
			IEL:	52		113			243	5	524
		0.1		02							

Scenario:	Existing Wit	hout Project				Project	Name:	Cedar	Avenue		
Road Name:							lumber:				
Road Segment:		v.									
SITE SF	ECIFIC IN	PUT DATA				r	IOISE I	NODE		S	
Highway Data				S	ite Con		(Hard =				
Average Daily Tr	affic (Adt):	19,680 vehicle	s					Autos:	15		
Peak Hour Pe	ercentage:	10%			Me	dium Tr	ucks (2 /	Axles):	15		
Peak Hou	r Volume:	1,968 vehicles	3		Hea	avy Tru	cks (3+ /	Axles):	15		
Vehio	le Speed:	40 mph			ehicle I						
Near/Far Lane	Distance:	48 feet		V		nix cleTvpe		Dav	Evening	Night	Dailv
Site Data					veni			77.5%	•	9.6%	
					M	dium T		84.8%		10.3%	
	er Height:	0.0 feet						86.5%		10.3%	
Barrier Type (0-Wal	· ,	0.0			,	ieavy i	iuchs.	00.3%	2.1%	10.0%	2.307
Centerline Dist.		59.0 feet		N	loise So	urce E	levation	s (in f	et)		
Centerline Dist. to		59.0 feet				Auto	s: 0.	000			
Barrier Distance to		0.0 feet			Mediur	n Truck	s: 2.	297			
Observer Height (Al		5.0 feet			Heav	y Truck	s: 8.	004	Grade Adj	ustment	0.0
	Elevation:	0.0 feet		-							
	Elevation:	0.0 feet		L	ane Equ		t Distan		feet)		
Ro	ad Grade:	0.0%				Auto		129			
	Left View:	-90.0 degree				n Truck		966			
F	light View:	90.0 degree	s		Heav	y Truck	s: 53.	982			
FHWA Noise Model	Calculations										
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite	Road	Fresr	nel	Barrier Atte	en Ber	m Atten
Autos:	66.51	1.43		-0.62		-1.20		-4.69	0.0	00	0.00
Medium Trucks:	77.72	-16.11		-0.60		-1.20		-4.88	0.0	00	0.00
Heavy Trucks:	82.99	-14.62		-0.60		-1.20		-5.35	0.0	00	0.00
Unmitigated Noise L	evels (witho	ut Topo and	barrie	er attenu	uation)						
VehicleType Le	eq Peak Hou	Leq Day		Leq Eve	ening	Leq	Night		Ldn	C	NEL
Autos:	66.		64.2		62.5		56.4		65.0		65.
Medium Trucks:	59.		58.3		51.9		50.4		58.9		59.
Heavy Trucks:	66.	6 (65.1		56.1		57.4	Ļ	65.7		65.
Vehicle Noise:	69.	в (68.2		63.7		60.4	1	68.9		69.
Centerline Distance	to Noise Co	ntour (in feet))								
				70 dl			dBA	6	60 dBA		dBA
			Ldn:	49			07		230		95
			IFI :	52			12		242		21

Scenario: Existing Without Proje	ect		Project Nan	e: Cedar	Avenue		
Road Name: Valley Bl.			Job Numb				
Road Segment: e/o Cedar Av.			0001101110	0			
SITE SPECIFIC INPUT DA	ТА		NOIS	E MODE		s	
Highway Data		Site Col	nditions (Har				
Average Daily Traffic (Adt): 13,210 ve	hicles			Autos:	15		
Peak Hour Percentage: 10%		Me	edium Trucks	(2 Axles):	15		
Peak Hour Volume: 1,321 vel	nicles	He	eavy Trucks (3+ Axles):	15		
Vehicle Speed: 40 mp	h	Vehicle	Mix				
Near/Far Lane Distance: 48 fee	t		nicleTvpe	Dav	Evening	Night	Daily
Site Data			Autos	; 77.5%	•	9.6%	
Barrier Height: 0.0 fe	ot	N	ledium Trucks	84.8%	4.9%	10.3%	
Barrier Type (0-Wall, 1-Berm): 0.0			Heavy Trucks	86.5%	2.7%	10.8%	2.38
Centerline Dist. to Barrier: 59.0 fe		Noise S	ource Elevat	ions (in f	eet)		-
Centerline Dist. to Observer: 59.0 fe			Autos:	0.000			
Barrier Distance to Observer: 0.0 fe		Mediu	ım Trucks:	2.297			
Observer Height (Above Pad): 5.0 fe		Hea	vv Trucks:	8.004	Grade Ad	justment	: 0.0
Pad Elevation: 0.0 fe							
Road Elevation: 0.0 fe	et	Lane Ed	uivalent Dis		feet)		
Road Grade: 0.0%		11-1		54.129			
Left View: -90.0 de	5			53.966 53.982			
Right View: 90.0 de	egrees	пеа	vy mucks.	53.982			
FHWA Noise Model Calculations							•
VehicleType REMEL Traffic Fl Autos: 66.51 -		ce Finite	-1.20	resnel -4.69	Barrier Att		m Atter
		-0.62 -0.60	-1.20 -1.20	-4.69 -4.88		000	0.00
		-0.60	-1.20	-4.88		000	0.00
Unmitigated Noise Levels (without Topo			-1.20	-0.30	0.0	000	0.00
		g Evening	Leg Nigh	<i>t</i>	Ldn	0	NEL
Autos: 64.4	62.5	60.7	1 0	54.7	63.3		63
Medium Trucks: 58.1	56.6	50.2		48.7	57.1	-	57
Heavy Trucks: 64.8	63.4	54.4		55.6	64.0		64
Vehicle Noise: 68.1	66.5	61.9		58.6	67.1		67
Centerline Distance to Noise Contour (in	feet)						
· · ·		70 dBA	65 dBA	(60 dBA	55	dBA
	Ldn:	38	82		176	3	379

FH	WA-RD-77-108 HIGI	HWAY I	NOISE PI	REDICTION	N MODEL		
Scenario: Existing W Road Name: Orange St. Road Segment: e/o Cedar					ame: Ced aber: 1113	ar Avenue 39	
SITE SPECIFIC I	NPUT DATA					DEL INPUT	S
Highway Data			Site Cor	nditions (H	ard = 10,	Soft = 15)	
Average Daily Traffic (Adt):	2,210 vehicles				Auto	s: 15	
Peak Hour Percentage:	10%		Me	dium Truck	s (2 Axle	s): 15	
Peak Hour Volume:	221 vehicles		He	avy Trucks	(3+ Axles	s): 15	
Vehicle Speed:	25 mph	ŀ	Vehicle	Mix			
Near/Far Lane Distance:	12 feet	ŀ		icleType	Dav	Evening	Night Daily
Site Data				Aut		•	9.6% 95.93%
Barrier Height:	0.0 feet		М	edium Truc	ks: 84.8	3% 4.9%	10.3% 1.69%
Barrier Type (0-Wall, 1-Berm):	0.0			Heavy Truc	ks: 86.5	5% 2.7%	10.8% 2.38%
Centerline Dist. to Barrier:	30.0 feet	-	Noine C	ource Elev	otiono (in	faat)	
Centerline Dist. to Observer:	30.0 feet	ł	NOISE 3	Autos:		(ieel)	
Barrier Distance to Observer:	0.0 feet			m Trucks:	0.000		
Observer Height (Above Pad):	5.0 feet			m Trucks: /y Trucks:	8.004	Grade Ar	ljustment: 0.0
Pad Elevation:	0.0 feet		near	ly mucks.	8.004	Olduc Ad	justinent. 0.0
Road Elevation:	0.0 feet		Lane Eq	uivalent D	istance (i	in feet)	
Road Grade:	0.0%			Autos:	29.816		
Left View:	-90.0 degrees		Mediu	m Trucks:	29.518		
Right View:	90.0 degrees		Heav	/y Trucks:	29.547		
FHWA Noise Model Calculation	IS						
VehicleType REMEL	Traffic Flow Di	istance	Finite	Road	Fresnel	Barrier At	ten Berm Atten
Autos: 58.73	-6.02	3.2	26	-1.20	-4.4	9 0.	000 0.000
Medium Trucks: 70.80	-23.56	3.3	13	-1.20	-4.8	6 0.	000 0.000
Heavy Trucks: 77.97	-22.08	3.3	12	-1.20	-5.7	7 0.	000 0.000
Unmitigated Noise Levels (with	out Topo and barri	ier atter	nuation)				
VehicleType Leq Peak Ho	ur Leq Day	Leq E	vening	Leq Nig	pht	Ldn	CNEL
	1.8 52.9		51.1		45.1	53.	
	9.4 47.9		41.5		39.9	48.	
	3.0 56.6		47.6		48.8	57.	
Vehicle Noise: 60	0.1 58.5		53.0		50.7	59.	2 59.4
Centerline Distance to Noise C	ontour (in feet)						*
			dBA	65 dB	A	60 dBA	55 dBA
	Ldn:		6	12		26	57
	CNEL:		6	13		28	59

Tuesday, July 18, 2017

Tuesday, July 18, 2017

	FHV	/A-RD-77-108 HI	IGHWAY	NOISE PR	REDICTIO	MODEL		_	_
Scenario	: Existing Wit	thout Project			Project Na	ame: Ceda	r Avenue		
	e: Orange St.				Job Nurr	ber: 1113	Э		
Road Segmen	t: w/o Vine St								
	PECIFIC IN	PUT DATA					EL INPUT	S	
Highway Data				Site Con	ditions (H	ard = 10, S	oft = 15)		
Average Daily 1	raffic (Adt):	1,800 vehicles				Autos	: 15		
Peak Hour F	Percentage:	10%		Me	dium Truck	is (2 Axles)	: 15		
Peak Ho	our Volume:	180 vehicles		He	avy Trucks	(3+ Axles)	: 15		
Veh	icle Speed:	25 mph		Vehicle I	Mix				
Near/Far Lan	e Distance:	12 feet		Veh	icleTvpe	Dav	Evening	Niaht	Dailv
Site Data					Aut	os: 77.5		9.6%	95.93%
Bari	rier Height:	0.0 feet		Me	edium Truc	ks: 84.89	6 4.9%	10.3%	1.69%
Barrier Type (0-Wa	•	0.0		ŀ	Heavy Truc	ks: 86.5	6 2.7%	10.8%	2.38%
Centerline Dis	t. to Barrier:	30.0 feet		Noise So	ource Elev	ations (in	feet)		
Centerline Dist. t	o Observer:	30.0 feet			Autos:	0.000	,		
Barrier Distance t	o Observer:	0.0 feet		Mediu	m Trucks:	2.297			
Observer Height (A	Above Pad):	5.0 feet			v Trucks:	8.004	Grade Ad	iustment.	: 0.0
	d Elevation:	0.0 feet			,				
	d Elevation:	0.0 feet		Lane Eq	uivalent D		feet)		
F	load Grade:	0.0%			Autos:	29.816			
	Left View:	-90.0 degrees			m Trucks:	29.518			
	Right View:	90.0 degrees		Heav	y Trucks:	29.547			
FHWA Noise Mode							1		
VehicleType	REMEL		Distance			Fresnel	Barrier Att		m Atten
Autos:	58.73	-6.91	3.2		-1.20	-4.49		000	0.00
Medium Trucks:	70.80	-24.45	3.3		-1.20	-4.86		000	0.00
Heavy Trucks:	77.97	-22.97	3.3	-	-1.20	-5.77	0.0	000	0.00
Unmitigated Noise				- í				1 -	
	Leq Peak Hou			Evening	Leq Nig	44.2	Ldn		NEL
Autos:	53.			50.2			52.8		53.
Medium Trucks:	48.			40.6 46.7		39.1 47.9	47.5	-	47.
Heavy Trucks: Vehicle Noise:	57.						56.3		56.
	59.		.ο	52.1		49.8	58.3	5	58.
Centerline Distanc	e to Noise Co	ntour (in feet)	70	dBA	65 dB	A	60 dBA	55	dBA
		Ld		5	11		23		50
		CNE		5	11		23		50 52
		ONE	-	•					-

FH	WA-RD-77-108	HIGHWA	Y NOISE P	REDICT	ION MO	DEL			
Scenario: Existing W	ithout Project			Project	t Name:	Cedar	Avenue		
Road Name: Orange St				Job N	lumber:	11139			
Road Segment: e/o Vine S	t.								
SITE SPECIFIC I	VPUT DATA						L INPUT	S	
Highway Data			Site Cor	nditions	(Hard =	10, So	oft = 15)		
Average Daily Traffic (Adt):	1,780 vehicle	es				Autos:	15		
Peak Hour Percentage:	10%		Me	dium Tr	ucks (2 /	Axles):	15		
Peak Hour Volume:	178 vehicles	s	He	avy Tru	cks (3+ /	Axles):	15		
Vehicle Speed:	25 mph		Vehicle	Mix					
Near/Far Lane Distance:	12 feet			icleType	9	Day	Evening	Night	Daily
Site Data						77.5%	•	9.6%	
Barrier Height:	0.0 feet		м	edium T		84.8%		10.3%	
Barrier Type (0-Wall, 1-Berm):	0.0			Heavy T		86.5%		10.8%	
Centerline Dist. to Barrier:	30.0 feet								
Centerline Dist. to Observer:	30.0 feet		Noise Se				eet)		
Barrier Distance to Observer:	0.0 feet			Auto		000			
Observer Height (Above Pad):	5.0 feet			m Truck		297			
Pad Elevation:	0.0 feet		Heav	/y Truck	:s: 8.	004	Grade Ad	justment	: 0.0
Road Elevation:	0.0 feet		Lane Eq	uivalen	t Distan	ce (in i	feet)		
Road Grade:	0.0%			Auto	s: 29.	816			
Left View:	-90.0 degree	25	Mediu	m Truck	s: 29.	518			
Right View:	90.0 degree		Heav	/y Truck	:s: 29.	547			
FHWA Noise Model Calculation	ıs								
VehicleType REMEL	Traffic Flow	Distanc	e Finite	Road	Fresr	nel	Barrier Att	en Ber	m Atter
Autos: 58.73	-6.96		3.26	-1.20		-4.49	0.0	000	0.00
Medium Trucks: 70.80			3.33	-1.20		-4.86		000	0.00
Heavy Trucks: 77.97	-23.02	:	3.32	-1.20		-5.77	0.0	000	0.00
Unmitigated Noise Levels (with			,						
VehicleType Leq Peak Ho			q Evening		Night		Ldn		NEL
		51.9	50.2		44.1		52.7		53
		46.9	40.6		39.0		47.5	-	47
		55.7	46.6		47.9		56.2		56
		57.6	52.1		49.8	3	58.2	2	58
Centerline Distance to Noise C	ontour (in feet		70 dBA	65	dBA	6	60 dBA	55	dBA
		Ldn:	70 ава 5		ава 11		23		49

Scenario: Existi	ng + Pr	oject				Project I	Name:	Cedar	Avenue		
Road Name: Ceda								11139			
Road Segment: n/o Va	alley Bl										
SITE SPECIF	IC INF	PUT DATA			0/4- 0					s	
Highway Data					Site Con	aitions (Hara :				
Average Daily Traffic (A		26,765 vehic	les					Autos:			
Peak Hour Percenta	•	10%				dium Tru		/	15		
Peak Hour Volu		2,677 vehicle	es		не	avy Truc	KS (3+	Axles):	15		
Vehicle Spe		40 mph			Vehicle I	Mix					
Near/Far Lane Distar	ice:	48 feet			Veh	icleType		Day	Evening	Night	Daily
Site Data						A	utos:	77.5%	12.9%	9.6%	95.89
Barrier Heid	nht:	0.0 feet			M	edium Tri	ucks:	84.8%	4.9%	10.3%	1.69
Barrier Type (0-Wall, 1-Be		0.0			I	leavy Tr	ucks:	86.5%	2.7%	10.8%	2.41
Centerline Dist. to Bar		59.0 feet			Noise So	ource Ele	evatio	ns (in fe	et)		
Centerline Dist. to Obser		59.0 feet				Autos	: 0	.000	,		
Barrier Distance to Obser	ver:	0.0 feet			Mediu	n Trucks	: 2	.297			
Observer Height (Above P		5.0 feet			Heav	v Trucks	: 8	.004	Grade Ad	iustment	0.0
Pad Elevat		0.0 feet		-		,					
Road Elevat		0.0 feet		1	Lane Eq				teet)		
Road Gra		0.0%				Autos		.129			
Left Vi		-90.0 degre				n Trucks v Trucks		.966			
Right Vi	ew:	90.0 degre	es		neav	y mucks	. 53	.982			
FHWA Noise Model Calcul						1	_		_	-	
VehicleType REME		Traffic Flow		stance		Road	Fres		Barrier Att		m Atter
	6.51 7.72	2.77 -14.76		-0.6	=	-1.20 -1.20		-4.69 -4.88		000	0.00
	2.99	-14.76			-	-1.20		-4.88 -5.35		000	
				-0.6		-1.20		-0.30	0.0	000	0.00
Unmitigated Noise Levels VehicleType Leg Pea					vening	Leq I	light		Ldn	0	NFI
Autos:	67.5		, 65.6	LUYL	63.8	Logi	57	7	66.4	-	67
Medium Trucks:	61.2		59.6		53.3		51		60.2		60
Heavy Trucks:	68.0	-	66.5		57.5		58		67.1	-	67
Vehicle Noise:	71.2		69.6		65.0		61.	-	70.2		70
		ntour (in fee	t)								
Centerline Distance to Noi	secor							1		1	
Centerline Distance to Noi	se cor			70 (dBA	65 c	<i>IBA</i>	6	60 dBA	55	dBA
Centerline Distance to Noi	se cor		Ldn:		dBA i1	65 c 13		e	30 dBA 283		dBA 10

Scenario: Existing + Project Project Name: Cedar Avenue Road Segment: :slot Summer: Job Number: 1139 Stre SPECIFIC INPUT DATA NOISE MODEL INPUTS Highway Data Site Conditions (Hard = 10, Soft = 15) Average Daily Traffic (Adt): 37,282 vehicles Peak Hour Percentage: 10% Meat/Far Lane Distance: 48 feet Site Data Autos: Site Data Autos: Site Data Autos: Vehicle Speed: 40 mph Neat/Far Lane Distance: 48 feet Vehicle Mix Vehicle Mix Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 feet Centerline Dist. to Observer: 59.0 feet Centerline Dist. to Observer: 59.0 feet Road Elevation: 0.0 feet Road Carde: 0.0% <
Site Conditions (Hard = 10, Soft = 15) Average Daily Traffic (Adt): 37,282 vehicles Autos:: 15 Peak Hour Porcentage: 10% Autos:: 15 Peak Hour Porcentage: 10% Medium Trucks (2 Aktes): 15 Peak Hour Volume: 3,728 vehicles Medium Trucks (2 Aktes): 15 Vehicle Speed: 40 mph Vehicle Mix Vehicle Mix Site Data Vehicle Type Day Evening Night Daily Barrier Height: 0.0 feet Autos:: 77.5% 12.9% 9.6% 95.87 Barrier Type (0.Walt, I-Berm): 0.0 1.00 Heavy Trucks: 86.5% 2.7% 10.8% 2.43 Centerline Dist. to Barrier: 59.0 feet Autos: 0.000 Medium Trucks: 2.297 Observer Height (Above Pad): 5.0 feet Autos: 0.04 Grade Adjustment: 0.0 Pad Elevation: 0.0 feet Road Grade: 0.0% Autos: 53.966 Laft View: -0.00 degrees Medium Trucks:
Average Daily Traffic (Adt): 37,282 vehicles Autos: 15 Peak Hour Percentage: 10% Medium Trucks (2 Axles): 15 Peak Hour Volume: 3,728 vehicles Medium Trucks (2 Axles): 15 Vehicle Speed: 40 mph Vehicle Mix Vehicle Mix Vehicle Speed: 48 feet Vehicle Mix Vehicle Mix Vehicle Out Autos: 77.5% 12.9% 9.6% Barrier Height: 0.0 feet Medium Trucks: 84.8% 4.9% 0.3% 1.70' Barrier Dist. to Barrier: 59.0 feet Moise Source Elevations (in feet) Autos: 0.000 Barrier Dist. to Observer: 59.0 feet Autos: 0.000 Medium Trucks: 2.297 Observer Height (Above Pad): 5.0 feet Autos: 0.00 Medium Trucks: 2.297 Observer Height (Above Pad): 5.0 feet Autos: 0.04 Grade Adjustment: 0.0 Pad Elevation: 0.0 feet Autos: 5.04 Grade Adjustment: 0.0 Road Elevation: 0.0 feet Autos: 5.41.29 Medium Trucks: 5.3.966 Lane Equivalent Distance (in feet) Autos: 5.3.966 Medium Trucks: 5.3.966
Beak Hour Percentage: 10% Medium Trucks (2 Axles): 15 Peak Hour Volume: 3,728 vehicles Heavy Trucks (3+ Axles): 15 Vehicle Speed: 40 mph Vehicle Mix Vehicle Mix Neat/Far Lane Distance: 48 feet Vehicle Wix Day Site Data Autos: 77.5% 12.9% 9.6% 95.87 Barrier Height: 0.0 feet Autos: 77.5% 10.3% 1.70 Barrier Distance: 50 feet Medium Trucks: 84.8% 4.9% 10.3% 1.70 Barrier Distance to Observer: 59.0 feet Moise Source Elevations (in feet) Autos: 0.000 Barrier Distance to Observer: 50.0 feet Autos: 0.00 Medium Trucks: 2.297 Observer Height (Above Pad): 5.0 feet Heavy Trucks: 8.004 Grade Adjustment: 0.0 Pad Elevation: 0.0 feet Lane Equivalent Distance (in feet) Lane Equivalent Distance (in feet) Lanes 53.966
Peak Hour Volume: 3,728 vehicles Vehicle Speed: 40 mph Near/Far Lane Distance: 48 feet Vehicle Mix Vehicle Mix Vehicle Mix Vehicle Mix Vehicle Type Day Evening Barrier Height: 0.0 feet Autos: 77.5% 12.9% 9.6% 95.87 Barrier Type (0-Wall, 1-Berm): 0.0 feet Heavy Trucks: 86.5% 2.7% 10.8% 2.43 Centerline Dist. to Doserver: 50.0 feet Autos: 0.000 Medium Trucks: 2.297 Observer Height (Above Pad): 5.0 feet Autos: 0.00 Medium Trucks: 8.004 Grade Adjustment: 0.0 Pad Elevation: 0.0 feet Road Grade: 0.0% Autos: 53.966 Laft View: -9.00 degrees Medium Trucks: 53.966 Medium Trucks: 53.966
Vehicle Speed: Near/Far Lane Distance: 48 feet Vehicle Mix Vehicle Type Day Evening Night Daily Site Data Autos: 77.5% 12.9% 9.6% 95.87 Barrier Height: Barrier Type (0-Wall, 1-Berni): 0.0 Medium Trucks: 84.8% 4.9% 10.3% 1.70' Barrier Dist. to Diserver: 59.0 feet Medium Trucks: 86.5% 2.7% 10.3% 2.43' Observer Height (Above Pad): 5.0 feet Autos: 0.000 Medium Trucks: 8.004 Grade Adjustment: 0.0 Pad Elevation: 0.0 feet Heavy Trucks: 8.004 Grade Adjustment: 0.0 Road Elevation: 0.0 feet Lane Equivalent Distance (in feet) Autos: 54.129 Medium Trucks: 53.966 Autos: 53.966 Autos: 54.97
Near/Far Lane Distance: 48 feet Vehicle MX Day Evening Night Daily Site Data Autos: 77.5% 12.9% 9.6% 95.87 Barrier Height: 0.0 feet Medium Trucks: 84.8% 4.9% 10.3% 1.70' Barrier Height: 0.0 Medium Trucks: 84.8% 4.9% 10.3% 1.70' Barrier Dist. to Barrier: 59.0 feet Meavy Trucks: 86.5% 2.7% 10.8% 2.43' Centerline Dist. to Observer: 59.0 feet Autos: 0.000 Medium Trucks: 2.297 Observer Height (Above Pad): 0.0 feet Autos: 0.04 Grade Adjustment: 0.0 Pad Elevation: 0.0 feet Lane Equivalent Distance (in feet) 0.0 Lane Equivalent Distance (in feet) Road Grade: 0.0% Medium Trucks: 53.966 Medium Trucks: 53.966
Near/Far Lane Distance: 48 feet Vehicle Type Day Evening Night Daily Site Data Autos: 77.5% 12.9% 9.6% 95.87 Barrier Height: 0.0 feet Medium Trucks: 84.8% 4.9% 10.3% 1.70 Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 59.0 feet Noise Source Elevations (in feet) Autos: 0.000 Barrier Distance to Observer: 69.0 feet Autos: 0.000 Medium Trucks: 2.297 Observer Height (Above Pad): 5.0 feet Equivalent Distance (in feet) 0.0 Lane Equivalent Distance (in feet) 0.0 Road Elevation: 0.0 feet Lane Equivalent Distance (in feet) 0.0 Medium Trucks: 53.966 Medium Trucks: 53.966
Site Data Autos: 77.5% 12.9% 9.6% 95.87 Barrier Height: 0.0 feet Medium Trucks: 84.8% 4.9% 10.3% 1.70' Barrier Type (0.Wall, 1-Berm): 0.0 Medium Trucks: 84.8% 4.9% 10.3% 1.70' Barrier Dist. to Barrier: 59.0 feet Moise Source Elevations (in feet) Noise Source Elevations (in feet) Autos: 0.000 Barrier Distance to Observer: 0.0 feet Autos: 0.297 Medium Trucks: 2.297 Observer Height (Above Pad): 0.0 feet Heavy Trucks: 8.004 Grade Adjustment: 0.0 Pad Elevation: 0.0 feet Lane Equivalent Distance (in feet) Autos: 54.129 Road Grade: 0.0% Lates 53.966 Medium Trucks: 53.966
Barrier Height: 0.0 feet Barrier Type (0-Wall, I-Berm): 0.0 Centerline Dist. to Barrier: 59.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 50.0 feet Deserver Height (Above Pad): 5.0 feet Road Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -9.0 degrees
Barrier Type (0-Wall, 1-Berm): 0.0 Heavy Trucks: 86.5% 2.7% 10.8% 2.43' Centerline Dist. to Dsarver: 59.0 feet Autos: 0.000 Autos: 0.000 Barrier Distance to Observer: 50.0 feet Autos: 0.000 Medium Trucks: 2.297 Observer Height (Above Pad): 5.0 feet Medium Trucks: 2.297 Heavy Trucks: 8.004 Grade Adjustment: 0.0 Road Grade: 0.0% Left View: -90.0 degrees Medium Trucks: 53.966
Canterline Dist. to Barrier: 50.0 feet Centerline Dist. to Diserver: 59.0 feet Barrier Dist. to Observer: 59.0 feet Barrier Dist. to Observer: 59.0 feet Barrier Dist. to Observer: 0.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Elevation: 0.0 feet Left View: -90.0 degrees
Centerline Dist. to Observer: 59.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Road Elevation: 0.0 feet Road Elevation: 0.0 feet Road Carde: 0.0% Left View: -90.0 degrees
Barrier Distance to Observer: 0.0 feet Autos:: 0.000 Observer Height (Above Pad): 5.0 feet Medium Trucks: 2.297 Pad Elevation: 0.0 feet Heavy Trucks: 8.004 Grade Adjustment: 0.0 Road Cirade: 0.0% Autos: 54.129 Autos: 53.966
Observer Height (Above Pad): 5.0 feet Medium Trucks: 2.29 Pad Elevation: 0.0 feet Heavy Trucks: 8.004 Grade Adjustment: 0.0 Road Crade: 0.0% Late Equivalent Distance (in feet) Late States Autos: 54.129 Left View: -90.0 degrees Medium Trucks: 53.966
Pad Elevation: 0.0 feet Heavy Trucks: 8.004 Grade Adjustifient: 0.0 Road Elevation: 0.0 feet Lane Equivalent Distance (in feet) Road Grade: 0.0% Autos: 54.129 Left View: -90.0 degrees Medium Trucks: 53.966
Road Grade: 0.0% Autos: 54.129 Left View: -90.0 degrees Medium Trucks: 53.966
Left View: -90.0 degrees Medium Trucks: 53.966
FHWA Noise Model Calculations
VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berm Atter
Autos: 66.51 4.21 -0.62 -1.20 -4.69 0.000 0.00
Medium Trucks: 77.72 -13.31 -0.60 -1.20 -4.88 0.000 0.00
Heavy Trucks: 82.99 -11.76 -0.60 -1.20 -5.35 0.000 0.00
Unmitigated Noise Levels (without Topo and barrier attenuation)
VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL
Autos: 68.9 67.0 65.2 59.2 67.8 68
Medium Trucks: 62.6 61.1 54.7 53.2 61.6 61
Heavy Trucks: 69.4 68.0 59.0 60.2 68.6 68
Vehicle Noise: 72.6 71.0 66.5 63.2 71.7 72
Centerline Distance to Noise Contour (in feet)
70 dBA 65 dBA 60 dBA 55 dBA
Ldn: 76 164 354 763
CNEL: 80 173 373 804

Tuesday, July 18, 2017

Tuesday, July 18, 2017

Average Daily Traffic (Adt): 27,793 vehicles Average Daily Traffic (Adt): 27,793 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 2,779 vehicles Vehicle Speed: 40 mph Nean/Far Lane Distance: 48 feet Barrier Height: 0.0 feet Barrier Type (0:Wall, 1-Berm): 0.0 Centerline Dist. to Diserver: 59.0 feet Diserver Height (bove Pad): 5.0 feet Road Grade: 0.0% Road Grade: 0.0% Left View: 90.0 degrees Road Grade: 0.0% Left View: 90.0 degrees FHWA Noise Model Calculations VehicleType VehicleType REMEL VehicleType Remet Atten Road Grade: 0.0% Left View: 90.0 degrees Heavy Trucks: 53.982 FHWA Noise Model		FH	WA-RD-77-108	HIGHW	AY NO	DISE PR	EDICTIO	N MOD	EL			
Road Segment: s/o 1-10 Fwy. Site SPECIFIC INPUT DATA NOISE MODEL INPUTS Mighway Data Site Conditions (Hard = 10, Soft = 15) Average Daily Traffic (Ad): 27,793 vehicles Autos: 15 Peak Hour Percentage: 10% Autos: 15 Peak Hour Volume: 2,779 vehicles Medium Trucks (2 Axles): 15 Vehicle Speet 48 feet Vehicle Mix Vehicle Mix Near/Far Lane Distance: 48 feet Vehicle Mix Vehicle Mix Barrier Type (O'Wall, 1-Berm): 0.0 Medium Trucks: 84.8% 4.9% 10.3% 1. Centerline Dist. to Observer: 50.0 feet Medium Trucks: 8.04 Grade Adjustment: 0.0% Barrier Type (O'Wall, 1-Berm): 0.0 feet Autos: 0.00 Tables Autos: 0.00 Centerline Dist. to Observer: 50.0 feet Autos: 0.00 Medium Trucks: 8.004 Grade Adjustment: 0.00 Road Elevation: 0.0 feet Lane Equivalent Distance Infert Orizance Inf	Scenari	o: Existing +	Project				Project Na	ame: C	edar /	Avenue		
SITE SPECIFIC INPUT DATA NOISE MODEL INPUTS Highway Data Site Conditions (Hard = 10, Soft = 15) Average Daily Traffic (Adt): 27,793 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 2,779 vehicles Vehicle Speed: 40 mph Near/Far Lane Distance: 48 feet Barrier Height: 0.0 feet Barrier Height: 0.0 feet Barrier Jost. to Barrier: 59.0 feet Centerline Dist. to Observer: 50.0 feet Road Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0 feet Routos:							Job Nun	nber: 1	1139			
Site Conditions (Hard = 10, Soft = 15) Average Daily Traffic (Adt): 27,793 vehicles Autos: 15 Peak Hour Volume: 2,779 vehicles Autos:: 15 Peak Hour Volume: 2,779 vehicles Medium Trucks (2 Axles): 15 Vehicle Speed: 40 mph Vehicle Type Day Evening Night Distance: Site Data Vehicle Type Day Evening Night Distance: 48 feet Vehicle Type Day Evening Night Distance: 48 feet Vehicle Type Day Evening Night Distance: 0.0 feet Medium Trucks: 84.8% 4.9% 10.3% 1: Barrier Distance to Observer: 50.0 feet Medium Trucks: 80.04 Grade Adjustment: 0.0 Centerline Dist. to Observer: 50.0 feet Medium Trucks: 8.004 Grade Adjustment: 0.0 Road Grade: 0.0% Left View: 90.0 degrees Heavy Trucks: 53.982 FHWA Noise Model Calculations VehicleType Left View: <td< th=""><th>Road Segmer</th><th>nt: s/o I-10 Fw</th><th>vy.</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></td<>	Road Segmer	nt: s/o I-10 Fw	vy.									
Average Daily Traffic (Adt): 27,793 vehicles Average Daily Traffic (Adt): 27,793 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 2,779 vehicles Vehicle Speed: 40 mph Near/Far Lane Distance: 48 feet Site Data Autos: 15 Barrier Height: 0.0 feet Medium Trucks: (2 Avdes): 15 Barrier Type (0-Wall, 1-Berm): 0.0 6 Mutos: 77.5% 12.9% 9.6% 95. Centerline Dist. to Dserver: 50.0 feet Medium Trucks: 84.8% 4.9% 10.3% 1. Barrier Sto Diserver: 0.0 feet Medium Trucks: 86.5% 2.7% 10.8% 2. Observer Height (bove Pad): 5.0 feet Moties Source Elevations (in feet) Autos: 6.6.1 2.97 Road Grade: 0.0% Left View: 90.0 degrees Heavy Trucks: 5.3.966 Heavy Trucks: 66.51 2.92 -0.62 -1.20 -4.69 0.000 0 Medium Trucks: 82		SPECIFIC IN	NPUT DATA								s	
Peak Hour Percentage: 10% Medium Trucks (2 Akles): 15 Peak Hour Volume: 2,779 vehicles Heavy Trucks (3 Akles): 15 Vehicle Speed: 40 mph Heavy Trucks: (3 Akles): 15 Neat/Far Lane Distance: 48 feet Vehicle Type Day Evening Night Do Site Data Autos: 77.5% 12.9% 9.6% 9.5% 2.7% 0.0% 2.7% Barrier Height: 0.0 feet Medium Trucks: 84.8% 4.9% 10.3% 1: Barrier Theight: 0.0 feet Medium Trucks: 8.65% 2.7% 10.8% 2. Centerline Dist. to Barrier: 59.0 feet Moles Mutos: 0.00 Medium Trucks: 8.004 Grade Adjustment: 0.0 Barrier Distance to Observer: 0.0 feet Autos: 5.16 4.002 4.003 Grade Adjustment: 0.0 Road Grade: 0.0% etaits: 5.0.00 Grade Adjustment: 0.00 0 Medium Trucks: 71.72	Highway Data				S	ite Cond	ditions (H	ard = 1	10, So	ft = 15)		
Peak Hour Volume: 2,779 vehicles Vehicle Speed: 40 mph Near/Far Lane Distance: 48 feet Vehicle Mix Vehicle Mix Site Data Vehicle Mix Barrier Height: 0.0 feet Barrier Height: 0.0 feet Barrier Jype (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 59.0 feet Barrier Jistance to Observer: 50.0 feet Barrier Jostance to Observer: 50.0 feet Pad Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees Right View: 90.0 degrees Heavy Trucks: 53.966 Heavy Trucks: 53.982 FHWA Noise Model Calculations Medium Trucks: VehicleType Left View: -0.60 Vehicle	Average Daily	Traffic (Adt):	27,793 vehicl	es				Α	utos:	15		
Vehicle Speed: Near/Far Lane Distance: 40 mph 48 feet Vehicle Mix Vehicle Type Day Evening Night Description Site Data Autos: 77.5% 12.9% 9.6% 95. Barrier Height: 0.0 feet Medium Trucks: 84.8% 4.9% 10.3% 1. Barrier Type (0-Wall, 1-Berm): 0.0 feet Medium Trucks: 84.8% 4.9% 10.3% 1. Centerline Dist to Disarrier: 59.0 feet Molise Source Elevations (in feet) 0.000 Medium Trucks: 86.5% 2.7% 10.8% 2.7 Observer Height (Move Pad): 5.0 feet Autos: 0.000 Medium Trucks: 80.04 Grade Adjustment: 0.0 Pad Elevation: 0.0 feet Left View: 90.0 degrees Medium Trucks: 53.966 Heavy Trucks: 53.982 FHWA Noise Model Calculations VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berm Atten Medium Trucks: 82.99 -12.67 -0.60	Peak Hour	Percentage:	10%			Med	lium Truck	(2 A)	des):	15		
Neat/Far Lane Distance: 48 feet Venicle MiX Levening Night Doc Site Data Autos: 77.5% 12.9% 9.6% 95. Barrier Height: 0.0 feet Medium Trucks: 84.8% 4.9% 10.3% 1. Barrier Height: 0.0 Centerline Dist. to Barrier: 59.0 feet Medium Trucks: 86.5% 2.7% 10.8% 2. Centerline Dist. to Barrier: 59.0 feet Autos: Autos: 0.00 Mole MiX 1. Heavy Trucks: 8.6.5% 2.7% 10.8% 2. Observer leight (Above Pad): 5.0 feet Autos: 6.16 Autos: 6.129 Medium Trucks: 2.297 Observer leight (Above Pad): 5.0 feet Medium Trucks: 8.004 Grade Adjustment: 0.0 Road Grade: 0.0% Lane Equivalent Distance (In feet) Autos: 53.966 Heavy Trucks: 53.982 VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bern At <t< td=""><td>Peak H</td><td>our Volume:</td><td>2,779 vehicle</td><td>s</td><td></td><td>Hea</td><td>ivy Trucks</td><td>; (3+ A)</td><td>des):</td><td>15</td><td></td><td></td></t<>	Peak H	our Volume:	2,779 vehicle	s		Hea	ivy Trucks	; (3+ A)	des):	15		
Near/Far Lane Distance: 48 feet VehicleType Day Evening Night Date Site Data Autos: 77.5% 12.9% 9.6% 95.0 Barrier Height: 0.0 feet Medium Trucks: 84.8% 4.9% 10.3% 1. Barrier Type (0-Wall, 1-Berm): 0.0 0 feet Medium Trucks: 86.5% 2.7% 10.8% 2.7% Centerline Dist. to Doserver: 59.0 feet Moise Source Elevations (in feet) Autos: 0.000 Barrier Distance to Observer: 0.0 feet Moliae Source Elevations (in feet) 0.000 Road Grade: 0.0% Heavy Trucks: 8.004 Grade Adjustment: 0.0 Road Grade: 0.0% Left View: 90.0 degrees Medium Trucks: 53.966 Heavy Trucks: 53.982 FHWA Noise Model Calculations VehicleType REIMEL Traffic Flow Distance Finite Road Fresnet Barrier Atten Berm Atten	Vei	hicle Speed:	40 mph		V	ehicle N	lix					
Site Data Autos: 77.5% 12.9% 9.6% 95.1 Barrier Height: 0.0 feet Medium Trucks: 84.8% 4.9% 10.3% 1. Barrier Type (0-Wall, 1-Berm): 0.0 Centetine Dist. to Barrier: 59.0 feet Heavy Trucks: 84.8% 4.9% 10.3% 1. Centertine Dist. to Diserver: 59.0 feet Noise Source Elevations: (in feet) Autos: 2.7% 10.8% 2.7% Observer Height (Above Pad): 5.0 feet Autos: Autos: 0.00 Medium Trucks: 2.97 Pad Elevation: 0.0 feet Autos: 6.129 Medium Trucks: 2.97 Road Grade: 0.0% Left View: 90.0 degrees Mutos: 53.966 FHWA Noise Model Calculations VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bernier Atten	Near/Far Lar	ne Distance:	48 feet		-			L	Dav	Evenina	Niaht	Dailv
Barrier Treight: Utilitie Heavy Trucks: 86.5% 2.7% 10.8% 2. Centerline Dist. to Diserver: 59.0 feet Heavy Trucks: 86.5% 2.7% 10.8% 2. Deserver: 59.0 feet Autos: 0.000 Medium Trucks: 2.297 Deserver: 0.0 feet Autos: 5.0.00 Medium Trucks: 2.297 Pad Elevation: 0.0 feet Heavy Trucks: 8.004 Grade Adjustment: 0.0 Road Grade: 0.0% Heavy Trucks: 53.966 Heavy Trucks: 53.966 FHWA Noise Model Calculations VehicleType REIMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bern Atten Autos: 66.51 2.92 -0.62 -1.20 -4.68 0.000 0 Medium Trucks: 71.72 -14.53 -0.60 -1.20 -4.68 0.000 0 Heavy Trucks: 82.99 -12.67 -6.60 -1.20 -5.35 0.000 0	Site Data							os: 7	7.5%	Ű		95.64%
Barrier Type (0-Wall, 1-Berm): 0.0 Heavy Trucks: 86.5% 2.7% 10.8% 2.7 Centerline Dist. to Desriver: 59.0 feet Noise Source Elevations (in feet) Autos: 0.000 Medium Trucks: 2.97 10.8% 2.7 Observer Height (Above Pad): 5.0 feet Autos: 0.000 Medium Trucks: 2.97 Heavy Trucks: 8.004 Grade Adjustment: 0.0 Pad Elevation: 0.0 feet Autos: 6.651 2.98 Medium Trucks: 53.0 feet Heavy Trucks: 53.0 feet Heavy Trucks: 53.0 feet Medium Trucks: 65.1 2.92 -0.62 -1.20 -4.69 0.000 0 Medium Trucks: 77.72 -14.53 -0.60 -1.20 -4.69 0.000 0 Umnitigated Noise Levels (without Topo and barrier attenuation) Vehiclo Nige Leq Night Left	Bar	rier Heiaht	0.0 feet			Me	dium Truc	ks: 8	4.8%	4.9%	10.3%	1.729
Centerline Dist. to Observer: 59.0 feet Noise Source Levations (in feet) Barrier Distance to Observer: 0.0 feet Autos: 0.000 Observer Height (Above Pad): 50.0 feet Medium Trucks: 2.297 Pad Elevation: 0.0 feet Heavy Trucks: 8.004 Grade Adjustment: 0.0 Road Elevation: 0.0 feet Latter Stance (in feet) Autos: 6.004 Road Calculations -90.0 degrees Medium Trucks: 53.966 Heavy Trucks: 53.966 FHWA Noise Model Calculations -90.0 degrees Finite Road Fresnel Barrier Atten Bern Attal VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bern Attal Autos: 66.51 2.92 -0.62 -1.20 -4.69 0.000 0 Medium Trucks: 82.99 -12.67 -0.60 -1.20 -4.69 0.000 0 Unnitigated Noise Levels (without Topo and barrier attenuation) UvehicleType Leq Day Leq Day Leq Evening <		•				н	leavy Truc	:ks: 8	6.5%	2.7%	10.8%	2.64%
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Observer Height (Above Pad): 5.0 feet Pad Elevation: Medium Trucks: 2.297 Heavy Trucks: Grade Adjustment: 0.0 Road Elevation: 0.0 feet Lane Equivalent Distance (in feet) Lane Equivalent Distance (in feet) Road Grade: 0.0% Autos: 54.129 Left View: -90.0 degrees Medium Trucks: 53.982 FHWA Noise Model Calculations VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berm Attain Autos: 66.51 2.92 -0.62 -1.20 -4.69 0.000 0 Medium Trucks: 77.7 -14.53 -0.60 -1.20 -4.89 0.000 0 Medium Trucks: 82.9 -12.67 -6.60 -1.20 -4.89 0.000 0 Medium Trucks: 82.9 -12.67 -6.83 57.9 66.5 Medium Trucks: 61.4 59.9 53.5 52.0 60.4 Heavy Trucks: 68.5 67.1 58.1 59							Autos:	0.0	00	,		
Pad Elevation: 0.0 feet Heavy Tracks: 8.004 Grade Adjustment: 0.0 Road Elevation: 0.0 feet Image: Construction of the constructi	Barrier Distance	to Observer:				Mediun	1 Trucks:	2.2	97			
Pad Elevation: 0.0 feet Lane Equivalent Distance (in feet) Road Grade: 0.0% Autos: 54.129 Left View: -90.0 degrees Medium Trucks: 53.966 Right View: 90.0 degrees Medium Trucks: 53.982 FHWA Noise Model Calculations VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berm Atten Weilwim Trucks: 77.72 -14.53 -0.60 -1.20 -4.69 0.000 0 Medium Trucks: 77.72 -14.53 -0.60 -1.20 -4.53 0.000 0 Medium Trucks: 77.72 -14.53 -0.60 -1.20 -4.58 0.000 0 Medium Trucks: 67.6 65.7 63.9 57.9 66.5 Medium Trucks: 61.4 59.9 53.5 52.0 60.4 Heavy Trucks: 68.5 67.1 58.1 59.3 67.7 Vehicle Noise: 71.5 69.9 65.2		,				Heav	/ Trucks:	8.0	04	Grade Ad	iustment	: 0.0
Road Grade: 0.0% Autos: 54.129 Left View: -90.0 degrees Medium Trucks: 53.966 Right View: 90.0 degrees Medium Trucks: 53.982 FHWA Noise Model Calculations VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berm Atten Autos: 66.51 2.92 -0.62 -1.20 -4.69 0.000 0 Medium Trucks: 77.72 -14.53 -0.60 -1.20 -4.69 0.000 0 Medium Trucks: 77.7 -14.53 -0.60 -1.20 -4.69 0.000 0 Medium Trucks: 70.62 -1.20 -4.69 0.000 0 Unmitigated Noise Levels (without Topo and barrier attenuation) U VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 67.6 65.7 63.9 57.9 66.5 66.5 Medium Trucks: 61.4 59.9												
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Right View: 90.0 degrees Heavy Trucks: 53.982 FHWA Noise Model Calculations VehicleType REINEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bern Atten Mutos: 66.51 2.92 -0.62 -1.20 -4.69 0.000 0 Medium Trucks: 717.72 -14.53 -0.60 -1.20 -4.68 0.000 0 Medium Trucks: 82.99 -12.67 -0.60 -1.20 -4.68 0.000 0 Unmitgated Noise Levels (without Topo and barrier attenuation) VehicleType Leq Peak Hour Leq Evening Leq Night Ldn CNEL Vehicle Type 68.5 67.7 63.9 57.9 66.5 Medium Trucks: 61.4 59.9 65.2 62.1 70.6 Heavy Trucks: 61.5 69.9 65.2 62.1 70.6 Centerline Distance to Noise Contour (in feet) - 70 dBA 65 dBA 60 dBA 55 dBA Ldr: 64 139 <td>F</td> <td></td>	F											
FHWA Noise Model Calculations Fritte Road Fresnel Barrier Atten Bern Atten VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bern Atten Autos: 66.51 2.92 -0.62 -1.20 -4.69 0.000 0 Medium Trucks: 77.72 -14.53 -0.60 -1.20 -4.69 0.000 0 Heavy Trucks: 82.99 -12.67 -0.60 -1.20 -5.35 0.000 0 Unnitigated Noise Levels (without Topo and barrier attenuation) UehicleType Leg Peak Hour Leg Day Leg Evening Leg Night Ldn CNEL Autos: 67.6 65.7 63.9 57.9 66.5 Medium Trucks: 61.4 59.9 53.5 52.0 60.4 Heavy Trucks: 68.5 67.1 58.1 59.3 67.7 Vehicle Noise: 71.5 69.9 65.2 62.1 70.6 Centerline Distance to Noise Contour (in feet) 70 dB			•									
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Autos: 66.51 2.92 -0.62 -1.20 -4.69 0.000 0 Medium Trucks: 77.72 -14.53 -0.60 -1.20 -4.69 0.000 0 Heavy Trucks: 82.99 -12.67 -0.60 -1.20 -5.35 0.000 0 Umritigate Moise Levels (without Topo and barrier attenuation) VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 67.6 65.7 63.9 57.9 66.5 Medium Trucks: 61.4 59.9 53.5 52.0 60.4 Heavy Trucks: 61.4 59.9 65.2 62.1 70.6 Centerline Distance to Noise Contour (in feet) To dBA 65 dBA 60 dBA 55 dBA Ldn: 64 139 299 645	FHWA Noise Mode											
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Heavy Trucks: 82.99 -12.67 -0.60 -1.20 -5.35 0.000 0 Unnitigated Noise Levels (without Topo and barrier attenuation) Leq Day Leq Evening Leq Night Ldn CNEL VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Medium Trucks: 61.4 59.9 53.5 52.0 60.4 Heavy Trucks: 68.5 67.1 58.1 59.3 67.7 Vehicle Noise: 71.5 69.9 65.2 62.1 70.6 Catterine Distance to Noise Contour (in feet) Log ABA 65 dBA 60 dBA 55 dBA Ldn: 64 139 299 645												0.00
VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 67.6 65.7 63.9 57.9 66.5 Medium Trucks: 61.4 59.9 53.5 52.0 60.4 Heavy Trucks: 68.5 67.1 58.1 59.3 67.7 Vehicle Noise: 71.5 69.9 65.2 62.1 70.6 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA Ldn: 64 139 299 645 645												0.00
VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 67.6 65.7 63.9 57.9 66.5 Medium Tucks: 61.4 59.9 53.5 52.0 60.4 Heavy Trucks: 68.5 67.1 58.1 59.3 67.7 Vehicle Noise: 71.5 69.9 65.2 62.1 70.6 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA Ldn: 64 139 299 645 645							-1.20	-	5.35	0.0	000	0.00
Autos: 67.6 65.7 63.9 57.9 66.5 Medium Trucks: 61.4 59.9 53.5 52.0 60.4 Heavy Trucks: 68.5 67.1 58.1 59.3 67.7 Vehicle Noise: 71.5 69.9 65.2 62.1 70.6 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA Ldn: 64 139 299 645	•			-				1				
Medium Trucks: 61.4 59.9 53.5 52.0 60.4 Heavy Trucks: 68.5 67.1 58.1 59.3 67.7 Vehicle Noise: 71.5 69.9 65.2 62.1 70.6 Centerline Distance to Noise Contour (in feet) 70.dBA 65.dBA 60.dBA 55.dBA Ldn: 64 139 299 645		1			eq Eve	•	Leq Ni	,				
Heavy Trucks: 68.5 67.1 58.1 59.3 67.7 Vehicle Noise: 71.5 69.9 65.2 62.1 70.6 Centerline Distance to Noise Contour (in feet) 70.dBA 65.dBA 60.dBA 55.dBA Ldn: 64 139 299 645												67.
Vehicle Noise: 71.5 69.9 65.2 62.1 70.6 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA Ldn: 64 139 299 645		-										60.
Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA Ldn: 64 139 299 645												67.
TO dBA 65 dBA 60 dBA 55 dBA Ldn: 64 139 299 645						65.2		62.1		70.6	Ó	70.
Ldn: 64 139 299 645	Centerline Distance	e to Noise C	ontour (in fee	9	70 d	RA	65 dB	Δ	6	0 dBA	55	dBA
				I dn:				-	0			
CIVEL. 00 140 313 019			C									
			C	VLL.	00		140			010		

	FHW	A-RD-77-108 H	GHWAY	Y NOISE PI	REDICTI	ON MO	DEL			
Scenario	p: Existing + Pr	oject			Project	Name: (Cedar	Avenue		
Road Name	e: Cedar Av.				Job N	umber:	11139			
Road Segmen	t: s/o Orange S	St.								
	PECIFIC INF	PUT DATA						L INPUT	s	
Highway Data				Site Cor	nditions	(Hard =	10, Se	oft = 15)		
Average Daily 1	raffic (Adt): 2	21,542 vehicles				,	Autos:	15		
Peak Hour I	Percentage:	10%		Me	dium Tru	icks (2 A	(xles):	15		
Peak Ho	our Volume:	2,154 vehicles		He	avy Truc	:ks (3+ A	(xles):	15		
Veh	icle Speed:	40 mph		Vehicle	Mix					
Near/Far Lan	e Distance:	48 feet			icleType		Dav	Evening	Night	Daily
Site Data		-					77.5%	•	9.6%	
	vior Hoight	0.0 feet		м	edium Tr		84.8%		10.3%	
Barrier Type (0-Wa	rier Height:	0.0 feet 0.0			Heavy Tr		86.5%		10.8%	
Centerline Dis	. ,	0.0 59.0 feet							10.070	2.11
Centerline Dis Centerline Dist. t		59.0 feet		Noise S			s (in f	eet)		
Barrier Distance t		0.0 feet			Autos	s: 0.0	000			
Observer Height (A		5.0 feet		Mediu	m Trucks	s: 2.2	297			
	d Elevation:	0.0 feet		Heav	/y Trucks	s: 8.0	004	Grade Ad	justment	: 0.0
	d Elevation:	0.0 feet		Lane Eq	uivalent	Distan	e (in	feet)		
	load Grade:	0.0%			Autos		<u> </u>			
	Left View:	-90.0 degrees		Mediu	m Trucks					
	Right View:	90.0 degrees			/y Trucks					
	•	-								
FHWA Noise Mode										
VehicleType		Traffic Flow	Distance	-	Road	Fresn		Barrier Att		m Atter
Autos:	66.51	1.82		0.62	-1.20		-4.69		000	0.00
Medium Trucks:	77.72	-15.68		0.60	-1.20		-4.88		000	0.00
Heavy Trucks:	82.99	-14.07	-0	0.60	-1.20		-5.35	0.0	000	0.00
Unmitigated Noise										
	Leq Peak Hour			Evening		Night		Ldn		NEL
Autos:	66.5			62.8		56.8		65.4		66
Medium Trucks:	60.2			52.4		50.8		59.3		59
Heavy Trucks:	67.1			56.7		57.9		66.3		66
Vehicle Noise:	70.3	3 68	.7	64.1		60.9		69.3	3	69
Centerline Distanc	e to Noise Col	ntour (in feet)								
				70 dBA		dBA	6	60 dBA		dBA
		Ld CNE		53 56		15 21		247		32
								260		60

Scenari	p: Existing + F	roiect				Project	Name:	Cedar	Avenue		
	e: Cedar Av.	.,					umber:				
Road Segmer	t: s/o Slover A	۸v.									
SITE	SPECIFIC IN	PUT DATA				N	OISE N	NODE		s	
Highway Data				S	ite Con	ditions					
Average Daily	Traffic (Adt):	19.938 vehicl	es					Autos:	15		
• •	Percentage:	10%			Me	dium Tru	icks (2 /	Axles):	15		
Peak H	our Volume:	1,994 vehicle	s		He	avy Truc	ks (3+ /	Axles):	15		
Vei	nicle Speed:	40 mph			ehicle l		-				
Near/Far Lar	ne Distance:	48 feet		V			-	Dav	Evening	Might	Deilu
Site Data		-			ven	icleType	utos:	Day	Evening	Night 9.6%	Daily
				_	14	A dium Tr		77.5% 84.8%	12.9% 4.9%	9.6%	
	rier Height:	0.0 feet				leavy Tr		86.5%		10.3%	
Barrier Type (0-W	. ,	0.0			r	leavy II	ucks.	00.3%	2.170	10.6%	2.437
Centerline Dis		59.0 feet		N	oise So	ource Ele	evation	s (in fe	et)		
Centerline Dist.		59.0 feet				Autos	s: 0.0	000			
Barrier Distance		0.0 feet			Mediur	n Trucks	: 2.:	297			
Observer Height (.	,	5.0 feet			Heav	y Trucks	s: 8.0	004	Grade Ad	iustmen	t: 0.0
	d Elevation:	0.0 feet					Distan	// /			
	d Elevation:	0.0 feet		La	ane Eq	uivalent			eet)		
,	Road Grade:	0.0%			1 4 Vi	Autos n Trucks		129			
	Left View:	-90.0 degre						966			
	Right View:	90.0 degre	es		Heav	y Trucks	53.	982			
FHWA Noise Mode	el Calculation	s									
VehicleType	REMEL	Traffic Flow	Distar		Finite		Fresr		Barrier Att		rm Atten
Autos:	66.51	1.49		-0.62		-1.20		-4.69		000	0.00
Medium Trucks:	77.72	-16.03		-0.60		-1.20		-4.88		000	0.00
Heavy Trucks:	82.99	-14.43		-0.60		-1.20		-5.35	0.0	000	0.00
Unmitigated Noise			barrier a	attenu	ation)						
	Leq Peak Hou			eq Eve	•	Leq I	Night		Ldn		NEL
Autos:	66	-	64.3		62.5		56.5		65.1		65.
Medium Trucks:	59		58.4		52.0		50.5		58.9		59.
	66	.8	65.3		56.3		57.6	6	65.9)	66.
Heavy Trucks:		9	68.3		63.7		60.5	5	69.0)	69.
Heavy Trucks: Vehicle Noise:	69										
Vehicle Noise:		ontour (in feel)								
		ontour (in feet) L	70 dE	BA	65 0	1BA	6	0 dBA	55	ō dBA
Vehicle Noise:		ontour (in feel) Ldn:	70 dE 50	BA	65 d 10		6	0 dBA 234		5 dBA 504

	FHV	VA-RD-77-108 H	IIGHWA	Y NOISE F	REDICTIO	N MODE	EL		
Scenario: E Road Name: \ Road Segment: \	Valley Bl.					ame: Ce nber: 11	edar Avenue 139		
SITE SPE	ECIFIC IN	IPUT DATA			NO	ISE MO	DEL INPUT	s	
Highway Data				Site Co	nditions (H	lard = 10), Soft = 15)		
Average Daily Traf	ffic (Adt):	19,713 vehicles				Au	tos: 15		
Peak Hour Per	centage:	10%		M	edium Truc	ks (2 Axi	les): 15		
Peak Hour	Volume:	1,971 vehicles		н	eavy Truck	s (3+ Ax	les): 15		
Vehicle	e Speed:	40 mph		Vehicle	Mix				
Near/Far Lane D	Distance:	48 feet					ay Evening	Night	Dailu
Site Data		-		Vei	hicleType		ay Evening 7.5% 12.9%	9.6%	Daily 95.90%
					Au Iedium True		12.9% 12.9%	9.6%	95.90%
	r Height:	0.0 feet			Heavy True		6.5% 4.9%	10.3%	2.41%
Barrier Type (0-Wall,	,	0.0			neavy 11u	<i>i</i> ks. ot	0.5% 2.1%	10.6%	2.41%
Centerline Dist. to		59.0 feet		Noise S	ource Elev	ations ((in feet)		
Centerline Dist. to C		59.0 feet			Autos:	0.00	0		
Barrier Distance to C		0.0 feet		Mediu	ım Trucks:	2.29	7		
Observer Height (Abo	,	5.0 feet		Hea	vy Trucks:	8.00	4 Grade Ad	justment:	0.0
	levation:	0.0 feet							
	levation:	0.0 feet		Lane E	quivalent E				
	d Grade:	0.0%			Autos:	54.12			
	eft View:	-90.0 degrees			Im Trucks:	53.96	-		
Rig	ght View:	90.0 degrees		Hea	vy Trucks:	53.98	2		
FHWA Noise Model C	alculation	s							
VehicleType F	REMEL	Traffic Flow	Distanc	e Finite	e Road	Fresnel	Barrier Att	en Ber	m Atten
Autos:	66.51	1.44	-().62	-1.20	-4	.69 0.0	000	0.000
Medium Trucks:	77.72	-16.09	-(0.60	-1.20	-4	.88 0.0	000	0.000
Heavy Trucks:	82.99	-14.57	-(0.60	-1.20	-5	.35 0.0	000	0.000
Unmitigated Noise Le	evels (with	out Topo and b	arrier at	enuation)					
VehicleType Leo	q Peak Hou	r Leq Day	Leo	Evening	Leq Ni	ght	Ldn	CI	VEL
Autos:	66	.1 6	4.2	62.5	5	56.4	65.0)	65.6
Medium Trucks:	59	.8 5	3.3	52.0)	50.4	58.9)	59.1
Heavy Trucks:	66	.6 6	5.2	56.2	2	57.4	65.8	3	65.9
Vehicle Noise:	69	.9 6	3.2	63.7	7	60.4	68.9	9	69.2
Centerline Distance to	o Noise Co	ontour (in feet)	1		r			1	
				'0 dBA	65 dE		60 dBA		dBA
			dn:	50	107		231		97
		CN		52	113		243		24

Tuesday, July 18, 2017

Tuesday, July 18, 2017

	FH\	WA-RD-77-108	HIGHW	AY NO	DISE PR	REDICTIO	N MOI	DEL			
Scenari	o: Existing + I	Project				Project Na	ame: (Cedar .	Avenue		
Road Nam	e: Valley Bl.					Job Nun	nber: 1	1139			
Road Segmer	t: e/o Cedar	Av.									
	SPECIFIC IN	IPUT DATA							L INPUT	S	
Highway Data				S	ite Con	ditions (H	ard =	10, So	oft = 15)		
Average Daily	Traffic (Adt):	13,243 vehicl	es				A	lutos:	15		
Peak Hour	Percentage:	10%			Me	dium Truci	ks (2 A	xles):	15		
Peak H	our Volume:	1,324 vehicle	s		He	avy Trucks	s (3+ A	xles):	15		
Vel	nicle Speed:	40 mph		V	ehicle l	Mix					
Near/Far Lar	ne Distance:	48 feet		-		icleType		Dav	Evening	Night	Dailv
Site Data						Au	tos:	77.5%	12.9%	9.6%	95.89%
Bar	rier Height:	0.0 feet			Me	edium Truc	ks: t	34.8%	4.9%	10.3%	1.69%
Barrier Type (0-W	all, 1-Berm):	0.0			ŀ	leavy Truc	ks: t	36.5%	2.7%	10.8%	2.42%
Centerline Dis		59.0 feet		N	oise So	ource Elev	ations	; (in fe	et)		
Centerline Dist. I		59.0 feet				Autos:	0.0	00			
Barrier Distance t		0.0 feet			Mediur	n Trucks:	2.2	97			
Observer Height (J	,	5.0 feet			Heav	v Trucks:	8.0	04	Grade Ad	justment	: 0.0
	d Elevation:	0.0 feet		Ŀ							
	d Elevation:	0.0 feet		L	ane Eq	uivalent D			eet)		
ŀ	Road Grade:	0.0%				Autos:	54.1				
	Left View:	-90.0 degre				n Trucks:	53.9				
	Right View:	90.0 degre	es		Heav	y Trucks:	53.9	182			
FHWA Noise Mode		-									
VehicleType	REMEL	Traffic Flow	Dista		Finite	Road	Fresn		Barrier Att		m Atten
Autos:	66.51	-0.29		-0.62		-1.20		4.69		000	0.00
Medium Trucks:	77.72			-0.60		-1.20		4.88		000	0.00
Heavy Trucks:	82.99			-0.60		-1.20		-5.35	0.0	000	0.00
Unmitigated Noise			-		/						
VehicleType Autos:	Leq Peak Hou 64		62.5	eq Eve	ening 60.7	Leq Ni	gnt 54.7		Ldn 63.3	-	NEL 63.
Medium Trucks:	58		56.6		50.2		54.7 48.7		57.1	-	63. 57.
	58		56.6 63.5		50.2 54.5		48.7		57.1 64.1		57. 64.
Heavy Trucks: Vehicle Noise:	64		66.5		54.5 62.0		55.7		67.2		67.
					o2.0		58.7		07.2	٤	٥/.
Centerline Distanc	e to Noise C	ontour (in fee	2	70 dl	BA	65 dE	A	6	0 dBA	55	dBA
			Ldn:	38		82		Ŭ	177		82
		с	NEL:	40		87			187		02
		0				5.					

	FHV	/A-RD-77-108	HIG	HWAY N	IOISE PR	EDICT	ION MO	DEL			
Scenario: Exis	sting + P	roject				Project	t Name:	Cedar	Avenue		
Road Name: Ora	nge St.					Job N	lumber:	11139			
Road Segment: e/o	Cedar A	IV.									
SITE SPEC	IFIC IN	PUT DATA							L INPUT	S	
Highway Data					Site Con	ditions	; (Hard =	10, So	oft = 15)		
Average Daily Traffic	(Adt):	2,835 vehicl	es					Autos:	15		
Peak Hour Percer	ntage:	10%			Med	dium Tr	rucks (2 /	Axles):	15		
Peak Hour Vo	lume:	283 vehicle	s		Hea	avy Tru	icks (3+ /	Axles):	15		
Vehicle S	peed:	25 mph			Vehicle N	<i>Ni</i> v					
Near/Far Lane Dist	ance:	12 feet		F		cleType	9	Day	Evening	Night	Daily
Site Data							Autos:	77.5%	•	9.6%	
Barrier He	aight.	0.0 feet			Me	dium T	rucks:	84.8%	4.9%	10.3%	2.09
Barrier Type (0-Wall, 1-E	•	0.0			н	leavy T	rucks:	86.5%	2.7%	10.8%	5.59
Centerline Dist. to B		30.0 feet		_		-					
Centerline Dist. to Obs		30.0 feet		1	Noise So				eet)		
Barrier Distance to Obs		0.0 feet				Auto		000			
Observer Height (Above		5.0 feet			Mediun			297			
Pad Elev		0.0 feet			Heavy	y Truck	(S: 8.	004	Grade Ad	justment.	0.0
Road Elev		0.0 feet			Lane Equ	ıivalen	t Distan	ce (in :	feet)		
Road G	ade:	0.0%			·	Auto	os: 29.	816	í		
Left	View:	-90.0 degre	es		Mediun	n Truck	(s: 29.	518			
Right	View:	90.0 degre			Heavy	y Truck	(s: 29.	547			
FHWA Noise Model Calc	ulations	5									
VehicleType REI	MEL	Traffic Flow		stance	Finite I		Fresr	nel	Barrier Att	en Ber	m Atter
Autos:	58.73	-5.11		3.2	6	-1.20		-4.49	0.0	000	0.00
Medium Trucks:	70.80	-21.55		3.3		-1.20		-4.86		000	0.00
Heavy Trucks:	77.97	-17.28		3.3	2	-1.20		-5.77	0.0	000	0.00
Unmitigated Noise Leve					(_						
, , ,	eak Hou			Leq E	vening	Leq	Night		Ldn		VEL
Autos:	55.		53.8		52.0		46.0		54.6		55
Medium Trucks:	51.		49.9		43.5		42.0		50.4		50
Heavy Trucks:	62.	-	61.4		52.4		53.6		62.0		62
Vehicle Noise:	63.	8	62.3		55.5		54.5	5	62.9	9	63
Centerline Distance to N	loise Co	ntour (in fee)					1			
			L	70 0			dBA	6	60 dBA		dBA
			Ldn:	1			22		47		02
			NFI :	1	n		23		49	1	05

Road Nam	o: Existing + P e: Orange St. nt: w/o Vine St.					Project I Job Nu			Avenue		
	SPECIFIC IN	PUT DATA								s	
Highway Data				S	ite Conc	litions (Hard =	: 10, So	oft = 15)		
Average Daily	Traffic (Adt):	1,954 vehicl	es					Autos:	15		
Peak Hour	Percentage:	10%			Mea	lium Tru	cks (2 .	Axles):	15		
Peak H	our Volume:	195 vehicle	s		Hea	vy Truci	ks (3+ .	Axles):	15		
Vei	hicle Speed:	25 mph		V	ehicle N	liv					
Near/Far Lai	ne Distance:	12 feet		v		leType		Dav	Evening	Night	Dailv
Site Data					10/10		utos:	77.5%	•	Ŷ	89.70%
	vior Hoight	0.0 feet			Me	dium Tru		84.8%		10.3%	
Barrier Type (0-W	rier Height:	0.0 feet				eavy Tru		86.5%		10.8%	7.629
Centerline Dis	. ,	30.0 feet									
Centerline Dist.		30.0 feet		N	oise So				et)		
Barrier Distance		0.0 feet				Autos.		000			
Observer Height (.		5.0 feet			Medium	Trucks.	: 2.	297			
	d Elevation:	0.0 feet			Heavy	Trucks.	: 8.	004	Grade Ad	iustment.	0.0
	d Elevation:	0.0 feet		L	ane Equ	ivalent	Distan	ce (in	feet)		
	Road Grade:	0.0%		E		Autos		816			
,	Left View:	-90.0 degre	~		Medium	Trucks		518			
	Right View:	90.0 degre				/ Trucks		.547			
FHWA Noise Mode	el Calculations										
VehicleType	REMEL	Traffic Flow	Dist	ance	Finite F	Road	Fres	nel	Barrier Att	en Ber	m Atten
Autos:	58.73	-6.85		3.26		-1.20		-4.49	0.0	000	0.00
Medium Trucks:	70.80	-22.09		3.33		-1.20		-4.86	0.0	000	0.00
Heavy Trucks:	77.97	-17.56		3.32		-1.20		-5.77	0.0	000	0.00
Unmitigated Noise	Levels (with	out Topo and	barrie	r attenu	ation)						
VehicleType	Leq Peak Hou	r Leq Daj	/	Leq Ev	ening	Leq N	light		Ldn	CI	NEL
Autos:	54.	0	52.1		50.3		44.	2	52.9)	53.
Medium Trucks:	50.	8	49.3		43.0		41.	4	49.9)	50.
Heavy Trucks:	62.	5	61.1		52.1		53.	3	61.7	,	61.
Vehicle Noise:	63.	4	61.9		54.6		54.	1	62.5	5	62
Centerline Distand	e to Noise Co	ntour (in fee	;)								
				70 di	BA	65 d		6	0 dBA		dBA
			Ldn: NFL:	9 10		20			44 45		94 97

FH	VA-RD-77-108 HIGI	HWAY I	NOISE PF	REDICTIC	N MOD	EL		
Scenario: Existing + F Road Name: Orange St. Road Segment: e/o Vine St					lame: Ce mber: 11	edar Avenue 139	e	
SITE SPECIFIC IN	IPUT DATA			NC	DISE MO	DEL INP	UTS	
Highway Data			Site Con	ditions (H	Hard = 1	0, Soft = 15)	
Average Daily Traffic (Adt):	1,813 vehicles				AL	itos: 15		
Peak Hour Percentage:	10%		Me	dium Truc	ks (2 Ax	les): 15		
Peak Hour Volume:	181 vehicles		He	avy Truck	s (3+ Ax	les): 15		
Vehicle Speed:	25 mph	-	Vehicle I	Mix				
Near/Far Lane Distance:	12 feet	-		icleType	0	ay Evenii	ng Nia	t Daily
Site Data			ven			7.5% 12.9		.6% 95.62%
Barrier Height:	0.0 feet		Me	edium Tru		4.8% 4.9		.3% 1.71%
Barrier Type (0-Wall, 1-Berm):	0.0		F	leavy Tru	cks: 8	6.5% 2.7	% 10	.8% 2.67%
Centerline Dist, to Barrier:	30.0 feet	-		,				
Centerline Dist. to Observer:	30.0 feet	-	Noise Sc	ource Ele				
Barrier Distance to Observer:	0.0 feet			Autos:	0.00			
Observer Height (Above Pad):	5.0 feet			n Trucks:			A	
Pad Elevation:	0.0 feet		Heav	y Trucks:	8.00	4 Grade	Adjustr	nent: 0.0
Road Elevation:	0.0 feet		Lane Eq	uivalent I	Distance	(in feet)		
Road Grade:	0.0%	Γ		Autos:	29.81	6		
Left View:	-90.0 degrees		Mediur	n Trucks:	29.51	8		
Right View:	90.0 degrees		Heav	y Trucks:	29.54	7		
FHWA Noise Model Calculation	s							
VehicleType REMEL		stance	Finite	Road	Fresne	Barrier	Atten	Berm Atten
Autos: 58.73	-6.89	3.2	6	-1.20	-4	1.49	0.000	0.000
Medium Trucks: 70.80	-24.36	3.3	3	-1.20	-4	.86	0.000	0.000
Heavy Trucks: 77.97	-22.44	3.3	2	-1.20	-5	5.77	0.000	0.000
Unmitigated Noise Levels (with	out Topo and barri	ier atter	nuation)					
VehicleType Leq Peak Hou	ır Leq Day	Leq E	vening	Leq N	light	Ldn		CNEL
Autos: 53	.9 52.0		50.2		44.2	ę	52.8	53.4
Medium Trucks: 48			40.7		39.2		47.6	47.8
Heavy Trucks: 57	.7 56.2		47.2		48.4	Į	56.8	56.9
Vehicle Noise: 59	.5 58.0		52.3		50.2	1	58.6	58.9
Centerline Distance to Noise Co	ontour (in feet)							
		70	dBA	65 dl	BA	60 dBA		55 dBA
	Ldn:	1	5	11		24		52
	CNEL:	4	5	12		25		54

Tuesday, July 18, 2017

Tuesday, July 18, 2017

	FHV	/A-RD-77-108 HIG	HWAY N		REDICTIO		L		_
Scenario	: OY 2019 W	ithout Project			Project Na	ame: Ce	dar Avenue		
Road Name	e: Cedar Av.				Job Nurr	ber: 11	139		
Road Segment	t: n/o Valley B	si.							
	PECIFIC IN	PUT DATA					DEL INPU	rs	
Highway Data			4	Site Con	ditions (H	ard = 10	, Soft = 15)		
Average Daily T	raffic (Adt):	28,240 vehicles				Au	tos: 15		
Peak Hour F	Percentage:	10%		Me	dium Truck	is (2 Axle	es): 15		
Peak Ho	our Volume:	2,824 vehicles		He	avy Trucks	(3+ Axle	es): 15		
Veh	icle Speed:	40 mph		Vehicle I	Mix				
Near/Far Lan	e Distance:	48 feet	-		icleType	Da	y Evening	Night	Dailv
Site Data					Aut		.5% 12.9%		
Barr	ier Height:	0.0 feet		Me	edium Truc	ks: 84	.8% 4.9%	10.3%	1.69%
Barrier Type (0-Wa	•	0.0		ŀ	leavy Truc	ks: 86	.5% 2.7%	10.8%	2.38%
Centerline Dist	t. to Barrier:	59.0 feet	-	Noise Sr	ource Elev	ations (in feet)		
Centerline Dist. to	o Observer:	59.0 feet	-	10.00 00	Autos:	0.000	,		
Barrier Distance to	o Observer:	0.0 feet		Modiu	n Trucks:	2.297			
Observer Height (A	bove Pad):	5.0 feet			v Trucks:	8.004		djustmen	t [.] 0.0
Pad	d Elevation:	0.0 feet						-,	
Road	d Elevation:	0.0 feet	1	Lane Eq	uivalent D		, ,		
R	oad Grade:	0.0%			Autos:	54.129			
	Left View:	-90.0 degrees			n Trucks:	53.966	-		
	Right View:	90.0 degrees		Heav	y Trucks:	53.982	2		
FHWA Noise Mode	l Calculation:	5							
VehicleType	REMEL	Traffic Flow D	istance	Finite	Road	Fresnel	Barrier A	tten Be	rm Atten
Autos:	66.51	3.00	-0.6	2	-1.20	-4.	69 0	.000	0.00
Medium Trucks:	77.72	-14.54	-0.60	D	-1.20	-4.	88 0	.000	0.00
Heavy Trucks:	82.99	-13.05	-0.60	D	-1.20	-5.	35 0	.000	0.00
Unmitigated Noise	Levels (with	out Topo and barr	ier atten	uation)					
	Leq Peak Hou		Leg E	•	Leq Nig		Ldn		NEL
Autos:	67.			64.0		58.0	66		67.
Medium Trucks:	61.			53.5		52.0	60		60.
Heavy Trucks:	68.			57.7		58.9	67	-	67
Vehicle Noise:	71.	4 69.8		65.2		61.9	70	.4	70.
Centerline Distance	e to Noise Co	ntour (in feet)	r					T	
			70 0		65 dB	A	60 dBA		5 dBA
		Ldn:		-	136		292		630
		CNEL:	6	6	143		308		663

	FHW	A-RD-77-108 HIG	HWAY	NOISE PF	REDICT	ION MO	DEL			
Scenari	p: OY 2019 Wit	nout Project			Projec	t Name:	Cedar	Avenue		
Road Nam	e: Cedar Av.				Job I	lumber:	11139			
Road Segmer	it: s/o Valley Bl.									
	SPECIFIC INP	UT DATA						L INPUT	S	
Highway Data				Site Con	ditions	; (Hard =	10, So	oft = 15)		
Average Daily	Traffic (Adt): 3	9,100 vehicles					Autos:	15		
Peak Hour	Percentage:	10%		Me	dium Ti	rucks (2 A	(xles)	15		
Peak H	our Volume: 3	,910 vehicles		He	avy Tru	icks (3+ A	(xles)	15		
	hicle Speed:	40 mph	F	Vehicle I	Mix					
Near/Far Lar	ne Distance:	48 feet	ŀ		icleTyp	e	Dav	Evening	Night	Daily
Site Data							77.5%	•	9.6%	
Bar	rier Height:	0.0 feet		Me	edium T	rucks:	84.8%	4.9%	10.3%	1.699
Barrier Type (0-W	•	0.0		ŀ	leavy 1	rucks:	86.5%	2.7%	10.8%	2.38
Centerline Dis		59.0 feet	-	Noise So	uree E	lovation	o lin fi	aa4)		
Centerline Dist.	to Observer:	59.0 feet	F	NOISE SC	Auto		5 (111 10 200	eel)		
Barrier Distance	to Observer:	0.0 feet		Mediur			297			
Observer Height (J	Above Pad):	5.0 feet			y Truck		297	Grade Ad	iustmont	0.0
Pa	d Elevation:	0.0 feet		neav	y mucr		504	Grade Adj	usunoni	0.0
Roa	d Elevation:	0.0 feet		Lane Eq	uivalen	t Distan	ce (in :	feet)		
F	Road Grade:	0.0%			Auto	os: 54.	129			
	Left View:	-90.0 degrees		Mediur						
	Right View:	90.0 degrees		Heav	y Truck	(s: 53.)	982			
FHWA Noise Mode	el Calculations									
VehicleType	REMEL	raffic Flow Di	istance	Finite	Road	Fresh	el	Barrier Att	en Ber	m Atter
Autos:	66.51	4.42	-0.6		-1.20		-4.69		000	0.00
Medium Trucks:	77.72	-13.13	-0.6		-1.20		-4.88		000	0.00
Heavy Trucks:	82.99	-11.64	-0.6	60	-1.20		-5.35	0.0	000	0.00
Unmitigated Noise										
<i>,</i>	Leq Peak Hour	Leq Day	Leq E	vening	Leq	Night		Ldn		VEL
Autos:	69.1	67.2		65.4		59.4		68.0		68
Medium Trucks:	62.8			54.9		53.4		61.8 68.7		62
Heavy Trucks: Vehicle Noise:	69.6 72.8	68.1 71.2		59.1		60.3		68. <i>i</i> 71.8		68
		=		66.6		63.4	•	71.8	5	72
Centerline Distanc	e to Noise Con	tour (in feet)	70	dBA	65	dBA	F	60 dBA	55	dBA
		Ldn:		ива 78		68		363		82
		Lun.		0		00		000	'	02

		MATIN						
Scenario: OY 2019 Without Proje	ct			roject Name		Avenue		
Road Name: Cedar Av.				Job Numbe	r: 11139			
Road Segment: s/o I-10 Fwy.								
SITE SPECIFIC INPUT DAT	A					L INPUTS	5	
Highway Data			Site Condi	tions (Harc	= 10, So	oft = 15)		
Average Daily Traffic (Adt): 32,070 veh	nicles				Autos:	15		
Peak Hour Percentage: 10%			Media	um Trucks (2 Axles):	15		
Peak Hour Volume: 3,207 vehi	cles		Heav	y Trucks (3	+ Axles):	15		
Vehicle Speed: 40 mph			Vehicle Mi	x				
Near/Far Lane Distance: 48 feet		F	Vehicl	еТуре	Day	Evening	Night	Daily
Site Data				Autos:	77.5%	12.9%	9.6%	95.939
Barrier Height: 0.0 fee	t		Med	ium Trucks:	84.8%	4.9%	10.3%	1.69%
Barrier Type (0-Wall, 1-Berm): 0.0	•		He	avy Trucks:	86.5%	2.7%	10.8%	2.38
Centerline Dist. to Barrier: 59.0 fee		1	Noise Sou	rce Elevati	ons (in fe	eet)		
Centerline Dist. to Observer: 59.0 fee	t	-		Autos:	0.000	,		
Barrier Distance to Observer: 0.0 fee	t		Medium	Trucks:	2.297			
Observer Height (Above Pad): 5.0 fee			Heavv	Trucks:	8.004	Grade Adj	ustment	0.0
Pad Elevation: 0.0 fee		-	,					
Road Elevation: 0.0 fee	t	4	Lane Equi	valent Dist		teet)		
Road Grade: 0.0%					4.129			
Left View: -90.0 deg	·		Medium		3.966			
Right View: 90.0 deg	grees		Heavy	TTUCKS: 5	3.982			
FHWA Noise Model Calculations			T					
VehicleType REMEL Traffic Flo		stance	Finite R			Barrier Atte		m Atten
	55	-0.6	-	1.20	-4.69	0.0		0.00
Medium Trucks: 77.72 -13.		-0.60		1.20	-4.88	0.0		0.00
Heavy Trucks: 82.99 -12.		-0.60		1.20	-5.35	0.0	00	0.00
Unmitigated Noise Levels (without Topo a VehicleType Leg Peak Hour Leg I		er atten Leg Ei		Leg Night		l dn	0	NFI
Autos: 68.2	66.3	LeyL	64.6	1 0	8.5	67.1		67.
Medium Trucks: 61.9	60.4		54.1		2.5	61.0		61
Heavy Trucks: 68.7	67.3		58.2	-	9.5	67.8		68
Vehicle Noise: 71.9	70.3		65.8		2.5	71.0		71.
Centerline Distance to Noise Contour (in fo	eet)							
•		70 0	/BA	65 dBA	e	0 dBA	55	dBA
	Ldn:	6	9	148		318	6	85

	FH1	WA-RD-77-108	HIGHWA	Y NOIS	E PREDIC	TION MO	DEL			
Scenario. Road Name. Road Segment.	Cedar Av.	Vithout Project				ct Name: Number:		Avenue		
	PECIFIC IN	NPUT DATA							s	
Highway Data				Site	Condition	s (Hard =	: 10, So	ft = 15)		
Average Daily Ti	raffic (Adt):	25,330 vehicle	es				Autos:	15		
Peak Hour P	ercentage:	10%			Medium	Frucks (2 /	Axles):	15		
Peak Ho	ur Volume:	2,533 vehicle	s		Heavy Ti	ucks (3+)	Axles):	15		
	cle Speed:	40 mph		Vehi	cle Mix					
Near/Far Lane	e Distance:	48 feet			VehicleTy	be	Day	Evening	Night	Daily
Site Data					,	Autos:	77.5%	12.9%	9.6%	
Barri	ier Heiaht:	0.0 feet			Medium	Trucks:	84.8%	4.9%	10.3%	1.69%
Barrier Type (0-Wa		0.0			Heavy	Trucks:	86.5%	2.7%	10.8%	2.38%
Centerline Dist.	to Barrier:	59.0 feet		Nois	e Source	Elevation	s (in fe	et)		
Centerline Dist. to	Observer:	59.0 feet					000	. /		
Barrier Distance to		0.0 feet		M	edium Truc		297			
Observer Height (A	,	5.0 feet			leavy Truc		004	Grade Ad	justment	0.0
	Elevation:	0.0 feet		_	,					
	Elevation:	0.0 feet		Lane	e Equivale			eet)		
Ro	oad Grade:	0.0%					129			
	Left View:	-90.0 degre			edium Truc		966			
,	Right View:	90.0 degre	es		Heavy Truc	:KS: 53.	982			
FHWA Noise Model	Calculation									
VehicleType	REMEL	Traffic Flow	Distan	-	inite Road			Barrier Att		m Atten
Autos:	66.51			0.62	-1.2	-	-4.69		000	0.000
Medium Trucks:	77.72			0.60	-1.2	-	-4.88		000	0.000
Heavy Trucks:	82.99			0.60	-1.2)	-5.35	0.0	000	0.000
Unmitigated Noise							1		1	
	eq Peak Ho			q Evenir	0	q Night		Ldn	-	VEL
Autos:			65.3		63.6	57.5		66.1		66.7
Medium Trucks:	60		59.4		53.0	51.5		59.9		60.2
Heavy Trucks:			66.2		57.2	58.5		66.8		66.9
Vehicle Noise:			69.3	(64.8	61.5	ō	70.0	נ	70.3
Centerline Distance	to Noise C	ontour (in feet	,	70 dBA		5 dBA	-	0 dBA		dBA
			Ldn:	70 dBA 59	6	5 dBA 126		0 dBA 272		ава 86
			Lan: NFL:	59 62		126		272 286		86 17
		G	VĽL.	02		133		200	6	

Tuesday, July 18, 2017

Tuesday, July 18, 2017

	HWA-RI	D-77-108 H	IIGHW	AY N	DISE PR	REDICTIO	MOL	πL			
Scenario: OY 201		t Project				Project Na			Avenue		
Road Name: Cedar A						Job Nun	nber: 1	1139			
Road Segment: s/o Slov	er Av.										
SITE SPECIFIC	INPUT	DATA				NO	ISE M	IODE		s	
Highway Data				S	lite Con	ditions (H	ard = 1	10, So	ft = 15)		
Average Daily Traffic (Adt	: 23,83	30 vehicles					A	utos:	15		
Peak Hour Percentage	: 10	0%			Me	dium Truci	(2 A	xles):	15		
Peak Hour Volume	2,383	3 vehicles			He	avy Trucks	(3+ A	xles):	15		
Vehicle Speed	: 40) mph		L.	ehicle l	Mix					
Near/Far Lane Distance	: 48	3 feet		F		cleType	1	Dav	Evening	Night	Dailv
Site Data						Au		77.5%	12.9%	9.6%	
Barrier Heigh		0 feet			Me	edium Truc	ks: 8	34.8%	4.9%	10.3%	1.69
Barrier Type (0-Wall, 1-Berm					F	leavy Truc	ks: 8	36.5%	2.7%	10.8%	2.38
Centerline Dist. to Barrie		0 feet		-							
Centerline Dist. to Observe		0 feet		^	loise Sc	ource Elev			et)		
Barrier Distance to Observe		0 feet				Autos:	0.0				
Observer Height (Above Pad		.0 feet				n Trucks:	2.2				
Pad Elevation		0 feet			Heav	y Trucks:	8.0	04	Grade Ad	ustment	.: 0.0
Road Elevation	r: 0.	.0 feet		L	ane Eq	uivalent D	istanc	e (in f	eet)		-
Road Grade	e: 0.	.0%				Autos:	54.1	29			
Left View	·: -90.	.0 degrees			Mediur	n Trucks:	53.9	66			
Right View	. 90.	0 degrees			Heav	y Trucks:	53.9	82			
FHWA Noise Model Calculat	ons										
VehicleType REMEL		fic Flow	Dista		Finite		Fresne		Barrier Att		rm Atter
Autos: 66		2.26		-0.62		-1.20		4.69	0.0	000	0.00
Medium Trucks: 77	. –	-15.28		-0.60		-1.20		4.88		000	0.00
Heavy Trucks: 82		-13.79		-0.60		-1.20	-	5.35	0.0	000	0.00
Unmitigated Noise Levels (w			-		/	1 16	and a d		Lala		
VehicleType Leq Peak Autos:	10ur 67.0	Leq Day	5.1	eq Ev	· ·	Leq Ni			Ldn 65.9		NEL
Autos: Medium Trucks:	60.6	-	5.1 9.1		63.3 52.8		57.2 51.2		59.7		66. 59.
Heavy Trucks:	67.4	-	9.1 3.0		52.8 56.9		58.2		59.7 66.5		59. 66.
Vehicle Noise:	70.7		3.0 3.0		64.5		58.2		69.7		70.
			9.0		04.5		01.2		69.7		70.
Centerline Distance to Noise	Contou	r (in feet)		70 d	RΔ	65 dE	A	6	0 dBA	55	5 dBA
		L	dn:	56		121			261		562

Road Name: Road Segment:	OY 2019 With	out Project			<u> </u>			. —		
Road Segment:	Vallov BI							Avenue		
•					Job I	lumber:	11139			
	w/o Cedar Av.									
	ECIFIC INPL	JT DATA						L INPUT	s	
Highway Data				Site Con	ditions	; (Hard =	10, So	oft = 15)		
Average Daily Tra	ffic (Adt): 20	,370 vehicles					Autos:	15		
Peak Hour Pe	rcentage:	10%		Me	dium Ti	rucks (2 /	Axles):	15		
Peak Hour	Volume: 2,	037 vehicles		He	avy Tru	icks (3+ /	Axles):	15		
	le Speed:	40 mph	F	Vehicle I	Mix					
Near/Far Lane	Distance:	48 feet	ŀ		icleTyp	e	Dav	Evening	Night	Daily
Site Data		-				Autos:	77.5%	•	9.6%	
Barrie	r Height:	0.0 feet		Me	edium 1	rucks:	84.8%	4.9%	10.3%	1.699
Barrier Type (0-Wall,		0.0		ŀ	leavy 1	rucks:	86.5%	2.7%	10.8%	2.389
Centerline Dist. t		59.0 feet	ŀ	Noise Sc		lovetic -	o lin f	241		
Centerline Dist. to	Observer:	59.0 feet	-	Noise Sc				et)		
Barrier Distance to (Observer:	0.0 feet		Mediur	Auto		000 297			
Observer Height (Ab	ove Pad):	5.0 feet			y Truck		297	Grade Ad	iustmont	0.0
Pad I	Elevation:	0.0 feet		neav	y mucr		004	Oldac Au	usunoni	0.0
Road I	Elevation:	0.0 feet		Lane Eq	uivalen	t Distan	ce (in i	feet)		
Roa	ad Grade:	0.0%			Auto	os: 54.	129			
l	eft View: -	90.0 degrees		Mediur			966			
Ri	ght View:	90.0 degrees		Heav	y Truck	(s: 53.	982			
FHWA Noise Model C	Calculations									
VehicleType	REMEL T	raffic Flow Di	istance	Finite	Road	Fresr	nel	Barrier Att	en Ber	m Atter
Autos:	66.51	1.58	-0.6		-1.20		-4.69		000	0.00
Medium Trucks:	77.72	-15.96	-0.6		-1.20		-4.88		000	0.00
Heavy Trucks:	82.99	-14.47	-0.6	60	-1.20		-5.35	0.0	000	0.00
Unmitigated Noise L									1	
,1	q Peak Hour	Leq Day		vening	Leq	Night		Ldn		VEL
Autos:	66.3	64.4		62.6		56.6		65.2		65
Medium Trucks:	60.0	58.4		52.1		50.5		59.0		59
Heavy Trucks:	66.7	65.3		56.3		57.5		65.9		66
Vehicle Noise:	70.0	68.3		63.8		60.5	ō	69.0)	69
Centerline Distance	o Noise Cont	our (in feet)	70	-/D.4	05	104		0.0		-10.4
		Ldn:		dBA 51		dBA 09	6	0 dBA 235		dBA 06
		Lan: CNEL:		51 53		15		235		06 34

	FH\	VA-RD-77-108	HIGH	WAY N	NOISE PI	REDICT	ION M	ODEL			
Road Nam	o: OY 2019 W e: Valley Bl. nt: e/o Cedar /	/ithout Project				Project	t Name.	-	Avenue		
SITE	SPECIFIC IN	IPUT DATA				ľ	NOISE	MODE	L INPUT	s	
Highway Data					Site Cor	ditions	(Hard	= 10, S	oft = 15)		
Average Daily	Traffic (Adt):	13,690 vehicl	es					Autos:	15		
Peak Hour	Percentage:	10%			Me	dium Tr	ucks (2	Axles):	15		
Peak H	our Volume:	1,369 vehicle	s		He	avy Tru	cks (3+	Axles):	15		
Ve	hicle Speed:	40 mph		H	Vehicle	Mix					
Near/Far La	ne Distance:	48 feet		H		icleType		Dav	Evening	Night	Dail
Site Data					VCI		Autos:	77.5%	•	9.6%	
						edium T				10.3%	
	rier Height:	0.0 feet				Heavy T				10.3 %	
Barrier Type (0-W		0.0			,	leavy I	rucks.	00.37	5 2.170	10.0 %	2.30
Centerline Dis		59.0 feet			Noise Se	ource E	levatio	ns (in f	eet)		
Centerline Dist.		59.0 feet		Γ		Auto	s: (0.000			
Barrier Distance		0.0 feet			Mediu	m Truck	:s: 2	2.297			
Observer Height (,	5.0 feet			Heav	/y Truck	:s: 8	3.004	Grade Ad	justment	: 0.0
	ad Elevation:	0.0 feet		H			4 Di - 4-		6		
	ad Elevation:	0.0 feet		H	Lane Eq				reet)		
	Road Grade:	0.0%				Auto m Truck		1.129			
	Left View:	-90.0 degre						3.966			
	Right View:	90.0 degre	es		nea	/y Truck	.s. 50	3.982			
FHWA Noise Mode		-									
VehicleType	REMEL	Traffic Flow		ance		Road	Fres		Barrier Att		m Atte
Autos:	66.51	-0.14		-0.6	-	-1.20		-4.69		000	0.0
Medium Trucks:	77.72			-0.6	-	-1.20		-4.88		000	0.0
Heavy Trucks:	82.99	-16.20		-0.6	-	-1.20		-5.35	0.0	000	0.0
Unmitigated Noise								-			
VehicleType Autos:	Leq Peak Hou		62.7	Leq E	vening	Leq	Night 54		Ldn		NEL
Autos: Medium Trucks:	64 58		62.7 56.7		60.9 50.4		54 48		63. 57.3		64 51
	58 65		56.7 63.6		50.4 54.5		48		57.3 64.1	-	
Heavy Trucks: Vehicle Noise:	68		66.6		54.5 62.1		58		67.3		64
Centerline Distand		-					50	-	57.5	-	
			/	70	dBA	65	dBA		60 dBA	55	dBA
			Ldn:	3	19	8	34		180	3	88

	FH	WA-RD-77-108	HIGH	IWAY NO	OISE PI	REDICTIC	ON MOI	DEL			
Road Nam	io: OY 2019 V ne: Orange St. nt: e/o Cedar					Project N Job Nu			Avenue		
SITE	SPECIFIC I	NPUT DATA				NO	DISE N	IODEI		s	
Highway Data				s	ite Con	ditions (l	Hard =	10, So	ft = 15)		
Average Daily	Traffic (Adt):	2,280 vehicl	es					Autos:	15		
Peak Hour	Percentage:	10%			Me	dium Truc	cks (2 A	xles):	15		
Peak H	lour Volume:	228 vehicle	s		He	avy Truck	ks (3+ A	xles):	15		
Ve	hicle Speed:	25 mph		V	ehicle	Mix					
Near/Far La	ne Distance:	12 feet		-		icleType		Day	Evening	Night	Daily
Site Data						AL	utos:	77.5%	12.9%	9.6%	95.93%
Ba	rrier Height:	0.0 feet			М	edium Tru	icks:	84.8%	4.9%	10.3%	1.69%
Barrier Type (0-W		0.0			- 1	Heavy Tru	icks:	86.5%	2.7%	10.8%	2.38%
Centerline Di	st. to Barrier:	30.0 feet		N	loise So	ource Ele	vation	s (in fe	et)		
Centerline Dist.	to Observer:	30.0 feet		-		Autos:					
Barrier Distance		0.0 feet			Mediu	m Trucks:					
Observer Height	(Above Pad):	5.0 feet				v Trucks:			Grade Ad	iustment	: 0.0
P	ad Elevation:	0.0 feet									
	ad Elevation:	0.0 feet		L	ane Eq	uivalent		<u> </u>	eet)		
	Road Grade:	0.0%				Autos:					
	Left View:	-90.0 degre	es			m Trucks:					
	Right View:	90.0 degre	es		Heav	y Trucks:	29.5	547			
FHWA Noise Mod	el Calculatior	IS									
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite	Road	Fresn	el I	Barrier Att	en Ber	m Atten
Autos:	58.73	-5.89		3.26		-1.20		-4.49	0.0	000	0.000
Medium Trucks:	70.80	-23.43		3.33		-1.20		-4.86	0.0	000	0.000
Heavy Trucks:	77.97	-21.94		3.32		-1.20		-5.77	0.0	000	0.000
Unmitigated Nois	e Levels (with	out Topo and	barrie	er attenu	uation)						
VehicleType	Leq Peak Ho	ur Leq Daj	/	Leq Ev	ening	Leq N	light		Ldn	C	NEL
Autos:	-	1.9	53.0		51.2		45.2		53.8		54.4
Medium Trucks:		9.5	48.0		41.6		40.1		48.5		48.8
Heavy Trucks:	58	3.2	56.7		47.7		48.9		57.3	3	57.4
Vehicle Noise:	60).2	58.7		53.2		50.9		59.3	3	59.6
Centerline Distan	ce to Noise C	ontour (in fee	t)								
				70 di	BA	65 d		6	0 dBA		dBA
			Ldn:	6		12			27		58
		С	NEL:	6		13	1		28		60

Tuesday, July 18, 2017

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		WA-RD-77-108	HIGH	NAT-IX							
		/ithout Project				Project N			Avenue		
	e: Orange St.					Job Nur	nber:	11139			
Road Segmen	t: w/o Vine S	L.									
	PECIFIC IN	IPUT DATA							L INPUT	5	
Highway Data				1	Site Con	ditions (H	lard =	10, Sc	oft = 15)		
Average Daily	raffic (Adt):	1,850 vehicle	s					Autos:	15		
Peak Hour I	Percentage:	10%			Me	dium Truc	ks (2 A	xles):	15		
Peak Ho	our Volume:	185 vehicles	6		He	avy Truck	s (3+ A	xles):	15		
Vet	icle Speed:	25 mph			Vehicle I	Mix					
Near/Far Lar	e Distance:	12 feet		- F		icleType		Dav	Evenina	Night	Dailv
Site Data						, ,		77.5%		9.6%	
Bar	rier Height:	0.0 feet			Me	edium Truc	cks:	84.8%	4.9%	10.3%	1.69
Barrier Type (0-Wa	•	0.0			ŀ	leavy Truc	cks:	86.5%	2.7%	10.8%	2.38
Centerline Dis	t. to Barrier:	30.0 feet		-	Voise Sc	ource Elev	ation	s (in fe	et)		
Centerline Dist. t	o Observer:	30.0 feet		- F	10.00 00	Autos:		000			
Barrier Distance t	o Observer:	0.0 feet			Modiur	n Trucks:		297			
Observer Height (/	Above Pad):	5.0 feet				v Trucks:		004	Grade Ad	ustment	- 00
Pa	d Elevation:	0.0 feet			mour	<i>y maana.</i>	0.0		,		
Roa	d Elevation:	0.0 feet		1	ane Eq	uivalent D			feet)		
F	load Grade:	0.0%				Autos:	29.8				
	Left View:	-90.0 degree	s			n Trucks:	29.5				
	Right View:	90.0 degree	s		Heav	y Trucks:	29.5	547			
FHWA Noise Mode	I Calculation	S									
VehicleType	REMEL	Traffic Flow	Dista	ance	Finite		Fresn	-	Barrier Atte	en Bei	rm Atter
Autos:	58.73	-6.79		3.26	-	-1.20		-4.49	0.0		0.00
Medium Trucks:	70.80			3.33	-	-1.20		-4.86	0.0		0.00
Heavy Trucks:	77.97	-22.85		3.32	2	-1.20		-5.77	0.0	00	0.00
Unmitigated Noise											
,,	Leq Peak Ho			Leq E		Leq Ni	•		Ldn		NEL
Autos:	54		52.1		50.3		44.3		52.9		53
Medium Trucks:	48		47.1		40.7		39.2		47.6		47
Heavy Trucks:	57		55.8		46.8		48.0		56.4		56
Vehicle Noise:	59		57.8		52.2		49.9		58.4	1	58
Centerline Distanc	e to Noise C	ontour (in feet))	=0		05.15					
			L	70 0		65 dE	\$A	6	0 dBA		dBA
			Ldn:	5		11			23		50
		Ch	IFI :	5		11			24		53

FH	WA-RD-77-108	B HIGHWA	Y NOISE P	REDICT	ION MO	DEL			
Scenario: OY 2019	Vithout Project			Project	t Name:	Cedar	Avenue		
Road Name: Orange St				Job N	lumber:	11139			
Road Segment: e/o Vine S	t.								
SITE SPECIFIC I	NPUT DATA			1	NOISE N	NODE	L INPUT	s	
Highway Data			Site Co	nditions	(Hard =	10, So	oft = 15)		
Average Daily Traffic (Adt):	1,830 vehic	les				Autos:	15		
Peak Hour Percentage:	10%		M	edium Tr	ucks (2 /	Axles):	15		
Peak Hour Volume:	183 vehicle	es	H	avy Tru	cks (3+ /	Axles):	15		
Vehicle Speed:	25 mph		Vehicle	Mix					
Near/Far Lane Distance:	12 feet			nicleType	9	Day	Evening	Night	Daily
Site Data						77.5%	•	9.6%	
Barrier Height:	0.0 feet		N	edium T	rucks:	84.8%	4.9%	10.3%	1.699
Barrier Type (0-Wall, 1-Berm):	0.0			Heavy T	rucks:	86.5%	2.7%	10.8%	2.38
Centerline Dist. to Barrier:	30.0 feet								
Centerline Dist. to Observer:	30.0 feet		Noise S		levation		eet)		
Barrier Distance to Observer:	0.0 feet			Auto		000			
Observer Height (Above Pad):	5.0 feet			m Truck		297	0		
Pad Elevation:	0.0 feet		Hea	vy Truck	:s: 8.	004	Grade Adj	ustment	0.0
Road Elevation:	0.0 feet		Lane Ec	uivalen	t Distan	ce (in i	feet)		
Road Grade:	0.0%			Auto	s: 29.	816			
Left View:	-90.0 degre	es	Mediu	m Truck	is: 29.	518			
Right View:	90.0 degre	es	Hea	vy Truck	:s: 29.	547			
FHWA Noise Model Calculation	15		1						
VehicleType REMEL	Traffic Flow	Distanc	e Finite	Road	Fresr	nel	Barrier Att	en Ber	m Atter
Autos: 58.73	-6.84		3.26	-1.20		-4.49	0.0	000	0.00
Medium Trucks: 70.80			3.33	-1.20		-4.86		000	0.00
Heavy Trucks: 77.97	-22.90		3.32	-1.20		-5.77	0.0	000	0.00
Unmitigated Noise Levels (with			,						
VehicleType Leq Peak Ho			q Evening		Night		Ldn		VEL
	4.0	52.1	50.3		44.2		52.9		53
	B.5	47.0	40.7		39.1		47.6		47
	7.2	55.8	46.7		48.0		56.3		56
	9.3	57.7	52.2		49.9	9	58.3	5	58
Centerline Distance to Noise C	ontour (in fee		70 dBA	65	dBA	6	0 dBA	55	dBA
		Ldn:	5		идн 11		23		06A 50
							20		

Soonaria	: OY 2019 W	ith Project				Project N	lame	Coder	Δυσριμο		
	2019 W	IIII Plojeci				Job Nu			Avenue		
Road Segmen		ม				300 110	nber.	11135			
•	PECIFIC IN					NC	NEE	MODE	L INPUT	c .	
JIL 3 Highway Data	PECIFIC IN	PUTDAT	•		Site Con	ditions (F				3	
Average Daily T	raffic (Adt):	28.305 vehi	icles					Autos:	15		
Peak Hour F	, ,	10%			Me	dium Truc	ks (2	Axles):	15		
	our Volume:	2.831 vehic	les			avy Truck			15		
Veh	icle Speed:	40 mph		-	Vehicle		-				
Near/Far Lan	e Distance:	48 feet		-		icleType	- 1	Day	Evening	Night	Daily
Site Data					VCII		itos:	77.5%	•	9.6%	
	rier Height:	0.0 feet			M	edium Tru		84.8%		10.3%	
Barrier Type (0-Wa		0.0			I	Heavy Tru	cks:	86.5%	2.7%	10.8%	2.41
Centerline Dis	t. to Barrier:	59.0 feet		-	Noise So	ource Ele	vatior	ns (in fe	et)		
Centerline Dist. to		59.0 feet		ŀ		Autos:		.000	.,		
Barrier Distance to		0.0 feet			Mediu	m Trucks:		.297			
Observer Height (A	,	5.0 feet			Heav	v Trucks:	8	.004	Grade Ad	justment	: 0.0
	d Elevation:	0.0 feet		-	1 F		N- 4	(1	(4)		
	d Elevation:	0.0 feet		-	Lane Eq	uivalent I Autos:		.129	eet)		
R	oad Grade:	0.0%			Madiu	n Trucks:		.129 .966			
	Right View:	-90.0 deg 90.0 deg				y Trucks:		.966 .982			
FHWA Noise Mode	I Calculation	-									
VehicleType	REMEL	Traffic Flow	v Dis	stance	Finite	Road	Fres	nel	Barrier Att	en Ber	m Atter
Autos:	66.51	3.0)1	-0.6	62	-1.20		-4.69	0.0	000	0.00
Medium Trucks:	77.72	-14.5	52	-0.6	60	-1.20		-4.88	0.0	000	0.00
Heavy Trucks:	82.99	-12.9	98	-0.6	60	-1.20		-5.35	0.0	000	0.00
Unmitigated Noise	Levels (with	out Topo ar	nd barri	ier attei	nuation)						
11	Leq Peak Hou	,		Leq E	vening	Leq N	<u> </u>		Ldn		NEL
Autos:	67		65.8		64.0		58.	-	66.6		67
Medium Trucks:	61		59.9		53.5		52.	-	60.4		60
Heavy Trucks:	68	-	66.8		57.8		59.	-	67.4		67
Vehicle Noise:	71		69.8		65.3		62.	0	70.5	5	70
			of)								
Centerline Distance	e to Noise Co	ontour (in fe	eij		10.4		~	-	0.104		10.4
	e to Noise Co	ontour (in fe	Ldn:		dBA	65 dl		6	0 dBA 294		dBA 33

	FHW	A-RD-77-108 HIG	HWAY I	NOISE PR	REDICT	ION MOI	DEL			
Road Nan	io: OY 2019 Wit ne: Cedar Av. nt: s/o Valley Bl.					Name: (lumber: 1		Avenue		
SITE	SPECIFIC INP	UT DATA			Ν	IOISE N	IODE	L INPUTS	5	
Highway Data				Site Con						
Average Daily	. ,	9,232 vehicles					Autos:	15		
	Percentage:	10%				ucks (2 A				
		3,923 vehicles		He	avy Tru	cks (3+ A	xles):	15		
	hicle Speed:	40 mph	ŀ	Vehicle I	Mix					
Near/Far La	ne Distance:	48 feet	Ē	Veh	icleType		Day	Evening	Night	Daily
Site Data						Autos:	77.5%	12.9%	9.6%	95.88%
Ba	rrier Height:	0.0 feet		Me	edium Ti	rucks:	84.8%	4.9%	10.3%	1.70%
Barrier Type (0-W		0.0		F	leavy Ti	rucks:	86.5%	2.7%	10.8%	2.43%
Centerline Di	st. to Barrier:	59.0 feet	ŀ	Noise So	ource Fl	levation	: (in fe	pet)		
Centerline Dist.	to Observer:	59.0 feet	F		Auto		•			
Barrier Distance	to Observer:	0.0 feet		Modiuu	n Truck	0.0				
Observer Height	Above Pad):	5.0 feet			v Truck			Grade Adj	ustment	0.0
P	ad Elevation:	0.0 feet					· · ·			
Ro	ad Elevation:	0.0 feet	L	Lane Eq				feet)		
	Road Grade:	0.0%			Auto		29			
	Left View:	-90.0 degrees		Mediur	m Truck	s: 53.9	966			
	Right View:	90.0 degrees		Heav	y Truck	s: 53.9	82			
FHWA Noise Mod	el Calculations									
VehicleType	REMEL	Traffic Flow Di	istance	Finite	Road	Fresn	el	Barrier Atte	en Ber	m Atten
Autos:	66.51	4.43	-0.6		-1.20		4.69	0.0		0.000
Medium Trucks:	77.72	-13.09	-0.6	60	-1.20		4.88	0.0	00	0.000
Heavy Trucks:	82.99	-11.54	-0.6	60	-1.20		-5.35	0.0	00	0.000
Unmitigated Nois	e Levels (withou	ut Topo and barr	ier attei	nuation)						
VehicleType	Leq Peak Hour	Leq Day	Leq E	vening	Leq	Night		Ldn	CI	VEL
Autos:	69.1	67.2		65.5		59.4		68.0		68.6
Medium Trucks:	62.8			55.0		53.4		61.9		62.1
Heavy Trucks:	69.7	68.2		59.2		60.4		68.8		68.9
Vehicle Noise:	72.9	71.2		66.7		63.4		71.9		72.2
Centerline Distan	ce to Noise Con	ntour (in feet)								
				dBA		dBA	6	60 dBA		dBA
		Ldn:		79		70		366		89
		CNEL:	8	33	1	79		386	8	31

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	FH\	WA-RD-77-108	HIGH	NAY N	OISE PR	EDICTIC	ON MOE	DEL			
Scenari	io: OY 2019 W	/ith Project				Project N	lame: C	edar /	Avenue		
Road Nam	e: Cedar Av.					Job Nu	mber: 1	1139			
Road Segmer	nt: s/o I-10 Fw	у.									
	SPECIFIC IN	IPUT DATA							INPUTS	S	
Highway Data				S	ite Con	ditions (I	lard = 1	10, So	ft = 15)		
Average Daily	Traffic (Adt):	32,563 vehicl	es				A	utos:	15		
Peak Hour	Percentage:	10%			Med	dium Truc	ks (2 A	xles):	15		
Peak H	lour Volume:	3,256 vehicle	s		Hea	avy Truck	's (3+ A	xles):	15		
	hicle Speed:	40 mph		v	ehicle N	lix					
Near/Far La	ne Distance:	48 feet				cleType	[Dav	Evening	Night	Daily
Site Data							itos: 7	7.5%	12.9%	9.6%	
Rai	rier Height:	0.0 feet			Me	dium Tru	cks: 8	34.8%	4.9%	10.3%	1.72%
Barrier Type (0-W	•	0.0			н	leavy Tru	cks: 8	36.5%	2.7%	10.8%	2.60%
Centerline Dis	st. to Barrier:	59.0 feet		٨	loise So	urce Ele	vations	(in fe	et)		
Centerline Dist.	to Observer:	59.0 feet				Autos:					
Barrier Distance		0.0 feet			Mediun	n Trucks:	2.2	97			
Observer Height (,	5.0 feet			Heav	v Trucks:	8.0	04	Grade Adj	ustment	: 0.0
	ad Elevation:	0.0 feet						- -			
	ad Elevation:	0.0 feet		L	ane Equ	ivalent l			eet)		
1	Road Grade:	0.0%				Autos:					
	Left View:	-90.0 degre				n Trucks:					
	Right View:	90.0 degre	es		Heav	y Trucks:	53.9	82			
FHWA Noise Mode											
VehicleType	REMEL	Traffic Flow	Dist	ance	Finite		Fresne		Barrier Atte		m Atten
Autos:	66.51	3.61		-0.62		-1.20		4.69	0.0		0.000
Medium Trucks:	77.72	-13.85		-0.60		-1.20		4.88	0.0		0.000
Heavy Trucks:	82.99	-12.05		-0.60		-1.20	-	5.35	0.0	00	0.000
Unmitigated Noise					<u> </u>						
VehicleType Autos:	Leq Peak Hou 68		/ 66.4	Leq Ev	ening 64.6	Leq N	ignt 58.6		Ldn 67.2		NEL 67.8
Autos: Medium Trucks:	68		60.6		64.6 54.2		58.6 52.6		67.2		67.8
Heavy Trucks:	69		67.7		54.2 58.7		52.6		68.3		68.4
Vehicle Noise:	72		70.6		58.7		59.9 62.8		71.2		71.6
Centerline Distand					00.0		52.0		71.2		71.0
Centennie Distant	Le lo MOISE CI	unoui (ill leel	,	70 d	BA	65 dl	BA	6	0 dBA	55	dBA
			Ldn:	71		154	Ļ		331	7	'13
		C	NEL:	75	5	162	2		348	7	'51

	FHWA-	RD-77-108 HIG	GHWAY	NOISE PR	REDICT		DEL			
Scenario: O	Y 2019 With	Project			Projec	t Name:	Cedar	Avenue		
Road Name: C	edar Av.				Job I	Vumber:	11139			
Road Segment: s/	o Orange St.									
	CIFIC INPL	IT DATA						L INPUT	S	
Highway Data				Site Con	ditions	s (Hard =	10, So	oft = 15)		
Average Daily Traffi	c (Adt): 25,	462 vehicles					Autos:			
Peak Hour Perc	entage:	10%		Me	dium Ti	rucks (2 A	(xles)	15		
Peak Hour \	olume: 2,5	546 vehicles		He	avy Tru	icks (3+ A	(xles)	15		
Vehicle	Speed:	40 mph		Vehicle I	Mix					
Near/Far Lane Di	stance:	48 feet			icleTyp	е	Day	Evening	Night	Daily
Site Data							77.5%	•	9.6%	
Barrier	Hoight:	0.0 feet		Me			84.8%		10.3%	1.709
Barrier Type (0-Wall, 1		0.0 feet					86.5%		10.8%	
Centerline Dist. to	,	0.0 59.0 feet								
Centerline Dist. to Ot		59.0 feet		Noise Sc				eet)		
Barrier Distance to Ot		0.0 feet			Auto		000			
Observer Height (Abov		5.0 feet		Mediur			297			
	e rau). evation:	0.0 feet		Heav	y Trucl	ks: 8.0	004	Grade Ad	iustment.	0.0
Road El		0.0 feet		Lane Eq	uivaler	nt Distan	ce (in	feet)		
	Grade:	0.0%			Auto		<u> </u>			
		90.0 degrees		Mediur						
		0.0 degrees			y Truck					
Ŷ		50.0 9			,					
FHWA Noise Model Ca										
			Distance		Road	Fresh		Barrier Att		m Atter
Autos:	66.51	2.55	-0.0		-1.20		-4.69		000	0.00
Medium Trucks:	77.72	-14.96	-0.0		-1.20		-4.88		000	0.00
Heavy Trucks:	82.99	-13.37	-0.	60	-1.20		-5.35	0.0	000	0.00
Unmitigated Noise Lev									1	
, , ,	Peak Hour	Leq Day		Evening	Leq	Night		Ldn		VEL
Autos:	67.2	65.3		63.6		57.5		66.1		66
Medium Trucks:	61.0	59.4		53.1		51.5		60.0		60
Heavy Trucks:	67.8	66.4		57.4		58.6		67.0		67
Vehicle Noise:	71.0	69.4	4	64.8		61.6	6	70.0)	70
Centerline Distance to	Noise Conte	our (in feet)								
				dBA		dBA	6	60 dBA		dBA
		Ldn		59		128		275		94
		CNFL		63		135		290	6	25

Scenari	p: OY 2019 V	WA-RD-77-10				Project			Avenue		
	e: Cedar Av.						umber:				
Road Segmer	t: s/o Slover	Av.									
SITE	SPECIFIC IN	NPUT DATA				N	OISE	NODE	L INPUT	s	
Highway Data				S	ite Con	ditions ((Hard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	23,928 vehic	les					Autos:	15		
Peak Hour	Percentage:	10%			Med	ium Tru	icks (2 /	Axles):	15		
Peak H	our Volume:	2,393 vehicle	es		Hea	avy Truc	ks (3+ /	Axles):	15		
Vel	nicle Speed:	40 mph			ehicle N	Al.					
Near/Far Lar	ne Distance:	48 feet		V		cleType	1	Dav	Evening	Night	Daily
Site Data					1011		utos:	77.5%	•	9.6%	
	ula u Haladati	0.0 feet			Me	dium Tr		84.8%		10.3%	1.70%
Barrier Type (0-Wa	rier Height:	0.0 feet				leavv Tr		86.5%		10.8%	2.449
Centerline Dis	. ,	59.0 feet									
Centerline Dist.		59.0 feet		N	loise So			s (in fe	eet)		
Barrier Distance t		0.0 feet				Autos	. 0.	000			
Observer Height (5.0 feet				n Trucks		297			
0 1	d Flevation:	0.0 feet			Heav	y Trucks	: 8.	004	Grade Ad	ustment.	0.0
Roa	d Elevation:	0.0 feet		L	ane Equ	iivalent	Distan	ce (in i	feet)		
F	Road Grade:	0.0%				Autos	: 54.	129	,		
	Left View:	-90.0 degre	es		Mediun	n Trucks	53.	966			
	Right View:	90.0 degre			Heav	y Trucks	53.	982			
FHWA Noise Mode	l Calculation	15									
VehicleType	REMEL	Traffic Flow	Dist	ance	Finite	Road	Fresr	nel	Barrier Att	en Ber	m Atten
Autos:	66.51	2.28	;	-0.62		-1.20		-4.69	0.0	000	0.00
Medium Trucks:	77.72			-0.60		-1.20		-4.88		000	0.00
Heavy Trucks:	82.99	-13.66	5	-0.60		-1.20		-5.35	0.0	000	0.00
Unmitigated Noise	Levels (with	nout Topo and	l barrie	r attenu	uation)						
21	Leq Peak Ho			Leq Ev	•	Leq I			Ldn		NEL
Autos:	•••	7.0	65.1		63.3		57.3	-	65.9		66.
Medium Trucks:).7	59.2		52.8		51.3	-	59.7		59.
Heavy Trucks:	67	7.5	66.1		57.1		58.3	3	66.7	,	66.
Vehicle Noise:	70).7	69.1		64.5		61.3	3	69.8	3	70.
Oranteellas Distance	e to Noise C	ontour (in fee	t)								
Centerline Distanc				70 d	ва Т	65 (1BA	6	60 dBA	55	dBA
Centerline Distanc				70 0		001					
Centeriine Distanc			Ldn:	57		12	2		264	5	68

	FH	WA-RD-77-108	HIGHW	VAY NO	DISE P	REDICT	ION MO	DEL			
Road Nam	io: OY 2019 V ne: Valley Bl. nt: w/o Cedar						t Name: lumber:		Avenue		
SITE	SPECIFIC II	NPUT DATA								s	
Highway Data				Si	ite Cor	nditions	(Hard =	10, So	oft = 15)		
Average Daily	Traffic (Adt):	20,403 vehicl	es					Autos:	15		
Peak Hour	Percentage:	10%			Me	dium Tr	ucks (2 A	(xles)	15		
Peak H	lour Volume:	2,040 vehicle	s		He	avy Tru	cks (3+ A	(xles)	15		
Ve	hicle Speed:	40 mph		V	ehicle	Mix					
Near/Far La	ne Distance:	48 feet				icleType	9	Day	Evening	Night	Daily
Site Data							Autos:	77.5%	12.9%	9.6%	95.90%
Ba	rrier Height:	0.0 feet			М	edium T	rucks:	84.8%	4.9%	10.3%	1.69%
Barrier Type (0-W	•	0.0			1	Heavy T	rucks:	86.5%	2.7%	10.8%	2.40%
Centerline Di	st. to Barrier:	59.0 feet		N	oise S	ource E	levation	s (in fe	et)		
Centerline Dist.		59.0 feet				Auto	s: 0.0	000	,		
Barrier Distance		0.0 feet			Mediu	m Truck		297			
Observer Height (,	5.0 feet				/y Truck		004	Grade Ad	justment	: 0.0
	ad Elevation:	0.0 feet									
	ad Elevation:	0.0 feet		La	ane Eq		t Distan	<u> </u>	feet)		
	Road Grade:	0.0%				Auto		129			
	Left View:	-90.0 degre				m Truck		966			
	Right View:	90.0 degre	es		Heav	/y Truck	s: 53.	982			
FHWA Noise Mod	el Calculation	ıs									
VehicleType	REMEL	Traffic Flow	Dista		Finite	Road	Fresr		Barrier Att		rm Atten
Autos:	66.51			-0.62		-1.20		-4.69		000	0.000
Medium Trucks:	77.72			-0.60		-1.20		-4.88		000	0.000
Heavy Trucks:	82.99	-14.42		-0.60		-1.20		-5.35	0.0	000	0.000
Unmitigated Noise											
VehicleType	Leq Peak Ho			Leq Eve		Leq	Night		Ldn		NEL
Autos:		5.3	64.4		62.6		56.6		65.2		65.8
Medium Trucks:		0.0	58.5		52.1		50.6		59.0		59.2
Heavy Trucks:		5.8	65.4		56.3		57.6		65.9		66.0
Vehicle Noise:		0.0	68.4		63.8		60.6	6	69.0)	69.4
Centerline Distant	ce to Noise C	ontour (in fee)	70.0		05	10.4				
			1	70 dE	3A		dBA	6	0 dBA		dBA
		~	Ldn:	51			10		236		509
		C	NEL:	54		1	15		249	ţ	536

Tuesday, July 18, 2017

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	FH	WA-RD-77-108	B HIGH	IWAY N	DISE PF	REDICTIO	N MOI	DEL			
Scenari	o: OY 2019 V	Vith Project				Project Na	ame: C	Cedar	Avenue		
	e: Valley Bl.					Job Nur	nber: 1	1139			
Road Segmer	t: e/o Cedar	Av.									
SITE	SPECIFIC IN	NPUT DATA							L INPUT	s	
Highway Data				S	ite Con	ditions (H	ard =	10, So	oft = 15)		
Average Daily	Traffic (Adt):	13,723 vehic	es				A	Autos:	15		
Peak Hour	Percentage:	10%			Me	dium Truck	is (2 A	xles):	15		
Peak H	our Volume:	1,372 vehicle	s		He	avy Trucks	(3+ A	xles):	15		
	nicle Speed:	40 mph		v	ehicle I	Nix					
Near/Far Lar	ne Distance:	48 feet		F		cleType		Dav	Evening	Night	Daily
Site Data						Aut	os: 1	77.5%	•	9.6%	
Bar	rier Height:	0.0 feet			Me	edium Truc	ks: t	34.8%	4.9%	10.3%	1.69%
Barrier Type (0-W	•	0.0			ŀ	łeavy Truc	ks: t	36.5%	2.7%	10.8%	2.429
Centerline Dis		59.0 feet		Λ	oise Sc	urce Elev	ations	; (in fe	et)		
Centerline Dist. I		59.0 feet				Autos:	0.0	00	,		
Barrier Distance t		0.0 feet			Mediur	n Trucks:	2.2	97			
Observer Height (,	5.0 feet			Heav	y Trucks:	8.0	04	Grade Ad	justment	: 0.0
	d Elevation:	0.0 feet				-		- () ((
	d Elevation:	0.0 feet		1	ane Equ	Autos:	54.1		eet)		
F	Road Grade: Left View:	0.0%			Madiu	n Trucks:	54.1 53.9				
	Right View:	-90.0 degre 90.0 degre				y Trucks:	53.9				
FHWA Noise Mode	- Calculation	-									
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite	Road	Fresn	e/	Barrier Att	en Bei	rm Atten
Autos:	66.51	-0.13		-0.62		-1.20		4.69	0.0	000	0.00
Medium Trucks:	77.72	-17.67		-0.60		-1.20	-	4.88	0.0	000	0.00
Heavy Trucks:	82.99	-16.12		-0.60		-1.20		-5.35	0.0	000	0.00
Unmitigated Noise			barrie	er attenu	ation)						
	Leq Peak Ho			Leq Ev	~	Leq Nig			Ldn		NEL
Autos:	-	1.6	62.7		60.9		54.8		63.5	-	64.
Medium Trucks:		3.2	56.7		50.4		48.8		57.3	-	57.
Heavy Trucks:		5.1	63.7		54.6		55.9		64.2	-	64.
Vehicle Noise:		3.3	66.7		62.1		58.8		67.3	3	67.
Centerline Distanc	e to Noise C	ontour (in fee	t)	70 d	RA	65 dB	Δ	6	0 dBA	55	dBA
			I dn:	39		84	••	0	182		391
		C	NFL:	41		89			191		112
		C C		41		09					

	FHW	A-RD-77-108	HIGH	WAY N	IOISE PF	REDICT		DEL			
Scenario: OY 2	019 Wi	th Project				Projec	t Name:	Cedar	Avenue		
Road Name: Oran	ge St.					Job I	lumber:	11139			
Road Segment: e/o C	edar A	v.									
SITE SPECIF	IC IN	PUT DATA							L INPUT	S	
Highway Data					Site Con	ditions	; (Hard =	10, So	oft = 15)		
Average Daily Traffic (A	dt):	2,905 vehicle	es					Autos:	15		
Peak Hour Percenta	ige:	10%			Me	dium T	ucks (2)	Axles):	15		
Peak Hour Volu	me:	290 vehicle	s		He	avy Tru	icks (3+ /	Axles):	15		
Vehicle Spe	ed:	25 mph			Vehicle I	<i>li</i> v					
Near/Far Lane Distar	nce:	12 feet		-		cleTyp	9	Day	Evening	Night	Daily
Site Data							Autos:	77.5%	•	9.6%	
Barrier Hei	aht.	0.0 feet			Me		rucks:	84.8%		10.3%	2.089
Barrier Type (0-Wall, 1-Be		0.0			F	leavy T	rucks:	86.5%		10.8%	5.529
Centerline Dist. to Bar		30.0 feet		L							
Centerline Dist. to Obser		30.0 feet		1	Noise Sc				eet)		
Barrier Distance to Obser		0.0 feet				Auto		000			
Observer Height (Above P		5.0 feet			Mediur			297			
Pad Eleva		0.0 feet			Heav	y Trucl	(s: 8.	004	Grade Ad	justment	0.0
Road Eleva		0.0 feet		7	Lane Eq	uivaler	t Distan	ce (in :	feet)		
Road Gra	ade:	0.0%			·	Auto	os: 29.	816	í		
Left V	iew:	-90.0 degre	es		Mediur	n Truci	(s: 29.	518			
Right V	iew:	90.0 degre	es		Heav	y Trucl	ks: 29.	547			
FHWA Noise Model Calcu	ations										
VehicleType REM	L	Traffic Flow	Dist	tance	Finite	Road	Fresi	nel	Barrier Att	en Ber	m Atter
Autos:	58.73	-5.00		3.2	6	-1.20		-4.49	0.0	000	0.00
Medium Trucks:	70.80	-21.47		3.3	3	-1.20		-4.86	0.0	000	0.00
Heavy Trucks:	77.97	-17.24		3.3	2	-1.20		-5.77	0.0	000	0.00
Unmitigated Noise Levels										1	
VehicleType Leq Pea		, ,		Leq E	vening	Leq	Night		Ldn		VEL
Autos:	55.8		53.9		52.1		46.1		54.7		55.
Medium Trucks:	51.	-	50.0		43.6		42.0	-	50.5		50.
Heavy Trucks:	62.9		61.4		52.4		53.7		62.0		62
Vehicle Noise:	63.9		62.4		55.6		54.6	6	63.0)	63
Centerline Distance to No.	ise Co	ntour (in feet)	70	10.4	05	104		0.104		-10.4
			I day		dBA		dBA 22	6	60 dBA 48		dBA
			Ldn: NFL:	1					48 49		02 06
				1			23				

FHWA-RD-77-108 F	IIGHWA	Y NOISE F	REDICTIO	NMODEL			
Scenario: OY 2019 With Project				ame: Ceda			
Road Name: Orange St.			Job Nun	nber: 1113	9		
Road Segment: w/o Vine St.							
SITE SPECIFIC INPUT DATA					EL INPUT	S	
Highway Data		Site Co	nditions (H	ard = 10, 3	Soft = 15)		
Average Daily Traffic (Adt): 2,004 vehicles				Auto			
Peak Hour Percentage: 10%			edium Truck				
Peak Hour Volume: 200 vehicles		н	eavy Trucks	(3+ Axles): 15		
Vehicle Speed: 25 mph		Vehicle	Mix				
Near/Far Lane Distance: 12 feet		Ve	hicleType	Day	Evening	Night	Daily
Site Data			Aut	os: 77.5	% 12.9%	9.6%	89.86
Barrier Height: 0.0 feet		٨	ledium Truc	ks: 84.8	% 4.9%	10.3%	2.66
Barrier Type (0-Wall, 1-Berm): 0.0			Heavy Truc	ks: 86.5	% 2.7%	10.8%	7.49
Centerline Dist. to Barrier: 30.0 feet		Noise S	ource Elev	ations (in	feet)		
Centerline Dist. to Observer: 30.0 feet			Autos:	0.000			
Barrier Distance to Observer: 0.0 feet		Medii	im Trucks:	2.297			
Observer Height (Above Pad): 5.0 feet			vy Trucks:	8.004	Grade Ac	liustment	: 0.0
Pad Elevation: 0.0 feet			,			,	
Road Elevation: 0.0 feet		Lane E	quivalent D		1 feet)		
Road Grade: 0.0%			Autos:	29.816			
Left View: -90.0 degrees			ım Trucks:	29.518			
Right View: 90.0 degrees		Hea	vy Trucks:	29.547			
FHWA Noise Model Calculations		1					
VehicleType REMEL Traffic Flow	Distant			Fresnel	Barrier At		rm Attei
Autos: 58.73 -6.73		3.26	-1.20	-4.49		000	0.0
Medium Trucks: 70.80 -22.02		3.33	-1.20	-4.80		000	0.0
Heavy Trucks: 77.97 -17.52		3.32	-1.20	-5.7	· 0.	000	0.0
Unmitigated Noise Levels (without Topo and b VehicleType Leg Peak Hour Leg Day		tenuation) g Evening	Leg Nie	aht	l dn	0	NFI
	2.2	4 Evening 50.4	, ,	44.3	53.	-	53
	z 9.4	43.0		44.5	50.	-	50
	1.2	43.0 52.1		53.4	61.	-	61
	1.9	54.1		54.1	62.		62
Centerline Distance to Noise Contour (in feet)							
		70 dBA	65 dB	A	60 dBA	55	dBA
L	dn:	10	20		44		95

	FHV	/A-RD-77-108	HIGHWA	AY NC	DISE PF	REDICT	ION MO	DEL			
Scenario: Road Name: Road Segment:		ith Project					Name: lumber:		Avenue		
	PECIFIC IN	PUT DATA								s	
Highway Data				Si	ite Con	ditions	(Hard =	10, Se	oft = 15)		
Average Daily Tr	affic (Adt):	1,863 vehicle	s					Autos:	15		
Peak Hour Pe	ercentage:	10%			Me	dium Tr	ucks (2 /	Axles):	15		
Peak Hou	ır Volume:	186 vehicles	5		He	avy Tru	cks (3+ /	Axles):	15		
Vehi	cle Speed:	25 mph		Ve	ehicle I	Mix					
Near/Far Lane	Distance:	12 feet				icleType	,	Day	Evening	Night	Daily
Site Data					-		Autos:	77.5%	•	9.6%	
Barri	er Heiaht:	0.0 feet			Me	edium T	rucks:	84.8%	4.9%	10.3%	1.71%
Barrier Type (0-Wal		0.0			ŀ	leavy T	rucks:	86.5%	2.7%	10.8%	2.66%
Centerline Dist.	to Barrier:	30.0 feet		N	nisa Sr	urce F	levation	s (in fi	oof)		
Centerline Dist. to	Observer:	30.0 feet			0.00 00	Auto		000			
Barrier Distance to	Observer:	0.0 feet			Modiu	n Truck		297			
Observer Height (Al	bove Pad):	5.0 feet				v Truck	0	004	Grade Ad	iustment	0.0
Pad	Elevation:	0.0 feet									
	Elevation:	0.0 feet		Lé	ane Eq		t Distan		feet)		
Ro	ad Grade:	0.0%				Auto		816			
	Left View:	-90.0 degree				m Truck		518			
F	Right View:	90.0 degree	es		Heav	ry Truck	s: 29.	547			
FHWA Noise Model	Calculations	5									
VehicleType	REMEL	Traffic Flow	Distan	се	Finite		Fresr		Barrier Att	en Ber	m Atten
Autos:	58.73	-6.78		3.26		-1.20		-4.49	0.0		0.000
Medium Trucks:	70.80	-24.24		3.33		-1.20		-4.86		000	0.000
Heavy Trucks:	77.97	-22.34		3.32		-1.20		-5.77	0.0	000	0.000
Unmitigated Noise			barrier a	ttenu	ation)						
	eq Peak Hou			q Eve	•	Leq	Night		Ldn	-	NEL
Autos:	54.	-	52.1		50.4		44.3		52.9		53.5
Medium Trucks:	48.	-	47.2		40.8		39.3		47.7		48.0
Heavy Trucks:	57.		56.3		47.3		48.6		56.9		57.0
Vehicle Noise:	59.	7	58.1		52.4		50.3	3	58.7	7	59.0
Centerline Distance	to Noise Co	ntour (in feet)								
				70 dE	BA		dBA	6	60 dBA		dBA
			Ldn:	5		1	1		25	:	53
			IFL:	6			2		26		55

Tuesday, July 18, 2017

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	FHV	VA-RD-77-108	HIGH	NAY N	IOISE PRE	DICTIO	N MODEL			
Scenario	p: HY 2035 W	ithout Project			F	Project Na	ame: Ceda	Avenue		
	e: Cedar Av.					Job Nun	ber: 1113)		
Road Segmen	t: n/o Valley E	BI.								
	SPECIFIC IN	PUT DATA						EL INPUT	S	
Highway Data				5	Site Cond	itions (H	ard = 10, S	oft = 15)		
Average Daily	raffic (Adt):	31,810 vehicle	s				Autos	: 15		
Peak Hour I	Percentage:	10%			Medi	um Truck	s (2 Axles)	: 15		
Peak Ho	our Volume:	3,181 vehicles	6		Heav	y Trucks	(3+ Axles)	: 15		
Vet	nicle Speed:	40 mph			Vehicle Mi	v				
Near/Far Lar	e Distance:	48 feet		H		eType	Dav	Evening	Night	Daily
Site Data						Aut		0	9.6%	
Bar	rier Height:	0.0 feet			Mea	lium Truc	ks: 84.8%	6 4.9%	10.3%	1.69%
Barrier Type (0-Wa	•	0.0			He	avy Truc	ks: 86.5%	6 2.7%	10.8%	2.38%
Centerline Dis	t. to Barrier:	59.0 feet		,	Voise Sou	rce Elev	ations (in	feet)		
Centerline Dist. t	o Observer:	59.0 feet		F		Autos:	0.000			
Barrier Distance t	o Observer:	0.0 feet			Medium		2.297			
Observer Height (/	Above Pad):	5.0 feet				Trucks:	8.004	Grade Ad	ustment	0.0
Pa	d Elevation:	0.0 feet								
	d Elevation:	0.0 feet		1	ane Equi		istance (in	feet)		
F	Road Grade:	0.0%				Autos:	54.129			
	Left View:	-90.0 degree			Medium		53.966			
	Right View:	90.0 degree	s		Heavy	Trucks:	53.982			
FHWA Noise Mode	l Calculation	s								
VehicleType	REMEL	Traffic Flow	Dist	ance	Finite R		Fresnel	Barrier Atte		m Atten
Autos:	66.51	3.52		-0.62	-	-1.20	-4.69	0.0		0.000
Medium Trucks:	77.72	-14.02		-0.60		-1.20	-4.88			0.000
Heavy Trucks:	82.99	-12.54		-0.60) .	-1.20	-5.35	0.0	00	0.00
Unmitigated Noise					<u> </u>					
	Leq Peak Hou	. 1 . 7		Leq Ev	v	Leq Ni		Ldn		NEL
Autos:	68		6.3		64.5		58.5	67.1		67.
Medium Trucks:	61		50.4		54.0		52.5	60.9		61.2
Heavy Trucks:	68		37.2		58.2		59.4	67.8		67.9
Vehicle Noise:	71		70.3		65.8		62.5	70.9		71.3
Centerline Distanc	e to Noise Co	ontour (in feet))	70	(D.4	05.10		00 -10 4		-10.4
				70 c		65 dB	А	60 dBA		dBA
			Ldn:	68	-	147		316	6	82
			IFI :	72		155		333		18

Fi	HWA-RD-77	7-108 HIGI	HWAY N	NOISE PR	EDICTI		DEL			
Scenario: HY 2035 Road Name: Cedar Av Road Segment: s/o Valle		oject			Project I Job Ni	Vame: (Imber: '		Avenue		
SITE SPECIFIC	INPUT DA	ТА			N	OISE N	IODE		S	
Highway Data				Site Cond	ditions ('Hard =	10, So	oft = 15)		
Average Daily Traffic (Adt):	44,660 v	ehicles					Autos:	15		
Peak Hour Percentage:	10%			Med	lium Tru	cks (2 A	xles):	15		
Peak Hour Volume:	4,466 ve	hicles		Hea	avy Truc	ks (3+ A	xles):	15		
Vehicle Speed:	40 m	ph	-	Vehicle N	liv					
Near/Far Lane Distance:	48 fe	et	-		leTvpe		Dav	Evening	Night	Dailv
Site Data				10/110			77.5%		9.6%	
Barrier Height:	0.0 f			Me	dium Tr		84.8%		10.3%	1.69%
Barrier Type (0-Wall, 1-Berm).		eel		н	leavy Tr		86.5%		10.8%	
Centerline Dist, to Barrier.		oot	_							
Centerline Dist. to Observer.			_	Noise So				et)		
Barrier Distance to Observer.					Autos		000			
Observer Height (Above Pad)		eet			n Trucks		297	~		
Pad Elevation:				Heavy	/ Trucks	: 8.0	004	Grade Adj	ustment.	0.0
Road Elevation	0.0 fe	eet		Lane Equ	iivalent	Distand	e (in t	eet)		
Road Grade:	0.0%		Γ		Autos	: 54.	129			
Left View:	-90.0 d	legrees		Medium	n Trucks	: 53.9	966			
Right View:	90.0 d	legrees		Heavy	/ Trucks	: 53.9	982			
FHWA Noise Model Calculation										
VehicleType REMEL	Traffic F		stance	Finite I		Fresn		Barrier Atte		m Atten
Autos: 66.5		4.99	-0.6	=	-1.20		-4.69	0.0		0.00
Medium Trucks: 77.7		2.55	-0.6		-1.20		-4.88	0.0		0.00
Heavy Trucks: 82.9	9 -1	1.06	-0.6	0	-1.20		-5.35	0.0	000	0.00
Unmitigated Noise Levels (wi	thout Topo	and barri	ier atter	nuation)						
VehicleType Leq Peak H		q Day	Leq E	vening	Leq I	<u> </u>		Ldn		VEL
	69.7	67.8		66.0		60.0		68.6		69.
	63.4	61.9		55.5		54.0		62.4		62.
	70.1	68.7		59.7		60.9		69.3		69.
Vehicle Noise:	73.4	71.8		67.2		63.9		72.4		72.
Centerline Distance to Noise	Contour (in	n feet)								
				dBA	65 0		6	0 dBA		dBA
		Ldn: CNFL:		5 0	18 19			397		55
								418		01

Average Daily Traffic (Adt): 33,010 vehicles Autos: 15 Peak Hour Volume: 3,301 vehicles Medium Trucks (2 Axles): 15 Peak Hour Volume: 3,301 vehicles Heavy Trucks (3+ Axles): 15 Vehicle Speed: 40 mph Heavy Trucks (3+ Axles): 15 Vehicle Speed: 40 mph Vehicle Type Day Evening Night Daily Site Data Autos: 7.5% 12.9% 9.6% 95.93 Medium Trucks: 48% 4.9% 10.3% 1.6% Barrier Height: 0.0 feet Medium Trucks: 4.8% 4.9% 10.3% 1.6% Barrier Distance to Observer: 0.0 feet Molise Source Elevations (in feet) Autos: 0.00 Centerline Dist. to Observer: 0.0 feet Autos: 0.00 Medium Trucks: 8.04 Grade Adjustment: 0.0 Road Elevation: 0.0 feet Autos: 6.51 3.68 -0.62 -1.20 -4.69 0.000 0.00 Medium Trucks: 7.72 -13.86 -0.60		FHV	VA-RD-77-108	HIGH	IWAY I	NOISE P	REDICTIC	ON MC	DDEL			
Road Segment: s/o 1-10 Fwy. Site SPECIFIC INPUT DATA NOISE MODEL INPUTS Average Daily Traffic (Adt): 33,010 vehicles Peak Hour Percentage: 10% Autos: 15 Medium Trucks (2 Axles): 15 Vehicle Speed: 40 mph Near/Far Lane Distance: 48 feet Vehicle Speed: 40 mph Near/Far Lane Distance: 48 feet Vehicle Type Day Lenning Night Barrier Height: 0.0 feet Centerline Dist. to Diserver: 59.0 feet Autos: 65.5% 2.7% 10.8% 95.39 Barrier Type (OWall, 1-Berm): 0.0 feet Add Grade: 0.0 feet Add Grade: 0.0 feet Reget Five Prove Reget Add mathemation Pad Elevation: 0.0 feet Reget Clavation: 0.0 feet Reget Clavation: 0.0 feet Reget Clavation: 0.0 feet Reget Clavation: 0.0 feet <t< th=""><th></th><th></th><th>ithout Project</th><th></th><th></th><th></th><th></th><th></th><th></th><th>Avenue</th><th></th><th></th></t<>			ithout Project							Avenue		
SITE SPECIFIC INPUT DATA NOISE MODEL INPUTS Highway Data Site Conditions (Hard = 10, Soft = 15) Avrage Daily Traffic (Adl): 33,010 vehicles Autos: 15 Peak Hour Percentage: 10% Medium Trucks (24 Akles): 15 Heavy Trucks (3+ Akles): 15 Peak Hour Volume: 3,301 vehicles Wehicle Speed: 40 mph Near/Far Lane Distance: 48 feet Vehicle Mix Site Data Vehicle Type Day Evening Night Daily Site Data Site Conditions (Hard = 10, Soft = 15) Medium Trucks: (3+ Akles): 15 Heavy Trucks (3+ Akles): 15 Heavy Trucks: 84.8% 4.9% 0.3% 16.9 Barrier Height: 0.0 feet Medium Trucks: 2.297 Notes Conce Elevations (in feet) Autos: (1 feet) Auto							Job Nu	mber:	11139			
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Scenario: HY 2035 Without Project Road Name: Cedar Av. Project Name: Cedar Avenue Job Number: 11139 Road Segment: si0 Orange St. Site Segment: si0 Orange St. Site Specific INPUT DATA NOISE MODEL INPUTS Highway Data Site Conditions (Hard = 10, Soft = 15) Average Daily Traffic (Adt): 25,910 vehicles Peak Hour Percentage: 10% Autos: 15 Vehicle Speed: 40 mph Near/Far Lane Distance: 48 feet Medium Trucks (2 Akles): 15 Vehicle Fype Day Evening Night Dail Barrier Type (O-Wall, 1-Berm): 0.0 Medium Trucks: 84.5% 2.7% 10.3% 1.6 Barrier Type (O-Wall, 1-Berm): 0.0 Centerline Dist. to Diserver: 59.0 feet Molse Source Elevations (in feet) Nolse Source Elevations (in feet) Observer Height (Above Pad): 5.0 feet 5.0 feet Heavy Trucks: 8.04 Grade Adjustment: 0.0
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Near/Far Lane Distance: 48 feet Venicle Mix Levening Night Dail Site Data Autos: 77.5% 12.9% 9.6% 95.9 Barrier Height: 0.0 feet Medium Trucks: 84.5% 2.7% 10.3% 1.6 Barrier Type (0-Wall, 1-Berm): 0.0 Heavy Trucks: 86.5% 2.7% 10.8% 2.8 Centerline Dist. to Darrier: 59.0 feet Noise Source Elevations (in feet) Autos: 0.000 Barrier Height (Above Pad): 5.0 feet Medium Trucks: 2.97 Heavy Trucks: 2.90 Observer Height (Above Pad): 5.0 feet Heavy Trucks: 2.00 Medium Trucks: 2.00
Near/Far Lane Distance: 48 feet VehicleType Day Evening Night Dai Site Data Autos: 77.5% 12.9% 9.6% </td
Site Data Autos: 77.5% 12.9% 9.6% 95.9 Barrier Height: 0.0 feet Medium Trucks: 84.8% 4.9% 10.3% 1.6 Barrier Type (0-Wall, 1-Berm): 0.0 6 Heavy Trucks: 86.5% 2.7% 10.8% 2.7% 10.8% 2.7% 10.8% 2.7% 10.8% 2.3% Centerline Dist to Barrier: 59.0 feet Noise Source Elevations (in feet) 4.utos: 0.000 4.utos: 2.000 Medium Trucks: 2.000 Medium Trucks: 2.000 10.8% 2.3%
Barrier Type (O-Wall, 1-Berm): 0.0 Heavy Trucks: 86.5% 2.7% 10.8% 2.3 Centerline Dist. to Barrier: 59.0 feet Noise Source Elevations (in feet) Noise Source Elevations (in feet) Image: Source Elevations (in
Barrier Type (0-Wall, 1-Berm): 0.0 Heavy Trucks: 86.5% 2.7% 10.8% 2.3 Centerline Dist. to Darrier: 59.0 feet Noise Source Elevations (in feet) Centerline Dist. to Observer: 0.0 feet Autos: 0.000 Barrier Distance to Observer: 0.0 feet Meilum Trucks: 2.37 Observer Height (Above Pad): 5.0 feet Heavy Trucks: 8.004
Centerline Dist. to Barrier: 59.0 feet Noise Source Elevations (in feet) Centerline Dist. to Observer: 59.0 feet Autos: 0.000 Barrier: Distance to Observer: 0.0 feet Medium Trucks: 2.297 Observer Height (Above Pad): 5.0 feet Heaver Trucks: 8.004 Grade Adjustment: 0.0
Centerline Dist. to Observer: 59.0 feet Autos: 0.000 Barrier Distance to Observer: 0.0 feet Medium Trucks: 2.297 Observer Height (Above Pad): 5.0 feet Heavy Trucks: 8.004 Grade Adjustment: 0.0
Barrier Distance to Observer: 0.0 feet Medium Trucks: 2.297 Observer Height (Above Pad): 5.0 feet Heavy Trucks: 8.004 Grade Adjustment: 0.0
Observer Height (Above Pad): 5.0 feet Heavy Trucks: 8.004 Grade Adjustment: 0.0
Pad Elevation: 0.0 feet
Road Elevation: 0.0 feet Lane Equivalent Distance (in feet)
Road Grade: 0.0% Autos: 54.129
Left View: -90.0 degrees Medium Trucks: 53.966
Right View: 90.0 degrees Heavy Trucks: 53.982
FHWA Noise Model Calculations
VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berm Atte
Autos: 66.51 2.63 -0.62 -1.20 -4.69 0.000 0.
Medium Trucks: 77.72 -14.91 -0.60 -1.20 -4.88 0.000 0.
Heavy Trucks: 82.99 -13.43 -0.60 -1.20 -5.35 0.000 0.
Unmitigated Noise Levels (without Topo and barrier attenuation)
VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL
Autos: 67.3 65.4 63.7 57.6 66.2 6
Medium Trucks: 61.0 59.5 53.1 51.6 60.0 6
Heavy Trucks: 67.8 66.3 57.3 58.6 66.9 6
Vehicle Noise: 71.0 69.4 64.9 61.6 70.0 7
Centerline Distance to Noise Contour (in feet)
70 dBA 65 dBA 60 dBA 55 dBA
Ldn: 59 128 276 594
CNEL: 63 135 291 626

Tuesday, July 18, 2017

Tuesday, July 18, 2017

	FH\	WA-RD-77-108	HIGHW	AY NC	ISE PR	EDICTIO	MOD	EL			
Scenario	: HY 2035 W	/ithout Project			ļ	Project Na	me: C	edar /	Avenue		
Road Name	e: Cedar Av.					Job Nur	ber: 11	139			
Road Segmen	t: s/o Slover	Av.									
	PECIFIC IN	NPUT DATA							INPUT:	5	
Highway Data				Si	te Cond	litions (H	ard = 1	0, So	ft = 15)		
Average Daily 1	raffic (Adt):	26,580 vehicl	es				A	utos:	15		
Peak Hour F	Percentage:	10%			Med	ium Truck	's (2 Ax	les):	15		
Peak Ho	our Volume:	2,658 vehicle	s		Hea	vy Trucks	(3+ Ax	les):	15		
Veh	icle Speed:	40 mph		V	ehicle M	lix					
Near/Far Lan	e Distance:	48 feet		-		leType	D	av	Evening	Night	Daily
Site Data						Aut	os: 7	7.5%	12.9%	9.6%	
Bari	rier Height:	0.0 feet			Me	dium Truc	ks: 8	4.8%	4.9%	10.3%	1.69%
Barrier Type (0-Wa	•	0.0			Н	eavy Truc	ks: 8	6.5%	2.7%	10.8%	2.38%
Centerline Dis		59.0 feet		N	oise Sol	urce Elev	ations	(in fe	et)		
Centerline Dist. t		59.0 feet				Autos:	0.00	0			
Barrier Distance t		0.0 feet			Medium	Trucks:	2.29	7			
Observer Height (A	,	5.0 feet			Heavy	Trucks:	8.00	14	Grade Adj	ustment	: 0.0
	d Elevation:	0.0 feet									
	d Elevation:	0.0 feet		Lä	ine Equ	ivalent D			eet)		
H	oad Grade:	0.0%				Autos:	54.12				
	Left View:	-90.0 degre				Trucks:	53.96				
	Right View:	90.0 degre	es		Heavy	Trucks:	53.98	32			
FHWA Noise Mode		-								-	
VehicleType	REMEL	Traffic Flow	Distar		Finite F		Fresne		Barrier Atte		rm Atten
Autos:	66.51	2.74		-0.62		-1.20		1.69	0.0		0.00
Medium Trucks:	77.72			-0.60		-1.20 -1.20		1.88	0.0		0.00
Heavy Trucks:	82.99			-0.60		-1.20	~	5.35	0.0	00	0.00
Unmitigated Noise VehicleType	Levels (with Leg Peak Hol			attenu eq Eve	<u> </u>	Leg Nig	tht		Ldn	0	NEL
Autos			65.5	SY LVC	63.8	Ley M	57.7		66.3		66.
Medium Trucks:	61		59.6		53.2		51.7		60.2		60.4
Heavy Trucks:	67		66.5		57.4		58.7		67.0		67.
Vehicle Noise:	71		69.5		65.0		61.7		70.2		70.
Centerline Distanc	e to Noise C	ontour (in feet)								
				70 dE	BA	65 dB	4	6	0 dBA	55	dBA
			Ldn:	60		130			281	6	605

Road Name: Road Segment: SITE Segment: Highway Data Average Daily Tra Peak Hour Pe Peak Hour Pe Peak Hour Vehici Near/Far Lane I Site Data	w/o Čedar A/ ECIFIC INP ffic (Adt): 2 roentage: r Volume: 2 le Speed: Distance: r Height: 1-Berm): to Barrier:	, /.			Je Conditi Mediur Heavy hicle Mix Vehicle	NOIS NOIS NOIS NOIS (Hai Trucks Trucks (rd = 10, S Autos. (2 Axles): (3+ Axles). Day	EL INPUT oft = 15) : 15 : 15	S Night	Daily
Highway Data Average Daily Tra Peak Hour Pel Peak Hour Velic Near/Far Lane I Site Data Barrier Type (0-Wall, Centerline Dist. to (iffic (Adt): 2 rcentage: r Volume: 2 le Speed: Distance: r Height: 1-Berm): to Barrier:	5,210 vehicles 10% 2,521 vehicles 40 mph 48 feet 0.0 feet 0.0			Mediur Heavy hicle Mix Vehicle	ons (Hai n Trucks Trucks (Type	rd = 10, S Autos. (2 Axles): (3+ Axles). Day	oft = 15) 15 15 15 15		Daily
Highway Data Average Daily Tra Peak Hour Pei Peak Hour Vehici Near/Far Lane ti Site Data Barrier Type (0-Wail, Centerline Dist. to (Centerline Dist. to (iffic (Adt): 2 rcentage: r Volume: 2 le Speed: Distance: r Height: 1-Berm): to Barrier:	5,210 vehicles 10% 2,521 vehicles 40 mph 48 feet 0.0 feet 0.0			Mediur Heavy hicle Mix Vehicle	n Trucks Trucks (Type	Autos (2 Axles) (3+ Axles) Day	15 15 15	Night	Daily
Peak Hour Pei Peak Hour Vehici Near/Far Lane I Site Data Barrier Type (0-Wall, Centerline Dist. to (Centerline Dist. to (rcentage: r Volume: 2 le Speed: Distance: r Height: 1-Berm): to Barrier:	10% 2,521 vehicles 40 mph 48 feet 0.0 feet 0.0		Veh	Heavy hicle Mix Vehicle	Trucks (Type	(2 Axles). (3+ Axles). Day	15 15	Night	Daily
Peak Hour Vehicl Near/Far Lane I Site Data Barrier Type (0-Walt, Centerline Dist. to (Centerline Dist. to (r Volume: 2 le Speed: Distance: r Height: 1-Berm): to Barrier:	2,521 vehicles 40 mph 48 feet 0.0 feet 0.0		Veh	Heavy hicle Mix Vehicle	Trucks (Type	(3+ Axles). Day	15	Night	Daily
Vehici Near/Far Lane I Site Data Barrier Type (0-Wall, Centerline Dist. to C	le Speed: Distance: r Height: 1-Berm): to Barrier:	40 mph 48 feet 0.0 feet 0.0		Veh	hicle Mix Vehicle	Гуре	Day		Night	Daily
Near/Far Lane I Site Data Barrie Barrier Type (0-Wall, Centerline Dist. to 0 Centerline Dist. to 0	Distance: r Height: 1-Berm): to Barrier:	48 feet 0.0 feet 0.0		Veh	Vehicle	<i>71</i> · ·		Evening	Night	Daily
Site Data Barrie Barrier Type (0-Wall, Centerline Dist. to (Centerline Dist. to (r Height: 1-Berm): to Barrier:	0.0 feet 0.0			Vehicle	<i>71</i> · ·		Evening	Night	Daily
Barrier Type (0-Wall, Centerline Dist. t Centerline Dist. to (1-Berm): to Barrier:	0.0		_		<i>71</i> · ·				
Barrie Barrier Type (0-Wall, Centerline Dist. to Centerline Dist. to (1-Berm): to Barrier:	0.0					s: 77.5%	6 12.9%	9.6%	95.93%
Barrier Type (0-Wall, Centerline Dist. t Centerline Dist. to (1-Berm): to Barrier:	0.0			Meaiu	m Truck	s: 84.8%	4.9%	10.3%	1.69%
Centerline Dist. to Centerline Dist. to 0	to Barrier:				Hear	y Truck			10.8%	
Centerline Dist. to 0										
	0.000/10/.	59.0 feet		Noi			tions (in f	eet)		
	Observer:	0.0 feet				Autos:	0.000			
Observer Height (Abo		5.0 feet			Aedium Ti		2.297			
	Elevation:	0.0 feet			Heavy Ti	UCKS:	8.004	Grade Ad	justment.	0.0
Road E	Elevation:	0.0 feet		Lan	ne Equiva	lent Dis	tance (in	feet)		
Roa	ad Grade:	0.0%			/	Autos:	54.129			
L	Left View:	-90.0 degrees		N	Aedium Ti	ucks:	53.966			
Ri	ight View:	90.0 degrees			Heavy Ti	ucks:	53.982			
FHWA Noise Model C	Calculations									
VehicleType	REMEL	Traffic Flow	Distan	ce I	Finite Roa	nd F	resnel	Barrier Att	en Ber	m Atten
Autos:	66.51	2.51		-0.62		.20	-4.69		000	0.00
Medium Trucks:	77.72	-15.03		-0.60		.20	-4.88		000	0.00
Heavy Trucks:	82.99	-13.55		-0.60	-1	.20	-5.35	0.0	000	0.00
Unmitigated Noise Le										
	q Peak Hour			q Even	· ·	Leq Nigh		Ldn		VEL
Autos:	67.2		5.3		63.5		57.5	66.1		66.
Medium Trucks:	60.9).4 5.2		53.0 57.2		51.5 58.4	59.9 66.8		60.
Heavy Trucks:	67.6				÷=					66.
Vehicle Noise:	70.9		9.3		64.7		61.5	69.9	9	70.
Centerline Distance t	to Noise Con	ntour (in feet)		70 dBA		CE JDA		60 dBA	57	dD A
			dn:	70 dBA 58	1	65 dBA 126		60 dBA 271		dBA 84
		CNE		58 62		126		271 285		84 15

FHWA-RD-77-108 H	GHWAT	NOISE PI	REDICTIO	N WC	DEL			
Scenario: HY 2035 Without Project			Project N			Avenue		
Road Name: Valley BI. Road Segment: e/o Cedar Av.			Job Nur	nber:	11139			
		1						
SITE SPECIFIC INPUT DATA		0/4- 0					S	
Highway Data		Site Con	ditions (H					
Average Daily Traffic (Adt): 16,880 vehicles					Autos:	15		
Peak Hour Percentage: 10%			dium Truc avy Truck			15 15		
Peak Hour Volume: 1,688 vehicles Vehicle Speed: 40 mph		пе	avy muck	\$ (3+.	Axies).	15		
Near/Far Lane Distance: 48 feet		Vehicle						
		Veh	icleType		Day	Evening	Night	Daily
Site Data		1		tos:	77.5%		9.6%	
Barrier Height: 0.0 feet			edium Tru		84.8%		10.3%	
Barrier Type (0-Wall, 1-Berm): 0.0		,	Heavy Tru	cks:	86.5%	2.7%	10.8%	2.38
Centerline Dist. to Barrier: 59.0 feet		Noise Se	ource Elev	vation	ns (in fe	et)		
Centerline Dist. to Observer: 59.0 feet			Autos:		000	,		
Barrier Distance to Observer: 0.0 feet		Mediu	m Trucks:	2.	297			
Observer Height (Above Pad): 5.0 feet		Heav	y Trucks:	8.	004	Grade Ad	justment	: 0.0
Pad Elevation: 0.0 feet Road Elevation: 0.0 feet		Lano Eg	uivalent D	Victor	co (in i	foot)		
Road Elevation: 0.0 feet Road Grade: 0.0%		LaneLy	Autos:		129	eei)		
Left View: -90.0 degrees		Modiu	m Trucks:		. 12.9			
Right View: 90.0 degrees			y Trucks:		.982			
FHWA Noise Model Calculations								
VehicleType REMEL Traffic Flow	Distance	Finite	Road	Fres	nel	Barrier Att	en Ber	m Atter
Autos: 66.51 0.77	-0.		-1.20		-4.69		000	0.00
Medium Trucks: 77.72 -16.77	-0.		-1.20		-4.88		000	0.00
Heavy Trucks: 82.99 -15.29	-0.		-1.20		-5.35	0.0	000	0.00
Unmitigated Noise Levels (without Topo and ba VehicleType Leg Peak Hour Leg Day		,	Log M	iaht	1	Ldn		NEL
VehicleType Leq Peak Hour Leq Day Autos: 65.5 63		Evening 61.8	Leq Ni	55.	7	64.4		65
Medium Trucks: 59.1 57		51.3		49.	-	58.3		58
Heavy Trucks: 65.9 64		55.4		56	-	65.1	-	65
Vehicle Noise: 69.2 67		63.0		59.	-	68.		68
Centerline Distance to Noise Contour (in feet)								
· · · · ·	70) dBA	65 dE	BA	6	0 dBA	55	dBA
Lo	In:	45	96			207	4	47

FH	IWA-RD-77-108 HIG	HWAY N	OISE PREDICT		DEL		
Scenario: HY 2035 \ Road Name: Orange Si Road Segment: e/o Cedar	L			Name: C lumber: 1	Cedar Aveni 1139	ue	
SITE SPECIFIC I	NPUT DATA				ODEL IN		
Highway Data		5	Site Conditions	(Hard =	10, Soft = 1	5)	
Average Daily Traffic (Adt):	2,740 vehicles			A	Autos: 15		
Peak Hour Percentage:	10%		Medium Tr	ucks (2 A	xles): 15		
Peak Hour Volume:	274 vehicles		Heavy Tru	cks (3+ A	xles): 15		
Vehicle Speed:	25 mph	1	/ehicle Mix				
Near/Far Lane Distance:	12 feet	H	VehicleType	. 1	Day Ever	ning Nie	aht Daily
Site Data						· ·	0.6% 95.93%
Barrier Height:	0.0 feet		Medium T	rucks: 8	84.8% 4	.9% 10	.3% 1.69%
Barrier Type (0-Wall, 1-Berm):	0.0		Heavy T	rucks: 8	86.5% 2	.7% 10	.8% 2.38%
Centerline Dist. to Barrier:	30.0 feet	-	Voise Source E	lovationa	(in fact)		
Centerline Dist. to Observer:	30.0 feet	ť	Auto		· · ·		
Barrier Distance to Observer:	0.0 feet		Medium Truck				
Observer Height (Above Pad):	5.0 feet		Heavy Truck			o Adiustr	nent: 0.0
Pad Elevation:	0.0 feet		neavy Truck	s. o.u	04 0/20	c Aujusu	nem. 0.0
Road Elevation:	0.0 feet	1	.ane Equivalen	t Distanc	e (in feet)		
Road Grade:	0.0%		Auto	s: 29.8	816		
Left View:	-90.0 degrees		Medium Truck		518		
Right View:	90.0 degrees		Heavy Truck	s: 29.5	547		
FHWA Noise Model Calculatio	ns	1					
VehicleType REMEL	Traffic Flow D	listance	Finite Road	Fresne	el Barrie	er Atten	Berm Atten
Autos: 58.73	3 -5.09	3.26	6 -1.20	-	4.49	0.000	0.000
Medium Trucks: 70.80		3.33			-4.86	0.000	0.000
Heavy Trucks: 77.9	7 -21.14	3.32	2 -1.20	-	-5.77	0.000	0.000
Unmitigated Noise Levels (wit		rier atten					
VehicleType Leq Peak Ho		Leg Ev	۰ ۱	Night	Ldn		CNEL
	5.7 53.8		52.0	46.0		54.6	55.2
	0.3 48.8		42.4	40.9		49.3	49.6
	9.0 57.5		48.5	49.7		58.1	58.2
	1.0 59.5	i	54.0	51.7		60.1	60.4
Centerline Distance to Noise C	Contour (in feet)						
		70 c		dBA	60 dB/	4	55 dBA
	Ldn.			14	30		66
	CNEL.	: 7		15	32		68

Tuesday, July 18, 2017

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	FH\	WA-RD-77-108	HIGH	IWAY N	OISE PI	REDICTIC	ON MO	DEL			
Scenari	o: HY 2035 W	/ithout Project				Project N	lame:	Cedar	Avenue		
	e: Orange St.					Job Nu	mber:	11139			
Road Segmer	it: w/o Vine S	t.									
	SPECIFIC IN	IPUT DATA							L INPUT	s	
Highway Data				5	Site Con	ditions (l	Hard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	2,270 vehicl	es					Autos:	15		
Peak Hour	Percentage:	10%			Me	dium Truc	cks (2 A	Axles):	15		
Peak H	our Volume:	227 vehicle	s		He	avy Truck	(3+ A	Axles):	15		
	nicle Speed:	25 mph		1	/ehicle	Mix					
Near/Far Lar	ne Distance:	12 feet				icleType		Day	Evening	Night	Daily
Site Data							utos:	77.5%	0	9.6%	,
Bar	rier Height:	0.0 feet			M	edium Tru	icks:	84.8%	4.9%	10.3%	1.69
Barrier Type (0-W	•	0.0			I	leavy Tru	icks:	86.5%	2.7%	10.8%	2.38
Centerline Dis		30.0 feet		1	loise So	ource Ele	vation	s (in fe	et)		
Centerline Dist. t		30.0 feet				Autos:		000	.,		
Barrier Distance t		0.0 feet			Mediu	n Trucks:	2.	297			
Observer Height (,	5.0 feet			Heav	v Trucks:	8.0	004	Grade Ad	iustmen	t: 0.0
	d Elevation:	0.0 feet		_							
	d Elevation:	0.0 feet		1	.ane Eq	uivalent l		_	feet)		
F	Road Grade:	0.0%				Autos:		816			
	Left View:	-90.0 degre				n Trucks:		518			
	Right View:	90.0 degre	es		Heav	y Trucks:	29.	547			
FHWA Noise Mode		-									
VehicleType	REMEL	Traffic Flow		stance		Road	Fresr		Barrier Att		rm Atter
Autos:	58.73			3.26		-1.20		-4.49		000	0.00
Medium Trucks:	70.80			3.33		-1.20		-4.86		000	0.00
Heavy Trucks:	77.97			3.32		-1.20		-5.77	0.0	000	0.00
Unmitigated Noise					<i></i>					-	
,	Leq Peak Ho			Leq Ev	~	Leq N	·		Ldn	-	NEL
Autos:	54		53.0		51.2		45.2	-	53.8	-	54
Medium Trucks:	49		48.0		41.6		40.1		48.5	-	48
Heavy Trucks:	58		56.7		47.7		48.9		57.3		57
Vehicle Noise:	60		58.6		53.1		50.8	5	59.3	5	59
Centerline Distanc	e to Noise C	ontour (in feel	<i>y</i>	70 0	IRA	65 d	RA	F	0 dBA	55	idBA
			I dn:	6		12		- ·	27		58
		C	NFI :	6		13			28		60
		0.		0		15					

Average Daily Traffic (Adt): 2,240 vehicles Autos: 15 Peak Hour Percentage: 10% Medium Trucks (2 Axles): 15 Peak Hour Volume: 224 vehicles Medium Trucks (2 Axles): 15 Vehicle Speed: 25 mph Heavy Trucks (3+ Axles): 15 Ste Data Autos: 77.5% 12.9% 9.6% 9.5% Barrier Height: 0.0 feet Medium Trucks: 84.8% 4.9% 10.3% 16 Barrier Type (0-Wall, 1-Berm): 0.0 0 feet Autos: 77.5% 12.9% 9.6% 9.3% 6.6% 9.3% 10.8% 2.3% Centerline Dist. to Observer: 30.0 feet Autos: 0.00 Medium Trucks: 8.65% 2.7% 10.8% 2.3% Canterline Dist. to Observer: 0.0 feet Autos: 0.00 Medium Trucks: 2.9.316 Road Elevation: 0.0 feet Autos: 2.9.518 Heavy Trucks: 2.9.518 Wehicle Type REMEL Traffic Flow Distance Finite Road		FHW	/A-RD-77-108	HIGH	WAY N	IOISE PF	REDICT	ION MO	DEL			
Road Segment: elo Vine St. SITE SPECIFIC INPUT DATA NOISE MODEL INPUTS Site Conditions (Hard = 10, Soft = 15) Average Daily Traffic (Adl): 2,40 vehicles Autos: 15 Peak Hour Volume: 2.40 vehicles Autos: 15 Peak Hour Volume: 2.40 vehicles Autos: 15 Peak Hour Volume: 2.40 vehicles Peak Hour Volume: 2.40 vehicles Autos: 15 Vehicle Specie Autos: 77.5% 12.9% 9.6% 95.3 Medium Trucks: 84.8% 4.8% 4.9% 10.3% 1.6% Barrier Height: 0.0 feet Medium Trucks: 86.5% 2.7% 10.8% 2.3 Centerline Dist. to Barrier: 3.0 feet Regin Vincks: 80.94 Grade Adjustment: 0.0 Autos: 5.0 feet Regin Vincks: 29.518 Heavy Trucks: 29.518 Heavy Trucks: 29.518	Scenario: HY	2035 Wi	thout Project				Projec	t Name:	Cedar	Avenue		
SITE SPECIFIC INPUT DATA NOISE MODEL INPUTS Highway Data Site Conditions (Hard = 10, Soft = 15) Autos:: 15 Average Daily Traffic (Adt): 2,240 vehicles Autos:: 15 Peak Hour Procentage: 10% Medium Trucks (2 Akes): 15 Peak Hour Volume: 224 vehicles Heavy Trucks (3+ Axles): 15 Vehicle Speed: 25 mph Near/Far Lane Distance: 12 feet Vehicle Type Day Evening Night Dail Site Data autos: 77.5% 12.9% 9.6% 95.9 Barrier Height: 0.0 feet Heavy Trucks: 86.5% 2.7% 10.8% 2.3 Centerline Dist. to Observer: 30.0 feet Autos: 2.30 Medium Trucks: 2.297 Barrier Distance to Observer: 0.0 feet Autos: 2.3816 Medium Trucks: 2.9518 Road Grade: 0.0% Late Equivalent Distance (in feet) Autos: 2.9.516 Road Grade: 0.0% Late Equivalent Distance Finite Road Fresnet Barrier Atten Berrier Atten	Road Name: Ora	ange St.					Job I	lumber:	11139			
Highway Data Site Conditions (Hard = 10, Soft = 15) Average Daily Traffic (Adt): 2,240 vehicles Autos: 15 Peak Hour Percentage: 10% Medium Trucks (2 Avles): 15 Peak Hour Volume: 224 vehicles Medium Trucks (2 Avles): 15 Vehicle Speed: 25 mph Near/Far Lane Distance: 12 feet Vehicle Mix Site Data Autos: 77.5% 12.9% 9.6% 95.9 Barrier Height: 0.0 feet Heavy Trucks: 88.6% 2.7% 10.3% 1.6 Barrier Dist. to Observer: 30.0 feet Medium Trucks: 2.237 10.3% 1.6 Barrier Dist. to Observer: 30.0 feet Autos: 2.297 10.3% 1.6 Barlei Dist. to Observer: 0.0 feet Autos: 2.3816 Autos: 2.3916 Road Grade: 0.0% Left View: -90.0 degrees Finite Road Fresnet Barrier Atten Berrier Atten VehicleType REMEL Traffic Flow Distance Finite Road Fresnet B	Road Segment: e/o	Vine St.										
Average Delity Traffic (Adt): 2,240 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 224 vehicles Vehicle Speed: 25 mph Near/Far Lane Distance: 12 feet Site Data Autos:: 77.5% Barrier Type (0-Wall, 1-Berm): 0.0 feet Centerline Dist. to Barrier: 30.0 feet Deserver Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Autos: 58.73 -5.96 3.26 -1.20 -4.49 </td <td></td> <td>IFIC IN</td> <td>PUT DATA</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>S</td> <td></td>		IFIC IN	PUT DATA								S	
Peak Hour Percentage: 10% Medium Trucks (2 Axles): 15 Peak Hour Volume: 224 vehicles Heavy Trucks (3 + Axles): 15 Vehicle Speed: 25 mph Vehicle Speed: 25 mph Site Data Autos: 77.5% 12.9% 9.6% 95.93 Barrier Height: 0.0 feet Medium Trucks: 84.8% 4.9% 0.3% 16 Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 30.0 feet Medium Trucks: 86.5% 2.7% 10.8% 2.3 Centerline Dist. to Dserver: 30.0 feet Moise Source Elevations (in feet) Medium Trucks: 2.297 Observer Height (Above Pad): 5.0 feet Heavy Trucks: 2.9.518 Heavy Trucks: 2.9.518 Road Grade: 0.0% Autos: 2.9.518 Heavy Trucks: 2.9.518 VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berrier Atten Autos: 58.73 -5.96 3.26 -1.20 -5.77 0.000 </td <td>Highway Data</td> <td></td> <td></td> <td></td> <td>4</td> <td>Site Con</td> <td>ditions</td> <td>(Hard =</td> <td>10, So</td> <td>oft = 15)</td> <td></td> <td></td>	Highway Data				4	Site Con	ditions	(Hard =	10, So	oft = 15)		
Peak Hour Volume: 224 vehicles Vehicle Speed: 25 mph Near/Far Lane Distance: 12 feet Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 feet Barrier Dist. to Observer: 30.0 feet Centerline Dist. to Observer: 30.0 feet Barrier Dist. to Observer: 30.0 feet Reavy Trucks: 8.8.5% 2.7% 10.8% 2.38 Observer Height (Abov Pad) 5.0 feet Medium Trucks: 8.004 Grade Adjustment: 0.0 Road Grade: 0.0% Autos: 2.3916 Medium Trucks: 2.9316 Wehicle Type Reguly Invise: 90.0 degrees Finite Road Fresnet Barrier Atten Berrier Atten Wohicle Type REMEL Traffic Flow Distance Finite Road Fresnet Barrier Atten Berrier Atten Wehicle Type REMEL Traffic Flow Distance Finite Road Fresnet Barrier Atten Berner Atten Wehicle Type Leq Peak Hour Leq Day Leq Evening	Average Daily Traffic	(Adt):	2,240 vehicle	es					Autos:	15		
Vehicle Speed: 25 mph Near/Far Lane Distance: 12 feet Site Data Autos:: Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Diserver: 30.0 feet Centerline Dist. to Diserver: 30.0 feet Darrier Height: 0.0 feet Centerline Dist. to Diserver: 30.0 feet Centerline Dist. to Diserver: 0.0 feet Deserver Height (Above Pad): 5.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: -90.0 degrees Wehicle Type REMEL Vehicle Type Remer Atten Autos: 58.73 F.96 3.26 -1.20 -4.49 Autos: 58.73 Finite Road Fresnet Barrier At	Peak Hour Percei	ntage:	10%			Me	dium Ti	ucks (2	Axles):	15		
Near/Far Lane Distance: 12 feet Venicle MIX Day Evening Night Dail Site Data Autos: 77.5% 12.9% 9.6% 95.9% Barrier Height: 0.0 feet Medium Trucks: 84.8% 4.9% 10.3% 16.8% Barrier Type (0-Wall, 1-Berrier: 30.0 feet Medium Trucks: 86.5% 2.7% 10.8% 2.3% Centerline Dist. to Barrier: 30.0 feet Moise Source Elevations (in feet) Noise Source Elevations (in feet) Medium Trucks: 8.04% Grade Adjustment: 0.0 Observer Height (Above Pad): 5.0 feet Heavy Trucks: 8.004 Grade Adjustment: 0.0 Pad Elevation: 0.0 feet Autos: 29.816 Medium Trucks: 29.518 Right View: 90.0 degrees Medium Trucks: 29.518 Heavy Trucks: 29.518 Heavy Trucks: 77.9 -22.02 3.32 -1.20 -4.49 0.000 0.0 Medium Trucks: 70.80 -23.50 3.33 -1.20 -5.77 0.000 </td <td>Peak Hour Vo</td> <td>olume:</td> <td>224 vehicle</td> <td>s</td> <td></td> <td>Hea</td> <td>avy Tru</td> <td>cks (3+)</td> <td>Axles):</td> <td>15</td> <td></td> <td></td>	Peak Hour Vo	olume:	224 vehicle	s		Hea	avy Tru	cks (3+)	Axles):	15		
Near/Far Lane Distance: 12 feet Site Data Autos: 77.5% 12.9% 9.6% 9.5% Site Data Autos: 77.5% 12.9% 9.6% 9.5% Barrier Type (0-Wall, 1-Berm): 0.0 Medium Trucks: 8.4% 4.9% 10.3% 1.6% Centerline Dist. to Dbserver: 30.0 feet Medium Trucks: 8.6.5% 2.7% 10.8% 2.3% Deserver Height (Above Pad): 5.0 feet Autos: 0.00 Medium Trucks: 8.004 Grade Adjustment: 0.0 Road Elevation: 0.0 feet Road Grade: 0.0% Left View: 90.0 degrees Medium Trucks: 2.9316 Medium Trucks: S.004 Grade Adjustment: 0.0 Context	Vehicle S	Speed:	25 mph			Vehicle I	Mix					
Site Data Autos: 77.5% 12.9% 9.6% 95.8% Barrier Height: 0.0 feet Medium Trucks: 84.8% 4.9% 10.3% 1.6% Barrier Type (0-Wall, 1-Berm): 0.0 feet Heavy Trucks: 86.5% 2.7% 10.8% 2.3% Centerline Dist. to Barrier: 30.0 feet Moise Source Elevations (in feet) Noise Moise Model Calculations Noise Model Calculations Noise Model Calculations Noise Source Elevations (in feet) Noise Model Calculations Noise Model Calculations Noise Source Elevations (in feet) Noise Model Calculations Noise Source Elevations (in feet) Noise Model Calculations Noise Source Elevations (in feet) Noise Source Elevations (in feet) Noise Source Elevations (in feet) Noise Model Calculations Noise Source Elevations (in feet)	Near/Far Lane Dis	tance:	12 feet		-			9	Dav	Evenina	Niaht	Daily
Barrier Type (W-Wall, 1-Berrin: 0.0 Heavy Trucks: 86.5% 2.7% 10.8% 2.30 Centerline Dist. to Diserver: 30.0 feet Moise Source Elevations (in feet) Autos: 0.000 Barrier Type (W-Wall, 1-Berrier): 5.0 feet Autos: 0.000 Meavy Trucks: 80.04 Grade Algustment: 0.0 Barrier Distance to Observer: 0.0 feet Autos: 0.000 Medium Trucks: 0.000 Pad Elevation: 0.0 feet Autos: 2.297 Heavy Trucks: 80.04 Grade Adjustment: 0.0 Road Elevation: 0.0 feet Autos: 29.518 Heavy Trucks: 29.518 VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berrier Atten Autos: 58.73 -5.96 3.26 -1.20 -4.49 0.000 0.0 Medium Trucks: 77.97 -22.02 3.32 -1.20 -5.77 0.000 0.0 Medium Trucks: 71.94 2.92 51.2 45.1 <td>Site Data</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>77.5%</td> <td>•</td> <td></td> <td></td>	Site Data								77.5%	•		
Barrier Type (0-Wall, 1-Berm): 0.0 Heavy Trucks: 86.5% 2.7% 10.8% 2.33 Centerline Dist. to Dserver: 30.0 feet Autos: 0.00 Moise Source Elevations (in feet) Autos: 0.00 Autos: 29.518 Heavy Trucks: 29.518 Heavy Trucks: 29.518 Heavy Trucks: 29.518 Heavy Trucks: 29.517 Noise Model Calculations Source Finite Road Fresnel Barrier Atten Bernier Atten MatterAutos: 58.73 -5.96 3.26 -1.20 -4.49 0.000 0.00 Medium Trucks: 77.97 -22.02 3.32 -1.20 -5.77 0.000 0.00 <td>Barrier H</td> <td>eiaht:</td> <td>0.0 feet</td> <td></td> <td></td> <td>Me</td> <td>edium 1</td> <td>rucks:</td> <td>84.8%</td> <td>4.9%</td> <td>10.3%</td> <td>1.699</td>	Barrier H	eiaht:	0.0 feet			Me	edium 1	rucks:	84.8%	4.9%	10.3%	1.699
Centerline Dist. to Barrier: 30.0 feet Centerline Dist. to Observer: 30.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Grade: 0.0% Left View: 90.0 degrees Right View: 90.0 degrees Right View: 90.0 degrees Heavy Trucks: 8.004 Generations: Traffic Flow VehicleType REMEL Traffic S2.0 3.3 -22.0 3.3 -1.20 -4.49 Autos: 58.73 -5.96 3.26 -1.20 -4.49 Autos: 57.77 0.00 0.0 Medium Trucks: 70.9 VehicleType Leg Peak Hour Leg Versite -4.49 Modum Trucks: 52.9 51.2 45.1 Medium Trucks: 52.9 51.2 51.2 Motos: 58.1						H	leavy 1	rucks:	86.5%	2.7%	10.8%	2.38
Centerline Dist. to Observer: 30.0 feet Autos: 0.000 Barrier Distance to Observer: 0.0 feet Autos: 0.000 Observer Height (Above Pad) 5.0 feet Heavy Trucks: 2.237 Pad Elevation: 0.0 feet Left View: 9.0.0 degrees Road Grade 0.0% Lane Equivalent Distance (in feet) Road Grade 0.0% Autos: 29.316 VehicleType REMEL Traffic Flow Distance Finite Road Fresnet Barrier Atten VehicleType REMEL Traffic Flow Distance Finite Road Fresnet Barrier Atten VehicleType REMEL Traffic Flow Distance Finite Road Fresnet Barrier Atten VehicleType REM Hour Leq Day 1.20 -4.49 0.000 0.0 Medium Trucks: 70.80 -23.50 3.33 -1.20 -4.46 0.000 0.0 Medium Trucks: 77.7 -2.02 3.32 -1.20 -5.7 0.000 0.0 <t< td=""><td></td><td></td><td>30.0 feet</td><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>			30.0 feet		-							
Barrier Distance to Observer: 0.0 feet Medium Trucks: 2.297 Observer Height (Abov Pad): 5.0 feet Heavy Trucks: 8.004 Grade Adjustment: 0.0 Pad Elevation: 0.0 feet Heavy Trucks: 8.004 Grade Adjustment: 0.0 Road Elevation: 0.0 feet Laft View: -90.0 degrees Autos: 29.816 Medium Trucks: 29.547 FHWA Noise Model Calculations Vehicle Type REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bern Atte Vehicle Type REMEL Traffic Flow Distance 11.20 -4.49 0.000 0.00 Medium Trucks: 70.80 -23.50 3.33 -1.20 -4.49 0.000 0.00 Medium Trucks: 77.97 -22.02 3.32 -1.20 -4.86 0.000 0.00 Muntity Trucks: 54.8 52.9 51.2 45.1 53.7 5 Medium Trucks: 58.1 56.7 47.6 48.9 57.2 <			30.0 feet		4	Noise So				eet)		
Observer Height (Above Pad): 5.0 feet Heavy Trucks: 8.004 Grade Adjustment: 0.0 Road Elevation: 0.0 feet Left View: 90.0 degrees Autos: 29.816 Autos: 29.816 Road Clavation: 0.0 feet Autos: 29.816 Medium Trucks: 29.518 Right View: 90.0 degrees Heavy Trucks: 29.518 Heavy Trucks: 29.547 FHWA Noise Model Calculations VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berner Atten Autos: 58.73 -5.96 3.26 -1.20 -4.49 0.000 0.0 Medium Trucks: 77.97 -22.02 3.32 -1.20 -5.77 0.000 0.0 Medium Trucks: 77.97 -22.02 3.32 -1.20 -5.77 0.000 0.0 Medium Trucks: 77.9 -22.02 3.32 -1.20 -5.77 0.000 0.0 VehicleType Leg Peak Hour Leg Day <td>Barrier Distance to Obs</td> <td>erver:</td> <td>0.0 feet</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Barrier Distance to Obs	erver:	0.0 feet									
Pad Elevation: 0.0 feet Preavy Trucks: 8.004 Grade Adjustment. 0.0 Road Elevation: 0.0 feet Left View: -90.0 degrees Autos: 29.816 Autos: 29.816 Keidel Calculations Vehicle Type REMEL Traffic Flow Distance Finite Road Fresnet Barrier Atten Berrier Atten Vehicle Type REMEL Traffic Flow Distance Finite Road Fresnet Barrier Atten Berrier Atten Vehicle Type REMEL Traffic Flow Distance Finite Road Fresnet Barrier Atten Berrier Atten Vehicle Type REMEL Traffic Flow Distance 1.20 -4.49 0.000 0.0 Medium Trucks: 70.80 -23.50 3.33 -1.20 -4.86 0.000 0.0 Medium Trucks: 77.97 -22.02 3.32 -1.20 -5.7 0.000 0.0 Vehicle Type Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL	Observer Height (Above	Pad);	5.0 feet							0		
Road Grade: 0.0% Autos: 29.816 Left View: -90.0 degrees Medium Trucks: 29.518 Heavy Trucks: 29.547 FHWA Noise Model Calculations VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berrier Atten Autos: 58.73 -5.96 3.26 -1.20 -4.49 0.000 0.0 Medium Trucks: 70.80 -23.50 3.33 -1.20 -4.49 0.000 0.0 Medium Trucks: 77.97 -22.02 3.32 -1.20 -5.77 0.000 0.0 VehicleType Leg Peak Hour Leg Pay Leg Evening Leg Night Ldn CNEL Medium Trucks: 54.8 52.9 51.2 45.1 53.7 5 Medium Trucks: 49.4 47.9 41.6 40.0 48.5 4 Heavy Trucks: 58.1 56.7 47.6 48.9 57.2 5 Vehicle Noise: 60.1	0 1		0.0 feet			Heav	y Truck	:s: 8.	004	Grade Ad	ustment	0.0
Left View: -90.0 degrees Medium Trucks: 29.518 Right View: 90.0 degrees Heavy Trucks: 29.547 FHWA Noise Model Calculations VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bermarkten Autos: 56.73 -5.96 3.26 -1.20 -4.49 0.000 0.00 Medium Trucks: 70.80 -23.50 3.33 -1.20 -4.49 0.000 0.00 Medium Trucks: 70.97 -22.02 3.32 -1.20 -4.49 0.000 0.00 Immitigated Noise Levels (without Topo and barrier attenuation) Unmitigated Noise -5.77 0.000 0.00 VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 54.8 52.9 51.2 45.1 53.7 5 Medium Trucks: 49.4 47.9 41.6 40.0 48.5 4 Heavy Trucks: 58.1 56.	Road Elev	vation:	0.0 feet		7	Lane Equ	uivalen	t Distan	ce (in i	feet)		
Right View: 90.0 degrees Heavy Trucks: 29.547 FHWA Noise Model Calculations VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bern Atten Autos: 58.73 -5.96 3.26 -1.20 -4.49 0.000 0.0 Medium Trucks: 70.0 -2.2.02 3.33 -1.20 -4.46 0.000 0.0 Heavy Trucks: 77.97 -22.02 3.32 -1.20 -5.77 0.000 0.0 Unnitigated Noise Levels (without Topo and barrier attenuation) VehicleType Leq Peak Hour Leq Qay Leq Evening Leq Night Ldn CNEL Autos: 54.8 52.9 51.2 45.1 53.7 5 Medium Trucks: 49.4 47.9 41.6 40.0 48.5 4 Heavy Trucks: 58.1 56.7 47.6 48.9 57.2 5 Vehicle Noise: 60.1 58.6 53.1 50.8 59.2 5	Road C	Grade:	0.0%				Auto	s: 29.	816			
FHWA Noise Model Calculations Distance Finite Road Fresnel Barrier Atten Bern Atten Autos: 58.73 -5.96 3.26 -1.20 -4.49 0.000 0.0 Medium Trucks: 70.80 -23.50 3.33 -1.20 -4.49 0.000 0.0 Heavy Trucks: 77.97 -22.02 3.32 -1.20 -5.77 0.000 0.0 Unnitigated Noise Levels (without Topo and barrier attenuation) VehicleType Leq Day Leq Evening Leq Night Ldn CNEL Medium Trucks: 49.4 47.9 41.6 40.0 48.5 4 Heavy Trucks: 58.1 56.7 47.6 48.9 57.2 5 Vehicle Noise: 60.1 58.6 53.1 50.8 59.2 5 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA	Left	View:	-90.0 degree	es		Mediur	n Truck	is: 29.	518			
VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bern Atte Autos: 58.73 -5.96 3.26 -1.20 -4.49 0.000 0.0 Medium Trucks: 70.80 -23.50 3.33 -1.20 -4.49 0.000 0.0 Heavy Trucks: 77.97 -22.02 3.32 -1.20 -5.77 0.000 0.0 Unnitigated Noise Levels (without Topo and barrier attenuation) VehicleType Leg Peak Hour Leg Day Leg Evening Leg Night Ldn CNEL Autos: 54.8 52.9 51.2 45.1 53.7 5 Medium Trucks: 49.4 47.9 41.6 40.0 48.5 4 Heavy Trucks: 58.1 56.7 47.6 48.9 57.2 5 Vehicle Noise: 60.1 58.6 53.31 50.8 59.2 5 Centerline Distance to Noise Contour (In feet) 70 dBA 65 dBA 60 dBA 55 dBA	Right	View:	90.0 degree	es		Heav	y Truck	:s: 29.	547			
Autos: 58.73 -5.96 3.26 -1.20 -4.49 0.000 0.0 Medium Trucks: 70.80 -23.50 3.33 -1.20 -4.49 0.000 0.0 Heavy Trucks: 77.97 -22.02 3.32 -1.20 -5.77 0.000 0.0 Untritigated Noise Levels (without Topo and barrier attenuation) Use Revening Leq Night Ldn CNEL Autos: 54.8 52.9 51.2 45.1 53.7 5 Medium Trucks: 49.4 47.9 41.6 40.0 48.5 4 Heavy Trucks: 58.1 56.7 47.6 48.9 57.2 5 Vehicle Noise: 60.1 58.6 53.1 50.8 59.2 5 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA	FHWA Noise Model Calo	culations	;									
Medium Trucks: 70.80 -23.50 3.33 -1.20 -4.86 0.000 0.00 Heavy Trucks: 77.97 -22.02 3.32 -1.20 -5.77 0.000 0.00 Umitigated Noise Levels (without Topo and barrier attenuation) VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 54.8 52.9 51.2 45.1 53.7 5 Medium Trucks: 49.4 47.9 41.6 40.0 48.5 4 Heavy Trucks: 58.1 56.7 47.6 48.9 57.2 5 Vehicle Noise: 60.1 58.6 53.1 50.8 59.2 5 Vehicle Noise: 60.4 58.6 50.4 60 dBA 55 dBA	VehicleType RE	MEL	Traffic Flow	Dis	stance	Finite	Road	Fresi	nel	Barrier Att	en Ber	m Atter
Heavy Trucks: 77.97 -22.02 3.32 -1.20 -5.77 0.000 0.0 Unmitigated Noise Levels (without Topo and barrier attenuation) Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 54.8 52.9 51.2 45.1 53.7 5 Medium Trucks: 49.4 47.9 41.6 40.0 48.5 4 Heavy Trucks: 58.1 56.7 47.6 48.9 57.2 5 Vehicle Noise: 60.1 58.6 53.3 50.8 59.2 5 Centerline Distance to Noise Contour (In feet) T 70 dBA 65 dBA 60 dBA 55 dBA	Autos:	58.73	-5.96		3.2	6	-1.20		-4.49	0.0	000	0.00
Unmitigated Noise Levels (without Topo and barrier attenuation) VehicleType Leq Peak How Leq Day Leq Evening Leq Night Ldn CNEL Autos: 54.8 52.9 51.2 45.1 53.7 55 Medium Trucks: 49.4 47.9 41.6 40.0 48.5 4 Heavy Trucks: 58.1 56.7 47.6 48.9 57.2 55 Vehicle Noise: 60.1 58.6 53.1 50.8 59.2 55 Centerline Distance to Noise Contour (In feet) 70 dBA 65 dBA 60 dBA 55 dBA	Medium Trucks:	70.80	-23.50		3.3	3	-1.20		-4.86	0.0	000	0.00
VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 54.8 52.9 51.2 45.1 53.7 5 Medium Trucks: 49.4 47.9 41.6 40.0 48.5 4 Heavy Trucks: 58.1 56.7 47.6 48.9 57.2 5 Vehicle Noise: 60.1 58.6 53.1 50.8 59.2 5 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA	Heavy Trucks:	77.97	-22.02		3.3	2	-1.20		-5.77	0.0	000	0.00
Autos: 54.8 52.9 51.2 45.1 53.7 5 Medium Trucks: 49.4 47.9 41.6 40.0 48.5 4 Heavy Trucks: 58.1 56.7 47.6 48.9 57.2 5 Vehicle Noise: 60.1 58.6 53.1 50.8 59.2 5 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA						/					1	
Medium Trucks: 49.4 47.9 41.6 40.0 48.5 4 Heavy Trucks: 58.1 56.7 47.6 48.9 57.2 55 Vehicle Noise: 60.1 58.6 53.1 50.8 59.2 5 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA	, , ,				Leq E	· ·	Leq	<u> </u>				
Heavy Trucks: 58.1 56.7 47.6 48.9 57.2 5 Vehicle Noise: 60.1 58.6 53.1 50.8 59.2 5 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA												54
Vehicle Noise: 60.1 58.6 53.1 50.8 59.2 5 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA			-						-			48
Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA												57
70 dBA 65 dBA 60 dBA 55 dBA	Vehicle Noise:	60.	1	58.6		53.1		50.8	3	59.2	2	59
	Centerline Distance to N	loise Co	ntour (in feet)					1			
Lan: 6 12 27 57				L					6			-
CNEL: 6 13 28 60												

	FHV	A-RD-77-108	HIGH	WAYN	IOISE PR	EDICTIC	л мо	DEL			
	o: HY 2035 W e: Cedar Av. ht: n/o Valley B					Project N Job Nu			Avenue		
SITE S	SPECIFIC IN	PUT DATA				NC	DISE	MODE	L INPUT	s	
Highway Data				:	Site Con	ditions (l	Hard =	: 10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	31,875 vehicl	es					Autos:	15		
Peak Hour I	Percentage:	10%			Med	dium Truc	cks (2)	Axles):	15		
Peak Ho	our Volume:	3,188 vehicle	s		Hea	avy Truck	is (3+)	Axles):	15		
Vel	nicle Speed:	40 mph		h	Vehicle I	Nix					
Near/Far Lar	ne Distance:	48 feet		-		cleType		Day	Evening	Night	Daily
Site Data				-		AL	itos:	77.5%	12.9%	9.6%	95.90
Bar	rier Heiaht:	0.0 feet			Me	edium Tru	cks:	84.8%	4.9%	10.3%	1.69
Barrier Type (0-Wa	all, 1-Berm):	0.0			H	łeavy Tru	cks:	86.5%	2.7%	10.8%	2.41
Centerline Dis		59.0 feet		1	Noise So	ource Ele	vation	s (in fe	et)		
Centerline Dist. t		59.0 feet				Autos:	0.	000	,		
Barrier Distance t		0.0 feet			Mediur	n Trucks:	2.	297			
Observer Height (/	,	5.0 feet			Heav	v Trucks:	8.	004	Grade Ad	justment	: 0.0
	d Elevation:	0.0 feet		E.							
	d Elevation:	0.0 feet		1	Lane Equ	uivalent			eet)		
F	Road Grade:	0.0%				Autos:		129			
	Left View:	-90.0 degre				n Trucks:	00.	966			
	Right View:	90.0 degre	es		Heav	y Trucks:	53.	982			
FHWA Noise Mode											
VehicleType	REMEL	Traffic Flow		ance	Finite		Fresi		Barrier Att		m Atter
Autos:	66.51	3.53		-0.62		-1.20		-4.69		000	0.00
Medium Trucks:	77.72 82.99	-14.01 -12.47		-0.60		-1.20 -1.20		-4.88 -5.35		000	0.00
Heavy Trucks:						-1.20		-5.35	0.0	000	0.00
Unmitigated Noise VehicleType	Levers (writing Leg Peak Hou			Leg Ev		Leq N	liaht		Ldn	0	NEL
Autos	68.	, ,	r 66.3	LUYLI	64.6	Logn	58.	5	67.1		67
Medium Trucks:	61	-	60.4		54.0		52.		61.0		61
Heavy Trucks:	68.	-	67.3		58.3		59.5	-	67.9	-	68
Vehicle Noise:	71.	9	70.3		65.8		62.	5	71.0)	71
Centerline Distanc	e to Noise Co	ntour (in fee	t)								
				70 c	/BA	65 d	BA	6	0 dBA	55	dBA
			Ldn:	6	9	148	3		318	e	685

	FHV	/A-RD-77-108 H	IGHWA	NOISE P	REDICTI	ON MOI	DEL			
Scenario: Road Name: Road Segment:		,				Name: (umber: 1		Avenue		
SITE SI	PECIFIC IN	PUT DATA			N	OISE N	IODEI		s	
Highway Data				Site Col	nditions	(Hard =	10, So	ft = 15)		
Average Daily Tr	affic (Adt):	44,792 vehicles	5			A	Autos:	15		
Peak Hour Pe	ercentage:	10%		Me	edium Tru	icks (2 A	xles):	15		
Peak Hou	ur Volume:	4,479 vehicles		He	avy Truc	:ks (3+ A	xles):	15		
Vehi	cle Speed:	40 mph		Vehicle	Mix					
Near/Far Lane	Distance:	48 feet			nicleType		Day	Evening	Night	Daily
Site Data				VC/			77.5%	12.9%	9.6%	
	an Haladat	0.0 feet		M	Iedium Tr		84.8%	4.9%	10.3%	
Barrier Type (0-Wal	er Height:	0.0			Heavy Tr	ucks:	36.5%	2.7%	10.8%	2.42%
Centerline Dist.	. ,	59.0 feet								
Centerline Dist. to		59.0 feet		Noise S	ource El		•	et)		
Barrier Distance to		0.0 feet			Autos					
Observer Height (Al	bove Pad):	5.0 feet			m Trucks			0		
Pad	Elevation:	0.0 feet		неа	vy Trucks	8: 8.0	104	Grade Ad	usunen.	0.0
Road	Elevation:	0.0 feet		Lane Eq	uivalent	Distanc	e (in f	eet)		
Ro	ad Grade:	0.0%			Autos	s: 54.1	29			
	Left View:	-90.0 degrees	5	Mediu	m Trucks	s: 53.9	966			
F	Right View:	90.0 degrees	6	Hea	vy Trucks	53.9	82			
FHWA Noise Model	Calculations	5		1						
VehicleType	REMEL	Traffic Flow	Distance	e Finite	Road	Fresn	el I	Barrier Att	en Ber	m Atten
Autos:	66.51	5.00	-0	.62	-1.20		4.69	0.0	000	0.000
Medium Trucks:	77.72	-12.52	-0	.60	-1.20		4.88	0.0	000	0.000
Heavy Trucks:	82.99	-10.97	-0	.60	-1.20		-5.35	0.0	000	0.000
Unmitigated Noise I				,						
	eq Peak Hou			Evening	,	Night		Ldn		NEL
Autos:	69.		7.8	66.0		60.0		68.6		69.2
Medium Trucks:	63.		1.9	55.5		54.0		62.4		62.7
Heavy Trucks:	70.	-	8.8	59.8		61.0		69.4		69.5
Vehicle Noise:	73.		1.8	67.3		64.0		72.5	5	72.8
Centerline Distance	to Noise Co	ntour (in feet)			r					
				0 dBA	65 0			0 dBA		dBA
			dn:	86	18			400		61
		CN	EL:	91	19	95		421	9	07

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	FH\	VA-RD-77-108	HIGHW	AY NO	DISE PR	EDICTIO	N MOE	DEL			
Scenario	: HY 2035 W	ith Project				Project Na	ame: C	edar	Avenue		
	e: Cedar Av.					Job Nur	nber: 1	1139			
Road Segmen	t: s/o I-10 Fw	у.									
	PECIFIC IN	IPUT DATA							L INPUT	5	
Highway Data				S	ite Con	ditions (H	ard = 1	10, So	ft = 15)		
Average Daily 1	raffic (Adt):	33,503 vehicle	es				A	utos:	15		
Peak Hour F	Percentage:	10%			Med	dium Truck	(2 A	xles):	15		
Peak Ho	our Volume:	3,350 vehicles	6		Hea	avy Trucks	; (3+ A	xles):	15		
	icle Speed:	40 mph		V	ehicle I	<i>lix</i>					
Near/Far Lan	e Distance:	48 feet		-		cleType	[Dav	Evening	Night	Dailv
Site Data						Aut	os: 7	7.5%	12.9%	9.6%	95.69%
Bari	rier Height:	0.0 feet			Ме	dium Truc	ks: e	84.8%	4.9%	10.3%	1.729
Barrier Type (0-Wa	•	0.0			H	leavy Truc	ks: E	86.5%	2.7%	10.8%	2.60%
Centerline Dis		59.0 feet		N	oise So	urce Elev	ations	(in fe	et)		
Centerline Dist. to		59.0 feet				Autos:	0.0	00			
Barrier Distance t		0.0 feet			Mediur	n Trucks:	2.2	97			
Observer Height (A	,	5.0 feet			Heav	y Trucks:	8.0	04	Grade Adj	ustment	: 0.0
	d Elevation:	0.0 feet									
	d Elevation:	0.0 feet		Li	ane Equ	ivalent D			eet)		
H	load Grade:	0.0%				Autos:	54.1				
	Left View:	-90.0 degree				n Trucks:	53.9 53.9				
	Right View:	90.0 degree	es		Heav	y Trucks:	53.9	82			
FHWA Noise Mode		-				1				-	
VehicleType	REMEL	Traffic Flow	Distar		Finite		Fresne		Barrier Atte		m Atten
Autos:	66.51	3.73		-0.62		-1.20		4.69	0.0		0.00
Medium Trucks:	77.72	-13.73		-0.60		-1.20 -1.20		4.88		00	0.00
Heavy Trucks:	82.99	-11.93		-0.60		-1.20		5.35	0.0	00	0.00
Unmitigated Noise VehicleType	Levels (with Leg Peak Hou			attenu eq Eve	<u> </u>	Leg Nig	wh4		Ldn	0	NEL
Autos	Ley Peak Hot 68		66.5	ey Eve	64.8	Leq Mg	58.7		67.3		67.
Medium Trucks:	62		60.7		54.3		52.8		61.2		61.
Heavy Trucks:	69		67.8		58.8		60.0		68.4		68.
Vehicle Noise:	72	-	70.7		66.0		62.9		71.4		71.
Centerline Distanc	e to Noise Co	ontour (in feet)								
				70 dE	BA	65 dB	A	6	0 dBA	55	dBA
			Ldn:	73		156			337	7	26
						100					

	FHW	/A-RD-77-108 H	IGHWA	Y NOISE P	REDICTIC	N MOI	DEL			
Scenar	io: HY 2035 Wi	th Project			Project N	lame: (Cedar	Avenue		
	e: Cedar Av.				Job Nur	mber: 1	11139			
Road Segme	nt: s/o Orange	St.								
	SPECIFIC IN	PUT DATA						L INPUT	s	
Highway Data				Site Cor	nditions (H	Hard =	10, Se	oft = 15)		
Average Daily	Traffic (Adt):	26,042 vehicles					Autos:	15		
Peak Hour	Percentage:	10%		Me	edium Truc	:ks (2 A	xles):	15		
Peak H	lour Volume:	2,604 vehicles		He	avy Truck	is (3+ A	xles):	15		
Ve	hicle Speed:	40 mph		Vehicle	Mix					
Near/Far La	ne Distance:	48 feet			nicleType	1	Dav	Evening	Night	Daily
Site Data		-		10.			77.5%	•	9.6%	
	rier Height:	0.0 feet		м	edium Tru		84.8%		10.3%	
ва Barrier Type (0-W	•	0.0 reet			Heavy Tru		86.5%		10.8%	
Centerline Di	. ,	0.0 59.0 feet								
Centerline Dist.		59.0 feet		Noise S	ource Ele			eet)		
Barrier Distance		0.0 feet			Autos:		000			
Observer Height (5.0 feet			m Trucks:		297			
	ad Elevation:	0.0 feet		Hea	vy Trucks:	8.0	004	Grade Ad	justment	: 0.0
	ad Elevation:	0.0 feet		Lane Eo	uivalent L	Distand	e (in	feet)		
	Road Grade:	0.0%			Autos:		<u> </u>			
	Left View:	-90.0 degrees		Mediu	m Trucks:					
	Right View:	90.0 degrees		Hea	vy Trucks:	53.9	982			
		-								
FHWA Noise Mod	el Calculations REMEL	Traffic Flow	Distanc	e Einite	Road	F	-1	Barrier Att		m Atter
VehicleType Autos:	REINEL 66.51	2.65		e Finite	-1.20	Fresn	ei -4.69		en Ber)00	m Atten 0.00
Medium Trucks:	77.72	-14.86		0.62 0.60	-1.20		-4.88		000	0.00
Heavy Trucks:	82.99	-14.00		0.60 0.60	-1.20		-4.00		000	0.00
					-1.20		-0.50	0.0	00	0.00
Unmitigated Nois					1	Carde d	1	Lata	0	
VehicleType Autos:	Leq Peak Hour 67.		5.4	Evening 63.7	Leq N	1gnt 57.6		Ldn 66.2		NEL 66
Autos: Medium Trucks:	67.		9.4 9.5	53.2		57.6		60.1		60
Heavy Trucks:	61.		9.5 6.5	53.2 57.5		51.6		60.1		67
Vehicle Noise:	71.		9.5 9.5	64.9		61.7		70.1		70
				04.5	-	51.7		70.		70
Centerline Distan	ce to Noise Co	ntour (in feet)		70 dBA	65 di	RA	,	60 dBA	55	dBA
		17	dn:	60 60	130			280		06A 102
								-00		

Scenario: HY 2035 With Project	~t			Project Na	me: Ced			
Road Name: Cedar Av.	JL				ber: 1113			
Road Segment: s/o Slover Av.				000 1441	001. 1110	5		
SITE SPECIFIC INPUT DA	174			NO		EL INPUT	c	
Highway Data	10		Site Con	ditions (H			5	
Average Daily Traffic (Adt): 26,678	/ehicles				Auto	s: 15		
Peak Hour Percentage: 10%			Me	dium Truck	s (2 Axles): 15		
Peak Hour Volume: 2,668 ve	ehicles		He	avy Trucks	(3+ Axles): 15		
Vehicle Speed: 40 m	ph	-	Vehicle I	Mix				
Near/Far Lane Distance: 48 fe	et	-		icleType	Day	Evening	Night	Daily
Site Data				Aut	os: 77.5	% 12.9%	9.6%	95.87
Barrier Height: 0.0 f	eet		Me	edium Truc	ks: 84.8	% 4.9%	10.3%	1.69
Barrier Type (0-Wall, 1-Berm): 0.0			ŀ	leavy Truc	ks: 86.5	% 2.7%	10.8%	2.43
Centerline Dist. to Barrier: 59.0 f	eet	-	Noise So	ource Elev	ations (in	feet)		
Centerline Dist. to Observer: 59.0 f	eet			Autos:	0.000	,		
Barrier Distance to Observer: 0.0 f	eet		Mediu	n Trucks:	2.297			
Observer Height (Above Pad): 5.0 f	eet			v Trucks:	8.004	Grade Ad	liustment	: 0.0
Pad Elevation: 0.0 f	eet	_						
Road Elevation: 0.0 f			Lane Eq	uivalent D		n feet)		
Road Grade: 0.0%				Autos:	54.129			
	degrees			n Trucks:	53.966			
Right View: 90.0 d	legrees		Heav	y Trucks:	53.982			
FHWA Noise Model Calculations		-						
VehicleType REMEL Traffic F	low Dis	stance	Finite	Road	Fresnel	Barrier Att	ten Ber	m Atter
Autos: 66.51	2.75	-0.6	-	-1.20	-4.6		000	0.00
	14.77	-0.6	-	-1.20	-4.8		000	0.00
Heavy Trucks: 82.99 -1	13.20	-0.6	0	-1.20	-5.3	5 0.0	000	0.00
Unmitigated Noise Levels (without Topo								
21	q Day	Leq E	•	Leq Nig		Ldn		NEL
Autos: 67.4	65.5		63.8		57.7	66.3		67
Medium Trucks: 61.1	59.6		53.3		51.7	60.2	-	60
Heavy Trucks: 68.0	66.6		57.5		58.8	67.1		67
Vehicle Noise: 71.2	69.6		65.0		61.8	70.2	2	70
Centerline Distance to Noise Contour (in	n feet)							
			dBA	65 dB	4	60 dBA		dBA
	Ldn:	6	1	132		283	6	511
	CNFL:	6		139		299		43

FI	HWA-RD-77-108 HIC	GHWAY	NOISE PRI	EDICTION	MODEL			
Scenario: HY 2035 Road Name: Valley Bl.			F		ne: Cedar ber: 11139			
Road Segment: w/o Ceda	ır Av.							
SITE SPECIFIC	INPUT DATA					L INPUT	s	
Highway Data			Site Cond	itions (Ha	rd = 10, S	oft = 15)		
Average Daily Traffic (Adt):	25,243 vehicles				Autos:	15		
Peak Hour Percentage:	10%		Medi	ium Trucks	(2 Axles):	15		
Peak Hour Volume:	2,524 vehicles		Hear	vy Trucks	(3+ Axles):	15		
Vehicle Speed:	40 mph		Vehicle M	ix				
Near/Far Lane Distance:	48 feet			leType	Day	Evening	Night	Daily
Site Data				Auto	s: 77.5%	5 12.9%	9.6%	95.91%
Barrier Height:	0.0 feet		Med	dium Truck	s: 84.8%	4.9%	10.3%	1.69%
Barrier Type (0-Wall, 1-Berm):			He	eavy Truck	s: 86.5%	5 2.7%	10.8%	2.40%
Centerline Dist. to Barrier:	59.0 feet		Noise Sou	ırce Eleva	tions (in f	eet)		
Centerline Dist. to Observer:	59.0 feet			Autos:	0.000	,		
Barrier Distance to Observer:			Medium		2.297			
Observer Height (Above Pad):				Trucks:	8.004	Grade Ad	justment.	0.0
Pad Elevation:	0.0 1001						·	
Road Elevation:	0.0 1001		Lane Equi			feet)		
Road Grade:	0.070			Autos:	54.129			
Left View:			Medium		53.966			
Right View:	90.0 degrees		Heavy	Trucks:	53.982			
FHWA Noise Model Calculation	ons							
VehicleType REMEL	Traffic Flow E	Distance	Finite R		resnel	Barrier Att	en Ber	m Atten
Autos: 66.5	1 2.51	-0.6	62	-1.20	-4.69	0.0	000	0.000
Medium Trucks: 77.7		-0.6		-1.20	-4.88		000	0.000
Heavy Trucks: 82.9	9 -13.50	-0.6	60	-1.20	-5.35	0.0	000	0.000
Unmitigated Noise Levels (wi	thout Topo and bar	rier atte	nuation)					
VehicleType Leq Peak H			vening	Leq Nigi		Ldn		VEL
	67.2 65.3		63.5		57.5	66.1		66.7
	50.9 59.4		53.0		51.5	59.9		60.2
	66.3		57.2		58.5	66.8		67.0
Vehicle Noise:	70.9 69.3	3	64.8		61.5	70.0	C	70.3
Centerline Distance to Noise	Contour (in feet)							
			dBA	65 dBA		60 dBA		dBA
	Ldn		59	126		272		86
	CNEL	.: (62	133		287	6	17

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	FH\	WA-RD-77-108	HIGHW	AY NO	DISE PR	REDICTIO	N MOD	EL			
Scenario	: HY 2035 W	/ith Project				Project Na	ame: C	edar .	Avenue		
Road Name					Job Number: 11139						
Road Segmen	t: e/o Cedar /	Av.									
	PECIFIC IN	IPUT DATA							L INPUT	S	
Highway Data				S	ite Con	ditions (H	ard = 1	0, So	ft = 15)		
Average Daily 1	raffic (Adt):	16,913 vehicl	es				Α	utos:	15		
Peak Hour F	Percentage:	10%			Med	dium Truck	(2 A)	des):	15		
Peak Ho	our Volume:	1,691 vehicle	s		Hea	avy Trucks	(3+ A)	des):	15		
Veh	icle Speed:	40 mph		V	ehicle I	Mix					
Near/Far Lan	e Distance:	48 feet				cleType	L)av	Evening	Night	Daily
Site Data						Aut		7.5%	12.9%	9.6%	,
Bar	ier Height:	0.0 feet			Me	edium Truc	ks: 8	4.8%	4.9%	10.3%	1.69%
Barrier Type (0-Wa	•	0.0			H	łeavy Truc	ks: 8	6.5%	2.7%	10.8%	2.419
Centerline Dis		59.0 feet		N	oise So	ource Elev	ations	(in fe	et)		
Centerline Dist. t		59.0 feet				Autos:	0.00				
Barrier Distance t		0.0 feet			Mediur	n Trucks:	2.29	97			
Observer Height (A	,	5.0 feet			Heav	v Trucks:	8.00)4	Grade Ad	ustment	: 0.0
	d Elevation:	0.0 feet									
	d Elevation:	0.0 feet		L	ane Equ	uivalent D			eet)		
F	oad Grade:	0.0%				Autos:	54.1				
	Left View:	-90.0 degre				n Trucks:	53.9				
	Right View:	90.0 degre	es		Heav	y Trucks:	53.9	32			
FHWA Noise Mode		-									
VehicleType	REMEL	Traffic Flow	Dista		Finite		Fresne		Barrier Att		m Atten
Autos:	66.51	0.77		-0.62		-1.20		4.69	0.0		0.00
Medium Trucks:	77.72	-16.76		-0.60		-1.20		4.88		00	0.00
Heavy Trucks:	82.99			-0.60		-1.20	~	5.35	0.0	00	0.00
Unmitigated Noise VehicleType					<u> </u>	1 10	- let		Ldn		NEL
Autos	Leq Peak Hou 65		63.6	eq Eve	61.8	Leq Nig	55.7		<u>Lun</u> 64.4		65
Medium Trucks:	59		57.6		51.3		49.7		58.2		58
Heavy Trucks:	59		57.0 64.5		55.5		49.7		65.1		50. 65.
Vehicle Noise:	69	-	67.6		63.0		59.7		68.2		68
Centerline Distanc	e to Noise Co	ontour (in feel)								
				70 dl	BA	65 dB	A	6	0 dBA	55	dBA
			Ldn:	45		97			208	. 4	49

	FHWA-	RD-77-108 HIG	HWAY	NOISE PF	REDICT	ION MO	DEL					
Scenario: H	IY 2035 With	Project		Project Name: Cedar Avenue								
Road Name: C	Drange St.			Job Number: 11139								
Road Segment: e	o Cedar Av.											
	CIFIC INPL	IT DATA						L INPUT	s			
Highway Data				Site Con	ditions	(Hard =	10, So	oft = 15)				
Average Daily Traf	fic (Adt): 3,	365 vehicles					Autos:	15				
Peak Hour Percentage: 10%				Me	dium Tr	ucks (2 /	Axles):	15				
Peak Hour Volume: 336 vehicles				He	avy Tru	cks (3+ /	Axles):	15				
	Speed:	25 mph		Vehicle I	Mix							
Near/Far Lane D	listance:	12 feet			icleType	,	Day	Evening	Night	Daily		
Site Data						Autos:	77.5%	12.9%	9.6%	92.889		
Barrier	Height:	0.0 feet		Me	edium T	rucks:	84.8%	4.9%	10.3%	2.039		
Barrier Type (0-Wall,	•	0.0		ŀ	leavy T	rucks:	86.5%	2.7%	10.8%	5.099		
Centerline Dist. to	,	30.0 feet		Noine Co			- (- 1	41				
Centerline Dist. to O		30.0 feet		Noise Sc				eet)				
Barrier Distance to O	bserver:	0.0 feet		1 1 F	Auto n Truck		000 297					
Observer Height (Abo	ve Pad):	5.0 feet			n Truck v Truck		297 004	Grade Ad	iustmont			
Pad E	levation:	0.0 feet		neav	у писк	s. o.	004	Graue Au	usuneni.	. 0.0		
Road E	levation:	0.0 feet		Lane Eq	uivalen	t Distan	ce (in i	feet)				
Road	d Grade:	0.0%			Auto	s: 29.	816					
Le	eft View: -9	0.0 degrees		Mediur	n Truck	s: 29.	518					
Rig	ht View:	0.0 degrees		Heav	y Truck	s: 29.	547					
FHWA Noise Model Ca	alculations											
VehicleType R	REMEL Tr	affic Flow Di	istance	Finite	Road	Fresr	nel	Barrier Att	en Ber	m Atter		
Autos:	58.73	-4.34	3.2		-1.20		-4.49		000	0.00		
Medium Trucks:	70.80	-20.94	3.3		-1.20		-4.86		000	0.00		
Heavy Trucks:	77.97	-16.95	3.3	32	-1.20		-5.77	0.0	000	0.00		
Unmitigated Noise Le				,								
,	Peak Hour	Leq Day	Leq E	vening	Leq	Night		Ldn		NEL		
Autos:	56.5	54.6		52.8		46.7		55.4		56		
Medium Trucks:	52.0	50.5		44.1		42.6		51.0		51		
Heavy Trucks:	63.1	61.7		52.7		53.9		62.3		62		
Vehicle Noise:	64.3	62.8		56.0		55.0	J	63.4	ł	63		
Centerline Distance to	Noise Conte	our (in feet)	70	dBA	65	dBA	6	0 dBA	55	dBA		
		Ldn:		<i>ава</i> 11		ава 23		50 50		08A		
		Lun.			4			50		00		

FHWA-RD-77-108 HIG	SHWAY	NOISE PI	REDICTIO	N MOL	DEL			
Scenario: HY 2035 With Project Road Name: Orange St. Road Segment: w/o Vine St.			Project N Job Nur			Avenue		
SITE SPECIFIC INPUT DATA						L INPUT	s	
Highway Data		Site Con	ditions (H	lard = '	10, So	ft = 15)		
Average Daily Traffic (Adt): 2,424 vehicles				A	utos:	15		
Peak Hour Percentage: 10%		Me	dium Truc	ks (2 A	xles):	15		
Peak Hour Volume: 242 vehicles		He	avy Truck	s (3+ A	xles):	15		
Vehicle Speed: 25 mph		Vehicle	Mix					
Near/Far Lane Distance: 12 feet			icleType	1	Day	Evening	Night	Daily
Site Data			Au	tos: 7	7.5%	12.9%	9.6%	90.91
Barrier Height: 0.0 feet		M	edium Truc	cks: 8	84.8%	4.9%	10.3%	2.49
Barrier Type (0-Wall, 1-Berm): 0.0		1	Heavy Truc	cks: 8	86.5%	2.7%	10.8%	6.60
Centerline Dist. to Barrier: 30.0 feet		Noise So	ource Elev	ations	(in fe	et)		
Centerline Dist. to Observer: 30.0 feet			Autos:	0.0	00			
Barrier Distance to Observer: 0.0 feet		Mediu	m Trucks:	2.2	97			
Observer Height (Above Pad): 5.0 feet		Heav	v Trucks:	8.0	04	Grade Ad	iustment	: 0.0
Pad Elevation: 0.0 feet								
Road Elevation: 0.0 feet		Lane Eq	uivalent D			eet)		
Road Grade: 0.0%			Autos:	29.8				
Left View: -90.0 degrees Right View: 90.0 degrees			m Trucks: vy Trucks:	29.5 29.5				
FHWA Noise Model Calculations								
	Distance	Finite	Road	Fresne	el .	Barrier Att	en Ber	m Atter
Autos: 58.73 -5.85	3.	26	-1.20	-	4.49	0.0	000	0.00
Medium Trucks: 70.80 -21.48	3.	33	-1.20	-	4.86	0.0	000	0.00
Heavy Trucks: 77.97 -17.24	3.	32	-1.20	-	5.77	0.0	000	0.00
Unmitigated Noise Levels (without Topo and bar		,						
VehicleType Leq Peak Hour Leq Day	,	Evening	Leq Ni	•		Ldn		NEL
Autos: 54.9 53.	-	51.3		45.2		53.8	-	54 50
Medium Trucks: 51.4 49.9 Heavy Trucks: 62.9 61.4	-	43.6 52.4		42.0 53.6		50.5 62.0		50 62
Heavy Trucks: 62.9 61.4 Vehicle Noise: 63.8 62.3		52.4 55.2		53.6		62.0		62
Centerline Distance to Noise Contour (in feet)	J	55.Z		54.5		02.5	7	03
Centenine Distance to Noise Contour (In feet)	7() dBA	65 dE	84	6	0 dBA	55	dBA
			00 UL		0		- 30	
l dr		10	22			47	1	01

	FHW	A-RD-77-108	HIGHV	NAY N	IOISE PF	REDICTI	ON MO	DEL				
Scenario: Road Name: Road Segment:		th Project			Project Name: Cedar Avenue Job Number: 11139							
SITE SP	PECIFIC INI	PUT DATA				N	OISE N	IODE	L INPUT	s		
Highway Data					Site Con	ditions	(Hard =	10, Sc	oft = 15)			
Average Daily Tra	affic (Adt):	2,273 vehicle	s					Autos:	15			
Peak Hour Pe	ercentage:	10%			Me	dium Tru	icks (2 A	Axles):	15			
Peak Hou	r Volume:	227 vehicles	3		He	avy Truc	:ks (3+ A	(xles):	15			
Vehic	le Speed:	25 mph		-	Vehicle I	Mise						
Near/Far Lane	Distance:	12 feet		F		icleType		Day	Evening	Night	Daily	
Site Data					ven			77.5%	•	9.6%		
					14	ءر edium Tr		84.8%		9.6%	1.71%	
	er Height:	0.0 feet				leavy Tr		86.5%		10.3%	2.61%	
Barrier Type (0-Wall	· ,	0.0			,	leavy II	uchs.	00.376	2.1 /0	10.078	2.0176	
Centerline Dist.		30.0 feet		1	Noise So	ource El	evation	s (in fe	et)			
Centerline Dist. to		30.0 feet				Autos	s: 0.0	000				
Barrier Distance to		0.0 feet			Mediui	n Trucks	s: 2.1	297				
Observer Height (Ab	ove Pad): Flevation:	5.0 feet			Heav	y Trucks	s: 8.0	004	Grade Ad	justment.	0.0	
	Elevation: Elevation:	0.0 feet 0.0 feet		- H	Lane Eq	uivələnf	Distan	co (in i	foot)			
	ad Grade:	0.0%		F	Lune Ly	Autos		<u> </u>	ceij			
	au Graue. Left View:	-90.0 degree			Modiu	n Trucks						
	light View:	90.0 degree				ry Trucks						
FHWA Noise Model	Calculations											
VehicleType	REMEL	Traffic Flow	Dista	ance	Finite	Road	Fresr	el	Barrier Att	en Ber	m Atten	
Autos:	58.73	-5.91		3.2	6	-1.20		-4.49	0.0	000	0.000	
Medium Trucks:	70.80	-23.39		3.3	3	-1.20		-4.86	0.0	000	0.000	
Heavy Trucks:	77.97	-21.55		3.3	2	-1.20		-5.77	0.0	000	0.000	
Unmitigated Noise L												
<i>,</i> ,	eq Peak Hour	. ,		Leq E	vening	Leq	Night		Ldn		VEL	
Autos:	54.9	-	53.0		51.2		45.2		53.8		54.4	
Medium Trucks:	49.5		48.0		41.7		40.1		48.6		48.8	
Heavy Trucks:	58.5		57.1		48.1		49.3		57.7		57.8	
Vehicle Noise:	60.	5	58.9		53.3		51.1		59.5	5	59.8	
Centerline Distance	to Noise Co	ntour (in feet										
					dBA		dBA	6	i0 dBA		dBA	
			Ldn:	6	-		3		28		60	
		CI	IEL:	6	6	1	4		29	6	63	

Tuesday, July 18, 2017

Tuesday, July 18, 2017

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APPENDIX 9.1:

OPERATIONAL STATIONARY-SOURCE NOISE CALCULATIONS



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Observer Location: R1

Source: Unloading/Docking Activity Condition: Operational Project Name: Cedar Avenue Job Number: 11139 Analyst: A. Wolfe

NOISE MODEL INPUTS									
Noise Distance to Observer	998.0 feet	Barrier Height:	0.0 feet						
Noise Distance to Barrier:	998.0 feet	Noise Source Height:	8.0 feet						
Barrier Distance to Observer:	0.0 feet	Observer Height:	5.0 feet						
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0						
Noise Source Elevation:	0.0 feet	Drop Off Coefficient:	20.0						
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling c 15 = 4.5 dBA per doubling							

NOISE MODEL PROJECTIONS								
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax	
Reference (Sample)	30.0	67.2	64.2	67.2	71.8	75.6	80.0	
Distance Attenuation	998.0	-30.4	-30.4	-30.4	-30.4	-30.4	-30.4	
Shielding (Barrier Attenuation)	998.0	0.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		36.8	33.8	36.8	41.4	45.2	49.6	
60 Minute Hourly Adjustmen	nt	36.8	33.8	36.8	41.4	45.2	49.6	

S	TATIONARY SOUR	CE NOISE PREDICTION MODEL	7/18/2017
Observer Location: R1 Source: Roof-Top Condition: Operation	•	Project Name: Cedar Avenue Job Number: 11139 Analyst: A. Wolfe	
	NOISE	MODEL INPUTS	
Noise Distance to Observer	954.0 feet	Barrier Height:	44.0 feet
Noise Distance to Barrier:	10.0 feet	Noise Source Height:	5.0 feet
Barrier Distance to Observer:	944.0 feet	Observer Height:	5.0 feet
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0
Noise Source Elevation:	44.0 feet	Drop Off Coefficient:	20.0
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling o 15 = 4.5 dBA per doubling	

	NOISE MODEL PROJECTIONS								
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax		
Reference (Sample)	5.0	77.2	74.4	76.1	77.4	77.7	78.2		
Distance Attenuation	954.0	-45.6	-45.6	-45.6	-45.6	-45.6	-45.6		
Shielding (Barrier Attenuation)	10.0	-10.1	-10.1	-10.1	-10.1	-10.1	-10.1		
Raw (Distance + Barrier)		21.5	18.7	20.4	21.7	22.0	22.5		
39 Minute Hourly Adjustmer	nt	19.6	16.8	18.5	19.8	20.1	20.6		

Observer Location: R1

Source: Parking Lot Vehicle Movements Condition: Operational Project Name: Cedar Avenue Job Number: 11139 Analyst: A. Wolfe

NOISE MODEL INPUTS								
Noise Distance to Observer	757.0 feet	Barrier Height:	0.0 feet					
Noise Distance to Barrier:	757.0 feet	Noise Source Height:	5.0 feet					
Barrier Distance to Observer:	0.0 feet	Observer Height:	5.0 feet					
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0					
Noise Source Elevation:	0.0 feet	Drop Off Coefficient:	15.0					
Barrier Elevation:	0.0 feet		20 = 6 dBA per doubling of distance 15 = 4.5 dBA per doubling of distance					

NOISE MODEL PROJECTIONS								
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax	
Reference (Sample)	10.0	52.2	49.0	50.0	55.0	61.0	71.9	
Distance Attenuation	757.0	-28.2	-28.2	-28.2	-28.2	-28.2	-28.2	
Shielding (Barrier Attenuation)	757.0	0.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		24.0	20.8	21.8	26.8	32.8	43.7	
60 Minute Hourly Adjustmen	nt	24.0	20.8	21.8	26.8	32.8	43.7	

S	TATIONARY SOURCE	NOISE PREDICTION MODEL	7/18/2017
Observer Location: R2 Source: Unloading Condition: Operation	• •	Project Name: Cedar Avenue Job Number: 11139 Analyst: A. Wolfe	
	NOISE M	ODEL INPUTS	
Noise Distance to Observer	868.0 feet	Barrier Height:	44.0 feet
Noise Distance to Barrier:	10.0 feet	Noise Source Height:	8.0 feet
Barrier Distance to Observer:	858.0 feet	Observer Height:	5.0 feet
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0
Noise Source Elevation:	0.0 feet	Drop Off Coefficient:	20.0
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling o 15 = 4.5 dBA per doubling	

NOISE MODEL PROJECTIONS								
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax	
Reference (Sample)	30.0	67.2	64.2	67.2	71.8	75.6	80.0	
Distance Attenuation	868.0	-29.2	-29.2	-29.2	-29.2	-29.2	-29.2	
Shielding (Barrier Attenuation)	10.0	-18.7	-18.7	-18.7	-18.7	-18.7	-18.7	
Raw (Distance + Barrier)		19.3	16.3	19.3	23.9	27.7	32.1	
60 Minute Hourly Adjustmer	nt	19.3	16.3	19.3	23.9	27.7	32.1	

Observer Location: R2

Source: Roof-Top Air Conditioning Condition: Operational Project Name: Cedar Avenue Job Number: 11139 Analyst: A. Wolfe

NOISE MODEL INPUTS								
Noise Distance to Observer	567.0 feet	Barrier Height:	44.0 feet					
Noise Distance to Barrier:	10.0 feet	Noise Source Height:	5.0 feet					
Barrier Distance to Observer:	557.0 feet	Observer Height:	5.0 feet					
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0					
Noise Source Elevation:	44.0 feet	Drop Off Coefficient:	20.0					
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling o 15 = 4.5 dBA per doubling						

NOISE MODEL PROJECTIONS								
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax	
Reference (Sample)	5.0	77.2	74.4	76.1	77.4	77.7	78.2	
Distance Attenuation	567.0	-41.1	-41.1	-41.1	-41.1	-41.1	-41.1	
Shielding (Barrier Attenuation)	10.0	-9.8	-9.8	-9.8	-9.8	-9.8	-9.8	
Raw (Distance + Barrier)		26.3	23.5	25.2	26.5	26.8	27.3	
39 Minute Hourly Adjustmen	ht	24.4	21.6	23.3	24.6	24.9	25.4	

STATIONARY SOURCE NOISE PREDICTION MODEL 7/18/2									
Observer Location: R2 Source: Parking Lo Condition: Operation	ot Vehicle Movements al	Project Name: Cedar Avenue Job Number: 11139 Analyst: A. Wolfe							
	NOISE MODEL INPUTS								
Noise Distance to Observer	383.0 feet	Barrier Height:	0.0 feet						
Noise Distance to Barrier:	383.0 feet	Noise Source Height:	5.0 feet						
Barrier Distance to Observer:	0.0 feet	Observer Height:	5.0 feet						
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0						
Noise Source Elevation:	0.0 feet	Drop Off Coefficient:	15.0						
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling o 15 = 4.5 dBA per doubling							

NOISE MODEL PROJECTIONS							
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax
Reference (Sample)	10.0	52.2	49.0	50.0	55.0	61.0	71.9
Distance Attenuation	383.0	-23.7	-23.7	-23.7	-23.7	-23.7	-23.7
Shielding (Barrier Attenuation)	383.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		28.5	25.3	26.3	31.3	37.3	48.2
60 Minute Hourly Adjustmer	nt	28.5	25.3	26.3	31.3	37.3	48.2

Observer Location: R3

Source: Unloading/Docking Activity Condition: Operational Project Name: Cedar Avenue Job Number: 11139 Analyst: A. Wolfe

NOISE MODEL INPUTS								
Noise Distance to Observer	342.0 feet	Barrier Height:	44.0 feet					
Noise Distance to Barrier:	10.0 feet	Noise Source Height:	8.0 feet					
Barrier Distance to Observer:	332.0 feet	Observer Height:	5.0 feet					
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0					
Noise Source Elevation:	0.0 feet	Drop Off Coefficient:	20.0					
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling o 15 = 4.5 dBA per doubling						

NOISE MODEL PROJECTIONS								
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax	
Reference (Sample)	30.0	67.2	64.2	67.2	71.8	75.6	80.0	
Distance Attenuation	342.0	-21.1	-21.1	-21.1	-21.1	-21.1	-21.1	
Shielding (Barrier Attenuation)	10.0	-18.7	-18.7	-18.7	-18.7	-18.7	-18.7	
Raw (Distance + Barrier)		27.4	24.4	27.4	32.0	35.8	40.2	
60 Minute Hourly Adjustmen	nt	27.4	24.4	27.4	32.0	35.8	40.2	

S	TATIONARY SOUR	CE NOISE PREDICTION MODEL	7/18/2017						
Observer Location: R3 Source: Roof-Top Condition: Operation	•	Project Name: Cedar Avenue Job Number: 11139 Analyst: A. Wolfe							
	NOISE MODEL INPUTS								
Noise Distance to Observer	169.0 feet	Barrier Height:	44.0 feet						
Noise Distance to Barrier:	10.0 feet	Noise Source Height:	5.0 feet						
Barrier Distance to Observer:	159.0 feet	Observer Height:	5.0 feet						
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0						
Noise Source Elevation:	44.0 feet	Drop Off Coefficient:	20.0						
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling o 15 = 4.5 dBA per doubling							

NOISE MODEL PROJECTIONS								
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax	
Reference (Sample)	5.0	77.2	74.4	76.1	77.4	77.7	78.2	
Distance Attenuation	169.0	-30.6	-30.6	-30.6	-30.6	-30.6	-30.6	
Shielding (Barrier Attenuation)	10.0	-7.1	-7.1	-7.1	-7.1	-7.1	-7.1	
Raw (Distance + Barrier)		39.5	36.7	38.4	39.7	40.0	40.5	
39 Minute Hourly Adjustmer	nt	37.6	34.8	36.5	37.8	38.1	38.6	

Observer Location: R3

Source: Parking Lot Vehicle Movements Condition: Operational Project Name: Cedar Avenue Job Number: 11139 Analyst: A. Wolfe

NOISE MODEL INPUTS								
Noise Distance to Observer	190.0 feet	Barrier Height:	0.0 feet					
Noise Distance to Barrier:	190.0 feet	Noise Source Height:	5.0 feet					
Barrier Distance to Observer:	0.0 feet	Observer Height:	5.0 feet					
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0					
Noise Source Elevation:	0.0 feet	Drop Off Coefficient:	15.0					
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling o 15 = 4.5 dBA per doubling						

NOISE MODEL PROJECTIONS								
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax	
Reference (Sample)	10.0	52.2	49.0	50.0	55.0	61.0	71.9	
Distance Attenuation	190.0	-19.2	-19.2	-19.2	-19.2	-19.2	-19.2	
Shielding (Barrier Attenuation)	190.0	0.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		33.0	29.8	30.8	35.8	41.8	52.7	
60 Minute Hourly Adjustmen	ht	33.0	29.8	30.8	35.8	41.8	52.7	

S	TATIONARY SOURCE	NOISE PREDICTION MODEL	7/18/2017						
Observer Location: R4 Source: Unloading/Docking Activity Condition: Operational		Project Name: Cedar Avenue Job Number: 11139 Analyst: A. Wolfe							
	NOISE MODEL INPUTS								
Noise Distance to Observer	194.0 feet	Barrier Height:	12.0 feet						
Noise Distance to Barrier: Barrier Distance to Observer:	10.0 feet 184.0 feet	Noise Source Height: Observer Height:	8.0 feet 5.0 feet						
Observer Elevation: Noise Source Elevation:	0.0 feet 0.0 feet	Barrier Type (0-Wall, 1-Berm): Drop Off Coefficient:	0 20.0						
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling o 15 = 4.5 dBA per doubling							

	NOISE MODEL PROJECTIONS								
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax		
Reference (Sample)	30.0	67.2	64.2	67.2	71.8	75.6	80.0		
Distance Attenuation	194.0	-16.2	-16.2	-16.2	-16.2	-16.2	-16.2		
Shielding (Barrier Attenuation)	10.0	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9		
Raw (Distance + Barrier)		41.1	38.1	41.1	45.7	49.5	53.9		
60 Minute Hourly Adjustmer	nt	41.1	38.1	41.1	45.7	49.5	53.9		

Observer Location: R4

Source: Roof-Top Air Conditioning Condition: Operational Project Name: Cedar Avenue Job Number: 11139 Analyst: A. Wolfe

NOISE MODEL INPUTS								
Noise Distance to Observer	382.0 feet	Barrier Height:	44.0 feet					
Noise Distance to Barrier:	382.0 feet	Noise Source Height:	5.0 feet					
Barrier Distance to Observer:	0.0 feet	Observer Height:	5.0 feet					
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0					
Noise Source Elevation:	44.0 feet	Drop Off Coefficient:	20.0					
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling o 15 = 4.5 dBA per doubling						

NOISE MODEL PROJECTIONS								
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax	
Reference (Sample)	5.0	77.2	74.4	76.1	77.4	77.7	78.2	
Distance Attenuation	382.0	-37.7	-37.7	-37.7	-37.7	-37.7	-37.7	
Shielding (Barrier Attenuation)	382.0	-18.9	-18.9	-18.9	-18.9	-18.9	-18.9	
Raw (Distance + Barrier)		20.6	17.8	19.5	20.8	21.1	21.6	
39 Minute Hourly Adjustmer	nt	18.7	15.9	17.6	18.9	19.2	19.7	

S	TATIONARY SOURCE NO	DISE PREDICTION MODEL	7/18/2017
Observer Location: R4 Source: Parking Lo <i>Condition:</i> Operation	ot Vehicle Movements al	Project Name: Cedar Avenue Job Number: 11139 Analyst: A. Wolfe	
	NOISE MOD	EL INPUTS	
Noise Distance to Observer	423.0 feet	Barrier Height:	0.0 feet
Noise Distance to Barrier:	423.0 feet	Noise Source Height:	5.0 feet
Barrier Distance to Observer:	0.0 feet	Observer Height:	5.0 feet
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0
Noise Source Elevation:	0.0 feet	Drop Off Coefficient:	15.0
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling o 15 = 4.5 dBA per doubling	

	NOISE MODEL PROJECTIONS							
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax	
Reference (Sample)	10.0	52.2	49.0	50.0	55.0	61.0	71.9	
Distance Attenuation	423.0	-24.4	-24.4	-24.4	-24.4	-24.4	-24.4	
Shielding (Barrier Attenuation)	423.0	0.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		27.8	24.6	25.6	30.6	36.6	47.5	
60 Minute Hourly Adjustmer	nt	27.8	24.6	25.6	30.6	36.6	47.5	

Observer Location: R5

Source: Unloading/Docking Activity Condition: Operational Project Name: Cedar Avenue Job Number: 11139 Analyst: A. Wolfe

NOISE MODEL INPUTS								
Noise Distance to Observer	921.0 feet	Barrier Height:	12.0 feet					
Noise Distance to Barrier:	10.0 feet	Noise Source Height:	8.0 feet					
Barrier Distance to Observer:	911.0 feet	Observer Height:	5.0 feet					
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0					
Noise Source Elevation:	0.0 feet	Drop Off Coefficient:	20.0					
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling c 15 = 4.5 dBA per doubling						

NOISE MODEL PROJECTIONS								
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax	
Reference (Sample)	30.0	67.2	64.2	67.2	71.8	75.6	80.0	
Distance Attenuation	921.0	-29.7	-29.7	-29.7	-29.7	-29.7	-29.7	
Shielding (Barrier Attenuation)	10.0	-9.6	-9.6	-9.6	-9.6	-9.6	-9.6	
Raw (Distance + Barrier)		27.9	24.9	27.9	32.5	36.3	40.7	
60 Minute Hourly Adjustmen	it	27.9	24.9	27.9	32.5	36.3	40.7	

S	TATIONARY SOURC	E NOISE PREDICTION MODEL	7/18/2017
Observer Location: R5 Source: Roof-Top Condition: Operation	•	Project Name: Cedar Avenue Job Number: 11139 Analyst: A. Wolfe	
	NOISE N	NODEL INPUTS	
Noise Distance to Observer	815.0 feet	Barrier Height:	44.0 feet
Noise Distance to Barrier:	10.0 feet	Noise Source Height:	5.0 feet
Barrier Distance to Observer:	805.0 feet	Observer Height:	5.0 feet
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0
Noise Source Elevation:	44.0 feet	Drop Off Coefficient:	20.0
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling o 15 = 4.5 dBA per doubling	

	NOISE MODEL PROJECTIONS								
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax		
Reference (Sample)	5.0	77.2	74.4	76.1	77.4	77.7	78.2		
Distance Attenuation	815.0	-44.2	-44.2	-44.2	-44.2	-44.2	-44.2		
Shielding (Barrier Attenuation)	10.0	-10.1	-10.1	-10.1	-10.1	-10.1	-10.1		
Raw (Distance + Barrier)		22.9	20.1	21.8	23.1	23.4	23.9		
39 Minute Hourly Adjustmer	nt	21.0	18.2	19.9	21.2	21.5	22.0		

Observer Location: R5

Source: Parking Lot Vehicle Movements Condition: Operational

Project Name: Cedar Avenue Job Number: 11139 Analyst: A. Wolfe

	NOISE MODEL INPUTS								
Noise Distance to Observer	809.0 feet	Barrier Height:	6.0 feet						
Noise Distance to Barrier:	799.0 feet	Noise Source Height:	5.0 feet						
Barrier Distance to Observer:	10.0 feet	Observer Height:	5.0 feet						
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0						
Noise Source Elevation:	0.0 feet	Drop Off Coefficient:	15.0						
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling o 15 = 4.5 dBA per doubling							

	NOISE MODEL PROJECTIONS								
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax		
Reference (Sample)	10.0	52.2	49.0	50.0	55.0	61.0	71.9		
Distance Attenuation	809.0	-28.6	-28.6	-28.6	-28.6	-28.6	-28.6		
Shielding (Barrier Attenuation)	799.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5		
Raw (Distance + Barrier)		18.1	14.9	15.9	20.9	26.9	37.8		
60 Minute Hourly Adjustmer	nt	18.1	14.9	15.9	20.9	26.9	37.8		

APPENDIX 10.1:

TEMPORARY CONSTRUCTION NOISE BARRIER ATTENUATION



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Observer Location: R5

Source: Peak Construction Activity Condition: Construction Mitigated Project Name: Cedar Job Number: 11139 Analyst: A. Wolfe 7/18/2017

NOISE MODEL INPUTS								
Noise Distance to Observer	78.0 feet	Barrier Height:	6.0 feet					
Noise Distance to Barrier:	10.0 feet	Noise Source Height:	8.0 feet					
Barrier Distance to Observer:	68.0 feet	Observer Height:	5.0 feet					
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0					
Noise Source Elevation:	0.0 feet	Drop Off Coefficient:	20.0					
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling o 15 = 4.5 dBA per doubling						

NOISE MODEL PROJECTIONS							
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax
Reference (Sample)	50.0	79.6	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	78.0	-3.9	-3.9	-3.9	-3.9	-3.9	-3.9
Shielding (Barrier Attenuation)	10.0	-2.9	-2.9	-2.9	-2.9	-2.9	-2.9

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APPENDIX 10.2:

TEMPORARY CONSTRUCTION NOISE BARRIER EXAMPLE PHOTOS



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Temporary Construction Noise Barrier Examples



I-Beam & Acoustic Material 01

I-Beam & Acoustic Material 02



I-Beam & Acoustic Material 03



K-Rail Plywood & Acoustic Material



K-Rail Temporary Fence & Acoustic Material



K-Rail-Mounted Acoustic Material 01

Temporary Construction Noise Barrier Examples



Pillar & Acoustic Material



Straw Bales 01



Straw Bales 02



Temporary Fence & Acoustic Material 01



Temporary Fence & Acoustic Material 02