

Noise Impact Analysis



# The Exchange

## NOISE IMPACT ANALYSIS CITY OF RIVERSIDE

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11145-07 Noise Study



## **TABLE OF CONTENTS**

TA	TABLE OF CONTENTS III				
		CES			
		XHIBITS			
	LIST OF TABLESV				
LIS	T OF A	BBREVIATED TERMS	.VI		
EX		<b>/E SUMMARY</b>			
		e Traffic Noise Analysis			
		itional Noise Analysis			
	•	ruction Noise Analysis			
		ruction Vibration Analysis			
	Summ	nary of CEQA Significance Findings	4		
1	INT	RODUCTION	7		
	1.1	Site Location	7		
	1.2	Project Description			
2	FUI	NDAMENTALS	11		
	2.1	Range of Noise	11		
	2.2	Noise Descriptors			
	2.3	Sound Propagation	12		
	2.4	Noise Control	13		
	2.5	Noise Barrier Attenuation			
	2.6	Land Use Compatibility With Noise			
	2.7	Community Response to Noise			
	2.8	Vibration			
3	REC	GULATORY SETTING	17		
	3.1	State of California Noise Requirements			
	3.2	State of California Building Code			
	3.3	City of Riverside General Plan			
	3.4 3.5	Operational Noise Standards Construction Noise Standards			
	3.6	Construction Vibration Standards			
4					
4					
	4.1 4.2	Noise-Sensitive Receivers Significance Criteria Summary			
5		STING NOISE LEVEL MEASUREMENTS			
5					
	5.1	Measurement Procedure and Criteria			
	5.2 5.3	Noise Measurement Locations Noise Measurement Results			
~					
6					
	6.1	FHWA Traffic Noise Prediction Model			
	6.2	Construction Vibration Assessment Methodology	37		



7	OFI	F-SITE TRANSPORTATION NOISE IMPACTS	39
	7.1	Traffic Noise Contours	39
	7.2	Existing Condition Project Traffic Noise Level Contributions	
	7.3	Opening Year 2022 Project Traffic Noise Level Contributions	
	7.4	Horizon Year 2040 Project Traffic Noise Level Contributions	48
8	ON	-SITE NOISE IMPACTS	49
	8.1	Exterior Noise Analysis	49
	8.2	Interior Noise Analysis	51
9	REC	CEIVER LOCATIONS	55
10	OP	ERATIONAL IMPACTS	57
	10.1	Reference Noise Levels	57
	10.2	Operational Noise Levels	62
	10.3	Unmitigated Operational Noise Level Compliance	
	10.4	Mitigated Operational Noise Level Compliance	
	10.5	Unmitigated Project Operational Noise Contribution	
	10.6	Operational Noise Mitigation Measures	
11	CO	NSTRUCTION IMPACTS	69
	11.1	Construction Noise Levels	69
	11.2	Construction Vibration Impacts	69
12	REF	ERENCES	73
13	CEF	RTIFICATION	75

## **APPENDICES**

APPENDIX 3.1: CITY OF RIVERSIDE MUNICIPAL CODE APPENDIX 5.1: STUDY AREA PHOTOS APPENDIX 5.2: NOISE LEVEL MEASUREMENT WORKSHEETS APPENDIX 7.1: OFF-SITE TRAFFIC NOISE LEVEL CONTOURS APPENDIX 8.1: ON-SITE TRAFFIC NOISE LEVEL CALCULATIONS APPENDIX 10.1: OPERATIONAL NOISE LEVEL CALCULATIONS

## LIST OF EXHIBITS

EXHIBIT ES-A: SUMMARY OF ON-SITE MITIGATION MEASURES	6
EXHIBIT 1-A: LOCATION MAP	9
EXHIBIT 1-B: SITE PLAN	10
EXHIBIT 2-A: TYPICAL NOISE LEVELS	11
EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION	15
EXHIBIT 2-C: TYPICAL LEVELS OF GROUND-BORNE VIBRATION	16
EXHIBIT 3-A: NOISE/LAND USE NOISE COMPATIBILITY CRITERIA	19
EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS	31
EXHIBIT 9-A: RECEIVER LOCATIONS	56
EXHIBIT 10-A: OPERATIONAL NOISE SOURCE AND RECEIVER LOCATIONS	61
EXHIBIT 11-A: CONSTRUCTION ACTIVITY AND RECEIVER LOCATIONS	70

## LIST OF TABLES

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS	5
TABLE 3-1: OPERATIONAL NOISE STANDARDS	
TABLE 4-1: SIGNIFICANCE OF NOISE IMPACTS AT NOISE-SENSITIVE RECEIVERS	24
TABLE 4-2: SIGNIFICANCE CRITERIA SUMMARY	
TABLE 5-1: 24-HOUR AMBIENT NOISE LEVEL MEASUREMENTS	
TABLE 6-1: OFF-SITE ROADWAY PARAMETERS	34
TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES	35
TABLE 6-3: TIME OF DAY VEHICLE SPLITS	
TABLE 6-4: DISTRIBUTION OF TRAFFIC FLOW BY VEHICLE TYPE (VEHICLE MIX)	36
TABLE 6-5: ON-SITE ROADWAY PARAMETERS	36
TABLE 6-6: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT	37
TABLE 7-1: EXISTING WITHOUT PROJECT CONDITIONS NOISE CONTOURS	40
TABLE 7-2: EXISTING WITH PROJECT CONDITIONS NOISE CONTOURS	
TABLE 7-3: OPENING YEAR 2022 WITHOUT PROJECT CONDITIONS NOISE CONTOURS	42
TABLE 7-4: OPENING YEAR 2022 WITH PROJECT CONDITIONS NOISE CONTOURS	43
TABLE 7-5: HORIZON YEAR 2040 WITHOUT PROJECT CONDITIONS NOISE CONTOURS	44
TABLE 7-6: HORIZON YEAR 2040 WITH PROJECT CONDITIONS NOISE CONTOURS	45
TABLE 7-7: EXISTING CONDITION OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS	46
TABLE 7-8: OPENING YEAR 2022 OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS	47
TABLE 7-9: HORIZON YEAR 2040 OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS	48
TABLE 8-1: EXTERIOR TRANSPORTATION NOISE LEVELS	50
TABLE 8-2: FIRST-FLOOR INTERIOR NOISE IMPACTS (CNEL)	52
TABLE 8-3: SECOND-FLOOR INTERIOR NOISE IMPACTS (CNEL)	53
TABLE 8-4: THIRD-FLOOR INTERIOR NOISE IMPACTS (CNEL)	
TABLE 8-5: FOURTH-FLOOR INTERIOR NOISE IMPACTS (CNEL)	54
TABLE 10-1: REFERENCE NOISE LEVEL MEASUREMENTS	60
TABLE 10-2: UNMITIGATED PROJECT OPERATIONAL NOISE LEVELS	
TABLE 10-3: UNMITIGATED OPERATIONAL NOISE LEVEL COMPLIANCE	65
TABLE 10-4: MITIGATED PROJECT OPERATIONAL NOISE LEVELS (RECEIVER LOCATION R5)	66
TABLE 10-5: MITIGATED OPERATIONAL NOISE LEVEL COMPLIANCE (RECEIVER LOCATION R5)	66



<b>TABLE 10-6:</b>	UNMITIGATED DAYTIME OPERATIONAL NOISE LEVEL CONTRIBUTIONS	7
TABLE 10-7:	UNMITIGATED NIGHTTIME OPERATIONAL NOISE LEVEL CONTRIBUTIONS	8
<b>TABLE 11-1:</b>	CONSTRUCTION EQUIPMENT VIBRATION LEVELS	1

## 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
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
I-215	Interstate 215
IEC	International Electrotechnical Commission
INCE	Institute of Noise Control Engineering
L <sub>eq</sub>	Equivalent continuous (average) sound level
L <sub>min</sub>	Minimum level measured over the time interval
mph	Miles per hour
PPV	Peak Particle Velocity
Project	The Exchange
REMEL	Reference Energy Mean Emission Level
RMS	Root-mean-square
SR-60	State Route 60
SR-91	State Route 91
VdB	Vibration Decibels



## **EXECUTIVE SUMMARY**

Urban Crossroads, Inc. has prepared this noise study to determine the noise exposure and the necessary noise mitigation measures for the proposed The Exchange development ("Project"). The Project site is located south of the Strong Street and east of Orange Street in the City of Riverside. The proposed mixed-use Project consists of multi-family residential dwelling units, multi-tenant commercial buildings, a vehicle fueling station, a drive-through restaurant, two hotels, a Recreational Vehicle (RV) overnight parking component, and on-site activities (e.g., farmers market, outdoor entertainment). This study has been prepared consistent with applicable City of Riverside noise standards, and significance criteria 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 traffic noise increases on the surrounding off-site areas, the changes in traffic noise levels on 23 roadway segments surrounding the Project site 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 Exchange 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 2022, and Horizon Year 2040 traffic conditions. The analysis shows that the unmitigated Project-related traffic noise level increases under all traffic scenarios will be *less than significant*.

### **ON-SITE TRAFFIC NOISE ANALYSIS**

A noise impact analysis has been completed to determine the noise exposure levels that would result from off-site transportation noise sources, and to identify potential noise mitigation measures that would achieve acceptable Project exterior and interior noise levels. The primary source of traffic noise affecting the Project site is anticipated to be from State Route 91 (SR-91), Interstate 215 (I-215), State Route 60 (SR-60), and Orange Street.

#### EXTERIOR NOISE LEVELS

No exterior noise mitigation is required to satisfy the City of Riverside General Plan Noise Element exterior land use/noise level compatibility criteria for residential, hotel, and commercial uses. Adjacent to SR-91, I-215, and SR-60, residential uses are shown to experience *conditionally acceptable* exterior noise levels of up to 61.7 dBA CNEL, hotel and RV uses are shown to experience *normally unacceptable* exterior noise levels ranging from 71.5 to 78.2 dBA CNEL, and commercial uses are shown to experience *conditionally acceptable* exterior noise levels of up to 65.4 dBA CNEL. Adjacent to Orange Street, however, commercial, and residential uses are shown to experience *normally acceptable* and *conditionally acceptable* exterior noise levels, respectively. Therefore, because of the future unmitigated exterior traffic noise levels at the Project site, additional interior noise analysis is required to satisfy the General Plan Noise Element



Figure N-10 *conditionally acceptable* residential and *normally unacceptable* hotel use requirements within the Project site. (3)

#### INTERIOR NOISE LEVELS

To present a conservative approach, this noise study evaluates the interior noise levels at the Project buildings based on the City of Riverside 45 dBA CNEL residential/hotel and California Green Building Standards Code 50 dBA CNEL commercial interior noise level standards. The Project buildings are shown to require a Noise Reduction (NR) of up to 33.4 dBA and a windows-closed condition requiring a means of mechanical ventilation (e.g. air conditioning).

#### INTERIOR NOISE MITIGATION MEASURES

To meet the City of Riverside 45 dBA CNEL interior noise standards the following on-site mitigation measures are required:

- <u>Windows</u>:
  - Residential buildings 12 to 20 and hotel buildings 1 and 2 adjacent to SR-91, I-215, and SR-60 require upgraded windows and sliding glass doors (all windows on all floors) with minimum STC ratings of 36 as indicated on Exhibit ES-A.
  - All other buildings require standards windows and sliding glass doors with a minimum STC rating of 27.
- Exterior Doors (Non-Glass):
  - Residential buildings 12 to 20 and hotel buildings 1 and 2 adjacent to SR-91, I-215, and SR-60 require upgraded exterior doors (all floors) with minimum STC ratings of 36.
  - All other residential building exterior doors shall be well weather-stripped and have minimum STC ratings of 27. Well-sealed perimeter gaps around the doors are essential to achieve the optimal STC rating. (4)
- <u>Walls</u>: At any penetrations of exterior walls by pipes, ducts, or conduits, the space between the wall and pipes, ducts, or conduits shall be caulked or filled with mortar to form an airtight seal.
- <u>Residential Roofs</u>: Roof sheathing of wood construction shall be per manufacturer's specification or caulked plywood of at least one-half inch thick. Ceilings shall be per manufacturer's specification or well-sealed gypsum board of at least one-half inch thick. Insulation with at least a rating of R-19 shall be used in the attic space.
- <u>Ventilation</u>:
  - Arrangements for any habitable room shall be such that any exterior door or window can be kept closed when the room is in use and still receive circulated air. A forced air circulation system (e.g. air conditioning) or active ventilation system (e.g. fresh air supply) shall be provided which satisfies the requirements of the Uniform Building Code.
  - Residential exterior vents shall be oriented away from SR-91, I-215, and SR-60. If such an orientation cannot be avoided, then an acoustical baffle shall be placed in the attic space behind the vents.



Based on the results of this analysis, the Project will satisfy the 45 dBA CNEL residential/hotel and 50 dBA CNEL commercial interior noise level standards. Exhibit ES-A shows the on-site interior noise mitigation measures.

While not required, this noise study recommends an interior noise level design goal of 40 dBA CNEL for residential and hotel uses using upgraded windows and sliding glass doors (all windows on all floors) with a minimum STC rating of 40 for all residential and hotel buildings.

#### **OPERATIONAL NOISE ANALYSIS**

Using reference noise levels to represent the expected noise sources from The Exchange site, this analysis estimates the Project-related stationary-source noise levels at nearby sensitive receiver locations. The normal activities associated with the Project are anticipated to include roof-top air conditioning units, entry gates, a drive-through speakerphone, car wash air blowers, residential and commercial parking lot vehicle movements, and dog park, outdoor pool/spa, RV parking, gas station activities, and outdoor event activities. The operational noise analysis shows that the Project-related stationary-source noise levels at one of 7 receiver locations, R5 as shown on Exhibit 10-A, will exceed the City of Riverside exterior noise level standards for residential uses. Project operational noise levels will satisfy the City of Riverside Municipal Code daytime and nighttime exterior noise level standards at all other receiver locations.

To reduce the potential operational noise level impacts at receiver location R5, a minimum 6foot high noise barrier is required as a Project operational noise mitigation measure. With the 6foot high noise barrier mitigation, the Project operational noise level impacts will be reduced to *less than significant* levels at receiver location R5.

Further, this analysis demonstrates that the Project will not contribute a long-term unmitigated 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 Project activities, such as the roof-top air conditioning units, entry gates, a drive-through speakerphone, car wash air blowers, residential and commercial parking lot vehicle movements, and dog park, outdoor pool/spa, RV parking, gas station activities, and outdoor event activities, are considered *less than significant*.

#### **OPERATIONAL NOISE MITIGATION MEASURES**

To reduce the operational noise levels to *less than significant* at receiver location R5, the Project shall construct the following noise barrier. The noise barrier shall provide a weight of at least 4 pounds per square foot of face area or provide a minimum transmission loss of 20 dBA. (5) The barriers shall consist of a solid face from top to bottom. Unnecessary openings or decorative cutouts shall not be made. All gaps (except for weep holes) should be filled with grout or caulking.

- A minimum 6-foot high noise barrier at the boundary between Project operational activities and receiver location R5 as shown on Exhibit 10-A;
- The noise barrier may be constructed using the following materials capable of providing a minimum transmission loss of 20 dBA.:



- Masonry block;
- Stucco veneer over wood framing (or foam core), or 1-inch-thick tongue and groove wood of sufficient weight per square foot;
- Glass (1/4-inch-thick), or other transparent material capable of the minimum transmission loss of 20 dBA;
- o Earthen berm;
- Any combination of these construction materials.

#### CONSTRUCTION NOISE ANALYSIS

Pursuant to Municipal Code Section 7.35.020 *Exemptions* subsection (G), "Noise sources associated with construction, repair, remodeling, or grading of any real property; provided a permit has been obtained from the City as required; and provided said activities do not take place between the hours of 7:00 p.m. and 7:00 a.m. on weekdays, between the hours of 5:00 p.m. and 8:00 a.m. on Saturdays, or at any time on Sunday or a federal holiday." Therefore, construction noise associated with the proposed Project is considered exempt from the City's Noise Ordinance. Consistent with direction from the City of Riverside Planning Department, if Project construction activities occur within the permitted hours of Municipal Code, Section 7.35.010(B)(5), the construction noise levels will be considered exempt from the Municipal Code noise level standards, and therefore, the construction of the Project will result in a *less than significant* noise impact.

#### **CONSTRUCTION VIBRATION ANALYSIS**

At distances ranging from 45 to 609 feet from Project construction activity, construction vibration velocity levels are shown to range from 16.4 to 79.3 VdB at the nearby sensitive receiver locations, which will remain below the Federal Transit Administration (FTA) 80 VdB threshold for sensitive receiver locations. Therefore, the vibration impacts due to Project construction will be *less than significant.* 

Further, vibration levels at the site of the closest sensitive receiver are unlikely to be sustained during the entire construction period but will occur rather only during the times that heavy construction equipment is operating simultaneously adjacent to the Project site perimeter. Moreover, construction at the Project site will be restricted to daytime hours consistent with City requirements thereby eliminating potential vibration impacts during the sensitive nighttime hours.

#### SUMMARY OF CEQA SIGNIFICANCE FINDINGS

The results of this The Exchange Noise Impact Analysis are summarized below based on the significance criteria in Section 4 of this report consistent with Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1). Table ES-1 shows the findings of significance for each potential noise and/or vibration impact under CEQA before and after any required mitigation measures described below.



Anghais	Report	Significance Findings			
Analysis	Section	Unmitigated	Mitigated		
Off-Site Traffic Noise Levels	7	Less Than Significant	n/a		
On-Site Traffic Noise Levels	8	Potentially Significant	Less Than Significant		
Operational Noise Levels	10	Potentially Significant	Less Than Significant		
Construction Noise Levels	11	Less Than Significant	n/a		
Construction Vibration Levels	11	Less Than Significant	n/a		

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS







minimum STC ratings of 36 and a means of mechanical ventilation (e.g., air conditioning).

While not required, this noise study recommends an interior noise level design goal of 40 dBA CNEL for residential and hotel uses using upgraded windows and sliding glass doors (all windows on all floors) with a minimum STC rating of 40 for all buildings.



## 1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of the proposed The Exchange ("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 transportation noise analysis, and evaluates the future exterior noise environment. In addition, this study includes an analysis of the potential Project-related long-term operational noise and short-term construction noise and vibration impacts.

## **1.1** SITE LOCATION

The proposed The Exchange Project is located south of the Strong Street and east of Orange Street in the City of Riverside, as shown on Exhibit 1-A. The proposed Project is located approximately 200 feet west of the Interstate 215 (I-215) and State Route 91 (SR-91) interchange, and roughly 150 feet north of SR-60. The closest airport to the Project site is Flabob Airport which is located approximately 2.5 miles southwest of the Project site.

The Project site is currently vacant. Existing single-family residential are located west, north, east (across I-215), and south (across SR-60) of the Project site, and the Fremont Elementary School is located west across Orange Street from the Project site.

### **1.2 PROJECT DESCRIPTION**

The proposed mixed-use Project consists of multi-family residential dwelling units, multi-tenant commercial buildings, a vehicle fueling station, a drive-through restaurant, two hotels, a Recreational Vehicle (RV) overnight parking component, and on-site activities (e.g., farmers market, outdoor entertainment), as shown on Exhibit 1-B.

The residential portion of the Project will be constructed on approximately 18.4 acres on the northern half of the Project site and includes a total of 482 one-, two- and three- bedroom residential units in 21 three-story buildings. Project plans identify 479,773 square feet of residential space, resulting in a density of 26.2 dwelling units per acre. A total of 886 vehicle parking spaces are proposed for the residential use. The commercial/retail, vehicle fueling station, and drive-through restaurant portion of the Project would be located on approximately 7.6 acres on the southwest corner of the Project site and includes a total of 49,500 square feet of multi-tenant lease space for restaurant and commercial retail tenants spread across 8 single-story buildings. The retail areas would generally operate 12 to 15-hours a day, with the exception of the proposed gas station, which would operate 24-hours a day.

Two hotel buildings would be located on approximately 7.4 acres, near the southeast corner of the Project site. The proposed RV Parking is located in the southeast corner of the Project site, closest to the I-215/SR-60 interchange, adjacent to the proposed hotels. The RV Parking will contain 23 RV spaces and 23 vehicle stalls. The two, four-story hotels will total 130,000 square



feet and contain 229 guest rooms. The hotels will operate independently of each other. The hotels and RV Parking would operate 24-hours a day.

The proposed development includes provisions for live entertainment and events and a farmer's market to serve the proposed residences and surrounding community. The live entertainment would occur within the courtyard in the center of Buildings P1 through P4. The events would occur on occasion, on Fridays, Saturdays, or Sundays. Events could include a farmer's market, outdoor entertainment, car shows (demonstration only), and similar events.

The Project is proposed to consist of up to 482 apartments, two hotels totaling 229 rooms, 18,500 square feet (sf) of shopping center use, 22,000 sf of high turnover sit-down restaurant use, 4,000 square feet of fast-food restaurant with drive-through window use, and a 16-vehicle fueling position gas station with convenience market and car wash, as shown on Exhibit 1-B. The on-site Project-only operational noise sources are expected to include: roof-top air conditioning units, entry gates, a drive-through speakerphone, car wash air blowers, residential and commercial parking lot vehicle movements, and dog park, outdoor pool/spa, RV parking, gas station activities, and outdoor event activities.



EXHIBIT 1-A: LOCATION MAP



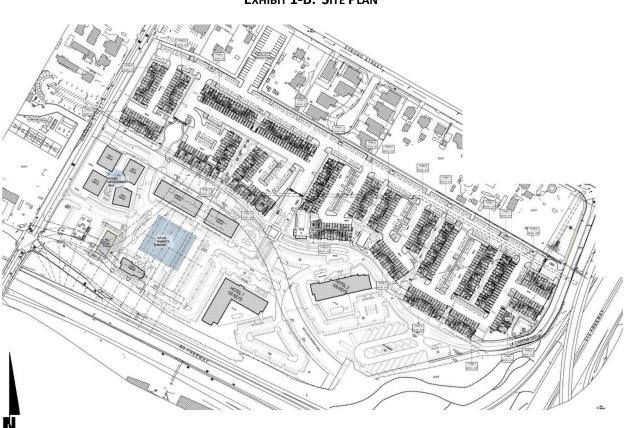


EXHIBIT 1-B: SITE PLAN



## 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. (6) 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. (7) 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 ( $L_{eq}$ ). Equivalent sound levels are not measured directly but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level ( $L_{eq}$ ) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period and is commonly used to describe the "average" noise levels within the environment.

Peak hour or average noise levels, while useful, do not completely describe a given noise environment. Noise levels lower than peak hour may be disturbing if they occur during times when quiet is most desirable, namely evening and nighttime (sleeping) hours. To account for this, the Community Noise Equivalent Level (CNEL), representing a composite 24-hour noise level is utilized. The CNEL is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time of day corrections require the addition of 5 decibels to dBA  $L_{eq}$  sound levels in the evening from 7:00 p.m. to 10:00 p.m., and the 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 City of Riverside relies on the 24-hour CNEL level to assess land use compatibility with transportation related noise sources.

## 2.3 SOUND PROPAGATION

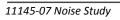
When sound propagates over a distance, it changes in level and frequency content. The way noise reduces with distance depends on the following factors.

### 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. (6)

### 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. (8)

#### 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. (6)

#### 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. (8)

### 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. (8)



### 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. (9)

#### 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. (10) 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. (10) 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*. (8)

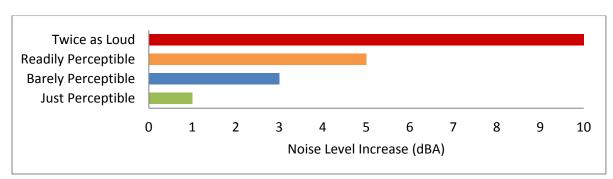


EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION

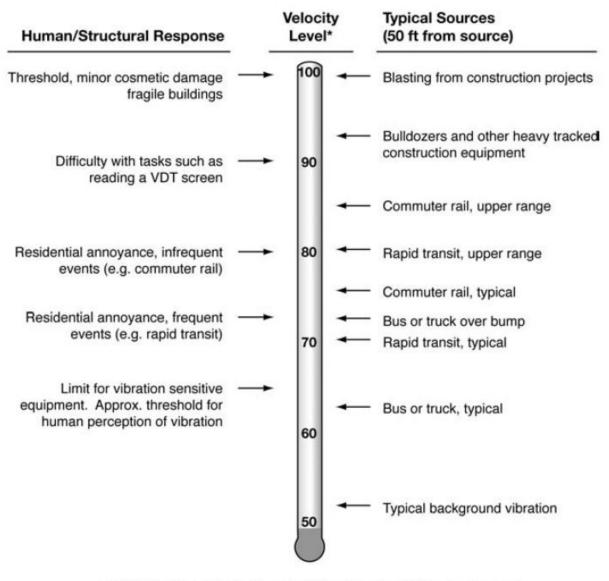
### 2.8 VIBRATION

Per the Federal Transit Administration (FTA) *Transit Noise Impact and Vibration Assessment* (11), 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<sup>-6</sup> inches/second

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



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

### 3.2 STATE OF CALIFORNIA BUILDING CODE

The State of California's noise insulation standards are codified in the California Code of Regulations, Title 24, Building Standards Administrative Code, Part 2, and the California Building Code. These noise standards are applied to new construction in California for the purpose of controlling interior noise levels resulting from exterior noise sources. The regulations specify that acoustical studies must be prepared when noise-sensitive structures, such as residential buildings, schools, or hospitals, are developed near major transportation noise sources, and where such noise sources create an exterior noise level of 60 dBA CNEL or higher. Acoustical studies that accompany building plans for noise-sensitive land uses must demonstrate that the structure has been designed to limit interior noise in habitable rooms to acceptable noise levels. For new residential buildings, schools, and hospitals, the acceptable interior noise limit for new construction is 45 dBA CNEL.

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. (13) 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  $L_{eq}$  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). Alternatively, if the interior noise levels of non-residential buildings satisfy the performance criteria of 50 dBA  $L_{eq}$  (1 hour), then the performance method as defined by the California's Green Building Standards Code can be used.

Since no interior noise level standards are identified in the City of Riverside General Plan Noise Element for commercial uses, this noise analysis relies on an interior noise level threshold of 50 dBA CNEL, consistent with the California Green Building Standards Code. The CNEL is used in place of a 1-hour L<sub>eq</sub> since it represents a more conservative analysis which applies the previously discussed (Section 2.2) CNEL adjustment factors to the evening and nighttime hours.

### 3.3 CITY OF RIVERSIDE GENERAL PLAN

The City of Riverside has adopted a Noise Element of the General Plan (3) to control and abate environmental noise, and to protect the citizens of the City of Riverside from excessive exposure to noise. The Noise Element specifies the maximum allowable unmitigated exterior noise levels for new developments impacted by transportation noise sources such as arterial roads, freeways, airports, and railroads. In addition, the Noise Element identifies several polices to minimize the impacts of excessive noise levels throughout the community and establishes noise level requirements for all land uses.

#### LAND USE COMPATIBILITY

The *Noise/Land Use Noise Compatibility Criteria* (Figure N-10) in the City of Riverside General Plan Noise Element provides guidelines to evaluate the land use compatibility of transportation related noise. The compatibility criteria, shown on Exhibit 3-A, provides the City with a planning tool to gauge the compatibility of land uses relative to existing and future exterior noise levels.

The Noise/Land Use Noise Compatibility Criteria describes categories of compatibility and not specific noise standards. According to these categories of compatibility, The Exchange residential uses are considered normally acceptable with unmitigated exterior noise levels below 60 dBA CNEL and conditionally acceptable with noise levels below 65 dBA CNEL. Commercial hotel land uses within the Project site are considered normally acceptable with exterior noise levels less than 60 dBA CNEL and conditionally acceptable with noise levels with noise levels of up to 70 dBA CNEL. Commercial business land uses are considered normally acceptable with exterior noise levels less than 65 dBA CNEL and conditionally acceptable with noise levels of up to 75 dBA CNEL. For conditionally acceptable land use, new construction or development should be undertaken only after a detailed analysis of noise reduction requirements is made and needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice.



Consistent with the land use compatibility guidelines, this noise study has been prepared to satisfy the land use compatibility criteria of the Noise Element as shown on Exhibit 3-A for each land use within the Project site. Further, interior noise level analysis for all land uses is based on the State of California Building Code interior noise levels discussed in Section 3.2 of 45 dBA CNEL for residential and hotel uses, and 50 dBA CNEL for commercial uses. This approach is consistent with Figure N-10 of the General Plan Noise Element.

iet suburban or no arterial	
streets within 1 block, no freeways within 1/4 mile. 55-65 dB Most somewhat noisy	
affic.	
ban areas near ways or	
isy urban	
nt to freeways ort traffic aring damage	
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onditionally nacceptable	
truction or develop- uld generally not be en, unless it can be ated that noise requirements can be to reduce noise o an acceptable level. Instruction or ent does proceed, a inalysis of noise requirements must be a needed noise features included in n.	
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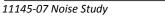
#### EXHIBIT 3-A: NOISE/LAND USE NOISE COMPATIBILITY CRITERIA

noise environment. They represent the constant A-weighted noise level that would be measured if all the sound energy received over the day were averaged. In order to account for the greater sensitivity of people to noise at night, the CNEL weighting includes a 5-decibel penalty on noise between 7:00 p.m. and 10:00 p.m. and a 10-decibel penalty on noise between 10:00 p.m. and 7:00 a.m. of the next day. The Ldn includes only the 10-decibel weighting for late-night noise events. For practical purposes, the two measures are equivalent for typical urban noise environments.

\* For properties located within airport influence areas, acceptable noise limits for single family residential uses are established by the Riverside County Airport Land Use Compatibility Plan.

SOURCE: STATE DEPARTMENT OF HEALTH,

AS MODIFIED BY THE CITY OF RIVERSIDE





### 3.4 OPERATIONAL NOISE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property such as The Exchange, operational noise that may include roof-top air conditioning units, entry gates, a drive-through speakerphone, car wash air blowers, residential and commercial parking lot vehicle movements, and dog park, outdoor pool/spa, RV parking, gas station activities, and outdoor event activities are typically evaluated against standards established under a City's Municipal Code.

For noise-sensitive residential properties, the Municipal Code identifies operational noise level limits for the daytime (7:00 a.m. to 10:00 p.m.) hours of 55 dBA  $L_{50}$  and 45 dBA  $L_{50}$  during the nighttime (10:00 p.m. to 7:00 a.m.) hours. (14) In addition, an exterior noise level standard of 60 dBA  $L_{50}$  is identified for both daytime and nighttime hours at community support land uses such as schools in the Project study area. Section 7.25.010 (A) indicates that these 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 ( $L_{25}$ ), or the standard plus 10 dBA for a cumulative period of more than 5 minutes in any hour ( $L_{2}$ ). The City of Riverside Municipal Code noise standards are shown on Table 3-1 and included in Appendix 3.1.

Land		Time	Exterior Noise Level Standards (dBA) <sup>1</sup>			
Jurisdiction	Land Use	Time Period	L <sub>50</sub> (30 mins)	L <sub>25</sub> (15 mins)	L <sub>8</sub> (5 mins)	L <sub>2</sub> (1 min)
	Residential	Daytime	55	60	65	70
City of Riverside <sup>2</sup>		Nighttime	45	50	55	60
	Community Support	Anytime	60	65	70	75

 TABLE 3-1: OPERATIONAL NOISE STANDARDS

 $^{1}$  The percent noise level is the level exceeded "n" percent of the time during the measurement period. L<sub>50</sub> is the noise level exceeded 50% of the time.

<sup>2</sup> Source: City of Riverside Municipal Code, Title 7 Noise Control, Section 7.25.010 (A) (Appendix 3.1).

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

#### **3.5 CONSTRUCTION NOISE STANDARDS**

Pursuant to Municipal Code Section 7.35.020 *Exemptions* subsection (G), "Noise sources associated with construction, repair, remodeling, or grading of any real property; provided a permit has been obtained from the City as required; and provided said activities do not take place between the hours of 7:00 p.m. and 7:00 a.m. on weekdays, between the hours of 5:00 p.m. and 8:00 a.m. on Saturdays, or at any time on Sunday or a federal holiday." Therefore, construction noise associated with the proposed Project is considered exempt from the City's Noise Ordinance. Consistent with direction from the City of Riverside Planning Department, if Project construction activities occur within the permitted hours of Municipal Code, Section 7.35.010(B)(5), the construction noise levels will be considered exempt from the Municipal Code noise level standards, and therefore, no analysis of construction noise levels is provided in this noise study.

#### **3.6 CONSTRUCTION VIBRATION STANDARDS**

The City of Riverside Municipal Code does not identify specific vibration standards for construction. Therefore, the construction-related vibration standards provided by the United States Department of Transportation Federal Transit Administration (FTA) are used in this analysis to assess the potential vibration impacts due to Project construction.

#### **3.6.1 FTA VIBRATION STANDARDS**

The United States Department of Transportation Federal Transit Administration (FTA) identifies guidelines (15) for maximum-acceptable vibration criteria for different types of land uses. These guidelines allow 80 VdB for residential uses and buildings where people normally sleep.

Construction activity can result in varying degrees of ground-borne vibration, depending on the equipment and methods used, distance to the affected structures and soil type. Construction vibration is generally associated with pile driving and rock blasting. Other construction equipment such as air compressors, light trucks, hydraulic loaders, etc., generates little or no ground vibration. Occasionally large bulldozers and loaded trucks can cause perceptible vibration levels at close proximity. While not enforceable regulations within the City of Riverside the FTA guidelines of 80 VdB for sensitive land uses provide the basis for determining the relative significance of potential Project related vibration impacts.



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## 4 SIGNIFICANCE CRITERIA

The following significance criteria are based on guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1) For the purposes of this report, impacts would be potentially significant if the Project results in or causes:

- A. 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 City of Riverside 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 closest airport to the Project site is Flabob Airport which is located approximately 2.5 miles southwest of the Project site, and therefore, the Project site is not located within two miles of a public airport or within an airport land use plan; nor is the Project within the vicinity of a private airstrip. As such, the Project site would not be exposed to excessive noise levels from airport operations, and therefore, impacts are considered *less than significant*, and no further noise analysis is conducted in relation to Guidelines E and F.

### 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.* (16) 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) (17) 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 (i.e., CNEL).

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 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		

Federal Interagency Committee on Noise (FICON), 1992.

#### 4.2 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, school, 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).

#### **ON-SITE TRAFFIC NOISE**

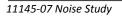
- If the on-site noise levels:
  - exceed the exterior land use compatibility criteria of the City of Riverside General Plan Noise Element, Figure N-10, for Project land uses; or
  - exceed an interior noise level of 45 dBA CNEL for residential and hotel uses, or 50 dBA CNEL for commercial uses within the Project site (State of California Building Code and Green Building Standards Code as discussed in Section 3.2).

#### **OPERATIONAL NOISE**

- If Project-related operational (stationary source) noise levels exceed the exterior 55 dBA L<sub>50</sub> daytime or 45 dBA L<sub>50</sub> nighttime noise level standards for sensitive residential land uses, or 60 dBA L<sub>50</sub> for community support uses. These standards shall not be exceeded for a cumulative period of 30 minutes (L<sub>50</sub>), or plus 5 dBA cannot be exceeded for a cumulative period of more than 15 minutes (L<sub>25</sub>) in any hour, or the standard plus 10 dBA for a cumulative period of more than 5 minutes (L<sub>8</sub>) in any hour, or the standard plus 15 dBA for a cumulative period of more than 1 minute (L<sub>2</sub>) in any hour (City of Riverside Municipal Code, Sections 7.25.010(A)); or
- If the existing ambient noise levels at the nearby noise-sensitive receivers near the Project site:
  - $\circ$  are less than 60 dBA L<sub>50</sub> and the Project creates a *readily perceptible* 5 dBA L<sub>50</sub> or greater Project-related noise level increase; or
  - range from 60 to 65 dBA L<sub>50</sub> and the Project creates a *barely perceptible* 3 dBA L<sub>50</sub> or greater Project-related noise level increase; or
  - $\circ~$  already exceed 65 dBA  $L_{50},$  and the Project creates a community noise level impact of greater than 1.5 dBA  $L_{50}$  (FICON, 1992).

#### CONSTRUCTION NOISE AND VIBRATION

- If Project-related construction activities occur anytime other than between the permitted hours of 7:00 a.m. to 7:00 p.m. on weekdays, or 8:00 a.m. to 5:00 p.m. on Saturdays, with no work allowed on Sundays or federal holidays (City of Riverside Municipal Code Section 7.35.010 (B) (5)).
- If short-term project generated construction source vibration levels exceed the FTA vibration standard of 80 vibration decibels (VdB) at noise-sensitive receiver locations.



Analysis	Receiving Land Use	Constitution (a)	Significance Criteria	
		Condition(s)	Daytime	Nighttime
Off-Site Traffic	Noise- Sensitive <sup>1</sup>	If ambient is < 60 dBA CNEL	≥ 5 dBA CNEL Project increase	
		If ambient is 60 - 65 dBA CNEL	≥ 3 dBA CNEL Project increase	
		If ambient is > 65 dBA CNEL	≥ 1.5 dBA CNEL Project increase	
On-Site Traffic <sup>2</sup>	Residential	Exterior Noise Level Criteria	See Exhibit 3-A	
		Interior Noise Level Standard	45 dBA CNEL	
	Hotel	Exterior Noise Level Criteria	See Exhibit 3-A	
		Interior Noise Level Standard	45 dBA CNEL	
	Commercial	Exterior Noise Level Criteria	See Exhibit 3-A	
		Interior Noise Level Standard	50 dBA CNEL	
Operational	Residential	Exterior Noise Level Standards <sup>3</sup>	See Table 3-1	
	Noise- Sensitive <sup>1</sup>	if ambient is < 60 dBA $L_{so}$	≥ 5 dBA L <sub>50</sub> Project increase	
		if ambient is 60 - 65 dBA L₅₀	≥ 3 dBA L <sub>50</sub> Project increase	
		if ambient is > 65 dBA $L_{so}$	≥ 1.5 dBA L <sub>50</sub> Project increase	
Construction <sup>4</sup>	Noise- Sensitive	Permitted hours of 7:00 a.m. to 7:00 p.m. on weekdays, or 8:00 a.m. to 5:00 p.m. on Saturdays, with no work allowed on Sundays or federal holidays		
		Vibration Level Standard <sup>5</sup>	80 VdB	

#### **TABLE 4-2: SIGNIFICANCE CRITERIA SUMMARY**

<sup>1</sup> Source: FICON, 1992.

<sup>2</sup> Source: City of Riverside General Plan Noise Element, Figure N-10 and the State of California Building Code standards (Section 3.2).

<sup>3</sup> Source: City of Riverside Municipal Code, Title 7 Noise Control, Section 7.25.010 (A) (Appendix 3.1).

<sup>4</sup> Source: City of Riverside Municipal Code, Section 7.35.020 consistent with direction from the City of Riverside Planning Department.

<sup>5</sup> Source: FTA Transit Noise and Vibration Impact Assessment.

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



## 5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, seven 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, October 18<sup>th</sup>, 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. (18)

## 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 any 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. (6)* 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. (11)

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

- Location L1 represents the noise levels at the Fremont Elementary School across Orange Street from the Project site. The noise level measurements collected show an overall 24-hour exterior noise level of 64.2 dBA CNEL. The hourly noise levels measured at location L1 ranged from 56.1 to 62.6 dBA L<sub>eq</sub> during the daytime hours and from 54.2 to 59.9 dBA L<sub>eq</sub> during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 58.6 dBA L<sub>eq</sub> with an average nighttime noise level of 57.2 dBA L<sub>eq</sub>.
- Location L2 represents the noise levels on Orange Street at the western Project site boundary near existing residential homes. The noise level measurements collected show an overall 24-hour exterior noise level of 69.4 dBA CNEL. The hourly noise levels measured at location L2 ranged from 63.3 to 70.7 dBA L<sub>eq</sub> during the daytime hours and from 56.1 to 65.2 dBA L<sub>eq</sub> during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 66.0 dBA L<sub>eq</sub> with an average nighttime noise level of 61.5 dBA L<sub>eq</sub>.
- Location L3 represents the noise levels on Strong Street north of Project site by near existing residential homes and a church. The 24-hour CNEL indicates that the overall exterior noise level is 66.7 dBA CNEL. At location L3 the background ambient noise levels ranged from 60.6 to 68.8 dBA L<sub>eq</sub> during the daytime hours to levels of 53.2 to 60.6 dBA L<sub>eq</sub> during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 65.7 dBA L<sub>eq</sub> with an average nighttime noise level of 57.3 dBA L<sub>eq</sub>.
- Location L4 represents the noise levels on Strong Street north of Project site by near existing residential homes. The noise level measurements collected show an overall 24-hour exterior noise level of 66.7 dBA CNEL. The hourly noise levels measured at location L4 ranged from 60.5 to 67.6 dBA L<sub>eq</sub> during the daytime hours and from 52.2 to 62.4 dBA L<sub>eq</sub> during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 64.2 dBA L<sub>eq</sub> with an average nighttime noise level of 58.2 dBA L<sub>eq</sub>.
- Location L5 represents the noise levels at the northeastern Project site boundary on La Cadena Drive near existing residential homes and Interstate 215. The noise level measurements collected show an overall 24-hour exterior noise level of 74.1 dBA CNEL. The hourly noise levels measured at location L5 ranged from 67.2 to 69.2 dBA L<sub>eq</sub> during the daytime hours and from 64.2 to 70.1 dBA L<sub>eq</sub> during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 68.2 dBA L<sub>eq</sub> with an average nighttime noise level of 67.2 dBA L<sub>eq</sub>.



- Location L6 represents the noise levels east of the Project site across Interstate 215 on Thornton Street near existing residential homes. The noise level measurements collected show an overall 24-hour exterior noise level of 71.3 dBA CNEL. The hourly noise levels measured at location L6 ranged from 65.2 to 67.4 dBA L<sub>eq</sub> during the daytime hours and from 61.2 to 67.0 dBA L<sub>eq</sub> during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 66.3 dBA L<sub>eq</sub> with an average nighttime noise level of 64.2 dBA L<sub>eq</sub>.
- Location L7 represents the noise levels south of the Project site on Russell Street near existing residential homes and commercial uses. The noise level measurements collected show an overall 24-hour exterior noise level of 82.2 dBA CNEL. The hourly noise levels measured at location L7 ranged from 75.4 to 80.8 dBA L<sub>eq</sub> during the daytime hours and from 70.9 to 77.7 dBA L<sub>eq</sub> during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 78.1 dBA L<sub>eq</sub> with an average nighttime noise level of 75.0 dBA L<sub>eq</sub>.

Table 5-1 provides the (energy average) noise levels used to describe the daytime and nighttime ambient conditions. These daytime and nighttime energy average noise levels represent the average of all hourly noise levels observed during these time periods expressed as a single number. Appendix 5.2 provides summary worksheets of the noise levels for each hour as well as the minimum, maximum, L<sub>1</sub>, L<sub>2</sub>, L<sub>5</sub>, L<sub>8</sub>, L<sub>25</sub>, L<sub>50</sub>, L<sub>90</sub>, L<sub>95</sub>, and L<sub>99</sub> 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 roadway network (e.g., SR-60 and I-215). The 24-hour existing noise level measurements shown on Table 5-1 present the existing ambient noise conditions.



Location <sup>1</sup>	Distance to Project	Description	Energy Average Hourly Noise Level (dBA L <sub>eq</sub> ) <sup>2</sup>		Average Noise (dBA	CNEL	
	Boundary (Feet)		Daytime	Nighttime	Daytime	Nighttime	
L1	220'	Located at the Fremont Elementary School across Orange Street from the Project site.	58.6	57.2	56.1	55.6	64.2
L2	0'	Located on Orange Street at the western Project site boundary near existing residential homes.	66.0	61.5	58.3	54.2	69.4
L3	320'	Located on Strong Street north of Project site by near existing residential homes and a church.	65.7	57.3	54.9	53.3	66.7
L4	270'	Located on Strong Street north of Project site by near existing residential homes.	64.2	58.3	52.5	51.7	66.7
L5	0'	Located at the northeastern Project site boundary on La Cadena Drive near existing residential homes and Interstate 215.	68.2	67.2	67.2	65.1	74.1
L6	390'	Located east of the Project site across Interstate 215 on Thornton Street near existing residential homes.	66.3	64.2	64.9	62.1	71.3
L7	860'	Located south of the Project site on Russell Street near existing residential homes and commercial uses.	78.1	75.0	74.4	71.8	82.2

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

<sup>1</sup> See Exhibit 5-A for the noise level measurement locations.

<sup>2</sup> The long-term 24-hour measurement worksheets are included in Appendix 5.2. "Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.





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



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# 6 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 estimated roadway noise impacts from vehicular traffic were calculated using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. (19) 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. (20) 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.

# 6.1.1 OFF-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

Table 6-1 presents the roadway parameters used to assess the Project's off-site transportation noise impacts. Table 6-1 identifies the 23 study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications per the City of Riverside General Plan Circulation Element, and the posted vehicle speeds. For this analysis, soft site conditions are used to analyze the traffic noise impacts within the Project study area. Soft site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. Caltrans' research has shown that the use of soft site conditions is appropriate for the application of the FHWA traffic noise prediction model as used in this off-site traffic noise analysis. (21)

The Existing, Opening Year 2022, and Horizon Year 2040 average daily traffic volumes used for this study are presented on Table 6-2 and are provided by *The Exchange Traffic Impact Analysis* prepared by Urban Crossroads, Inc. (2) Table 6-3 presents the time of day vehicle splits and Table 6-4 presents the traffic flow distributions (vehicle mix) used for this analysis. The vehicle mix provides the hourly distribution percentages of automobile, medium trucks, and heavy trucks for input into the FHWA noise prediction model.



ID	Roadway	Segment	Adjacent Land Use <sup>1</sup>	Distance from Centerline to Nearest Adjacent Land Use (Feet) <sup>2</sup>	Vehicle Speed (mph) <sup>3</sup>
1	Main St.	s/o Placentia Ln.	Business Park	50'	50
2	Main St.	n/o Columbia Av.	Residential	50'	50
3	Main St.	s/o Columbia Av.	Residential	50'	50
4	Main St.	n/o Strong St.	Residential	50'	45
5	Main St.	s/o Strong St.	Residential/School	50'	25
6	Main St.	n/o Russell St.	Commercial	50'	35
7	Main St.	s/o Russell St.	Residential	50'	35
8	Orange St.	n/o Columbia Av.	Residential	33'	35
9	Orange St.	s/o Columbia Av.	Residential	33'	35
10	Orange St.	n/o Strong St.	Residential	33'	35
11	Orange St.	s/o Strong St.	Residential	33'	35
12	Orange St.	n/o Russell St.	Residential	33'	35
13	Orange St.	s/o Russell St.	Residential	33'	35
14	Primer St.	n/o Columbia Av.	Commercial	33'	35
15	La Cadena Dr.	n/o I-215 Ramps	Business Park	33'	40
16	La Cadena Dr.	s/o I-215 Ramps	Commercial	33'	40
17	La Cadena Dr.	n/o Strong St.	Residential	33'	40
18	Placentia Ln.	e/o Main St.	Industrial	44'	25
19	Columbia Av.	e/o Orange St.	Residential	44'	45
20	Columbia Av.	e/o Primer St.	Commercial	44'	45
21	Strong St.	w/o Main St.	Residential	33'	25
22	Strong St.	e/o Main St.	Residential	33'	25
23	Russell St.	e/o Main St.	Residential	44'	35

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

<sup>1</sup> Source: Google Earth aerial imagery and the City of Riverside General Plan Land Use/Urban Design Element, Figure LU-10. <sup>2</sup> Distance to adjacent land use is based upon the right-of-way distances for each functional roadway classification provided in the City of Riverside General Plan Circulation Element.

<sup>3</sup> Source: The Exchange Traffic Impact Analysis, June 2018.



			Average Daily Traffic (1,000's) <sup>1</sup>							
ID	Roadway	Segment	Exis	ting	Openin 20	-	Horizon Year 2040			
			Without Project	With Project	Without Project	With Project	Without Project	With Project		
1	Main St.	s/o Placentia Ln.	14.7	15.6	42.7	43.6	44.7	45.6		
2	Main St.	n/o Columbia Av.	16.0	17.0	42.5	43.4	44.6	45.5		
3	Main St.	s/o Columbia Av.	13.5	14.8	40.8	42.0	42.9	44.1		
4	Main St.	n/o Strong St.	14.0	15.3	40.8	42.1	42.9	44.2		
5	Main St.	s/o Strong St.	13.8	14.3	40.4	41.0	42.6	43.2		
6	Main St.	n/o Russell St.	12.5	14.3	21.6	23.3	23.1	24.9		
7	Main St.	s/o Russell St.	10.3	11.0	21.0	21.6	23.1	23.7		
8	Orange St.	n/o Columbia Av.	3.7	3.9	4.6	4.8	4.8	5.0		
9	Orange St.	s/o Columbia Av.	4.3	5.0	7.8	8.5	10.7	11.4		
10	Orange St.	n/o Strong St.	5.1	6.1	7.7	8.7	8.6	9.6		
11	Orange St.	s/o Strong St.	6.0	8.5	8.3	10.7	8.9	11.4		
12	Orange St.	n/o Russell St.	5.8	8.1	7.0	9.4	9.1	11.4		
13	Orange St.	s/o Russell St.	3.7	4.2	4.2	4.7	5.8	6.3		
14	Primer St.	n/o Columbia Av.	8.7	9.5	24.3	25.1	26.5	27.3		
15	La Cadena Dr.	n/o I-215 Ramps	5.1	5.3	5.5	5.8	7.6	7.9		
16	La Cadena Dr.	s/o I-215 Ramps	2.0	3.7	2.2	3.9	2.6	4.3		
17	La Cadena Dr.	n/o Strong St.	2.0	3.7	2.0	3.9	2.4	4.3		
18	Placentia Ln.	e/o Main St.	3.2	3.4	9.1	9.4	14.7	14.9		
19	Columbia Av.	e/o Orange St.	9.5	10.1	28.9	29.4	31.4	31.9		
20	Columbia Av.	e/o Primer St.	16.8	18.1	31.3	32.6	34.6	35.9		
21	Strong St.	w/o Main St.	2.7	3.4	3.2	3.9	5.0	5.7		
22	Strong St.	e/o Main St.	2.5	4.0	3.0	4.5	4.8	6.2		
23	Russell St.	e/o Main St.	3.1	4.9	3.9	5.7	5.1	6.8		

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

<sup>1</sup> Source: The Exchange Traffic Impact Analysis, June 2018.

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

		Time of Day Splits <sup>1</sup>		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%

<sup>1</sup> Source: Typical Southern California vehicle mix. "Daytime" = 7:00 a.m. to 7:00 p.m.; "Evening" = 7:00 p.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.



Classification		Tatal		
Classification	Autos	Medium Trucks	Heavy Trucks	Total
SR-91 / I-215	89.10%	4.58%	6.32%	100.00%
SR-60	89.00%	6.59%	4.41%	100.00%
All Roadways <sup>2</sup>	97.42%	1.84%	0.74%	100.00%

<sup>1</sup> Source: Caltrans Traffic Data Branch Annual Average Daily Truck Traffic on the California Highways System, 2016.

<sup>2</sup> Source: Typical Southern California vehicle mix.

#### 6.1.2 ON-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

The on-site roadway parameters including the average daily traffic (ADT) volumes used for this study are presented on Table 6-5. The average daily traffic volumes for SR-91, I-215, and SR-60 are based on a 10-percent increase in existing volumes obtained from the Caltrans Traffic Data Branch Annual Average Daily Truck Traffic on the California Highways System 2016 data. Future traffic volumes on Orange Street are based on *The Exchange Traffic Impact Analysis* prepared by Urban Crossroads, Inc. (2) Soft site conditions were used to analyze the traffic noise impacts within the Project study area which account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. Research by Caltrans shows that the use of soft site conditions is appropriate for the application of the FHWA traffic noise prediction model used in this analysis. (21)

As previously described, Table 6-3 presents the time of day vehicle splits and Table 6-4 presents the traffic flow distributions (vehicle mix) used for this analysis. The vehicle mix provides the hourly distribution percentages of automobile, medium trucks, and heavy trucks for input into the FHWA noise prediction model.

Roadway Segment	Lanes	Classification	Future ADT Volume <sup>1</sup>	Vehicle Speed (mph)²	Site Conditions
SR-91/I-215	10	Freeway	187,000	70	Soft
SR-60	10	Freeway	187,000	70	Soft
Orange St.	2	Collector	12,500	35	Soft

#### TABLE 6-5: ON-SITE ROADWAY PARAMETERS

<sup>1</sup> Freeway volumes are based on a 10-percent increase in existing volumes obtained from the Caltrans Traffic Data Branch Annual Average Daily Truck Traffic on the California Highways System, 2016. Roadway capacity volume for Orange Street are based on The Exchange Traffic Impact Analysis, June 2018.

<sup>2</sup> Freeway speeds are based on a conservative 5 mph above the posted speed limit of 65 mph, and the posted speed limit is used for Orange Street per The Exchange Traffic Impact Analysis, June 2018.

"ADT" = Average Daily Traffic



The site plan is used to identify the relationship between the roadway centerline elevation, the pad elevation and the centerline distance to any intervening noise barriers, and the building façade. The exterior noise level impacts were placed five feet above the pad elevation at the proposed building façade for first-floor level analysis. All second-floor receivers were located 14 feet above the proposed finished floor elevation; third floor receivers (apartments, hotels) were located at 23 feet, and fourth floor receivers (hotels) were located at 32 feet.

# 6.2 CONSTRUCTION VIBRATION ASSESSMENT METHODOLOGY

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-generated vibration levels are 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 6-6. 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 method defined by the FTA. (11) To describe the potential vibration levels capable of causing building damage the FTA provides the following equation:  $L_{VdB}(D) = L_{VdB}(25 \text{ ft}) - 30\log(D/25)$ 

Equipment	Vibration Decibels (VdB) at 25 feet
Small bulldozer	58
Jackhammer	79
Loaded Trucks	86
Large bulldozer	87

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

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# 7 OFF-SITE TRANSPORTATION NOISE IMPACTS

To assess the off-site transportation CNEL noise level impacts associated with development of the proposed Project, noise contours were developed based on *The Exchange 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 Conditions Without / With Project</u>: This scenario refers to the existing present-day noise conditions without and with the proposed Project.
- <u>Opening Year 2022 Without / With Buildout of the Project</u>: This scenario refers to Year 2022 noise conditions without and with Buildout of the proposed Project. This scenario includes all cumulative projects identified in the Traffic Impact Analysis.
- <u>Horizon Year 2040 Without / With Project</u>: This scenario refers to the background noise conditions at future Year 2040 without and with the proposed Project. This scenario corresponds to 2040 conditions, and includes all cumulative projects identified in the Traffic Impact Analysis.

# 7.1 TRAFFIC NOISE CONTOURS

Noise contours were used to assess the Project's incremental traffic-related noise impacts at land uses adjacent to roadways conveying Project traffic. The noise contours represent the distance to noise levels of a constant value and are measured from the center of the roadway for the 70, 65, and 60 dBA noise levels. The noise contours do not consider the effect of any existing noise barriers or topography that may attenuate ambient noise levels. In addition, because the noise contours reflect modeling of vehicular noise on area roadways, they appropriately do not reflect noise contributions from the surrounding stationary noise sources within the Project study area. Tables 7-1 and 7-6 present a summary of the exterior traffic noise levels, without barrier attenuation, for the 23 study area roadway segments analyzed from the without Project to the with Project conditions under Existing, Opening Year 2022, and Horizon Year 2040 conditions. Appendix 7.1 includes a summary of the traffic noise level contours for each of the traffic scenarios.



	Road		Adjacent	CNEL at Nearest	Distance to Contour from Centerline (Feet)		
ID		Segment	Land Use <sup>1</sup>	Adjacent Land Use (dBA) <sup>2</sup>	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Main St.	s/o Placentia Ln.	Business Park	69.7	RW	103	222
2	Main St.	n/o Columbia Av.	Residential	70.1	51	109	235
3	Main St.	s/o Columbia Av.	Residential	69.3	RW	97	210
4	Main St.	n/o Strong St.	Residential	68.4	RW	84	180
5	Main St.	s/o Strong St.	Residential/School	62.1	RW	RW	69
6	Main St.	n/o Russell St.	Commercial	65.2	RW	51	111
7	Main St.	s/o Russell St.	Residential	64.3	RW	RW	97
8	Orange St.	n/o Columbia Av.	Residential	62.2	RW	RW	46
9	Orange St.	s/o Columbia Av.	Residential	62.9	RW	RW	51
10	Orange St.	n/o Strong St.	Residential	63.6	RW	RW	57
11	Orange St.	s/o Strong St.	Residential	64.3	RW	RW	64
12	Orange St.	n/o Russell St.	Residential	64.2	RW	RW	63
13	Orange St.	s/o Russell St.	Residential	62.2	RW	RW	46
14	Primer St.	n/o Columbia Av.	Commercial	65.9	RW	38	82
15	La Cadena Dr.	n/o I-215 Ramps	Business Park	65.0	RW	33	71
16	La Cadena Dr.	s/o I-215 Ramps	Commercial	61.0	RW	RW	38
17	La Cadena Dr.	n/o Strong St.	Residential	61.0	RW	RW	38
18	Placentia Ln.	e/o Main St.	Industrial	56.8	RW	RW	RW
19	Columbia Av.	e/o Orange St.	Residential	67.6	RW	66	142
20	Columbia Av.	e/o Primer St.	Commercial	70.1	45	96	208
21	Strong St.	w/o Main St.	Residential	57.4	RW	RW	RW
22	Strong St.	e/o Main St.	Residential	57.1	RW	RW	RW
23	Russell St.	e/o Main St.	Residential	60.1	RW	RW	45

TABLE 7-1: EXISTING WITHOUT PROJECT CONDITIONS NOISE CONTOURS

<sup>2</sup> 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.



	Road		Adjacent	CNEL at Nearest	Distance to Contour from Centerline (Feet)		
ID		Segment	Land Use <sup>1</sup>	Adjacent Land Use (dBA) <sup>2</sup>	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Main St.	s/o Placentia Ln.	Business Park	70.0	50	107	231
2	Main St.	n/o Columbia Av.	Residential	70.3	53	114	245
3	Main St.	s/o Columbia Av.	Residential	69.7	RW	104	223
4	Main St.	n/o Strong St.	Residential	68.7	RW	89	191
5	Main St.	s/o Strong St.	Residential/School	62.3	RW	RW	71
6	Main St.	n/o Russell St.	Commercial	65.8	RW	56	121
7	Main St.	s/o Russell St.	Residential	64.6	RW	RW	102
8	Orange St.	n/o Columbia Av.	Residential	62.4	RW	RW	48
9	Orange St.	s/o Columbia Av.	Residential	63.5	RW	RW	57
10	Orange St.	n/o Strong St.	Residential	64.4	RW	RW	65
11	Orange St.	s/o Strong St.	Residential	65.8	RW	37	81
12	Orange St.	n/o Russell St.	Residential	65.6	RW	36	78
13	Orange St.	s/o Russell St.	Residential	62.8	RW	RW	50
14	Primer St.	n/o Columbia Av.	Commercial	66.3	RW	40	87
15	La Cadena Dr.	n/o I-215 Ramps	Business Park	65.2	RW	34	73
16	La Cadena Dr.	s/o I-215 Ramps	Commercial	63.6	RW	RW	58
17	La Cadena Dr.	n/o Strong St.	Residential	63.6	RW	RW	58
18	Placentia Ln.	e/o Main St.	Industrial	57.0	RW	RW	RW
19	Columbia Av.	e/o Orange St.	Residential	67.9	RW	69	148
20	Columbia Av.	e/o Primer St.	Commercial	70.4	47	101	218
21	Strong St.	w/o Main St.	Residential	58.4	RW	RW	RW
22	Strong St.	e/o Main St.	Residential	59.1	RW	RW	RW
23	Russell St.	e/o Main St.	Residential	62.1	RW	RW	60

TABLE 7-2: EXISTING WITH PROJECT CONDITIONS NOISE CONTOURS



	Road		Adjacent	CNEL at Nearest	Distance to Contour from Centerline (Feet)		
ID		Segment	Land Use <sup>1</sup>	Adjacent Land Use (dBA) <sup>2</sup>	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Main St.	s/o Placentia Ln.	Business Park	74.3	97	210	452
2	Main St.	n/o Columbia Av.	Residential	74.3	97	209	451
3	Main St.	s/o Columbia Av.	Residential	74.1	95	204	439
4	Main St.	n/o Strong St.	Residential	73.0	79	171	368
5	Main St.	s/o Strong St.	Residential/School	66.8	RW	66	142
6	Main St.	n/o Russell St.	Commercial	67.5	RW	74	159
7	Main St.	s/o Russell St.	Residential	67.4	RW	73	156
8	Orange St.	n/o Columbia Av.	Residential	63.2	RW	RW	54
9	Orange St.	s/o Columbia Av.	Residential	65.5	RW	35	76
10	Orange St.	n/o Strong St.	Residential	65.4	RW	35	76
11	Orange St.	s/o Strong St.	Residential	65.7	RW	37	80
12	Orange St.	n/o Russell St.	Residential	65.0	RW	33	71
13	Orange St.	s/o Russell St.	Residential	62.8	RW	RW	50
14	Primer St.	n/o Columbia Av.	Commercial	70.4	35	76	163
15	La Cadena Dr.	n/o I-215 Ramps	Business Park	65.4	RW	35	75
16	La Cadena Dr.	s/o I-215 Ramps	Commercial	61.4	RW	RW	41
17	La Cadena Dr.	n/o Strong St.	Residential	61.0	RW	RW	38
18	Placentia Ln.	e/o Main St.	Industrial	61.3	RW	RW	54
19	Columbia Av.	e/o Orange St.	Residential	72.5	64	138	298
20	Columbia Av.	e/o Primer St.	Commercial	72.8	68	146	315
21	Strong St.	w/o Main St.	Residential	58.1	RW	RW	RW
22	Strong St.	e/o Main St.	Residential	57.8	RW	RW	RW
23	Russell St.	e/o Main St.	Residential	61.1	RW	RW	52



				Adjacent	CNEL at Nearest	Distance to Contour from Centerline (Feet)		
ID	Road	Dad Segment Adjacent Land Use <sup>1</sup>		Adjacent Land Use (dBA) <sup>2</sup>	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	
1	Main St.	s/o Placentia Ln.	Business Park	74.4	99	213	459	
2	Main St.	n/o Columbia Av.	Residential	74.4	99	212	457	
3	Main St.	s/o Columbia Av.	Residential	74.3	96	208	447	
4	Main St.	n/o Strong St.	Residential	73.1	81	174	376	
5	Main St.	s/o Strong St.	Residential/School	66.9	RW	67	143	
6	Main St.	n/o Russell St.	Commercial	67.9	RW	78	168	
7	Main St.	s/o Russell St.	Residential	67.5	RW	74	159	
8	Orange St.	n/o Columbia Av.	Residential	63.4	RW	RW	55	
9	Orange St.	s/o Columbia Av.	Residential 65.8		RW	37	81	
10	Orange St.	n/o Strong St.	Residential 65.9		RW	38	82	
11	Orange St.	s/o Strong St.	Residential 6		RW	44	94	
12	Orange St.	n/o Russell St.	Residential		RW	40	86	
13	Orange St.	s/o Russell St.	ssell St. Residential 63.3		RW	RW	54	
14	Primer St.	n/o Columbia Av.	Commercial	70.5		77	166	
15	La Cadena Dr.	n/o I-215 Ramps	Business Park	65.6	RW	36	78	
16	La Cadena Dr.	s/o I-215 Ramps	Commercial	63.9	RW	RW	60	
17	La Cadena Dr.	n/o Strong St.	Residential	63.9	RW	RW	60	
18	Placentia Ln.	e/o Main St.	Industrial	61.4	RW	RW	55	
19	Columbia Av.	e/o Orange St.	Residential	72.5	65	140	302	
20	Columbia Av.	e/o Primer St.	Commercial	73.0	70	150	323	
21	Strong St.	w/o Main St.	Residential	59.0	RW	RW	RW	
22	Strong St.	e/o Main St.	Residential	59.6	RW	RW	RW	
23	Russell St.	e/o Main St.	Residential	62.7	RW	RW	67	



			Adiacent	CNEL at Nearest	Distance to Contour from Centerline (Feet)		
ID	Road	d Segment Adjacent Land Use <sup>1</sup>		Adjacent Land Use (dBA) <sup>2</sup>	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Main St.	s/o Placentia Ln.	Business Park 74.5		100	216	466
2	Main St.	n/o Columbia Av.	Residential	74.5	100	216	466
3	Main St.	s/o Columbia Av.	Residential	74.4	98	211	454
4	Main St.	n/o Strong St.	Residential	73.2	82	177	380
5	Main St.	s/o Strong St.	Residential/School	67.0	RW	68	147
6	Main St.	n/o Russell St.	Commercial	67.8	RW	77	167
7	Main St.	s/o Russell St.	Residential	67.8	RW	77	167
8	Orange St.	n/o Columbia Av.	Residential	63.4	RW	RW	55
9	Orange St.	s/o Columbia Av.	Residential	66.8		44	94
10	Orange St.	n/o Strong St.	Residential	65.9	RW	38	81
11	Orange St.	s/o Strong St.	Residential	66.0	RW	39	83
12	Orange St.	n/o Russell St.	Residential 66.1		RW	39	85
13	Orange St.	s/o Russell St.	Residential	64.2	RW	RW	63
14	Primer St.	n/o Columbia Av.	Commercial	70.8	37	80	172
15	La Cadena Dr.	n/o I-215 Ramps	Business Park	66.8	RW	43	93
16	La Cadena Dr.	s/o I-215 Ramps	Commercial	62.1	RW	RW	46
17	La Cadena Dr.	n/o Strong St.	Residential	61.8	RW	RW	43
18	Placentia Ln.	e/o Main St.	Industrial	63.4	RW	RW	74
19	Columbia Av.	e/o Orange St.	Residential	72.8	68	146	315
20	Columbia Av.	e/o Primer St.	Commercial	73.3	72	156	336
21	Strong St.	w/o Main St.	Residential	60.1	RW	RW	33
22	Strong St.	e/o Main St.	Residential	59.9	RW	RW	RW
23	Russell St.	e/o Main St.	Residential	62.2	RW	RW	62



			Adiacent	CNEL at Nearest	Distance to Contour from Centerline (Feet)		
ID	Road	Segment	Adiacent		70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Main St.	s/o Placentia Ln.	Business Park 74.6		102	219	473
2	Main St.	n/o Columbia Av.	Residential	74.6	102	219	472
3	Main St.	s/o Columbia Av.	Residential	74.5	100	215	462
4	Main St.	n/o Strong St.	Residential	73.3	84	180	388
5	Main St.	s/o Strong St.	Residential/School	67.1	RW	69	149
6	Main St.	n/o Russell St.	Commercial	68.2	RW	81	175
7	Main St.	s/o Russell St.	Residential	68.0	RW	79	169
8	Orange St.	n/o Columbia Av.	Residential	63.5	RW	RW	57
9	Orange St.	s/o Columbia Av.	Residential	67.1	RW	46	98
10	Orange St.	n/o Strong St.	Residential	66.4	RW	41	88
11	Orange St.	s/o Strong St.	Residential	67.1	RW	46	98
12	Orange St.	n/o Russell St.	Residential	esidential 67.1		46	98
13	Orange St.	s/o Russell St.	Residential	64.5	RW	RW	66
14	Primer St.	n/o Columbia Av.	Commercial	70.9	38	82	176
15	La Cadena Dr.	n/o I-215 Ramps	Business Park	66.9	RW	44	96
16	La Cadena Dr.	s/o I-215 Ramps	Commercial	64.3	RW	RW	64
17	La Cadena Dr.	n/o Strong St.	Residential	64.3	RW	RW	64
18	Placentia Ln.	e/o Main St.	Industrial	63.4	RW	RW	75
19	Columbia Av.	e/o Orange St.	Residential	72.9	69	148	319
20	Columbia Av.	e/o Primer St.	Commercial	73.4	74	160	345
21	Strong St.	w/o Main St.	Residential	60.6	RW	RW	36
22	Strong St.	e/o Main St.	Residential	61.0	RW	RW	38
23	Russell St.	e/o Main St.	Residential	63.5	RW	RW	75

TABLE 7-6: HORIZON YEAR 2040 WITH PROJECT CONDITIONS NOISE CONTOURS



# 7.2 EXISTING CONDITION PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-1 presents the Existing without Project conditions CNEL noise levels. The without Project exterior noise levels are expected to range from 56.8 to 70.1 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 57.0 to 70.4 dBA CNEL. As shown on Table 7-7 the Project will generate a noise level increase of up to 2.7 dBA CNEL on the study area roadway segments. Based on the significance criteria in Section 4, the Project-related noise level increases are considered *less than significant* under Existing with Project conditions at the land uses adjacent to roadways conveying Project traffic.

ID	Road	Segment	Adjacent Land Use <sup>1</sup>	CN La	Threshold Exceeded? <sup>3</sup>		
			Land Use	No Project	With Project	Project Addition	Exceeded:
1	Main St.	s/o Placentia Ln.	Business Park	69.7	70.0	0.3	No
2	Main St.	n/o Columbia Av.	Residential	70.1	70.3	0.3	No
3	Main St.	s/o Columbia Av.	Residential	69.3	69.7	0.4	No
4	Main St.	n/o Strong St.	Residential	68.4	68.7	0.4	No
5	Main St.	s/o Strong St.	Residential/School	62.1	62.3	0.2	No
6	Main St.	n/o Russell St.	Commercial	65.2	65.8	0.6	No
7	Main St.	s/o Russell St.	Residential	64.3	64.6	0.3	No
8	Orange St.	n/o Columbia Av.	Residential	62.2	62.4	0.2	No
9	Orange St.	s/o Columbia Av.	Residential	62.9	63.5	0.7	No
10	Orange St.	n/o Strong St.	Residential	63.6	64.4	0.8	No
11	Orange St.	s/o Strong St.	Residential	64.3	65.8	1.5	No
12	Orange St.	n/o Russell St.	Residential	64.2	65.6	1.5	No
13	Orange St.	s/o Russell St.	Residential	62.2	62.8	0.6	No
14	Primer St.	n/o Columbia Av.	Commercial	65.9	66.3	0.4	No
15	La Cadena Dr.	n/o I-215 Ramps	Business Park	65.0	65.2	0.2	No
16	La Cadena Dr.	s/o I-215 Ramps	Commercial	61.0	63.6	2.7	No
17	La Cadena Dr.	n/o Strong St.	Residential	61.0	63.6	2.7	No
18	Placentia Ln.	e/o Main St.	Industrial	56.8	57.0	0.3	No
19	Columbia Av.	e/o Orange St.	Residential	67.6	67.9	0.3	No
20	Columbia Av.	e/o Primer St.	Commercial	70.1	70.4	0.3	No
21	Strong St.	w/o Main St.	Residential	57.4	58.4	1.0	No
22	Strong St.	e/o Main St.	Residential	57.1	59.1	2.0	No
23	Russell St.	e/o Main St.	Residential	60.1	62.1	2.0	No

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

<sup>1</sup>Source: Google Earth aerial imagery and the City of Riverside General Plan Land Use/Urban Design Element, Figure LU-10.

<sup>2</sup> 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. <sup>3</sup> Significance Criteria (Section 4).



# 7.3 OPENING YEAR 2022 PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-3 presents the Opening Year 2022 without Project conditions CNEL noise levels which are expected to range from 57.8 to 74.3 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-4 shows the Opening Year 2022 with Project conditions will range from 59.0 to 74.4 dBA CNEL. As shown on Table 7-8 the Project will generate a noise level increase of up to 2.9 dBA CNEL on the study area roadway segments. Based on the significance criteria in Section 4, the Project-related noise level increases are considered *less than significant* under Opening Year 2022 with Project conditions at the land uses adjacent to roadways conveying Project traffic.

ID	Road	Segment	Adjacent Land Use <sup>1</sup>	CN La	Threshold Exceeded? <sup>2</sup>		
				No Project	With Project	Project Addition	
1	Main St.	s/o Placentia Ln.	Business Park	74.3	74.4	0.1	No
2	Main St.	n/o Columbia Av.	Residential	74.3	74.4	0.1	No
3	Main St.	s/o Columbia Av.	Residential	74.1	74.3	0.1	No
4	Main St.	n/o Strong St.	Residential	73.0	73.1	0.1	No
5	Main St.	s/o Strong St.	Residential/School	66.8	66.9	0.1	No
6	Main St.	n/o Russell St.	Commercial	67.5	67.9	0.3	No
7	Main St.	s/o Russell St.	Residential	67.4	67.5	0.1	No
8	Orange St.	n/o Columbia Av.	Residential	63.2	63.4	0.2	No
9	Orange St.	s/o Columbia Av.	Residential	65.5	65.8	0.4	No
10	Orange St.	n/o Strong St.	Residential	65.4	65.9	0.5	No
11	Orange St.	s/o Strong St.	Residential	65.7	66.8	1.1	No
12	Orange St.	n/o Russell St.	Residential	65.0	66.3	1.3	No
13	Orange St.	s/o Russell St.	Residential	62.8	63.3	0.5	No
14	Primer St.	n/o Columbia Av.	Commercial	70.4	70.5	0.1	No
15	La Cadena Dr.	n/o I-215 Ramps	Business Park	65.4	65.6	0.2	No
16	La Cadena Dr.	s/o I-215 Ramps	Commercial	61.4	63.9	2.5	No
17	La Cadena Dr.	n/o Strong St.	Residential	61.0	63.9	2.9	No
18	Placentia Ln.	e/o Main St.	Industrial	61.3	61.4	0.1	No
19	Columbia Av.	e/o Orange St.	Residential	72.5	72.5	0.1	No
20	Columbia Av.	e/o Primer St.	Commercial	72.8	73.0	0.2	No
21	Strong St.	w/o Main St.	Residential	58.1	59.0	0.9	No
22	Strong St.	e/o Main St.	Residential	57.8	59.6	1.8	No
23	Russell St.	e/o Main St.	Residential	61.1	62.7	1.6	No

#### TABLE 7-8: OPENING YEAR 2022 OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS

<sup>1</sup>Source: Google Earth aerial imagery and the City of Riverside General Plan Land Use/Urban Design Element, Figure LU-10.

<sup>2</sup> 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. <sup>3</sup> Significance Criteria (Section 4).



# 7.4 HORIZON YEAR 2040 PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-5 presents the Horizon Year 2040 without Project conditions CNEL noise levels are expected to range from 59.9 to 74.5 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-6 shows the Horizon Year 2040 with Project conditions will range from 60.6 to 74.6 dBA CNEL. As shown on Table 7-9 the Project will generate a noise level increase of up to 2.5 dBA CNEL on the study area roadway segments. Based on the significance criteria in Section 4, the Project-related noise level increases are considered *less than significant* under Horizon Year 2040 with Project conditions at the land uses adjacent to roadways conveying Project traffic.

ID	Road	Segment	Adjacent Land Use <sup>1</sup>	CN La	Threshold Exceeded? <sup>2</sup>		
				No Project	With Project	Project Addition	
1	Main St.	s/o Placentia Ln.	Business Park	74.5	74.6	0.1	No
2	Main St.	n/o Columbia Av.	Residential	74.5	74.6	0.1	No
3	Main St.	s/o Columbia Av.	Residential	74.4	74.5	0.1	No
4	Main St.	n/o Strong St.	Residential	73.2	73.3	0.1	No
5	Main St.	s/o Strong St.	Residential/School	67.0	67.1	0.1	No
6	Main St.	n/o Russell St.	Commercial	67.8	68.2	0.3	No
7	Main St.	s/o Russell St.	Residential	67.8	68.0	0.1	No
8	Orange St.	n/o Columbia Av.	Residential	63.4	63.5	0.2	No
9	Orange St.	s/o Columbia Av.	Residential	66.8	67.1	0.3	No
10	Orange St.	n/o Strong St.	Residential	65.9	66.4	0.5	No
11	Orange St.	s/o Strong St.	Residential	66.0	67.1	1.1	No
12	Orange St.	n/o Russell St.	Residential	66.1	67.1	1.0	No
13	Orange St.	s/o Russell St.	Residential	64.2	64.5	0.4	No
14	Primer St.	n/o Columbia Av.	Commercial	70.8	70.9	0.1	No
15	La Cadena Dr.	n/o I-215 Ramps	Business Park	66.8	66.9	0.2	No
16	La Cadena Dr.	s/o I-215 Ramps	Commercial	62.1	64.3	2.2	No
17	La Cadena Dr.	n/o Strong St.	Residential	61.8	64.3	2.5	No
18	Placentia Ln.	e/o Main St.	Industrial	63.4	63.4	0.1	No
19	Columbia Av.	e/o Orange St.	Residential	72.8	72.9	0.1	No
20	Columbia Av.	e/o Primer St.	Commercial	73.3	73.4	0.2	No
21	Strong St.	w/o Main St.	Residential	60.1	60.6	0.6	No
22	Strong St.	e/o Main St.	Residential	59.9	61.0	1.1	No
23	Russell St.	e/o Main St.	Residential	62.2	63.5	1.2	No

#### TABLE 7-9: HORIZON YEAR 2040 OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS

<sup>1</sup>Source: Google Earth aerial imagery and the City of Riverside General Plan Land Use/Urban Design Element, Figure LU-10.

<sup>2</sup> 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. <sup>3</sup> Significance Criteria (Section 4).



# 8 ON-SITE NOISE IMPACTS

A noise impact analysis has been completed to determine the noise exposure levels that would result from off-site transportation noise sources, and to identify potential noise mitigation measures that would achieve acceptable Project exterior and interior noise levels. The primary source of traffic noise affecting the Project site is anticipated to be from SR-91, I-215, SR-60, and Orange Street. The Project would also be exposed to nominal traffic noise from the Project's internal local streets. However, due to the distance, topography and low traffic volume/speed, traffic noise from these roads will not make a substantive contribution to ambient noise conditions. This section analyzes on-site exterior and interior noise levels at the Project building.

# 8.1 EXTERIOR NOISE ANALYSIS

Using the FHWA traffic noise prediction model, and the parameters outlined in Section 6, the expected future exterior noise levels at the first to fourth floor building façades were calculated. Table 6-1 presents a summary of future exterior noise level impacts at the first-floor receiver locations. The on-site transportation noise level impacts indicate that the unmitigated exterior noise levels will range from 61.7 to 78.2 dBA CNEL. The on-site traffic noise analysis calculations are provided in Appendix 8.1.

No exterior noise mitigation is required to satisfy the City of Riverside General Plan Noise Element exterior land use/noise level compatibility criteria for residential, hotel, RV, and commercial uses. Adjacent to SR-91, I-215, and SR-60, residential uses are shown to experience *conditionally acceptable* exterior noise levels of up to 61.7 dBA CNEL, hotel and RV uses are shown to experience *normally unacceptable* exterior noise levels ranging from 71.5 to 78.2 dBA CNEL, and commercial uses are shown to experience *conditionally acceptable* exterior noise levels of up to 65.4 dBA CNEL. Adjacent to Orange Street, however, commercial, and residential uses are shown to experience *normally acceptable* and *conditionally acceptable* exterior noise levels, respectively. Therefore, because of the future unmitigated exterior traffic noise levels at the Project site, additional interior noise analysis is required to satisfy the General Plan Noise Element Figure N-10 *conditionally acceptable* residential and *normally unacceptable* hotel use requirements within the Project site. (3)



The Exchange Noise Impact Analysis

Commercial (Hotel)Severe SevereIndividualCombined AcceptableNormally MomallyNormally MacceptableNormally <br< th=""><th>Receiver Location</th><th>Land Lse<sup>1</sup></th><th>Traffic Noise</th><th>Unmitigat Noise Level</th><th>Unmitigated Exterior Noise Level (dBA CNEL)</th><th>Compatil</th><th>Noise/Land Use Compatibility Criteria (dBA CNEL)<sup>2</sup></th><th>e IBA CNEL)<sup>2</sup></th><th>Land Use Comnatibility</th><th>Compatibility Requirements<sup>2</sup></th></br<>	Receiver Location	Land Lse <sup>1</sup>	Traffic Noise	Unmitigat Noise Level	Unmitigated Exterior Noise Level (dBA CNEL)	Compatil	Noise/Land Use Compatibility Criteria (dBA CNEL) <sup>2</sup>	e IBA CNEL) <sup>2</sup>	Land Use Comnatibility	Compatibility Requirements <sup>2</sup>
$ \left. \begin{array}{c c c c c c } \hline \  \  \  \  \  \  \  \  \  \  \  \  \$		2	Source	Individual	Combined	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable		
	East	-	SR-91/I-215	61.2					Conditionally	Interior Analvsis &
	Apartment Buildings	Residential	SR-60	51.5	61.7	< 60	60 - 65	65 - 70	Acceptable	Mech. Ventilation
(Hotel)SR-6071.471.370.300.7000.70UnacceptableCommercialSR-91/1-21550.178.250.178.26070.80Unacceptable(Hotel)SR-6078.278.265.465.465.757.570.80UnacceptableCommercial (Business)SR-6057.265.465.465.757.5575AcceptableCommercial (Business)SR-6057.265.465.456.757.575AcceptableCommercial (Business)Orange St.61.462.856.75575575AcceptableResidentialOrange St.61.462.963.6557.557575AcceptableResidentialOrange St.61.462.963.6557.757575Acceptable	East Hotel	Commercial	SR-91/I-215	52.2	71 5	03 ^	UL UJ	08 02	Normally	Interior Analysis &
$ \left. \begin{array}{c c c c c c c c c c c c c c c c c c c $	Building	(Hotel)	SR-60	71.4	C'T/	00 >	0/ - 00	00 - 07	Unacceptable	Mech. Ventilation
(Hotel)SR-6078.278.270.400-7001-70UnacceptableCommercial (Business)SR-6065.465.465.4657575ConditionallyCommercial (Business)SR-6057.265.465.665 - 75>75AcceptableCommercial (Business)SR-6057.262.865 - 75>75AcceptableResidentialOrange St.61.462.965.965 - 75>75AcceptableResidentialOrange St.62.962.960 - 6565 - 70Conditionally	South Hotel	Commercial	SR-91/I-215	50.1	C 02	037	02 03	08 02	Normally	Interior Analysis &
$\left. \begin{array}{c c c c c c c c c c c c c c c c c c c $	Building	(Hotel)	SR-60	78.2	7.01	00 ×	00 - 7U	00 - 01	Unacceptable	Mech. Ventilation
$\left[ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Fast Food Building	Commercial (Business)	SR-60	65.4	65.4	< 65	65 - 75	> 75	Conditionally Acceptable	Interior Analysis & Mech. Ventilation
(Business)         Orange St.         61.4         62.8         < 65         75         > 75         Acceptable           Residential         Orange St.         62.9         60         60         65         70         Conditionally	West	Commercial	SR-60	57.2					Normally	Standard
Residential     Orange St.     62.9     62.9     < 60     60 - 65     65 - 70     Conditionally	Commercial Building	(Business)	Orange St.	61.4	62.8	< 65	65 - 75	> 75	Acceptable	Construction
Residential     Orange St.     62.9     62.9     < 60     60 - 65     65 - 70     Controllority       Acceptable	West								Conditionally	Interior Analysis 8
	Apartment	Residential	Orange St.	62.9	62.9	< 60	60 - 65	65 - 70	Accentationality	Mach Vantilation
	Building								שררב הומחוב	

# TABLE 8-1: EXTERIOR TRANSPORTATION NOISE LEVELS

<sup>1</sup> Based on the categories found in Figure N-10 of the City of Riverside General Plan Noise Element. <sup>2</sup> Source: Figure N-10 of the City of Riverside General Plan Noise Element. "Mech." = Mechanical

50

# 8.2 INTERIOR NOISE ANALYSIS

To ensure that the interior noise levels comply with the City of Riverside interior noise level standards, future noise levels were calculated at the first to fourth-floor building façades for applicable floors of residential, commercial, and hotel uses. No interior noise analysis is provided for RVs within the RV overnight parking lot within the Project site, as the Project has no control over the materials used in the assembly of individual owners' RVs visiting the parking lot area.

# 8.2.1 NOISE REDUCTION METHODOLOGY

The interior noise level is the difference between the predicted exterior noise level at the building facade and the noise reduction of the structure. Typical building construction will provide a Noise Reduction (NR) of approximately 12 dBA with "windows open" and a minimum 25 dBA noise reduction with "windows closed." (8; 22) However, sound leaks, cracks and openings within the window assembly can greatly diminish its effectiveness in reducing noise. Several methods are used to improve interior noise reduction, including: (1) weather-stripped solid core exterior doors; (2) upgraded dual glazed windows; (3) mechanical ventilation/air conditioning; and (4) exterior wall/roof assembles free of cut outs or openings.

## 8.2.2 INTERIOR NOISE LEVEL ASSESSMENT

Tables 8-2 to 8-5 show that the buildings within the Project will require a windows-closed condition and a means of mechanical ventilation (e.g. air conditioning). Table 8-2 shows that the future exterior noise levels at the first-floor building façades are expected to range from 61.7 to 78.2 dBA CNEL. The first-floor interior noise level analysis shows that the City of Riverside 45 dBA CNEL residential/hotel and 50 dBA CNEL commercial interior noise standards can be satisfied using upgraded windows and sliding glass doors with minimum STC ratings of 36 for residential buildings 12 to 20 and hotel buildings 1 and 2 indicated on Exhibit ES-A adjacent to SR-91, I-215, and SR-60. All other buildings require standard windows and sliding glass doors with a minimum STC rating of 27.

Table 8-3 shows the future unmitigated noise levels at the second-floor building façades are expected to range from 62.8 to 78.4 dBA CNEL. The second-floor interior noise level analysis shows that the City of Riverside 45 dBA CNEL residential/hotel and 50 dBA CNEL commercial interior noise standards can be satisfied using upgraded windows and sliding glass doors with minimum STC ratings of 36 for residential buildings 12 to 20 and hotel buildings 1 and 2 indicated on Exhibit ES-A adjacent to SR-91, I-215, and SR-60. All other buildings require standard windows and sliding glass doors with a minimum STC rating of 27.

Table 8-4 shows the future unmitigated noise levels at the third-floor building façades of residential and hotel uses are expected to range from 62.6 to 78.4 dBA CNEL. The third-floor interior noise level analysis shows that the City of Riverside 45 dBA CNEL residential/hotel and 50 dBA CNEL commercial interior noise standards can be satisfied using upgraded windows and sliding glass doors with minimum STC ratings of 36 for residential buildings 12 to 20 and hotel buildings 1 and 2 indicated on Exhibit ES-A adjacent to SR-91, I-215, and SR-60. All other buildings require standard windows and sliding glass doors with a minimum STC rating of 27.

Table 8-5 shows the future unmitigated noise levels at the fourth-floor building façades of hotel uses are expected to range from 72.9 to 78.3 dBA CNEL. The fourth-floor interior noise level analysis shows that the City of Riverside 45 dBA CNEL residential/hotel interior noise standards can be satisfied using upgraded windows and sliding glass doors with minimum STC ratings of 36 for hotel buildings 1 and 2 indicated on Exhibit ES-A adjacent to SR-91, I-215, and SR-60. All other buildings require standard windows and sliding glass doors with a minimum STC rating of 27.

While not required, this noise study recommends an interior noise level design goal of 40 dBA CNEL for residential and hotel uses using upgraded windows and sliding glass doors (all windows on all floors) with a minimum STC rating of 40 for all residential and hotel buildings.

Receiver Location	Noise Level at Façade <sup>1</sup>	Required Interior NR <sup>2</sup>	Estimated Interior NR <sup>3</sup>	Upgraded Windows <sup>4</sup>	Interior Noise Level⁵	Threshold	Threshold Exceeded?
East Apartment Buildings	61.7	16.7	34.0	Yes	27.7	45	No
East Hotel Building	71.5	26.5	34.0	Yes	37.5	45	No
South Hotel Building	78.2	33.2	34.0	Yes	44.2	45	No
Fast Food Building	65.4	15.4	25.0	No	40.4	50	No
West Commercial Building	62.8	12.8	25.0	No	37.8	50	No
West Apartment Building	62.9	17.9	25.0	No	37.9	45	No

TABLE 8-2: FIRST-FLOOR INTERIOR NOISE IMPACTS (CNEL)

<sup>1</sup> Exterior noise level at the facade with a windows closed condition requiring a means of mechanical ventilation (e.g. air conditioning).

<sup>2</sup> Noise reduction required to satisfy the State of California Building Code 45 dBA CNEL interior noise standard for residential and hotel uses and the 50 dBA CNEL standard based on California Green Building Standards Code, Section 5.507.4.2 performance standards.

<sup>3</sup> A minimum of 25 dBA noise reduction is assumed with standard building construction.

<sup>4</sup> Does the required interior noise reduction trigger upgraded windows with a minimum STC rating of greater than 27?

<sup>5</sup> Estimated interior noise level with minimum STC rating for all windows.

"NR" = Noise Reduction



Receiver Location	Noise Level at Façade <sup>1</sup>	Required Interior NR <sup>2</sup>	Estimated Interior NR <sup>3</sup>	Upgraded Windows⁴	Interior Noise Level⁵	Threshold	Threshold Exceeded?
East Apartment Buildings	76.8	31.8	34.0	Yes	42.8	45	No
East Hotel Building	71.5	26.5	34.0	Yes	37.5	45	No
South Hotel Building	78.4	33.4	34.0	Yes	44.4	45	No
Fast Food Building	<b>_</b> <sup>6</sup>	_6	_6	_6	_6	_6	<b>—</b> <sup>6</sup>
West Commercial Building	_6	_6	_6	_6	_6	_6	<b>_</b> <sup>6</sup>
West Apartment Building	62.8	17.8	25.0	No	37.8	45	No

#### TABLE 8-3: SECOND-FLOOR INTERIOR NOISE IMPACTS (CNEL)

<sup>1</sup> Exterior noise level at the facade with a windows closed condition requiring a means of mechanical ventilation (e.g. air conditioning).

<sup>2</sup> Noise reduction required to satisfy the State of California Building Code 45 dBA CNEL interior noise standard for residential and hotel uses and the 50 dBA CNEL standard based on California Green Building Standards Code, Section 5.507.4.2 performance standards.

<sup>3</sup> A minimum of 25 dBA noise reduction is assumed with standard building construction.

<sup>4</sup> Does the required interior noise reduction trigger upgraded windows with a minimum STC rating of greater than 27?

<sup>5</sup> Estimated interior noise level with minimum STC rating for all windows.

<sup>6</sup> The use does not have the given floor, and therefore, no interior noise reduction analysis is required.

"NR" = Noise Reduction

Receiver Location	Noise Level at Façade <sup>1</sup>	Required Interior NR <sup>2</sup>	Estimated Interior NR <sup>3</sup>	Upgraded Windows <sup>4</sup>	Interior Noise Level <sup>5</sup>	Threshold	Threshold Exceeded?
East Apartment Buildings	77.2	32.2	34.0	Yes	43.2	45	No
East Hotel Building	72.9	27.9	34.0	Yes	38.9	45	No
South Hotel Building	78.4	33.4	34.0	Yes	44.4	45	No
Fast Food Building	_6	_6	_6	_6	_6	_6	_6
West Commercial Building	_6	_6	_6	_6	_6	_6	_6
West Apartment Building	62.6	17.6	25.0	No	37.6	45	No

<sup>1</sup> Exterior noise level at the facade with a windows closed condition requiring a means of mechanical ventilation (e.g. air conditioning).

<sup>2</sup> Noise reduction required to satisfy the State of California Building Code 45 dBA CNEL interior noise standard for residential and hotel uses and the 50 dBA CNEL standard based on California Green Building Standards Code, Section 5.507.4.2 performance standards.

<sup>3</sup> A minimum of 25 dBA noise reduction is assumed with standard building construction.

<sup>4</sup> Does the required interior noise reduction trigger upgraded windows with a minimum STC rating of greater than 27?

<sup>5</sup> Estimated interior noise level with minimum STC rating for all windows.

<sup>6</sup> The use does not have the given floor, and therefore, no interior noise reduction analysis is required.

"NR" = Noise Reduction



Receiver Location	Noise Level at Façade <sup>1</sup>	Required Interior NR <sup>2</sup>	Estimated Interior NR <sup>3</sup>	Upgraded Windows⁴	Interior Noise Level⁵	Threshold	Threshold Exceeded?
East Apartment Buildings	_6	_6	_6	<b>_</b> <sup>6</sup>	_6	_6	<b>_</b> <sup>6</sup>
East Hotel Building	72.9	27.9	34.0	Yes	38.9	45	No
South Hotel Building	78.3	33.3	34.0	Yes	44.3	45	No
Fast Food Building	_6	_6	_6	_6	_6	_6	_6
West Commercial Building	_6	_6	_6	_6	_6	_6	_6
West Apartment Building	_6	_6	_6	_6	_6	_6	_6

#### TABLE 8-5: FOURTH-FLOOR INTERIOR NOISE IMPACTS (CNEL)

<sup>1</sup> Exterior noise level at the facade with a windows closed condition requiring a means of mechanical ventilation (e.g. air conditioning).

<sup>2</sup> Noise reduction required to satisfy the State of California Building Code 45 dBA CNEL interior noise standard for residential and hotel uses and the 50 dBA CNEL standard based on California Green Building Standards Code, Section 5.507.4.2 performance standards.

<sup>3</sup> A minimum of 25 dBA noise reduction is assumed with standard building construction.

<sup>4</sup> Does the required interior noise reduction trigger upgraded windows with a minimum STC rating of greater than 27?

<sup>5</sup> Estimated interior noise level with minimum STC rating for all windows.

<sup>6</sup> The use does not have the given floor, and therefore, no interior noise reduction analysis is required.

"NR" = Noise Reduction



# 9 **RECEIVER LOCATIONS**

To assess the potential for long-term operational and short-term construction noise impacts, the following seven receiver locations as shown on Exhibit 9-A were identified as representative locations for focused analysis. Sensitive receivers are generally defined as locations where people reside or where the presence of unwanted sound could otherwise adversely affect the use of the land. Noise-sensitive land uses are generally considered to include: schools, hospitals, single-family dwellings, mobile home parks, churches, libraries, and recreation areas. Moderately noise-sensitive land uses typically include: multi-family dwellings, hotels, motels, dormitories, out-patient clinics, cemeteries, golf courses, country clubs, athletic/tennis clubs, and equestrian clubs. Land uses that are considered relatively insensitive to noise include business, commercial, and professional developments. Land uses that are typically not affected by noise include: industrial, manufacturing, utilities, agriculture, natural open space, undeveloped land, parking lots, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals.

Sensitive receivers near the Project site include existing residential homes and the Fremont Elementary School, as described below. The closest sensitive receiver location is represented by R3 at approximately 18 feet west of the Project site boundary. 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 100 feet west of the Project site, R1 represents existing Fremont Elementary School on Orange Street. A 24-hour noise level measurement was taken near this location, L1, to describe the existing ambient noise environment.
- R2: Location R2 represents existing residential homes located approximately 95 feet west of the Project site on Orange Street. A 24-hour noise level measurement was taken near this location, L2, to describe the existing ambient noise environment.
- R3: Location R3 represents the existing residential outdoor living area (backyard) located roughly 18 feet west of the Project site on Strong Street. A 24-hour noise level measurement was taken near this location, L3, to describe the existing ambient noise environment.
- R4: Location R4 represents the existing residential outdoor living area (backyard) located roughly 16 feet north of the Project site on Sonic Court. A 24-hour noise level measurement was taken near this location, L4, to describe the existing ambient noise environment.
- R5: Location R5 represents the existing residential outdoor living area (backyard) located roughly 29 feet north of the Project site on Strong Street. A 24-hour noise level measurement was taken near this location, L5, to describe the existing ambient noise environment.
- R6: Location R6 represents the existing residential homes located approximately 442 feet east of the Project site across SR-91/I-215. A 24-hour noise level measurement was taken near this location, L6, to describe the existing ambient noise environment.



R7: Location R7 represents the existing residential homes located approximately 585 feet south of the Project site across SR-60. A 24-hour noise level measurement was taken near this location, L7, to describe the existing ambient noise environment.



**EXHIBIT 9-A: RECEIVER LOCATIONS** 

# **10 OPERATIONAL IMPACTS**

This section analyzes the potential operational noise impacts due to the Project's stationary noise sources on the off-site sensitive receiver locations identified in Section 9. Exhibit 10-A identifies the receiver locations and noise source locations used to assess the Project-related operational noise levels.

# **10.1** 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 10-1 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 roof-top air conditioning units, entry gates, a drive-through speakerphone, car wash air blowers, residential and commercial parking lot vehicle movements, and dog park, outdoor pool/spa, RV parking, gas station activities, and outdoor event activities all operating continuously. These noise level impacts will likely vary throughout the day.

# **10.1.1** ROOF-TOP AIR CONDITIONING UNITS

To assess the noise levels created by the roof-top air conditioning units at the Project site, reference noise levels measurements were taken at the Santee Walmart on July 27<sup>th</sup>, 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. Using a uniform reference distance of 50 feet, the reference noise level noise level is 54.4 dBA L<sub>50</sub>. 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 noise attenuation provided by a parapet wall is not reflected in this reference noise level measurement.

# 10.1.2 RESIDENTIAL ENTRY GATE ACTIVITY

A reference noise level measurement was collected on Wednesday, November 29<sup>th</sup>, 2017, by Urban Crossroads, Inc. at entry gate to the Oak Glen Apartments residential community in the City of Irvine. The reference noise level measurement represents multiple noise sources which produced a reference noise level of 50.7 dBA  $L_{50}$  at the uniform reference distance of 50 feet. The noise sources associated with the reference entry gate activity measurement include residential entry and exit gates opening and closing, cars and trucks driving over the metal gate tracks, keypad code entry, and phone ringing and people talking over the entrance intercom. Entry gate activities are conservatively anticipated to operate for 60 minutes per hour.



## **10.1.3 DRIVE-THROUGH SPEAKERPHONE**

To describe the potential noise level impacts associated with potential drive-through speakerphones and vehicle activities, a reference noise level measurement was collected on Friday, December 19<sup>th</sup>, 2014 at a Panera Bread restaurant located at 423 South Associated Road in the City of Brea. The reference noise levels collected at the Panera Bread restaurant are expected to reflect potential drive-through speakerphone noise level activities at the Project site, since the reference measurement includes both drive-through speakerphone and vehicle activity noise. The noise sources included in the reference noise level measurement consist of voices of the Panera Bread employees over the speakerphone, customers' voices ordering food, car engines idling, car radios playing music, and cars queuing in the drive-through lane. At 50 feet from the speakerphone, a reference noise level of 50.4 dBA L<sub>50</sub> was measured. This reference noise level measurement overstates the actual average noise levels since it represents the average of 28 speakerphone menu board ordering events observed over a two-hour period. In other words, the Panera Bread speakerphone menu board reference noise level describes continuous drive-through operations and does not include any periods of inactivity.

# **10.1.3 CAR WASH TUNNEL AIR BLOWERS**

On June 10<sup>th</sup>, 2016, a reference noise level measurement was taken by Urban Crossroads at the Audi Mission Viejo dealership to describe the air blowers used in a car wash tunnel. A reference noise level of 74.3 dBA Leq was measured at the uniform distance of 50 feet. The reference noise level measurement includes a five-unit air blower system with background pressure washer noise and is used to represent the proposed Project facilities. It is anticipated that the air dryers within the proposed car wash will operate for 45 minutes during the peak hour conditions.

# **10.1.3** PARKING LOT VEHICLE MOVEMENTS (RESIDENTIAL)

To determine the noise levels associated with a residential apartment community parking lot, Urban Crossroads collected reference noise level measurements at the Windemere Apartment community in the City of Riverside on August 24<sup>th</sup>, 2016. The reference 1-hour noise level measurement is based on the peak hour of activity over a total measurement duration of 24hours and indicates that the parking lot vehicle movements generates noise levels of 44.0 dBA  $L_{50}$  at a normalized distance of 50 feet. The residential parking lot noise levels are mainly due to cars pulling in and out of spaces and residents going to and from their apartment homes, and includes horns honking in the parking lot. Noise associated with parking lot vehicle movements is expected during the typical daytime, and nighttime conditions for the entire hour (60 minutes).

# 10.1.4 PARKING LOT VEHICLE MOVEMENTS (COMMERCIAL)

To determine the noise levels associated with commercial parking lot vehicle movements, Urban Crossroads collected reference noise level measurements at the Laguna Niguel Walmart located at 27470 Alicia Parkway on May 30, 2012. The 15-minute noise level measurement indicates that the parking lot vehicle movements generates noise levels of 41.7 dBA L<sub>50</sub> at a normalized distance of 50 feet. The parking lot noise levels are mainly due to cars pulling in and out of spaces, car alarms sounding, and customers moving shopping carts. Noise associated with parking lot vehicle

movements is expected during the typical daytime, and nighttime conditions for the entire hour (60 minutes).

## 10.1.5 DOG PARK ACTIVITY

To describe the potential noise level impacts associated with a dog park, a reference noise level measurement was collected on Wednesday, October 8<sup>th</sup>, 2014 at La Paws Dog Park in the City of Mission Viejo. The reference noise level measurement at the dog park includes people talking, dogs running, playing fetch, chasing each other, growling, barking and dog owners talking on cell phones. As observed during the noise level measurement, the dual entry gate of the La Paws Dog Park was identified as a key source of noise when opened and closed due to metal hinges squeaking and the metal to metal contact with the gate and its closure. At the normalized reference distance of 50 feet from the noise source, the reference noise level is 38.5 dBA. The dog park activities are estimated to operate continuously for up to 60 minutes during the peak hour conditions.

## 10.1.6 OUTDOOR POOL/SPA ACTIVITY

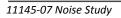
To represent the noise levels associated with pool activities, Urban Crossroads collected a reference noise level measurement on July 5<sup>th</sup>, 2017 at the Covenant Hill Clubhouse Pool in the unincorporated community of Ladera Ranch in the County of Orange. The measured reference noise level at the uniform 50-foot reference distance is 48.7 dBA  $L_{50}$  for pool activity. The pool activity noise levels include kids playing, running, screaming, splashing, playing with a ball, and parents talking. Noise associated with pool activities is expected to occur for the entire hour (60 minutes).

## 10.1.7 RV PARKING LOT ACTIVITY

On Wednesday, September 16<sup>th</sup>, 2015, Urban Crossroads, Inc. collected short-term operational noise level measurements at the Giant RV Parts and Service Center located at 41150 Juniper Street in the City of Murrieta. An RV engine idle and air brake noise reference measurement was taken over a one-minute period outside of the Giant RV Murrieta service garage, with background service garage and RV towing noise sources. The reference measurement results in a noise level of 66.0 dBA  $L_{50}$  at a uniform distance of 50 feet.

## **10.1.8 GAS STATION ACTIVITY**

To describe the potential noise level impacts created by the gas station of the proposed Project uses, a reference noise level measurement was collected on Tuesday, April 26<sup>th</sup>, 2016 at an ARCO gas station located at 6501 Quail Hill Parkway in the City of Irvine. The reference noise level measurement includes six cars fueling at once, car doors closing, engines starting, fuel pump TV sounds, and background car pass-by events within a 3-minute period. At a uniform reference noise level noise level distance of 50 feet, the reference noise level is 45.6 dBA L<sub>50</sub>.





#### **10.1.9 OUTDOOR EVENT ACTIVITIES**

To assess the noise impacts during outdoor event activities, such as live or amplified music and a farmer's market, reference noise levels measurements were taken at a live, amplified music concert and community event on September 19<sup>th</sup>, 2013. Located at the entrance of Clubhouse 2 of the Gate 12 Outdoor Event Space in the City of Laguna Woods, the noise level measurements describe a community concert including a stage, sound amplifying equipment (e.g. speakers), and unamplified crowd noise. At approximately 5 feet from the stage, the exterior noise levels were measured at 73.1 dBA L<sub>eq</sub>. This equates to a reference noise level of 53.1 dBA L<sub>eq</sub> at 50 feet from the noise source. Outdoor event activities are expected to occur for the full hour under Project operational conditions (60 minutes).

Noise Source	Duration	Ref. Distance	Noise Source	Hourly Activity	Reference Noise Level (dBA L₅₀)	
Noise Source	(hh:mm:ss)	(Feet)	Height (Feet)	(Mins) <sup>10</sup>	@ Ref. Dist.	@ 50 Feet
Roof-Top Air Conditioning Unit <sup>1</sup>	96:00:00	5'	5'	39	74.4	54.4
Residential Entry Gate Activity <sup>2</sup>	00:04:00	40'	5'	60	52.6	50.7
Drive-Through Speakerphone <sup>3</sup>	02:00:00	15'	3'	60	60.9	50.4
Car Wash Tunnel Air Blowers <sup>4</sup>	00:03:04	10'	8'	60	81.6	67.6
Residential Parking Lot Vehicle Movements <sup>5</sup>	01:00:00	10'	5'	60	44.0	33.5
Commercial Parking Lot Vehicle Movements <sup>6</sup>	00:15:00	5'	5'	60	56.7	41.7
Dog Park Activity <sup>7</sup>	00:15:00	5'	4'	60	58.5	38.5
Outdoor Pool/Spa Activity <sup>8</sup>	00:10:00	5'	4'	60	68.7	48.7
RV Parking Lot Activity <sup>9</sup>	00:01:00	10'	6'	60	76.5	66.0
Gas Station Activity <sup>10</sup>	00:03:00	5'	5'	60	65.6	45.6
Outdoor Event Activity <sup>11</sup>	00:01:20	5'	8'	60	73.1	53.1

#### TABLE 10-1: REFERENCE NOISE LEVEL MEASUREMENTS

<sup>1</sup> As measured by Urban Crossroads, Inc. on 7/27/2015 at the Santee Walmart located at 170 Town Center Parkway.

<sup>2</sup> As measured by Urban Crossroads, Inc. on 11/29/2017 at the entry gate to the Oak Glen Apartment community in the City of Irvine.

<sup>3</sup> As measured by Urban Crossroads, Inc. on 12/19/2014 at a Panera Bread drive-thru in the City of Brea.

<sup>4</sup> As measured by Urban Crossroads, Inc. on 6/6/2016 at the Audi Mission Viejo Dealership located at 28451 Marguerite Parkway.

<sup>5</sup> As measured by Urban Crossroads, Inc. on 8/24/2016 in the parking lot of the Windemere Apartment community in the City of Riverside.

<sup>6</sup> As measured by Urban Crossroads, Inc. on 5/30/2012 at the Laguna Niguel Walmart located at 27470 Alicia Parkway.

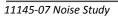
<sup>7</sup> As measured by Urban Crossroads, Inc. on 10/8/2014 at the La Paws Dog Park in the City of Mission Viejo.

<sup>8</sup> As measured by Urban Crossroads, Inc. on 7/5/2017 at the Covenant Hill Clubhouse pool in the unincorporated community of Ladera Ranch in the County of Orange. <sup>9</sup> As measured by Urban Crossroads, Inc. on 9/16/2015 at the Giant RV located at 41150 Juniper Street in the City of Murrieta.

<sup>10</sup> As measured by Urban Crossroads, Inc. on 4/26/2016 at an ARCO gas station located at 6501 Quail Hill Parkway in the City of Irvine.

<sup>11</sup> As measured by Urban Crossroads, Inc. on 9/19/2013 at an outdoor community gathering with live, amplified jazz band at the Gate 12 Outdoor Event Space in the City of Laguna Woods.

<sup>12</sup> Anticipated 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.





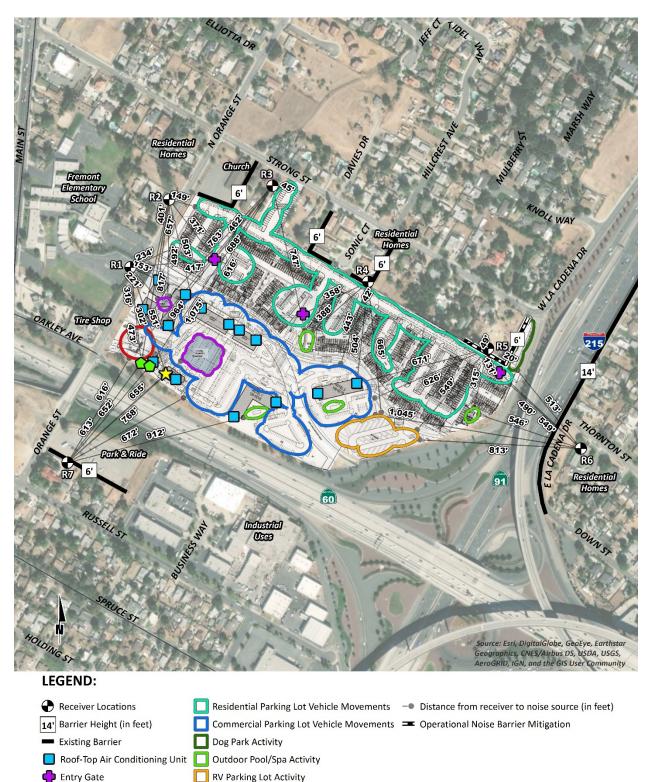


EXHIBIT 10-A: OPERATIONAL NOISE SOURCE AND RECEIVER LOCATIONS



🙆 Car Wash Tunnel

☆ Drive-Through Speakerphone

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Gas Station Activity

**Outdoor Event Activity** 

# **10.2 OPERATIONAL NOISE LEVELS**

Based upon the reference noise levels, it is possible to estimate the Project operational stationary-source noise levels at each of the sensitive receiver locations. The operational noise level calculations shown on Table 10-2 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 SPL<sub>2</sub> is the resulting noise level after attenuation, SPL<sub>1</sub> is the source noise level, D<sub>2</sub> is the distance to the reference sound pressure level (SPL<sub>1</sub>), and D<sub>1</sub> is the distance to the receiver location. Table 10-2 indicates that the hourly noise levels associated with the roof-top air conditioning units, entry gates, a drive-through speakerphone, car wash air blowers, residential and commercial parking lot vehicle movements, and dog park, outdoor pool/spa, RV parking, gas station activities, and outdoor event activities are expected to range from 36.6 to 49.9 dBA L<sub>50</sub> at the sensitive off-site receiver locations. The operational noise level calculation worksheets are included in Appendix 10.1, and include barrier attenuation provided by intervening structures between each noise source and the receiver locations, where applicable, from the existing noise barriers and planned Project buildings.



Receiver	No inc	Project	Operational	Noise Level	s (dBA)³
Location	Noise Source <sup>2</sup>	L <sub>50</sub> (30 mins)	L <sub>25</sub> (15 mins)	L <sub>8</sub> (5 mins)	L <sub>2</sub> (1 min)
	Roof-Top Air Conditioning Unit	42.8	44.5	45.8	46.1
	Residential Entry Gate Activity	32.2	34.9	40.3	43.3
	Drive-Through Speakerphone	29.6	30.8	32.3	34.0
	Car Wash Tunnel Air Blowers	48.1	58.5	59.1	59.8
	Residential Parking Lot Vehicle Movements	23.5	26.5	34.5	40.5
R1 —	Commercial Parking Lot Vehicle Movements	30.0	34.0	37.0	40.4
NI	Dog Park Activity	_4	_4	_4	_4
	Outdoor Pool/Spa Activity	_4	_4	_4	_4
	RV Parking Lot Activity	_4	_4	_4	_4
	Gas Station Activity	29.6	30.9	33.5	38.4
	Outdoor Event Activity	40.2	56.3	59.2	61.0
	Combined Noise Level:	49.9	60.7	62.3	63.6
	Roof-Top Air Conditioning Unit	34.4	36.1	37.4	37.7
	Residential Entry Gate Activity	33.3	36.0	41.4	44.4
	Drive-Through Speakerphone	_4	_4	_4	_4
	Car Wash Tunnel Air Blowers	35.3	45.7	46.3	47.0
	Residential Parking Lot Vehicle Movements	26.4	29.4	37.4	43.4
R2	Commercial Parking Lot Vehicle Movements	26.7	30.7	33.7	37.1
RZ	Dog Park Activity	_4	_4	_4	-4
	Outdoor Pool/Spa Activity	_4	_4	_4	_4
	RV Parking Lot Activity	_4	_4	_4	_4
	Gas Station Activity	23.2	24.5	27.1	32.0
	Outdoor Event Activity	26.3	42.4	45.3	47.1
	Combined Noise Level:	39.9	48.1	50.2	52.1
	Roof-Top Air Conditioning Unit	29.7	31.4	32.7	33.0
	Residential Entry Gate Activity	31.3	34.0	39.4	42.4
	Drive-Through Speakerphone	_4	_4	_4	_4
	Car Wash Tunnel Air Blowers	32.9	43.3	43.9	44.6
	Residential Parking Lot Vehicle Movements	34.2	37.2	45.2	51.2
	Commercial Parking Lot Vehicle Movements	25.3	29.3	32.3	35.7
R3 —	Dog Park Activity	_4	_4	_4	_4
	Outdoor Pool/Spa Activity	25.2	28.2	31.5	34.6
	RV Parking Lot Activity	_4	_4	_4	_4
	Gas Station Activity	19.9	21.2	23.8	28.7
	Outdoor Event Activity	29.4	45.5	48.4	50.2
	Combined Noise Level:	39.3	48.3	51.5	54.7
	Roof-Top Air Conditioning Unit	27.2	28.9	30.2	30.5
	Residential Entry Gate Activity	28.1	30.8	36.2	39.2
	Drive-Through Speakerphone	_4	_4	_4	_4
R4 —	Car Wash Tunnel Air Blowers	_4	_4	_4	_4
	Residential Parking Lot Vehicle Movements	29.1	32.1	40.1	46.1
	Commercial Parking Lot Vehicle Movements	22.0	26.0	29.0	32.4

TABLE 10-2: UNMITIGATED PROJECT OPERATIONAL NOISE LEVELS



Receiver		Project Operational Noise Levels (dBA) <sup>3</sup>				
Location	Noise Source <sup>2</sup>	L <sub>50</sub> (30 mins)	L <sub>25</sub> (15 mins)	L <sub>8</sub> (5 mins)	L <sub>2</sub> (1 min)	
	Dog Park Activity	_4	-4	_4	_4	
	Outdoor Pool/Spa Activity	25.4	28.4	31.7	34.8	
	RV Parking Lot Activity	43.7	44.2	44.9	46.8	
	Gas Station Activity	_4	_4	_4	_4	
	Combined Noise Level:	44.1	44.9	46.9	50.1	
	Roof-Top Air Conditioning Unit	29.9	31.6	32.9	33.2	
	Residential Entry Gate Activity	42.3	45.0	50.4	53.4	
	Drive-Through Speakerphone	-4	-4	_4	_4	
	Car Wash Tunnel Air Blowers	-4	-4	-4	_4	
	Residential Parking Lot Vehicle Movements	33.6	36.6	44.6	50.6	
R5	Commercial Parking Lot Vehicle Movements	25.2	29.2	32.2	35.6	
	Dog Park Activity	46.5	49.0	53.2	60.6	
	Outdoor Pool/Spa Activity	32.7	35.7	39.0	42.1	
	RV Parking Lot Activity	38.0	38.5	39.2	41.1	
	Gas Station Activity	_4	_4	_4	_4	
	Combined Noise Level:	48.7	51.1	55.7	61.8	
	Roof-Top Air Conditioning Unit	-4	-4	_4	_4	
	Residential Entry Gate Activity	22.0	24.7	30.1	33.1	
	Drive-Through Speakerphone	_4	_4	_4	_4	
	Car Wash Tunnel Air Blowers	_4	_4	_4	_4	
	Residential Parking Lot Vehicle Movements	10.7	13.7	21.7	27.7	
R6	Commercial Parking Lot Vehicle Movements	14.4	18.4	21.4	24.8	
	Dog Park Activity	10.3	12.8	17.0	24.4	
	Outdoor Pool/Spa Activity	20.0	23.0	26.3	29.4	
	RV Parking Lot Activity	40.3	40.8	41.5	43.4	
	Gas Station Activity	_4	_4	_4	_4	
	Combined Noise Level:	40.4	41.0	42.0	44.1	
	Roof-Top Air Conditioning Unit	21.0	22.7	24.0	24.3	
	Residential Entry Gate Activity	_4	_4	_4	_4	
	Drive-Through Speakerphone	18.4	19.6	21.1	22.8	
	Car Wash Tunnel Air Blowers	36.3	46.7	47.3	48.0	
	Residential Parking Lot Vehicle Movements	_4	_4	_4	_4	
	Commercial Parking Lot Vehicle Movements	15.1	19.1	22.1	25.5	
R7	Dog Park Activity	_4	_4	_4	_4	
	Outdoor Pool/Spa Activity	13.8	16.8	20.1	23.2	
-	RV Parking Lot Activity	_4	_4	_4	_4	
-	Gas Station Activity	14.1	15.4	18.0	22.9	
	Outdoor Event Activity	23.9	40.0	42.9	44.7	
-	Combined Noise Level:	36.8	47.6	48.7	49.7	

<sup>1</sup> See Exhibit 10-A for the receiver and noise source locations.

<sup>2</sup> Reference noise sources as shown on Table 10-1.

 <sup>3</sup> Operational noise level calculations are provided in Appendix 10.1.
 <sup>4</sup> Receiver location has two or more rows of intervening structures between it and the noise source, and therefore, does not have a direct line of sight to the noise source.



# **10.3** UNMITIGATED OPERATIONAL NOISE LEVEL COMPLIANCE

To demonstrate compliance with local noise regulations, the 24-hour Project-only operational noise levels are evaluated against exterior noise level threshold based on the City of Riverside exterior noise level standards. Table 10-3 shows the operational noise levels associated with The Exchange Project will satisfy the City of Riverside Municipal Code exterior noise level standards at all receiver locations (R1 to R4, R6, R7) except for receiver location R5 where the unmitigated exterior noise levels are shown to exceed the noise level standards.

- ·		Noise	Thursday			
Receiver Location <sup>1</sup>	Land Use	L <sub>50</sub> (30 mins)	L <sub>25</sub> (15 mins)	L <sub>8</sub> (5 mins)	L <sub>2</sub> (1 min)	Threshold Exceeded? <sup>3</sup>
Daytime	Residential	55	60	65	70	-
Nighttime	Standards	45 50 55		60	-	
Daytime	CS Standards	60	65	70	75	-
R1	School	49.9	60.7	62.3	63.6	No
R2	Residential	39.9	48.1	50.2	52.1	No
R3	Residential	39.3	48.3	51.5	54.7	No
R4	Residential	44.1	44.9	46.9	50.1	No
R5	Residential	48.7	51.1	55.7	61.8	Yes
R6	Residential	40.4	41.0	42.0	44.1	No
R7	Residential	36.8	47.6	48.7	49.7	No

TABLE 10-3: UNMITIGATED OPERATIONAL NOISE LEVEL COMPLIANCE

<sup>1</sup> See Exhibit 10-A for the receiver and noise source locations.

<sup>2</sup> Estimated unmitigated Project operational noise levels as shown on Table 10-2.

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

"CS" = Community Support

# **10.4 MITIGATED OPERATIONAL NOISE LEVEL COMPLIANCE**

Therefore, exterior noise mitigation is required in the form of a 6-foot high exterior noise barrier adjacent to receiver location R5, as previously shown on Exhibit 10-A. Table 10-4 shows the mitigation Project operational noise levels will approach 43.4 dBA  $L_{50}$  at receiver location R5 with the required noise barrier mitigation.

_		Project Operational Noise Levels (dBA) <sup>3</sup>				
Receiver Location <sup>1</sup>	Noise Source <sup>2</sup>	L <sub>50</sub> (30 mins)	L <sub>25</sub> (15 mins)	L <sub>8</sub> (5 mins)	L2 (1 min)	
	Roof-Top Air Conditioning Unit	24.7	26.4	27.7	28.0	
	Residential Entry Gate Activity	36.8	39.5	44.9	47.9	
	Drive-Through Speakerphone	-4	-4	_4	_4	
	Car Wash Tunnel Air Blowers	-4	-4	_4	_4	
	Residential Parking Lot Vehicle Movements	28.0	31.0	39.0	45.0	
R5	Commercial Parking Lot Vehicle Movements	19.7	23.7	26.7	30.1	
	Dog Park Activity	39.6	42.1	46.3	53.7	
	Outdoor Pool/Spa Activity	27.2	30.2	33.5	36.6	
-	RV Parking Lot Activity	38.0	38.5	39.2	41.1	
	Gas Station Activity	_4	-4	_4	_4	
	Combined Noise Level:	43.4	45.5	49.7	55.4	

#### TABLE 10-4: MITIGATED PROJECT OPERATIONAL NOISE LEVELS (RECEIVER LOCATION R5)

<sup>2</sup> Reference noise sources as shown on Table 10-1.

<sup>3</sup> Mitigated operational noise level calculations are provided in Appendix 10.1.

<sup>4</sup> Receiver location has two or more rows of intervening structures between it and the noise source, and therefore, does not have a direct line of sight to the noise source.

As shown on Table 10-5, the mitigation Project operational noise levels at receiver location R5 will satisfy the City of Riverside exterior noise level standards, and therefore, Project operational noise level impacts will be *less than significant* with mitigation.

_ ·	1 a mal	Noise				
Receiver Location <sup>1</sup>	Land Use	L <sub>50</sub> (30 mins)	L <sub>25</sub> (15 mins)	L <sub>8</sub> (5 mins)	L <sub>2</sub> (1 min)	Threshold Exceeded? <sup>3</sup>
Daytime	Residential	55	60	65	70	-
Nighttime	Standards	45	50	55	60	-
R5	Residential	43.4	45.5	49.7	55.4	No

<sup>1</sup> See Exhibit 10-A for the receiver and noise source locations.

<sup>2</sup> Mitigated Project operational noise levels as shown on Table 10-4.

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



# 10.5 UNMITIGATED PROJECT OPERATIONAL NOISE CONTRIBUTION

To describe the Project operational noise level contributions, the Project operational noise levels were combined with the existing ambient noise levels measurements for the off-site 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. (6) 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. Noise levels that would be experienced at receiver locations when Project-source noise is added to the ambient daytime and nighttime conditions are presented on Tables 10-6 and 10-7, respectively.

As indicated on Tables 10-6 and 10-7, the Project will contribute an operational noise level increase during the daytime hours of up to 0.9 dBA  $L_{50}$  and during the nighttime hours of up to 1.0 dBA  $L_{50}$ . The Project-related operational noise level contributions of up to 1.0 dBA  $L_{50}$  on the existing ambient noise environment are shown to satisfy the significance criteria discussed in Section 4, and 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*.

Receiver Location <sup>1</sup>	Total Project Operational Noise Level (dBA L <sub>50</sub> ) <sup>2</sup>	Measurement Location <sup>3</sup>	Reference Ambient Noise Levels (dBA L₅o) <sup>4</sup>	Combined Project and Ambient (dBA L₅o) <sup>5</sup>	Project Contribution (dBA L₅o) <sup>6</sup>	Threshold Exceeded? <sup>7</sup>
R1	49.9	L1	56.1	57.0	0.9	No
R2	39.9	L2	58.3	58.4	0.1	No
R3	39.3	L3	54.9	55.0	0.1	No
R4	44.1	L4	52.5	53.1	0.6	No
R5	48.7	L5	67.2	67.3	0.1	No
R6	40.4	L6	64.9	64.9	0.0	No
R7	36.8	L7	74.4	74.4	0.0	No

<sup>1</sup> See Exhibit 10-A for the sensitive receiver locations.

<sup>2</sup> Unmitigated Project operational noise levels as shown on Table 10-3.

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

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

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

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

<sup>7</sup> Significance Criteria as defined in Section 4.



Receiver Location <sup>1</sup>	Total Project Operational Noise Level (dBA L <sub>50</sub> ) <sup>2</sup>	Measurement Location <sup>3</sup>	Reference Ambient Noise Levels (dBA L₅o) <sup>4</sup>	Combined Project and Ambient (dBA L <sub>50</sub> ) <sup>5</sup>	Project Contribution (dBA L₅o) <sup>6</sup>	Threshold Exceeded? <sup>7</sup>
R1	49.9	L1	55.6	56.6	1.0	No
R2	39.9	L2	54.2	54.4	0.2	No
R3	39.3	L3	53.3	53.5	0.2	No
R4	44.1	L4	51.7	52.4	0.7	No
R5	48.7	L5	65.1	65.2	0.1	No
R6	40.4	L6	62.1	62.1	0.0	No
R7	36.8	L7	71.8	71.8	0.0	No

TABLE 10-7: UNMITIGATED NIGHTTIME OPERATIONAL NOISE LEVEL CONTRIBUTIONS

<sup>1</sup> See Exhibit 10-A for the sensitive receiver locations.

<sup>2</sup> Unmitigated Project operational noise levels as shown on Table 10-3.

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

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

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

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

<sup>7</sup> Significance Criteria as defined in Section 4.

# **10.6** OPERATIONAL NOISE MITIGATION MEASURES

To reduce the operational noise levels to *less than significant* at receiver location R5, the Project shall construct the following noise barrier, as shown on Exhibit 10-A of this report. The noise barrier shall provide a weight of at least 4 pounds per square foot of face area or provide a minimum transmission loss of 20 dBA. (5) The barriers shall consist of a solid face from top to bottom. Unnecessary openings or decorative cutouts shall not be made. All gaps (except for weep holes) should be filled with grout or caulking.

- A minimum 6-foot high noise barrier at the boundary between Project operational activities and receiver location R5 as shown on Exhibit 10-A;
- The noise barrier may be constructed using the following materials capable of providing a minimum transmission loss of 20 dBA.:
  - Masonry block;
  - Stucco veneer over wood framing (or foam core), or 1-inch-thick tongue and groove wood of sufficient weight per square foot;
  - Glass (1/4-inch-thick), or other transparent material capable of the minimum transmission loss of 20 dBA;
  - o Earthen berm;
  - Any combination of these construction materials.



# **11 CONSTRUCTION IMPACTS**

This section analyzes potential impacts resulting from the short-term construction activities associated with the development of the Project. Exhibit 11-A shows the construction activity boundaries in relation to the nearby sensitive receiver locations.

# **11.1** CONSTRUCTION NOISE LEVELS

Pursuant to Municipal Code Section 7.35.020 *Exemptions* subsection (G), "Noise sources associated with construction, repair, remodeling, or grading of any real property; provided a permit has been obtained from the City as required; and provided said activities do not take place between the hours of 7:00 p.m. and 7:00 a.m. on weekdays, between the hours of 5:00 p.m. and 8:00 a.m. on Saturdays, or at any time on Sunday or a federal holiday." Therefore, construction noise associated with the proposed Project is considered exempt from the City's Noise Ordinance. Consistent with direction from the City of Riverside Planning Department, if Project construction activities occur within the permitted hours of Municipal Code, Section 7.35.010(B)(5), the construction noise levels will be considered exempt from the Municipal Code noise level standards, and therefore, no analysis of construction noise levels is provided in this noise study.

# **11.2 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 (FTA). 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 6-6 and the construction vibration assessment methodology published by the FTA, it is possible to estimate the Project vibration impacts at the receiver locations adjacent to the Project site, as shown on Exhibit 11-A. Table 11-1 presents the expected Project related vibration levels at each of the sensitive receiver locations based on the FTA threshold of 80 VdB.





**EXHIBIT 11-A: CONSTRUCTION ACTIVITY AND RECEIVER LOCATIONS** 



At distances ranging from 45 to 609 feet from Project construction activity, construction vibration velocity levels are shown to range from 16.4 to 79.3 VdB at the nearby sensitive receiver locations, which will remain below the FTA 80 VdB threshold for sensitive receiver locations, as shown on Table 11-1. Therefore, the vibration impacts due to Project construction will be *less than significant*.

Further, vibration levels at the site of the closest sensitive receiver are unlikely to be sustained during the entire construction period but will occur rather only during the times that heavy construction equipment is operating simultaneously adjacent to the Project site perimeter. Moreover, construction at the Project site will be restricted to daytime hours consistent with City requirements thereby eliminating potential vibration impacts during the sensitive nighttime hours.

	Distance to						
Receiver Location <sup>1</sup>	Property Line (Feet)	Small Bulldozer	Jackhammer	Loaded Trucks	Large Bulldozer	Highest Vibration Level	Threshold Exceeded? <sup>3</sup>
R1	115'	38.1	59.1	66.1	67.1	67.1	No
R2	125'	37.0	58.0	65.0	66.0	66.0	No
R3	46'	50.1	71.1	78.1	79.1	79.1	No
R4	45'	50.3	71.3	78.3	79.3	79.3	No
R5	49'	49.2	70.2	77.2	78.2	78.2	No
R6	451'	20.3	41.3	48.3	49.3	49.3	No
R7	609'	16.4	37.4	44.4	45.4	45.4	No

TABLE 11-1: CONSTRUCTION EQUIPMENT VIBRATION LEVELS

<sup>1</sup>Noise receiver locations are shown on Exhibit 11-A.

<sup>2</sup> Based on the Vibration Source Levels of Construction Equipment included on Table 6-6.

 $^{3}$  Does the vibration level exceed the FTA vibration standard of 80 VdB?



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# **12 REFERENCES**

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- 2. Urban Crossroads, Inc. *The Exchange Traffic Impact Analysis.* June 2018.
- 3. City of Riverside. General Plan Noise Element. November 2007.
- 4. Harris, Cyril M. Noise Control in Buildings. s.l. : McGraw-Hill, Inc., 1994.
- U.S. Department of Transportation Federal Highway Administration. Acoustical Consideration. Noise Barrier Design Handbook. [Online] [Cited: November 28, 2016.] https://www.fhwa.dot.gov/environment/noise/noise\_barriers/design\_construction/design/design0 3.cfm.
- 6. California Department of Transportation Environmental Program. *Technical Noise Supplement A Technical Supplement to the Traffic Noise Analysis Protocol.* Sacramento, CA : s.n., September 2013.
- 7. Environmental Protection Agency Office of Noise Abatement and Control. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. March 1974. EPA/ONAC 550/9/74-004.
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- 9. U.S. Department of Transportation, Federal Highway Administration. *Highway Traffic Noise in the United States, Problem and Response.* April 2000. p. 3.
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- 13. State of California. 2013 California Green Building Standards Code. January 2014.
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- 19. U.S. Department of Transportation, Federal Highway Administration. FHWA Highway Traffic Noise Prediction Model. December 1978. FHWA-RD-77-108.
- 20. 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.

- 21. **California Department of Transportation.** *Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report.* June 1995. FHWA/CA/TL-95/23.
- 22. —. Traffic Noise Analysis Protocol. May 2011.



# **13 CERTIFICATION**

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed The Exchange 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:

CITY OF RIVERSIDE MUNICIPAL CODE



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### Title 7

## **NOISE CONTROL**

Chapters:

- 7.05 POLICY AND INTENT
- 7.10 DEFINITIONS
- 7.15 ADMINISTRATION AND ENFORCEMENT
- 7.20 SOUND LEVEL MEASUREMENT
- 7.23 AMBIENT NOISE LEVELS
- 7.25 NUISANCE EXTERIOR SOUND LEVEL LIMITS
- 7.30 NUISANCE INTERIOR SOUND LEVEL LIMITS
- 7.35 GENERAL NOISE REGULATIONS
- 7.40 VARIANCE PROCEDURE
- 7.45 SEVERABILITY

# POLICY AND INTENT

# Sections: 7.05.010 Policy and intent.

# Section 7.05.010 Policy and intent.

It is determined that certain noise levels are detrimental to the public health, safety and welfare and are contrary to the public interest. Therefore, the City Council declares that creating, maintaining, causing or allowing to create, maintain or cause any noise in a manner not in conformity with the provisions of this chapter, is a public nuisance and shall be punishable as such.

In order to control unnecessary, excessive and/or annoying noise in the City, it is declared to be the policy of the City to prohibit such noise generated by the sources specified in this chapter. It shall be the goal of the City to minimize noise levels and mitigate the effects of noise to provide a safe and healthy living environment. (Ord. 6273 § 1 (part), 1996)

# DEFINITIONS

#### Sections:

- 7.10.010 Definitions generally.
- 7.10.015 A-weighted sound level.
- 7.10.020 Agricultural property.
- 7.10.025 Ambient noise level.
- 7.10.030 Commercial purpose.
- 7.10.035 Construction.
- 7.10.040 Community support land use category.
- 7.10.045 Cumulative period.
- 7.10.050 Decibel (dB).
- 7.10.055 Demolition.
- 7.10.060 Emergency.
- 7.10.065 Emergency work.
- 7.10.070 Fixed noise source.
- 7.10.075 Grading.
- 7.10.080 Impulsive sound.
- 7.10.085 Industrial land use category.
- 7.10.090 Intrusive noise.
- 7.10.095 Minor maintenance.
- 7.10.100 Mobile noise source.
- 7.10.105 Motor vehicle.
- 7.10.110 Muffler or sound dissapative device.
- 7.10.115 Noise.
- 7.10.120 Noise Control Officer.
- 7.10.125 Noise disturbance.
- 7.10.130 Noise source.
- 7.10.135 Noise zone.
- 7.10.140 Nonurban land use category.
- 7.10.145 Office/commercial land use category.
- 7.10.150 Person.
- 7.10.155 Powered model vehicle.
- 7.10.160 Public recreation facility land use category.
- 7.10.165 Public right-of-way.
- 7.10.170 Public space.
- 7.10.175 Residential land use category.
- 7.10.180 Sound.
- 7.10.185 Sound amplifying equipment.
- 7.10.190 Sound level.
- 7.10.195 Sound level meter.
- 7.10.200 Sound pressure.
- 7.10.205 Sound pressure level.
- 7.10.210 Supplementary definitions of technical terms.

# Section 7.10.010 Definitions generally.

For the purposes of this title, the words and phrases defined in this chapter shall have the meanings respectively ascribed to them by this chapter. (Ord. 6273 § 1 (part), 1996)

# Section 7.10.015 A-weighted sound level.

"A-weighted sound level" means the sound pressure level in decibels as measured on a sound level meter using the A-weighing network. The level is designated dB(A) or dBA. (Ord. 6273 § 1 (part), 1996)

# Section 7.10.020 Agricultural property.

"Agricultural property" means a parcel of real property which is developed for agricultural and incidental residential purposes which is located within any permitted zone. (Ord. 6273 § 1 (part), 1996)

# Section 7.10.025 Ambient noise level.

"Ambient noise level" means the all-encompassing noise level associated with a given environment, being a composite of sounds from all sources, excluding an alleged offensive noise, at the location and approximate time at which the comparison with the offensive noise is to be made. The ambient noise level constitutes the normal or existing level of environmental noise at a given location. (Ord. 6273 § 1 (part), 1996)

# Section 7.10.030 Commercial purpose.

"Commercial purpose" means the use, operation or maintenance of any sound amplification equipment for the purpose of advertising any business, goods or services, or for the purposes of attracting the attention of the public, or soliciting patronage of customers to any performance, show, entertainment, exhibition or event, or for the purpose of demonstrating such sound equipment. (Ord. 6273 § 1 (part), 1996)

# Section 7.10.035 Construction.

"Construction" means any site preparation including grading, building, fabricating, assembly, substantial repair, alteration, or similar action. (Ord. 6273 § 1 (part), 1996)

# Section 7.10.040 Community support land use category.

"Community support land use category" means areas developed with schools, libraries, fire stations, hospitals and similar uses in any zone. (Ord. 6273 § 1 (part), 1996)

# Section 7.10.045 Cumulative period.

"Cumulative period" means a total period of time composed of time segments which may be continuous or discontinuous. (Ord. 6273 § 1 (part), 1996)

# Section 7.10.050 Decibel (dB).

"Decibel (dB)" means a unit for measuring amplitude of a sound, equal to twenty times the logarithm to the base ten of the ratio of the pressure of the sound measured to the reference pressure, which is twenty micropascals (twenty micronewtons per square meter). (Ord. 6273 § 1 (part), 1996)

# Section 7.10.055 Demolition.

"Demolition" means any dismantling, intentional destruction or removal of structures, site improvements, landscaping or utilities. (Ord. 6273 § 1 (part), 1996)

# Section 7.10.060 Emergency.

"Emergency" means any occurrence or set of circumstances involving actual or imminent physical trauma or property damage which demands immediate action. (Ord. 6273 § 1 (part), 1996)

# Section 7.10.065 Emergency work.

"Emergency work" means work made necessary to restore property to a safe condition following a physical trauma or property damage caused by an emergency or work necessary to prevent or minimize damage from a potential emergency. (Ord. 6273 § 1 (part), 1996)

# Section 7.10.070 Fixed noise source.

"Fixed noise source" means a stationary device which creates sounds from a fixed location, including residential, agricultural, industrial and commercial machinery and equipment, pumps fans, compressors, air conditioners and refrigeration devices. (Ord. 6273 § 1 (part), 1996)

# Section 7.10.075 Grading.

"Grading" means any excavating and/or filling of earth material to prepare a site for construction or the placement of improvements. (Ord. 6273 § 1 (part), 1996)

# Section 7.10.080 Impulsive sound.

"Impulsive sound" means sound of short duration, usually less than one second, with an abrupt onset and rapid decay. Examples include explosions, drum beats, drop-forge impacts, fire crackers, discharge of firearms and one object striking another. (Ord. 6273 § 1 (part), 1996)

# Section 7.10.085 Industrial land use category.

"Industrial land use category" means any area occupied by land uses whose primary operation involves warehousing, manufacturing, assembling, distributing, packaging or processing goods in the BMP, I, and AIR zones. (Ord. 6967 § 2, 2007; (Ord. 6273 § 1 (part), 1996)

# Section 7.10.090 Intrusive noise.

"Intrusive noise" means a noise which intrudes over and above the existing ambient noise. The relative intrusiveness of the sound depends upon its amplitude, duration, frequency and time of occurrence, tonal or informational content as well as its relationship to the prevailing ambient noise level. (Ord. 6273 § 1 (part), 1996)

# Section 7.10.095 Minor maintenance.

"Minor maintenance" means work required to keep property used for residential purposes in an existing state. (Ord. 6273 § 1 (part), 1996)

# Section 7.10.100 Mobile noise source.

"Mobile noise source" means any noise source other than a fixed noise source. (Ord. 6273 § 1 (part), 1996)

# Section 7.10.105 Motor vehicle.

"Motor vehicle" means any self-propelled vehicle as defined in the California Vehicle Code, including all on-highway types of motor vehicles subject to registration under said code, and all off-highway type motor vehicles subject to identification under said code. (Ord. 6273 § 1 (part), 1996)

## Section 7.10.110 Muffler or sound dissapative device.

"Muffler or sound dissapative device" means a device for abating the sound of escaping gases from an internal combustion engine. (Ord. 6273 § 1 (part), 1996)

#### Section 7.10.115 Noise.

"Noise" means any sound which exceeds the appropriate actual or presumed ambient noise level or which annoys or tends to disturb humans or which causes or tends to cause an adverse psychological or physiological effect on humans. (Ord. 6273 § 1 (part), 1996)

# Section 7.10.120 Noise Control Officer.

"Noise Control Officer" means the City official(s) or duly authorized representative(s) with the responsibility to enforce the noise ordinance. (Ord. 6273 § 1 (part), 1996)

#### Section 7.10.125 Noise disturbance.

"Noise disturbance" means any sound which endangers or injures the safety or health of humans or animals, or annoys or disturbs a reasonable person of normal sensitivities or endangers or injures personal or real property. (Ord. 6273 § 1 (part), 1996)

#### Section 7.10.130 Noise source.

"Noise source" means a disturbance causing operation which originates from noise generating mechanism. An example of a noise source is the combination of a motor, pump and compressor. (Ord. 6273 § 1 (part), 1996)

#### Section 7.10.135 Noise zone.

"Noise zone" means defined areas of generally consistent land use where the ambient noise levels are generally similar within a range of five decibels. (Ord. 6273 § 1 (part), 1996)

#### Section 7.10.140 Nonurban land use category.

"Nonurban land use category" means vacant land or land primarily for agricultural production containing ten acres or more. (Ord. 6273 § 1 (part), 1996)

#### Section 7.10.145 Office/commercial land use category.

"Office/commercial land use category" means areas developed with office and/or commercial uses in the O, CRC, CR-NC, CR, and CG zones. (Ord. 6967 § 2, 2007; Ord. 6273 § 1 (part), 1996)

#### Section 7.10.150 Person.

"Person" means any individual, association, partnership or corporation and includes any officer, employee, department, agency or instrumentality of a State or any political subdivision of a State. (Ord. 6273 § 1 (part), 1996)

# Section 7.10.155 Powered model vehicle.

"Powered model vehicle" means airborne, waterborne or land-borne vehicles such as model airplanes, model boats, and model vehicles of any type or size which are not designed for carrying persons or property and which can be propelled in any form other than manpower or wind power. (Ord. 6273 § 1 (part), 1996)

# Section 7.10.160 Public recreation facility land use category.

"Public recreation facility land use category" means areas developed with public parks and other public recreational facilities. (Ord. 6273 § 1 (part), 1996)

# Section 7.10.165 Public right-of-way.

"Public right-of-way" means any street, avenue, boulevard, highway, sidewalk or alley or similar place which is owned or controlled by a government entity. (Ord. 6273 § 1 (part), 1996)

#### Section 7.10.170 Public space.

"Public space" means any real property or structures which are owned or controlled by a government entity. (Ord. 6273 § 1 (part), 1996)

#### Section 7.10.175 Residential land use category.

"Residential land use category" means areas primarily used for residential purposes in the RE, RA-5, RR, RC, R-1-1-1/2 acre, R-1-13000, R-1-10500, R-1-8500, R-1-7000, R-3-2500, R-3-4000, R-3-3000, R-3-2000, R-3-1500, and R-4 zones. (Ord. 6967 § 2, 2007; Ord. 6273 § 1 (part), 1996)

#### Section 7.10.180 Sound.

"Sound" means an oscillation in pressure, particle displacement, particle velocity or other physical parameter, in a medium with internal forces that causes compression and rarefaction of that medium. The description of sound may include any characteristic of such sound, including duration, intensity and frequency. (Ord. 6273 § 1 (part), 1996)

# Section 7.10.185 Sound amplifying equipment.

"Sound amplifying equipment" means any device for the amplification of the human voice, or music, or any other sound, excluding devices in motor vehicles when heard only by the occupants of the vehicle, excluding warning devices on authorized emergency vehicles or horns or other warning devices on any vehicle used only for traffic safety purposes. (Ord. 6273 § 1 (part), 1996)

# Section 7.10.190 Sound level.

"Sound level" means the weighted sound pressure level obtained by the use of a sound level meter and frequency weighing network, such as A, B or C, as specified in American National Standards Institute specifications for sound level meter ANSI S1.4-1971 or the latest approved revision thereof. If the frequency weighing method used is not stated, the A-weighing shall apply. (Ord. 6273 § 1 (part), 1996)

# Section 7.10.195 Sound level meter.

"Sound level meter" means an instrument, including a microphone, an amplifier, an output meter, and frequency weighing networks for the measurement of sound levels which satisfies the requirements for S2A meters in American National Standards Institute specifications for

sound level meters, S1.4-1971, or the most recent revision thereof. (Ord. 6273 § 1 (part), 1996)

## Section 7.10.200 Sound pressure.

"Sound pressure" means the instantaneous difference between the actual pressure and the average or barometric pressure at a given point in space, as produced by sound energy. (Ord. 6273 § 1 (part), 1996)

#### Section 7.10.205 Sound pressure level.

"Sound pressure level" in decibels means twenty times the logarithm to the base ten of the ratio of the pressure of this sound to the reference pressure, which reference pressure shall be explicitly stated. (Ord. 6273 § 1 (part), 1996)

## Section 7.10.210 Supplementary definitions of technical terms.

Definitions of technical terms not defined herein shall be obtained from the American National Standard, "Acoustical Terminology" S1.1-1961 (R-1971) or the latest revision thereof. (Ord. 6273 § 1 (part), 1996)

## ADMINISTRATION AND ENFORCEMENT

#### Section:

# 7.15.005 Administration and enforcement.

#### Section 7.15.005 Administration and enforcement.

A. The noise regulation shall be enforced by the Code Enforcement Division of the Community & Economic Development Department and/or the Riverside Police Department.

B. It shall be the responsibility of the Code Enforcement Division and/or the Riverside Police Department to enforce the provisions of this Title and to perform all other functions required by this Title. Such duties shall include, but not be limited to investigating potential violations, issuing warning notices and citations, and providing evidence to the City Attorney for legal action.

C. A violation of these regulations may be prosecuted as a misdemeanor or as an infraction. Each day a violation occurs shall constitute a separate offense and shall be punishable as such. However, nothing in these regulations shall prevent any code compliance officer or his duly authorized representatives from efforts to obtain voluntary compliance by way of warning, notice or education. (Ord. 7341 § 6, 2016; Ord. 6959 § 1, 2007; Ord. 6844 § 15, 2006; Ord. 6273 § 1 (part), 1996)

# SOUND LEVEL MEASUREMENT

# Section: 7.20.010 Sound level measurement.

#### Section 7.20.010 Sound level measurement.

Except as provided by Chapter 17.35, General Noise Regulations, any sound or noise level measurement made to enforce this title shall be measured with a sound level meter using the A-weighing scale at slow response. The exterior noise level shall be measured at the position or positions along the complainant's property line closest to the noise source or where the noise level is highest. If the complaint concerns an interior source, noise measurements shall be made at a point at least four feet from the wall, ceiling or floor nearest the noise source with windows opened or closed as would be normal for the season. (Ord. 6273 § 1 (part), 1996)

# AMBIENT NOISE LEVELS

# Sections:7.23.010Ambient Sound Levels.7.23.020Mixed Use Development.7.23.030Infill Single-Family Residential Development.

# Section 7.23.010 Ambient Sound Levels.

Title 7 - Noise Control of the Riverside Municipal Code shall be consistent with Title 24 of the Health and Safety Code of the State of California as may be amended from time to time. (Ord. 6967 § 3, 2007)

#### Section 7.23.020 Mixed Use Development.

Where a new development proposal includes a mix of residential and nonresidential uses within the same project, the interior ambient noise standard for the residential component of the project may be increased by 5 decibels. (Ord. 6967 § 3, 2007)

#### Section 7.23.030 Infill Single-Family Residential Development.

Where a new development proposal includes an infill single-family residential use, the interior ambient noise standard for the proposal may be increased by 5 decibels. (Ord. 6967 § 3, 2007)

## NUISANCE EXTERIOR SOUND LEVEL LIMITS

# Section: 7.25.010 Exterior sound level limits.

#### Section 7.25.010 Exterior sound level limits.

- A. Unless a variance has been granted as provided in this chapter, it shall be unlawful for any person to cause or allow the creation of any noise which exceeds the following:
  - 1. The exterior noise standard of the applicable land use category, up to five decibels, for a cumulative period of more than thirty minutes in any hour; or
  - 2. The exterior noise standard of the applicable land use category, plus five decibels, for a cumulative period of more than fifteen minutes in any hour; or
  - 3. The exterior noise standard of the applicable land use category, plus ten decibels, for a cumulative period of more than five minutes in any hour; or
  - 4. The exterior noise standard of the applicable land use category, plus fifteen decibels, for the cumulative period of more than one minute in any hour; or
  - 5. The exterior noise standard for the applicable land use category, plus twenty decibels or the maximum measured ambient noise level, for any period of time.
- B. If the measured ambient noise level exceeds that permissible within any of the first four noise limit categories, the allowable noise exposure standard shall be increased in five decibel increments in each category as appropriate to encompass the ambient noise level. In the event the ambient noise level exceeds the fifth noise limit category, the maximum allowable noise level under said category shall be increased to reflect the maximum ambient noise level.
- C. If possible, the ambient noise level shall be measured at the same location along the property line with the alleged offending noise source inoperative. If for any reason the alleged offending noise source cannot be shut down, then the ambient noise must be estimated by performing a measurement in the same general area of the source but at a sufficient distance that the offending noise is inaudible. If the measurement location is on the boundary between two different districts, the noise shall be the arithmetic mean of the two districts.
- D. Where the intruding noise source is an air-conditioning unit or refrigeration system which was installed prior to the effective date of this chapter, the exterior noise level when measured at the property line shall not exceed sixty dBA for units installed before 1-1-80 and fifty-five dBA for units installed after 1-1-80.

# Table 7.25.010A

Exterior Noise Standards						
Land Use Category	Time Period	Noise Level				
Residential	Night (10 p.m. to 7 a.m.) Day (7 a.m. to 10 p.m.)	45 dBA 55 dBA				
Office/commercial	Any time	65 dBA				
Industrial	Any time	70 dBA				
Community support	Any time	60 dBA				
Public recreation facility	Any time	65 dBA				
Nonurban	Any time	70 dBA				

# Table 7.25.010B

Land Use Category/Zoning Matrix				
Land Use Category	Underlying Zone			
Residential	RE, RA-5, RR, RC, R-1-1/2 acre, R-1-13000, R-1-10500, R-1-8500, R-1-7000, R-3-2500, R-3-4000, R-3-3000, R-3-2000, R-3-1500, R-4			
Office/commercial	O, CRC, CR-NC, CR, CG			
Industrial	BMP, I, AIR			
Community support	Any permitted zone			
Nonurban	Any permitted zone			

(Ord. 6967 § 5, 2007; Ord. 6273 § 1 (part), 1996)

#### NUISANCE INTERIOR SOUND LEVEL LIMITS

#### Section:

# 7.30.015 Interior sound level limits.

#### Section 7.30.015 Interior sound level limits.

- A. No person shall operate or cause to be operated, any source of sound indoors which causes the noise level, when measured inside another dwelling unit, school or hospital, to exceed:
  - 1. The interior noise standard for the applicable land category area, up to five decibels, for a cumulative period of more than five minutes in any hour;
  - 2. The interior noise standard for the applicable land use category, plus five decibels, for a cumulative period of more than one minute in any hour;
  - 3. The interior noise standard for the applicable land use category, plus ten decibels or the maximum measured ambient noise level, for any period of time.
- B. If the measured interior ambient noise level exceeds that permissible within the first two noise limit categories in this section, the allowable noise exposure standard shall be increased in five decibel increments in each category as appropriate to reflect the interior ambient noise level. In the event the interior ambient noise level exceeds the third noise limit category, the maximum allowable interior noise level under said category shall be increased to reflect the maximum interior ambient noise level.
- C. The interior noise standard for various land use districts shall apply, unless otherwise specifically indicated, within structures located in designated zones with windows opened or closed as is typical of the season.

#### Table 7.30.015

Interior Noise Standard						
Land Use Category	Time Period	Noise Level				
Residential	Night (10 p.m. C 7 a.m.) Day (7 a.m. C 10 p.m.)	35 dBA 45 dBA				
School	7 a.m. C 10 p.m. (while school is in session)	45 dBA				
Hospital	Any time	45 dBA				

(Ord. 6273 § 1 (part), 1996)

# GENERAL NOISE REGULATIONS

Sections:

7.35.010 General noise regulations.

7.35.020 Exemptions.

## Section 7.35.010 General noise regulations.

A. Notwithstanding the sound level meter standards described in this ordinance, it is nonetheless unlawful for any person to make, continue, or cause to be made or continued any disturbing, excessive or offensive noise which causes discomfort or annoyance to reasonable persons of normal sensitivity. The factors which should be considered in determining whether a violation of this section exists, include the following:

- 1. The sound level of the objectionable noise.
- 2. The sound level of the ambient noise.
- 3. The proximity of the noise to residential sleeping facilities.
- 4. The zoning of the area.
- 5. The population density of the area.
- 6. The time of day or night.
- 7. The duration of the noise.
- 8. Whether the noise is recurrent, intermittent, or constant.
- 9. Whether the noise is produced by a commercial or noncommercial

activity.

- 10. Whether the nature of the noise is usual or unusual.
- 11. Whether the noise is natural or unnatural.

B. It is unlawful for any person to make, continue, or cause to be made or continued any disturbing, excessive or offensive noise which causes discomfort or annoyance to reasonable persons of normal sensitivity. The following acts, among others, are declared to be disturbing, excessive and offensive noises in violation of this section:

1. Radios, Television Sets, Musical Instruments and similar stationary or mobile devices: Operating, playing or permitting the operation or playing of any radio, television set, audio equipment, drum, musical instrument, or similar device which produces or reproduces sound in such a manner as to disturb the peace, quiet and comfort of neighboring residents or persons of normal sensitivity. The operation of any such set, instrument, audio equipment, television set, machine or similar device between the hours of 10:00 p.m. and 7:00 a.m. in such a manner as to be plainly audible at a distance of 50 feet from the building, structure or vehicle in which it is located, shall be prima facie evidence of a violation of this section.

2. Loud Speakers (Amplified Sound): Using, or operating, or permitting to be used or operated, for any purpose, any loud speaker, loudspeaker system, or similar device between the hours of 10:00 p.m. and 7:00 a.m. such that the sound therefrom creates a noise disturbance across a residential property line, or at any time exceeds the maximum permitted noise level for the underlying land use category, except for any non-commercial public speaking, public assembly or other activity for which a variance has been issued.

3. Animals and Birds: Owning, possessing, or permitting to be harbored any animal or bird which frequently or for a continued duration howls, barks, meows, squawks, or makes other sounds which create a noise disturbance across a residential or commercial property line.

4. Loading and Unloading: Loading, unloading, opening, closing or other handling of boxes, crates, containers, building materials, garbage cans, or similar objects, or permitting these activities between the hours of 10:00 p.m. and 7:00 a.m. in such a manner as to cause a noise disturbance across a residential property line or at any time exceeds the maximum permitted noise level for the underlying land use category.

5. Construction: Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration, grading or demolition work between the hours of 7:00 p.m. and 7:00 a.m. on week days and between 5:00 p.m. and 8:00 a.m. on Saturdays or at any time on Sunday or federal holidays.

6. Domestic Power Tools: Operating or permitting the operation of any mechanically powered saw, sander, drill grinder, lawn or garden tool, or similar tool between 10:00 p.m. and 7:00 a.m. so as to create a noise disturbance across a residential or commercial property line. Any motor, machinery, pump, compressor, generator etc., shall be sufficiently muffled and maintained so as not to create a noise disturbance.

7. Powered Model Vehicles: Operating or permitting the operation of powered model vehicles between the hours of 10:00 p.m. and 7:00 a.m. so as to create a noise disturbance across a residential or commercial property line or at any time exceeds the maximum permitted noise level for the underlying land use category.

8. Stationary Non-emergency Signaling Devices: Sounding, or permitting the sounding of any signal from any stationary bell, chime, siren, whistle, or similar device intended primarily for non-emergency purposes, from any place, for more than 10 seconds in any hourly period. Houses of worship and the Mission Inn carillons shall be exempt from the operation of this provision. Sound sources covered by this provision and not exempted under this subsection may be exempted by a variance.

9. Emergency Signaling Devices: The intentional sounding or permitting the sounding outdoors of any fire, burglar or civil defense alarm, siren, whistle or similar stationary emergency signaling device, except for emergency purposes or for testing. Testing of a stationary emergency signaling device shall not occur before 7:00 a.m. or after 7:00 p.m. Any such testing shall only use the minimum cycle test time. In no case shall the test time exceed 10 seconds or occur more than once each calendar month.

10. Vehicle, Motorcycle, Motorboat or Aircraft Repair and Testing: Repairing, rebuilding, modifying or testing any motor vehicle, motorboat or aircraft, or permitting any these activities, in such a manner as to create a noise disturbance across a residential property line, or at any time exceeds the maximum permitted noise level for the underlying land use category shall not be permitted except where said activities are directly related to officially sanctioned events. underlying land use category.

11. For other than noise sources identified in 1-10 above, the following noise disturbance shall be prohibited:

a. Plainly audible across property boundaries;

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

c. Plainly audible at a distance of 50 feet in any direction from the source of music or sound between the hours of 7:00 a.m. and 10:00 p.m.; or

d. Plainly audible at a distance of 25 feet in any direction from the source of music or sound between the hours of 10:00 p.m. and 7:00 a.m. (Ord. 7341 §6, 2016; Ord. 6959 §2, 2007; Ord. 6328 § 1, 1996; Ord. 6273 § 1 (part), 1996)

# Section 7.35.020 Exemptions.

The following activities shall be exempt from the provisions of this title:

A. Emergency Work. The provisions of this Title shall not apply to the emission of

sound for the purpose of alerting persons to the existence of an emergency or in the performance of emergency work.

B. Entertainment Events. The provisions of this Title shall not apply to those reasonable sounds emanating from authorized school bands, school athletic and school entertainment events and occasional public and private outdoor or indoor gatherings, public dances, shows, bands, sporting and entertainment events conducted between the hours of 7:00 a.m. and 10:00 p.m.

C. Federal or State Preempted Activities. The provisions of this Chapter shall not apply to any other activity the noise level of which is regulated by state or federal law.

D. Minor Maintenance to Residential Property. The provisions of this Title shall not apply to noise sources associated with minor maintenance to property used for residential purposes, provided the activities take place between the hours of 7:00 a.m. and 10:00 p.m.

E. Right-Of-Way Construction. The provisions of this Title shall not apply to any work performed in the City right-of-ways when, in the opinion of the Public Works Director or his designee, such work will create traffic congestion and/or hazardous or unsafe conditions.

F. Public Health, Welfare and Safety Activities. The provisions of this Title shall not apply to construction maintenance and repair operations conducted by public agencies and/or utility companies or their contractors which are deemed necessary to serve the best interests of the public and to protect the public health, welfare and safety, including but not limited to, trash collection, street sweeping, debris and limb removal, removal of downed wires, restoring electrical service, repairing traffic signals, unplugging sewers, vacuuming catch basins, repairing of damaged poles, removal of abandoned vehicles, repairing of water hydrants and mains, gas lines, oil lines, sewers, storm drains, roads, sidewalks, etc.

G. Noise sources associated with construction, repair, remodeling, or grading of any real property; provided a permit has been obtained from the City as required; and provided said activities do not take place between the hours of 7:00 p.m. and 7:00 a.m. on weekdays, between the hours of 5:00 p.m. and 8:00 a.m. on Saturdays, or at any time on Sunday or a federal holiday. (Ord. 7341 § 6, 2016; Ord. 6917 § 1, 2006; Ord. 6328 § 2, 1996; Ord. 6273 § 1 (part), 1996)

# VARIANCE PROCEDURE

Sections:7.40.010Variance procedure.7.40.020Appeals.

# Section 7.40.010 Variance procedure.

A. The Zoning Administrator is authorized to grant variances for exemption from any provision of this title, and may limit area of applicability, noise levels, time limits, and other terms and conditions determined appropriate to protect the public health, safety, and welfare. The provisions of this section shall in no way affect the duty to obtain any permit or license required by law for such activities.

B. Any person seeking a variance pursuant to this section shall file an application with the Zoning Administrator. The application shall be signed by the property owner or owner's representative using forms supplied by the Community & Economic Development Department - Planning Division. The application shall contain information which demonstrates that bringing the source of the sound or activity into compliance with this title would constitute an unreasonable hardship to the applicant, the community, or other persons. The Zoning Administrator may require additional information if it is necessary to make a determination regarding the variance request. The application shall be accompanied by a fee established by resolution of the City Council.

C. A separate application shall be filed for each noise source; provided, however, several mobile sources under common ownership or several fixed sources on a single property may be combined into one application. Any person who claims to be adversely affected by the allowance of the variance may file a statement with the Zoning Administrator containing any information to support his claim. If the Zoning Administrator determines that a sufficient controversy exists regarding a variance application, the variance may be set for public hearing before the Planning Commission.

D. Public notice of the consideration of a proposed variance from the standards of this chapter shall be provided by the Zoning Administrator by mailing such notice to property owners within three hundred feet of the exterior boundaries of the property under consideration. The notice shall invite interested persons to notify the Planning Division of any concerns or comments within ten days of the date of the notice.

E. In determining whether to grant or deny the application, the Zoning Administrator or the Planning Commission shall consider comments received from property owners within three hundred feet, hardship on the applicant, the community, or other persons affected and property affected and any other adverse impacts. The requested variance may be granted in whole or in part and upon such terms and conditions as it deems necessary if, from the facts presented on the application, the Zoning Administrator or the Planning Commission finds that:

1. The strict application of the provisions of this title would result in practical difficulties or unnecessary hardships inconsistent with the general purpose of this title;

2. There are exceptional circumstances or conditions applicable to the property involved or to the intended use or development of the property that do not apply generally to other property in the same zone or neighborhood;

3. The granting of such variance will not be materially detrimental to the public welfare or injurious to the property or improvements in the zone or neighborhood in which the property is located;

4. The granting of such variance will not be contrary to the objectives of any part of the adopted General Plan.

F. A variance shall be granted by a notice to the applicant containing all the necessary conditions, including any time limits on the permitted activity. The variance shall not become effective until all the conditions are agreed to by the applicant. Noncompliance with any condition of the variance shall terminate the variance and subject the person holding it to those provisions of this chapter for which the variance was granted.

G. A variance shall be valid for a period not exceeding one year after the date on which it was granted. Applications for extensions of the time limits specified in variances or for the modification of other substantial conditions shall be treated like applications for initial variances.

H. In the event the Zoning Administrator does not approve an application for a variance within ten days after the application is filed it shall be placed on the agenda of the next regularly scheduled Planning Commission, unless the Commission refers the matter to the City Council. (Ord. 7341 § 6, 2016; Ord. 6967 § 7, 2007; Ord. 6462 § 8-10, 1999; Ord. 6273 § 1 (part), 1996)

# Section 7.40.020 Appeals.

Any person aggrieved by the approval or disapproval of a variance, may appeal the decision of the Zoning Administrator or Planning Commission to the City Council within ten days after the date of such approval or disapproval. The City Council shall hold a hearing thereon, upon notice to the applicant, considering the same criteria presented to the Zoning Administrator. (Ord. 6462 § 11, 1999; Ord. 6273 § 1 (part), 1996)

97

# SEVERABILITY

Section: 7.45.010 Severability

# Section 7.45.010 Severability

If any section, subsection, sentence, clause or phrase in this title is for any reason held to be invalid or unconstitutional by decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions of this title. The City Council hereby declares that it would have passed this title and each section, subsection, clause or phrase thereof irrespective of the fact that any one or more other sections, subsections, clauses or phrases may be declared invalid or unconstitutional. (Ord. 6328 § 3, 1996)

APPENDIX 5.1:

**STUDY AREA PHOTOS** 



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# JN:11145 Northgate



L1\_E 33, 59' 52.490000", 117, 21' 46.360000"



L1\_N 33, 59' 52.500000", 117, 21' 46.360000"



L1\_S 33, 59' 52.470000", 117, 21' 46.360000"



33, 59' 52.490000", 117, 21' 46.360000"



L2\_E 33, 59' 52.930000", 117, 21' 42.790000"



L2\_N 33, 59' 52.760000", 117, 21' 42.870000"

L3\_5 33, 59' 56.680000", 117, 21' 38.280000"

L3\_W 33, 59' 56.720000", 117, 21' 38.250000"



L3\_N

33, 59' 56.680000", 117, 21' 38.280000"



L3\_E

33, 59' 56.580000", 117, 21' 38.340000"

<image>



L2\_S 33, 59' 52.930000", 117, 21' 42.790000"





JN:11145 Northgate

### JN:11145 Northgate



L4\_E 33, 59' 52.350000", 117, 21' 30.040000"



L4\_N 33, 59' 52.380000", 117, 21' 30.040000"



L4\_W 33, 59' 52.380000", 117, 21' 30.040000"



L5\_E 33, 59' 45.070000", 117, 21' 23.340000"



L5\_N 33, 59' 45.070000", 117, 21' 23.370000"



L5\_S 33, 59' 45.070000", 117, 21' 23.340000"

104

L7\_E 33, 59' 42.060000", 117, 21' 53.850000"

L7\_N 33, 59' 41.850000", 117, 21' 54.510000"



L6\_S 33, 59' 42.200000", 117, 21' 19.300000"



33, 59' 42.200000", 117, 21' 19.300000"

L5\_W 33, 59' 45.110000", 117, 21' 23.370000"

L6\_N 33, 59' 42.370000", 117, 21' 19.250000"





JN:11145 Northgate

### JN:11145 Northgate



L7\_S 33, 59' 41.940000", 117, 21' 54.270000"



L7\_W 33, 59' 41.780000", 117, 21' 54.680000"

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APPENDIX 5.2:

**NOISE LEVEL MEASUREMENT WORKSHEETS** 



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24-Hour	CNEL	64.2				$\mathbb{H}$	9.99		22 23		%661	51.0	55.0	52.7	50.0	0.02	52.4		50.0	0.1C	53.0	53.0	56.0 55.0	52.0	52.0	51.0	52.0	52.0	52.0	53.0	53.0	55.0 13.0	54.0	53.0	53.0	50.0	URBAN
rage Leq	Night	57.2		s)		H	<b>1.82</b>		21 2		195%	52.0	56.0	53.5	51.0	0.75	53.3		51.0	0.25 52.0	53.0	54.0	57.0 55.0	52.0	53.0	53.0	52.0	52.0	53.0	54.0	54.0	56.0	55.0	54.0 55.0	54.0	52.0	
Energy Average Leq	Day	58.6		L50% (30 Minutes)		H	9.82 9.82		19 20		%061	53.0	56.0	53.9	51.0	0.76	0.55		51.0	52.0	54.0	54.0	57.0 56.0	53.0	54.0	53.0	53.0	53.0	53.0	54.0	54.0	56.0	55.0	54.0	54.0	52.0	
1145	. Wolfe	/8/2017		T20		$\mathbb{H}$	2:85 79		17 18		L50%	54.0	58.0	56.1	53.0	0.60	0.cc		53.0	0.4c	55.0	57.0	59.0	57.0	56.0 25	55.0 E4 0	55.0	55.0	55.0 58.0	56.0	57.0	58.0	57.0	56.0	56.0	54.0	
y JN: 11145	Analyst: A. Wolfe	Date: 8/8/2017				H	9.72 8.72		15 16		125%	56.0	60.0	57.8	54.0	DU.U	/.0c		54.0	0.00	56.0	58.0	60.0 59.0	59.0	58.0	57.0	56.0	57.0	57.0 50.0	58.0	58.0	60.0	59.0	57.0	57.0	56.0	
				L2% (1 Minute)		H	8.93		13 14		78%	58.0	63.0	59.9	55.0	0.10	58.3		55.0	0.76	57.0	59.0	61.0 61.0	62.0	63.0	59.0	59.0	58.0	58.0	60.0	60.0	61.0	60.0 61.0	58.0	59.0	60.09	
	om the			——L2% (1			2:99 2:99	5	12	Beginning	15%	59.0	70.0	61.1	57.0	02.0	0.85	nmary	57.0	0.75	58.0	60.0	62.0 61.0	63.0	70.0	60.0 EQ 0	60.0	59.0	59.0 62 0	60.0	60.0	62.0	60.U 61.0	59.0 61 0	0.10	60.0	
	across Orange Street from the	5					t.ə.	5	10 11		12%	60.0	72.0	62.9	59.0	03.0	60.9	Hourly Summary	59.0	60.0 60.0	60.0	61.0	63.0 63.0	66.0	72.0	61.0 60.0	62.0	61.0	62.0 66.0	62.0	61.0	64.0	62.U 63.0	60.0 62.0	61.0	61.0	100
						9.	Z.88 Z.8		6		L1%	61.0	72.0	64.4	60.0	0.00	02.3		60.0	62 U	61.0	62.0	65.0 63.0	68.0	72.0	62.0 61.0	64.0	62.0	64.0 68.0	63.0	62.0	67.0	0.co 64.0	61.0 62.0	62.0	62.0	
	lementary Sch					H	20°3		. 9		Lmin	50.4	54.4		49.1		Sec.		49.3	5.05 7.05	52.5	52.7	56.0 54.0	51.1	51.6	50.4 E0 0	51.2	51.4	51.8 57 4	51.9	52.9	54.4	52.2 54.1	52.7 52.0	57.4	49.1	
ter	the Fremont E						.ez		4 5		Lmax	67.4	87.4	Average	67.8 70.4		AVELABE		69.5 70 å	70 q	68.3	67.8	72.9 71.3	76.4	87.4	67.4 7 4	74.6	67.7	70.9	67.6	70.8	83.9	72.2	71.9	5 69	72.9	
Project Name: Northgate Center	L1- Located at the Fremont Elementary School	Project site.	nadjusted)				2:99		2		Lea	56.1	62.6	58.6	54.2	04.U	7.16		54.2	55.1	56.2	57.5	59.9 59.3	59.3	62.6	56.7 56.7	56.7	56.5	56.8 50 0	57.6	57.8	61.1	58.6 58.6	56.9	1.0C	56.6	
oject Name: N		Location: p	Hourly Leq dBA Readings (unadjusted)				2.8 2.4		0		Hour	Min	Max	/erage:	Min	X PIAX	verage.		- 0		i m	4	5 G	7	00 (	ۍ رو	11	12	13	15	16	17	19 19	20	21	23	
Pri			fourly Leg dB				45.00 45.00	<b>H</b> 35.0 +	-		Time Period		Day	Energy Average:	Night		Ellergy Average.				Night								NeU	655						Night	

24-Hour	CNEL	69.4			0.0		2 23		%667	49.0 55 0	51.7	49.0 56.0	51.1		49.0	49.0	50.0	52.0	56.0 54.0	50.0	51.0 49.0	49.0	49.0	50.0	52.0	51.0	54.0	54.0	54.0	53.0 53.0	52.0 49.0	<b>URBAN</b> crossroads
erage Leq	Night	61.5		ss)	53.3		21 22		762%	50.0 57.0	52.7	50.0 56.0	52.0		50.0	50.0	51.0	53.0	56.0 55.0	51.0	51.0 50.0	50.0	50.0	51.0	53.0	53.0	55.0 57.0	55.0	55.0	54.0 54.0	53.0 50.0	
Energy Average Leq	Day	66.0		L50% (30 Minutes)	9.99		19 20		%067	50.0 58.0	53.4	50.0 57.0	52.4		50.0	50.0	51.0	54.0	57.0 55.0	52.0	52.0 51.0	50.0	50.0	52.0	54.0	54.0	55.0	56.0	56.0	54.0 55.0	54.0 51.0	
JN: 11145	A. Wolfe	Date: 8/8/2017			<b>7.0</b> 7		17 18		L50%	54.0 67 0	58.3	51.0 58.0	54.2		52.0	52.0	53.0	56.0	58.0 58.0	59.0	56.0 54 0	54.0	54.0	56.0 57 0	59.0	61.0	62.0 67 0	61.0	59.0	58.0 57.0	56.0 52.0	
	<i>Analyst:</i> A. Wolfe	Date: 8			<b>2.</b> 99		15 16		L25%	60.0 70.0	64.7	52.0 62.0	56.0		53.0	53.0	54.0	58.0	60.0 62.0	66.0	64.0 62.0	62.0 62.0	62.0	63.0 64.0	65.0	67.0	68.0 70.0	68.0	65.0	65.0 60.0	58.0 54.0	
nt Summa				L2% (1 Minute)	<b>8.</b> 43		13 14		%8 <b>7</b>	68.0 72.0	70.1	55.0 69.0	61.9		57.0	55.0	58.0	66.0	68.0 69.0	71.0	70.0 69.0	0.69	0.69	69.0	0.69	71.0	71.0	72.0	71.0	71.0 68.0	66.0 63.0	
24-Hour Noise Level Measurement Summary	ar existing	0		<b>—</b> L2% (	0.43		11 12	Hour Beginning	L5%	73.0	71.1	57.0 71.0	64.6	mmarv	60.0	58.0	62.0	69.0 	70.0 71.0	72.0	71.0	70.0	70.0	70.0	70.0	71.0	72.0	73.0	72.0	72.0 70.0	68.0 66.0	
se Level M	boundary nea				5.58		10	Hou	12%	72.0 75.0	72.9	64.0 73.0	69.2	Hourly Summary	66.0	66.0 64.0	68.0	72.0	73.0 73.0	74.0	73.0	72.0	72.0	72.0	72.0	73.0	73.0 75.0	74.0	74.0	74.0 72.0	71.0 70.0	110
-Hour Nois	12- Located on Orange Street at the western Project site boundary near existing				<b>9.4</b> 3 8.53		8		<b>71%</b>	73.0 76.0	74.1	0.69 74.0	71.8		70.0	70.0	71.0	73.0	74.0 74.0	76.0	73.0	73.0	73.0	73.0	74.0	74.0	74.0 76.0	76.0	75.0	75.0 73.0	73.0 72.0	
24	t at the weste				<b>8.43</b>		6 7		Lmin	48.1 54.2		47.8 55.6			48.3	47.8 40 E	49.7	51.7	55.6 53.4	49.0	50.1 48 1	49.0	48.7	50.0	51.4	50.3	52.8 51.2	53.1	53.6	52.5 53.2	51.5 48.3	
ter	Orange Stree	nes.			2.2a	9	4 5		Lmax	78.8 98 q	Average	76.2 80.2	Average		77.5	76.5 76.2	78.3	81.7	89.2 84.3	82.9	78.8	81.1	89.7	79.7 oc 7	84.2	81.4	80.1 08 0	85.4	87.2	89.5 82.0	82.4 81.1	
Vorthgate Cen	-2- Located on	residential homes	nadjusted)			85 	2 3		Гeq	63.3 70.7	66.0	56.1 65.2	61.5		57.1	56.7 E6.1	58.2	62.2	65.2 64.8	66.6	64.6 63.8	63.5	64.4	64.0 64 o	65.0	66.2	66.7 70.7	67.5	65.9	66.6 63.3	62.0 60.0	
Project Name: Northgate Center		Location: r	Hourly Leq dBA Readings (unadjusted)		+	. 95 . 25	0 1		Hour	Min VeM	verage:	Min VeM	verage:		0	<del>,</del> ,	4 M	4 -	n o	7	∞ σ	10	11	12	14	15	16	18	19	20 21	22 23	
Pr			Hourly Leq dB	OF D	<b>b) psJ γi</b>				Time Period	Day	Energy Average:	Night	Energy Average:				Night								Day						Night	

Project Name: Northgate Center	iter	7	24-HOUL NO		our Noise Level Measurement Summary			JN: 11145	Energy Average Leg	erage Leq	24-Hour
Stro	ng Stree	L3- Located on Strong Street north of Project site by near existing residential	iject site by n€	sar existing re	ssidential		Analyst:	Analyst: A. Wolfe	Day	Night	CNEL
homes and a church.	Ļ						Date:	Date: 8/8/2017	65.7	57.3	66.7
	-	-	-	-		-L2% (1 Minute)	-	- F	L50% (30 Minutes)	es)	-
8.72	9.82	9.09	1.60	T'79 7'89	<b>2.8</b> 8	<b>7.</b> £ð	0.7 <b>0</b>	<b>6.89</b>	6 <sup>.</sup> 09	9.03	0.92
4	- -	6 7	7 8	9 10	11 12	13 14	15 16	17 18	19 20	21 22	2 23
				Í	Hour Beginning	<b>P</b>					
ΓU	Lmax	Lmin	L1%	L2%	L5%	<b>78%</b>	L25%	L50%	%067	<b>762%</b>	%667
82 SO	78.6 98 5	47.5 52 8	71.0 79.0	0.69 76.0	64.0 73.0	61.0 71.0	55.0 66.0	52.0 60.0	49.0 55.0	48.0 54.0	48.0 53.0
		Average:	74.5	72.2	69.1	6.99	58.8	54.9	52.2	51.6	50.9
7	71.9	47.6	59.0	56.0	55.0	54.0	53.0	52.0	50.0	49.0	48.0
ω			72.0	70.0	65.0	61.0	57.0	56.0	54.0	54.0	54.0
	Ave	Average:	66.8	62.6	58.3	56.7	54.4	53.3	51.7	51.2	50.6
				Hourly	Hourly Summary						
'n	74.5	47.8	65.0	59.0	55.0	55.0	53.0	52.0	50.0	49.0	49.0
13	73.9	47.6	61.0	57.0	55.0	54.0	53.0	52.0	51.0	50.0	49.0
~ ∝	/1.9 80.8	48.9 48.0	59.0 67.0	59.0 59.0	56.0 56.0	54.0 55.0	53.0 53.0	52.0	50.0	50.0 49.0	49.0 48.0
7	76.4	51.3	0.69	64.0	58.0	57.0	56.0	55.0	53.0	53.0	52.0
	77.8	52.0	70.0	67.0	62.0	59.0	56.0	54.0	53.0	53.0	52.0
	/9.4	53.b	72.0	70.0	65.U	61.0	0.73	56.0	54.0	54.0	54.0
ກດ	92.4 95.2	48.8 48.7	74.0 74.0	73.0 73.0	70.0	69.0 68.0	60.0 57.0	53.0 53.0	51.0 50.0	51.0 50.0	50.0 49.0
	88.6	48.0	74.0	71.0	68.0	65.0	55.0	52.0	50.0	49.0	48.0
	88.0 04 r	47.6 47.5	75.0	72.0	69.0 70.0	67.0 57.0	56.0	52.0	49.0	48.0	48.0
<i>,</i> ,	94.5 86 9	C.14 494	74.0	73.0	70.0 69 D	07.0 67.0	0.76	54 D	49.0 51 0	40.U 51 ()	40.0 50.0
	92.3	49.8	73.0	71.0	68.0	66.0	58.0	55.0	53.0	52.0	51.0
0,	95.0	50.2	76.0	73.0	70.0	68.0	60.0	55.0	53.0	52.0	51.0
0,	95.1	51.0	75.0	73.0	71.0	69.0	62.0	57.0	53.0	53.0	52.0
	85.0	51.4	75.0	73.0	71.0	69.0 71.0	62.0 CC 0	57.0	54.0	53.0	52.0
	<u>94.9</u> 00 г	7.76	0.67 75 0	/0.0	70.0	0.1/	0.06	60.U	0.66	0.42 0.23	0.55
	78.6	52.8	72.0	70.0	67.0	65.0	58.0	56.0	54.0	54.0	53.0
	81.1	51.5	72.0	70.0	66.0	64.0	56.0	55.0	53.0	53.0	52.0
	86.3	52.2	71.0	69.0	64.0	61.0	57.0	55.0	54.0	53.0	53.0
	80.5 75.7	51.5 48.8	70.0 68.0	67.0 64.0	62.0 57.0	56.0 56.0	56.0 53.0	55.0 57.0	53.0 51.0	53.0 50.0	52.0 50.0
		2			)		2		5		

24-Hour	CNEL	66.7						+	2.7.	 S 	2 23			%667	47.0	51.0	48.8	47.0 52 0	49.1		18 U	48.0	47.0	49.0	49.0 73.0	52.0 52.0	49.0	50.0	49.0	48.U 47 N	47.0	47.0	47.0	48.U	51.0	50.0	50.0	50.0 50.0	49.0	48.0	URBAN
erage Leq	Night	58.3			55)			6.8	:09 :9		21 22			762%	48.0	51.0	49.5	48.0 53.0	49.6		18.0	48.0	48.0	49.0	50.0	52.0 52.0	50.0	50.0	49.0	49.U 48.0	48.0	48.0	48.0	49.U	51.0	50.0	51.0	51.0 51.0	50.0	48.0	
Energy Average Leq	Day	64.2						$\square$	.09 19		19 20			%067	48.0	52.0	49.9	48.0 53.0	50.0		18 U	48.0	48.0	50.0	51.0	53.0 53.0	51.0	50.0	49.0	49.0 48.0	49.0	48.0	48.0	49.0 51.0	52.0	51.0	51.0	51.0 51.0	50.0	49.0	
JN: 11145	A. Wolfe	Date: 8/8/2017			ר ב 		+	2.2 9.78			17 18			<i>150%</i>	50.0	57.0	52.5	49.0 55 0	51.7		10.0	50.0	50.0	51.0	53.0	55.0	54.0	52.0	52.0	52.U	51.0	50.0	51.0	52.0	57.0	53.0	53.0	53.0 53.0	52.0	50.0	
:NI	Analyst: A. Wolfe	Date: 8						5.3	+		15 16			L25%	53.0	66.0	56.9	50.0 58.0	52.8		ξÛÛ	51.0	51.0	51.0	54.0	58.0	59.0	56.0	55.0	54.0	55.0	53.0	56.0	61.U	66.0	58.0	55.0	54.0 55.0	53.0	51.0	
				1 Minutel	rz% (T INIUNE)			С. С. С.	Е9 'Т9		13 14			%8 <b>7</b>	61.0	73.0	67.2	52.0 67.0	57.1		5 U	52.0	52.0	53.0	57.0	66.0	71.0	68.0	64.0	60.U	66.0	65.0	68.0	0.17	73.0	70.0	64.0	61.0 64.0	67.0	55.0	
	dential			1 /80 1	) %Z ]			S"	-		11 12		Hour Beginning	<b>L5%</b>	65.0	74.0	69.8	53.0 67.0	58.7		53 ()	53.0	54.0	55.0	59.0	67.0	73.0	71.0	67.0	0.69.U	70.0	68.0	70.0	0.27	74.0	72.0	67.0	65.0 67.0	67.0	58.0	
	ır existing resio	)						2.8	F		10	)	нон	L2%	71.0	76.0	73.5	58.0 72.0	64.0	Hourly Summany		58.0	58.0	59.0	67.0	68.U 72.0	76.0	74.0	72.0	74.0	73.0	72.0	73.0	0.67	76.0	75.0	72.0	71.0 72.0	68.0	66.0	
	ect site by nea							S't	·9		6 - -	)		L1%	73.0	78.0	75.4	61.0 74.0	67.6		66 D	61.0	61.0	62.0	71.0	74.0	78.0	76.0	74.0	0.67	75.0	74.0	75.0	76.0	78.0	76.0	74.0	73.0 74.0	71.0	70.0	
	t north of Proj	,						<b>4</b> .			6 7			Lmin	46.9	50.4		46.5 52 1		þ	A7 5	46.8	46.5	48.1	49.2	51.4	48.5	49.2	48.3	47.4 47.2	46.9	47.0	47.0	47.6 48.2	50.4	49.5	50.0	50.2 50.3	47.9	47.5	
iter	i Strong Street	)			_						4			Lmax	79.2	89.7	Average	71.5 82 4	Average		27 7	78.0	71.5	82.0	79.0	82.4 80.1	87.2	88.0	83.3	84.6 85 9	83.2	82.1	80.9	87.3 80.6	86.4	88.4	80.7	79.2 89.7	78.3	78.6	
Project Name: Northgate Center	L4- Located on Strong Street north of Project site by near existing residential	homes.	inadiusted)						<b>Z</b> .a	75	3 7			ped	60.5	67.6	64.2	52.2 62 4	58.3		ר רי רי	53.4	52.2	55.2	58.2	60.2 62.4	66.5	64.5	61.8	63.2 64 1	62.5	61.3	63.0	60.3 7 7	67.6	65.7	61.4	60.5 63.9	60.3	57.2	
oject Name:		Location: }	Hourly Lea dBA Readinas (unadiusted)						<u>د.</u>	23	0			Hour	Min	Max	verage:	Min Max	verage:	þ	c	) <del>(</del> -	5 -	m	41	n u	7	∞	б ;	11	12	13	14	15 16	17	18	19	20 21	22	23	
Pr			ourly Lea dB		85.0 $ op$			→ 1 0.0 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2		<b>0.0</b> 0.00 0.00 0.00	35.0 +			Time Period	Dav	lan	Energy Average:	Night	Energy Average:	5				Night									Day						Niaht	INIGILL	

24-Hour	CNEL	74.1				8.29	23		%667	62.0 65.0	63.7	55.0	66.0 70.3	59.2		55.0	55.0 55.0	57.0	62.0	64.0 66.0	65.0	65.0	0.co 65.0	64.0	63.0	64.U 63.0	63.0	63.0 52.0	03.U 63.0	64.0	63.0 53.0	61.0	
rage Leq	Night	67.2		s)		6.7 <b>a</b>	21 22		767	63.0 66.0	64.7	57.0	67.0	61.1		58.0	57.0	60.0	63.0	66.0 67.0	66.0	66.0 25.0	00.0 66.0	65.0	65.0 CT 0	0.69	64.0	64.0	64.0 64.0	65.0	64.0	62.0	60.0
Energy Average Leq	Day	68.2		– L50% (30 Minutes)		6.7à	19 20		%061	64.0 67.0	65.3	58.0	67.0	62.0		59.0	58.0	61.0	64.0	67.0 67.0	67.0	67.0	00.0 66.0	66.0	65.0 CT 0	0.co 65.0	64.0	65.0 64 0	04.U 65.D	65.0	65.0 64.0	63.0	61.0
JN: 11145	A. Wolfe	Date: 8/8/2017				2.7ð	17 18		<b>L50%</b>	66.0 68.0	67.2	62.0	69.0 57 2	65.1		63.0	62.0 62.0	64.0	67.0	0.69	68.0	68.0	00.0 68.0	68.0	67.0	67.0 67.0	66.0	67.0 66.0	00.U	67.0	67.0 57.0	66.0	64.0
	Analyst: A. Wolfe	Date:				S.73 2.73	15 16		L25%	67.0 69.0	68.3	64.0	70.0	66.8		65.0	64.0 64.0	66.0	0.69	/0.0 70.0	0.69	0.69	0.69	0.69	68.0	68.0 68.0	68.0	68.0 67.0	0.70 68.0	68.0	68.0	000.0 67.0	66.0
24-Hour Noise Level Measurement Summary				-L2% (1 Minute)		<b>2.8</b> 3	13 14	50	<i>%8</i> 7	69.0 71.0	69.8	67.0	71.0	68.7		67.0	67.0 67.0	68.0	70.0	/1.0 71.0	71.0	71.0	70.0	70.0	70.0	0.07	69.0	69.0 60.0	0.69	70.0	70.0	0.07	68.0
Aeasureme	Drive near			<b>—</b>		8.83	11 12	Hour Beginning	T5%	69.0 71.0	70.3	68.0	72.0	69.7	Hourly Summary	68.0	68.0 68.0	69.0	71.0	72.0	71.0	71.0	71.0	71.0	70.0	70.0	70.0	70.0	0.60	70.0	70.0	70.0	69.0
ise Level N	on La Cadena					0'69 T'69	9 10	Hc	12%	71.0 73.0	71.6	69.0	73.0	70.9	Hourly	70.0	69.0 69.0	71.0	72.0	73.0	72.0	72.0	72.0	72.0	71.0	71.0 71.0	71.0	71.0	0.17	72.0	72.0	71.0	70.0
4-Hour No	15-1 ocated at the northeastern Proiect site houndary on 1a Cadena Drive near	e 215.				Z.69	7 8		11%	72.0 74.0	72.5	71.0	75.0	72.2		71.0	71.0	72.0	73.0	75.0	73.0	73.0	74.0	72.0	72.0	72.0	72.0	72.0	72.0	72.0	73.0	72.0	71.0
2	stern Project s	existing residential homes and Interstate 215.				9.ea	9		Lmin	60.6 64.4	Average:	52.1	64.8	Average:		52.1	54.2	55.2	59.5	62.8 64.8	63.6	64.4	02.0 63.3	62.6	61.2	62.6 60.6	60.8	62.6 60.7	61.9	62.1	61.3 60.6	58.9	56.1
enter	at the northea	lential homes			_	<b>Z:89</b>	4		Гтах	76.6 84.6		75.5		AVE		75.5	88.1 76.7	79.2	80.1	/9.8 82.6	78.6	76.6	83.1	84.6	77.1	76.8	79.2	82.8	0.00	77.6	77.5	89.2	83.4
Northgate Ce	15- Located	existing resid	(unadjusted)			6.29 2.43	2 3		bəŢ	67.2 69.2	68.2	64.2	70.1	67.2		64.3	64.7 64.2	65.9	68.2	69.6 70.1	69.1	69.2 50.1	0.69 0.69	68.8	68.2	67.5 67.5	67.5	67.5 67.2	67.7	68.1	67.9	67.9	65.8
Project Name: Northgate Center		Location:	Hourly Leq dBA Readings (unadjusted)			<b>64.7</b>	0 1		Hour	Min Max	Energy Average:	Min	Max	Energy Average:		0		۱m	4 1	n u	2	∞ α	ر 10	11	12	13	15	16 17	17	19	20	22	23
4			Hourly Leg d	QE O		rly Leq (			Time Period	Day	Energy	Night		Energy				Night								Dav						+- -:IV	INBIN

	24-Hour	CNEL	71.3					$\mathbb{H}$	9.23		22 23		%667	59.0	63.0	01.8	0.55 63.0	56.9		53.0	53.0	53.0	55.0 ED 0	53.0 62.0	63.0	62.0	62.0	62.0	62.0	61.0	62.0 62.0	62.0 62.0	63.0	63.0	62.0	62.0 61.0	59.0	58.0 56.0	
	erage Leq	Night	64.2		(Si				·S9		21 2		195%	61.0	64.0 C2 C	62.0 55.0	0.cc 64.0	58.7		56.0	55.0	55.0	57.0	0.1.0 63.0	64.0	63.0	63.U	0.20 62.0	63.0	62.0	63.0 63.0	63.0 63.0	64.0	63.0	63.0	62.0 61.0	61.0	60.0 57.0	
	Energy Average Leg	Day	66.3		– L50% (30 Minutes)				99		19 20		%067	61.0	64.0	63.2	0.05 64.0	59.1		56.0	56.0	56.0	58.0	63.0	64.0	63.0	64.0 62.0	0.2.0 63.0	63.0	63.0	64.0 62.0	63.U 64.0	64.0	64.0	64.0	63.U 62.0	61.0	60.0 58.0	
	1145	. Wolfe	/8/2017						99		17 18		150%	64.0	66.0	64.9	0.85 66.0	62.1		60.0	59.0	60.0	61.0	65.0	66.0	65.0	65.U	65.0	65.0	65.0	65.0 65.0	0.co 65.0	66.0	65.0	65.0 Gr 0	64.0 64.0	64.0	63.0 61.0	
λ.	JN: 11145	Analyst: A. Wolfe	Date: 8/8/2017					Þ.	29 99		15 16		L25%	65.0	67.0	00.1 61 0	0.10	63.9		62.0	61.0	62.0	63.0 65.0	67.0	67.0	0.99	66.0	0.00	66.0	66.0	66.0 66.0	00.U 67.0	67.0	66.0	67.0	0.00 66.0	65.0	65.0 63.0	
24-Hour Noise Level Measurement Summary					-L2% (1 Minute)				99		13 14		78%	67.0	69.0	64 0	69.0 69.0	66.0		64.0	64.0	64.0	65.0 67 0	0.79	69.0	68.0	0.80	00.0 68.0	68.0	68.0	68.0	08.0 68.0	0.69	68.0	68.0	68.0 68.0	67.0	67.0 65.0	
easuremen		treet near			<b>—</b> —L2% (1			6	S9			Hour Beginning	L5%	68.0	70.0	65.0	0.69	66.7	nmary	65.0	65.0	65.0	66.0 58.0	0°00 69.0	69.0	0.69	69.0	0.60	68.0	68.0	69.0	0.80 69.0	70.0	69.0	69.0	0.69	68.0	67.0 66.0	
e Level Me		on Thonrton S							99		10 11	Hour	L2%	69.0	72.0	/0.3 66.0	71.0	68.3	Hourly Summary	67.0	66.0	66.0	68.0 70.0	71.0	71.0	71.0	/0.0	70.0	70.0	69.0	70.0	70.0	71.0	71.0	70.0	72.0	70.0	69.0 67.0	
Hour Nois		nterstate 215 (							99 99		8		L1%	70.0	74.0 71 F	C.1/	72.0	69.7		0.69	67.0	68.0	69.0 71.0	72.0	72.0	73.0	/1.0	72.0	71.0	70.0	71.0	71.0	73.0	72.0	71.0	74.0	72.0	70.0 69.0	
24-		tt site across li							99 (19)		6 7		Lmin	57.9	62.3		61.6			51.1	51.3	51.1	53.6	59.7	61.6	61.1	61.4	00.1 60.8	61.3	59.6	61.4 50 5	61.8 61.8	62.3	62.2	61.5	60.8 59.4	57.9	57.4 54.7	
	er	t of the Projec	tial homes.						99 .59		4 5		Lmax	73.8		AVEIAGE.	81.9	Average:		76.2	77.8	77.7	75.3	2.17	79.1	6.77	ک.د/ م <del>بر</del>	76.4	79.2	73.8	75.1 75.2	2.c/ 2.77	83.9	79.4	80.3	86.9	79.9	79.7 75.7	
	Project Name: Northgate Center	L6- Located east of the Project site across Interstate 215 on Thonrton Street near	existing residential homes.	adjusted)					4.1ä	)         	2 3		ped	65.2	67.4	61.3	2.10	64.2		61.8	61.2	61.4	63.0 65.4	66.6	67.0	66.5	66.3 66.4	66.1	66.0	65.9	66.4 c 2	00.2 66.6	67.4	66.6	66.6 22.0	66.3	65.2	64.4 62.6	
	ject Name: N		Location: ex	Readings (un					8.1.8		0 1		Hour	Min	Max Max	didge.	Max	erage:		0	) (-1	2	m <	4 rv	9	2	x c	ر 10	11	12	13	15	16	17	18	19 20	21	22 23	
	Pro			Hourly Leq dBA Readings (unadjusted)	QE ()	(A			rly l				Time Period	Dav	Encred Aug	Ellergy Average:	Night	Energy Average:					Night								Dav.	лау						Night	

Project Name: Northgate Center	Northgate Ce	5	ıter	2	24-Hour No	iise Level	our Noise Level Measurement Summary	ent Summa		JN: 11145	Energy Av	Energy Average Leq	24-Hour
Location: L7- Located south of the Project site on Russell Street near existing residential	L7- Located south of the Project site on Ru	outh of the Project site on Ru	oject site on Ru	2	issell Street r	near existing	residential		Analyst: A. Wolfe	A. Wolfe	Day	Night	CNEL
nomes and commercial uses.	nomes and commercial uses.	immercial uses.	es.						Date:	Date: 8/8/2017	78.1	75.0	82.2
Hourly Leq dBA Readings (unadjusted)	unadjusted)						<b>—</b> 12%	-12% (1 Minute)			– L50% (30 Minutes)	esl	
						H		H					
e.rr e.ov e.rr e.rr r.rr	e.47 0.77 7.77	L. TT	L. TT	5.11	8.9T	8. <i>TT</i>	.08 8.77	4.77 .08	6.77 2.87	.08 .08	4.2T T.2T	6.27 2.27	5.27
	3 4 6	5	9	- -		9 10	11 12	13 14	15 16	17 18	19 20	21 22	23
)	)	)	)		)	)	Begi						
Hour Lea Lmax Lmin	lmax		Lmin		11%	12%	15%	18%	125%	150%	%061	195%	%66 <i>1</i>
75.4 92.4	92.4		66.7		84.0	81.0	78.0	77.0	74.0	72.0	70.0	0.69	68.0
- Max 80.8 105.1 /0.3 Fnergy Average: 78.1 Аverage:	105.1 Averade:	Average.			92.0 86 5	89.0 84.3	86.U 81 2	85.0 70.0	76 5	74.4	71 0	712	70.1
n 70.9 83.9	83.9	0,000,000			78.0	76.0	74.0	73.0	71.0	0.69	66.0	66.0	65.0
	99.6		71.0		87.0	84.0	81.0	80.0	77.0	75.0	73.0	72.0	72.0
Energy Average: 75.0 Average:		Average:	rage:		82.0	79.6	76.9	75.8	73.4	71.8	69.4	68.9	67.9
						Hourly	Hourly Summary						
83.9 63.6	83.9 63.6	63.6			78.0	76.0	74.0	73.0	71.0	0.69	67.0	66.0	65.0
72.8 92.3 64.6	94.9 04.3 92.3 64.6	64.5 64.6			81.0 79.0	77.0	75.0	/3.0 74.0	/1.0 72.0	69.0 71.0	66.0 68.0	60.0 67.0	0.co 66.0
74.9 92.2	92.2		67.6		81.0	80.0	77.0	76.0	75.0	73.0	71.0	71.0	0.69
77.0 99.6	9.66 200 2		70.4		85.0	83.0	79.0	78.0	75.0	74.0	72.0	72.0	71.0
5 //./ 99.3 /0.1 6 77.7 95.5 71.0	99.3 95.5		71.0		87.0 87.0	84.0 84.0	81.0 81.0	0.9/ 80.0	/6.0 77.0	75.0	73.0 73.0	72.0 72.0	72.0
77.9 97.2	97.2		70.0		86.0	84.0	81.0	80.0	77.0	75.0	73.0	72.0	71.0
93.8 68.8	93.8 68.8	68.8			85.0	83.0	80.0	79.0	76.0	74.0	72.0	71.0	70.0
77.6 95.5	92.6 95.5		1.0/		86.0 86.0	84.0 84.0	82.0 81.0	80.0 80.0	0.77 77.0	0.c/ 75.0	73.0 73.0	72.0 72.0	0.1/ 70.0
80.8 102.5	102.5		0.69		92.0	89.0	84.0	81.0	77.0	75.0	72.0	72.0	70.0
98.7	98.7		68.4		87.0 87.0	85.0	81.0	80.0	77.0	75.0 75.0	72.0	71.0	70.0
2.45 4.77 80 5 0 0 0	94.5 99 D		69.3 69.5		0.08 89.0	84.U 87 D	81.U 86.0	85.0	0.77 78 0	0.c/ 75.0	73 D	72 O	71.0
78.5 96.4	96.4		70.3		87.0	85.0	82.0	81.0	78.0	76.0	73.0	73.0	72.0
77.9 95.8	95.8		70.1		87.0	85.0	82.0	80.0	77.0	75.0	73.0	72.0	71.0
80.4 105.1	105.1		69.9		90.0	87.0	83.0	81.0	77.0	75.0 	72.0	72.0	71.0
18 75.5 94.7 68.0 19 75.4 92.4 67.6	94.7 92.4		62.0 67.6		84.0 84.0	81.0 82 0	78.0 80.0	77.0 78.0	75.0 74.0	73.0 77 0	71.0 70.0	70.0	69.0 69.0
75.7 95.6	95.6		67.0		85.0	83.0	79.0	78.0	75.0	73.0	70.0	0.07	68.0
75.9 93.2	93.2		66.7		84.0	82.0	80.0	79.0	75.0	73.0	70.0	69.0	68.0
	88.4 92.3		64.8 65.0	_	80.0 80.0	79.0 77.0	76.0 75.0	75.0 74.0	72.0 72.0	70.0 70.0	68.0 68.0	67.0 67.0	66.0 66.0

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APPENDIX 7.1:

**OFF-SITE TRAFFIC NOISE LEVEL CONTOURS** 

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F	HWA-RD-77-108	HIGHWA	Y NOISE	E PREDICTIO	N MODEL			
Scenario: Existing \	Vithout Project			Project N	ame: North	gate		
Road Name: Main St.				Job Nur	nber: 1114	5		
Road Segment: s/o Place	ntia Ln.							
SITE SPECIFIC	INPUT DATA					EL INPUT	s	
Highway Data			Site 0	Conditions (H		· · ·		
Average Daily Traffic (Adt):		s			Autos			
Peak Hour Percentage:				Medium Truc				
Peak Hour Volume:	1,470 vehicle	s		Heavy Truck	s (3+ Axles,	: 15		
Vehicle Speed:			Vehic	le Mix				
Near/Far Lane Distance:	36 feet		1	/ehicleType	Day	Evening	Night	Daily
Site Data				Au	tos: 77.5	% 12.9%	9.6%	97.42%
Barrier Height:	0.0 feet			Medium True	cks: 84.8	% 4.9%	10.3%	1.84%
Barrier Type (0-Wall, 1-Berm):	0.0			Heavy True	cks: 86.5	% 2.7%	10.8%	0.74%
Centerline Dist. to Barrier.			Noise	e Source Elev	ations (in	feet)		
Centerline Dist. to Observer.	00.0 1001			Autos:	0.000			
Barrier Distance to Observer.	0.0 1001		Me	dium Trucks:	2.297			
Observer Height (Above Pad):			н	eavy Trucks:	8.006	Grade Adj	iustment	0.0
Pad Elevation:	0.0 1001		1	E		641		
Road Elevation:	0.0 1001		Lane	Equivalent D Autos:	46.915	teet)		
Road Grade:	0.070			dium Trucks:				
Left View: Right View:	00.0 409.0			leavy Trucks:	46.726 46.744			
FHWA Noise Model Calculatio	ons							
VehicleType REMEL	Traffic Flow	Distanc	e Fil	nite Road	Fresnel	Barrier Atte	en Ber	m Atten
Autos: 70.2	0 -0.74		0.31	-1.20	-4.65	0.0	000	0.00
Medium Trucks: 81.0	0 -17.97		0.34	-1.20	-4.87	0.0	000	0.00
Heavy Trucks: 85.3	8 -21.93		0.34	-1.20	-5.43	0.0	000	0.00
Unmitigated Noise Levels (wi	thout Topo and	barrier at	tenuatio	on)				
VehicleType Leq Peak H			q Evenin			Ldn		NEL
	58.6	66.7	-	4.9	58.9	67.5		68.
		60.7	-	4.3	52.8	61.2	-	61.4
	52.6	61.2		2.1	53.4	61.7		61.9
Vehicle Noise:	70.3	68.5	6	5.5	60.7	69.2	2	69.
Centerline Distance to Noise	Contour (in fee		70 - 10 4	05 -15		00 -104		10.4
	Contour (in fee	Í	70 dBA	65 dE	8A	60 dBA		dBA
	•		70 dBA 45 48	65 dE 96 103		60 dBA 207 222	4	dBA 46

	FHW	/A-RD-77-108	HIGH	WAY N	DISE PRE	EDICTI	ом мо	DEL			
Scenario: Ex Road Name: Ma	ain St.	,					Name: Imber:		ate		
Road Segment: n/e	o Columbi	a Av.									
	IFIC IN	PUT DATA							L INPUT	s	
Highway Data				s	ite Cond	itions (	'Hard =	10, Sc	oft = 15)		
Average Daily Traffic	(Adt): 1	6,000 vehicles	s					Autos:	15		
Peak Hour Perce	entage:	10%			Medi	ium Tru	cks (2 A	Axles):	15		
Peak Hour V	olume:	1,600 vehicles	s		Heav	vy Truc	ks (3+ A	Axles):	15		
Vehicle	Speed:	50 mph			ehicle Mi	lv					
Near/Far Lane Dis	stance:	36 feet		-		leType		Day	Evening	Night	Daily
Site Data					Verner		utos:	77.5%	•	•	97.42
					Men	lium Tri		84.8%		10.3%	
Barrier H		0.0 feet				avy Tri		86.5%		10.8%	
Barrier Type (0-Wall, 1-		0.0			110	<i>ai</i> , <i>i</i> , <i></i>	10/10.	00.070	2.170	10.070	0.11
Centerline Dist. to I Centerline Dist. to Ob		50.0 feet		Λ	loise Sou	irce Ele	evation	s (in fe	eet)		
Barrier Distance to Ob		50.0 feet				Autos	: 0.0	000			
		0.0 feet			Medium	Trucks	: 2.	297			
Observer Height (Abov		5.0 feet			Heavy	Trucks	: 8.0	006	Grade Ad	justment.	0.0
Pad Ele		0.0 feet			ane Equi	voloni	Distan	aa (in	fa a 4 )		
Road Ele		0.0 feet		-	ane Equi				ieel)		
	Grade:	0.0%			Medium	Autos					
	t View:	-90.0 degree									
Righ	t View:	90.0 degree	es		Heavy	Trucks	: 46.	/44			
FHWA Noise Model Cal	culations										
	MEL	Traffic Flow	Dist	ance	Finite R		Fresr		Barrier Att		m Atter
Autos:	70.20	-0.37		0.31		-1.20		-4.65		000	0.00
Medium Trucks:	81.00	-17.61		0.34		-1.20		-4.87		000	0.00
Heavy Trucks:	85.38	-21.56		0.34		-1.20		-5.43	0.0	000	0.00
Unmitigated Noise Lev			-								
	Peak Hou			Leq Ev		Leq I			Ldn		NEL
Autos:	68.		67.0		65.3		59.2		67.9		68
Medium Trucks:	62.	-	61.0		54.7		53.1		61.6	-	61.
Heavy Trucks:	63.	0	61.5		52.5		53.7	'	62.1	1	62
Vehicle Noise:	70.	6	68.9		65.8		61.1		69.6	5	70
Centerline Distance to	Noise Co	ntour (in feet	)								
				70 d		65 c		6	60 dBA		dBA
			Ldn:	47		10	2		219	4	71
			VFI :	51		10			235		06

Monday, June 18, 2018

	FHV	VA-RD-77-108	HIGH	WAY I	NOISE PF	REDICTIO	ON MOI	DEL			
	io: Existing Wit e: Main St.	thout Project				Project N Job Nu			ate		
	nt: s/o Columb	ia Av.				000 110		11140			
	SPECIFIC IN	PUT DATA								s	
Highway Data					Site Con	ditions (					
Average Daily	Traffic (Adt): 1	3,500 vehicle	s					Autos:	15		
Peak Hour	Percentage:	10%				dium True					
Peak H	our Volume:	1,350 vehicle	s		Hea	avy Truck	(3+ A	xles):	15		
Ve	hicle Speed:	50 mph		-	Vehicle I	Nix					
Near/Far La	ne Distance:	36 feet		-		cleType		Dav	Evening	Night	Dailv
Site Data							itos:	77.5%	•		97.429
Ba	rier Height:	0.0 feet			Me	dium Tru	icks:	84.8%	4.9%	10.3%	1.849
Barrier Type (0-W	'all, 1-Berm):	0.0			H	leavy Tru	icks:	86.5%	2.7%	10.8%	0.749
Centerline Dis		50.0 feet		Ē	Noise So	urce Ele	vations	s (in fe	eet)		
Centerline Dist.	to Observer:	50.0 feet		F		Autos		000	,		
Barrier Distance	to Observer:	0.0 feet			Mediur	n Trucks	2.2	97			
Observer Height (	Above Pad):	5.0 feet			Heav	v Trucks	8.0	006	Grade Ad	iustment	t: 0.0
	ad Elevation:	0.0 feet		_							
	ad Elevation:	0.0 feet		_	Lane Equ			· ·	leet)		
1	Road Grade:	0.0%				Autos:					
	Left View:	-90.0 degre				n Trucks.					
	Right View:	90.0 degre	es		Heav	y Trucks:	46.7	744			
FHWA Noise Mod		-									
VehicleType	REMEL	Traffic Flow	Dist	tance	Finite		Fresn	-	Barrier Att		rm Atten
Autos:	70.20	-1.11		0.3		-1.20		-4.65		000	0.00
Medium Trucks:	81.00	-18.34		0.3		-1.20		-4.87		000	0.00
Heavy Trucks:	85.38	-22.30		0.3		-1.20		-5.43	0.0	000	0.00
Unmitigated Noise VehicleType	e Levels (with Lea Peak Hou				venina	Lea N	liaht		Ldn		NEL
Autos:	Ley reak Hou 68		66.3	Ley E	64.5	Leq N	58.5		67.1	-	NEL 67
Medium Trucks:	61.	-	60.3		53.9		50.5		60.8		61
Heavy Trucks:	62		60.8		51.8		53.0		61.4		61.
Vehicle Noise:	69		68.2		65.1		60.3		68.9		69
					05.1		00.3		00.5	,	03
Centerline Distant	ce to NOISE CO	ontour (in fee	9	70	dBA	65 d	BA	E	0 dBA	55	i dBA
								<u> </u>			
			Ldn:	4	12	91			195	4	121

	FHV	VA-RD-77-108 H	IGHWAY	NOISE PR	REDICTIC	N MODEL			
	o: Existing Wi e: Main St.	thout Project				ame: Nort			
	nt: n/o Strong	St.			500 110		-0		
SITE	SPECIFIC IN	IPUT DATA					EL INPUTS	5	
Highway Data				Site Con	ditions (F	lard = 10,	Soft = 15)		
Average Daily	Traffic (Adt):	14,000 vehicles				Auto	s: 15		
Peak Hour	Percentage:	10%				ks (2 Axles	/		
Peak H	our Volume:	1,400 vehicles		He	avy Truck	s (3+ Axles	s): 15		
Vei	hicle Speed:	45 mph		Vehicle	Mix				
Near/Far Lar	ne Distance:	36 feet			icleType	Day	Evening	Night D	aily
Site Data					AL	tos: 77.5	i% 12.9%	9.6% 97.	.42%
Bar	rier Heiaht:	0.0 feet		Me	edium Tru	cks: 84.8	4.9%	10.3% 1.	.84%
Barrier Type (0-W		0.0		F	Heavy Tru	cks: 86.5	6% 2.7%	10.8% 0	.74%
Centerline Dis	st. to Barrier:	50.0 feet		Noise Sr	ource Ele	vations (in	foot)		
Centerline Dist.	to Observer:	50.0 feet		10/30 00	Autos:	0.000	1001)		
Barrier Distance	to Observer:	0.0 feet		Modiu	m Trucks:	2.297			
Observer Height (	Above Pad):	5.0 feet			v Trucks:	8.006	Grade Adi	ustment: 0.0	1
Pa	ad Elevation:	0.0 feet			,		,	usunoni. o.c	·
Roa	ad Elevation:	0.0 feet		Lane Eq	uivalent I	Distance (i	n feet)		
ŀ	Road Grade:	0.0%			Autos:	46.915			
	Left View:	-90.0 degrees		Mediu	m Trucks:	46.726			
	Right View:	90.0 degrees		Heav	y Trucks:	46.744			
FHWA Noise Mode	el Calculation	s							
VehicleType	REMEL	Traffic Flow	Distance	e Finite	Road	Fresnel	Barrier Atte	en Berm A	tten
Autos:	68.46	-0.49	-	.31	-1.20	-4.6			0.00
Medium Trucks:									0.00
	79.45	-17.73	-	.34	-1.20	-4.8			
Heavy Trucks:	79.45 84.25	-17.73 -21.68	-	.34 .34	-1.20 -1.20	-4.8 -5.4			
Heavy Trucks: Unmitigated Noise	84.25 E Levels (with	-21.68 out Topo and ba	0 arrier att	.34 enuation)	-1.20	-5.4	3 0.0	00 0	0.00
Heavy Trucks: Unmitigated Noise VehicleType	84.25 E Levels (with Leq Peak Hou	-21.68 out Topo and ba	0 arrier atte Leq	.34 enuation) Evening		-5.4 ight	3 0.0	00 0 CNEL	0.000
Heavy Trucks: Unmitigated Noise VehicleType Autos:	84.25 E Levels (with Leg Peak Hou 67	-21.68 out Topo and ba r Leq Day .1 65	0 arrier atte Leq	.34 enuation) Evening 63.4	-1.20	-5.4 ight 57.4	2 0.0 2 <i>Ldn</i> 66.0	00 0 CNEL	66.6
Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks:	84.25 E Levels (with Leg Peak Hou 67 60	-21.68 out Topo and ba r Leq Day .1 65 .9 59	0 arrier atto Leq 5.2 0.4	.34 enuation) Evening 63.4 53.0	-1.20 Leq N	-5.4 ight 57.4 51.4	3 0.0 Ldn 66.0 59.9	00 0 <i>CNEL</i>	0.000 66.0 60.
Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks: Heavy Trucks:	84.25 E Levels (with Leq Peak Hou 67 60 61	-21.68 out Topo and ba rr Leq Day .1 65 .9 59 .7 60	0 arrier atte Leq 5.2 0.4	.34 enuation) Evening 63.4 53.0 51.2	-1.20 Leq N	-5.4 ight 57.4 51.4 52.5	23 0.0 Ldn 66.0 59.9 60.9	00 0	66.0 60.1 61.0
Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks:	84.25 E Levels (with Leg Peak Hou 67 60	-21.68 out Topo and ba rr Leq Day .1 65 .9 59 .7 60	0 arrier atto Leq 5.2 0.4	.34 enuation) Evening 63.4 53.0	-1.20 Leq N	-5.4 ight 57.4 51.4	3 0.0 Ldn 66.0 59.9	00 0	0.000 66.0 60. 61.0
Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks: Heavy Trucks:	84.25 2 Levels (with Leq Peak Hou 67 60 61 68	-21.68 out Topo and ba r Leq Day .1 65 .9 59 .7 60 .9 67	0 arrier atte Leq 0.4 0.3 7.2	.34 enuation) Evening 63.4 53.0 51.2 64.0	-1.20	-5.4 ight 57.4 51.4 52.5 59.4	2 0.0 2 2.0 2 2.0 2.0 2 2.0 2 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0	00 (	66.0 60.1 61.0 68.4
Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks: Heavy Trucks: Vehicle Noise:	84.25 2 Levels (with Leq Peak Hou 67 60 61 68	-21.68 out Topo and ba r Leq Day .1 65 .9 59 .7 60 .9 67 ontour (in feet)	0 arrier atte Leq 0.4 0.3 7.2 7	.34 enuation) Evening 63.4 53.0 51.2 64.0 0 dBA	-1.20 Leq N	-5.4 ight 57.4 51.4 52.5 59.4	3 0.0 <i>Ldn</i> 66.0 59.9 60.9 60 dBA	00 ( CNEL 55 dBA	66.0 60.1 61.0 68.4
Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks: Heavy Trucks: Vehicle Noise:	84.25 2 Levels (with Leq Peak Hou 67 60 61 68	-21.68 out Topo and ba r Leq Day .1 65 .9 59 .7 60 .9 67 ontour (in feet)	0 arrier atte 2.2 0.4 0.3 7.2 7.2 7.1 10.7	.34 enuation) Evening 63.4 53.0 51.2 64.0	-1.20	-5.4 ight 57.4 51.4 52.5 59.4	2 0.0 2 2.0 2 2.0 2.0 2 2.0 2 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0	00 (	66.0 60.1 61.0 68.4

Monday, June 18, 2018

	FH\	WA-RD-77-108	HIGHW	VAY N	OISE PF	REDICTIO	N MOD	EL			
Scenar	io: Existing W	ithout Project				Project N	ame: N	orthga	ate		
Road Nam	e: Main St.					Job Nun	nber: 1	1145			
Road Segme	nt: s/o Strong	St.									
	SPECIFIC IN	NPUT DATA								S	
Highway Data				5	Site Con	ditions (H		-	,		
Average Daily	. ,		s					utos:	15		
	Percentage:	10%				dium Truci		,	15		
	lour Volume:	1,380 vehicle	s		He	avy Trucks	s (3+ A)	des):	15		
	hicle Speed:	25 mph		١	/ehicle l	<i>lix</i>					
Near/Far La	ne Distance:	36 feet			Vehi	cleType	Ľ	Day	Evening	Night	Daily
Site Data						Au	os: 7	7.5%	12.9%	9.6%	97.42%
Ba	rrier Height:	0.0 feet			Me	edium Truc	:ks: 8	4.8%	4.9%	10.3%	1.84%
Barrier Type (0-W	/all, 1-Berm):	0.0			ŀ	leavy Truc	:ks: 8	6.5%	2.7%	10.8%	0.74%
Centerline Di		50.0 feet		1	Voise Sc	urce Elev	ations	(in fe	et)		
Centerline Dist.		50.0 feet				Autos:	0.0	00			
Barrier Distance		0.0 feet			Mediur	n Trucks:	2.29	97			
Observer Height	,	5.0 feet			Heav	y Trucks:	8.00	06	Grade Adj	ustment	0.0
	ad Elevation:	0.0 feet		-	ana Ea	ivalent D	lotono	o /in 6	0.041		
	ad Elevation: Road Grade:	0.0 feet		-	ane Equ	Autos:	46.9		eel)		
	Road Grade:	0.0% -90.0 deare			Modiu	n Trucks:	46.7				
	Right View:	90.0 degre				y Trucks:	46.7				
FHWA Noise Mod	el Calculation	IS									
VehicleType	REMEL	Traffic Flow	Dista	ance	Finite	Road	Fresne	1	Barrier Atte	en Ber	m Atten
Autos:	58.73	2.00		0.31		-1.20	-,	4.65	0.0	00	0.00
Medium Trucks:	70.80	-15.24		0.34	L .	-1.20		4.87	0.0	00	0.00
Heavy Trucks:	77.97	-19.19		0.34	Ļ	-1.20	-	5.43	0.0	00	0.00
Unmitigated Nois			barrier	atten	uation)						
VehicleType	Leq Peak Hou			Leq Ev	·	Leq Ni			Ldn		NEL
Autos:			57.9		56.2		50.1		58.7		59.4
Medium Trucks:			53.2		46.8		45.3		53.7		54.0
Heavy Trucks:	÷.		56.5		47.5		48.7		57.1		57.3
Vehicle Noise:			61.1		57.2		53.2		61.7		62.
Centerline Distan	ce to Noise C	ontour (in feet	)	=0		05.15					10.4
				70 a		65 dE	А	6	0 dBA		dBA
			Ldn:	14		30			65	1	41
			VFI :	15		32			69		50

	FHV	VA-RD-77-108	HIGHV	VAY NO	OISE PR	EDICTI	ON MOD	EL			
Scenario	: Existing Wi	thout Project				Project	Name: N	orthg	ate		
Road Name	e: Main St.					Job Nu	umber: 1	1145			
Road Segmen	t: n/o Russell	St.									
	PECIFIC IN	PUT DATA								S	
Highway Data				S	ite Con	ditions (	(Hard = 1	0, So	oft = 15)		
Average Daily 1	raffic (Adt): 1	2,500 vehicles					A	utos:	15		
Peak Hour I	Percentage:	10%			Med	dium Tru	cks (2 A	des):	15		
Peak Ho	our Volume:	1,250 vehicles			Hea	avy Truc	ks (3+ A)	des):	15		
Veh	icle Speed:	35 mph		V	ehicle N	Ai~					
Near/Far Lan	e Distance:	36 feet				cleType	ſ	Day	Evening	Night	Daily
Site Data					VCIII			7.5%		9.6%	
					Ma	dium Tr		4.8%		10.3%	
	rier Height:	0.0 feet				leavy Tr		4.0% 6.5%		10.3%	
Barrier Type (0-Wa		0.0			-	eavy II	ucks. c	0.3%	2.170	10.6%	0.74
Centerline Dis		50.0 feet		Ν	loise So	urce Ele	evations	(in fe	et)		
Centerline Dist. t		50.0 feet				Autos	: 0.0	00			
Barrier Distance t		0.0 feet			Mediun	n Trucks	: 2.2	97			
Observer Height (A	,	5.0 feet			Heav	v Trucks	: 8.0	D6	Grade Ad	iustment.	0.0
	d Elevation:	0.0 feet		-							
	d Elevation:	0.0 feet		L	ane Equ		Distance		eet)		
F	load Grade:	0.0%				Autos					
	Left View:	-90.0 degree	s			n Trucks					
	Right View:	90.0 degree	s		Heav	y Trucks	46.7	44			
FHWA Noise Mode	I Calculation:	s									
VehicleType	REMEL	Traffic Flow	Dista	ance	Finite	Road	Fresne	e/ .	Barrier Att	en Ber	m Atten
Autos:	64.30	0.11		0.31		-1.20	-	4.65	0.0	000	0.00
Medium Trucks:	75.75	-17.13		0.34		-1.20	-	4.87	0.0	000	0.00
Heavy Trucks:	81.57	-21.08		0.34		-1.20	-	5.43	0.0	000	0.00
Unmitigated Noise		1								T	
	Leq Peak Hou			Leq Ev		Leq I			Ldn		VEL
Autos:	63.		1.6		59.9		53.8		62.4		63.
Medium Trucks:	57.		6.3		49.9		48.3		56.8		57.
Heavy Trucks:	59.		8.2		49.2		50.4		58.8		58.
Vehicle Noise:	65		i4.0		60.6		56.2		64.7	,	65
Centerline Distanc	e to Noise Co	ontour (in feet)		70 4	04	05.	10.4		0 -0 4		-/0.4
				70 di		65 c		6	0 dBA		dBA
		,									
			.dn: IEL:	22 24		4			104 111		23 38

Monday, June 18, 2018

		NA-RD-77-108	nign	IWAT I							
	rio: Existing W ne: Main St.	ithout Project				Project N Job Nur			ate		
Road Segme	nt: s/o Russell	St.									
	SPECIFIC IN	IPUT DATA							L INPUT	S	
Highway Data					Site Con	ditions (H	lard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	10,300 vehicle	es					Autos:	15		
Peak Hour	Percentage:	10%			Mee	dium Truc	ks (2 A	xles):	15		
Peak H	lour Volume:	1,030 vehicle	es		Hea	avy Truck	s (3+ A	xles):	15		
	hicle Speed:	35 mph		-	Vehicle I	Nix					
Near/Far La	ne Distance:	36 feet		F		cleType		Day	Evening	Night	Daily
Site Data						Au	tos:	77.5%	12.9%	9.6%	97.42
Ba	rrier Heiaht:	0.0 feet			Me	dium Tru	cks:	84.8%	4.9%	10.3%	1.849
Barrier Type (0-V	Vall, 1-Berm):	0.0			H	leavy Tru	cks:	86.5%	2.7%	10.8%	0.749
	st. to Barrier:	50.0 feet			Noise So	urce Ele	vation	s (in fe	et)		
Centerline Dist.		50.0 feet				Autos:	0.0	000			
Barrier Distance		0.0 feet			Mediur	n Trucks:	2.2	297			
Observer Height	· /	5.0 feet			Heav	y Trucks:	8.0	006	Grade Ad	justmen	t: 0.0
-	ad Elevation:	0.0 feet		-	Lana Fre		N-4				
	ad Elevation:	0.0 feet		-	Lane Equ			· ·	eet)		
	Road Grade:	0.0%				Autos:	46.9				
	Left View:	-90.0 degre				n Trucks:	46.				
	Right View:	90.0 degre	es		Heav	y Trucks:	46.	44			
FHWA Noise Moo											
VehicleType	REMEL	Traffic Flow		stance	Finite		Fresn	-	Barrier Att		rm Atter
Autos:				0.3		-1.20		-4.65		000	0.00
Medium Trucks:				0.3		-1.20		-4.87		000	0.00
Heavy Trucks:	81.57	-21.93		0.3	4	-1.20		-5.43	0.0	000	0.00
Unmitigated Nois											
VehicleType	Leq Peak Hou		/	Leq E	vening	Leq N	<u> </u>		Ldn	-	NEL
Autos:	-		60.8		59.0		53.0		61.6	-	62
Medium Trucks:		.9	55.4		49.0		47.5		56.0		56
Heavy Trucks:		.8	57.4		48.3		49.6		57.9		58
Vehicle Noise:	64	.9	63.2		59.8		55.4		63.9	9	64
Centerline Distan	ce to Noise C	ontour (in fee	t)							-	
			L		dBA	65 dE	ЗA	6	0 dBA		5 dBA
			Ldn:	2	20	42			91		196
			NFI :	-	21	45			97		209

	FHW	A-RD-77-108 HI	GHWAY I	NOISE PF	REDICTI	ON MOI	DEL			
Road Nan	io: Existing With ne: Orange St. nt: n/o Columbia	,			Project I Job NL	Name: N umber: 1		ate		
SITE	SPECIFIC INF	PUT DATA			N	OISE N	IODE	L INPUTS	5	
Highway Data				Site Con	ditions (	Hard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt): 3	3,700 vehicles					Autos:	15		
Peak Hour	Percentage:	10%			dium Tru		/	15		
Peak H	lour Volume:	370 vehicles		He	avy Truc	ks (3+ A	xles):	15		
Ve	hicle Speed:	35 mph	ŀ	Vehicle I	Mix					
Near/Far La	ne Distance:	12 feet	-		icleType		Day	Evening	Night	Daily
Site Data					A	utos:	77.5%	12.9%	9.6%	97.42%
Ba	rrier Height:	0.0 feet		Me	edium Tri	ucks:	84.8%	4.9%	10.3%	1.84%
Barrier Type (0-W		0.0		ŀ	leavy Tri	ucks:	86.5%	2.7%	10.8%	0.74%
Centerline Di	st. to Barrier:	33.0 feet	-	Noise Sc	ource Ele	evations	s (in fe	et)		
Centerline Dist.	to Observer:	33.0 feet			Autos			,		
Barrier Distance	to Observer:	0.0 feet		Mediur	n Trucks					
Observer Height	(Above Pad):	5.0 feet			y Trucks			Grade Adj	ustment	0.0
P	ad Elevation:	0.0 feet			·					
Ro	ad Elevation:	0.0 feet		Lane Eq	uivalent	Distand	e (in t	feet)		
	Road Grade:	0.0%			Autos	: 32.8	333			
	Left View:	-90.0 degrees		Mediur	n Trucks	: 32.5	562			
	Right View:	90.0 degrees		Heav	y Trucks	: 32.5	589			
FHWA Noise Mod	el Calculations		1							
VehicleType	REMEL	Traffic Flow	Distance	Finite	Road	Fresn	el	Barrier Atte	en Ber	m Atten
Autos:	64.30	-5.18	2.6	i4	-1.20		-4.52	0.0	00	0.000
Medium Trucks:	75.75	-22.42	2.6	9	-1.20		-4.86	0.0	00	0.000
Heavy Trucks:	81.57	-26.37	2.6	9	-1.20		-5.69	0.0	00	0.000
Unmitigated Nois	e Levels (witho	ut Topo and ba	rrier attei	nuation)						
VehicleType	Leq Peak Hour	Leq Day	Leq E	vening	Leq I	Vight		Ldn		VEL
Autos:	60.6	5 58.	.7	56.9		50.8		59.5	i	60.1
Medium Trucks:	54.8	3 53.	.3	47.0		45.4		53.9	1	54.1
Heavy Trucks:	56.7	<b>7</b> 55.	.3	46.2		47.5		55.8		56.0
Vehicle Noise:	62.8	3 61.	.1	57.6		53.3		61.8		62.2
Centerline Distan	ce to Noise Cor	ntour (in feet)								
			70	dBA	65 c	iBA	6	i0 dBA	55	dBA
		Ldi	n:	9	20			43	9	94
		CNE	L: 1	10	22	2		46	1	00

Monday, June 18, 2018

	FHW	/A-RD-77-108	HIGHWA	Y NOIS	E PREDICT	ION MO	DEL			
Scenario	c: Existing Wit	hout Project			Projec	t Name:	Northg	ate		
Road Name	e: Orange St.	-			Job N	lumber:	11145			
Road Segmen	t: s/o Columbi	a Av.								
	PECIFIC IN	PUT DATA						L INPUT	S	
Highway Data				Site	Conditions	(Hard =	10, Sc	oft = 15)		
Average Daily 1	Traffic (Adt):	4,300 vehicles					Autos:	15		
Peak Hour I	Percentage:	10%			Medium Tr			15		
Peak Ho	our Volume:	430 vehicles			Heavy Tru	cks (3+ /	Axles):	15		
Veh	icle Speed:	35 mph		Veh	icle Mix					
Near/Far Lar	e Distance:	12 feet			VehicleType	e	Dav	Evening	Niaht	Dailv
Site Data					,1	Autos:	77.5%		9.6%	97.429
Bar	rier Height:	0.0 feet			Medium T	rucks:	84.8%	4.9%	10.3%	1.84%
Barrier Type (0-Wa	•	0.0			Heavy T	rucks:	86.5%	2.7%	10.8%	0.74%
Centerline Dis	t. to Barrier:	33.0 feet		Noi	se Source E	levation	s (in fe	pet)		
Centerline Dist. t	o Observer:	33.0 feet		1101	Auto		000			
Barrier Distance t	o Observer:	0.0 feet			edium Truck		297			
Observer Height (A	Above Pad):	5.0 feet			Heavy Truck		006	Grade Ad	ustment	0.0
Pa	d Elevation:	0.0 feet								
	d Elevation:	0.0 feet		Lan	e Equivalen			feet)		
F	load Grade:	0.0%			Auto		833			
	Left View:	-90.0 degree			edium Truck		562			
	Right View:	90.0 degree	s		Heavy Truck	:s: 32.	589			
FHWA Noise Mode	l Calculations	5								
VehicleType	REMEL	Traffic Flow	Distanc		inite Road	Fresr	-	Barrier Att		m Atten
Autos:	64.30	-4.52		2.64	-1.20		-4.52	0.0		0.00
Medium Trucks:	75.75	-21.76		2.69	-1.20		-4.86	0.0		0.00
Heavy Trucks:	81.57	-25.72	1	2.69	-1.20		-5.69	0.0	00	0.00
Unmitigated Noise			oarrier at	tenuat						
	Leq Peak Hou			r Eveni	° ,	Night		Ldn		NEL
Autos:	61.		9.3		57.5	51.5		60.1		60.
Medium Trucks:	55.		4.0		47.6	46.1		54.5		54.
Heavy Trucks:	57.		5.9		46.9	48.1		56.5		56.0
Vehicle Noise:	63.	5 6	1.7		58.3	53.9	)	62.4		62.9
Centerline Distanc	e to Noise Co	ntour (in feet)								
				70 dBA	65	dBA	6	60 dBA		dBA
			.dn: FI:	10 11		22 24		48 51		03 10

	FHWA-	RD-77-108	HIGH	WAY NO	DISE PREDIC	TION M	ODEL			
Scenario: Existing Road Name: Orange Road Segment: n/o Stre	St.	ut Project				ct Name Number				
SITE SPECIFIC	C INPU	T DATA				NOISE	MODE	L INPUT	s	
Highway Data				S	ite Condition	s (Hard	= 10, So	oft = 15)		
Average Daily Traffic (Ad	t): 5,1	00 vehicles					Autos:	15		
Peak Hour Percentag	ie:	10%			Medium 1	rucks (2	Axles):	15		
Peak Hour Volum	ie: 5	10 vehicles			Heavy Tr	ucks (3+	Axles):	15		
Vehicle Spee	d:	35 mph		V	ehicle Mix					
Near/Far Lane Distand	e:	12 feet			VehicleTy	20	Day	Evening	Night	Daily
Site Data					venielery	Autos:	77.5%		9.6%	
					Medium		84.8%		10.3%	
Barrier Heigl		0.0 feet				Trucks:			10.8%	
Barrier Type (0-Wall, 1-Bern Centerline Dist, to Barrie	·	0.0								
Centerline Dist. to Observe		33.0 feet 33.0 feet		N	oise Source	Elevatio	ons (in f	eet)		
Barrier Distance to Observe		0.0 feet			Au	los: (	0.000			
Observer Height (Above Pa					Medium Truc	ks: 1	2.297			
Pad Elevatio	·	5.0 feet 0.0 feet			Heavy Truc	ks: t	3.006	Grade Ad	justment.	0.0
Road Elevatio		0.0 feet		1	ane Equivale	nt Dista	nco (in	foot)		
Road Grad		0.0 feet		-			2.833			
Left Vie		0.0% 0.0 degree			Medium Truc		2.562			
Right Vie		0.0 degree			Heavy Truc		2.589			
FHWA Noise Model Calcula	tions									
VehicleType REMEL	. Tr	affic Flow	Dist	tance	Finite Road	Fre	snel	Barrier Att	en Ber	m Atten
Autos: 64	1.30	-3.78		2.64	-1.20	)	-4.52	0.0	000	0.00
Medium Trucks: 75	5.75	-21.02		2.69	-1.20		-4.86	0.0	000	0.00
Heavy Trucks: 81	.57	-24.98		2.69	-1.20	)	-5.69	0.0	000	0.00
Unmitigated Noise Levels (			barrie							
VehicleType Leq Peak		Leq Day		Leq Eve		q Night		Ldn		VEL
Autos:	62.0		0.1		58.3	52		60.9		61.
Medium Trucks:	56.2	-	4.7		48.3	46		55.3		55.
Heavy Trucks:	58.1		6.7		47.6	48	-	57.3		57.
Vehicle Noise:	64.2		2.5		59.0	54	.7	63.2	2	63.
Centerline Distance to Nois	e Conto	our (in feet)		70 /						
				70 dE		5 dBA	1 6	60 dBA		dBA
			.dn: IFL:	12 12		25 27		54 57		16 24

Monday, June 18, 2018

	FHV	VA-RD-77-108	HIGH	WAY N	IOISE PF	REDICTIO	ON NC	DEL			
Road Nan	io: Existing Wi ne: Orange St. nt: s/o Strong S	,				Project I Job Nu			jate		
	SPECIFIC IN	PUT DATA							L INPUT	s	
Highway Data				4	Site Con	ditions (	Hard =	10, Se	oft = 15)		
Average Daily	Traffic (Adt):	6,000 vehicle	5					Autos:	15		
Peak Hour	Percentage:	10%			Mee	dium Tru	cks (2 .	Axles):	15		
Peak H	lour Volume:	600 vehicle	5		Hea	avy Truci	ks (3+ .	Axles):	15		
Ve	hicle Speed:	35 mph			Vehicle I	<i>liy</i>					
Near/Far La	ne Distance:	12 feet				cleType		Dav	Evening	Night	Dailv
Site Data							utos:	77.5%	•		97.429
Da	rrier Height:	0.0 feet			Me	dium Tru	icks:	84.8%	4.9%	10.3%	1.849
Barrier Type (0-W	/all, 1-Berm):	0.0			H	leavy Tru	icks:	86.5%	2.7%	10.8%	0.74
Centerline Di		33.0 feet		1	Noise So	urce Ele	vation	s (in f	eet)		
Centerline Dist.		33.0 feet				Autos.	: 0.	000			
Barrier Distance		0.0 feet			Mediur	n Trucks	: 2.	297			
Observer Height	· · · ·	5.0 feet			Heav	v Trucks	8.	006	Grade Ad	justmen	t: 0.0
	ad Elevation:	0.0 feet									
	ad Elevation:	0.0 feet		1	Lane Equ				feet)		
	Road Grade:	0.0%				Autos		833			
	Left View:	-90.0 degree				n Trucks		562			
	Right View:	90.0 degree	es		Heav	y Trucks	: 32	589			
FHWA Noise Mod											
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite		Fresi		Barrier Att		rm Atter
Autos:	64.30	-3.08		2.64		-1.20		-4.52		000	0.00
Medium Trucks:	75.75	-20.32		2.69	-	-1.20		-4.86		000	0.00
Heavy Trucks:		-24.27		2.69	-	-1.20		-5.69	0.0	000	0.00
Unmitigated Nois								-			
VehicleType	Leq Peak Hou			Leq E		Leq N			Ldn		NEL
Autos:	62	-	60.8		59.0		52.	-	61.6	-	62
Medium Trucks:	56		55.4		49.1		47.	-	56.0	-	56
Heavy Trucks:	58	-	57.4		48.3		49.	-	57.9	-	58
Vehicle Noise:	64	.9	63.2		59.7		55.4	1	63.9	9	64
Centerline Distan	ce to Noise Co	ontour (in feet	)								
			L	70 0		65 d		(	60 dBA		6 dBA
			Ldn:	1	3	28	3		60		129
			VFI :	1.		30			64		138

	FHV	NA-RD-77-108	HIGHWA	NOISE PI	REDICTI	ON MOD	DEL			
	o: Existing Wi e: Orange St. nt: n/o Russell	,				Name: N umber: 1		ate		
SITE S	SPECIFIC IN	IPUT DATA			N	OISE N	IODE	L INPUT	S	
Highway Data				Site Con	ditions	(Hard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	5,800 vehicles				A	Autos:	15		
Peak Hour	Percentage:	10%		Me	dium Tru	icks (2 A	xles):	15		
Peak H	our Volume:	580 vehicles		He	avy Truc	ks (3+ A	xles):	15		
Vel	hicle Speed:	35 mph		Vehicle	Miy					
Near/Far Lar	ne Distance:	12 feet			icleType		Dav	Evening	Night	Daily
Site Data				VCI			77.5%	~	9.6%	
Par	rier Heiaht:	0.0 feet		M	edium Tr	ucks: 8	34.8%	4.9%	10.3%	1.84%
Barrier Type (0-W		0.0		1	Heavy Tr	ucks: 8	36.5%	2.7%	10.8%	0.74%
Centerline Dis	. ,	33.0 feet								
Centerline Dist. t		33.0 feet		Noise Se				eet)		
Barrier Distance	to Observer:	0.0 feet		Mark	Autos					
Observer Height ()	Above Pad):	5.0 feet			m Trucks v Trucks			Grade Ad	iuotmont	
Pa	d Elevation:	0.0 feet		Heav	y Trucks	8.0	00	Grade Adj	usunen	. 0.0
Roa	d Elevation:	0.0 feet		Lane Eq	uivalent	Distanc	e (in t	feet)		
F	Road Grade:	0.0%			Autos	: 32.8	33			
	Left View:	-90.0 degree	s	Mediu	m Trucks	s: 32.5	62			
	Right View:	90.0 degree	s	Heav	y Trucks	: 32.5	89			
FHWA Noise Mode	Calculation	s								
N/ 1 1 1 T										
VehicleType	REMEL	Traffic Flow	Distance	e Finite	Road	Fresn		Barrier Att	en Bei	m Atten
Autos:	REMEL 64.30	-3.23	2	64	-1.20		4.52	0.0	000	0.00
Autos: Medium Trucks:	REMEL	-3.23 -20.46	2	64 69	-1.20 -1.20		4.52 4.86	0.0 0.0	000	0.00
Autos:	REMEL 64.30	-3.23	2	64	-1.20		4.52	0.0 0.0	000	0.00
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise	REMEL 64.30 75.75 81.57 e Levels (with	-3.23 -20.46 -24.42 out Topo and I	2 2 2 barrier att	64 69 69 <b>enuation)</b>	-1.20 -1.20		4.52 4.86	0.0 0.0	000 000 000	0.00 0.00 0.00
Autos: Medium Trucks: Heavy Trucks: <b>Unmitigated Noise</b> VehicleType	REMEL 64.30 75.75 81.57 e Levels (with Leg Peak Hou	-3.23 -20.46 -24.42 out Topo and I Ir Leq Day	2 2 2 barrier att Leq	64 69 69 enuation) Evening	-1.20 -1.20 -1.20	Night	4.52 4.86	0.0 0.0 0.0 <i>Ldn</i>	000 000 000 C	0.000 0.000 0.000
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType Autos:	REMEL 64.30 75.75 81.57 • Levels (with Leq Peak Hou 62	-3.23 -20.46 -24.42 out Topo and I r Leq Day .5 6	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	64 69 69 <i>enuation)</i> <i>Evening</i> 58.8	-1.20 -1.20 -1.20	Vight 52.8	4.52 4.86	0.0 0.0 0.0 <i>Ldn</i> 61.4	000 000 000 C	0.000 0.000 0.000 NEL 62.0
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks:	REMEL 64.30 75.75 81.57 E Levels (with Leg Peak Hou 62 56	-3.23 -20.46 -24.42 out Topo and I Ir Leq Day .5 6 .8 5	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		-1.20 -1.20 -1.20 <i>Leq</i> (	Vight 52.8 47.4	4.52 4.86	0.0 0.0 0.0 <i>Ldn</i> 61.4 55.8	000 000 000 C	0.000 0.000 0.000 NEL 62.0 56.1
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks: Heavy Trucks:	REMEL 64.30 75.75 81.57 2 Levels (with Leq Peak Hou 62 56 58	-3.23 -20.46 -24.42 out Topo and I II Leq Day .5 6 .8 5 .6 5	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		-1.20 -1.20 -1.20	Vight 52.8 47.4 49.4	4.52 4.86 5.69	0.0 0.0 0.0 <i>Ldn</i> 61.4 55.8 57.8	000 000 000 C	0.000 0.000 0.000 NEL 62.0 56.1 57.9
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks:	REMEL 64.30 75.75 81.57 E Levels (with Leg Peak Hou 62 56	-3.23 -20.46 -24.42 out Topo and I II Leq Day .5 6 .8 5 .6 5	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		-1.20 -1.20 -1.20	Vight 52.8 47.4	4.52 4.86 5.69	0.0 0.0 0.0 <i>Ldn</i> 61.4 55.8	000 000 000 C	0.000 0.000 0.000 NEL 62.0 56.1 57.9
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks: Heavy Trucks:	REMEL           64.30           75.75           81.57           e Levels (with           Leq Peak Hot           62           56           58           64	-3.23 -20.46 -24.42 out Topo and I II I.5 6 8.8 5 .6 5 8.8 6	2 2 2 5 barrier att 50.6 55.3 57.2 53.0		-1.20 -1.20 -1.20 <i>Leq</i> /	Night 52.8 47.4 49.4 55.2	4.52 4.86 5.69	0.0 0.0 <i>Ldn</i> 61.4 55.8 57.8 63.7	000 000 000 C	0.000 0.000 0.000 NEL 62.0 56. 57.0 64.2
Autos: Medium Trucks: Heavy Trucks: Unnitigated Noise VehicleType Autos: Medium Trucks: Heavy Trucks: Vehicle Noise:	REMEL           64.30           75.75           81.57           e Levels (with           Leq Peak Hot           62           56           58           64	-3.23 -20.46 -24.42 out Topo and I II II II II II II II II II II II II I	2 2 2 barrier att Leq 00.6 55.3 57.2 33.0 7	64 69 69 <i>Evening</i> 58.8 48.9 48.2 59.6	-1.20 -1.20 -1.20 <i>Leq I</i>	Night 52.8 47.4 49.4 55.2	4.52 4.86 5.69	0.0 0.0 0.0 61.4 55.8 57.8 63.7	000 000 000 C 4 3 3 7	0.000 0.000 NEL 62.0 56.1 57.5 64.2 dBA
Autos: Medium Trucks: Heavy Trucks: Unnitigated Noise VehicleType Autos: Medium Trucks: Heavy Trucks: Vehicle Noise:	REMEL           64.30           75.75           81.57           e Levels (with           Leq Peak Hot           62           56           58           64	-3.23 -20.46 -24.42 out Topo and I ir Leq Day 5.5 6 8.8 5 8.6 5 8.8 6 ontour (in feet)	2 2 2 5 barrier att 50.6 55.3 57.2 53.0		-1.20 -1.20 -1.20 <i>Leq</i> /	Night 52.8 47.4 49.4 55.2 1BA 7	4.52 4.86 5.69	0.0 0.0 <i>Ldn</i> 61.4 55.8 57.8 63.7	000 000 000 C 4 3 3 7 7 7 7 7 7 7 7	0.000 0.000 0.000 NEL 62.0 56.1 57.5 64.2

Monday, June 18, 2018

	FH\	WA-RD-77-108	HIGHW	VAY N	OISE PF	EDICTIO	N MODE	EL			
Scenar	io: Existing W	ithout Project				Project Na	ame: No	orthga	ate		
Road Nam	e: Orange St.					Job Nur	nber: 11	145			
Road Segme	nt: s/o Russell	I St.									
	SPECIFIC IN	NPUT DATA							INPUT	s	
Highway Data				5	Site Con	ditions (H	ard = 10	), So	ft = 15)		
Average Daily	Traffic (Adt):	3,700 vehicle	s				AL	itos:	15		
	Percentage:	10%				dium Truck		,	15		
Peak H	lour Volume:	370 vehicle	s		Hea	avy Trucks	: (3+ Ax	les):	15		
	hicle Speed:	35 mph		1	Vehicle I	lix					
Near/Far La	ne Distance:	12 feet		F	Vehi	cleType	D	ay	Evening	Night	Daily
Site Data						Aut	os: 77	.5%	12.9%	9.6%	
Ba	rrier Height:	0.0 feet			Me	dium Truc	ks: 84	1.8%	4.9%	10.3%	1.849
Barrier Type (0-W	•	0.0			H	leavy Truc	ks: 86	6.5%	2.7%	10.8%	0.749
Centerline Di		33.0 feet		1	Voise So	urce Elev	ations	'in fe	et)		
Centerline Dist.		33.0 feet		-		Autos:	0.00		,		
Barrier Distance		0.0 feet			Mediur	n Trucks:	2.29				
Observer Height (	,	5.0 feet			Heav	V Trucks:	8.00	6	Grade Ad	iustment	: 0.0
	ad Elevation:	0.0 feet		_				-			
	ad Elevation:	0.0 feet		1	ane Equ	ivalent D			eet)		
	Road Grade:	0.0%				Autos:	32.83	-			
	Left View:	-90.0 degre				n Trucks:	32.56	-			
	Right View:	90.0 degre	es		Heav	y Trucks:	32.58	9			
FHWA Noise Mod		-									
VehicleType	REMEL	Traffic Flow	Dista		Finite		Fresnel		Barrier Att		rm Atten
Autos:	64.30			2.64		-1.20		.52	0.0		0.00
Medium Trucks:	75.75			2.69		-1.20		.86		000	0.00
Heavy Trucks:	81.57			2.69	-	-1.20	-5	.69	0.0	000	0.00
Unmitigated Nois					<u> </u>						
VehicleType	Leq Peak Hou			.eq Ev	ening	Leq Nig	· · · ·		Ldn		NEL
Autos:		).6	58.7		56.9		50.8		59.5		60.
Medium Trucks:		1.8	53.3		47.0		45.4		53.9		54.
Heavy Trucks:		6.7	55.3		46.2		47.5		55.8	-	56.
Vehicle Noise:			61.1		57.6		53.3		61.8	3	62.
Centerline Distan	ce to Noise C	ontour (in fee	t)	70	(0.4	05 10		_	0.404		
			I dn:	70 a		65 dB	А	6	0 dBA 43		dBA 94
		-	NFL:	9		20 22			45		94 100

	FHV	VA-RD-77-108	HIGH	WAY NO	DISE PF	REDICTI	ON MOD	EL			
Scenari	o: Existing Wi	thout Project				Project	Name: N	orthga	ate		
Road Nam	e: Primer St.					Job N	umber: 1	1145			
Road Segmen	t: n/o Columb	ia Av.									
	SPECIFIC IN	IPUT DATA							INPUT:	S	
Highway Data				S	ite Con	ditions	(Hard = 1	10, So	ft = 15)		
Average Daily	Traffic (Adt):	8,700 vehicles	5				A	utos:	15		
Peak Hour	Percentage:	10%			Me	dium Tru	icks (2 A)	des):	15		
Peak H	our Volume:	870 vehicles	5		He	avy Truc	ks (3+ A)	(les):	15		
Vel	nicle Speed:	35 mph		V	ehicle l	Ai~					
Near/Far Lar	ne Distance:	12 feet				cleType	ſ	Day	Evening	Night	Daily
Site Data					Ven			7.5%	12.9%	9.6%	
					1.14	r dium Tr		4.8%	4.9%	10.3%	
	rier Height:	0.0 feet				leavy Tr		6.5%	2.7%	10.8%	
Barrier Type (0-W		0.0			'	ieavy II	<i>u</i> cks. c	0.570	2.170	10.070	0.74
Centerline Dis		33.0 feet		N	oise Sc	urce El	evations	(in fe	et)		
Centerline Dist. t		33.0 feet				Autos	s: 0.0	00			
Barrier Distance		0.0 feet			Mediur	n Trucks	s: 2.2	97			
Observer Height (	,	5.0 feet			Heav	y Trucks	s: 8.0	06	Grade Adj	iustment.	0.0
	d Elevation:	0.0 feet					Distance	- // /			
	d Elevation:	0.0 feet		L	ane Eq		Distance		eet)		
F	Road Grade:	0.0%				Autos					
	Left View:	-90.0 degree				n Trucks					
	Right View:	90.0 degree	s		Heav	y Trucks	32.5	89			
FHWA Noise Mode	el Calculation:	s									
VehicleType	REMEL	Traffic Flow	Dist	tance	Finite		Fresne		Barrier Att	en Ber	m Atter
Autos:	64.30	-1.46		2.64		-1.20	-	4.52	0.0	000	0.00
Medium Trucks:	75.75	-18.70		2.69		-1.20	-	4.86	0.0	000	0.00
Heavy Trucks:	81.57	-22.66		2.69		-1.20	-	5.69	0.0	000	0.00
Unmitigated Noise					<b>/</b>						
	Leq Peak Hou			Leq Eve		Leq	Night		Ldn		NEL
Autos:	64.		52.4		60.6		54.6		63.2		63.
Medium Trucks:	58.		57.0		50.7		49.1		57.6		57
Heavy Trucks:	60.		59.0		49.9		51.2		59.5		59
Vehicle Noise:	66		54.8		61.4		57.0		65.5	5	65
Centerline Distanc	e to Noise Co	ontour (in feet)	)								
			∟	70 dl			dBA	6	0 dBA		dBA
			Ldn:	17		- 3	6		77	1	65
			IEL:	18			8		82		77

Monday, June 18, 2018

Scenario: Existing Road Name: La Cad	ena D	Dr.				Project N Job Nui			ate		
Road Segment: n/o I-21	5 Ra	mps									
SITE SPECIFIC	C INF	PUT DATA							L INPUT	s	
Highway Data					Site Con	ditions (F	lard =	10, Sc	oft = 15)		
Average Daily Traffic (Ad	t): {	5,100 vehicles						Autos:	15		
Peak Hour Percentag	e:	10%			Mee	dium Truc	ks (2 A	xles):	15		
Peak Hour Volum	e:	510 vehicles			Hea	avy Truck	s (3+ A	xles):	15		
Vehicle Spee	d:	40 mph		F	Vehicle I	Ai~					
Near/Far Lane Distanc	e:	12 feet		-		cleType	1	Day	Evening	Night	Daily
Site Data								77.5%	•	9.6%	
					Me	dium Tru		84.8%		10.3%	
Barrier Heigh Barrier Type (0-Wall, 1-Bern		0.0 feet 0.0				leavy Tru		86.5%		10.8%	
Centerline Dist. to Barrie		33.0 feet		L							
Centerline Dist. to Observe		33.0 feet		L	Noise So				eet)		
Barrier Distance to Observe		0.0 feet				Autos:		000			
Observer Height (Above Pag		5.0 feet				n Trucks:		297			
Pad Elevatio	/	0.0 feet			Heav	y Trucks:	8.0	006	Grade Ad	ustmen	t: 0.0
Road Elevatio		0.0 feet			Lane Equ	livalent L	Distand	e (in i	feet)		
Road Grad		0.0%		Ē		Autos:	32.8	333	,		
l eft Vie		-90.0 degree	s		Mediur	n Trucks:	32.5	562			
Right Vie	w:	90.0 degree			Heav	y Trucks:	32.	589			
FHWA Noise Model Calcula	tions										
VehicleType REMEL		Traffic Flow	Dis	stance	Finite	Road	Fresn	el	Barrier Att	en Be	rm Atten
Autos: 66	.51	-4.36		2.6	4	-1.20		4.52	0.0	000	0.00
Medium Trucks: 77	.72	-21.60		2.6	9	-1.20		-4.86	0.0	000	0.00
Heavy Trucks: 82	.99	-25.56		2.6	9	-1.20		-5.69	0.0	000	0.00
Unmitigated Noise Levels (	vitho	ut Topo and L	arri	er atter	nuation)						
VehicleType Leq Peak	Hour	Leq Day		Leq E	vening	Leq N	ight		Ldn	C	NEL
Autos:	63.6	6 6	1.7		59.9		53.9		62.5	5	63.
Medium Trucks:	57.6	3 5	6.1		49.7		48.2		56.7	7	56.
Heavy Trucks:	58.9	95	7.5		48.5		49.7		58.1	I	58.
Vehicle Noise:	65.6	6 6	3.9		60.6		56.1		64.6	3	65.
Centerline Distance to Nois	e Col	ntour (in feet)									
				70	dBA	65 di	BA	e	0 dBA	55	i dBA
		L	dn:	1	4	31			67		144

	FHWA	A-RD-77-108	HIGH	HWAY N	IOISE PF	REDICTIO		EL			
Scenario: Exist Road Name: La C Road Segment: s/o l-	adena D	r. ,				Project Na Job Nun			te		
SITE SPECII	FIC INP	UT DATA				NO	ISE M	ODEL	INPUT	S	
Highway Data					Site Con	ditions (H	ard = 1	0, Sof	ťt = 15)		
Average Daily Traffic (. Peak Hour Percent Peak Hour Volu	age:	,000 vehicle: 10% 200 vehicle:				dium Truci avy Trucks	ks (2 Ax		15 15 15		
Vehicle Sp	eed:	40 mph			Vehicle I	Niv					
Near/Far Lane Dista	nce:	12 feet		-		cleType	a l	ay	Evening	Night	Daily
Site Data				-				7.5%	12.9%	9.6%	
Barrier He	iaht <sup>.</sup>	0.0 feet			Me	edium Truc	:ks: 8	4.8%	4.9%	10.3%	1.84%
Barrier Type (0-Wall, 1-Be		0.0			H	leavy Truc	:ks: 8	6.5%	2.7%	10.8%	0.74%
Centerline Dist. to Ba	rrier:	33.0 feet		t.	Noise Sc	urce Elev	ations	(in fe	of)		
Centerline Dist. to Obse	rver:	33.0 feet		Ē		Autos:	0.00				
Barrier Distance to Obse	rver:	0.0 feet			Modiur	n Trucks:	2.29				
Observer Height (Above F	Pad):	5.0 feet				v Trucks:	8.00		Grade Ad	iustment	0.0
Pad Eleva	tion:	0.0 feet		_				-			
Road Eleva	tion:	0.0 feet		1	Lane Equ	uivalent D			eet)		
Road Gr	ade:	0.0%				Autos:	32.83				
Left \		-90.0 degree				n Trucks:	32.56				
Right \	/iew:	90.0 degree	es		Heav	y Trucks:	32.58	39			
FHWA Noise Model Calcu	lations										
VehicleType REM	EL 7	raffic Flow	Dis	stance	Finite	Road	Fresne	I E	Barrier Att	en Bei	m Atten
	66.51	-8.43		2.64		-1.20		1.52	0.0		0.00
	77.72	-25.67		2.6	-	-1.20		1.86	0.0		0.000
Heavy Trucks:	82.99	-29.62		2.6	9	-1.20	-8	5.69	0.0	000	0.00
Unmitigated Noise Levels											
	ak Hour	Leq Day		Leq E	vening	Leq Ni			Ldn	-	NEL
Autos:	59.5		57.6		55.9		49.8		58.4		59.0
Medium Trucks:	53.5		52.0		45.7		44.1		52.6		52.8
Heavy Trucks:	54.9		53.4		44.4		45.6		54.0		54.
Vehicle Noise:	61.5		59.8		56.5		52.0		60.5	ò	61.
Centerline Distance to No	oise Con	tour (in feet	)								10.4
			L		dBA	65 dE	A	60	) dBA		dBA
			Ldn: VFL:	8	3	17			36		77
				8		18			38		82

	FH\	VA-RD-77-108	HIGHW	VAY N	OISE PF	REDICTIO	N MOD	EL			
Scenario	: Existing Wi	ithout Project				Project Na	ame: N	orthga	ate		
Road Name	e: La Cadena	Dr.				Job Nurr	nber: 1	145			
Road Segmen	t: n/o Strong	St.									
	PECIFIC IN	IPUT DATA							INPUT:	5	
Highway Data				5	Site Con	ditions (H	ard = 1	0, So	ft = 15)		
Average Daily T	raffic (Adt):	2,000 vehicle	s				A	itos:	15		
Peak Hour F	Percentage:	10%				dium Truck		,	15		
Peak Ho	our Volume:	200 vehicle	s		Hea	avy Trucks	: (3+ Ax	les):	15		
	icle Speed:	40 mph		١	Vehicle I	Nix					
Near/Far Lan	e Distance:	12 feet			Vehi	cleType	D	ay	Evening	Night	Daily
Site Data						Aut	os: 7	7.5%	12.9%	9.6%	97.429
Barr	rier Height:	0.0 feet			Me	dium Truc	ks: 8	4.8%	4.9%	10.3%	1.84%
Barrier Type (0-Wa	all, 1-Berm):	0.0			H	leavy Truc	ks: 8	6.5%	2.7%	10.8%	0.74%
Centerline Dist		33.0 feet		1	Voise So	urce Elev	ations	(in fe	et)		
Centerline Dist. to		33.0 feet				Autos:	0.00	0			
Barrier Distance to		0.0 feet			Mediur	n Trucks:	2.29	7			
Observer Height (A	,	5.0 feet			Heav	v Trucks:	8.00	6	Grade Adj	iustment	: 0.0
	d Elevation:	0.0 feet		_							
	d Elevation:	0.0 feet		1	Lane Equ	ivalent D			eet)		
R	load Grade:	0.0%			Marthur	Autos:	32.83	-			
	Left View:	-90.0 degre				n Trucks:	32.56	-			
	Right View:	90.0 degre	es		neav	y Trucks:	32.58	99			
FHWA Noise Mode		-				1	_			1 -	
VehicleType Autos:	REMEL 66.51	Traffic Flow -8.43		ance 2.64	Finite	-1.20	Fresne	1.52	Barrier Atte		rm Atten
Autos: Medium Trucks:	77.72	-8.43		2.69		-1.20		1.52 1.86	0.0		0.00
Heavy Trucks:	82.99	-25.67		2.69		-1.20		1.80 5.69	0.0		0.00
					-	-1.20	-0	0.09	0.0	00	0.00
Unmitigated Noise VehicleType	Leveis (with Leg Peak Hou			Leg Ev	<u> </u>	Leg Nig	what		Ldn	0	NEL
Autos:	Ley Peak Hot 59		57.6	Leq Ev	55.9	Leq Mg	49.8		58.4		59.0
Medium Trucks:	53		52.0		45.7		44.1		52.6		52.1
Heavy Trucks:	54		53.4		44.4		45.6		54.0		54.
	57		59.8		56.5		52.0		60.5		61.
Vehicle Noise:	61	.5	00.0								
· · -											
Vehicle Noise:				70 d	IBA	65 dB	A	6	0 dBA	55	dBA
Vehicle Noise:				70 d 8		65 dB 17	A	6	0 dBA 36		dBA 77

	FHW	/A-RD-77-108	HIGH	WAY NO	DISE PR	EDICT	ION MO	DEL			
Scenario: E Road Name: P Road Segment: e	lacentia Lr	, I.					Name: umber:				
SITE SPE	CIFIC IN	PUT DATA				Ν	IOISE I	NODE	L INPUT	s	
Highway Data				s	ite Cond	litions	(Hard =	10, Se	oft = 15)		
Average Daily Traff	ic (Adt):	3,200 vehicles	s					Autos:	15		
Peak Hour Perc	entage:	10%			Med	lium Tri	ucks (2 /	Axles):	15		
Peak Hour \	/olume:	320 vehicles	s		Hea	vy Tru	cks (3+ /	Axles):	15		
Vehicle	Speed:	25 mph		V	ehicle N	liv					
Near/Far Lane D	istance:	36 feet		F		leType		Day	Evening	Night	Daily
Site Data					10/10			77.5%	•	•	97.42
	I la la hati	0.0.6			Me	, dium T		84.8%		10.3%	
Barrier Barrier Type (0-Wall, 1		0.0 feet 0.0						86.5%		10.8%	
Centerline Dist. to		44.0 feet									
Centerline Dist. to Ol		44.0 feet		N	loise So	urce E		<u> </u>	eet)		
Barrier Distance to Ol		0.0 feet				Auto		000			
Observer Height (Abov		5.0 feet			Medium			297			
	evation:	0.0 feet			Heavy	/ Truck	s: 8.	006	Grade Ad	justment.	0.0
Road El		0.0 feet		L	ane Equ	ivalen	Distan	ce (in	feet)		
	Grade:	0.0%				Auto		460			
Le	ft View:	-90.0 degree	es		Medium	n Truck	s: 40.	241			
Rigi	ht View:	90.0 degree			Heavy	/ Truck	s: 40.	262			
FHWA Noise Model Ca	lculations										
	EMEL	Traffic Flow	Dist	ance	Finite I		Fresr		Barrier Att		m Atter
Autos:	58.73	-4.35		1.28		-1.20		-4.61		000	0.00
Medium Trucks:	70.80	-21.59		1.31		-1.20		-4.87		000	0.00
Heavy Trucks:	77.97	-25.54		1.31		-1.20		-5.50	0.0	000	0.00
Unmitigated Noise Lev			-					1			
	Peak Hou			Leq Ev		Leq	Night		Ldn		VEL
Autos:	54.		52.6		50.8		44.7		53.4		54
Medium Trucks:	49.	-	47.8		41.5		39.9		48.4		48
Heavy Trucks:	52.		51.1		42.1		43.3		51.3		51
Vehicle Noise:	57.		55.7		51.8		47.9	9	56.4	1	56
Centerline Distance to	Noise Co	ntour (in feet	)	70 -	DA I	65	dD A		eo dBA	57	dD A
			I dn:	70 d	BA		dBA		60 dBA		dBA
			Lan: VFI :	5 12 25 54 6 12 27 58					25 27	58	

Monday, June 18, 2018

Road Nan	<i>io:</i> Existing Wi ne: Columbia A nt: e/o Orange	v.				Project N Job Nur			ate		
	SPECIFIC IN	PUT DATA			0/4- 0					S	
Highway Data					Site Con	ditions (H					
Average Daily	. ,	9,500 vehicles						Autos:			
	Percentage:	10%				dium Truc					
	lour Volume:	950 vehicles			Hea	avy Truck	s (3+)	axies):	15		
	hicle Speed:	45 mph			Vehicle I	/lix					
Near/Far La	ne Distance:	36 feet			Vehi	cleType		Day	Evening	Night	Daily
Site Data						Au	tos:	77.5%	12.9%	9.6%	97.42%
Ba	rrier Heiaht:	0.0 feet			Me	dium Tru	cks:	84.8%	4.9%	10.3%	1.84%
Barrier Type (0-W	/all, 1-Berm):	0.0			H	leavy Tru	cks:	86.5%	2.7%	10.8%	0.74%
Centerline Di		44.0 feet		5	Noise So	urce Ele	vation	s (in f	eet)		
Centerline Dist.	to Observer:	44.0 feet		F		Autos:		000			
Barrier Distance	to Observer:	0.0 feet			Mediur	n Trucks:		297			
Observer Height	(Above Pad):	5.0 feet			Heav	v Trucks:	8	006	Grade Ad	ustment	: 0.0
P	ad Elevation:	0.0 feet									
Ro	ad Elevation:	0.0 feet			Lane Equ	ivalent L		· ·	feet)		
	Road Grade:	0.0%				Autos:		460			
	Left View:	-90.0 degrees			Mediur	n Trucks:	40.	241			
	Right View:	90.0 degrees			Heav	y Trucks:	40.	262			
FHWA Noise Mod		-									
VehicleType	REMEL	Traffic Flow	Dista		Finite		Fresi	-	Barrier Att		rm Atten
Autos:	68.46	-2.17		1.2		-1.20		-4.61	0.0		0.000
Medium Trucks:		-19.41		1.3		-1.20		-4.87	0.0		0.000
Heavy Trucks:	84.25	-23.37		1.3	1	-1.20		-5.50	0.0	00	0.000
Unmitigated Nois					· · ·						
VehicleType	Leq Peak Hou			Leq E	vening	Leq N	<u> </u>		Ldn		NEL
Autos:	66	-	1.5		62.7		56.6	-	65.3		65.9
Medium Trucks:	60		3.6		52.3		50.7		59.2		59.4
Heavy Trucks:	61		9.6		50.5		51.8		60.1		60.3
Vehicle Noise:	68	.2 6	5.5		63.3		58.6	6	67.2	2	67.6
Centerline Distan	ce to Noise Co	ontour (in feet)		=0	10.4						
			. ட	-	dBA	65 dE	3A		60 dBA		dBA
			dn:	2	9	61			132 142		285 306
		CNI				66					

	FHV	/A-RD-77-108	HIGHWA	NO YY	ISE PR	REDICT	ION MOI	DEL			
Road Nam	<ul> <li>D: Existing Wit</li> <li>Columbia A</li> <li>t: e/o Primer \$</li> </ul>	v.					Name: I umber: ·				
SITE	SPECIFIC IN	PUT DATA				Ν	IOISE N	/IODE	L INPUT	5	
Highway Data				Sit	te Con	ditions	(Hard =	10, So	oft = 15)		
Average Daily	Traffic (Adt): 1	6,800 vehicles						Autos:	15		
Peak Hour	Percentage:	10%			Med	dium Tri	ucks (2 A	(xles)	15		
Peak H	our Volume:	1,680 vehicles	;		Hea	avy Tru	cks (3+ A	(xles)	15		
Vei	nicle Speed:	45 mph		Ve	hicle N	Nix					
Near/Far Lar	ne Distance:	36 feet				cleType		Day	Evening	Night	Daily
Site Data								77.5%	•	9.6%	
Bar	rier Height:	0.0 feet			Ме	dium T	rucks:	84.8%	4.9%	10.3%	1.84%
Barrier Type (0-W	•	0.0			h	leavy T	rucks:	86.5%	2.7%	10.8%	0.74%
Centerline Dis	. ,	44.0 feet		Nie	vice Ce	uree E	levation	o (in f	a a 41		
Centerline Dist.	o Observer:	44.0 feet		NC	lise 30	Auto		5 (111 10 200	eel)		
Barrier Distance	o Observer:	0.0 feet			Modium	n Truck		297			
Observer Height (.	Above Pad):	5.0 feet				y Truck		006	Grade Ad	ustment	0.0
Pa	d Elevation:	0.0 feet		_		·			,		
	d Elevation:	0.0 feet		La	ne Equ		t Distand	· ·	feet)		
F	Road Grade:	0.0%				Auto					
	Left View:	-90.0 degree				n Truck					
	Right View:	90.0 degree	S		Heav	y Truck	s: 40.2	262			
FHWA Noise Mode					_		_	. 1			
VehicleType Autos:	REMEL 68.46	Traffic Flow 0.30	Distan	ce 1.28	Finite	-1.20	Fresn	el -4.61	Barrier Att		m Atten 0.00
Medium Trucks:	08.40 79.45	-16.94		1.28		-1.20		-4.61	0.0		0.00
Heavy Trucks:	84.25	-10.94		1.31		-1.20		-4.67	0.0		0.00
				-	- 41 1	-1.20		-0.00	0.0	00	0.00
Unmitigated Noise VehicleType	Levels (with Leq Peak Hou			q Eve		l ea	Night		Ldn	C	VEL
Autos:	68.		36.9		65.2		59.1	I	67.7		68.
Medium Trucks:	62.	6 6	61.1		54.8		53.2		61.7		61.
Heavy Trucks:	63.	5 6	62.0		53.0		54.3		62.6	;	62.
Vehicle Noise:	70.	7 (	68.9		65.8		61.1		69.7		70.
Centerline Distand	e to Noise Co	ntour (in feet)									
				70 dB	A		dBA	6	60 dBA		dBA
			.dn:				17				
			IFL:	45			6		208		48

	FH\	WA-RD-77-108	HIGH	WAY N	IOISE PF	REDICTIO	N MODEL			
Scenari	o: Existing Wi	ithout Project				Project Na	ame: North	gate		
	e: Strong St.					Job Nun	nber: 1114	5		
Road Segmer	nt: w/o Main S	it.								
	SPECIFIC IN	IPUT DATA						EL INPUT	S	
Highway Data					Site Con	ditions (H	ard = 10, S	Soft = 15)		
Average Daily	Traffic (Adt):	2,700 vehicle	s				Autos	: 15		
Peak Hour	Percentage:	10%					ks (2 Axles			
Peak H	our Volume:	270 vehicle	s		He	avy Trucks	s (3+ Axles	: 15		
Ve	hicle Speed:	25 mph		F	Vehicle I	Nix				
Near/Far La	ne Distance:	12 feet		F	Vehi	cleType	Dav	Evening	Niaht	Dailv
Site Data						Aut	os: 77.5	% 12.9%	9.6%	97.429
Ra	rier Height:	0.0 feet			Me	dium Truc	ks: 84.8	% 4.9%	10.3%	1.84%
Barrier Type (0-W	•	0.0			ŀ	leavy Truc	ks: 86.5	% 2.7%	10.8%	0.74%
Centerline Dis		33.0 feet		Ē	Noise Sc	urce Elev	ations (in	feet)		
Centerline Dist.		33.0 feet		F		Autos:	0.000			
Barrier Distance		0.0 feet			Mediur	n Trucks:	2.297			
Observer Height (	,	5.0 feet			Heav	v Trucks:	8.006	Grade Ad	justment	t: 0.0
	ad Elevation:	0.0 feet		-						
	ad Elevation:	0.0 feet		L	Lane Eq		istance (ir	feet)		
I	Road Grade:	0.0%				Autos:	32.833			
	Left View:	-90.0 degre				n Trucks:	32.562			
	Right View:	90.0 degre	es		Heav	y Trucks:	32.589			
FHWA Noise Mode		-								
VehicleType	REMEL	Traffic Flow	Dist	ance	Finite		Fresnel	Barrier Att		rm Atten
Autos:	58.73	-5.08		2.6		-1.20	-4.52		000	0.00
Medium Trucks:	70.80	-22.32		2.6		-1.20	-4.86		000	0.00
Heavy Trucks:	77.97	-26.28		2.6	9	-1.20	-5.69	0.0	000	0.00
Unmitigated Noise					<u> </u>					
VehicleType	Leq Peak Hou			Leq E	vening	Leq Ni		Ldn		NEL
Autos:	55		53.2		51.4		45.4	54.0		54.
Medium Trucks:	50		48.5		42.1		40.5	49.0	-	49.
Heavy Trucks:	53		51.8		42.7		44.0	52.3		52.
Vehicle Noise:	58		56.3		52.4		48.5	57.0	)	57.
Centerline Distance	e to Noise Co	ontour (in feet	)							
			L		dBA	65 dB	A	60 dBA		i dBA
		-	Ldn: VFL:	4	4	10 10		21 22		45 48

	FHV	/A-RD-77-108	HIGH	WAY N	OISE PR	EDICTI	ON MC	DEL			
Scenario: Exis Road Name: Stro	ng St.	,				Project Job Ni	Name: umber:				
Road Segment: e/o	Main St.										
SITE SPECI	FIC IN	PUT DATA							L INPUT	S	
Highway Data				S	Site Cond	ditions (	(Hard =	: 10, So	oft = 15)		
Average Daily Traffic (	Adt):	2,500 vehicles	s					Autos:	15		
Peak Hour Percen	tage:	10%			Med	lium Tru	icks (2	Axles):	15		
Peak Hour Vol	ume:	250 vehicles	s		Hea	avy Truc	:ks (3+ .	Axles):	15		
Vehicle Sp	eed:	25 mph		V	ehicle N	liv					
Near/Far Lane Dista	ance:	12 feet		F		cleType		Dav	Evening	Night	Dailv
Site Data					• • • • •		utos:	77.5%	0	9.6%	
Barrier He	iaht:	0.0 feet			Me	dium Tr	ucks:	84.8%	4.9%	10.3%	
Barrier Type (0-Wall, 1-B		0.0 reet				leavy Tr		86.5%		10.8%	
Centerline Dist. to Ba		0.0 33.0 feet									
Centerline Dist. to Obse		33.0 feet		^	loise So				eet)		
Barrier Distance to Obse		0.0 feet				Autos		000			
Observer Height (Above I		5.0 feet				n Trucks		297			
Pad Flev		0.0 feet			Heavy	/ Trucks	s: 8.	006	Grade Ad	justment.	0.0
Road Eleva		0.0 feet		L	ane Equ	ivalent	Distan	ce (in	feet)		
Road G		0.0%		-		Autos		.833	,		
	View:	-90.0 degree			Mediun	1 Trucks		562			
Right		90.0 degree				/ Trucks		.589			
FHWA Noise Model Calcu	Ilations	5									
VehicleType REM	1EL	Traffic Flow	Dis	stance	Finite I	Road	Fres	nel	Barrier Att	en Ber	m Atter
Autos:	58.73	-5.42		2.64		-1.20		-4.52	0.0	000	0.00
Medium Trucks:	70.80	-22.66		2.69		-1.20		-4.86	0.0	000	0.00
Heavy Trucks:	77.97	-26.61		2.69		-1.20		-5.69	0.0	000	0.00
Unmitigated Noise Level			1								
	ak Hou			Leq Ev		Leq I			Ldn		VEL
Autos:	54.		52.9		51.1		45.	-	53.		54
Medium Trucks:	49.		48.1		41.8		40.	-	48.		48.
Heavy Trucks:	52.		51.4		42.4		43.	-	52.0		52.
Vehicle Noise:	57.	-	56.0		52.1		48.	2	56.	7	57
Centerline Distance to No	oise Co	ntour (in feet	)	70 d	DA	65 0		4	60 dBA	FF	dBA
			I da:								ава 13
Ldn:				4	4 9 20 5 10 21			4			
	CNEL:					10	0		21		45

Monday, June 18, 2018

	FHW	/A-RD-77-108	HIGH	IWAY I		REDICTI	ON MO	DDEL			
	∷ Existing Wit ∷ Russell St. ∷ e/o Main St.	,				Project Job N		Northo 11145			
	PECIFIC IN	PUT DATA							L INPUT	ſS	
Highway Data					Site Con	ditions	(Hard :				
Average Daily T	raffic (Adt):	3,100 vehicles						Autos:			
Peak Hour P		10%				dium Tru					
Peak Ho	ur Volume:	310 vehicles			He	avy Truc	cks (3+	Axles):	15		
Veh	icle Speed:	35 mph		-	Vehicle I	Mix					
Near/Far Lane	e Distance:	36 feet		-		icleType		Dav	Evening	Night	Dailv
Site Data							Autos:	77.5%	•	•	,
		0.0 feet			Me	edium Tr		84.8%			
Barrier Type (0-Wa		0.0			ŀ	leavy Ti	ucks:	86.5%			
Centerline Dist		44.0 feet		Ē	Noise So	ource El	evatio	ns (in f	eet)		
Centerline Dist. to		44.0 feet		Ē		Autos	s: 0	.000			
Barrier Distance to	o Observer:	0.0 feet			Mediu	n Truck	s: 2	.297			
Observer Height (A	bove Pad):	5.0 feet			Heav	y Truck		006	Grade A	diustmer	nt: 0.0
Pad	d Elevation:	0.0 feet		_		,					
Road	d Elevation:	0.0 feet		_	Lane Eq				feet)		
R	oad Grade:	0.0%				Autos		.460			
	Left View:	-90.0 degree	s			n Truck		).241			
	Right View:	90.0 degree	s		Heav	y Trucks	s: 40	.262			
FHWA Noise Model											
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite		Fres		Barrier A		erm Atter
Autos:	64.30	-5.95		1.2	-	-1.20		-4.61		.000	0.00
Medium Trucks:	75.75	-23.18		1.3		-1.20		-4.87		.000	0.00
Heavy Trucks:	81.57	-27.14		1.3		-1.20		-5.50	0.	.000	0.00
Unmitigated Noise			_					-			
<i></i>	.eq Peak Hou			Leq E	vening	Leq	Night	_	Ldn		CNEL
Autos:	58.		6.5		54.8		48		57		57
Medium Trucks:	52.		51.2		44.8		43		51		52
Heavy Trucks:	54.		53.1		44.1		45		53		53
Vehicle Noise:	60.	7 5	59.0		55.5		51	.1	59	.7	60
Centerline Distance	e to Noise Co	ntour (in feet)		70	dBA	6E	dBA		60 dBA	6	5 dBA
			dn:		<i>ава</i> 9		9 9	1	42	5	90
			_an: IFI :		9		9		42 45		90 96
		CA	IEL:	1	10	2	1		40		90

	FHW	A-RD-77-108 H	lighw	AY N	OISE PF	REDICT	ION MOI	DEL			
Scenario: Road Name: Road Segment:		,					Name: N lumber: 1		ate		
SITE SP	PECIFIC INF	PUT DATA				N	IOISE N	10DE	L INPUT	s	
Highway Data				9)	Site Con	ditions	(Hard =	10, Sc	oft = 15)		
Average Daily Tra	affic (Adt): 15	5,600 vehicles						Autos:	15		
Peak Hour Pe	ercentage:	10%			Me	dium Tr	ucks (2 A	xles):	15		
Peak Hou	ir Volume:	1,560 vehicles			Hea	avy Tru	cks (3+ A	xles):	15		
Vehic	cle Speed:	50 mph			/ehicle I	Mix					
Near/Far Lane	Distance:	36 feet		H		icleType	2	Day	Evening	Night	Daily
Site Data				-				77.5%	•	9.6%	
Barrie	er Height:	0.0 feet			Me	edium T	rucks:	84.8%	4.9%	10.3%	1.84%
Barrier Type (0-Wall		0.0			F	leavy T	rucks:	86.5%	2.7%	10.8%	0.74%
Centerline Dist.		50.0 feet			laine Ca	uree E	levations	in f	a (1		
Centerline Dist. to	Observer:	50.0 feet		-	voise su	Auto			el)		
Barrier Distance to	Observer:	0.0 feet			Madium	Auto n Truck					
Observer Height (Ab	ove Pad):	5.0 feet				y Truck			Grade Ad	iustmont	
Pad	Elevation:	0.0 feet			neav	у писк	s. o.u	100	Graue Auj	usunen	. 0.0
Road	Elevation:	0.0 feet		L	ane Equ	uivalen	t Distand	e (in :	feet)		
Ro	ad Grade:	0.0%				Auto	s: 46.9	915			
	Left View:	-90.0 degrees	5		Mediur	n Truck	s: 46.7	26			
R	light View:	90.0 degrees	5		Heav	y Truck	s: 46.7	744			
FHWA Noise Model	Calculations										
VehicleType		Traffic Flow	Distan	ice	Finite		Fresn	el	Barrier Att	en Ber	m Atten
Autos:	70.20	-0.48		0.31	l	-1.20		4.65	0.0	000	0.000
Medium Trucks:	81.00	-17.72		0.34		-1.20		-4.87		000	0.000
Heavy Trucks:	85.38	-21.67		0.34	ļ	-1.20		-5.43	0.0	000	0.00
Unmitigated Noise L					,						
<i>,</i>	eq Peak Hour			eq Ev	rening	Leq	Night		Ldn	-	NEL
Autos:	68.8		6.9		65.2		59.1		67.7		68.3
Medium Trucks:	62.4		0.9 1.4		54.6 52.4		53.0		61.5 62.0		61.7
Heavy Trucks: Vehicle Noise:	62.8						53.6			-	62.1
	70.5		8.8		65.7		61.0		69.5	)	70.0
Centerline Distance	to Noise Cor	ntour (in feet)		70 a	ID A	65	dBA	4	0 dBA	FF	dBA
		,	dn:	46			00	Ľ	215		ивл 64
		CN		40	-		07		215		98
		CN		30	,				201	4	

Monday, June 18, 2018

	FHW	/A-RD-77-108 I	HIGHWAY	NOIS	E PREDI	CTION		DEL			
Scenario	b: Existing Wit	h Project			Proj	ect Na	me: N	lorthg	ate		
Road Name	e: Main St.				Jo	b Numi	ber: 1	1145			
Road Segmen	t: n/o Columb	ia Av.									
	PECIFIC IN	PUT DATA							L INPUT	s	
Highway Data				Site	Conditio	ns (Ha	ard = 1	10, Sc	oft = 15)		
Average Daily 1	raffic (Adt): 1	7,000 vehicles						utos:	15		
Peak Hour I	Percentage:	10%			Medium			/	15		
		1,700 vehicles			Heavy	Trucks	(3+ A	xles):	15		
	icle Speed:	50 mph		Veh	icle Mix						
Near/Far Lar	e Distance:	36 feet			VehicleT	ype	l	Day	Evening	Night	Daily
Site Data						Auto	os: 7	7.5%	12.9%	9.6%	97.42%
Ban	rier Height:	0.0 feet			Mediur	n Truck	ks: 8	84.8%	4.9%	10.3%	1.84%
Barrier Type (0-Wa	•	0.0			Heav	y Truck	ks: 8	36.5%	2.7%	10.8%	0.74%
Centerline Dis		50.0 feet		Nois	se Source	e Eleva	ations	(in fe	eet)		
Centerline Dist. t		50.0 feet				utos:	0.0		,		
Barrier Distance t		0.0 feet		м	edium Tru	icks:	2.2	97			
Observer Height (/	,	5.0 feet		1	Heavy Tru	icks:	8.0	06	Grade Ad	ljustment	0.0
	d Elevation:	0.0 feet		1.00	e Equival	lant Di		o (in i	fa a 4 )		
	d Elevation: Road Grade:	0.0 feet 0.0%		Lan		utos:	46.9		eel)		
r	Left View:	-90.0 dearee		14	edium Tru		46.7				
	Right View:	90.0 degree			Heavy Tru		46.7				
FHWA Noise Mode	Calculation	;									
VehicleType	REMEL	Traffic Flow	Distance	F	inite Roa	d F	resne	e/	Barrier Att	en Be	rm Atten
Autos:	70.20	-0.10	0	.31	-1.3	20	-	4.65	0.0	000	0.00
Medium Trucks:	81.00	-17.34	0	.34	-1.3	20	-	4.87	0.0	000	0.00
Heavy Trucks:	85.38	-21.30	0	.34	-1.3	20	-	5.43	0.0	000	0.00
Unmitigated Noise	Levels (with	out Topo and L	barrier att	enuati	ion)						
	Leq Peak Hou			Eveni		eq Nig			Ldn		NEL
Autos:	69.		7.3		65.5		59.5		68.		68.
Medium Trucks:	62.		1.3		54.9		53.4		61.8	-	62.
Heavy Trucks: Vehicle Noise:	63. 70		i1.8 i9.2		52.8 66.1		54.0 61.3		62.4		62. 70
					00.1		01.3		69.9	a	70.
Centerline Distanc	e to Noise Co	ntour (in feet)		0 dBA		65 dB/	, 1	-	0 dBA	=	dBA
		,	dn:	49		106	•	0	228		191
		-	IGN. IFI :	49 53		114			220		527
		CIV		55		1.14			- 10		

	FHWA	-RD-77-108 H	GHW	AY NC	DISE PF	REDICTI	ON MOD	ΞL			
Scenario: E	xisting With I	Project				Project	Name: N	orthg	ate		
Road Name: M	lain St.					Job Ni	umber: 1	145			
Road Segment: sl	o Columbia	Av.									
	CIFIC INPL	JT DATA								5	
Highway Data				Si	ite Con	ditions	(Hard = 1	0, So	ft = 15)		
Average Daily Traff	ic (Adt): 14,8	800 vehicles					A	itos:	15		
Peak Hour Perc	entage:	10%			Me	dium Tru	icks (2 Ax	les):	15		
Peak Hour \	/olume: 1,4	480 vehicles			He	avy Truc	ks (3+ Ax	les):	15		
Vehicle	Speed:	50 mph		14	ehicle l	Ai-					
Near/Far Lane D	istance:	36 feet				cleType	L .	ay	Evening	Night	Daily
Site Data					VCIII			7.5%	12.9%	9.6%	
					1.14	dium Tr		4.8%	4.9%	10.3%	1.849
Barrier		0.0 feet				leavy Tr		4.0 % 6.5%		10.3%	
Barrier Type (0-Wall, 1		0.0			,	icavy II	<i>uch</i> 3. 0	0.070	2.170	10.070	0.74
Centerline Dist. to Centerline Dist. to Ol		50.0 feet		N	oise Sc	urce El	evations	(in fe	et)		
Barrier Distance to Ol		50.0 feet				Autos	a: 0.00	0			
		0.0 feet			Mediur	n Trucks	: 2.29	17			
Observer Height (Abov		5.0 feet			Heav	y Trucks	8.00	6	Grade Adj	ustment:	0.0
Pad El Road Fl	evation:	0.0 feet		1.	ano Ea	ivalont	Distance	(in f	oot)		
	Grade:	0.0 feet			ine Ly	Autos					
		0.0% 90.0 degrees			Modium	n Trucks					
		90.0 degrees				y Trucks					
nigi	n view.	90.0 degrees			neuv	y mucho	40.75				
FHWA Noise Model Ca											
			Distar		Finite		Fresne		Barrier Atte		m Atten
Autos:	70.20	-0.71		0.31		-1.20		1.65	0.0		0.00
Medium Trucks:	81.00	-17.94		0.34		-1.20		1.87	0.0		0.00
Heavy Trucks:	85.38	-21.90		0.34		-1.20	-{	5.43	0.0	00	0.00
Unmitigated Noise Lev			-		<b>/</b>						
	Peak Hour	Leq Day		eq Eve		Leq I			Ldn		VEL
Autos:	68.6	66			64.9		58.9		67.5		68.
Medium Trucks:	62.2	60			54.3		52.8		61.2		61.
Heavy Trucks:	62.6	61			52.2		53.4		61.8		61.
Vehicle Noise:	70.3	68	.6		65.5		60.7		69.3		69
Centerline Distance to	Noise Cont	our (in feet)		70.1		05	104	_	0.104		-10.4
				70 dE 45	5A		1BA	6	0 dBA		dBA
Ldn:			45	96 208 448 104 223 481			48				
		CNE		48		40			223		04

Monday, June 18, 2018

<u>^</u>											
	io: Existing Wi ie: Main St.	th Project				Project N	ame: No nber: 11		te		
	nt: n/o Strong :	St				JOD INUI	nber. 11	145			
ů	SPECIFIC IN			1		NC		DEI	INPUT	-	
JIL Highway Data	SPECIFIC IN	PUIDAIA		5	Site Con	ditions (F				3	
Average Dailv	Traffic (Adt): 1	15.300 vehicle	s					tos:	15		
• •	Percentage:	10%			Mee	dium Truc	ks (2 Axl	les):	15		
Peak H	lour Volume:	1,530 vehicle	s		Hea	avy Truck	s (3+ Axl	es):	15		
Ve	hicle Speed:	45 mph			/ehicle I	Aiv.					
Near/Far La	ne Distance:	36 feet		-		cleType	Da	av l	Evening	Night	Daily
Site Data								.5%	12.9%	9.6%	
Ba	rrier Height:	0.0 feet			Me	dium Tru	cks: 84	.8%	4.9%	10.3%	
Barrier Type (0-W		0.0 1001			H	leavy Tru	cks: 86	6.5%	2.7%	10.8%	0.749
Centerline Di	st. to Barrier:	50.0 feet			Voise So	urce Ele	vations	in fee	of)		
Centerline Dist.	to Observer:	50.0 feet		÷		Autos:	0.00				
Barrier Distance	to Observer:	0.0 feet			Mediur	n Trucks:	2.29				
Observer Height	(Above Pad):	5.0 feet				V Trucks:	8.00		Grade Ad	ustment	0.0
	ad Elevation:	0.0 feet									
	ad Elevation:	0.0 feet		1	.ane Equ	ivalent L			et)		
	Road Grade:	0.0%				Autos:	46.91	-			
	Left View:	-90.0 degre				n Trucks:	46.72	-			
	Right View:	90.0 degre	es		Heav	y Trucks:	46.74	4			
FHWA Noise Mod	el Calculation	s									
VehicleType	REMEL	Traffic Flow	Dista		Finite		Fresnel	-	arrier Atte		rm Atten
Autos:	68.46	-0.10		0.31		-1.20		.65	0.0		0.00
Medium Trucks:	79.45	-17.34		0.34		-1.20		.87	0.0		0.00
Heavy Trucks:	84.25	-21.30		0.34	l.	-1.20	-5	.43	0.0	00	0.00
Unmitigated Nois											
VehicleType	Leq Peak Hou	. ,		.eq Ev	~	Leq N	•	1	dn	-	NEL
Autos:	67	-	65.6		63.8		57.7		66.4		67.
Medium Trucks:	61		59.7		53.4		51.8		60.3		60.
Heavy Trucks:	62		60.7		51.6		52.9		61.2		61.
Vehicle Noise:	69	.3	67.6		64.4		59.7		68.3	5	68.
	ce to Noise Co	ontour (in feet	)							T	
Centerline Distan				70 d	ID A	65 dE	3A	60	dBA	55	dBA
Centerline Distan											
Centerline Distan			Ldn: NFI :	38	3	83			178	3	384 12

	FH\	NA-RD-77-108	HIGH	WAY N	IOISE PR	EDICT		EL			
	o: Existing W e: Main St. nt: s/o Strong	,					Name: N umber: 1				
SITE	SPECIFIC IN	IPUT DATA				N	IOISE M	ODE	L INPUTS	5	
Highway Data				:	Site Con	ditions	(Hard = 1	10, So	oft = 15)		
Average Daily	Traffic (Adt):	14,300 vehicle	s				Α	utos:	15		
Peak Hour	Percentage:	10%			Med	dium Tri	ucks (2 A	(les):	15		
Peak H	our Volume:	1,430 vehicle	s		Hea	avy True	cks (3+ A	(les):	15		
Vei	hicle Speed:	25 mph		5	Vehicle N	<i>li</i> v					
Near/Far Lar	ne Distance:	36 feet		-		cleType		Day	Evening	Night	Daily
Site Data				-				7.5%	v	9.6%	
Bar	rier Heiaht:	0.0 feet			Me	dium T	rucks: 8	4.8%	4.9%	10.3%	1.84%
Barrier Type (0-W		0.0			h	leavy T	rucks: 8	6.5%	2.7%	10.8%	0.74%
Centerline Dis	st. to Barrier:	50.0 feet		-	Noise So	urce F	evations	(in fi	eet)		
Centerline Dist.	to Observer:	50.0 feet		÷	10.00 00	Auto			501)		
Barrier Distance	to Observer:	0.0 feet			Mediun						
Observer Height (.	Above Pad):	5.0 feet				v Truck			Grade Adj	ustmen	t· 0.0
Pa	ad Elevation:	0.0 feet			neav	y muck	5. 0.0	00	Grade Adj	usunen	. 0.0
Roa	ad Elevation:	0.0 feet		1	Lane Equ	iivalen	Distanc	e (in	feet)		
F	Road Grade:	0.0%				Auto	s: 46.9	15			
	Left View:	-90.0 degree	es		Mediun	n Truck	s: 46.7	26			
	Right View:	90.0 degree	es		Heav	y Truck	s: 46.7	44			
FHWA Noise Mode	el Calculation	S									
FHWA Noise Mode VehicleType	el Calculation REMEL	s Traffic Flow	Dist	ance	Finite	Road	Fresne	e/	Barrier Atte	en Be	rm Atten
			Dist	ance 0.31		Road -1.20		el 4.65	Barrier Atte 0.0		
VehicleType	REMEL	Traffic Flow	Dist		1		-			00	0.000
VehicleType Autos:	REMEL 58.73	Traffic Flow 2.16	Dist	0.3	1 4	-1.20	-	4.65	0.0	00	0.000
VehicleType Autos: Medium Trucks: Heavy Trucks:	REMEL 58.73 70.80 77.97	Traffic Flow 2.16 -15.08 -19.04		0.3 <sup>4</sup> 0.34 0.34	1 4 4	-1.20 -1.20	-	4.65 4.87	0.0 0.0	00	0.000
VehicleType Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise	REMEL 58.73 70.80 77.97	Traffic Flow 2.16 -15.08 -19.04 out Topo and	barrie	0.3 <sup>4</sup> 0.34 0.34	1 4 4 <i>uation)</i>	-1.20 -1.20 -1.20	-	4.65 4.87	0.0 0.0	00	0.000
VehicleType Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType Autos:	REMEL 58.73 70.80 77.97 E Levels (with	Traffic Flow           2.16           -15.08           -19.04           out Topo and           Ir         Leq Day	barrie	0.3 <sup>4</sup> 0.3 <sup>4</sup> 0.3 <sup>4</sup> r atten	1 4 4 <i>vening</i> 56.3	-1.20 -1.20 -1.20	-	4.65 4.87	0.0 0.0 0.0 <i>Ldn</i> 58.9	00 00 00	0.000 0.000 0.000 NEL 59.5
VehicleType Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType	REMEL 58.73 70.80 77.97 E Levels (with Leq Peak Hou	Traffic Flow           2.16           -15.08           -19.04           out Topo and           Ir         Leq Day           .0	barriei	0.3 <sup>4</sup> 0.3 <sup>4</sup> 0.3 <sup>4</sup> r atten	1 4 4 <b>uation)</b> vening	-1.20 -1.20 -1.20	- Night	4.65 4.87	0.0 0.0 0.0	00 00 00	0.000 0.000 0.000 NEL 59.5
VehicleType Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType Autos:	REMEL 58.73 70.80 77.97 2 Levels (with Leq Peak Hou 60	Traffic Flow           2.16           -15.08           -19.04           out Topo and           r         Leq Day           .0           .9	<i>barriei</i> ⁄ 58.1	0.3 <sup>4</sup> 0.3 <sup>4</sup> 0.3 <sup>4</sup> r atten	1 4 4 <i>vening</i> 56.3	-1.20 -1.20 -1.20	- - Night 50.3	4.65 4.87	0.0 0.0 0.0 <i>Ldn</i> 58.9	00 00 00	0.000 0.000 0.000 <i>NEL</i> 59.5 54.1
VehicleType Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks:	REMEL 58.73 70.80 77.97 2 Levels (with Leq Peak Hou 60 54	Traffic Flow           2.16           -15.08           -19.04           out Topo and           ur         Leq Day           .0           .9           .1	<i>barriei</i> ⁄ 58.1 53.3	0.3 <sup>4</sup> 0.3 <sup>4</sup> 0.3 <sup>4</sup> r atten	1 4 4 <i>vening</i> 56.3 47.0	-1.20 -1.20 -1.20	Night 50.3 45.4	4.65 4.87	0.0 0.0 0.0 <i>Ldn</i> 58.9 53.9	00 00 00	0.000 0.000 0.000 <i>NEL</i> 59.5 54.1 57.3
VehicleType Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks: Heavy Trucks:	REMEL           58.73           70.80           77.97           e Levels (with           Leq Peak Hot           60           54           58           62	Traffic Flow           2.16           -15.08           -19.04           Out Topo and           ur         Leq Day           .0           .9           .1           .9	barrier 58.1 53.3 56.6 61.2	0.3 <sup>-</sup> 0.3 <sup>2</sup> 0.3 <sup>2</sup> r atten Leq E	1 4 4 <i>vening</i> 56.3 47.0 47.6 57.3	-1.20 -1.20 -1.20 <i>Leq</i>	Night 50.3 45.4 48.9 53.4	4.65 4.87 5.43	0.0 0.0 0.0 58.9 53.9 57.2 61.9		0.000 0.000 0.000 <i>NEL</i> 59.5 54.1 57.3 62.3
VehicleType Autos: Medium Trucks: Heavy Trucks: Unnitigated Noise VehicleType Autos: Medium Trucks: Heavy Trucks: Vehicle Noise:	REMEL           58.73           70.80           77.97           e Levels (with           Leq Peak Hot           60           54           58           62	Traffic Flow           2.16           -15.08           -19.04           Out Topo and           In           Leg Day           .0           .1           .9           Ontour (in feet)	barriei 58.1 53.3 56.6 61.2	0.3 <sup>-</sup> 0.3 <sup>2</sup> 0.3 <sup>2</sup> r atten Leq Ev	1 4 4 <u>vening</u> 56.3 47.0 47.6 57.3	-1.20 -1.20 -1.20 <i>Leq</i> 65	Night 50.3 45.4 48.9 53.4	4.65 4.87 5.43	0.0 0.0 0.0 58.9 53.9 57.2 61.9 50 dBA	00 00 00 00	0.000 0.000 0.000 WEL 59.5 54.1 57.3 62.3
VehicleType Autos: Medium Trucks: Heavy Trucks: Unnitigated Noise VehicleType Autos: Medium Trucks: Heavy Trucks: Vehicle Noise:	REMEL           58.73           70.80           77.97           e Levels (with           Leq Peak Hot           60           54           58           62	Traffic Flow         2.16           -15.08         -19.04           out Topo and         Image: Comparison of the second sec	barrier 58.1 53.3 56.6 61.2	0.3 <sup>-</sup> 0.3 <sup>2</sup> 0.3 <sup>2</sup> r atten Leq E	1 4 4 4 56.3 47.0 47.6 57.3 4BA 4	-1.20 -1.20 -1.20 <i>Leq</i> 65	Night 50.3 45.4 48.9 53.4	4.65 4.87 5.43	0.0 0.0 0.0 58.9 53.9 57.2 61.9	00 00 00 00	0.000 0.000 0.000 <i>NEL</i> 59.5 54.1 57.3 62.3

Monday, June 18, 2018

	FH\	NA-RD-77-108	HIGHW	AY N	IOISE PF	REDICTIO	N MODE	L		
Scenar	io: Existing Wi	ith Project				Project N	ame: No	thgate		
	e: Main St.					Job Nur	nber: 111	45		
Road Segme	nt: n/o Russell	l St.								
	SPECIFIC IN	IPUT DATA						DEL INPUT	ſS	
Highway Data				:	Site Con	ditions (H	lard = 10	Soft = 15)		
Average Daily	Traffic (Adt):	14,300 vehicles	s				Aut	os: 15		
Peak Hour	Percentage:	10%				dium Truc		·		
Peak H	lour Volume:	1,430 vehicles	5		He	avy Truck	s (3+ Axle	es): 15		
	hicle Speed:	35 mph		1	Vehicle I	Mix				
Near/Far La	ne Distance:	36 feet			Vehi	cleType	Da	y Evening	Night	Daily
Site Data						Au	tos: 77.	5% 12.9%	9.6	% 97.42%
Ba	rrier Height:	0.0 feet			Me	edium Tru	cks: 84	8% 4.9%	10.3	% 1.84%
Barrier Type (0-W	•	0.0			ŀ	leavy Tru	cks: 86	5% 2.7%	10.8	% 0.74%
Centerline Di		50.0 feet		1	Noise Sc	ource Elev	vations (i	n feet)		
Centerline Dist.		50.0 feet				Autos:	0.000	,		
Barrier Distance		0.0 feet			Mediur	n Trucks:	2.297			
Observer Height (	,	5.0 feet			Heav	y Trucks:	8.006	Grade A	djustme	nt: 0.0
	ad Elevation:	0.0 feet					N-4	(Inc. 4 4)		
	ad Elevation:	0.0 feet		-	Lane Equ	Autos:	46.915			
	Road Grade: Left View:	0.0%			Modius	n Trucks:	46.726			
	Right View:	-90.0 degree 90.0 degree				y Trucks:	46.744			
FHWA Noise Mod	- el Calculation	ŝ								
VehicleType	REMEL	Traffic Flow	Distar	nce	Finite	Road	Fresnel	Barrier A	tten B	erm Atten
Autos:	64.30	0.69		0.31	1	-1.20	-4.	65 0.	.000	0.00
Medium Trucks:	75.75	-16.54		0.34	4	-1.20	-4.	87 0.	.000	0.00
Heavy Trucks:	81.57	-20.50		0.34	4	-1.20	-5.	43 0.	.000	0.00
Unmitigated Nois	e Levels (with	out Topo and	barrier a	atten	uation)					
VehicleType	Leq Peak Hou			eq E	/ening	Leq N		Ldn		CNEL
Autos:	64		62.2		60.4		54.4	63		63.
Medium Trucks:	58		56.8		50.5		48.9	57		57.0
Heavy Trucks: Vehicle Noise:	60		58.8 64.6		49.7 61.2		51.0 56.8	59 65	-	59. 65.
					01.2		00.0	60		05.0
Centerline Distan	ce to Noise Co	ontour (in feet	,	70 c	1BA	65 dE	RA	60 dBA	4	55 dBA
			I dn:	24		53	<i>~</i> ·	113		244
			VFI :	21		56		121		261
		0.			-	00				

	FHV	VA-RD-77-108	HIGHW	AY N	OISE PF	REDICTIO	ON MOI	DEL			
	io: Existing Wi e: Main St.	th Project				Project N Job Nu			ate		
	nt: s/o Russell	St.				JOD INU	mber:	11145			
SITE	SPECIFIC IN	PUT DATA								s	
Highway Data				S	ite Con	ditions (l	Hard =	10, Sc	ft = 15)		
Average Daily	Traffic (Adt): 1	1,000 vehicles					1	Autos:	15		
Peak Hour	Percentage:	10%			Mee	dium Truo	cks (2 A	xles):	15		
Peak H	lour Volume:	1,100 vehicles			Hea	avy Truck	(3+ A	xles):	15		
	hicle Speed:	35 mph		v	ehicle l	Mix					
Near/Far La	ne Distance:	36 feet		F		icleTvpe		Dav	Evening	Night	Daily
Site Data						A	itos:	77.5%			97.429
Bai	rrier Height:	0.0 feet			Me	edium Tru	icks:	84.8%	4.9%	10.3%	1.849
Barrier Type (0-W	•	0.0			F	leavy Tru	icks:	86.5%	2.7%	10.8%	0.749
Centerline Di		50.0 feet		-							
Centerline Dist.	to Observer:	50.0 feet		^	loise Sc	ource Ele			et)		
Barrier Distance	to Observer:	0.0 feet				Autos:		000			
Observer Height (	Above Pad):	5.0 feet				n Trucks:		97	Grade Ad	inatmont	
Pa	ad Elevation:	0.0 feet			Heav	y Trucks:	8.0	06	Grade Adj	usuneni	0.0
Roa	ad Elevation:	0.0 feet		L	ane Equ	uivalent l	Distand	e (in :	eet)		
1	Road Grade:	0.0%				Autos:	46.9	915			
	Left View:	-90.0 degree	s		Mediur	n Trucks:	46.7	26			
	Right View:	90.0 degree	s		Heav	y Trucks:	46.7	744			
FHWA Noise Mod	el Calculation:	s									
VehicleType	REMEL	Traffic Flow	Dista	nce	Finite	Road	Fresn	el	Barrier Att	en Ber	m Atten
Autos:	64.30	-0.45		0.31		-1.20		4.65	0.0	000	0.00
Medium Trucks:	75.75	-17.68		0.34		-1.20		4.87		000	0.00
Heavy Trucks:	81.57	-21.64		0.34		-1.20		-5.43	0.0	000	0.00
Unmitigated Noise	e Levels (with	out Topo and I									
VehicleType	Leq Peak Hou			.eq Ev		Leq N			Ldn		VEL
Autos:	63		51.1		59.3		53.2		61.9		62.
Medium Trucks:	57.		5.7		49.3		47.8		56.2		56.
Heavy Trucks:	59.		57.6		48.6		49.9		58.2		58.
Vehicle Noise:	65		3.5		60.0		55.7		64.2	2	64.
Centerline Distant	ce to Noise Co	ontour (in feet)		70 d	R4	65 d	RA	F	0 dBA	55	dBA
			dn:	20		44		Ľ	95		05
			EL:	20		44			102		19
		0/1		22						-	

Monday, June 18, 2018

Scenario: Existi Road Name: Orang Road Segment: n/o C	ge St.	,				Project N Job Nur			ate		
SITE SPECIF	IC IN	PUT DATA							L INPUT	s	
Highway Data					Site Con	ditions (H	lard =	10, Sc	oft = 15)		
Average Daily Traffic (A	dt): 3	3,900 vehicles					,	Autos:	15		
Peak Hour Percenta	ige:	10%			Me	dium Truc	ks (2 A	(xles):	15		
Peak Hour Volu	me:	390 vehicles			He	avy Truck	s (3+ A	(xles):	15		
Vehicle Spe	ed:	35 mph		-	Vehicle I	Aire					
Near/Far Lane Distar	ice:	12 feet		-		cleType		Day	Evening	Night	Daily
Site Data				-	VCIII			77.5%	•	9.6%	
					M	dium Tru		84.8%		10.3%	
Barrier Heig		0.0 feet				leavv Tru		86.5%		10.3%	
Barrier Type (0-Wall, 1-Bei		0.0			,	ieavy IIu	JNG.	00.370	2.1 /0	10.070	0.747
Centerline Dist. to Bar		33.0 feet		1	Noise Sc	urce Ele	ation	s (in fe	eet)		
Centerline Dist. to Obser		33.0 feet				Autos:	0.0	000			
Barrier Distance to Obser		0.0 feet			Mediur	n Trucks:	2.2	297			
Observer Height (Above P	· · /	5.0 feet			Heav	y Trucks:	8.0	006	Grade Ad	iustment	: 0.0
Pad Elevat		0.0 feet		-					(		
Road Elevat		0.0 feet			Lane Equ	ivalent L			reet)		
Road Gra		0.0%				Autos:	32.0				
Left Vi		-90.0 degrees				n Trucks:	32.				
Right Vi	ew:	90.0 degrees	5		Heav	y Trucks:	32.	589			
FHWA Noise Model Calcul	ations	:		I							
VehicleType REME	L	Traffic Flow	Dista	ance	Finite	Road	Fresn	el	Barrier Att	en Ber	m Atten
Autos: 6	64.30	-4.95		2.64	4	-1.20		-4.52	0.0	000	0.000
Medium Trucks:	75.75	-22.19		2.69	9	-1.20		-4.86	0.0	000	0.000
Heavy Trucks: 8	31.57	-26.14		2.69	9	-1.20		-5.69	0.0	000	0.000
Unmitigated Noise Levels	(witho	ut Topo and b	arrier	atten	uation)						
VehicleType Leq Pea	k Hour	Leq Day	1	Leq E	vening	Leq N	ght		Ldn	C	NEL
Autos:	60.8	3 5	3.9		57.1		51.1		59.7	7	60.3
Medium Trucks:	55.	1 5	3.5		47.2		45.6		54.1		54.3
Heavy Trucks:	56.9	9 5	5.5		46.5		47.7		56.1		56.2
Vehicle Noise:	63.0	) 6	1.3		57.9		53.5		62.0	)	62.4
	se Co	ntour (in feet)									
Centerline Distance to Noi											dBA
Centerline Distance to Noi		,		70 c	dBA	65 dE	3A	C	60 dBA	55	aBA
Centerline Distance to Noi			dn:		dBA 0	65 dE 21	SA	6	60 dBA 45		ава 97

	FHV	VA-RD-77-108	HIGHWA	Y NOISE I	PREDICT	ION MOD	DEL			
Scenario: Ex Road Name: Or Road Segment: slo	ange St.	,				Name: N umber: 1		ate		
SITE SPEC	CIFIC IN	PUT DATA			N	IOISE N	IODE	L INPUTS	S	
Highway Data				Site Co	onditions	(Hard =	10, Sc	oft = 15)		
Average Daily Traffic	c (Adt):	5,000 vehicles				A	Autos:	15		
Peak Hour Perce	entage:	10%		N	ledium Tru	ucks (2 A	xles):	15		
Peak Hour V	olume:	500 vehicles		H	leavy Truc	cks (3+ A	xles):	15		
Vehicle S	Speed:	35 mph		Vehicle	Mix					
Near/Far Lane Dis	stance:	12 feet			hicleType		Day	Evening	Night	Daily
Site Data						Autos:	, 77.5%	12.9%	9.6%	97.429
Barrier H	loiaht.	0.0 feet			Medium Ti	rucks: 8	34.8%	4.9%	10.3%	1.84%
Barrier Type (0-Wall, 1-		0.0			Heavy Tr	ucks: 8	36.5%	2.7%	10.8%	0.74%
Centerline Dist. to E		33.0 feet		Noice	Source El	ovetions	lin fe	a4)		
Centerline Dist. to Ob	server:	33.0 feet		Noise	Auto:			el)		
Barrier Distance to Obs	server:	0.0 feet		Madi	um Truck					
Observer Height (Above	e Pad):	5.0 feet			avy Truck			Grade Adj	ustmont	0.0
Pad Ele	vation:	0.0 feet			,				uoumonn	0.0
Road Ele	vation:	0.0 feet		Lane E	quivalent		· ·	eet)		
	Grade:	0.0%			Autos					
	t View:	-90.0 degree			um Truck					
Righ	t View:	90.0 degree	S	Hea	avy Truck:	s: 32.5	89			
FHWA Noise Model Cal										
VehicleType RE	MEL	Traffic Flow	Distand		e Road	Fresn		Barrier Atte		m Atten
VehicleType RE Autos:	64.30	Traffic Flow -3.87		2.64	-1.20		4.52	0.0	00	0.00
VehicleType RE Autos: Medium Trucks:	64.30 75.75	Traffic Flow -3.87 -21.11		2.64 2.69	-1.20 -1.20		4.52 4.86	0.0 0.0	00	0.00 0.00
VehicleType RE Autos: Medium Trucks: Heavy Trucks:	64.30 75.75 81.57	Traffic Flow -3.87 -21.11 -25.06		2.64 2.69 2.69	-1.20 -1.20 -1.20		4.52	0.0	00	0.00
VehicleType RE Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise Leve	64.30 75.75 81.57 els (with	Traffic Flow -3.87 -21.11 -25.06 Dut Topo and	barrier at	2.64 2.69 2.69 <b>tenuation</b>	-1.20 -1.20 -1.20	-	4.52 4.86	0.0 0.0 0.0	00 00 00	0.00 0.00 0.00
VehicleType RE Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise Leve VehicleType Leq F	MEL 64.30 75.75 81.57 els (withe Peak Hou	Traffic Flow           -3.87           -21.11           -25.06           Dut Topo and I           r           Leq Day	barrier at	2.64 2.69 2.69 <b>tenuation</b> 7 Evening	-1.20 -1.20 -1.20 ) Leq	Night	4.52 4.86	0.0 0.0 0.0	00 00 00 <i>CI</i>	0.00 0.00 0.00
VehicleType RE Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise Leva VehicleType Leq F Autos:	64.30 75.75 81.57 els (withe Peak Hou 61.	Traffic Flow         -3.87           -21.11         -25.06           Out Topo and r         -21.11           r         Leq Day           9         0	barrier at Lei	2.64 2.69 2.69 <b>tenuation</b> 7 Evening 58.	-1.20 -1.20 -1.20 ) Leq 2	Night 52.1	4.52 4.86	0.0 0.0 0.0 <i>Ldn</i> 60.8	00 00 00 <i>CI</i>	0.00 0.00 0.00
VehicleType RE Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise Leve VehicleType Leq F Autos: Medium Trucks:	MEL 64.30 75.75 81.57 els (with Peak Hou 61. 56.	Traffic Flow         -3.87           -21.11         -25.06           Out Topo and r         -27.11           r         Leq Day           9         6           1         5	barrier at Lei 50.0 54.6	2.64 2.69 2.69 <b>tenuation</b> 7 Evening 58. 48.	-1.20 -1.20 -1.20 ) Leq 2 3	Night 52.1 46.7	4.52 4.86	0.0 0.0 0.0 <u>Ldn</u> 60.8 55.2	00 00 00 <i>CI</i>	0.00 0.00 0.00 <u>VEL</u> 61 55
VehicleType RE Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise Leva VehicleType Leq F Autos:	64.30 75.75 81.57 els (withe Peak Hou 61.	Traffic Flow           -3.87           -21.11           -25.06           Out Topo and fr           r         Leq Day           9         6           1         5           0         5	barrier at Lei	2.64 2.69 2.69 <b>tenuation</b> 7 Evening 58.	-1.20 -1.20 -1.20 ) Leq 2 3 5	Night 52.1	-4.52 -4.86 -5.69	0.0 0.0 0.0 <i>Ldn</i> 60.8	00 00 00 <i>CI</i>	0.00 0.00 0.00 VEL 61. 55. 57.
VehicleType RE Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise Leve VehicleType Leg F Autos: Heavy Trucks: Vehicle Noise:	EMEL 64.30 75.75 81.57 els (with Peak Hou 61. 56. 58 64.	Traffic Flow         -3.87           -21.11         -25.06           Dut Topo and r         r         Leq Day           9         6           1         5           1         6	barrier at Lee 50.0 54.6 56.6 52.4	2.64 2.69 2.69 <b>tenuation</b> 7 Evening 58. 48. 47.	-1.20 -1.20 -1.20 ) Leq 2 3 5	Night 52.1 46.7 48.8	-4.52 -4.86 -5.69	0.0 0.0 0.0 <i>Ldn</i> 60.8 55.2 57.1	00 00 00 <i>CI</i>	0.00 0.00 0.00 VEL 61. 55. 57.
VehicleType RE Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise Leve VehicleType Leg F Autos: Medium Trucks: Heavy Trucks:	EMEL 64.30 75.75 81.57 els (with Peak Hou 61. 56. 58 64.	Traffic Flow         -3.87           -21.11         -25.06           Dut Topo and r         r         Leq Day           9         6           1         5           1         6	barrier at Leo 50.0 54.6 56.6 52.4	2.64 2.69 2.69 <b>tenuation</b> 7 Evening 58. 48. 47.	-1.20 -1.20 -1.20 ) Leq 2 3 5 9	Night 52.1 46.7 48.8	-4.52 -4.86 -5.69	0.0 0.0 0.0 <i>Ldn</i> 60.8 55.2 57.1	00 00 00 <i>CI</i>	0.000 0.000 0.000 VEL 61.4 55.4 57.3
VehicleType RE Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise Leve VehicleType Leg F Autos: Heavy Trucks: Vehicle Noise:	EMEL 64.30 75.75 81.57 els (with Peak Hou 61. 56. 58 64.	Traffic Flow           -3.87           -21.11           -25.06           Dut Topo and           r         Leq Day           9         (           1         (           0         (           1         (           entour (in feet)         (	barrier at Leo 50.0 54.6 56.6 52.4	2.64 2.69 2.69 7 Evening 58. 48. 47. 58.	-1.20 -1.20 -1.20 ) <i>Leq</i> 2 3 5 9	Night 52.1 46.7 48.8 54.6	-4.52 -4.86 -5.69	0.0 0.0 0.0 <u>Ldn</u> 60.8 55.2 57.1 63.1	00 00 00 <i>CI</i> 55	0.000 0.000 0.000 VEL 61.4 55.4 57.3 63.4

	FHV	VA-RD-77-108	HIGH	IWAY I	NOISE PI	REDICTIO	и мо	DEL			
Scenario	: Existing Wi	th Project				Project N	ame:	Northg	ate		
Road Name	: Orange St.					Job Nur	nber:	11145			
Road Segment	n/o Strong	St.									
	PECIFIC IN	IPUT DATA							L INPUT	s	
Highway Data					Site Con	ditions (H	lard =	10, Sc	oft = 15)		
Average Daily T	raffic (Adt):	6,100 vehicle	s					Autos:	15		
Peak Hour P		10%				dium Truc		/	15		
	ur Volume:	610 vehicle	s		He	avy Truck	s (3+ /	Axles):	15		
	icle Speed:	35 mph		ľ	Vehicle I	Mix					
Near/Far Lane	e Distance:	12 feet		ľ	Veh	cleType		Day	Evening	Night	Daily
Site Data						Au	tos:	77.5%	12.9%	9.6%	97.429
Barr	ier Height:	0.0 feet			Me	edium True	cks:	84.8%	4.9%	10.3%	1.84%
Barrier Type (0-Wa	ll, 1-Berm):	0.0			ŀ	leavy Tru	cks:	86.5%	2.7%	10.8%	0.749
Centerline Dist.		33.0 feet		Ī	Noise So	ource Elev	ation	s (in fe	eet)		
Centerline Dist. to		33.0 feet		Ī		Autos:	0.	000	,		
Barrier Distance to		0.0 feet			Mediur	n Trucks:	2.	297			
Observer Height (A	,	5.0 feet			Heav	v Trucks:	8.	006	Grade Ad	justment	: 0.0
	Elevation:	0.0 feet		ŀ							
	Elevation:	0.0 feet		ŀ	Lane Eq	uivalent D			reet)		
R	oad Grade:	0.0%				Autos:		833			
	Left View:	-90.0 degre				n Trucks:		562			
,	Right View:	90.0 degre	es		Heav	y Trucks:	32.	589			
FHWA Noise Model		-									
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite		Fresr	-	Barrier Att		m Atten
Autos:	64.30	-3.01		2.6		-1.20		-4.52		000	0.00
Medium Trucks:	75.75	-20.24		2.6	-	-1.20		-4.86		000	0.00
Heavy Trucks:	81.57	-24.20		2.6	-	-1.20		-5.69	0.0	000	0.00
Unmitigated Noise								1		-	
	eq Peak Hou			Leq E	vening	Leq Ni			Ldn		NEL
Autos:	62		60.8		59.1		53.0		61.6	-	62.
Medium Trucks:	57		55.5		49.1		47.6	-	56.0	-	56.
Heavy Trucks: Vehicle Noise:	58		57.4		48.4		49.6		58.0		58.
	65		63.3		59.8		55.4	•	64.0	J	64.
Centerline Distance	e to Noise Co	ontour (in fee	2	70	dBA	65 dE	RΔ	6	0 dBA	55	dBA
			I dn:		13	28	<i>w</i> -1	1 0	61		31
		C	NFL:		13	20			65		40

	FHV	VA-RD-77-108 I	HIGHW	AY NO	DISE PF	REDICTIO	ON MC	DEL			
	o: Existing Wi	th Project				Project N					
	e: Orange St.					Job Nu	mber:	11145			
Road Segmen	t: s/o Strong S	St.									
SITE S	SPECIFIC IN	PUT DATA							L INPUT	s	
Highway Data				S	ite Con	ditions (I	Hard =	: 10, So	oft = 15)		
Average Daily	Traffic (Adt):	8,500 vehicles						Autos:	15		
Peak Hour	Percentage:	10%			Me	dium Truc	cks (2 .	Axles):	15		
Peak H	our Volume:	850 vehicles			Hea	avy Truck	(3+ .	Axles):	15		
Vel	nicle Speed:	35 mph		v	ehicle l	Mix					
Near/Far Lar	ne Distance:	12 feet		-		icleType		Dav	Evening	Night	Daily
Site Data							utos:	77.5%			97.429
Par	rier Height:	0.0 feet			Me	dium Tru	icks:	84.8%	4.9%	10.3%	1.849
Barrier Type (0-W	•	0.0 1001			F	leavy Tru	icks:	86.5%	2.7%	10.8%	0.749
Centerline Dis		33.0 feet				-					
Centerline Dist. 1		33.0 feet		N	oise So	ource Ele			eet)		
Barrier Distance	o Observer:	0.0 feet				Autos:		000			
Observer Height (	Above Pad):	5.0 feet				n Trucks:		297			
0 1	d Elevation:	0.0 feet			Heav	y Trucks:	8.	006	Grade Ad	justment	: 0.0
Roa	d Elevation:	0.0 feet		L	ane Eq	uivalent	Distan	ce (in i	feet)		
F	Road Grade:	0.0%			-	Autos:	32	.833			
	Left View:	-90.0 degrees	5		Mediur	n Trucks:	32	.562			
	Right View:	90.0 degree	S		Heav	y Trucks:	32	.589			
FHWA Noise Mode	Calculation	s									
VehicleType	REMEL	Traffic Flow	Dista	nce	Finite	Road	Fres	nel	Barrier Att	en Ber	m Atten
Autos:	64.30	-1.57		2.64	-	-1.20		-4.52	0.0	000	0.00
Medium Trucks:	75.75	-18.80		2.69		-1.20		-4.86	0.0	000	0.00
Heavy Trucks:	81.57	-22.76		2.69		-1.20		-5.69	0.0	000	0.00
Unmitigated Noise	Levels (with	out Topo and b	arrier	attenu	ation)						
	Leq Peak Hou			eq Ev		Leq N			Ldn		NEL
Autos:	64.		2.3		60.5		54.		63.1		63.
Medium Trucks:	58.	-	6.9		50.6		49.	-	57.5		57.
Heavy Trucks:	60.		8.9		49.8		51.		59.4		59.
Vehicle Noise:	66	-	4.7		61.3		56.	9	65.4	4	65
Centerline Distanc	e to Noise Co	ontour (in feet)	-	70 d		05 -1	04		0.404		-10.4
		,	dn:	70 al		65 d 35		1 6	60 dBA 76		dBA 63
		CN		10		30			76 81		63 74
		CN	EL.	17		31			01		14

Monday, June 18, 2018

	FHW	/A-RD-77-108	HIGH	I YAWH	NOISE PF	REDICTI	ON MO	DDEL			
	: Existing Wit : Orange St. : n/o Russell	,				Project Job N		Northo 11145			
	PECIFIC IN	PUT DATA							L INPUT	ſS	
Highway Data					Site Con	ditions	(Hard :				
Average Daily T	raffic (Adt):	8,100 vehicle:	5					Autos:			
Peak Hour P		10%				dium Tru					
Peak Ho	ur Volume:	810 vehicles	3		He	avy Truc	cks (3+	Axles):	15		
Vehi	icle Speed:	35 mph		-	Vehicle I	Mix					
Near/Far Lane	e Distance:	12 feet		F		cleType		Dav	Evening	Night	Dailv
Site Data							Autos:	77.5%	•	•	
	ier Height:	0.0 feet			Me	edium Tr		84.8%			
Barrier Type (0-Wa	ll, 1-Berm):	0.0			ŀ	leavy Tr	ucks:	86.5%	2.7%	10.8	% 0.749
Centerline Dist.		33.0 feet		Ē	Noise Sc	ource El	evatio	ns (in f	eet)		
Centerline Dist. to		33.0 feet		Ē		Autos	s: 0	.000	í		
Barrier Distance to	Observer:	0.0 feet			Mediur	n Truck		.297			
Observer Height (A	bove Pad):	5.0 feet			Heav	y Truck		.006	Grade A	diustme	nt: 0.0
Pad	l Elevation:	0.0 feet		_		·					
Road	l Elevation:	0.0 feet		_	Lane Eq			· ·	feet)		
Re	oad Grade:	0.0%				Autos		.833			
	Left View:	-90.0 degree	s			n Truck		.562			
1	Right View:	90.0 degree	es		Heav	y Trucks	s: 32	.589			
FHWA Noise Model											
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite		Fres	-	Barrier A		erm Atter
Autos:	64.30	-1.77		2.6		-1.20		-4.52		.000	0.00
Medium Trucks:	75.75	-19.01		2.6	-	-1.20		-4.86		.000	0.00
Heavy Trucks:	81.57	-22.97		2.6	-	-1.20		-5.69	0.	.000	0.00
Unmitigated Noise								-			
<i></i>	eq Peak Hou	. ,		Leq E	vening	Leq	Night		Ldn		CNEL
Autos:	64.	-	52.1		60.3		54	-	62		63
Medium Trucks:	58.	-	56.7		50.4		48	-	57		57.
Heavy Trucks:	60.		58.7		49.6		50	-	59	-	59
Vehicle Noise:	66.	2	64.5		61.0		56	.7	65	.2	65
Centerline Distance	e to Noise Co	ntour (in feet	)	70	dBA	05	dBA		60 dBA		ID A
			l dn:		dBA 6		aba 4	1	50 dBA 73	1 2	5 dBA 158
			Lan: JFI :		6 7	-	4 6		73 78		158 169
											109

	FHV	VA-RD-77-108	HIGHWA	Y NOISE P	REDICT	ION MOD	EL			
Road Nam	io: Existing Wi ie: Orange St. nt: s/o Russell					Name: No lumber: 11				
SITE	SPECIFIC IN	IPUT DATA			P	IOISE M	DDEL INP	UTS		
Highway Data				Site Col	nditions	(Hard = 1	0, Soft = 1	5)		
Average Daily	Traffic (Adt):	4,200 vehicles	3			A	utos: 15			
Peak Hour	Percentage:	10%		Me	edium Tr	ucks (2 Ax	<i>les):</i> 15			
Peak H	lour Volume:	420 vehicles	3	He	avy Tru	cks (3+ Ax	<i>les):</i> 15			
Ve	hicle Speed:	35 mph		Vehicle	Mix					
Near/Far La	ne Distance:	12 feet			nicleType		ay Even	ina Ni	ight	Daily
Site Data							7.5% 12.5	· ·	•	97.42%
Ba	rrier Heiaht:	0.0 feet		M	Iedium T				0.3%	1.84%
Barrier Type (0-W		0.0			Heavy T	rucks: 8	6.5% 2.	7% 10	0.8%	0.74%
Centerline Di		33.0 feet				-				
Centerline Dist.		33.0 feet		Noise S		levations	. /			
Barrier Distance		0.0 feet			Auto					
Observer Height (		5.0 feet			m Truck					
	ad Elevation:	0.0 feet		Hea	vy Truck	s: 8.00	6 Grade	e Adjust	ment:	0.0
Roa	ad Elevation:	0.0 feet		Lane Eq	uivalen	t Distance	e (in feet)			
	Road Grade:	0.0%			Auto	s: 32.83	33			
	Left View:	-90.0 degree	s	Mediu	m Truck	s: 32.56	62			
	Right View:	90.0 degree	s	Hea	vy Truck	s: 32.58	39			
FHWA Noise Mod	el Calculation	s								
VehicleType	REMEL	Traffic Flow	Distan	ce Finite	Road	Fresne	l Barrie	r Atten	Bern	n Atten
Autos:	64.30	-4.63		2.64	-1.20	-4	4.52	0.000		0.00
Medium Trucks:	75.75	-21.87		2.69	-1.20	-4	1.86	0.000		0.00
Heavy Trucks:	81.57	-25.82		2.69	-1.20	-8	5.69	0.000		0.000
Unmitigated Noise										
VehicleType	Leq Peak Hou			q Evening		Night	Ldn		CN	
Autos:	61		59.2	57.4		51.4		60.0		60.0
Medium Trucks:	55		53.9	47.5		46.0		54.4		54.
Heavy Trucks:	57		55.8	46.8		48.0		56.4		56.
Vehicle Noise:			61.6	58.2		53.8		62.3		62.8
Centerline Distant	ce to Noise Co	ontour (in feet,	1	70 - 10 4	05	-/0.4	00 -/04			04
				70 dBA 10		dBA 2	60 dBA 47		55 0	
			Ldn:	10		2	47		10	2
			IEL:	11		3	50		10	0

Monday, June 18, 2018

	FHV	VA-RD-77-108 F	IIGHWAY	NOISE PI	REDICTION	MODEL		
Scenario	o: Existing Wit	th Project			Project Na	me: North	gate	
Road Name	e: Primer St.	-			Job Num	ber: 11145		
Road Segmen	t: n/o Columb	ia Av.						
	PECIFIC IN	PUT DATA					L INPUTS	
Highway Data				Site Con	ditions (Ha	ard = 10, S	oft = 15)	
Average Daily 1	raffic (Adt):	9,500 vehicles				Autos.	15	
Peak Hour F	Percentage:	10%		Me	dium Truck	s (2 Axles)	15	
Peak Ho	our Volume:	950 vehicles		He	avy Trucks	(3+ Axles)	15	
Veh	icle Speed:	35 mph		Vehicle	Mix			
Near/Far Lan	e Distance:	12 feet			icleType	Dav	Evening	Night Daily
Site Data					Aut	os: 77.5%	•	9.6% 97.42%
Bari	rier Height:	0.0 feet		M	edium Truc	ks: 84.8%	6 4.9%	10.3% 1.84%
Barrier Type (0-Wa	all, 1-Berm):	0.0		I	leavy Truc	ks: 86.5%	6 2.7%	10.8% 0.74%
Centerline Dis		33.0 feet		Noise So	ource Eleva	ations (in f	eet)	
Centerline Dist. to		33.0 feet			Autos:	0.000	,	
Barrier Distance to		0.0 feet		Mediu	n Trucks:	2.297		
Observer Height (A	,	5.0 feet		Heav	v Trucks:	8.006	Grade Adju	stment: 0.0
	d Elevation:	0.0 feet						
	d Elevation:	0.0 feet		Lane Eq	uivalent Di		teet)	
ĸ	Road Grade:	0.0%			Autos:	32.833		
	Left View:	-90.0 degrees			n Trucks:	32.562		
	Right View:	90.0 degrees	5	Heav	y Trucks:	32.589		
FHWA Noise Mode								
VehicleType	REMEL	Traffic Flow	Distance			Fresnel	Barrier Atte	
Autos:	64.30	-1.08		.64	-1.20	-4.52	0.00	
Medium Trucks:	75.75	-18.32 -22.28		.69	-1.20 -1.20	-4.86	0.00	
Heavy Trucks:	81.57			.69	-1.20	-5.69	0.00	0.00
Unmitigated Noise VehicleType				,	1 16-		Ldn	CNEL
Autos	Leq Peak Hou 64		2.8	Evening 61.0	Leq Nig	54.9	Lan 63.6	CIVEL 64
Medium Trucks:	58		7.4	51.0		49.5	58.0	58.
Heavy Trucks:	50. 60.		9.4	50.3		49.5 51.6	59.9	60.
Vehicle Noise:	66		5.2	61.7		57.4	65.9	66.
Oranta dina Distana	e to Noise Co	ontour (in feet)						
Centerline Distance		. ,					00 10 4	CC 104
Centerline Distance			70	) dBA	65 dB/	9	60 dBA	55 dBA
Centerline Distance		L	dn:	18	65 dB/ 38	4	81	175

	FHV	VA-RD-77-108	HIGH	WAY NO	DISE PF	REDICT	ION MO	DDEL			
	: Existing Wi						t Name:				
	: La Cadena					Job N	lumber:	11145			
Road Segment	: n/o I-215 R	amps									
	PECIFIC IN	PUT DATA							L INPUT	s	
Highway Data				S	ite Con	ditions	(Hard :	= 10, S	oft = 15)		
Average Daily T	raffic (Adt):	5,300 vehicles	s					Autos:	15		
Peak Hour F	Percentage:	10%			Mee	dium Tr	ucks (2	Axles).	15		
Peak Ho	ur Volume:	530 vehicles	s		Hea	avy Tru	cks (3+	Axles).	15		
Veh	icle Speed:	40 mph		v	ehicle I	Nix					
Near/Far Lan	e Distance:	12 feet		-		cleType	9	Dav	Evening	Night	Dailv
Site Data					1011		Autos:	77.5%		9.6%	
	ier Height:	0.0 feet			Me	dium T		84.8%		10.3%	
ват Barrier Type (0-Wa	•	0.0 reet 0.0					rucks:			10.8%	
Centerline Dist		33.0 feet									
Centerline Dist. to		33.0 feet		N	loise So	ource E	levatio	ns (in f	eet)		
Barrier Distance to		0.0 feet				Auto	os: 0	.000			
Observer Height (A		5.0 feet			Mediur	n Truck	(s: 2	.297			
	d Flevation:	0.0 feet			Heav	y Truck	:s: 8	.006	Grade Ad	justment.	0.0
	l Elevation:	0.0 feet		1	ane Equ	ivalor	t Dista	nco (in	foot)		
	n Elevation. oad Grade:	0.0 feet		-	une Equ	Auto		.833	1001)		
	Left View:	-90.0 degree			Mediur			.562			
	Right View:	90.0 degree				y Truck					
	tight view.	90.0 degree	:5		neav	y mach	.5. 52				
FHWA Noise Model	Calculation	s									
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite	Road	Fres	nel	Barrier At	en Ber	m Atter
Autos:	66.51	-4.20		2.64		-1.20		-4.52	0.0	000	0.00
Medium Trucks:	77.72	-21.44		2.69		-1.20		-4.86	0.0	000	0.00
Heavy Trucks:	82.99	-25.39		2.69		-1.20		-5.69	0.	000	0.00
Unmitigated Noise	Levels (with	out Topo and	barrie	er attenu	ation)						
VehicleType L	eq Peak Hou	r Leq Day	'	Leq Ev	ening	Leq	Night		Ldn	CI	VEL
Autos:	63	.8 0	61.9		60.1		54.	.0	62.	7	63
Medium Trucks:	57	.8	56.3		49.9		48	.4	56.		57
Heavy Trucks:	59	.1	57.7		48.6		49.	.9	58.	2	58
Vehicle Noise:	65	.8	64.0		60.8		56	.2	64.	3	65
Centerline Distance	e to Noise Co	ontour (in feet,	)								
				70 di		65	dBA		60 dBA	55	dBA
			Ldn:	15		:	32		68	1	48
			VEL:	16			34		73		58

Monday, June 18, 2018

FHWA	RD-77-108 HIG	HWAY	NOISE PF	REDICTIO	ом мо	DEL			
Scenario: Existing With F Road Name: La Cadena Dr. Road Segment: s/o I-215 Ram				Project N Job Nu					
SITE SPECIFIC INPL	JT DATA						L INPUT	S	
Highway Data			Site Con	ditions (l	Hard =	= 10, S	oft = 15)		
Average Daily Traffic (Adt): 3,7	700 vehicles					Autos:	15		
Peak Hour Percentage:	10%		Me	dium Truc	cks (2	Axles):	15		
Peak Hour Volume: 3	370 vehicles		He	avy Truck	ks (3+	Axles):	15		
Vehicle Speed:	40 mph	-	Vehicle I	Mix					
Near/Far Lane Distance:	12 feet	-		cleType		Day	Evening	Night	Daily
Site Data				A	utos:	77.5%	12.9%	9.6%	97.42%
Barrier Height:	0.0 feet		Me	edium Tru	icks:	84.8%	4.9%	10.3%	1.84%
Barrier Type (0-Wall, 1-Berm):	0.0		ŀ	leavy Tru	icks:	86.5%	2.7%	10.8%	0.74%
Centerline Dist. to Barrier:	33.0 feet		Noise So	ource Ele	vatior	ns (in f	eet)		
Centerline Dist. to Observer:	33.0 feet			Autos		000	,		
Barrier Distance to Observer:	0.0 feet		Mediur	n Trucks:	2	297			
Observer Height (Above Pad):	5.0 feet			v Trucks:		.006	Grade Ad	liustmen	t: 0.0
Pad Elevation:	0.0 feet			· · · ·	-			,	
Road Elevation:	0.0 feet	_	Lane Eq				feet)		
Road Grade:	0.0%			Autos:		.833			
	90.0 degrees			n Trucks:		.562			
Right View:	90.0 degrees		Heav	y Trucks:	32	.589			
FHWA Noise Model Calculations									
		listance	Finite		Fres	-	Barrier At		rm Atten
Autos: 66.51	-5.76	2.6		-1.20		-4.52		000	0.000
Medium Trucks: 77.72	-23.00	2.6	-	-1.20		-4.86		000	0.000
Heavy Trucks: 82.99	-26.95	2.6	-	-1.20		-5.69	0.	000	0.00
Unmitigated Noise Levels (without						-		1 6	
VehicleType Leq Peak Hour Autos: 62.2	Leq Day 60.3		vening 58.5	Leq N	iight 52	-	Ldn 61		NEL 61.
Autos: 62.2 Medium Trucks: 56.2	54.7		58.5 48.3		52. 46	-	55		55.
	54.7 56.1		48.3		46.	-	56.	-	56.0
Heavy Trucks: 57.5 Vehicle Noise: 64.2	62.5		59.2		40. 54	-	50. 63.		63.
			59.Z		34.	/	63.	2	03.
Centerline Distance to Noise Conte	our (in feet)	70	dBA	65 d	RA	1	60 dBA	54	dBA
	l dn		2	25		- · ·	54		116
	CNEL		2	20			58		124
	ONLL		-	2.					

	FH	WA-RD-77-108 H	IIGHWAY	NOISE P	REDICTION	N MODEL		
	o: Existing W e: La Cadena nt: n/o Strong	a Dr.				ame: Northo aber: 11145		
SITE	SPECIFIC II	NPUT DATA			NO	ISE MODE	L INPUTS	
Highway Data				Site Cor	nditions (Ha	ard = 10, S	oft = 15)	
Average Daily	Traffic (Adt):	3,700 vehicles				Autos:	15	
Peak Hour	Percentage:	10%		Me	dium Truck	s (2 Axles).	15	
Peak H	our Volume:	370 vehicles		He	avy Trucks	(3+ Axles).	15	
Vei	hicle Speed:	40 mph		Vehicle	Mix			
Near/Far Lar	ne Distance:	12 feet			icleType	Dav	Evening	Night Daily
Site Data				VCI	Aut		•	9.6% 97.42%
	rier Heiaht:	0.0 feet		м	edium Truc			10.3% 1.84%
ваг Barrier Type (0-W		0.0 Teet			Heavy Truc			10.8% 0.74%
Centerline Dis	. ,	33.0 feet						
Centerline Dist.		33.0 feet		Noise S	ource Elev		eet)	
Barrier Distance		0.0 feet			Autos:	0.000		
Observer Height (		5.0 feet			m Trucks:	2.297	~	
	ad Elevation:	0.0 feet		Heav	/y Trucks:	8.006	Grade Adju	ustment: 0.0
Roa	ad Elevation:	0.0 feet		Lane Eq	uivalent Di	istance (in	feet)	
F	Road Grade:	0.0%			Autos:	32.833		
	Left View:	-90.0 degrees		Mediu	m Trucks:	32.562		
	Right View:	90.0 degrees		Heav	/y Trucks:	32.589		
FHWA Noise Mode	el Calculation	IS						
VehicleType	REMEL	Traffic Flow	Distance	Finite	Road	Fresnel	Barrier Atte	n Berm Atten
Autos:	66.51	-5.76	2.	64	-1.20	-4.52	0.00	0.000
Medium Trucks:	77.72	-23.00	2.	69	-1.20	-4.86	0.00	0.000
Heavy Trucks:	82.99	-26.95	2.	69	-1.20	-5.69	0.00	0.000
Unmitigated Noise			arrier atte	enuation)				
	Leq Peak Ho		,	Evening	Leq Nig		Ldn	CNEL
Autos:			).3	58.5		52.5	61.1	61.7
Medium Trucks:			1.7	48.3		46.8	55.3	55.5
Heavy Trucks:			6.1	47.1		48.3	56.7	56.8
Vehicle Noise:	-		2.5	59.2		54.7	63.2	63.6
Centerline Distance	e to Noise C	ontour (in feet)	7(	) dBA	65 dB	4	60 dBA	55 dBA
		17	dn:	12	25		54	116
		CNE		12	23		58	124
		ONL			21			.24

Monday, June 18, 2018

Monday, June 18, 2018

	FHV	VA-RD-77-108	HIGHW	AY N	OISE PR	EDICTIO	N MODEL			
	e: Existing Wi e: Placentia L t: e/o Main St	n.					ame: North hber: 1114			
SITE S	PECIFIC IN	IPUT DATA				NO	ISE MOD	EL INPUT	s	
Highway Data				S	ite Cond	litions (H	ard = 10, S	Soft = 15)		
	, ,	3,400 vehicle 10% 340 vehicle 25 mph				vy Trucks	Autos (s (2 Axles, (3+ Axles,	: 15		
Near/Far Lan	e Distance:	36 feet				leType	Dav	Evening	Night D	aily
Site Data		0.0 feet		_		Aut Aut dium Truc	os: 77.5	% 12.9%	9.6% 97	.42°
Barrier Type (0-Wa	ier Height:	0.0 teet			Н	eavy Truc	ks: 86.5	% 2.7%	10.8% 0	.749
Centerline Dis		44.0 feet								
Centerline Dist. to		44.0 feet		^	loise So		ations (in	feet)		
Barrier Distance to		0.0 feet				Autos:	0.000			
Observer Height (A	bove Pad):	5.0 feet				Trucks:	2.297	Crada Ad	iustment: 0.0	~
Pa	d Elevation:	0.0 feet			Heavy	Trucks:	8.006	Graue Auj	usuneni. U.	J
Road	d Elevation:	0.0 feet		L	ane Equ	ivalent D	istance (in	feet)		
R	oad Grade:	0.0%				Autos:	40.460			
	Left View: Right View:	-90.0 degre 90.0 degre				n Trucks: / Trucks:	40.241 40.262			
FHWA Noise Mode	Calculation	s								
VehicleType	REMEL	Traffic Flow	Distar	псе	Finite F	Road	Fresnel	Barrier Atte	en Berm A	tter
Autos:	58.73	-4.08		1.28		-1.20	-4.61	0.0	000 0	0.00
Medium Trucks:	70.80	-21.32		1.31		-1.20	-4.87			0.00
Heavy Trucks:	77.97	-25.28		1.31		-1.20	-5.50	0.0	000 (	0.00
Unmitigated Noise	Levels (with	out Topo and	barrier a	attenu	uation)					
VehicleType	Leq Peak Hou	ir Leq Day	' L	eq Ev	ening	Leq Nig	ght	Ldn	CNEL	
Autos:	54		52.8		51.1		45.0	53.6		54
Medium Trucks:	49		48.1		41.7		40.2	48.6		48
Heavy Trucks:	52		51.4		42.3		43.6	51.9		52
Vehicle Noise:	57	.6	55.9		52.0		48.1	56.6	3	57
Centerline Distance	e to Noise Co	ontour (in feet	)							
				70 d	BA	65 dB	A	60 dBA	55 dB/	4
			I dn:	6		12		26	57	
			VFI :	6		12		20	60	

	FHV	VA-RD-77-108	HIGHV	VAY N	OISE PF	REDICT	ION MOE	DEL			
Road Nan	io: Existing Wi ne: Columbia A nt: e/o Orange	w.					Name: N umber: 1		ate		
SITE	SPECIFIC IN	IPUT DATA							L INPUT	s	
Highway Data				S	Site Con	ditions	(Hard = '	10, Sc	oft = 15)		
Average Daily	Traffic (Adt): 1	10,100 vehicle	s				A	utos:	15		
Peak Hour	Percentage:	10%			Me	dium Tri	ucks (2 A	xles):	15		
Peak H	lour Volume:	1,010 vehicles	S		He	avy Tru	cks (3+ A	xles):	15		
Ve	hicle Speed:	45 mph		L.	ehicle l	Mix					
Near/Far La	ne Distance:	36 feet		F		icleType		Day	Evening	Night	Daily
Site Data					VCII			77.5%		•	97.429
		0.0.4			Me	edium Ti		34.8%		10.3%	
Barrier Type (0-V	rrier Height:	0.0 feet				leavy T		36.5%		10.8%	
	st. to Barrier:	0.0 44.0 feet									
Centerline Dist.		44.0 feet		٨	loise So	ource E	evations	(in fe	et)		
Barrier Distance		44.0 feet				Auto		00			
Observer Height		5.0 feet			Mediur	n Truck	s: 2.2	97			
	ad Flevation:	0.0 feet			Heav	y Truck	s: 8.0	06	Grade Ad	justment.	0.0
	ad Elevation: ad Elevation:	0.0 feet		1	ane Fo	uivalen	Distanc	e (in i	feet)		
	Road Grade:	0.0%		-	uno 24	Auto			000)		
	Left View:	-90.0 deared			Mediur	n Truck					
	Right View:	90.0 degree				y Truck					
FHWA Noise Mod	el Calculation	s									
VehicleType	REMEL	Traffic Flow	Dista	ance	Finite	Road	Fresne	e/	Barrier Att	en Ber	m Atten
Autos:	68.46	-1.91		1.28		-1.20	-	4.61	0.0	000	0.00
Medium Trucks:	79.45	-19.15		1.31		-1.20	-	4.87	0.0	000	0.00
Heavy Trucks:	84.25	-23.10		1.31		-1.20	-	5.50	0.0	000	0.00
Unmitigated Nois					<b>/</b>						
VehicleType	Leq Peak Hou			Leq Ev	•	Leq	Night		Ldn		VEL
Autos:	66		64.7		63.0		56.9		65.5		66.
Medium Trucks:			58.9		52.5		51.0		59.5		59.
Heavy Trucks:		-	59.8		50.8		52.1		60.4		60.
Vehicle Noise:			66.7		63.6		58.9		67.4	1	67.
Centerline Distan	ce to Noise Co	ontour (in feet	)	70 -		65				57	dD A
				70 d	ва	65	dBA	6	i0 dBA	55	dBA
			1 .d.a.	00		-			400		07
			Ldn: VEL:	30 32			4		138 148		97 19

	FH\	NA-RD-77-108	HIGHV	VAY N	OISE PI	REDICTI		DDEL			
	rio: Existing W					Project			ate		
	ne: Columbia A					Job Ni	imber:	11145			
Road Segme	ent: e/o Primer	St.									
	SPECIFIC IN	IPUT DATA								S	
Highway Data				S	lite Con	ditions (	Hard		,		
Average Daily	Traffic (Adt):	18,100 vehicles	6					Autos:	15		
	Percentage:	10%				dium Tru			15		
Peak H	lour Volume:	1,810 vehicles	6		He	avy Truc	ks (3+	Axles):	15		
Ve	ehicle Speed:	45 mph		v	ehicle	Mix					
Near/Far La	ane Distance:	36 feet		F	Veh	icleType		Day	Evening	Night	Daily
Site Data						A	utos:	77.5%	12.9%	9.6%	97.429
Ra	rrier Heiaht:	0.0 feet			M	edium Tr	ucks:	84.8%	4.9%	10.3%	1.84%
Barrier Type (0-V		0.0			ŀ	Heavy Tr	ucks:	86.5%	2.7%	10.8%	0.74%
Centerline D	ist. to Barrier:	44.0 feet			loise Sc	ource Ele	evatio	ns (in fe	et)		
Centerline Dist.	to Observer:	44.0 feet		Ē		Autos		.000			
Barrier Distance	to Observer:	0.0 feet			Mediu	m Trucks		297			
Observer Height	(Above Pad):	5.0 feet				v Trucks			Grade Ad	iustment	0.0
P	ad Elevation:	0.0 feet								,	
Ro	ad Elevation:	0.0 feet		L	ane Eq	uivalent			leet)		
	Road Grade:	0.0%				Autos		.460			
	Left View:	-90.0 degree	es			m Trucks		).241			
	Right View:	90.0 degree	es		Heav	ry Trucks	: 40	.262			
FHWA Noise Mod											
VehicleType	REMEL	Traffic Flow	Dista			Road	Fres	-	Barrier Att		m Atten
Autos:		0.63		1.28		-1.20		-4.61		000	0.00
Medium Trucks:		-16.61		1.31		-1.20		-4.87		000	0.00
Heavy Trucks:	84.25	-20.57		1.31		-1.20		-5.50	0.0	000	0.00
Unmitigated Nois											
VehicleType	Leq Peak Hou	, ,		Leq Ev	•	Leq I	·		Ldn		NEL
Autos:			57.3		65.5		59		68.1		68.
Medium Trucks:			51.4		55.1		53		62.0	-	62.
Heavy Trucks:			52.4		53.3		54		62.9	-	63.
Vehicle Noise:			69.3		66.1		61	.4	70.0	)	70.
Centerline Distan	ce to Noise C	ontour (in feet)	)	70 d	04	65 (	04		0 dBA		dBA
				70 a 44		65 0		6	204		39 39
			Ldn: JFL :	44		93	-		204		.39 .71
		Ch	VEL:	47		10			210	4	11

	FHW	A-RD-77-108	HIGHW.	AY NO	OISE PI	REDIC	TION MO	DEL			
Scenario: E Road Name: S Road Segment: w	trong St.	n Project					t Name:   Number:				
	CIFIC INF	PUT DATA								s	
Highway Data				S	ite Cor	ditions	s (Hard =	10, S	oft = 15)		
Average Daily Traff	ic (Adt): 3	3,400 vehicles					,	Autos.	15		
Peak Hour Perc	entage:	10%			Me	dium T	rucks (2 A	(xles)	15		
Peak Hour \	/olume:	340 vehicles			He	avy Tru	ıcks (3+ A	(xles)	15		
Vehicle	Speed:	25 mph		14	ehicle	Mise					
Near/Far Lane D	stance:	12 feet		ľ		icleTyp	e	Dav	Evening	Night	Daily
Site Data					1011			77.5%	•	9.6%	,
Barrier	Hoight:	0.0 feet			М	edium 1	rucks:	84.89	4.9%	10.3%	1.84
Barrier Type (0-Wall, 1		0.0			1	Heavy T	Trucks:	86.5%	5 2.7%	10.8%	0.74
Centerline Dist. to	,	33.0 feet			laiaa C		levation	o (in f	0.04)		
Centerline Dist. to Ol	bserver:	33.0 feet		N	ioise si	Auto		<b>5 (111 1</b> 200	eel)		
Barrier Distance to Ol	bserver:	0.0 feet				Auto m Truci		297			
Observer Height (Abov	e Pad):	5.0 feet						297	Grade Ad	iuotmon	
Pad El	evation:	0.0 feet			Heal	ry Truci	KS: 8.0	000	Grade Auj	usunen	. 0.0
Road El	evation:	0.0 feet		L	ane Eq	uivaler	nt Distand	ce (in	feet)		
Road	Grade:	0.0%				Auto	os: 32.6	833			
Le	ft View:	-90.0 degree	s		Mediu	m Truci	ks: 32.	562			
Rigi	ht View:	90.0 degree	s		Heav	y Truci	ks: 32.	589			
FHWA Noise Model Ca	lculations										
VehicleType R	EMEL	Traffic Flow	Distar	ice	Finite	Road	Fresh	el	Barrier Att	en Be	rm Attei
Autos:	58.73	-4.08		2.64		-1.20		-4.52	0.0	000	0.0
Medium Trucks:	70.80	-21.32		2.69		-1.20		-4.86	0.0	000	0.0
Heavy Trucks:	77.97	-25.28		2.69		-1.20		-5.69	0.0	000	0.0
Unmitigated Noise Lev	els (witho	ut Topo and	barrier a	ttenu	uation)						
,, ,	Peak Hour			eq Ev	ening	Leq	Night		Ldn	-	NEL
Autos:	56.1		54.2		52.4		46.4		55.0		55
Medium Trucks:	51.0		19.5		43.1		41.6		50.0		50
Heavy Trucks:	54.2		52.8		43.7		45.0	_	53.3		53
Vehicle Noise:	59.0	) !	57.3		53.4		49.5	,	58.0	)	58
Centerline Distance to	Noise Cor	ntour (in feet)									
				70 di	BA		dBA		60 dBA	55	dBA
			dn:	5			11		24		52 Fe
		Ch	IEL:	6			12		26		56

Monday, June 18, 2018

Monday, June 18, 2018

	FH\	WA-RD-77-108	HIGHWA	AY NO	ISE PREDI	CTION I	IODEL			
Road Nam	io: Existing Wi e: Strong St. nt: e/o Main Si	,					e: North er: 11145			
SITE	SPECIFIC IN	IPUT DATA				NOIS	E MODE	L INPUT	s	
Highway Data				Sit	e Conditio	ns (Hare	d = 10, S	oft = 15)		
	Traffic (Adt): Percentage: lour Volume:	4,000 vehicle 10% 400 vehicle					Autos. 2 Axles). + Axles).	15		
Ve	hicle Speed:	25 mph		Ve	hicle Mix					
Near/Far La	ne Distance:	12 feet		Ve	VehicleT	me	Dav	Evening	Night	Daily
Site Data					venieler	Autos			9.6%	
	rier Heiaht:	0.0 feet		_	Mediun	n Trucks			10.3%	
Barrier Type (0-W		0.0			Heavy	/ Trucks	86.5%	6 2.7%	10.8%	0.74%
Centerline Dis		33.0 feet		No	ise Source	Elovati	ono (in t	(a a 4)		
Centerline Dist.	to Observer:	33.0 feet		/vc		itos:	0.000	eel)		
Barrier Distance	to Observer:	0.0 feet			Al Medium Tru		2.297			
Observer Height (	Above Pad):	5.0 feet			Heavy Tru		2.297	Grade Ad	iustment	: 0.0
	ad Elevation:	0.0 feet		_						
	ad Elevation:	0.0 feet		La	ne Equival			feet)		
1	Road Grade:	0.0%					32.833			
	Left View: Right View:	-90.0 degre 90.0 degre			Medium Tru Heavy Tru		32.562 32.589			
FHWA Noise Mod	ů.	•								
VehicleType	REMEL	Traffic Flow	Distan	ce	Finite Road	1 En	esnel	Barrier Att	en Bei	m Atten
Autos	58.73	-3.38	Diotan	2.64	-1.2		-4.52		000	0.00
Medium Trucks:	70.80	-20.62		2.69	-1.2	20	-4.86	0.0	000	0.00
Heavy Trucks:	77.97	-24.57		2.69	-1.2	20	-5.69	0.0	000	0.00
Unmitigated Noise	e Levels (with	out Topo and	barrier a	ttenua	tion)					
VehicleType	Leq Peak Hou	ur Leq Day	/ Le	q Eve	ning L	eq Night		Ldn	C	NEL
Autos:	56		54.9		53.1		7.1	55.		56.3
Medium Trucks:	51		50.2		43.8		2.3	50.7		50.9
Heavy Trucks:	54	.9	53.5		44.4	4	5.7	54.0	)	54.2
Vehicle Noise:	59	0.7	58.0		54.1	5	0.2	58.	7	59.
Centerline Distant	ce to Noise Co	ontour (in fee	)							
				70 dB	A	65 dBA		60 dBA	55	dBA
			Ldn: NFL :	6 6		13 13		27 29		58 62

F	HW	A-RD-77-108	HIGI	HWAY N	IOISE PF	REDICTI	ON MO	DDEL			
Scenario: Existing	With	n Project				Project	Name:	Northg	gate		
Road Name: Russell						Job Ni	umber:	11145			
Road Segment: e/o Main	n St.										
SITE SPECIFIC	INF	PUT DATA							L INPUT	S	
Highway Data					Site Con	ditions (	Hard :	= 10, S	oft = 15)		
Average Daily Traffic (Adt)	): 4	4,900 vehicles	6					Autos:	15		
Peak Hour Percentage	e:	10%			Me	dium Tru	icks (2	Axles).	15		
Peak Hour Volume		490 vehicles	5		He	avy Truc	ks (3+	Axles).	15		
Vehicle Speed	f:	35 mph			Vehicle I	Mix					
Near/Far Lane Distance	e:	36 feet				icleType		Day	Evening	Night	Daily
Site Data							utos:	77.5%	•		97.42
Barrier Height	f.	0.0 feet			Me	edium Tr	ucks:	84.8%	6 4.9%	10.3%	1.84
Barrier Type (0-Wall, 1-Berm)		0.0			ŀ	leavy Tr	ucks:	86.5%	6 2.7%	10.8%	0.74
Centerline Dist. to Barrier		44.0 feet		-		·					
Centerline Dist. to Observer		44.0 feet		1	Noise So				eet)		
Barrier Distance to Observer		0.0 feet				Autos		.000			
Observer Height (Above Pad		5.0 feet				n Trucks		.297			
Pad Elevation		0.0 feet			Heav	y Trucks	: 8	.006	Grade Ad	justment	: 0.0
Road Elevation	n:	0.0 feet		1	Lane Eq	uivalent	Distar	nce (in	feet)		
Road Grade	e:	0.0%				Autos	: 40	.460			
Left View	<i>r:</i>	-90.0 degree	s		Mediur	n Trucks	: 40	.241			
Right View	/:	90.0 degree	es		Heav	y Trucks	: 40	.262			
FHWA Noise Model Calculati	ions										
VehicleType REMEL		Traffic Flow	Di	istance	Finite	Road	Fres	nel	Barrier Att	en Bei	m Atter
Autos: 64.	30	-3.96		1.28	В	-1.20		-4.61	0.0	000	0.00
Medium Trucks: 75.	75	-21.20		1.31	1	-1.20		-4.87	0.0	000	0.00
Heavy Trucks: 81.	57	-25.15		1.31	1	-1.20		-5.50	0.0	000	0.00
Unmitigated Noise Levels (w			barri	ier atten	uation)						
VehicleType Leq Peak H		1.7		Leq Ev		Leq I			Ldn		NEL
Autos:	60.4		58.5		56.8		50		59.3		59
Medium Trucks:	54.7		53.2		46.8		45		53.		53
Heavy Trucks:	56.5		55.1		46.1		47.	-	55.		55
Vehicle Noise:	62.7		60.9		57.5		53	.1	61.6	5	62
Centerline Distance to Noise	Cor	ntour (in feet,	)					1			
				70 0		65 0			60 dBA		dBA
			Ldn:	1:	-	2	-		57		22
		CI	VFI :	13	3	2	R		60	1	30

Monday, June 18, 2018

Scenario: OY 2019 Without Pr Road Name: Main St. Road Segment: s/o Placentia Ln.	oject			Project Na Job Num			ate		
SITE SPECIFIC INPUT DA	ТА							S	
Highway Data		3	ne Cond	litions (Ha					
Average Daily Traffic (Adt): 42,700 ve	ehicles					utos:	15		
Peak Hour Percentage: 10%				ium Truck			15		
Peak Hour Volume: 4,270 ve			неа	vy Trucks	(3+ AX	ies):	15		
Vehicle Speed: 50 m		V	ehicle M	lix					
Near/Far Lane Distance: 36 fe	et		Vehic	leType	D	lay	Evening	Night	Daily
Site Data				Auto	os: 7	7.5%	12.9%	9.6%	97.42%
Barrier Height: 0.0 1	eet		Me	dium Truc	ks: 8	4.8%	4.9%	10.3%	1.84%
Barrier Type (0-Wall, 1-Berm): 0.0			H	eavy Truc	ks: 8	6.5%	2.7%	10.8%	0.749
Centerline Dist. to Barrier: 50.0 f	eet		laisa Sa	urce Eleva	ations	(in fo	of		
Centerline Dist. to Observer: 50.0 f	eet		0136 301	Autos:	0.00		eij		
Barrier Distance to Observer: 0.0 f	eet		Modium	Trucks:	2.29	-			
Observer Height (Above Pad): 5.0 f	eet			Trucks:	8.00		Grade Ad	ustmont	0.0
Pad Elevation: 0.0 f	eet							uounoni	0.0
Road Elevation: 0.0 f	eet	L	ane Equ	ivalent Di	stance	e (in f	eet)		
Road Grade: 0.0%				Autos:	46.91				
	legrees			Trucks:	46.72				
Right View: 90.0 d	legrees		Heavy	Trucks:	46.74	14			
FHWA Noise Model Calculations									
VehicleType REMEL Traffic F			Finite F		Fresne		Barrier Atte		m Atten
Autos: 70.20	3.90	0.31		-1.20		1.65	0.0		0.00
	3.34	0.34		-1.20		1.87	0.0		0.00
	7.30	0.34		-1.20	-{	5.43	0.0	00	0.00
Unmitigated Noise Levels (without Topo			· · ·	1 16-	4.4		l da	0	
,, ,	q Day Lo 71.3	eq Ev	v	Leq Nig	63.5		Ldn 72.1		VEL 72
Autos: 73.2 Medium Trucks: 66.8	71.3 65.3		69.5 58.9		63.5 57.4		72.1 65.8		72. 66.
Heavy Trucks: 67.2	65.8		56.8		57.4 58.0		66.4		66.
Vehicle Noise: 74.9	73.2		70.1		65.3		73.9		74
	13.2		70.1		05.5		75.8		74.
Oracle Mars Distance to Nation Oracle (	- f 1)								
Centerline Distance to Noise Contour (in	n feet)	70 d	BA	65 dB	4	6	) dBA	55	dBA
Centerline Distance to Noise Contour (ii	l dn:	70 d		65 dB/ 195	4		0 dBA 421		dBA 07

FHV	VA-RD-77-108	HIGHWA	Y NOISE F	PREDICT	ION MODEL	-		
e: Main St.	,							
SPECIFIC IN	IPUT DATA			N	IOISE MOI	DEL INPUT	s	
			Site Co	nditions	(Hard = 10,	Soft = 15)		
raffic (Adt): 4	42,500 vehicle	6			Auto	os: 15		
Percentage:	10%		М	edium Tri	ucks (2 Axle	s): 15		
our Volume:	4,250 vehicles	6	н	eavy Tru	cks (3+ Axle	s): 15		
nicle Speed:	50 mph		Mahiala					
e Distance:	36 feet				0	- E-maine	Allertat	Delle
			ve			•	•	Daily
			л					1.84%
. ,				Heavy I	UCKS: 80.	0% Z.7%	10.8%	0.74%
			Noise S	Source E	evations (in	1 feet)		
				Auto	s: 0.000			
			Medi	um Truck	s: 2.297			
,			Hea	vv Truck	s: 8.006	Grade Ad	ljustment.	0.0
				·			-	
			Lane E			in teet)		
	•							
Right View:	90.0 degree	es	Hea	ivy Truck	s: 46.744			
REMEL	Traffic Flow	Distan	ce Finite		Fresnel	Barrier At	ten Ber	m Atten
70.20	3.88		0.31	-1.20	-4.6	65 0.0	000	0.00
81.00	-13.36		0.34	-1.20	-4.8	87 0.0	000	0.00
							000	0.00
85.38	-17.32		0.34	-1.20	-5.4	13 0.1	000	0.000
Levels (with	out Topo and		ttenuation)	)	-			
Levels (with Leq Peak Hou	out Topo and Ir Leq Day	Le	t <b>tenuation</b> ) q Evening	Leq	Night	Ldn	CI	VEL
Levels (with Leq Peak Hou 73	out Topo and Ir Leq Day .2	Le 71.3	ttenuation) q Evening 69.9	Leq	Night 63.5	Ldn 72.	<i>Ci</i>	VEL 72.
Levels (with Leq Peak Hou 73 66	out Topo and Ir Leq Day .2 .8	Le 71.3 65.3	ttenuation) q Evening 69.9 58.9	Leq	Night 63.5 57.4	Ldn 72. 65.	C/ 1 8	VEL 72.7
Levels (with Leq Peak Hou 73 66 67	out Topo and Ir Leq Day .2 .8 .2	2 Le 71.3 65.3 65.8	ttenuation) q Evening 69.9 58.9 56.7	Leq 5 9 7	Night 63.5 57.4 58.0	Ldn 72. 65. 66.	C/ 1 8 3	VEL 72.7 66.1
Levels (with Leq Peak Hou 73 66	out Topo and Ir Leq Day .2 .8 .2	Le 71.3 65.3	ttenuation) q Evening 69.9 58.9	Leq 5 9 7	Night 63.5 57.4	Ldn 72. 65.	C/ 1 8 3	VEL 72.7 66.1
Levels (with Leq Peak Hou 73 66 67 74	out Topo and Ir Leq Day .2 .8 .2	Le 71.3 65.3 65.8 73.1	ttenuation) q Evening 69. 58. 56. 70.	<i>Leq</i> 5 9 7	Night 63.5 57.4 58.0 65.3	Ldn 72. 65. 66. 73.	C/ 1 8 3 9	VEL 72.7 66.3 66.3 74.3
Levels (with Leq Peak Hou 73 66 67 74	out Topo and Ir Leq Day 2 8 .2 .9 ontour (in feet	2 Le 71.3 65.3 65.8 73.1	ttenuation) q Evening 69. 58. 56. 70. 70. 70 dBA	Leq 5 7 1 65	Night 63.5 57.4 58.0 65.3 dBA	Ldn 72. 65. 66. 73. 60 dBA	Cl 1 8 3 9 55	VEL 72.7 66.5 74.3 dBA
Levels (with Leq Peak Hou 73 66 67 74	out Topo and r Leq Day 2 8 9 5 5 5 5 5 5 5 5 5 5 5 5 5	Le 71.3 65.3 65.8 73.1	ttenuation) q Evening 69. 58. 56. 70.	Leq 5 7 1 65 1	Night 63.5 57.4 58.0 65.3	Ldn 72. 65. 66. 73.	CI 1 8 3 9 55 9	VEL 72.7 66.5 66.5 74.3
	Y 2019 W     Main St.     tr n/o Columb     Ymain St.     tr n/o Columb     Ymain St.     tr n/o Columb     Ymain St.     traffic (Adt): 4     Parerotage:     var Volume:     icle Speed:     te Distance:     icle Speed:     to Barrier:     o Observer:     to Observer:     to Observer:     d Elevation:     d Elevation:     d Elevation:     ted flevation:     RemEL     To220     81.00     81.00	:: OY 2019 Without Project           :: Main St.           :: In of Columbia Av.           SPECIFIC INPUT DATA           SPECIFIC INPUT DATA           Pradio (Ad):           Values           Parcentage:           10%           Obsenver:           0.0 feet           0 Observer:           0.0 feet           0 Observer:           0.0 feet           0 Observer:           0.0 feet           0.0 degree           RelMEL           Traffic Flow           70.20           81.00           -13.36	2: OY 2019 Without Project 2: Main St. 4: n/o Columbia Av. SPECIFIC INPUT DATA SPECIFIC INPUT DATA Fraffic (Ad): 42,500 vehicles Percentage: 10% Percentage: 4,250 vehicles incle Speed: 50 mph e Distance: 36 feet Frier Height: 0.0 feet all, 1-Berm): 0.0 t. to Barrier: 50.0 feet o Observer: 0.0 feet d Elevation: 0.0 feet d Elevat	DY 2019 Without Project           2: Main St.           2: Main St.           2: Main St.           2: Columbia Av.           SPECIFIC INPUT DATA           Site Contraction           Fredific (Adt): 42,500 vehicles           Percentage:           10%           Murror Volume:           4.250 vehicles           Hicle Speed:           50 mph           Vehicle           rier Height:           0.0 feet           All, 1-Berm):           0.0           t. to Barrier:           50.0 feet           o Observer:           0.0 feet           Head           d Elevation:           0.0 feet           Left Wew:           90.0 degrees           Head           I Calculations           REMEL         Traffic Flow           70.20         3.88           0.31	DY 2019 Without Project         Project           2: Main St.         Job N           SPECIFIC INPUT DATA         Site Conditions           SPECIFIC INPUT DATA         Site Conditions           Parcentage:         10%           Dur Volume:         4,250 vehicles           Percentage:         10%           Dur Volume:         4,250 vehicles           Percentage:         10%           Dur Volume:         36 feet           Vehicle Mix         Vehicle Mix           vehicle Speed:         50 mph           frier Height:         0.0 feet           0 Observer:         0.0 feet           0 Observer:         0.0 feet           0 Observer:         0.0 feet           d Elevation:         0.0 feet           d Elevation:         0.0 feet           Left Wiew:         90.0 degrees           Right View:         90.0 degrees           REMEL         Traffic Flow         Distance           70.20         3.88         0.31           70.20         3.88         0.31	Dr. OY 2019 Without Project         Project Name: Nor           2: Main St.         Job Number: 111           2: Main St.         Job Number: 111           3: Volumbia Av.         Site Conditions (Hard = 10, Site Conditions (Hard = 10, Medium Trucks (2 Axle Heavy Trucks (3 + Axle Vehicle Type           Percentage:         10%           Vehicle Speed:         50 mph           Vehicle Mix         Law           vehicle Speed:         50 mph           Vehicle Mix         Law           vehicle Type         Day           Autos:         77.           rier Height:         0.0 feet           0 Observer:         50.0 feet           0 Observer:         50.0 feet           0 Observer:         0.0 feet           d Elevation:         0.0 feet           d Elevation:         0.0 feet           Left Weiw:         90.0 degrees           Right View:         90.0 degrees           Right View:         90.0 degrees           Reduet         Traffic Flow           Distance         Finite Road           70.20         3.88         0.31           71.20         -4.6	St.         Job Number:         11145           2: Main St.         Job Number:         11145           SPECIFIC INPUT DATA         NOISE MODEL INPUT           SPECIFIC INPUT DATA         Site Conditions (Hard = 10, Soft = 15)           Traffic (Ad):         42,500 vehicles           Percentage:         10%           ur Volume:         4,250 vehicles           bicle Speed:         50 mph           vehicle Type         Day           percentage:         10           vehicle Type         Day           Vehicle Type         Day           el Distance:         36 feet           Vehicle Mix         15           Heavy Trucks:         84.5%           1. 1-Berm):         0.0           o Observer:         50.0 feet           o Observer:         50.0 feet           Above Pad):         5.0 feet           d Elevation:         0.0 degrees           Right View:         90.0 degrees           Heavy Trucks:         46.74 <td< td=""><td>Project Name:     Northgate       2: Main St.     Job Number:       2: Main St.     Job Number:       2: Main St.     Job Number:       3PECIFIC INPUT DATA     NOISE MODEL       Site Conditions (Hard = 10, Soft = 15)       Traffic (Adt):     42,500 vehicles       Percentage:     10%       Dur Volume:     4,250 vehicles       Incle Speed:     50 mph       Vehicle Mix     Day       Incle Speed:     50 mph       Vehicle Mix     Day       Vehicle Mix     Autos:       11.1-Berm):     0.0       1. to Barrier:     50.0 feet       0 Observer:     0.0 feet       0 Observer:     0.0 feet       4 Elevation:     0.0 feet       Autos:     40:91       Left Wiew:     90.0 degrees       Right View:     90.0 degrees       Remut     Traffic Flow       102tance     Finite Road       70.20     3.88       0.34     -1.20</td></td<>	Project Name:     Northgate       2: Main St.     Job Number:       2: Main St.     Job Number:       2: Main St.     Job Number:       3PECIFIC INPUT DATA     NOISE MODEL       Site Conditions (Hard = 10, Soft = 15)       Traffic (Adt):     42,500 vehicles       Percentage:     10%       Dur Volume:     4,250 vehicles       Incle Speed:     50 mph       Vehicle Mix     Day       Incle Speed:     50 mph       Vehicle Mix     Day       Vehicle Mix     Autos:       11.1-Berm):     0.0       1. to Barrier:     50.0 feet       0 Observer:     0.0 feet       0 Observer:     0.0 feet       4 Elevation:     0.0 feet       Autos:     40:91       Left Wiew:     90.0 degrees       Right View:     90.0 degrees       Remut     Traffic Flow       102tance     Finite Road       70.20     3.88       0.34     -1.20

Monday, June 18, 2018

	FH	WA-RD-77-108	HIGHW	AY NO	DISE PF	REDICTIO	N MC	DEL			
Scenar	io: OY 2019 V	Vithout Project				Project N	lame:	Northg	ate		
Road Nam	e: Main St.					Job Nur	mber:	11145			
Road Segme	nt: s/o Columi	oia Av.									
	SPECIFIC IN	NPUT DATA			ite 0					S	
Highway Data				3	ne Con	ditions (F			,		
• •	, ,	40,800 vehicles	s					Autos:	15		
	Percentage:	10%				dium Truc			15		
	lour Volume:	4,080 vehicles	s		He	avy Truck	S (3+	Axies):	15		
ve Near/Far La	hicle Speed:	50 mph		V	ehicle l	Nix					
Near/Far La	ne Distance:	36 feet			Vehi	cleType		Day	Evening	Night	Daily
Site Data							itos:	77.5%	12.9%	9.6%	
Bai	rrier Height:	0.0 feet				edium Tru		84.8%		10.3%	
Barrier Type (0-W	/all, 1-Berm):	0.0			ŀ	leavy Tru	cks:	86.5%	2.7%	10.8%	0.749
Centerline Dis	st. to Barrier:	50.0 feet		N	oise Sc	ource Elev	vatior	s (in fe	et)		-
Centerline Dist.	to Observer:	50.0 feet				Autos:		000			
Barrier Distance		0.0 feet			Mediur	n Trucks:	-	297			
Observer Height (		5.0 feet				y Trucks:			Grade Ad	justment	: 0.0
	ad Elevation:	0.0 feet				·					
	ad Elevation:	0.0 feet		L	ane Eq	uivalent L			'eet)		
1	Road Grade:	0.0%				Autos:		.915			
	Left View:	-90.0 degree				n Trucks:		726			
	Right View:	90.0 degree	es		Heav	y Trucks:	46	744			
FHWA Noise Mode	el Calculation	IS									
VehicleType	REMEL	Traffic Flow	Distar		Finite		Fres	-	Barrier Att		rm Atten
Autos:	70.20			0.31		-1.20		-4.65		000	0.00
Medium Trucks:	81.00			0.34		-1.20		-4.87		000	0.00
Heavy Trucks:	85.38			0.34		-1.20		-5.43	0.0	000	0.00
Unmitigated Noise			-		<u> </u>					-	
VehicleType Autos:	Leq Peak Ho		71.1	eq Eve		Leq N			Ldn 71.9		NEL 72.
Autos: Medium Trucks:			71.1 65.1		69.3 58.7		63. 57.		71.9 65.6		72. 65.
Heavy Trucks:			65.1 65.6		58.7		57. 57.		66.3		65. 66.
Vehicle Noise:		-	05.0 73.0		56.6 69.9		57. 65.	-	73.7	-	74
Centerline Distand					03.5		55.		75.	,	74.
Centernile Distant	Le lo NOISE C	uniour (in feet,	,	70 di	BA	65 dE	BA	6	0 dBA	55	dBA
			Ldn:	88		190			408		380
			VFI :	95		204			439		945
		01		00		204					

	FH\	NA-RD-77-108	HIGHW	AY NO	DISE PF	REDICTIC	ON MO	DEL			
Scenar	<i>io:</i> OY 2019 W	/ithout Project				Project N	lame:	Northg	ate		
Road Nan	ne: Main St.					Job Nu	mber:	11145			
Road Segme	nt: n/o Strong	St.									
SITE	SPECIFIC IN	IPUT DATA							L INPUT	s	
Highway Data				S	ite Con	ditions (F	Hard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	40,800 vehicles	6					Autos:	15		
Peak Hour	Percentage:	10%			Mee	dium Truc	:ks (2 /	Axles):	15		
Peak H	lour Volume:	4,080 vehicles	8		Hea	avy Truck	:s (3+ A	Axles):	15		
Ve	ehicle Speed:	45 mph		V	ehicle I	Nix					
Near/Far La	ne Distance:	36 feet		Ē		cleType		Day	Evening	Night	Daily
Site Data								77.5%	•	•	97.42
Ba	rrier Height:	0.0 feet			Me	edium Tru	cks:	84.8%	4.9%	10.3%	1.849
Barrier Type (0-V	•	0.0			F	leavy Tru	cks:	86.5%	2.7%	10.8%	0.749
	ist. to Barrier:	50.0 feet		_							
Centerline Dist.	to Observer:	50.0 feet		N	oise Sc	urce Ele			eet)		
Barrier Distance	to Observer:	0.0 feet				Autos:		000			
Observer Height	(Above Pad):	5.0 feet				n Trucks:		297	Grade Ad	iuotmont	
Р	ad Elevation:	0.0 feet			Heav	y Trucks:	8.	006	Grade Adj	usuneni	0.0
Ro	ad Elevation:	0.0 feet		L	ane Equ	uivalent I	Distan	ce (in i	feet)		
	Road Grade:	0.0%				Autos:	46.	915			
	Left View:	-90.0 degree	es		Mediur	n Trucks:	46.	726			
	Right View:	90.0 degree	es		Heav	y Trucks:	46.	744			
FHWA Noise Mod	el Calculation	s									
VehicleType	REMEL	Traffic Flow	Dista	nce	Finite	Road	Fresr	nel	Barrier Att	en Ber	m Atten
Autos:	68.46	4.16		0.31		-1.20		-4.65	0.0	000	0.00
Medium Trucks:	79.45	-13.08		0.34		-1.20		-4.87	0.0	000	0.00
Heavy Trucks:	84.25	-17.04		0.34		-1.20		-5.43	0.0	000	0.00
Unmitigated Nois			barrier	attenu	ation)						
VehicleType	Leq Peak Hou			eq Eve	ening	Leq N			Ldn		VEL
Autos:			69.8		68.1		62.0		70.6		71.
Medium Trucks:			64.0		57.6		56.1		64.6		64.
Heavy Trucks:		-	64.9		55.9		57.1		65.5		65.
Vehicle Noise:			71.8		68.7		64.0	)	72.5	5	73.
Centerline Distan	ce to Noise C	ontour (in feet,	)								
			ட	70 dl		65 dl		6	0 dBA		dBA
			Ldn:	74		159			343		39
		C/	VEL:	79		171			368	7	92

Monday, June 18, 2018

				<i>/</i> (1 ) (1 )	010211	EDICTIC					
	o: OY 2019 W	ithout Project				Project N			ate		
	e: Main St. nt: s/o Strong :	P+				Job Nu	mper:	11145			
Ŷ	Ŷ										
SITE : Highway Data	SPECIFIC IN	PUT DATA		s	ite Con	NC ditions (l			L INPUT oft = 15)	5	
Average Daily	Traffic (Adt):	10.400 vehicle	\$					Autos:	,		
,	Percentage:	10%	-		Mee	dium Truc					
	our Volume:	4,040 vehicle	s		Hea	avy Truck	s (3+	, Axles):	15		
Ve	hicle Speed:	25 mph		-				· ·			
Near/Far La		36 feet		V	ehicle I	lix cleType		Day	Evening	Night	Daily
Site Data					vern		itos:	77.5%	•	9.6%	
						AL dium Tru		84.8%		9.6%	
	rier Height:	0.0 feet				leavy Tru		84.8%		10.3%	
Barrier Type (0-W	. ,	0.0			-	eavy III	CKS.	00.3%	2.170	10.0%	0.745
Centerline Dis		50.0 feet		۸	loise So	urce Ele	vatior	ıs (in fe	eet)		
Centerline Dist.		50.0 feet				Autos:	0.	000			
Barrier Distance		0.0 feet			Mediur	n Trucks:	2	297			
Observer Height (	,	5.0 feet			Heav	Trucks:	8	006	Grade Ad	justmen	t: 0.0
	ad Elevation:	0.0 feet			ono Eau	livalent	Distar	aa (in	fa a 4)		
	ad Elevation:	0.0 feet		2	ane Equ				ieel)		
	Road Grade:	0.0%				Autos:		.915			
	Left View:	-90.0 degree				n Trucks: v Trucks:		.726 .744			
	Right View:	90.0 degree	es		Heav	V Trucks:	40	.744			
FHWA Noise Mod		-				1					
VehicleType	REMEL	Traffic Flow	Dista		Finite		Fres		Barrier Att		rm Atten
Autos:	58.73	6.67		0.31		-1.20		-4.65		000	0.00
Medium Trucks:	70.80	-10.57		0.34		-1.20		-4.87		000	0.00
Heavy Trucks:	77.97	-14.53		0.34		-1.20		-5.43	0.0	000	0.00
Unmitigated Noise					,	1	in the d	1	Lata		
VehicleType Autos:	Leq Peak Hou 64		62.6	.eq Ev	ening 60.8	Leq N	ignt 54		Ldn 63.4		NEL 64.
Medium Trucks:	64 59		02.0 57.9		51.5		54. 49	-	58.4		64. 58
	59		57.9 61.2		52.1		49. 53.	-	58.4 61.1		58. 61.
Heavy Trucks: Vehicle Noise:			• • • =								
	67		65.7		61.8		57.	9	66.4	ŧ	66.
Centerline Distant	ce to Noise Co	ontour (in feet	)	70 d		65 d	DA	4	SO dBA		ō dBA
			1	70 a	0/1	00 0	2/4	1 0	JU UDM	20	UDA
			I day			20			194		200
			Ldn: VFL:	29 31		62 66			134 142		288 306

	FHW	/A-RD-77-108 H	IGHWAY	NOISE PR	REDICT	ION MOI	DEL			
Road Nam	o: OY 2019 W e: Main St. nt: n/o Russell	-				Name: I umber:				
SITE S	SPECIFIC IN	PUT DATA			N	IOISE N	IODE	L INPUTS	5	
Highway Data				Site Con	ditions	(Hard =	10, So	oft = 15)		
Average Daily	Traffic (Adt): 2	1,600 vehicles					Autos:	15		
Peak Hour	Percentage:	10%		Me	dium Tr	ucks (2 A	xles):	15		
Peak H	our Volume:	2,160 vehicles		He	avy Tru	cks (3+ A	(xles):	15		
Vel	nicle Speed:	35 mph		Vehicle	Mix					
Near/Far Lar	ne Distance:	36 feet			icleType		Day	Evening	Night	Daily
Site Data				VCII			77.5%	•	9.6%	
Par	rier Height:	0.0 feet		Me	edium T.	rucks:	84.8%		10.3%	1.84%
Barrier Type (0-Wa		0.0		ŀ	Heavy T	rucks:	86.5%	2.7%	10.8%	0.74%
Centerline Dis	. ,	50.0 feet								
Centerline Dist. t		50.0 feet		Noise So				eet)		
Barrier Distance	o Observer:	0.0 feet			Auto m Truck		000			
Observer Height ()	Above Pad):	5.0 feet					297	Over de Adi		0.0
0 1	d Elevation:	0.0 feet		Heav	ry Truck	s: 8.0	006	Grade Adj	ustment:	0.0
Roa	d Elevation:	0.0 feet		Lane Eq	uivalen	t Distand	ce (in	feet)		
F	Road Grade:	0.0%			Auto	s: 46.9	915			
	Left View:	-90.0 degrees		Mediu	m Truck	s: 46.7	726			
	Right View:	90.0 degrees		Heav	y Truck	s: 46.7	744			
FHWA Noise Mode	l Calculations	;								
VehicleType	REMEL	Traffic Flow	Distance	Finite	Road	Fresn	el	Barrier Atte	en Ber	m Atten
Autos:	64.30	2.48	0.	31	-1.20		-4.65	0.0	00	0.000
Medium Trucks:	75.75	-14.75		34	-1.20		-4.87	0.0		0.000
Heavy Trucks:	81.57	-18.71	0.	34	-1.20		-5.43	0.0	00	0.000
Unmitigated Noise			-				r			
,,	Leq Peak Hou			Evening	Leq	Night		Ldn		IEL
Autos:			.0	62.2		56.2		64.8		65.4
	65.		-							
Medium Trucks:	60.	1 58		52.3		50.7		59.2		
Heavy Trucks:	60. 62.	1 58 0 60	).6	52.3 51.5		52.8		61.1		61.3
	60.	1 58 0 60	).6	52.3						61.3
Heavy Trucks: Vehicle Noise:	60. 62. 68.	1 58 0 60 1 66	0.6 6.4	52.3 51.5 63.0		52.8 58.6		61.1 67.1		61.3 67.5
Heavy Trucks: Vehicle Noise:	60. 62. 68.	1 58 0 60 1 66 ntour (in feet)	0.6 6.4 70	52.3 51.5 63.0 0 dBA	65	52.8 58.6 dBA		61.1 67.1 60 dBA	55	59.4 61.3 67.5 dBA
Heavy Trucks:	60. 62. 68.	1 58 0 60 1 66 ntour (in feet)	0.6 6.4 70 dn:	52.3 51.5 63.0	65 6	52.8 58.6		61.1 67.1	55	61.3 67.5

### Monday, June 18, 2018

	FH\	WA-RD-77-108	HIGHW	/AY N	OISE PF	REDICTIO	N MO	DEL			
Scenar	io: OY 2019 V	/ithout Project				Project N	ame:	Northg	ate		
Road Nam	e: Main St.					Job Nur	nber:	11145			
Road Segme	nt: s/o Russell	St.									
	SPECIFIC IN	IPUT DATA							L INPUT	s	
Highway Data					Site Con	ditions (H					
Average Daily	Traffic (Adt):	21,000 vehicle	s					Autos:	15		
	Percentage:	10%				dium Truc		/			
	lour Volume:	2,100 vehicle	s		He	avy Truck	s (3+ )	Axles):	15		
	hicle Speed:	35 mph			Vehicle I	Mix					
Near/Far La	ne Distance:	36 feet			Vehi	cleType		Day	Evening	Night	Daily
Site Data						Au	tos:	77.5%	12.9%	9.6%	97.429
Rai	rrier Height:	0.0 feet			Me	edium True	cks:	84.8%	4.9%	10.3%	1.84%
Barrier Type (0-W	/all, 1-Berm):	0.0			ŀ	leavy Tru	cks:	86.5%	2.7%	10.8%	0.749
Centerline Dis		50.0 feet		1	Voise Sc	ource Elev	vation	s (in fe	eet)		
Centerline Dist.		50.0 feet				Autos:	0.	000	,		
Barrier Distance		0.0 feet			Mediur	n Trucks:	2.	297			
Observer Height (	,	5.0 feet			Heav	v Trucks:	8.	006	Grade Ad	iustment	: 0.0
	ad Elevation:	0.0 feet			_						
	ad Elevation:	0.0 feet		4	ane Equ	uivalent D			reet)		
	Road Grade:	0.0%				Autos:		915			
	Left View:	-90.0 degre				n Trucks:		726			
	Right View:	90.0 degre	es		Heav	y Trucks:	46.	744			
FHWA Noise Mode		-									
VehicleType	REMEL	Traffic Flow	Dista		Finite		Fresi		Barrier Att		m Atten
Autos:	64.30	2.36		0.31		-1.20		-4.65	0.0		0.00
Medium Trucks:	75.75	-14.88		0.34		-1.20		-4.87		000	0.00
Heavy Trucks:	81.57			0.34	-	-1.20		-5.43	0.0	000	0.00
Unmitigated Noise					<u> </u>						
VehicleType	Leq Peak Hou			.eq E	/ening	Leq Ni			Ldn		NEL
Autos:	65		63.9		62.1		56.1		64.7		65.
Medium Trucks:	60		58.5		52.1		50.6	-	59.1		59.
Heavy Trucks:	61		60.4		51.4		52.7		61.0		61.
Vehicle Noise:	68		66.3		62.9		58.5	Ō	67.0	)	67.
Centerline Distant	ce to Noise C	ontour (in fee	)	70 -	ID A	6E -1	24				dD A
			Ldn	70 c		65 dE	м	1 6	0 dBA 146		dBA
		0	Ldn: NFL:	3	-	68 73			146 156		15 37
		L.	VEL:	34	+	/3			100	3	100

	FHV	VA-RD-77-108	HIGH	WAY NO	DISE PF	REDICTI		EL			
Scenari	p: OY 2019 W	ithout Project				Project	Name: N	orthga	te		
Road Nam	e: Orange St.					Job N	umber: 11	145			
Road Segmen	t: n/o Columb	ia Av.									
	SPECIFIC IN	IPUT DATA					OISE M			S	
Highway Data				S	ite Con	ditions	(Hard = 1	0, Sof	t = 15)		
Average Daily	Traffic (Adt):	4,600 vehicles	;				Au	itos:	15		
Peak Hour	Percentage:	10%			Me	dium Tru	icks (2 Ax	les):	15		
Peak H	our Volume:	460 vehicles	;		Hea	avy Truc	ks (3+ Ax	les):	15		
Vel	nicle Speed:	35 mph		V	ehicle I	Mix					
Near/Far Lar	ne Distance:	12 feet				icleType		ay	Evening	Night	Daily
Site Data					Veni			ay 7.5%	12.9%	9.6%	
		0.0.6			Me	, dium Tr		4.8%	4.9%	10.3%	1.84
	rier Height:	0.0 feet				leavy Tr		6.5%	2.7%	10.8%	
Barrier Type (0-Wa Centerline Dis		0.0 33.0 feet									
Centerline Dist.		33.0 feet		N	oise So	ource El	evations	(in fee	et)		
Barrier Distance		0.0 feet				Autos	a: 0.00	0			
Observer Height (		5.0 feet			Mediur	n Trucks	3: 2.29	7			
0 1	d Elevation:	0.0 feet			Heav	y Trucks	8.00	6 (	Grade Adj	iustment.	0.0
	d Elevation:	0.0 feet		1.	ane Fai	uivalent	Distance	íin fe	et)		
	Road Grade:	0.0%		-		Autos					
r	Left View:	-90.0 degree			Modiur	n Trucks					
	Right View:	90.0 degree				y Trucks					
	rugin view.	30.0 degree	.5		mour	<i>y maon</i>	. 02.00				
FHWA Noise Mode		-									
VehicleType	REMEL	Traffic Flow	Dist	ance	Finite		Fresne		Barrier Atte		m Atter
Autos:	64.30	-4.23		2.64		-1.20		1.52	0.0		0.00
Medium Trucks:	75.75	-21.47		2.69		-1.20		1.86	0.0		0.00
Heavy Trucks:	81.57	-25.43		2.69		-1.20	-8	5.69	0.0	000	0.00
Unmitigated Noise					<b>/</b>					1	
	Leq Peak Hou			Leq Eve		Leq			Ldn		VEL
Autos:	61		59.6		57.8		51.8		60.4		61
Medium Trucks:	55		54.3		47.9		46.4		54.8		55
Heavy Trucks:	57		56.2		47.2		48.4		56.8		56
Vehicle Noise:	63		62.0		58.6		54.2		62.7	'	63
Centerline Distanc	e to Noise Co	ontour (in feet)		70 -4	24	05	10.4				-10.4
			L	70 dE			1BA		) dBA		dBA
			dn:	11		2	3		50	1	08
			IEL:	12		2	-		54		16

Monday, June 18, 2018

Barrier Height:         0.0 feet           Barrier Type (0-Wall, 1-Berm):         0.0           Centerline Dist. to Barrier:         33.0 feet           Barrier Dista to Observer:         33.0 feet           Barrier Dista co Observer:         30.0 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           FWA Noise Model Calculations         Vehicle Type           Autos:         64.30         -1.94           Autos:         75.75         -19.18           2.69         -1.20         -4.52         0.000           Junitigated Noise Levels (without Topo and barrier attenuation)         Torque Viculation:         0.00           Junitigated Noise:         63.8         61.9         60.1         54.1         62.7           Autos:         63.8         61.9         60.1         54.1         62.7         63.           Medium Trucks:         58.1	Scenario: ON Road Name: Or Road Segment: s/c	ange St.	,				Project I Job Nu			jate		
Average Daily Traffic (Adt):         7,800 vehicles         Autos:         15           Peak Hour Percentage:         10%         Medium Trucks (2 Axles):         15           Peak Hour Volume:         780 vehicles         Heavy Trucks (3+ Axles):         15           Vehicle Speed:         35 mph         Vehicle Type         Day         Evening         Night         Daily           Site Data         Autos:         7.5%         12.9%         9.6%         97.429           Barrier Theight:         0.0 feet         Autos:         84.8%         4.9%         10.3%         9.6%         97.429           Barrier Type (0-Wall, 1-Berm):         0.0         10.8%         9.6%         97.429         Medium Trucks:         84.8%         4.9%         10.3%		CIFIC IN	PUT DATA			04-0					S	
Peak Hour Percentage:         10%         Medium Trucks (2 Axles):         15           Peak Hour Volume:         780 vehicles         Heavy Trucks (3+ Axles):         15           Vehicle Speed:         35 mph         Vehicle Mix         Vehicle Mix           Site Data         Autos:         77.5%         12.9%         9.6%         97.423           Barrier Height:         0.0 feet         Autos:         77.5%         12.9%         9.6%         97.423           Barrier Type (0-Wall, 1-Berm):         0.0         Centerline Dist. to Dasriver:         33.0 feet         Medium Trucks:         84.8%         4.9%         10.3%         18.49           Deserver Height (Above Pad):         5.0 feet         Heavy Trucks:         80.06         Grade Adjustment:         0.0           Pad Elevation:         0.0 feet         Heavy Trucks:         80.06         Grade Adjustment:         0.0           Road Grade:         0.0%         Autos:         32.563         Heavy Trucks:         80.00         Grade Adjustment:         0.0           Pad Elevation:         0.0 feet         Heavy Trucks:         82.56         0.000         0.00           Road Grade:         0.0%         Distance         Finite Road         Fresnei         Barrier Atten         Bern Att	* /				-	Site Con	aitions (i	Hard =				
Peak Hour Volume:         780 vehicles Ste Date         Heavy Trucks (3+ Axles):         15           Vehicle Speed:         35 mph         Vehicle Mix         Vehicle Mix         Vehicle Mix           Site Date         Day         Evening         Night         Daily           Site Date         Autos:         77.5%         12.9%         9.6%         97.42'           Barrier Height:         0.0 feet         Autos:         77.5%         12.9%         9.6%         97.42'           Barrier Type (O-Wall, 1-Berm):         0.0         feet         Heavy Trucks:         84.8%         4.9%         10.3%         1.84'           Centerline Dist. to Diserver:         33.0 feet         Moise Source Elevations (in feet)         Noise Source Elevations (in feet)         0.0           Road Elevation:         0.0 feet         Heavy Trucks:         8.06         Grade Adjustment:         0.0           Road Grade:         0.0%         Autos:         32.589         Medium Trucks:         32.589           FHWA Noise Model Calculations         Vehicle Type         ReBarrier Atten         Bernier Atten         Bernier Atten           Vehicle Type         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Bernier Atten	• •			s								
Vehicle Speed:         35 mph Near/Far Lane Distance:         Vehicle Mix           Site Data         Autos:         77.5%         12.9%         9.6%         97.42           Barrier Type (0-Wall, 1-Berm):         0.0         feet         Medium Trucks:         84.8%         4.9%         10.3%         1.84           Barrier Type (0-Wall, 1-Berm):         0.0         feet         Medium Trucks:         84.8%         4.9%         10.3%         1.84           Barrier Type (0-Wall, 1-Berm):         0.0         feet         Medium Trucks:         84.8%         4.9%         10.8%         0.749           Centerline Dist. to Diserver:         0.0 feet         Autos:         0.000         Medium Trucks:         2.297           Observer Height (Above Pad):         5.0 feet         Autos:         0.000         Medium Trucks:         8.006         Grade Adjustment:         0.0           Road Elevation:         0.0 feet         Autos:         32.833         Medium Trucks:         32.562           FHWA Noise Model Calculations         Vehicle Type         Ref Medium Trucks:         32.569         1.20         -4.52         0.000         0.00           Medium Trucks:         61.3         -1.94         2.64         -1.20         -4.62         0.000 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>												
Near/Far Lane Distance:         12 fet         Vehicle Type         Day         Evening         Night         Daily           Site Data         Autos:         77.5%         12.9%         9.6%         97.42%           Barrier Height:         0.0 feet         Medium Trucks:         84.8%         4.9%         10.3%         1.84%           Barrier Type (Io-Walt, 1-Bernie:         33.0 feet         Medium Trucks:         84.5%         2.7%         10.8%         0.74           Centerline Dist. to Barrie:         33.0 feet         Meavy Trucks:         86.5%         2.7%         10.8%         0.74           Deserver Height (Above Pad):         5.0 feet         Autos:         0.000         Medium Trucks:         2.297           Observer Height (Above Pad):         5.0 feet         Heavy Trucks:         80.06         Grade Adjustment:         0.0           Pad Elevation:         0.0 feet         Medium Trucks:         32.833         Medium Trucks:         32.562           Heavy Trucks:         81.57         -23.13         2.69         -12.0         -4.52         0.000         0.000           Medium Trucks:         75.75         -19.18         2.69         -12.0         -4.68         0.000         0.000           Medium Trucks: <td></td> <td></td> <td></td> <td>s</td> <td></td> <td>Hea</td> <td>avy Truci</td> <td>(S (3+</td> <td>Axies):</td> <td>15</td> <td></td> <td></td>				s		Hea	avy Truci	(S (3+	Axies):	15		
Site Data         Vehicle type         Day         Leventse         Day         Day         <					1	Vehicle I	Nix					
Barrier Height:         0.0 feet         Medium Trucks:         8.4.%         4.9%         10.3%         1.849           Barrier Type (0-Wall, 1-Berm):         0.0         10.0         Heavy Trucks:         86.5%         2.7%         10.8%         0.749           Centerline Dist. to Dbserver:         33.0 feet         Auros:         0.000         Noise Source Elevations (in feet)         Noise Source Elevations (in feet)         Noise Source Adjustment:         0.0           Barrier Distance to Observer:         0.0 feet         Auros:         0.000         Medium Trucks:         2.297         Heavy Trucks:         8.006         Grade Adjustment:         0.0           Road Elevation:         0.0 feet         Lane Equivalent Distance (in feet)         Auros:         32.589           FHWA Noise Model Calculations         Vehicle Type         Refilt Flow         Distance         Finite Road         Fresnel         Barrier Atten         Berm Atten           Autos:         64.30         -1.94         2.64         -1.20         -4.56         0.000         0.000           Medium Trucks:         75.75         -19.18         2.69         -1.20         -4.66         0.000         0.000           Medium Trucks:         81.57         -23.13         2.69         -1.20	Near/Far Lane Dis	stance:	12 feet			Vehi	cleType		Day	Evening	Night	Daily
Barrier Type (OV-Well, 1-Berm):         0.0         Heavy Trucks:         86.5%         2.7%         10.8%         0.749           Centerline Dist. to Diserver:         3.0         feet         Noise Source Elevations (in feet)         Noise Model Calculations         Noise Model Calculations         Noise Source Elevation (in feet)         Noise Source Elevation (in feet)         Noise Model Calculations         Noise Model Calculations         Noise Source Elevation (in feet)         Noise Source Elevate (in feet)         Noise Source Elevation (in feet) </td <td>Site Data</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>A</td> <td>utos:</td> <td>77.5%</td> <td>12.9%</td> <td>9.6%</td> <td>97.429</td>	Site Data						A	utos:	77.5%	12.9%	9.6%	97.429
Barrier Type (0-Wall, 1-Berm):         0.0         Heavy Trucks:         86.5%         2.7%         10.8%         0.74%           Centerline Dist. to Dserver:         3.0 feet         Noise Source Elevations (in feet)         Noise S	Barrier H	leiaht <sup>.</sup>	0.0 feet			Me	dium Tru	icks:	84.8%	4.9%	10.3%	1.84%
Centerline Dist. to Observer:         33.0 feet         Noise Source Levators (in teet)           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:         8.006         Grade Adjustment:         0.0           Road Elevation:         0.0 feet         Lane Equivalent Distance (in feet)         Autos:         32.589           FHWA Noise Model Calculations         -90.0 degrees         Finite Road         Fresnel         Barrier Atten         Bernier Atten           VehicleType         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Bernier Atten           Autos:         64.30         -1.94         2.64         -1.20         -4.52         0.000         0.000           Medium Trucks:         75.75         -19.18         2.69         -1.20         -4.66         0.000         0.000           Medium Trucks:         81.57         -23.13         2.69         -1.20         -4.66         0.000         0.000           Uheidel Type         Leg Peak Hour         Leg Qay         Leg Evening         Leg Night         Ldn <td></td> <td></td> <td></td> <td></td> <td></td> <td>H</td> <td>leavy Tru</td> <td>icks:</td> <td>86.5%</td> <td>2.7%</td> <td>10.8%</td> <td>0.74%</td>						H	leavy Tru	icks:	86.5%	2.7%	10.8%	0.74%
Centerline Dist. to Observer:         3.0 feet         Autos:         0.000           Barrier Distance to Observer:         0.0 feet         Medium Trucks:         2.297           Observer: Height (Above Pad):         5.0 feet         Heavy Trucks:         8.006         Grade Adjustment:         0.0           Pad Elevation:         0.0 feet         Lane Equivalent Distance (in feet)         Lane Equivalent Distance (in feet)           Road Grade:         0.0%         Autos:         32.833         Medium Trucks:         32.582           FHWA Noise Model Calculations         90.0 degrees         Heavy Trucks:         32.589         Medium Trucks:         32.69           Vehicle Type         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Berm Atten           Autos:         64.30         -1.94         2.69         -1.20         -4.82         0.000         0.000           Medium Trucks:         81.5         -2.81.3         2.69         -1.20         -4.62         0.000         0.000           Unmitigated Noise Levels (without Topo and barrier attenuation)         Vehicle Type         Leq Peak Hour         Leq Day         Leq Right         Ldn         CNEL           Medium Trucks:         58.1         56.6 <td>Centerline Dist. to E</td> <td>Barrier:</td> <td>33.0 feet</td> <td></td> <td></td> <td>Voise So</td> <td>urce Ele</td> <td>vatio</td> <td>ıs (in f</td> <td>eet)</td> <td></td> <td></td>	Centerline Dist. to E	Barrier:	33.0 feet			Voise So	urce Ele	vatio	ıs (in f	eet)		
Barrier Distance to Observer:         0.0 feet         Medium Trucks:         2.297           Observer Height (Above Pad):         5.0 feet         Heavy Trucks:         8.006         Grade Adjustment:         0.0           Pad Elevation:         0.0 feet         Lane Equivalent Distance (in feet)         Lane Equivalent Distance (in feet)           Road Grade         0.0%         Autos:         32.589           FHWA Noise Model Calculations         0.0 degrees         Heavy Trucks:         32.589           FHWA Noise Model Calculations         Distance         Finite Road         Fresnel         Barrier Atten         Bern Atten           Vehicle Type         REMEL         Traffic Flow         Distance         Finite Road         -4.52         0.000         0.000           Medium Trucks:         75.75         -19.18         2.69         -1.20         -4.56         0.000         0.000           Medium Trucks:         75.75         -19.18         2.69         -1.20         -4.66         0.000         0.000           Medium Trucks:         81.57         -23.13         2.69         -1.20         -5.69         0.000         0.000           Umitigated Noise:         63.8         61.9         60.1         54.1         62.7         63. </td <td>Centerline Dist. to Ob</td> <td>server:</td> <td>33.0 feet</td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Centerline Dist. to Ob	server:	33.0 feet		-							
Observer Height (Above Pad):         5.0 feet         Heavy Trucks:         8.006         Grade Adjustment:         0.0           Pad Elevation:         0.0 feet         Let view:         90.0 feet         Lane Equivalent Distance (in feet)         Lane Equivalent Distance (in feet)         Lane Equivalent Distance (in feet)           Road Elevation:         0.0 feet         Autos:         32.833         Medium Trucks:         32.562           Right View:         90.0 degrees         Heavy Trucks:         32.562         Heavy Trucks:         32.562           FHWA Noise Model Calculations         Distance         Finite Road         Fresnel         Barrier Atten         Berm Atten           Autos:         64.30         -1.94         2.64         -1.20         -4.62         0.000         0.00           Medium Trucks:         81.57         -23.13         2.69         -1.20         -5.69         0.000         0.00           Unitigated Noise Levels (without Topo and barrier attenuation)         Vehicle Type         Leq Reak Hour         Leq Vering         Leq Night         Ldn         CNEL           Autos:         63.8         61.9         60.1         54.1         62.7         63.           Medium Trucks:         58.1         56.6         50.2         48.6	Barrier Distance to Ob	server:	0.0 feet			Mediur		-				
Pad Elevation:         0.0 feet           Road Clevation:         0.0 feet           Road Grade:         0.0%           Autos:         32.833           Left View:         90.0 degrees           Right View:         90.0 degrees           FHWA Noise Model Calculations         Distance         Finite Road         Fresnel         Barrier Atten         Berm Atten           VehicleType         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Berm Atten           Autos:         64.30         -1.94         2.64         -1.20         -4.82         0.000         0.00           Medium Trucks:         17.57         -19.18         2.69         -1.20         -4.86         0.000         0.00           Medium Trucks:         81.7         -23.13         2.69         -1.20         -4.86         0.000         0.00           Unitigated Noise Levels (without Topo and barrier attenuation)         Leq Evening         Leq Night         Ldn         CNEL           Medium Trucks:         63.8         61.9         60.1         54.1         62.7         63.           Medium Trucks:         59.9         58.5         49.5         50.7         59.1 <td>Observer Height (Above</td> <td>e Pad):</td> <td>5.0 feet</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Grade Ad</td> <td>liustmen</td> <td>t: 0.0</td>	Observer Height (Above	e Pad):	5.0 feet							Grade Ad	liustmen	t: 0.0
Road Grade:         0.0%         Autos:         32.833           Left View:         90.0 degrees         Medium Trucks:         32.562           FHWA Noise Model Calculations         Yehicle Type         RefML         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Berm Atten           Autos:         64.30         -1.94         2.64         -1.20         -4.52         0.000         0.000           Medium Trucks:         81.57         -23.13         2.69         -1.20         -4.86         0.000         0.000           Medium Trucks:         81.57         -23.13         2.69         -1.20         -4.66         0.000         0.000           Unnitigated Noise Levels (without Topo and barrier attenuation)         Vehicle Type         Leq Peak Hour         Leq Day         Leq Night         Ldn         CNEL           Medium Trucks:         63.8         61.9         60.1         54.1         62.7         63:           Medium Trucks:         59.9         58.5         49.5         50.7         59.1         59:           Vehicle Noise:         66.0         64.3         60.9         56.5         65.0         65:           Centerline Distance to Noise Contour (in feet)	Pad Ele	evation:	0.0 feet					-			,	
Left View:         -90.0 degrees         Medium Trucks:         32.562           Right View:         90.0 degrees         Heavy Trucks:         32.569           FHWA Noise Model Calculations         Medium Trucks:         32.589           Vehicle Type         REMEL         Traffic Flow         Distance         Finite Road         Fresnet         Barrier Atten         Berm Atten           Autos:         64.30         -1.94         2.64         -1.20         -4.52         0.000         0.000           Medium Trucks:         75.75         -19.18         2.69         -1.20         -4.66         0.000         0.000           Medium Trucks:         81.57         -23.13         2.69         -1.20         -5.69         0.000         0.000           Unnitigated Noise Levels (without Topo and barrier attenuation)         Vehicle Type         Leq Peak Hour         Leq Qay         Leq Evening         Leq Night         Ldn         CNEL           Autos:         63.8         61.9         60.1         54.1         62.7         63:           Medium Trucks:         59.9         58.5         49.5         50.7         59.1         59:           Vehicle Noise:         66.0         64.3         00.9         56.5         65.0<	Road Ele	evation:	0.0 feet		1	ane Equ	livalent	Distar	nce (in	feet)		
Right View:         90.0 degrees         Heavy Trucks:         32.589           FHWA Noise Model Calculations         VehicleType         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Berm Atten           Autos:         64.30         -1.94         2.64         -1.20         -4.52         0.000         0.000           Medium Trucks:         75.75         -19.18         2.69         -1.20         -4.66         0.000         0.000           Medium Trucks:         81.57         -23.13         2.69         -1.20         -5.69         0.000         0.000           Unnitigated Noise Levels (without Topo and barrier attenuation)         VehicleType         Leq Peak Hour         Leq Day         Leq Evening         Leq Night         Ldn         CNEL           Autos:         63.8         61.9         60.1         54.1         62.7         63.3           Medium Trucks:         58.1         56.6         50.2         48.6         57.1         57.3           Heavy Trucks:         59.9         58.5         49.5         50.7         59.1         59.9           Vehicle Noise:         66.0         64.3         60.9         56.5         65.5         65.5	Road	Grade:	0.0%				Autos:	32	.833			
FHWA Noise Model Calculations         Distance         Finite Road         Fresnel         Barrier Atten         Berrn Atten           Autos:         64.30         -1.94         2.64         -1.20         -4.52         0.000         0.000           Medium Trucks:         75.75         -19.18         2.69         -1.20         -4.86         0.000         0.000           Heavy Trucks:         81.57         -23.13         2.69         -1.20         -5.69         0.000         0.000           Unnitigated Noise Levels (without Topo and barrier attenuation)         VehicleType         Leq Peak Hour         Leq Day         Leq Night         Ldn         CNEL           Autos:         63.8         61.9         60.1         54.1         62.7         63.           Medium Trucks:         58.1         56.6         50.2         48.6         57.1         57.           Heavy Trucks:         59.9         58.5         49.5         50.7         59.1         59.9           Vehicle Noise:         66.0         64.3         60.9         56.5         65.0         65.0           Centerline Distance to Noise Contour (in feet)         70 dBA         65 dBA         60 dBA         55 dBA	Lef	ft View:	-90.0 degre	es		Mediur	n Trucks.	32	.562			
VehicleType         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Berm Atten           Autos:         64.30         -1.94         2.64         -1.20         -4.52         0.000         0.000           Medium Trucks:         75         7-9.18         2.69         -1.20         -4.62         0.000         0.000           Umitigated Noise Levels (without Topo and barrier attenuation)         2.69         -1.20         -5.69         0.000         0.000           Umitigated Noise Levels (without Topo and barrier attenuation)         VehicleType         Leq Peak Hour         Leg Zevening         Leq Night         Ldn         CNEL           Autos:         63.8         61.9         60.1         54.1         62.7         63.3           Medium Trucks:         58.1         56.6         50.2         48.6         57.1         57.           Heavy Trucks:         59.9         58.5         49.5         50.7         59.1         59.9           Vehicle Noise:         66.0         64.3         60.9         56.5         65.0         65.5           Centerline Distance to Noise Contour (in feet)         70 dBA         65 dBA         60 dBA         55 dBA	Righ	t View:	90.0 degre	es		Heav	y Trucks:	32	.589			
Autos:         64.30         -1.94         2.64         -1.20         -4.52         0.000         0.00           Medium Trucks:         75.75         -19.18         2.69         -1.20         -4.62         0.000         0.000           Heavy Trucks:         81.57         -23.13         2.69         -1.20         -4.66         0.000         0.000           Unitigated Noise Levels (without Topo and barrier attenuation)         Leq Resk Hour         Leq Day         Leq Evening         Leq Night         Ldn         CNEL           Autos:         63.8         61.9         60.1         54.1         62.7         63.           Medium Trucks:         58.1         56.6         50.2         48.6         57.1         59.1         59.9           Vehicle Noise:         66.0         64.3         60.9         56.5         65.0 <td>FHWA Noise Model Cal</td> <td>culations</td> <td>5</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	FHWA Noise Model Cal	culations	5									
Medium Trucks:         75.75         -19.18         2.69         -1.20         -4.86         0.000         0.000           Heavy Trucks:         81.57         -23.13         2.69         -1.20         -5.69         0.000         0.000           Umitigated Noise Levels (without Topo and barrier attenuation)           VehicleType         Leq Peak Hour         Leq Day         Leq Vening         Leq Night         Ldn         CNEL           Autos:         63.8         61.9         60.1         54.1         62.7         63.           Medium Trucks:         58.1         56.6         50.2         48.6         57.1         57.           Heavy Trucks:         59.9         58.5         49.5         50.7         59.1         59.           Vehicle Noise:         66.0         64.3         60.9         56.5         65.0         65.           Centerline Distance to Noise Contour (in feet)         TO dBA         65 dBA         60 dBA         55 dBA				Dist				Fres				
Heavy Trucks:         81.57         -23.13         2.69         -1.20         -5.69         0.000         0.000           Unnitigated Noise Levels (without Topo and barrier attenuation)         Leq Revening         Leq Night         Ldn         CNEL           Vehicle Type         Leq Peak Hour         Leq Day         Leq Evening         Leq Night         Ldn         CNEL           Autos:         63.8         61.9         60.1         54.1         62.7         63.           Medium Trucks:         58.1         56.6         50.2         48.6         57.1         57.           Heavy Trucks:         59.9         58.5         49.5         50.7         59.1         59.           Vehicle Noise:         66.0         64.3         60.9         56.5         65.0         65.           Centerline Distance to Noise Contour (in feet)         T         70 dBA         65 dBA         60 dBA         55 dBA										•••		
Minitigated Noise Levels (without Topo and barrier attenuation)           VehicleType         Leq Peak Hour         Leq Day         Leq Evening         Leq Night         Ldn         CNEL           Autos:         63.8         61.9         60.1         54.1         62.7         63.           Medium Trucks:         58.1         56.6         50.2         48.6         57.1         57.           Heavy Trucks:         59.9         58.5         49.5         50.7         59.1         59.           Vehicle Noise:         66.0         64.3         60.9         56.5         65.0         65.           Centerline Distance to Noise Contour (in feet)         70 dBA         65 dBA         60 dBA         55 dBA	Medium Trucks:	75.75										
VehicleType         Leq Peak Hour         Leq Day         Leq Evening         Leq Night         Ldn         CNEL           Autos:         63.8         61.9         60.1         54.1         62.7         63.           Medium Trucks:         58.1         56.6         50.2         48.6         57.1         57.           Heavy Trucks:         59.9         58.5         49.5         50.7         59.1         59.           Vehicle Noise:         66.0         64.3         60.9         56.5         65.0         65.           Centerline Distance to Noise Contour (in feet)         70 dBA         65 dBA         60 dBA         55 dBA	Heavy Trucks:	81.57	-23.13		2.69	9	-1.20		-5.69	0.	000	0.00
Autos:         63.8         61.9         60.1         54.1         62.7         63.           Medium Trucks:         58.1         56.6         50.2         48.6         57.1         57.           Heavy Trucks:         59.9         58.5         49.5         50.7         59.1         59.           Vehicle Noise:         66.0         64.3         60.9         56.5         65.0         65.           Centerline Distance to Noise Contour (in feet)         70 dBA         65 dBA         60 dBA         55 dBA									1			
Medium Trucks:         58.1         56.6         50.2         48.6         57.1         57.           Heavy Trucks:         59.9         58.5         49.5         50.7         59.1         59.           Vehicle Noise:         66.0         64.3         60.9         56.5         65.0         65.           Centerline Distance to Noise Contour (in feet)         70 dBA         65 dBA         60 dBA         55 dBA			. ,		Leq E	~	Leq N	·		-		
Heavy Trucks:         59.9         58.5         49.5         50.7         59.1         59.9           Vehicle Noise:         66.0         64.3         60.9         56.5         65.0         65.           Centerline Distance to Noise Contour (in feet)           70 dBA         65 dBA         60 dBA         55 dBA			-									
Vehicle Noise:         66.0         64.3         60.9         56.5         65.0         65.           Centerline Distance to Noise Contour (in feet)         70 dBA         65 dBA         60 dBA         55 dBA			-						-		•	
Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 80 dBA 55 dBA			-									
70 dBA 65 dBA 60 dBA 55 dBA	Vehicle Noise					60.9		56.	5	65.	0	65.
				)					_			
Lan: 15 33 (1 154		Noise Co	ntour (in feet	<u> </u>	70 -	10.4	05 -					
CNEL: 16 35 76 164		Noise Co							(			
CIVICL. 10 35 /6 104		Noise Co	•		1	5		1	6			

	FHV	VA-RD-77-108	HIGHWA	Y NOISE P	REDICT		EL		
	o: OY 2019 W e: Orange St. nt: n/o Strong 3					Name: No lumber: 11			
SITE S	SPECIFIC IN	IPUT DATA			P	IOISE MO	DDEL INPU	TS	
Highway Data				Site Col	nditions	(Hard = 10	0, Soft = 15)		
Average Daily	Traffic (Adt):	7,700 vehicles				AL	itos: 15		
Peak Hour	Percentage:	10%		Me	edium Tr	ucks (2 Ax	les): 15		
Peak H	our Volume:	770 vehicles		He	avy Tru	cks (3+ Ax	<i>les):</i> 15		
Vel	nicle Speed:	35 mph		Vehicle					
Near/Far Lar	ne Distance:	12 feet			nicleType		ay Evening	Night	Daily
Site Data				Ver			7.5% 12.9%	, v	
				-	, Iedium T		4.8% 4.9%		
Bar Barrier Type (0-Wa	rier Height:	0.0 feet 0.0			Heavy T		5.5% 2.7%		
Centerline Dis	. ,	0.0 33.0 feet			,				
Centerline Dist.		33.0 feet		Noise S	ource E	levations	(in feet)		
Barrier Distance		0.0 feet			Auto				
Observer Height (		5.0 feet		Mediu	ım Truck	s: 2.29			
<b>U</b> 1	d Elevation:	0.0 feet		Hea	vy Truck	s: 8.00	6 Grade A	Adjustmer	nt: 0.0
	d Elevation: d Elevation:	0.0 feet		Lane Fr	wivalen	t Distance	(in feet)		
	o Elevation. Road Grade:	0.0%		Lano La	Auto		. ,		
r	Left View:	-90.0 degree		Modiu	m Truck				
	Right View:	90.0 degree			vy Truck				
FHWA Noise Mode	Calculation	s							
VehicleType	REMEL	Traffic Flow	Distan	ce Finite	Road	Fresnel	Barrier A	Atten Be	erm Atten
Autos:	64.30	-1.99		2.64	-1.20	-4	.52 (	0.000	0.000
Medium Trucks:	75.75	-19.23		2.69	-1.20	-4	.86 (	0.000	0.000
Heavy Trucks:	81.57	-23.19		2.69	-1.20	-5	5.69 (	0.000	0.000
Unmitigated Noise									
,1	Leq Peak Hou			q Evening	,	Night	Ldn		CNEL
Autos:	63		61.8	60.1		54.0		2.6	63.3
Medium Trucks:	58		56.5	50.1		48.6		7.1	57.3
Heavy Trucks:	59	-	58.4	49.4		50.7		9.0	59.1
Vehicle Noise:	66		64.3	60.8	1	56.4	6	5.0	65.4
Centerline Distanc	a to Noisa Cr	ontour (in feet							
	e 10 110/36 OC								
	0 10 110/30 00			70 dBA		dBA	60 dBA	5	5 dBA
			_dn: IFI :	70 dBA 15 16	3	dBA 13 15	71 76	5	5 dBA 153 163

Monday, June 18, 2018

	FH\	WA-RD-77-108	HIGHW	VAY N	OISE PF	REDICTIO	N MOD	EL			
Scenar	io: OY 2019 V	Vithout Project				Project N	ame: N	orthga	ate		
Road Nam	e: Orange St.					Job Nun	nber: 1	1145			
Road Segme	nt: s/o Strong	St.									
	SPECIFIC IN	NPUT DATA								S	
Highway Data				5	Site Con	ditions (H	lard = 1	0, So	ft = 15)		
Average Daily	Traffic (Adt):	8,300 vehicle	s				A	utos:	15		
Peak Hour	Percentage:	10%			Me	dium Truci	ks (2 Ax	(les):	15		
Peak H	lour Volume:	830 vehicle	s		He	avy Trucks	s (3+ Ax	(les):	15		
	hicle Speed:	35 mph		1	/ehicle	Nix					
Near/Far La	ne Distance:	12 feet			Vehi	cleType	D	av	Evening	Night	Daily
Site Data							tos: 7	7.5%	12.9%	9.6%	
Ba	rrier Height:	0.0 feet			Me	dium Truc	:ks: 8	4.8%	4.9%	10.3%	1.849
Barrier Type (0-W	/all, 1-Berm):	0.0			ŀ	leavy Truc	cks: 8	6.5%	2.7%	10.8%	0.749
Centerline Di		33.0 feet		^	Voise Sc	urce Elev	ations	(in fe	et)		
Centerline Dist.		33.0 feet				Autos:	0.00		.,		
Barrier Distance		0.0 feet			Mediur	n Trucks:	2.29	97			
Observer Height (	,	5.0 feet			Heav	v Trucks:	8.00	)6	Grade Ad	iustment	: 0.0
	ad Elevation:	0.0 feet			_						
	ad Elevation:	0.0 feet		1	ane Eq	uivalent D			eet)		
	Road Grade:	0.0%				Autos:	32.83				
	Left View:	-90.0 degre				n Trucks:	32.56	-			
	Right View:	90.0 degre	es		Heav	y Trucks:	32.58	39			
FHWA Noise Mod		-									
VehicleType	REMEL	Traffic Flow	Dista		Finite		Fresne		Barrier Atte		m Atter
Autos:	64.30			2.64		-1.20		1.52	0.0		0.00
Medium Trucks:	75.75			2.69		-1.20		1.86		000	0.00
Heavy Trucks:	81.57	-22.86		2.69	)	-1.20	-{	5.69	0.0	000	0.00
Unmitigated Nois					<u> </u>						
VehicleType	Leq Peak Hou			Leq Ev	·	Leq Ni			Ldn		NEL
Autos:	•		62.2		60.4		54.4		63.0		63.
Medium Trucks:		3.3	56.8		50.5		48.9		57.4		57.
Heavy Trucks:		).2	58.8		49.7		51.0		59.3	-	59.
Vehicle Noise:		3.3	64.6		61.1		56.8		65.3	3	65.
Centerline Distan	ce to Noise C	ontour (in fee	)								
				70 d		65 dE	8A	6	0 dBA		dBA
		-	Ldn: NFL:	16 17	-	35 37			74 80		60 71

	FHV	VA-RD-77-108	HIGH	WAY NO	DISE PI	REDICTI	ON MODE	EL.			
Scenario	: OY 2019 W	ithout Project				Project	Name: No	orthgate			
Road Name	: Orange St.					Job N	umber: 11	145			
Road Segment	: n/o Russell	St.									
	PECIFIC IN	PUT DATA					OISE MO			S	
Highway Data				S	ite Con	ditions	(Hard = 10	), Soft	= 15)		
Average Daily T	raffic (Adt):	7,000 vehicles	\$				AL	tos:	15		
Peak Hour F	Percentage:	10%			Me	dium Tru	icks (2 Ax	les):	15		
Peak Ho	ur Volume:	700 vehicles	5		He	avy Truc	:ks (3+ Ax	les):	15		
Veh	icle Speed:	35 mph		V	ehicle I	Mix					
Near/Far Lan	e Distance:	12 feet		-		icleType	D	ay E	vening	Night	Daily
Site Data					VCII			.5%	12.9%	9.6%	
Barr	ier Height:	0.0 feet			Me	edium Tr	ucks: 84	.8%	4.9%	10.3%	1.84
Barrier Type (0-Wa		0.0		1	ŀ	leavy Tr	ucks: 86	6.5%	2.7%	10.8%	0.74
Centerline Dist		33.0 feet		H							
Centerline Dist. to		33.0 feet		N	oise So		evations (		9		
Barrier Distance to	Observer:	0.0 feet				Autos					
Observer Height (A	bove Pad):	5.0 feet				m Trucks			rada Adi	iuotmont	
	d Elevation:	0.0 feet			Heav	y Trucks	8: 8.00	6 G	rade Adj	iustment:	0.0
Road	d Elevation:	0.0 feet		L	ane Eq	uivalent	Distance	(in fee	et)		
R	oad Grade:	0.0%				Autos	s: 32.83	3			
	Left View:	-90.0 degree	s		Mediu	n Trucks	s: 32.56	2			
	Right View:	90.0 degree	s		Heav	y Trucks	32.58	9			
FHWA Noise Mode	Calculation	S									
VehicleType	REMEL	Traffic Flow	Dist	tance	Finite	Road	Fresnel	Ba	arrier Atte	en Ber	m Atter
Autos:	64.30	-2.41		2.64		-1.20	-4	.52	0.0	000	0.00
Medium Trucks:	75.75	-19.65		2.69		-1.20	-4	.86	0.0	000	0.00
Heavy Trucks:	81.57	-23.60		2.69		-1.20	-5	.69	0.0	000	0.00
Unmitigated Noise											
	.eq Peak Hou			Leq Ev		Leq	Night	L	dn		VEL
Autos:	63.		51.4		59.7		53.6		62.2		62
Medium Trucks:	57.		56.1		49.7		48.2		56.6		56
Heavy Trucks:	59.		58.0		49.0		50.2		58.6		58
Vehicle Noise:	65		53.9		60.4		56.0		64.6	6	65
Centerline Distance	e to Noise Co	ontour (in feet)		=0.1							
			∟	70 d			dBA		dBA		dBA
			Ldn:	14		3	1	6	6	1	43
			IEL:	15		-	3	-	'1		53

Monday, June 18, 2018

		VA-RD-77-108	HIGH	IWAY N	IOISE PH						
Road Nar	rio: OY 2019 W ne: Orange St. ent: s/o Russell	,				Project N Job Nur			ate		
SITE	SPECIFIC IN	IPUT DATA				NO	ISE N	IODE		S	
Highway Data					Site Con	ditions (H	lard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	4,200 vehicle	s					Autos:	15		
Peak Hou	Percentage:	10%			Me	dium Truc	ks (2 A	xles):	15		
Peak I	lour Volume:	420 vehicle	s		He	avy Truck	s (3+ A	xles):	15		
Ve	ehicle Speed:	35 mph		-	Vehicle I	Niv					
Near/Far La	ane Distance:	12 feet		F		cleType		Day	Evening	Night	Daily
Site Data								77.5%	•	9.6%	
P	rrier Height:	0.0 feet			Me	edium True	cks:	84.8%	4.9%	10.3%	1.84%
Barrier Type (0-V	Vall, 1-Berm):	0.0			ŀ	leavy Tru	cks:	86.5%	2.7%	10.8%	0.74%
	ist. to Barrier:	33.0 feet			Noise Sc	ource Elev	ation	s (in fe	eet)		
Centerline Dist.		33.0 feet				Autos:	0.0	000			
Barrier Distance		0.0 feet			Mediur	n Trucks:	2.2	297			
Observer Height	• • •	5.0 feet			Heav	y Trucks:	8.0	006	Grade Ad	ustment	: 0.0
	ad Elevation:	0.0 feet			1 E -		N- 4				
Ro	ad Elevation:	0.0 feet			Lane Eq	uivalent D		· ·	eet)		
	Road Grade:	0.0%				Autos:	32.8				
	Left View: Right View:	-90.0 degre 90.0 degre				n Trucks: v Trucks:	32.5 32.5				
FHWA Noise Mod	°	0					_				
VehicleType	REMEL	s Traffic Flow	Dis	tance	Finite	Road	Fresn	el	Barrier Att	en Ber	m Atten
Autos:	64.30	-4.63		2.6	4	-1.20		4.52	0.0		0.000
Medium Trucks	75.75	-21.87		2.6	9	-1.20		-4.86	0.0	00	0.000
Heavy Trucks	81.57	-25.82		2.6	9	-1.20		-5.69	0.0	00	0.00
Unmitigated Nois	e Levels (with	out Topo and	barrie	er atten	uation)						
VehicleType	Leq Peak Hou	ir Leq Day	/	Leq E	vening	Leq Ni	ght		Ldn	C	NEL
Autos:	61	.1	59.2		57.4		51.4		60.0	)	60.0
Medium Trucks:	55	.4	53.9		47.5		46.0		54.4	ļ.	54.
Heavy Trucks:	57	.2	55.8		46.8		48.0		56.4	ļ.	56.
Vehicle Noise.	63	.4	61.6		58.2		53.8		62.3	5	62.
Centerline Distan	ce to Noise Co	ontour (in feet	)							T	
			L		dBA	65 dE	BA	6	0 dBA		dBA
			Ldn:	1	0	22			47	1	02
			NFI :		1	23			50		09

	FHV	/A-RD-77-108	HIGHW/	AY N	IOISE PF	REDICT	ION MO	DEL			
Road Name	o: OY 2019 W e: Primer St. ht: n/o Columb	,					Name: I umber:		ate		
SITE S	SPECIFIC IN	PUT DATA				N	IOISE N	<b>IODE</b>	L INPUT	s	
Highway Data				5	Site Con	ditions	(Hard =	10, Sc	oft = 15)		
Average Daily	. ,							Autos:	15		
	Percentage:	10%					ucks (2 A		15		
		2,430 vehicles			He	avy Truc	cks (3+ A	(xies):	15		
	nicle Speed:	35 mph		۱	Vehicle I	Mix					
Near/Far Lar	ne Distance:	12 feet			Veh	icleType		Day	Evening	Night	Daily
Site Data								77.5%		9.6%	
Bar	rier Height:	0.0 feet				edium Ti		84.8%		10.3%	
Barrier Type (0-W	all, 1-Berm):	0.0			ŀ	leavy Ti	rucks:	86.5%	2.7%	10.8%	0.74%
Centerline Dis	t. to Barrier:	33.0 feet		1	Voise Sc	ource El	evation	s (in fe	eet)		
Centerline Dist. t	o Observer:	33.0 feet				Auto		000			
Barrier Distance t	o Observer:	0.0 feet			Mediur	n Truck		297			
Observer Height (J	Above Pad):	5.0 feet				v Truck		006	Grade Ad	iustment	: 0.0
Pa	d Elevation:	0.0 feet									
Roa	d Elevation:	0.0 feet		L	Lane Eq				feet)		
F	Road Grade:	0.0%				Autos					
	Left View:	-90.0 degree	s		Mediur	m Truck					
	Right View:	90.0 degree	s		Heav	y Truck	s: 32.	589			
FHWA Noise Mode	el Calculations										
VehicleType	REMEL	Traffic Flow	Distan			Road	Fresn		Barrier Att		rm Atten
Autos:	64.30	3.00		2.64		-1.20		-4.52		000	0.000
Medium Trucks:	75.75	-14.24		2.69	-	-1.20		-4.86		000	0.000
Heavy Trucks:	81.57	-18.20		2.69	9	-1.20		-5.69	0.0	000	0.000
Unmitigated Noise											
	Leq Peak Hou			eq Ev	/ening	Leq	Night		Ldn	-	NEL
Autos:	68.		6.8		65.1		59.0		67.6		68.2
Medium Trucks:	63.		51.5		55.1		53.6		62.0		62.3
Heavy Trucks:	64.	-	3.4		54.4		55.6		64.0		64.1
Vehicle Noise:	71.	0 6	69.3		65.8		61.4		70.0	)	70.4
Centerline Distance	e to Noise Co	ntour (in feet)		70	0.4	05	-/D.4		0.104		-10.4
				70 d			dBA	6	60 dBA		dBA
			.dn:	33	-		1		152	-	328
		CN	IEL:	35	D	7	6		163	3	351

	FH	WA-RD-77-108	HIGH	NAY N	OISE PF	REDICTIO	N MOI	DEL			
Scenar	io: OY 2019 V	Vithout Project				Project N	ame: N	Northg	ate		
Road Nam	e: La Cadena	Dr.				Job Nur	nber: 1	1145			
Road Segme	nt: n/o I-215 F	tamps									
	SPECIFIC IN	NPUT DATA								S	
Highway Data				5	Site Con	ditions (H	lard =	10, So	ft = 15)		
Average Daily	Traffic (Adt):	5,500 vehicle	s				A	Autos:	15		
Peak Hour	Percentage:	10%			Me	dium Truc	ks (2 A	xles):	15		
Peak H	lour Volume:	550 vehicle	5		He	avy Truck	s (3+ A	xles):	15		
	hicle Speed:	40 mph		1	/ehicle	Nix					
Near/Far La	ne Distance:	12 feet				cleType		Dav	Evening	Night	Daily
Site Data						Au	tos:	77.5%	12.9%	9.6%	97.42
Bai	rrier Height:	0.0 feet			Me	dium Tru	cks:	84.8%	4.9%	10.3%	1.849
Barrier Type (0-W	/all, 1-Berm):	0.0			ŀ	leavy Tru	cks:	86.5%	2.7%	10.8%	0.74
Centerline Dis		33.0 feet			Voise Sc	ource Elev	ations	s (in fe	et)		
Centerline Dist.		33.0 feet				Autos:	0.0		.,		
Barrier Distance		0.0 feet			Mediur	n Trucks:	2.2	97			
Observer Height (		5.0 feet			Heav	v Trucks:	8.0	06	Grade Ad	justment	: 0.0
	ad Elevation:	0.0 feet									
	ad Elevation:	0.0 feet		1	ane Eq	uivalent L			eet)		
	Road Grade:	0.0%				Autos:	32.8				
	Left View:	-90.0 degree				n Trucks:	32.5				
	Right View:	90.0 degree	es		Heav	y Trucks:	32.5	689			
FHWA Noise Mode											
VehicleType	REMEL	Traffic Flow	Dist	ance	Finite		Fresn	-	Barrier Att		rm Atter
Autos:	66.51			2.64		-1.20		4.52		000	0.00
Medium Trucks:	77.72			2.69		-1.20		4.86		000	0.00
Heavy Trucks:	82.99			2.69		-1.20		-5.69	0.0	000	0.00
Unmitigated Noise					<u> </u>					-	
VehicleType	Leq Peak Ho			Leq Ev		Leq N			Ldn		NEL
Autos:			62.0		60.2		54.2		62.8	-	63.
Medium Trucks:			56.4		50.1		48.5		57.0	-	57.
Heavy Trucks: Vehicle Noise:			57.8 64.2		48.8		50.0 56.4		58.4 64.9		58. 65.
					00.9		50.4		04.8	7	05.
Centerline Distant	Le lo Noisê C	ontour (in feet	,	70 d	IBA	65 dE	ЗА	6	0 dBA	55	dBA
			Ldn:	15		33			70		151
			VEL:	16	-	35			75		162
		0.				50			-		-

F	HWA-RD-77	-108 HI	GHWAY	NOISE	PREDICT	ION MO	DEL			
Scenario: OY 2019	Without Pro	ject			Projec	t Name:	Northg	ate		
Road Name: La Cade	na Dr.				Job I	lumber:	11145			
Road Segment: s/o I-215	Ramps									
SITE SPECIFIC	INPUT DA	ТА						l input	s	
Highway Data				Site Co	onditions	(Hard =	: 10, S	oft = 15)		
Average Daily Traffic (Adt)	: 2,200 ve	hicles					Autos:	15		
Peak Hour Percentage	: 10%			N	ledium Ti	ucks (2 )	Axles):	15		
Peak Hour Volume	220 ve	hicles		h	leavy Tru	cks (3+ )	Axles):	15		
Vehicle Speed	: 40 mp	bh		Vehicle	Mix					
Near/Far Lane Distance	: 12 fee	et			hicleTyp		Dav	Evening	Night	Daily
Site Data						Autos:	77.5%	•	9.6%	
Barrier Height	: 0.0 fe	ot			Aedium T	rucks:	84.8%	4.9%	10.3%	
Barrier Type (0-Wall, 1-Berm)		ier.		1	Heavy T	rucks:	86.5%	2.7%	10.8%	0.74
Centerline Dist. to Barrier		oot		<u> </u>	,					
Centerline Dist. to Observer				Noise \$	Source E			eet)		
Barrier Distance to Observer	. 00.0 10				Auto		000			
Observer Height (Above Pad)					um Trucł		297			
Pad Elevation				Hea	avy Truck	:s: 8.	006	Grade Ad	justment.	0.0
Road Elevation	. 0.0 10			Lane E	quivaler	t Distan	ce (in	feet)		
Road Grade		el		24/10 2	Auto		833			
Left View		oarooc		Medi	um Truck		562			
Right View		•			avy Truck		589			
		0			· ·					
FHWA Noise Model Calculati	ons Traffic Fl		<u>.</u>				. 1	<b>D</b>		•
VehicleType REMEL			Distance		e Road -1.20	Fresi	-4.52	Barrier Att		m Atter
Autos: 66.		8.02		.64 .69	-1.20				000	0.00
Medium Trucks: 77. Heavy Trucks: 82.		5.25 9.21		.69 .69	-1.20		-4.86 -5.69		000 000	0.00
		-			-		-3.09	0.0	000	0.00
Unmitigated Noise Levels (w			1		<u> </u>		1			
VehicleType Leq Peak H		Day		Evening		Night	_	Ldn 58.8		VEL
Autos:	59.9	58		56.		50.2				59
Medium Trucks:	54.0	52		46.		44.		53.0		53
Heavy Trucks:	55.3	53.	-	44.		46.		54.4		54
Vehicle Noise:	62.0	60	.2	56.	9	52.4	4	60.9	)	61
Centerline Distance to Noise	Contour (in	feet)	_				-			
				0 dBA		dBA		60 dBA		dBA
		Ld	n:	8		18		38	8	32
		CNE		9		19		41		38

Monday, June 18, 2018

	FHV	VA-RD-77-108	HIGH	WAYN	IOISE PF	REDICTI	ON MC	DDEL				
Road Nam	o: OY 2019 W e: La Cadena nt: n/o Strong \$	Dr.				Project Job N	Name: umber:					
	SPECIFIC IN	PUT DATA							L INPUT	rs		
Highway Data					Site Con	ditions	(Hard =	= 10, S	oft = 15)			
Average Daily	Traffic (Adt):	2,000 vehicles						Autos.	: 15			
Peak Hour	Percentage:	10%			Mee	dium Tru	ıcks (2	Axles)	: 15			
Peak H	our Volume:	200 vehicles			Hea	avy Truc	:ks (3+	Axles)	: 15			
Ve	hicle Speed:	40 mph		-	Vehicle I	Ai~						
Near/Far La	ne Distance:	12 feet		-		cleType		Day	Evening	Nigl	ht l	Daily
Site Data							utos:	77.5%	•	v		97.429
					Me	dium Tr		84.89				1.849
Bar Barrier Type (0-W	rier Height: all, 1-Berm):	0.0 feet 0.0				leavy Tr		86.5%				0.749
Centerline Dis	st. to Barrier:	33.0 feet		-	Noise So	urce Fl	evatio	ns (in f	eet)			
Centerline Dist.	to Observer:	33.0 feet		F		Autos		.000	,			
Barrier Distance	to Observer:	0.0 feet			Mediur	n Trucks		.297				
Observer Height (	Above Pad):	5.0 feet				v Trucks		.006	Grade A	diustm	ent:	0.0
Pa	ad Elevation:	0.0 feet				·				-,		
Roa	ad Elevation:	0.0 feet			Lane Equ	uivalent	Distar	nce (in	feet)			
I	Road Grade:	0.0%				Autos		.833				
	Left View:	-90.0 degree	s		Mediur	n Trucks	s: 32	.562				
	Right View:	90.0 degree	s		Heav	y Trucks	s: 32	.589				
FHWA Noise Mode												
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite		Fres		Barrier A		Berm	Atten
Autos:	66.51	-8.43		2.6	-	-1.20		-4.52	-	.000		0.00
Medium Trucks:	77.72	-25.67		2.6	-	-1.20		-4.86		.000		0.00
Heavy Trucks:	82.99	-29.62		2.6	-	-1.20		-5.69	0	.000		0.00
Unmitigated Noise			barrie					_				
	Leq Peak Hou			Leq E	vening	Leq	Night		Ldn		CN	
Autos:	59.		7.6		55.9		49.	-	58			59.
Medium Trucks:	53.		2.0		45.7		44.		52			52.
Heavy Trucks:	54.		3.4		44.4		45.	-	54			54.
Vehicle Noise:	61.	.5 5	9.8		56.5		52.	0	60	.5		61.
Centerline Distance	e to Noise Co	ontour (in feet)										
			. L		dBA		dBA		60 dBA		55 d	
			.dn:		3	1			36		77	
		CN	FI:	2	3	1	8		38		82	

	FHW	A-RD-77-108 H	IIGHWA	Y NOI	SE PR	EDICTI	ON MO	DEL			
	: OY 2019 Wi : Placentia Ln : e/o Main St.						Name:   umber:		ate		
SITE S	PECIFIC INF	PUT DATA				N	OISE N	/ODE	L INPUT	s	
Highway Data				Site	e Con	ditions	(Hard =	10, So	oft = 15)		
Average Daily T Peak Hour F	( )	9,100 vehicles 10%			Мес	dium Tru	ı ıcks (2 A	Autos: Axles):	15 15		
Peak Ho	ur Volume:	910 vehicles			Hea	avy Truc	ks (3+ A	(xles):	15		
Veh	icle Speed:	25 mph									
Near/Far Lan		36 feet		Veł	nicle N			-			
				_	veni	cleType		Day	Evening	Night	Daily
Site Data				-				77.5%		9.6%	
Barr	ier Height:	0.0 feet				dium Tr		84.8%		10.3%	
Barrier Type (0-Wa		0.0			н	leavy Tr	UCKS:	86.5%	2.7%	10.8%	0.74%
Centerline Dist		44.0 feet		Noi	ise So	urce El	evation	s (in fe	eet)		
Centerline Dist. to		44.0 feet				Autos	s: 0.0	000	,		
Barrier Distance to	Observer:	0.0 feet		٨	<i>lediun</i>	n Trucks	: 23	297			
Observer Height (A	bove Pad):	5.0 feet			Heav	V Trucks	: 8.0	006	Grade Ad	iustment	: 0.0
Pad	d Elevation:	0.0 feet									
	d Elevation:	0.0 feet		Lar	ie Equ		Distan	· ·	feet)		
R	oad Grade:	0.0%				Autos					
	Left View:	-90.0 degrees				n Trucks					
	Right View:	90.0 degrees			Heavy	y Trucks	s: 40.1	262			
FHWA Noise Model											
VehicleType		Traffic Flow	Distance		Finite I		Fresh		Barrier Att	en Bei	m Atten
Autos:	58.73	0.19		.28		-1.20		-4.61		000	0.000
Medium Trucks:	70.80	-17.05		.31		-1.20		-4.87		000	0.000
Heavy Trucks:	77.97	-21.00	1	.31		-1.20		-5.50	0.0	000	0.000
Unmitigated Noise											
	.eq Peak Hour		,	Even	•	Leq	Night		Ldn	-	NEL
Autos:	59.0	5 5	7.1		55.3		49.3		57.9		58.5
Medium Trucks:	53.9		2.4		46.0		44.4		52.9		53.1
Heavy Trucks:	57.1	1 5	5.7		46.6		47.9		56.2	2	56.4
Vehicle Noise:	61.9	9 6	).2		56.3		52.4		60.9	)	61.3
Centerline Distance	e to Noise Col	ntour (in feet)									
				'0 dBA	1		dBA	6	60 dBA		dBA
			dn:	11		-	3		51		09
		CN	EL:	12		2	5		54	1	16

Monday, June 18, 2018

IWA-RD-77-108	HIGHWA	Y NOI	SE PREDIC	FION MO	DDEL			
Without Project			Projec	t Name:	Northg	ate		
			Job	Number:	11145			
e St.								
NPUT DATA							s	
		Site	Condition:	s (Hard =	= 10, So	oft = 15)		
	5					15		
10%					/	15		
	S		Heavy Tri	ıcks (3+	Axles):	15		
		Veh	icle Mix					
36 feet			VehicleTyp	е	Day	Evening	Night	Daily
				Autos:	77.5%	12.9%	9.6%	97.429
0.0 feet			Medium	Trucks:	84.8%	4.9%	10.3%	1.84%
0.0			Heavy	Trucks:	86.5%	2.7%	10.8%	0.749
44.0 feet		Noi	se Source I	levatio	ns (in fe	eet)		
			Aut	os: 0	.000	,		
		٨	ledium Truc	ks: 2	.297			
			Heavy Truc	ks: 8	.006	Grade Ad	justment	: 0.0
		Lan				reet)		
90.0 degree	es		neavy muc	KS. 40	.202			
	Distan							rm Atten
								0.00
								0.00
					-5.50	0.0	000	0.00
		q Even			F			NEL 70.
					-			70. 64
					-		-	65.
	04.4 71.3		68.1	63.	-	72.0		72.
	)							
S.0 Contour (in feet	-	70 dBA	65	i dBA	6	0 dBA	55	dBA
Contour (in feet	-	70 dBA 60		<i>dBA</i> 129	ŧ	0 dBA 278		dBA 599
	Without Project Av. pe St. <b>NPUT DATA</b> 28,900 vehicle: 45 mph 36 feet 0.0 get 1.5 - 18.54 hout Topo and Dur Leq Day 1.2 - 50	Without Project Av. pe St. NPUT DATA 28,900 vehicles 10% 2,890 vehicles 45 mph 36 feet 0.0 feet 0.0 feet 0.0 feet 44.0 feet 44.0 feet 44.0 feet 44.0 feet 44.0 feet 0.0 feet 5.0 feet 5.1 f.54 thou Topo and barrier at 1.2 f.69.3 f.50 6.3 f.50	Without Project           Av.           ye St.           NPUT DATA           28,900 vehicles           10%           10%           28,900 vehicles           10%           28,900 vehicles           45 mph           45 mph           0.0 feet           10%           -90.0 degrees           90.0 degrees           16           2.66           1.28           5           -14.58           1.31           5           5           1.18.54           1.28           5.0           63.5	Without Project Av.         Project Job I           Av.         Job I           Les L.         Job I           NPUT DATA         Site Conditions           28,900 vehicles         Heavy Tra           10%         Medium T           45 mph         Vehicle Mix           36 feet         Vehicle Mix           0.0 feet         Medium Trac           0.0 feet         Medium Trac           0.0 feet         Heavy Trac           0.0 feet         Lane Equivaler           0.00 degrees         -1.20           90.0 degrees         1.31         -1.20           5         -18.54         1.31         -1.20           hour Topo and barrier attenuation)         Leq Zen Fig. 67.5         5.0	Without Project Av.         Project Name: Job Number:           Av.         Job Number:           je St.         Site Conditions (Hard I Site Conditions (Hard I 28,900 vehicles           10%         Site Conditions (Hard I 28,900 vehicles           10%         Medium Trucks (2 Heavy Trucks (3+ 45 mph           36 feet         Vehicle Mix           0.0 feet         Medium Trucks: Heavy Trucks: (2 Heavy Trucks: 2 Heavy Trucks: 2 Heavy Trucks: 2 Heavy Trucks: 40 Modium Trucks: 40 Autos: 0 Medium Trucks: 40 Heavy Trucks: 40 Hea	Av.         Job Number: 11145           ie St.         NPUT DATA         NOISE MODE           NPUT DATA         Site Conditions (Hard = 10, Sc         Autos:           28,900 vehicles         Autos:         Autos:           10%         Heavy Trucks (2 Axles):         Heavy Trucks (2 Axles):           25,900 vehicles         Heavy Trucks (2 Axles):         Heavy Trucks (3 Axles):           45 mph         Vehicle Mix         Latos: 77.5%           0.0 feet         Noise Source Elevations (inference)         Autos: 0.00           44.0 feet         Autos: 0.00         Medium Trucks: 2.297           5.0 feet         Heavy Trucks: 8.066         0.00           0.0 feet         Lane Equivalent Distance (in 10.0%         Autos: 40.460           0.0 feet         Lane Equivalent Distance (in 10.0%)         Autos: 40.460           0.0 feet         Lane Equivalent Distance (in 10.0%)         Autos: 40.460           0.0 degrees         Finite Road         Fresnel           6         2.66         1.28         -1.20         -4.61           5         -14.58         1.31         -1.20         -4.61           5         -14.58         1.31         -1.20         -4.61           5         -14.58         1.31	Without Project Av.         Project Name: Northgate Job Number: 11145           Av.         Job Number: 11145           Instruction         Site Conditions (Hard = 10, Soft = 15)           28,900 vehicles         Autos:         15           10%         Medium Trucks (24, Asles):         15           28,900 vehicles         Heavy Trucks (34, Asles):         15           28,900 vehicles         Vehicle Mix         Day         Evening           36 feet         Vehicle Mix         Medium Trucks:         24.8%         4.9%           0.0         feet         Medium Trucks:         24.8%         4.9%           0.0         Heavy Trucks:         86.5%         2.7%           44.0 feet         Noise Source Elevations (in feet)         Autos:         0.00           0.0 feet         Autos:         0.00         Grade Ad           0.0 feet         Autos:         0.00         Grade Ad           0.0 feet         Lane Equivalent Distance (in feet)         Autos:         40.40           0.0 feet         Lane Equivalent Distance (in feet)         0.05           0.00 degrees         Medium Trucks:         40.261         0.05           90.0 degrees         1.31         1.20         -4.61         0.05 <td>Without Project Av.         Project Name: Northgate Job Number: 11145           Av.         Job Number: 11145           is Site Conditions (Hard = 10, Soft = 15)         Autos: 15           28,900 vehicles         Site Conditions (Hard = 10, Soft = 15)           10%         Autos: 15           10%         Medium Tucks (2 Axles): 15           45 mph         Vehicle Mix           0.0         Feet           44.0 feet         Vehicle Mix           0.0         Feet           44.0 feet         Autos: 0.000           0.0 feet         Molise Source Elevations (In feet)           0.0 feet         Autos: 2.297           0.0 feet         Autos: 2.297           0.0 feet         Autos: 0.000           0.0 feet         Mole Guiva Trucks: 2.297           0.0 feet         Autos: 40.460           0.0 feet         Lare Equivalent Distance (in feet)           0.0 feet         Lare Equivalent Distance (in feet)           0.0 grees         Medium Trucks: 40.262           90.0 degrees         -1.20         -4.61         0.000           5&lt;-18.54</td> 1.31         -1.20         -5.50         0.000           5<-14.58	Without Project Av.         Project Name: Northgate Job Number: 11145           Av.         Job Number: 11145           is Site Conditions (Hard = 10, Soft = 15)         Autos: 15           28,900 vehicles         Site Conditions (Hard = 10, Soft = 15)           10%         Autos: 15           10%         Medium Tucks (2 Axles): 15           45 mph         Vehicle Mix           0.0         Feet           44.0 feet         Vehicle Mix           0.0         Feet           44.0 feet         Autos: 0.000           0.0 feet         Molise Source Elevations (In feet)           0.0 feet         Autos: 2.297           0.0 feet         Autos: 2.297           0.0 feet         Autos: 0.000           0.0 feet         Mole Guiva Trucks: 2.297           0.0 feet         Autos: 40.460           0.0 feet         Lare Equivalent Distance (in feet)           0.0 feet         Lare Equivalent Distance (in feet)           0.0 grees         Medium Trucks: 40.262           90.0 degrees         -1.20         -4.61         0.000           5<-18.54

I	HWA-	RD-77-108	HIGH	IWAY N	OISE PR	EDICTI	ON MO	DEL			
Scenario: OY 201		out Project				Project					
Road Name: Columb						Job N	umber:	11145			
Road Segment: e/o Prin	ner St.										
SITE SPECIFIC	INPU	T DATA							L INPUT	S	
Highway Data				5	Site Cond	ditions	(Hard =	: 10, S	oft = 15)		
Average Daily Traffic (Ad	): 31,3	00 vehicles	\$					Autos:	15		
Peak Hour Percentage	<del>)</del> :	10%			Med	dium Tru	icks (2 J	Axles):	15		
Peak Hour Volum	e: 3,1	30 vehicles	5		Hea	avy Truc	:ks (3+ )	Axles):	15		
Vehicle Spee	1:	45 mph			ehicle N	Nix					
Near/Far Lane Distance	<del>)</del> .	36 feet		F		cleType		Dav	Evening	Night	Dailv
Site Data							Autos:	77.5%			97.42
Barrier Heigh	<b>4</b> .	0.0 feet			Me	dium Tr	ucks:	84.8%	4.9%	10.3%	1.84
Barrier Type (0-Wall, 1-Berm		0.0 1001			H	leavy Tr	ucks:	86.5%	2.7%	10.8%	
Centerline Dist. to Barrie		0.0 14.0 feet									
Centerline Dist. to Observe		14.0 feet		^	loise So				eet)		
Barrier Distance to Observe		0.0 feet				Autos		000			
Observer Height (Above Pad		5.0 feet				n Trucks		297			
Pad Elevatio		0.0 feet			Heavy	y Trucks	s: 8.	006	Grade Ac	ljustment	: 0.0
Road Elevatio		0.0 feet		L	ane Equ	iivalent	Distan	ce (in	feet)		
Road Grad		0.0%				Autos		460	í		
Left View		0.0 degree	s		Mediun	n Trucks	s: 40.	241			
Right View		0.0 degree			Heavy	y Trucks	s: 40.	262			
FHWA Noise Model Calculat	ions										
VehicleType REMEL	Tr	affic Flow	Dis	tance	Finite I		Fresi	nel	Barrier At	ten Ber	m Atter
Autos: 68	46	3.00		1.28		-1.20		-4.61	0.	000	0.00
	45	-14.23		1.31		-1.20		-4.87		000	0.00
Heavy Trucks: 84	25	-18.19		1.31		-1.20		-5.50	0.	000	0.00
Unmitigated Noise Levels (v					· _						
VehicleType Leq Peak		Leq Day		Leq Ev		Leq	Night		Ldn		NEL
Autos:	71.5		59.6		67.9		61.8		70.		71
Medium Trucks:	65.3		53.8		57.5		55.9		64.		64
Heavy Trucks:	66.2		64.7		55.7		57.0		65.		65
Vehicle Noise:	73.4		71.6		68.5		63.	3	72.	4	72
Centerline Distance to Noise	Conto	our (in feet)	•	-				1			
			L	70 d			dBA		60 dBA		dBA
			Ldn: IFI :	63 68			36 16		293 315		i32 i78

	FHW.	A-RD-77-108	HIG	HWAY N	IOISE PF	REDICTIC	ON MC	DEL				
Scenario: OY 20 Road Name: Strong Road Segment: w/o Ma	St.	thout Project				Project N Job Nu						
SITE SPECIFI	C INF	PUT DATA				NC	DISE	MODE	L INPU	TS		
Highway Data					Site Con	ditions (I	Hard =	= 10, S	oft = 15)			
Average Daily Traffic (Ad	dt): 3	3,200 vehicle	s					Autos	: 15			
Peak Hour Percenta	qe:	10%			Me	dium Truc	cks (2	Axles)	: 15			
Peak Hour Volum	ne:	320 vehicle	s		He	avy Truck	(3+	Axles)	: 15			
Vehicle Spe	ed:	25 mph		-	Vehicle I		-					
Near/Far Lane Distan	ce:	12 feet		-				D	Evenino		a la t	Deile
Site Data					veni	cleType		Day 77.5%	,	· ·		Daily
					14	AL dium Tru	itos:	84.8%			).6% ).3%	97.42% 1.84%
Barrier Heig		0.0 feet				eaum Tru Ieavy Tru		86.5%			0.3% 0.8%	0.74%
Barrier Type (0-Wall, 1-Ben	· ·	0.0			r	leavy IIu	CKS.	00.07	0 2.17	0 10	1.070	0.74%
Centerline Dist. to Barr		33.0 feet			Noise Sc	ource Ele	vatior	ns (in i	eet)			
Centerline Dist. to Observ		33.0 feet				Autos:	0	.000				
Barrier Distance to Observ		0.0 feet			Mediur	n Trucks:	2	.297				
Observer Height (Above Pa	· ·	5.0 feet			Heav	y Trucks:	8	.006	Grade A	djustr	nent:	0.0
Pad Elevati		0.0 feet		-	l ono Ea	uivalent l	Distor	nee (in	fact)			
Road Elevati		0.0 feet		H	Lane Equ				leel)			
Road Gra		0.0%				Autos:		.833				
Left Vie		-90.0 degre				n Trucks:		.562				
Right Vie	ew:	90.0 degre	es		Heav	y Trucks:	32	.589				
FHWA Noise Model Calcula												
VehicleType REME	-	Traffic Flow	D	istance	Finite		Fres		Barrier A		Bern	n Atten
	8.73	-4.35		2.6		-1.20		-4.52		0.000		0.000
	0.80	-21.59		2.6		-1.20		-4.86	-	0.000		0.000
Heavy Trucks: 7	7.97	-25.54		2.6	9	-1.20		-5.69	C	0.000		0.000
Unmitigated Noise Levels (					· · ·			-				
VehicleType Leq Peak				Leq E	vening	Leq N	<u> </u>		Ldn		CN	
Autos:	55.8	-	53.9		52.2		46.		-	1.7		55.3
Medium Trucks:	50.7		49.2		42.8		41.			9.7		50.0
Heavy Trucks:	53.9		52.5		43.5		44.			8.1		53.2
Vehicle Noise:	58.7	7	57.1		53.1		49.	2	57	7.7		58.1
Centerline Distance to Nois	se Cor	ntour (in feet	)	70	-10.4	05.5	0.4	-	00 -10 4			04
			Lala		dBA 5	65 di		1	60 dBA 23		55 0	
			Ldn: NFI :		5	11 11			23 25		5	-
		Ci	VEL:	:	)	11			20		5	2

	FHW	/A-RD-77-108	HIGHWA	Y N	OISE PF	REDICTIO	N MOD	EL			
Road Nam	io: OY 2019 Wi ne: Strong St. nt: e/o Main St.					Project N Job Nur			ate		
SITE	SPECIFIC IN	PUT DATA							INPUTS	5	
Highway Data				S	Site Con	ditions (H	lard = 1	10, So	ft = 15)		
Average Daily	Traffic (Adt):	3,000 vehicles					А	utos:	15		
Peak Hour	Percentage:	10%			Me	dium Truc	ks (2 A)	des):	15		
Peak H	lour Volume:	300 vehicles			He	avy Truck	s (3+ A)	des):	15		
Ve	hicle Speed:	25 mph			ehicle l	<b></b>					
Near/Far La	ne Distance:	12 feet				icleType		Day	Evening	Night	Daily
Site Data					Ven			7.5%	12.9%	9.6%	
Pa	rrier Heiaht:	0.0 feet			Me	dium Tru	cks: 8	4.8%	4.9%	10.3%	1.84%
Barrier Type (0-W		0.0 1001			F	leavy Tru	cks: 8	6.5%	2.7%	10.8%	0.74%
Centerline Di	. ,	33.0 feet				,					
Centerline Dist.		33.0 feet		^	loise Sc	ource Ele			et)		
Barrier Distance	to Observer:	0.0 feet				Autos:	0.00				
Observer Height		5.0 feet				n Trucks:	2.29		Over de Adi		
	ad Elevation:	0.0 feet			Heav	y Trucks:	8.00	J6	Grade Adj	ustmen	2 0.0
Ro	ad Elevation:	0.0 feet		L	ane Eq	uivalent L	Distance	e (in f	eet)		
	Road Grade:	0.0%				Autos:	32.8	33			
	Left View:	-90.0 degree	s		Mediur	n Trucks:	32.5	62			
	Right View:	90.0 degree	s		Heav	y Trucks:	32.5	89			
FHWA Noise Mod	el Calculations	;									
VehicleType	REMEL	Traffic Flow	Distan	ce	Finite	Road	Fresne	e/ 1	Barrier Atte	en Be	m Atten
Autos:	58.73	-4.63		2.64		-1.20	~	4.52	0.0	00	0.000
Medium Trucks:	70.80	-21.87		2.69		-1.20		4.86	0.0	00	0.000
Heavy Trucks:	77.97	-25.82		2.69		-1.20	-	5.69	0.0	00	0.000
Unmitigated Noise	e Levels (witho	out Topo and I	oarrier a	ttenı	uation)						
VehicleType	Leq Peak Hou	r Leq Day	Le	q Ev	ening	Leq N	ight		Ldn	-	NEL
Autos:	55.	5 5	3.6		51.9		45.8		54.4		55.1
Medium Trucks:	50		8.9		42.6		41.0		49.5		49.7
Heavy Trucks:	53.	-	2.2		43.2		44.4		52.8		52.9
Vehicle Noise:			6.8		52.9		49.0		57.5		57.8
Centerline Distan	ce to Noise Co	ntour (in feet)	-	70 d	04	05 -1			0.0		-10.4
		,	dn:	70 a. 5	ВА	65 dE 10	5A	6	0 dBA 22		dBA 48
			.an: IEL:	5 5		10			22		48 51
		0/1		5							

Monday, June 18, 2018

Monday, June 18, 2018

Monday, June 18, 2018

	FH\	WA-RD-77-108	HIGHWA	AY NOIS	SE PF	REDICTIC	N MOE	DEL			
Scenar	io: OY 2019 V	/ithout Project				Project N	lame: N	lorthg	ate		
Road Nam	e: Russell St.					Job Nui	mber: 1	1145			
Road Segme	nt: e/o Main S	t.									
	SPECIFIC IN	IPUT DATA							L INPUTS	5	
Highway Data				Site	Con	ditions (F	lard = 1	10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	3,900 vehicle	s				A	utos:	15		
	Percentage:	10%				dium Truc			15		
Peak F	lour Volume:	390 vehicle	s		Hea	avy Truck	s (3+ A	xles):	15		
	hicle Speed:	35 mph		Veh	icle I	Mix					
Near/Far La	ne Distance:	36 feet				cleType	1	Dav	Evening	Night	Daily
Site Data							itos: 7	7.5%	12.9%	9.6%	
Ba	rrier Height:	0.0 feet			Me	edium Tru	cks: 8	34.8%	4.9%	10.3%	1.84%
Barrier Type (0-W	•	0.0			H	łeavy Tru	cks: 8	86.5%	2.7%	10.8%	0.74%
Centerline Di	st. to Barrier:	44.0 feet		Nois	se So	ource Ele	vations	(in fe	et)		
Centerline Dist.	to Observer:	44.0 feet				Autos:					
Barrier Distance	to Observer:	0.0 feet		14	1ediur	n Trucks:					
Observer Height	(Above Pad):	5.0 feet				y Trucks:			Grade Adj	ustment	: 0.0
	ad Elevation:	0.0 feet				·			,		
	ad Elevation:	0.0 feet		Lan	e Equ	uivalent L			'eet)		
	Road Grade:	0.0%				Autos:	40.4				
	Left View:	-90.0 degree				n Trucks:					
	Right View:	90.0 degree	es		Heav	y Trucks:	40.2	62			
FHWA Noise Mod	el Calculation	S									
VehicleType	REMEL	Traffic Flow	Distan		inite	Road	Fresne	_	Barrier Atte		m Atten
Autos:	64.30	-4.95		1.28		-1.20		4.61	0.0		0.00
Medium Trucks:	75.75	-22.19		1.31		-1.20		4.87	0.0		0.00
Heavy Trucks:	81.57	-26.14		1.31		-1.20	-	5.50	0.0	00	0.00
Unmitigated Nois											
VehicleType	Leq Peak Hou			eq Eveni	~	Leq N			Ldn		NEL
Autos:	59		57.5		55.8		49.7		58.3		58.9
	53		52.2		45.8		44.3		52.7		53.0
Medium Trucks:		1.0	54.1		45.1		46.3		54.7		54.8
Heavy Trucks:	55	-									61.1
Heavy Trucks: Vehicle Noise:	61		60.0		56.5		52.1		60.7		01.
Heavy Trucks:	61										
Heavy Trucks: Vehicle Noise:	61	ontour (in feet	)	70 dBA		65 dl	ВА	6	0 dBA	55	dBA
Heavy Trucks: Vehicle Noise:	61	ontour (in feet				65 dl 23 24	BA	6		55 1	*

	FHV	/A-RD-77-108	HIGH	WAY N	OISE PF	REDICTI	ON MO	DEL			
Scenario: O	Y 2019 W	ith Project				Project	Name:	Northg	ate		
Road Name: M	ain St.					Job Ni	umber:	11145			
Road Segment: s/	o Placenti	a Ln.									
	CIFIC IN	PUT DATA							L INPUT	s	
Highway Data				S	Site Con	ditions (	(Hard =	10, So	oft = 15)		
Average Daily Traffi	c (Adt): 4	3,600 vehicles	;				,	Autos:	15		
Peak Hour Perc	entage:	10%			Mee	dium Tru	icks (2 A	(xles)	15		
Peak Hour \	/olume:	4,360 vehicles	;		Hea	avy Truc	:ks (3+ A	(xles)	15		
Vehicle	Speed:	50 mph		L.	ehicle l	Ai-					
Near/Far Lane Di	stance:	36 feet		-		cleType		Day	Evening	Night	Daily
Site Data					veni			77.5%		9.6%	
					M	dium Tr		84.8%		10.3%	
Barrier	•	0.0 feet				leavy Tr		86.5%		10.3%	
Barrier Type (0-Wall, 1		0.0				leavy II	UCKS.	00.3%	2.170	10.0%	0.747
Centerline Dist. to		50.0 feet		٨	loise So	urce Ele	evation	s (in fe	eet)		
Centerline Dist. to Ot		50.0 feet				Autos	a: 0.0	000			
Barrier Distance to Ol		0.0 feet			Mediur	n Trucks	: 2.2	297			
Observer Height (Abov	,	5.0 feet			Heav	y Trucks	.: 8.0	006	Grade Ad	justment	0.0
	evation:	0.0 feet		_							
Road Ele		0.0 feet		L	ane Equ	uivalent			feet)		
	Grade:	0.0%				Autos					
Le	ft View:	-90.0 degree	s			n Trucks					
Rigi	nt View:	90.0 degree	s		Heav	y Trucks	46.	744			
FHWA Noise Model Ca	lculations	5									
VehicleType R	EMEL	Traffic Flow	Dis	tance	Finite	Road	Fresn	el	Barrier Att	en Ber	m Atten
Autos:	70.20	3.99		0.31		-1.20		-4.65	0.0	000	0.00
Medium Trucks:	81.00	-13.25		0.34		-1.20		-4.87	0.0	000	0.00
Heavy Trucks:	85.38	-17.21		0.34		-1.20		-5.43	0.0	000	0.00
Unmitigated Noise Lev		1								1	
	Peak Hou			Leq Ev		Leq I			Ldn		VEL
Autos:	73.		71.4		69.6		63.6		72.2		72.
Medium Trucks:	66.		65.4		59.0		57.5		65.9		66.
Heavy Trucks:	67.	-	65.9		56.8		58.1		66.5	-	66.
Vehicle Noise:	75.	-	73.3		70.2		65.4		74.0	)	74.
Centerline Distance to	Noise Co	ntour (in feet)		70 -	04	05.	10.4		0.104		-10.4
			L	70 d			1BA		60 dBA 427		dBA 20
			_dn: IEL:	92 99		19 21			427		20 88

Monday, June 18, 2018

						REDICTIC	-				
	io: OY 2019 W	/ith Project				Project N			ate		
	ne: Main St. nt: n/o Columb	10 Au				Job Nu	mber:	11145			
÷											
SITE Highway Data	SPECIFIC IN	IPUT DATA			Site Con	NC ditions (F			L INPUT	S	
	Traffic (Adt):	12 100 vehicle			one oon	unions (i		Autos:			
• •	Percentage:	+3,400 venicie 10%	5		Mo	dium Truc					
	Fercentage. Iour Volume:	4.340 vehicle				avy Truck					
	hicle Speed:		5		110	avy muck	3 (347	ixies).	15		
	nicie Speea: ne Distance:	50 mph			Vehicle I	Nix					
Near/Far La	ine Distance:	36 feet			Vehi	cleType		Day	Evening	Night	Daily
Site Data						AL	itos:	77.5%	12.9%	9.6%	6 97.42%
Ba	rrier Height:	0.0 feet			Me	edium Tru	cks:	84.8%	4.9%	10.3%	6 1.84%
Barrier Type (0-V		0.0			ŀ	łeavy Tru	cks:	86.5%	2.7%	10.8%	6 0.74%
Centerline Di		50.0 feet			Noise Sc	ource Ele	vation	s (in fe	eet)		
Centerline Dist.	to Observer:	50.0 feet		F		Autos:		000			
Barrier Distance	to Observer:	0.0 feet			Mediur	n Trucks:		297			
Observer Height	(Above Pad):	5.0 feet				v Trucks:		006	Grade Ad	iustmen	t: 0.0
P	ad Elevation:	0.0 feet				,					
Ro	ad Elevation:	0.0 feet		1	Lane Eq	uivalent I	Distand	ce (in i	feet)		
	Road Grade:	0.0%				Autos:	46.9	915			
	Left View:	-90.0 degree	es		Mediur	n Trucks:	46.	726			
	Right View:	90.0 degree	es		Heav	y Trucks:	46.	744			
FHWA Noise Mod	el Calculation	s									
VehicleType	REMEL	Traffic Flow	Dista	ance	Finite	Road	Fresn	el	Barrier Att	en Be	erm Atten
Autos:	70.20	3.97		0.3	1	-1.20		-4.65	0.0	000	0.00
Medium Trucks:	81.00	-13.27		0.3	4	-1.20		-4.87	0.0	000	0.00
Heavy Trucks:	85.38	-17.23		0.3	4	-1.20		-5.43	0.0	000	0.00
Unmitigated Nois	e Levels (with	out Topo and	barrier	atten	uation)						
VehicleType	Leq Peak Hou			Leq E	vening	Leq N			Ldn	-	ONEL
Autos:	73	.3	71.4		69.6		63.6		72.2	2	72.0
Medium Trucks:	66	.9	65.4		59.0		57.5		65.9	)	66.
Heavy Trucks:	67	.3	65.9		56.8		58.1		66.4	ļ.	66.0
Vehicle Noise:	75	.0	73.2		70.2		65.4		74.0	)	74.4
Centerline Distan	ce to Noise Co	ontour (in feet	)								
				-	dBA	65 di		e	60 dBA		5 dBA
					<u> </u>	198			426		917
			Ldn:	9	2	198	•		420		517

	FHWA	A-RD-77-108 HIG	HWAY N	IOISE PF	REDICTIO	N MODEL	-		
Road Nam	io: OY 2019 With le: Main St. nt: s/o Columbia				Project N Job Nur	ame: Nort nber: 111			
SITE	SPECIFIC INP	UT DATA			NO	ISE MOD	DEL INPUT	'S	
Highway Data				Site Con	ditions (H	lard = 10,	Soft = 15)		
• •	Traffic (Adt): 42					Auto			
	Percentage:	10%			dium Truc		-, -		
		,200 vehicles		He	avy Trucks	s (3+ Axle	s <i>):</i> 15		
	hicle Speed:	50 mph	1	Vehicle I	Mix				
Near/Far La	ne Distance:	36 feet		Veh	icleType	Day	Evening	Night	Daily
Site Data						tos: 77.5	5% 12.9%	9.6%	
Bai	rrier Height:	0.0 feet		Me	edium Truc	cks: 84.8	3% 4.9%	10.3%	1.84%
Barrier Type (0-W	'all, 1-Berm):	0.0		F	leavy Truc	cks: 86.5	5% 2.7%	10.8%	0.74%
Centerline Dis	st. to Barrier:	50.0 feet	-	Noise Sr	ource Elev	ations (in	i feet)		
Centerline Dist.	to Observer:	50.0 feet	-		Autos:	0.000			-
Barrier Distance		0.0 feet		Mediur	n Trucks:	2.297			
Observer Height (	Above Pad):	5.0 feet			y Trucks:	8.006	Grade Ac	liustment	0.0
Pa	ad Elevation:	0.0 feet	_		,				
	ad Elevation:	0.0 feet	1	Lane Eq	uivalent D		in feet)		
1	Road Grade:	0.0%			Autos:	46.915			
		-90.0 degrees			n Trucks:	46.726 46.744			
	Right View:	90.0 degrees		neav	y Trucks:	40.744			
FHWA Noise Mode					<u> </u>				•
VehicleType Autos:	REMEL 7 70.20	Traffic Flow Di 3.82	stance 0.3	Finite	-1.20	Fresnel -4.6	Barrier At		m Atten
Autos: Medium Trucks:	70.20	-13.41	0.34		-1.20	-4.0		000 000	0.000
Heavy Trucks:	81.00	-13.41	0.34		-1.20	-4.8		000	0.000
					-1.20	-0.4		000	0.000
Unmitigated Noise VehicleType	Leg Peak Hour	Leq Day	Leq E		Leg Ni	aht	Ldn	0	NEL
Autos:	73.1	71.2	LOY LI	69.5	Login	63.4	72		72.6
Medium Trucks:	66.7	65.2		58.9		57.3	65.	-	66.0
Heavy Trucks:	67.1	65.7		56.7		57.9	66.		66.4
Vehicle Noise:	74.8	73.1		70.0		65.3	73.	-	74.3
Centerline Distant	ce to Noise Con	tour (in feet)							
			70 c	1BA	65 dE	BA	60 dBA	55	dBA
		Ldn:	9	0	193		416	. 8	97
		CNEL:	9	6	208		447	g	64

Monday, June 18, 2018

	FHW	A-RD-77-108	HIGH	IWAY N	IOISE PF	REDICTIO	N MO	DEL			
Scenario: OY 2	019 Wi	th Project				Project N	ame:	Northg	ate		
Road Name: Main	St.					Job Nur	nber:	11145			
Road Segment: n/o S	trong S	t.									
SITE SPECIF	IC INF	PUT DATA								s	
Highway Data				4	Site Con	ditions (H	lard =	10, Sc	oft = 15)		
Average Daily Traffic (/	( <i>dt):</i> 42	2,100 vehicle	s					Autos:	15		
Peak Hour Percent	•	10%				dium Truc		/	15		
Peak Hour Volu		4,210 vehicle	s		Hea	avy Truck	s (3+ A	(xles)	15		
Vehicle Sp		45 mph			Vehicle I	/ix					
Near/Far Lane Dista	nce:	36 feet			Vehi	cleType		Day	Evening	Night	Daily
Site Data						Au	tos:	77.5%	12.9%	9.6%	97.42%
Barrier Hei	aht:	0.0 feet			Me	dium True	cks:	84.8%	4.9%	10.3%	1.84%
Barrier Type (0-Wall, 1-Be	rm):	0.0			H	leavy Tru	cks:	86.5%	2.7%	10.8%	0.74%
Centerline Dist. to Ba		50.0 feet		7	Noise So	urce Elev	ation	s (in fe	et)		
Centerline Dist. to Obse		50.0 feet				Autos:	0.0	000			
Barrier Distance to Obse		0.0 feet			Mediur	n Trucks:	2.3	297			
Observer Height (Above F		5.0 feet			Heav	y Trucks:	8.0	006	Grade Ad	justment	0.0
Pad Eleva		0.0 feet		H	lono Em	ivalent D	latan	aa (in j	[0.04]		
Road Eleva Road Gr		0.0 feet		Ľ.	Lane Equ	Autos:	46.		eel)		
Road Gr		0.0%			Modium	n Trucks:	46.				
Right V		-90.0 degre 90.0 degre				y Trucks:	46. 46.				
FHWA Noise Model Calcu	lations	-									
VehicleType REM	EL	Traffic Flow	Dis	stance	Finite	Road	Fresr	iel	Barrier Att	en Be	rm Atten
Autos:	68.46	4.29		0.3	1	-1.20		-4.65	0.0	000	0.00
Medium Trucks:	79.45	-12.95		0.34	4	-1.20		-4.87	0.0	000	0.00
Heavy Trucks:	84.25	-16.90		0.34	4	-1.20		-5.43	0.0	000	0.00
Unmitigated Noise Levels			barrie	er atten	uation)						
VehicleType Leq Pea				Leq E	/ening	Leq Ni			Ldn		NEL
Autos:	71.9	-	70.0		68.2		62.1		70.8	-	71.
Medium Trucks:	65.6	-	64.1		57.8		56.2		64.7		64.9
Heavy Trucks:	66.5		65.1		56.0		57.3		65.6		65.
Vehicle Noise:	73.7		72.0		68.8		64.1		72.7	1	73.
Centerline Distance to No	ise Co	ntour (in feet	<i>)</i>	70		65 -15					dD A
				70 0	IBA	65 dE	A	1 6	0 dBA	1 55	dBA
			1		-				050		7.5.4
			Ldn: NFL:	7		163			350 376		754 309

Barrier Height:         0.0 feet           Barrier Type (0-Wall, 1-Berm):         0.0           Centerline Dist. to Barrier:         50.0 feet           Centerline Dist. to Observer:         50.0 feet           Barrier Height:         0.0 feet           Barrier Joist to Observer:         50.0 feet           Barrier Distance to Observer:         0.0 feet           Pad Elevation:         0.0 feet           Road Elevation:         0.0 feet           Road Grade:         0.0%           Left View:         -90.0 degrees           Right View:         90.0 degrees           Right View:         90.0 degrees           Redum Trucks:         26.73           Redum Trucks:         46.726           Heavy Trucks:         46.726           Heavy Trucks:         46.726           Noise Model Calculations         Medium Trucks:           VehicleType         REMEL         Traffic Flow           VehicleType         Leq Value         1.20           Medium Trucks:         77.97         14.46           0.34         -1.20         -5.43           Medium Trucks:         59.4         57.9           1.6         50.0         50.4           Medi				DEL	N MOI	REDICTIO	NOISE PR	IGHWAY	RD-77-108 H	FHW	
SITE SPECIFIC INPUT DATA         NOISE MODEL INPUTS           Highway Data         Site Conditions (Hard = 10, Soft = 15)         Average Daily Traffic (Adt): 41,000 vehicles         Autos: 15           Peak Hour Percentage:         10%         Medium Trucks (2 AVes): 15         Heavy Trucks: (3 + Axles): 15           Peak Hour Volume:         4,100 vehicles         Heavy Trucks: (3 + Axles): 15         Vehicle Speed:         25 mph           Near/Far Lane Distance:         36 feet         Vehicle Mix         Vehicle Type         Day         Evening         Night           Site Data         Autos:         77.5%         12.9%         9.6%           Barrier Height:         0.0 feet         Autos:         Tr.5%         12.9%         9.6%           Barrier Type (O-Wall, 1-Berm):         0.0 feet         Medium Trucks:         84.8%         4.9%         10.3%           Barrier Distance to Observer:         50.0 feet         Autos:         0.000         Medium Trucks:         2.297           Observer Height (Move Pad):         5.0 feet         Heavy Trucks:         8.006         Grade Adjustmen           Road Grade:         0.0%         Left View:         9.00 degrees         Heavy Trucks:         46.726           Hight View:         90.0 degrees         Right View:         90.01			ate						Project	Main St.	Road Nam
Highway Data         Site Conditions (Hard = 10, Soft = 15)           Average Daily Traffic (Adt): 41,000 vehicles         Autos: 16 × 160           Peak Hour Procentage: 10%         Medium Trucks (2 Avles): 15           Peak Hour Volume: 4,100 vehicles         Heavy Trucks: (3+ Avles): 15           Vehicle Speed: 25 mph         Heavy Trucks: (3+ Avles): 15           Near/Far Lane Distance: 36 feet         Vehicle Mix           Ste Data         Vehicle Mix           Ste Data         0.0 feet           Barrier Height: 0.0 feet         Medium Trucks: 84.8%         4.9%         10.3%           Barrier Josit. to Barrier: 50.0 feet         Moise Source Elevations (in feet)         0.8%         2.7%         10.8%           Centerline Dist. to Observer: 50.0 feet         Madium Trucks: 2.297         Medium Trucks: 2.297         Medium Trucks: 46.726         10.8%           Road Grade: 0.0%         Lane Equivalent Distance (n feet)         10.6         10.6         10.8%         10.0%         10.8%           FHWA Noise Model Calculation:         0.0 feet         Medium Trucks: 46.726         10.8%         10.8%           Road Grade: 0.0%         Grade: 0.0%         Heavy Trucks: 46.726         10.9%         10.0%           Road Grade: 0.0%         Medium Trucks: 46.726         10.0%         10.0%         10.0% </th <th></th> <th><u> </u></th> <th></th> <th></th> <th></th> <th>NO</th> <th></th> <th></th> <th></th> <th>•</th> <th>•</th>		<u> </u>				NO				•	•
Average Daily Traffic (Ad): 41,000 vehicles Peak Hour Potreentage: 10%         Autos: 15           Peak Hour Potreentage: 10%         Medium Trucks (2 Axles): 15           Peak Hour Voltree: 4,100 vehicles Vehicle Speed: 25 mph Near/Far Lane Distance: 36 feet         Medium Trucks (2 Axles): 15           Site Data         Vehicle Type         Day           Barrier Height: 0.0 feet Centerline Dist. to Dserver: 50.0 feet         Medium Trucks: 24.8% 4.9% 10.3%           Barrier Type (0-Wall, 1-Berm): 0.0         Noise Source Elevations (in feet)           Centerline Dist. to Dserver: 50.0 feet         Noise Source Elevations (in feet)           Barrier Type (0-Wall, 1-Berm): 0.0 feet         Medium Trucks: 24.89.15           Pad Elevation: 0.0 feet         Medium Trucks: 24.9.15           Road Elevation: 0.0 feet         Medium Trucks: 46.9.15           Road Grade: 0.0%         Autos: 46.726           Heavy Trucks: 46.726         Heavy Trucks: 46.744           FHWA Noise Model Calculations         Vehicle Type           Vehicle Type         REMEL         Traffic Flow           Vehicle Type         REMEL         Traffic Flow           Vehicle Type         Cervels (without Topo and barrier attenuation)           Vehicle Type         Leq Day         Leq Newing           Vehicle Type         Leg Day         Leg Revening         Leg Vening     <		5					Site Con		DATA	PECIFIC INP	
Peak Hour Percentage:         10%         Medium Trucks (2 Axles):         15           Peak Hour Volume:         4,100 vehicles         Heavy Trucks (3+ Axles):         15           Vehicle Speed:         25 mph         Vehicle Mix         Deg         Evening         Night           Site Data         Autos:         77.5%         12.9%         9.6%           Barrier Height:         0.0 feet         Autos:         77.5%         12.9%         9.6%           Barrier Type (0-Wall, 1-Berm):         0.0         feet         Noise Source Elevations (in feet)         0.0%           Centerline Dist. to Desriver:         50.0 feet         Noise Source Elevations (in feet)         Autos:         0.000           Barrier Height:         0.0 feet         Autos:         0.000         Medium Trucks:         2.97           Observer Height (Above Pad):         5.0 feet         Medium Trucks:         2.93         Medium Trucks:         46.915           Road Elevation:         0.0 feet         Lane Equivalent Distance (in feet)         Autos:         46.726           Road Grade:         0.0%         Left View:         90.0 degrees         Heavy Trucks:         46.744           FHWA Noise Model Calculations         Vehicle Type         REMEL         Traffic Flow         Distance						uluolis (l	Sile Con				* /
Peak Hour Volume:         4,100         vehicles         Heavy Trucks (3+ Axles):         15           Vehicle Speed:         25         mph         Vehicle Mix         Vehicle Mix         Vehicle Type         Day         Evening         Night           Site Data         Barrier Height:         0.0 feet         Madio::         77.5%         12.9%         9.6%           Barrier Type (0-Wail, 1-Berm):         0.0         feet         Medium Trucks:         84.8%         4.9%         10.3%           Centerline Dist. to Dserver:         50.0 feet         Moise Source Elevations (in feet)         Oo         Moise Source Elevations (in feet)         Autos:         77.5%         12.9%         9.6%           Centerline Dist. to Observer:         50.0 feet         Moise Source Elevations (in feet)         Moise Source Elevations (in feet)         Autos:         7.7%         10.8%           Road Grade::         0.0%         Left View:         -90.0 degrees         Heavy Trucks:         46.726         Heavy Trucks:         46.726           FHWA Noise Model Calculations         Vehicle Type         Traffic Flow         Distance         Finite Road         Fresnet         Barrier Atten         Be           Autos:         58.73         6.73         0.31         -1.20         -4.65         <										. ,	• •
Vehicle Speed:         25 mph           Near/Far Lane Distance:         36 feet           Vehicle Type         Day         Evening         Night           Site Data         Autos:         77.5%         12.9%         9.6%           Barrier Height:         0.0 feet         Medium Trucks:         84.8%         4.9%         10.3%           Barrier Type (0-Wall, 1-Berrn):         0.0         Medium Trucks:         84.8%         4.9%         10.3%           Centerline Dist. to Darrier:         50.0 feet         Autos:         0.000         Medium Trucks:         86.5%         2.7%         10.8%           Diserver Height (Above Pad):         5.0 feet         Autos:         0.000         Medium Trucks:         8.006         Grade Adjustmen           Road Elevation:         0.0 feet         Medium Trucks:         46.915         Medium Trucks:         46.915           Road Grade:         0.0%         Medium Trucks:         46.726         Heavy Trucks:         46.915           VehicleType         REMEL         Triffic Flow         Distance         Finite Road         Fresnel         Barrier Attern         Be           Watious:         58.73         6.73         0.31         -1.20         -4.65         0.000											
Near/Far Lane Distance:         36 feet         VehicleType         Day         Evening         Night           Site Data         VehicleType         Day         Evening         Night           Barrier Type (0-Wall, 1-Berm):         0.0 feet         Autos:         7.5%         12.9%         9.6%           Barrier Type (0-Wall, 1-Berm):         0.0         Medium Trucks:         84.8%         4.9%         10.3%           Centerline Dist. to Diserver:         50.0 feet         Moise Source Elevations (in feet)         0.0%           Barrier Type         Contextion:         0.0 feet         Autos:         0.000         Medium Trucks:         8.06         Grade Adjustmen           Pad Elevation:         0.0 feet         Heavy Trucks:         8.006         Grade Adjustmen           Road Grade:         0.0%         Medium Trucks:         46.915         Medium Trucks:         46.915           VehicleType         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Be           VehicleType         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Be           VehicleType         Leq Veix         77.97         14.46         0.34			15	Axles):	s (3+ A	avy Truck	He				
Barrier Height:         0.0 feet         Day         Devince Type         Devince Type         Day         Devince Type         Devince Type <thdevince th="" type<="">         Devince Type         Dev</thdevince>						Nix	Vehicle I				
Barrier Height:         0.0 feet         Medium Trucks:         84.8%         4.9%         10.3%           Barrier Type (0-Wall, 1-Berm):         0.0         10.4         Heavy Trucks:         86.5%         2.7%         10.8%           Centerline Dist. to Dbserver:         50.0 feet         Moles Source Elevations (in feet)         Noise Source Elevations (in feet)         Noise Source Elevations (in feet)         Medium Trucks:         2.297         Heavy Trucks:         8.006         Grade Adjustmen           Pad Elevation:         0.0 feet         Autos:         0.0 feet         Autos:         4.0%         1.0%           Road Grade:         0.0%         Left View:         -90.0 degrees         Heavy Trucks:         46.726         Heavy Trucks:         46.726           FHWA Noise Model Calculations         VehicleType         REMEL         Traffic Flow         Distance         Finite Road         Fresnet         Barrier Atten         Be           Autos:         58.73         6.73         0.31         -1.20         -4.65         0.000           Medium Trucks:         77.97         -14.46         0.34         -1.20         -5.43         0.000           Unnitigated Noise Levels (without Topo and barrier attenuation)         Vehicle Noise:         67.5         65.8         61.9	Daily	Night	Evening	Day		cleType	Vehi		36 feet	Distance:	Near/Far Lar
Damer Taylin.         Out feet           Barrier Type (Or-Well, 1-Berm):         0.0           Centerline Dist. to Diserver:         50.0 feet           Centerline Dist. to Observer:         50.0 feet           Diserver Height (Above Pad):         5.0 feet           Pad Elevation:         0.0 feet           Road Elevation:         0.0 feet           Road Grade:         0.0%           Left View:         90.0 degrees           Right View:         90.0 degrees           VehicleType         REMEL           VehicleType         REMEL           VehicleType         REMEL           VehicleType         REMEL           VehicleType         REMEL           VehicleType         REMEL           VehicleType         Remer Targefic Flow           Distance         Finite Road           Heavy Trucks:         67.3           0.34         -1.20           -4.65         0.000           Medium Trucks:         70.80           -10.51         0.34           -1.20         -4.65           0.000         -5.43           Use Levels (without Topo and barrier attenuation)           VehicleType         Leq Day	6 97.429	9.6%	12.9%	77.5%	itos:	Au					Site Data
Barrier Type (0-Wall, 1-Berm):         0.0         Heavy Trucks:         86.5%         2.7%         10.8%           Centerline Dist. to Desrver:         50.0 feet         Noise Source Elevations (in feet)         Autos:         0.00           Desrver Height (Above Pad):         5.0 feet         Autos:         2.7%         10.8%           Pad Elevation:         0.0 feet         Autos:         2.7%         10.8%           Road Grade:         0.0 feet         Autos:         4.00%         Grade Adjustmen           Left View:         90.0 degrees         Medium Trucks:         4.6.915         Medium Trucks:         4.6.726           FHWA Noise Model Calculations:         Frinite Road         Fresnel         Barrier Atten         Berrier Atten         Berrier Atten           Vehicle Type         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Berrier Atten           Wehicum Trucks:         70.80         -10.51         0.34         -1.20         -4.65         0.000           Medium Trucks:         70.80         -10.51         0.34         -1.20         -5.43         0.000           Unnitigated Noise Levels (without Topo and barrier attenuation)         Vehicle Noise:         64.6         62.7         60	6 1.849	10.3%	4.9%	84.8%	cks:	dium True	Me		0 feet	or Hoiaht	Bar
Centerline Dist. to Barrier:         50.0 feet         Noise Source Elevations (in feet)           Centerline Dist. to Observer:         50.0 feet         Autos:         0.000           Barrier Distance to Observer:         0.0 feet         Medium Trucks:         2.297           Observer Height (Above Pad):         5.0 feet         Medium Trucks:         2.297           Pad Elevation:         0.0 feet         Medium Trucks:         8.006         Grade Adjustment           Road Grade:         0.0%         Autos:         46.915         Medium Trucks:         46.726           Left View:         -90.0 degrees         Medium Trucks:         46.726         Medium Trucks:         46.744           FHWA Noise Model Calculations         Vehicle Type         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Be           Vehicle Type         RMEL         Traffic Flow         Distance         4.120         -5.43         0.000           Medium Trucks:         77.97         -14.46         0.34         -1.20         -4.65         0.000           Umitigated Noise Levels (without Topo and barrier attenuation)         Leq Pay         Leq Pay         Leq Row         0.63.5           Medium Trucks:         64.6	6 0.749	10.8%	2.7%	86.5%	cks:	leavy Tru	ŀ			•	
Noise Source Levations (in feet)           Barrier Distance to Observer:         50.0 feet           Barrier Distance to Observer:         0.0 feet           Deserver Height (Above Pad):         5.0 feet           Pad Elevation:         0.0 feet           Road Elevation:         0.0 feet           Road Elevation:         0.0 feet           Road Grade:         0.0%           Left View:         -90.0 degrees           Right View:         90.0 degrees           Right View:         90.0 degrees           Right View:         90.0 degrees           Heavy Trucks:         46.726           Heavy Trucks:         77.97           14.46         0.34         -1.20           Autos:         58.73         6.73         0.31           VehicleType         REMEL         Traffic Flow         Distance           Junititigated Noise Levels (without Topo and barrier attenuation)         -5.43         0.000           Umititigated Noise:         64.6         62.7         60.9         54.9         63.5           Medium Trucks:         59.4         57.9         51.6         50.0         58.5           Heavy Trucks:         62.6         61.2         52.2         53.4 <t< td=""><td></td><td></td><td></td><td></td><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td></t<>						-					
Barrier Distance to Observer:         0.0 feet         Autos:         0.000           Observer Height (Above Pad):         5.0 feet         Medium Trucks:         2.97           Pad Elevation:         0.0 feet         Heavy Trucks:         8.006         Grade Adjustmen           Road Elevation:         0.0 feet         Lane Equivalent Distance (in feet)         Image: Comparison of the			eet)				Noise Sc				
Observer Height (Above Pad):         5.0 feet         Madium Trucks:         2.297           Pad Elevation:         0.0 feet         Heavy Trucks:         8.006         Grade Adjustment           Road Grade:         0.0 feet         Lane Equivalent Distance (in feet)         Autos:         46.915           Left View:         -90.0 degrees         Medium Trucks:         46.726         Heavy Trucks:         46.726           FHWA Noise Model Calculations         VehicleType         ReMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Bee           VehicleType         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Bee           Medium Trucks:         70.80         -10.51         0.34         -1.20         -4.65         0.000           Medium Trucks:         77.97         -14.46         0.34         -1.20         -5.43         0.000           Umitigiated Moise Levets (without Topo and barrier attenuation)         Ueq Day         Leq Revening         Leq Night         Ldn         CC           Autos:         64.6         62.7         60.9         54.9         63.5         Medium Trucks:         54.5           Medium Trucks:											
Pad Elevation:         0.0 feet         Heavy Trucks:         8.006         Grade Adjustment           Road Elevation:         0.0 feet         Lane Equivalent Distance (in feet)         Lane Equivalent Distance (in feet)           Road Grade:         0.0%         Autos:         46.915         Medium Trucks:         46.726           FHWA Noise Model Calculations         Vehicle Type         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Be           Autos:         58.73         6.73         0.31         -1.20         -4.65         0.000           Medium Trucks:         70.80         -10.51         0.34         -1.20         -4.65         0.000           Unnitigated Noise Levels (without Topo and barrier attenuation)         VehicleType         Leq Day         Leq Evening         Leq Night         Ldn         C           Autos:         59.4         57.9         51.6         50.0         58.5           Medium Trucks:         67.5         65.8         61.9         58.0         66.5			~ · · ·								
Road Elevation:         0.0 feet         Lane Equivalent Distance (in feet)           Road Grade:         0.0%         Autos:         46.915           Left View:         -90.0 degrees         Medium Trucks:         46.726           FHWA Noise Model Calculations         Heavy Trucks:         46.744           FHWA Noise Model Calculations         Distance         Finite Road         Freshel           VehicleType         REMEL         Traffic Flow         Distance         Finite Road         Freshel           Autos:         58.73         6.73         0.31         -1.20         -4.65         0.000           Medium Trucks:         70.80         -10.51         0.34         -1.20         -5.43         0.000           Unnitigated Noise Levels (without Topo and barrier attenuation)         Vehicle Type         Leq Day         Leq Day         Leq Neing         Log         Autos:         64.5           Medium Trucks:         69.4         57.9         51.6         50.0         68.5         Filewy Trucks:         59.4         57.9         51.8         50.0         68.5           Medium Trucks:         69.4         57.9         51.6         50.0         68.5         50.0         58.5           Medium Trucks:         62.6	t: 0.0	justment:	Grade Adj	006	8.0	y Trucks:	Heav			,	0,
Road Grade:         0.0%         Autos:         46.915           Left View:         -90.0 degrees         Medium Trucks:         46.726           Heavy Trucks:         46.726         Heavy Trucks:         46.744           FHWA Noise Model Calculations         VehicleType         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Be           VehicleType         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Be           Medium Trucks:         70.80         -10.51         0.34         -1.20         -4.65         0.000           Medium Trucks:         77.97         -14.46         0.34         -1.20         -5.43         0.000           Unmitigated Noise Levels (without Topo and barrier attenuation)         VehicleType         Leq Peak Hour         Leq Day         Leq Evening         Leq Night         Ldn         CC           Autos:         64.6         62.7         60.9         54.9         63.5           Medium Trucks:         59.4         57.9         51.6         50.0         58.5           Heavy Trucks:         62.6         61.2         52.2         53.4         61.8           <			feet)	ce (in	Distand	uivalent D	Lane Eq				
Left View:         -90.0 degrees         Medium Trucks:         46.726           Right View:         90.0 degrees         Heavy Trucks:         46.726           FHWA Noise Model Calculations         Heavy Trucks:         46.744           Vehicle Type         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Barrier Atten </td <td></td> <td></td> <td>,</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>			,								
Right View:         90.0 degrees         Heavy Trucks:         46.744           FHWA Noise Model Calculations         VenicleType         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Be           Autos:         58.7         6.73         0.31         -1.20         -4.65         0.000           Medium Trucks:         70.80         -10.51         0.34         -1.20         -4.67         0.000           Heavy Trucks:         77.97         -14.46         0.34         -1.20         -5.43         0.000           Unnitigated Noise Levels (without Topo and barrier attenuation)         VehicleType         Leq Day         Leq Revining         Leq Night         Ldn         C           Autos:         64.6         62.7         60.9         54.9         63.5           Medium Trucks:         59.4         57.9         51.6         50.0         58.5           Medium Trucks:         59.4         57.9         51.6         50.0         58.5           Vehicle Noise:         67.5         65.8         61.9         58.0         66.5				726	46.7	n Trucks:	Mediur		0.0 dearees	Left View:	
VehicleType         REMEL         Traffic Flow         Distance         Finite Road         Fresnet         Barrier Atten         Be           Autos:         58.73         6.73         0.31         -1.20         -4.65         0.000           Medium Trucks:         70.80         -10.51         0.34         -1.20         -4.67         0.000           Heavy Trucks:         77.97         -14.46         0.34         -1.20         -5.43         0.000           Unnitigated Noise Levels (without Topo and barrier attenuation)         Leq Night         Ldn         C         C           VehicleType         Leg Peak Hour         Leg Day         Leg Vening         Leq Night         Ldn         C           Autos:         64.6         62.7         60.9         54.9         63.5           Medium Trucks:         59.4         57.9         51.6         50.0         58.5           Heavy Trucks:         62.6         61.2         52.2         53.4         61.8           Vehicle Noise:         67.5         65.8         61.9         58.0         66.5				.744	46.	y Trucks:	Heav		0	Right View:	
Autos:         58.73         6.73         0.31         -1.20         -4.65         0.000           Medium Trucks:         70.80         -10.51         0.34         -1.20         -4.87         0.000           Heavy Trucks:         77.97         -14.46         0.34         -1.20         -5.43         0.000           Unmitigated Moise Levels (without Topo and barrier attenuation)         VehicleType         Leq Peak Hour         Leq Day         Leq Evening         Leq Night         Ldn         C           Autos:         64.6         62.7         60.9         54.9         63.5         Medium Trucks:         59.4         57.9         51.6         50.0         58.5           Heavy Trucks:         62.6         61.2         52.2         53.4         61.8         64.5											FHWA Noise Mode
Medium Trucks:         70.80         -10.51         0.34         -1.20         -4.87         0.000           Heavy Trucks:         77.97         -14.46         0.34         -1.20         -5.43         0.000           Unnitigated Noise Levels (without Topo and barrier attenuation)         VehicleType         Leq Day         Leq Kening         Leq Night         Ldn         C           Autos:         64.6         62.7         60.9         54.9         63.5           Medium Trucks:         59.4         57.9         51.6         50.0         58.5           Heavy Trucks:         62.6         61.2         52.2         53.4         61.8           Vehicle Noise:         67.5         65.8         61.9         58.0         66.5	erm Atter	en Ber	Barrier Atte	nel	Fresn	Road	Finite	Distance	ffic Flow	REMEL	VehicleType
Heavy Trucks:         77.97         -14.46         0.34         -1.20         -5.43         0.000           Unmitigated Noise Levels (without Topo and barrier attenuation)         Leq Neght         Leq Neght         Leq Neght         63.5           Vehicle Type         Leq Peak Hour         Leq Day         Leq Vening         Leq Night         Ldn         0.00           Matos:         64.6         62.7         60.9         54.9         63.5           Medium Trucks:         59.4         57.9         51.6         50.0         58.5           Heavy Trucks:         62.6         61.2         52.2         53.4         61.8           Vehicle Noise:         67.5         65.8         61.9         58.0         66.5	0.00						• ·			58.73	
Unmitigated Noise Levels (without Topo and barrier attenuation)           VehicleType         Leq Peak Hour         Leq Day         Leq Evening         Leq Night         Ldn         CC           Autos:         64.6         62.7         60.9         54.9         63.5           Medium Trucks:         59.4         57.9         51.6         50.0         58.5           Heavy Trucks:         62.6         61.2         52.2         53.4         61.8           Vehicle Noise:         67.5         65.8         61.9         58.0         66.5	0.00										
VehicleType         Leq Peak Hour         Leq Day         Leq Vehicle         Leq Night         Ldn         CC           Autos:         64.6         62.7         60.9         54.9         63.5           Medium Trucks:         59.4         57.9         51.6         50.0         58.5           Heavy Trucks:         62.6         61.2         52.2         53.4         61.8           Vehicle Noise:         67.5         65.8         61.9         58.0         66.5	0.00	000	0.0	-5.43		-1.20	34	0.	-14.46	77.97	Heavy Trucks:
Autos:         64.6         62.7         60.9         54.9         63.5           Medium Trucks:         59.4         57.9         51.6         50.0         58.5           Heavy Trucks:         62.6         61.2         52.2         53.4         61.8           Vehicle Noise:         67.5         65.8         61.9         58.0         66.5							<u></u>				
Medium Trucks:         59.4         57.9         51.6         50.0         58.5           Heavy Trucks:         62.6         61.2         52.2         53.4         61.8	CNEL					Leq Ni					
Heavy Trucks:         62.6         61.2         52.2         53.4         61.8           Vehicle Noise:         67.5         65.8         61.9         58.0         66.5	64	-		-					-		
Vehicle Noise: 67.5 65.8 61.9 58.0 66.5	58.										
	61.	-									
Centerline Distance to Noise Contour (in feet)	66	5	66.5	0	58.0		61.9	5.8	-		
	5 dBA	FE	O dBA	4	24	65 45	dBA	7/	ur (in feet)	to Noise Cor	Centerline Distand
	291										
	309										

	FH\	WA-RD-77-108	HIGHV	VAY NO	DISE PI	REDICTIO	ON MO	DDEL			
	rio: OY 2019 V	/ith Project				Project I			ate		
	ne: Main St.	-				Job Nu	imber:	11145			
Road Segme	nt: n/o Russel	I St.									
	SPECIFIC IN	IPUT DATA								S	
Highway Data				S	ite Con	ditions (	Hard :		,		
, ,	, ,	23,300 vehicles	S					Autos:	15		
	Percentage:	10%				dium Tru			15		
	our Volume:	2,330 vehicles	s		He	avy Truci	ks (3+	Axles):	15		
	hicle Speed:	35 mph		V	ehicle l	Mix					
Near/Far La	ne Distance:	36 feet			Veh	icleType		Day	Evening	Night	Daily
Site Data						A	utos:	77.5%	12.9%	9.6%	97.429
Ra	rrier Heiaht:	0.0 feet			Me	edium Tru	ucks:	84.8%	4.9%	10.3%	1.84%
Barrier Type (0-V		0.0			ŀ	Heavy Tru	ucks:	86.5%	2.7%	10.8%	0.74%
Centerline Di	st. to Barrier:	50.0 feet			laisa Sr	ource Ele	watio	ne (in fe	of)		
Centerline Dist.	to Observer:	50.0 feet		~	0136 30	Autos		.000	el)		
Barrier Distance	to Observer:	0.0 feet			Modiuu	m Trucks		.000			
Observer Height	(Above Pad):	5.0 feet				v Trucks		.006	Grade Ad	iustment	0.0
P	ad Elevation:	0.0 feet								lounom	0.0
Ro	ad Elevation:	0.0 feet		L	ane Eq	uivalent	Distar	nce (in f	feet)		
	Road Grade:	0.0%				Autos		.915			
	Left View:	-90.0 degree	es			m Trucks		.726			
	Right View:	90.0 degree	es		Heav	ry Trucks	: 46	.744			
FHWA Noise Mod	el Calculation	s									
VehicleType	REMEL	Traffic Flow	Dista	ance	Finite	Road	Fres	nel	Barrier Att	en Ber	m Atter
Autos:		2.81		0.31		-1.20		-4.65		000	0.00
Medium Trucks:		-14.42		0.34		-1.20		-4.87		000	0.00
Heavy Trucks:	81.57	-18.38		0.34		-1.20		-5.43	0.0	000	0.00
Unmitigated Nois	e Levels (with	out Topo and	barrier	attenu	uation)						
VehicleType	Leq Peak Ho	ur Leq Day	' I	Leq Eve	ening	Leq N	light		Ldn		VEL
Autos:	66		64.3		62.6		56.	-	65.1		65.
Medium Trucks:			59.0		52.6		51.	-	59.5	-	59.
Heavy Trucks:			60.9		51.9		53.		61.5		61.
Vehicle Noise:	68	1.5	66.7		63.3		58.	9	67.4	1	67.
Centerline Distan	ce to Noise C	ontour (in feet	)								
				70 di		65 d		6	i0 dBA		dBA
			Ldn:	34		73	-		157	3	38
			VFI :	36		78			168		61

	FHW	A-RD-77-108 I	HIGHW	AY NO	OISE P	REDICT	TION MO	DEL			
Scenario: OY 2 Road Name: Mair Road Segment: s/o F	St.	,					t Name:   Number:				
SITE SPECI	FIC INP	PUT DATA							L INPUT	S	
Highway Data				S	ite Cor	ditions	; (Hard =	10, S	oft = 15)		
Average Daily Traffic (	Adt): 21	,600 vehicles						Autos:	15		
Peak Hour Percent	tage:	10%			Me	dium Ti	rucks (2 A	(xles)	15		
Peak Hour Vol	ume: 2	2,160 vehicles			He	avy Tru	icks (3+ A	(xles).	15		
Vehicle Sp	eed:	35 mph		v	ehicle	Miv					
Near/Far Lane Dista	nce:	36 feet				icleTyp	e	Dav	Evening	Night	Daily
Site Data								77.5%	•	9.6%	
Barrier He	iaht:	0.0 feet			м	edium T	rucks:	84.8%	4.9%	10.3%	6 1.84
Barrier Type (0-Wall, 1-Be		0.0				Heavy T	rucks:	86.5%	2.7%	10.8%	6 0.74
Centerline Dist. to Ba	rrier:	50.0 feet		N	loise S	ource E	levation	s (in f	eet)		
Centerline Dist. to Obse	rver:	50.0 feet		-		Auto		000			
Barrier Distance to Obse	rver:	0.0 feet			Mediu	m Truck		297			
Observer Height (Above H	Pad):	5.0 feet				v Truck		006	Grade Ad	iustmen	t: 0.0
Pad Eleva	ation:	0.0 feet							,		
Road Eleva	ation:	0.0 feet		L	ane Eq	uivalen	t Distan	ce (in	feet)		
Road Gi	rade:	0.0%				Auto	os: 46.	915			
Left	/iew:	-90.0 degrees				m Truck					
Right \	/iew:	90.0 degrees	S		Heav	ry Truck	ks: 46.	744			
FHWA Noise Model Calcı											
VehicleType REM		Traffic Flow	Dista			Road	Fresh	-	Barrier Att		erm Atter
Autos:	64.30	2.48		0.31		-1.20		-4.65		000	0.0
Medium Trucks:	75.75	-14.75		0.34		-1.20		-4.87		000	0.00
Heavy Trucks:	81.57	-18.71		0.34		-1.20		-5.43	0.0	000	0.0
Unmitigated Noise Levels											
VehicleType Leq Pe Autos:	ak Hour 65.9		4.0	eq Ev	ening 62.2	Leq	Night 56.2		Ldn 64.8		NEL 65
Autos: Medium Trucks:	60.1		4.0 8.6		52.3		50.2		64.6 59.2		59
Heavy Trucks:	62.0	-	0.0 0.6		51.5		52.8		61.1	-	61
Vehicle Noise:	68.1		6.4		63.0		58.6		67.1		67
Centerline Distance to No	oise Con	ntour (in feet)									
				70 di			dBA		60 dBA		5 dBA
			dn:	32			69		149		321
		CN	EL:	34			74		159		343

Monday, June 18, 2018

Monday, June 18, 2018

Monday, June 18, 2018

	FH\	NA-RD-77-108 H	IIGHWAY	NOISE P	REDICTION	N MODEL		
Scenar	io: OY 2019 W	/ith Project			Project Na	ame: Northg	gate	
	ne: Orange St.				Job Num	nber: 11145		
Road Segme	nt: n/o Columb	bia Av.						
	SPECIFIC IN	IPUT DATA					L INPUTS	;
Highway Data				Site Cor	nditions (H	ard = 10, S	oft = 15)	
Average Daily	Traffic (Adt):	4,800 vehicles				Autos:	15	
Peak Hour	Percentage:	10%				(s (2 Axles)		
Peak F	lour Volume:	480 vehicles		He	eavy Trucks	(3+ Axles):	: 15	
	hicle Speed:	35 mph		Vehicle	Mix			-
Near/Far La	ne Distance:	12 feet		Veh	icleType	Day	Evening	Night Daily
Site Data					Aut	os: 77.5%	6 12.9%	9.6% 97.42%
Ba	rrier Height:	0.0 feet		М	edium Truc	ks: 84.8%	6 4.9%	10.3% 1.84%
Barrier Type (0-W	•	0.0			Heavy Truc	ks: 86.5%	6 2.7%	10.8% 0.74%
Centerline Di		33.0 feet		Noise S	ource Elev	ations (in f	eet)	-
Centerline Dist.		33.0 feet			Autos:	0.000	,	
Barrier Distance		0.0 feet		Mediu	m Trucks:	2.297		
Observer Height	· · · ·	5.0 feet		Hear	vy Trucks:	8.006	Grade Adjı	ustment: 0.0
	ad Elevation:	0.0 feet		1			64	
	ad Elevation:	0.0 feet		Lane Eq		istance (in	teet)	
	Road Grade:	0.0%		Mark	Autos: m Trucks:	32.833		
	Left View: Right View:	-90.0 degrees			m Trucks: vy Trucks:	32.562 32.589		
	Right view.	90.0 degrees		nea	ry muchs.	32.009		
FHWA Noise Mod		-						
VehicleType	REMEL	Traffic Flow	Distance			Fresnel	Barrier Atte	
Autos:	64.30	-4.05		64	-1.20	-4.52	0.00	
Medium Trucks:	75.75	-21.29		69	-1.20	-4.86	0.00	
Heavy Trucks:	81.57	-25.24		69	-1.20	-5.69	0.00	00 0.00
Unmitigated Nois								
VehicleType Autos:	Leq Peak Hou 61		Leq 9.8	Evening	Leq Nig		Ldn 60.6	CNEL
Autos: Medium Trucks:	61 56		9.8 1.4	58.0 48.1		52.0 46.5	60.6 55.0	61.1 55.1
Heavy Trucks:	50		4.4 6.4	48.1		46.5 48.6	55.0 57.0	
Vehicle Noise:	63		2.2	47.4		40.0 54.4	62.9	
Centerline Distan				20.0				
Contonine Distant		inteal (infect)	70	) dBA	65 dB.	A	60 dBA	55 dBA
		L	dn:	11	24		52	111
		CN	EL:	12	26		55	119
		CNI	EL:	12	26		55	119

	FHV	VA-RD-77-108 I	IIGHW	AY NO	DISE PR	EDICTI	ON MO	DEL			
Scenario: Road Name:	OY 2019 W Orange St.	ith Project				Project Job Ni	Name: umber:		ate		
Road Segment:	s/o Columbi	ia Av.									
SITE SP	PECIFIC IN	PUT DATA								s	
Highway Data				S	ite Cond	ditions	(Hard =	10, Sc	oft = 15)		
Average Daily Tra	affic (Adt):	8,500 vehicles						Autos:	15		
Peak Hour Pe	ercentage:	10%			Med	dium Tru	icks (2 /	Axles):	15		
Peak Hou	ır Volume:	850 vehicles			Hea	avy Truc	ks (3+ /	Axles):	15		
Vehic	cle Speed:	35 mph		V	ehicle N	Nix					
Near/Far Lane	Distance:	12 feet		-		cleTvpe		Dav	Evening	Niaht	Dailv
Site Data							utos:	77.5%	•	5	97.429
Barrie	er Height:	0.0 feet			Me	dium Tr	ucks:	84.8%	4.9%	10.3%	1.849
Barrier Type (0-Wall		0.0			н	leavy Tr	ucks:	86.5%	2.7%	10.8%	0.749
Centerline Dist.		33.0 feet				-					
Centerline Dist. to		33.0 feet		N	oise So				eet)		
Barrier Distance to	Observer:	0.0 feet				Autos		000			
Observer Height (Ab	ove Pad):	5.0 feet				n Trucks		297	Our de Ad		
	Elevation:	0.0 feet			Heavy	y Trucks	: 8.	006	Grade Ad	ustment:	0.0
Road	Elevation:	0.0 feet		L	ane Equ	iivalent	Distan	ce (in i	feet)		
Ro	ad Grade:	0.0%				Autos	: 32.	833			
	Left View:	-90.0 degrees	3		Mediun	n Trucks	32.	562			
R	light View:	90.0 degrees	6		Heavy	y Trucks	32.	589			
FHWA Noise Model	Calculations	5									
VehicleType	REMEL	Traffic Flow	Distar	nce	Finite I	Road	Fresr	nel	Barrier Att	en Ber	m Atten
Autos:	64.30	-1.57		2.64		-1.20		-4.52	0.0	000	0.00
Medium Trucks:	75.75	-18.80		2.69		-1.20		-4.86	0.0	000	0.00
Heavy Trucks:	81.57	-22.76		2.69		-1.20		-5.69	0.0	000	0.00
Unmitigated Noise L	evels (with	out Topo and k	arrier a	attenu	ation)						
	eq Peak Hou			eq Eve		Leq I			Ldn		VEL
Autos:	64.		2.3		60.5		54.5		63.1		63.
Medium Trucks:	58.		6.9		50.6		49.0		57.5		57.
Heavy Trucks:	60.		8.9		49.8		51.1		59.4		59.
Vehicle Noise:	66.	-	4.7		61.3		56.9	)	65.4	1	65
Centerline Distance	to Noise Co	ntour (in feet)		70 dl	24	65 0		6	0 dBA	55	dBA
		,	dn:	16		3			76		ава 63
			an: FL:	10		3			76 81		63 74

Monday, June 18, 2018

	FHV	VA-RD-77-108	HIGH	WAY N	OISE PF	REDICTI	ON MC	DDEL			
Road Nan	io: OY 2019 W ne: Orange St. nt: n/o Strong St					Project I Job Ni					
	SPECIFIC IN	PUT DATA							L INPUT	s	
Highway Data				1	Site Con	ditions (	Hard =	= 10, Se	oft = 15)		
Average Daily	Traffic (Adt):	8,700 vehicles						Autos:	15		
Peak Hour	Percentage:	10%			Mee	dium Tru	cks (2	Axles):	15		
Peak H	lour Volume:	870 vehicles			Hea	avy Truc	ks (3+	Axles):	15		
Ve	hicle Speed:	35 mph		H	Vehicle I	Ai~					
Near/Far La	ne Distance:	12 feet		H		cleType		Dav	Evening	Night	Dailv
Site Data							utos:	77.5%	•		97.42
Pa	rrier Height:	0.0 feet			Ме	dium Tru		84.8%		10.3%	
Barrier Type (0-W	/all, 1-Berm):	0.0			H	leavy Tri	ucks:	86.5%	2.7%	10.8%	0.74
Centerline Di		33.0 feet		1	Voise So	urce Ele	evatior	ns (in f	eet)		
Centerline Dist.		33.0 feet				Autos	: 0.	.000			
Barrier Distance		0.0 feet			Mediur	n Trucks	: 2	.297			
Observer Height	· · · ·	5.0 feet			Heav	y Trucks	: 8	.006	Grade Ad	justment	: 0.0
	ad Elevation:	0.0 feet		-							
	ad Elevation:	0.0 feet		1	Lane Equ				feet)		
	Road Grade:	0.0%				Autos		.833			
	Left View: Right View:	-90.0 degree 90.0 degree				n Trucks y Trucks		.562 .589			
FHWA Noise Mod	el Calculation	s									
VehicleType	REMEL	Traffic Flow	Dist	ance	Finite	Road	Fres	nel	Barrier Att	en Bei	rm Atter
Autos:	64.30	-1.46		2.64	1	-1.20		-4.52	0.0	000	0.00
Medium Trucks:	75.75	-18.70		2.69	)	-1.20		-4.86	0.0	000	0.00
Heavy Trucks:	81.57	-22.66		2.69	9	-1.20		-5.69	0.0	000	0.00
Unmitigated Nois			barrie								
VehicleType	Leq Peak Hou			Leq E		Leq N	<u> </u>		Ldn	-	NEL
Autos:	64		2.4		60.6		54.	-	63.3	-	63
Medium Trucks:	58		7.0		50.7		49.		57.	-	57
Heavy Trucks:	60		9.0		49.9		51.	-	59.	-	59
Vehicle Noise:	66	.5 6	64.8		61.4		57.	0	65.	5	65
Centerline Distan	ce to Noise Co	ontour (in feet)						1			
			, L	70 0		65 0		(	60 dBA		dBA
			.dn: IFI :	11		36	-		77 82		165 177

	FHW	A-RD-77-108 H	GHWAY	NOISE PR	REDICTI	ON MOI	DEL			
Road Nam	o: OY 2019 Wi e: Orange St. nt: s/o Strong S	,				Name: N umber: 1		ate		
SITE	SPECIFIC INI	PUT DATA						L INPUTS	5	
Highway Data				Site Con	ditions (	(Hard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt): 1	0,700 vehicles				A	Autos:	15		
Peak Hour	Percentage:	10%		Me	dium Tru	icks (2 A	xles):	15		
Peak H	our Volume:	1,070 vehicles		He	avy Truc	ks (3+ A	xles):	15		
Vei	hicle Speed:	35 mph		Vehicle I	Mise					
Near/Far Lar	ne Distance:	12 feet			icleType		Day	Evening	Night	Daily
Site Data				Ven			77.5%	•	9.6%	
				M	edium Tr		34.8%		10.3%	1.84%
	rier Height:	0.0 feet			Heavy Tr		36.5%		10.8%	0.74%
Barrier Type (0-W Centerline Dis	. ,	0.0 33.0 feet			,				10.070	0.1 1.0
Centerline Dist		33.0 feet		Noise So	ource Ele	evations	s (in fe	eet)		
Barrier Distance		0.0 feet			Autos	a: 0.0	00			
Observer Height (		5.0 feet		Mediu	m Trucks	s: 2.2	97			
	ad Flevation:	0.0 feet		Heav	ry Trucks	:: 8.0	06	Grade Adj	ustment:	0.0
	d Elevation:	0.0 feet		Lane Eq	uivalent	Distanc	e (in	feet)		
	Road Grade:	0.0%			Autos			,		
,	Left View:	-90.0 degrees		Mediu	m Trucks					
	Right View:	90.0 degrees			y Trucks					
FHWA Noise Mode	el Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite	Road	Fresn	el	Barrier Atte	en Ber	m Atten
Autos:	64.30	-0.57	2.	64	-1.20		4.52	0.0	00	0.000
Medium Trucks:	75.75	-17.80	2.	69	-1.20		4.86	0.0	00	0.000
Heavy Trucks:	81.57	-21.76	2.	69	-1.20		5.69	0.0	00	0.000
Unmitigated Noise				,						
,1	Leq Peak Hour			Evening	Leq I			Ldn		VEL
Autos:	65.3	2 63		61.5		55.5		64.1		64.7
								58.5		58.7
Medium Trucks:	59.4	• • •		51.6		50.0				
Medium Trucks: Heavy Trucks:	59.4 61.3	3 59	.9	50.8		52.1		60.4		
Medium Trucks: Heavy Trucks: Vehicle Noise:	59.4 61.3 67.4	3 59 4 65	.9					60.4 66.4		
Medium Trucks: Heavy Trucks:	59.4 61.3 67.4	3 59 4 65	.9 .7	50.8 62.3		52.1 57.9		66.4		60.6 66.8
Medium Trucks: Heavy Trucks: Vehicle Noise:	59.4 61.3 67.4	3 59 4 65 ntour (in feet)	.9 .7 70	50.8 62.3 0 dBA	65 0	52.1 57.9		66.4 60 dBA	55	66.8 dBA
Medium Trucks: Heavy Trucks: Vehicle Noise:	59.4 61.3 67.4	3 59 4 65	.9 .7 70 70	50.8 62.3		52.1 57.9 //BA 1		66.4	55 1	66.8

Monday, June 18, 2018

	FH\	NA-RD-77-108	HIGHWAY	NOISE	PREDICTIO	N MODEL			
Road Nam	io: OY 2019 W ne: Orange St. nt: n/o Russell	,				ame: Nort nber: 1114			
SITE	SPECIFIC IN			1	NO	ISE MOD	EL INPUT	s	
Highway Data	or con to in	01 5/11/1		Site 0	Conditions (H			<u> </u>	
Peak H Ve	Percentage: lour Volume: hicle Speed:	9,400 vehicles 10% 940 vehicles 35 mph		Vehic	Medium Truck Heavy Trucks I <b>e Mix</b>		s): 15		
Near/Far La	ne Distance:	12 feet		1	/ehicleType	Day	Evening	Night Da	aily
Site Data Bar Barrier Type (0-W	rrier Height:	0.0 feet			Au Medium Truc Heavy Truc		3% 4.9%	10.3% 1.	.429 .849 .749
Centerline Di		33.0 feet			e Source Elev				
Roa	to Observer:	33.0 feet 0.0 feet 5.0 feet 0.0 feet 0.0 feet 0.0% -90.0 degree	s	H Lane	Autos: dium Trucks: eavy Trucks: <b>Equivalent D</b> Autos: dium Trucks:	0.000 2.297 8.006 Distance (i 32.833 32.562		ljustment: 0.0	)
FHWA Noise Mode	Right View:	90.0 degree	s	Н	eavy Trucks:	32.589			
VehicleType	REMEL	Traffic Flow	Distance	e Fii	nite Road	Fresnel	Barrier Att	en Berm A	tter
Autos: Medium Trucks:	64.30 75.75	-1.13 -18.37 -22.32	2	.64 .69 .69	-1.20 -1.20 -1.20	-4.5 -4.8	6 0.0	000 0	0.00 0.00
Heavy Trucks:	81.57					-5.6	9 0.0	000 0	0.00
Unmitigated Noise					,				
VehicleType Autos:	Leq Peak Hou 64		Leq	Evenin	g Leq Ni 0.9	ght 54.9	Ldn 63.5	CNEL	64
Autos: Medium Trucks:	64 58		2.7 7.4	-	0.9 1.0	54.9 49.5	63.5 57.9	-	64. 58
Heavy Trucks:	58 60		97.4 i9.3	-	0.3	49.5 51.5	59.9	-	58. 60.
Vehicle Noise:	66		19.3 15.1		1.7	57.3	59.5 65.8	-	66
				0		57.0	55.0	-	
Centerline Distant	ce to NOISE C	ontour (in feet)		0 dBA	65 dE	24	60 dBA	55 dBA	-
		,	dn:	17	38		81	174	<u> </u>
			IGN. IFI :	19	40		86	186	
		C/A			40			.50	

	FHW	/A-RD-77-108	HIGH	WAY NO	DISE PR	EDICTI	он мо	DEL			
Scenario: O Road Name: O Road Segment: s/	range St.	,				Project Job N	Name: umber:				
SITE SPEC	CIFIC IN	PUT DATA				N	OISE	MODE	L INPUT	s	
Highway Data				s	ite Con	ditions	(Hard =	10, So	oft = 15)		
Average Daily Traffi	c (Adt):	4,700 vehicles	6					Autos:	15		
Peak Hour Perce	entage:	10%			Med	dium Tru	icks (2 )	Axles):	15		
Peak Hour V	olume:	470 vehicles	6		Hea	avy Truc	:ks (3+ )	Axles):	15		
Vehicle	Speed:	35 mph			ehicle N						
Near/Far Lane Di	stance:	12 feet		v		n <b>ix</b> cleTvpe		Dav	Evening	Niaht	Dailv
Site Data					veni		lutos:	77.5%	•	<b>J</b>	97.429
					Ma	ر dium Tr		84.8%		9.0%	1.849
Barrier I		0.0 feet				leavy Tr		86.5%		10.3%	0.749
Barrier Type (0-Wall, 1-		0.0			-	eavy II	UCKS.	00.3%	2.170	10.0%	0.745
Centerline Dist. to		33.0 feet		N	loise So	urce El	evation	s (in f	eet)		
Centerline Dist. to Ob		33.0 feet				Autos	s: 0.	000			
Barrier Distance to Ob		0.0 feet			Mediun	n Trucks	s: 2.	297			
Observer Height (Abov	,	5.0 feet			Heav	y Trucks	s: 8.	006	Grade Ad	justment.	0.0
Pad Ele		0.0 feet		-							
Road Ele		0.0 feet		L	ane Equ				feet)		
	Grade:	0.0%				Autos		833			
	ft View:	-90.0 degree	es			n Trucks		562			
Righ	nt View:	90.0 degree	es		Heav	y Trucks	s: 32.	589			
FHWA Noise Model Ca	lculations	;									
VehicleType RE	EMEL	Traffic Flow	Dist	ance	Finite	Road	Fresi	nel	Barrier Att	en Ber	m Atten
Autos:	64.30	-4.14		2.64		-1.20		-4.52	0.0	000	0.00
Medium Trucks:	75.75	-21.38		2.69		-1.20		-4.86	0.0	000	0.00
Heavy Trucks:	81.57	-25.33		2.69		-1.20		-5.69	0.0	000	0.00
Unmitigated Noise Lev	els (witho	out Topo and	barrie	r attenu	uation)						
	Peak Hou			Leq Ev		Leq	Night		Ldn		VEL
Autos:	61.		59.7		57.9		51.9		60.5		61.
Medium Trucks:	55.		54.4		48.0		46.4		54.9		55.
Heavy Trucks:	57.		56.3		47.3		48.	-	56.9	9	57.
Vehicle Noise:	63.	8	62.1		58.7		54.3	3	62.8	3	63.
Centerline Distance to	Noise Co	ntour (in feet,	)				18.4	1			
				70 di			dBA		60 dBA		dBA
			Ldn:	11			4		51	1	10
			VFI :	12		-	5		54		17

Monday, June 18, 2018

	FHV	VA-RD-77-108	HIGHW	AY N	OISE PF	REDICTIO	N MO	DEL			
Road Nan	rio: OY 2019 W ne: Primer St. nt: n/o Columb	,				Project N Job Nur			ate		
	SPECIFIC IN	PUT DATA								5	
Highway Data				S	Site Con	ditions (H	lard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt): 2	25,100 vehicles						Autos:	15		
Peak Hour	Percentage:	10%			Mee	dium Truc	ks (2 A	(xles):	15		
Peak H	lour Volume:	2,510 vehicles			Hea	avy Truck	s (3+ A	(xles):	15		
Ve	hicle Speed:	35 mph		N	/ehicle	<i>liy</i>					
Near/Far La	ne Distance:	12 feet		-		cleType		Day	Evening	Night	Daily
Site Data						Au	tos:	, 77.5%	12.9%	9.6%	97.429
Ba	rrier Heiaht:	0.0 feet			Me	dium Tru	cks:	84.8%	4.9%	10.3%	1.849
Barrier Type (0-W	Vall, 1-Berm):	0.0			H	leavy Tru	cks:	86.5%	2.7%	10.8%	0.74%
	ist. to Barrier:	33.0 feet		٨	loise So	urce Ele	vation	s (in fe	et)		
Centerline Dist.		33.0 feet				Autos:	0.0	000			
Barrier Distance	to Observer:	0.0 feet			Mediur	n Trucks:	2.3	297			
Observer Height	· /	5.0 feet			Heav	v Trucks:	8.0	006	Grade Ad	ustment	: 0.0
	ad Elevation:	0.0 feet		_							
	ad Elevation:	0.0 feet		L	ane Equ	uivalent E			eet)		
	Road Grade:	0.0%				Autos:	32.				
	Left View:	-90.0 degree				n Trucks:	32.				
	Right View:	90.0 degree	s		Heav	y Trucks:	32.	589			
FHWA Noise Mod					a contraction of the second						
VehicleType	REMEL	Traffic Flow	Dista		Finite		Fresr	-	Barrier Att		m Atten
Autos:		3.14		2.64		-1.20		-4.52	0.0		0.00
Medium Trucks:		-14.10		2.69		-1.20		-4.86	0.0		0.00
Heavy Trucks:	81.57	-18.06		2.69		-1.20		-5.69	0.0	00	0.00
Unmitigated Nois											
VehicleType	Leq Peak Hou	. ,		.eq Ev	•	Leq N	<u> </u>		Ldn	-	NEL
Autos:	68		67.0		65.2		59.2		67.8		68.
Medium Trucks:			61.6		55.3		53.7		62.2		62.
Heavy Trucks:			63.6		54.5		55.8		64.1		64.
Vehicle Noise:	71	.1 (	69.4		66.0		61.6		70.1		70.
Centerline Distan	ce to Noise Co	ontour (in feet)									
				70 d		65 dE	зA	e	0 dBA 156		dBA
											35
			_dn: IFI :	34 36		72 77			166		158

	FHV	/A-RD-77-108	HIGHW	AY N	OISE PF	REDICT	ION MOI	DEL			
	o: OY 2019 W 9: La Cadena t: n/o I-215 Ra	Dr.					Name: I umber: ·		ate		
SITE S	PECIFIC IN	PUT DATA							L INPUTS	5	
Highway Data				S	Site Con	ditions	(Hard =	10, So	oft = 15)		
Average Daily 7	raffic (Adt):	5,800 vehicles						Autos:	15		
Peak Hour F	Percentage:	10%			Me	dium Tri	ucks (2 A	xles):	15		
Peak Ho	our Volume:	580 vehicles			Hea	avy Tru	cks (3+ A	xles):	15		
Veh	icle Speed:	40 mph		L.	/ehicle I	Niv					
Near/Far Lan	e Distance:	12 feet		ľ		cleType		Day	Evening	Night	Daily
Site Data				_	1011			77.5%	•	9.6%	
Bar	rier Height:	0.0 feet			Me	dium Ti	rucks:	84.8%		10.3%	1.849
Barrier Type (0-Wa	•	0.0			F	leavy T	rucks:	86.5%	2.7%	10.8%	0.74%
Centerline Dis	. ,	33.0 feet		-							
Centerline Dist. t		33.0 feet		^	loise So		levation		eet)		
Barrier Distance to	o Observer:	0.0 feet				Auto n Truck		000 297			
Observer Height (A	Above Pad):	5.0 feet							Crada Adi	interest	
	d Elevation:	0.0 feet			Heav	y Truck	s: 8.0	006	Grade Adj	ustment.	0.0
Roa	d Elevation:	0.0 feet		L	ane Equ	uivalen	t Distand	ce (in	feet)		
F	oad Grade:	0.0%				Auto	s: 32.8	333			
	Left View:	-90.0 degree	s		Mediur	n Truck	s: 32.5	562			
	Right View:	90.0 degree	s		Heav	y Truck	s: 32.5	589			
FHWA Noise Mode	l Calculations										
VehicleType	REMEL	Traffic Flow	Distan		Finite		Fresn		Barrier Atte		m Atten
Autos:	66.51	-3.81		2.64		-1.20		-4.52	0.0		0.00
Medium Trucks:	77.72	-21.04		2.69		-1.20		-4.86	0.0		0.00
Heavy Trucks:	82.99	-25.00		2.69	)	-1.20		-5.69	0.0	00	0.00
Unmitigated Noise								1			
L	Leq Peak Hou			eq Ev	ening	Leq	Night		Ldn		VEL
Autos:	64.		52.2		60.5		54.4		63.0		63.
Medium Trucks:	58.		56.7		50.3		48.7		57.2		57.
Heavy Trucks:	59.	-	58.1		49.0		50.3		58.6		58.
Vehicle Noise:	66.	-	64.4		61.1		56.6		65.1		65.
Centerline Distanc	e to Noise Co	ntour (in feet)		70 '		07	-10.4	-	0.0		-10.4
				70 d			dBA	6	0 dBA		dBA
			_dn: IFI :	16 17		-	14 16		73 78		57 68

	FH\	WA-RD-77-108	HIGHW	AY N	OISE PF	REDICTIO	N MODEL			
Scenari	io: OY 2019 V	Vith Project				Project Na	ame: Norti	ngate		
	e: La Cadena					Job Nun	nber: 1114	5		
Road Segmer	nt: s/o I-215 R	tamps								
	SPECIFIC IN	NPUT DATA						EL INPUT	s	
Highway Data				S	Site Con	ditions (H	ard = 10, 3	Soft = 15)		
Average Daily	Traffic (Adt):	3,900 vehicle	s				Auto	s: 15		
Peak Hour	Percentage:	10%			Mee	dium Truck	s (2 Axles	): 15		
Peak H	our Volume:	390 vehicle	s		Hea	avy Trucks	(3+ Axles	): 15		
	hicle Speed:	40 mph		v	/ehicle I	Nix				
Near/Far La	ne Distance:	12 feet		F		cleType	Day	Evening	Night	Daily
Site Data						Aut	os: 77.5	% 12.9%	9.6%	97.429
Bar	rier Height:	0.0 feet			Me	dium Truc	ks: 84.8	% 4.9%	10.3%	1.84%
Barrier Type (0-W	•	0.0			H	leavy Truc	ks: 86.5	% 2.7%	10.8%	0.74%
Centerline Dis		33.0 feet			loise So	urce Elev	ations (in	feet)		
Centerline Dist.		33.0 feet				Autos:	0.000	,		
Barrier Distance		0.0 feet			Mediur	n Trucks:	2,297			
Observer Height (	,	5.0 feet			Heav	v Trucks:	8.006	Grade Ad	justment.	0.0
	ad Elevation:	0.0 feet						- (4)		
	ad Elevation:	0.0 feet		-	ane Equ	Autos:	istance (il 32.833	1 feet)		
,	Road Grade:	0.0%			1 4 m all 1 m	n Trucks:				
	Left View: Right View:	-90.0 degre 90.0 degre				y Trucks:	32.562 32.589			
	•	•	62		neav	y mucho.	32.303			
FHWA Noise Mode	el Calculation REMEL	s Traffic Flow	Distar		Finite	Deed	Fresnel	Barrier Att		m Atten
VehicleType Autos:	66.51	-5.53		2.64		-1.20	-4.5		en Ber 000	m Atten 0.00
Medium Trucks:	77.72			2.69		-1.20	-4.8		000	0.00
Heavy Trucks:	82.99			2.69		-1.20	-5.6		000	0.00
Unmitigated Noise	e Levels (with	out Topo and	barrier a	tten	uation)					
VehicleType	Leq Peak Hou	ur Leq Daj	/ Le	eq Ev	ening	Leq Ni	ght	Ldn	CI	VEL
Autos:	62	2.4	60.5		58.8		52.7	61.3	3	61.
Medium Trucks:	56	6.4	54.9		48.6		47.0	55.5	5	55.
Heavy Trucks:	57	<sup>7</sup> .8	56.3		47.3		48.5	56.9	9	57.
Vehicle Noise:	64	1.4	62.7		59.4		54.9	63.4	1	63.
Centerline Distance	ce to Noise C	ontour (in fee	t)				1		1	
				70 d		65 dB	A	60 dBA		dBA
			Ldn:	12	2	26		56	1	20
		-	NFL:	13		28		60		29

F	HWA-I	RD-77-108	HIGH	HWAY N	IOISE PF	REDICTI	ON MO	DEL			
Scenario: OY 2019	With I	Project				Project	Name:	Northg	ate		
Road Name: La Cade	na Dr.					Job N	umber:	11145			
Road Segment: n/o Stror	ıg St.										
SITE SPECIFIC	INPU	T DATA							L INPUT	s	
Highway Data					Site Con	ditions	(Hard =	10, S	oft = 15)		
Average Daily Traffic (Adt)	3,9	00 vehicles						Autos:	15		
Peak Hour Percentage		10%			Me	dium Tru	icks (2 A	(xles)	15		
Peak Hour Volume	3	90 vehicles			He	avy Truc	ks (3+ A	(xles)	15		
Vehicle Speed		40 mph			Vehicle I	Ai~					
Near/Far Lane Distance		12 feet		-		cleType		Day	Evening	Night	Daily
Site Data					Ven		utos:	77.5%		9.6%	
						r dium Tr		84.8%		10.3%	
Barrier Height		0.0 feet				leavy Tr		04.0% 86.5%		10.3%	
Barrier Type (0-Wall, 1-Berm)		0.0			'	ieavy II	uchs.	00.5 /	2.170	10.070	0.747
Centerline Dist. to Barrier	-	33.0 feet		7	Noise Sc	urce El	evation	s (in f	eet)		
Centerline Dist. to Observer	-	33.0 feet		Γ		Autos	a: 0.0	000			
Barrier Distance to Observer		0.0 feet			Mediur	n Trucks	: 2.:	297			
Observer Height (Above Pad)		5.0 feet			Heav	y Trucks	. 8.0	006	Grade Ad	justment	: 0.0
Pad Elevation		0.0 feet		-							
Road Elevation		0.0 feet		4	Lane Eq				teet)		
Road Grade		0.0%				Autos		833			
Left View	-	0.0 degree				n Trucks		562			
Right View	: 9	0.0 degree	s		Heav	y Trucks	: 32.	589			
FHWA Noise Model Calculati	ons										
VehicleType REMEL	Tra	affic Flow	Dis	stance	Finite	Road	Fresr	el	Barrier Att	en Bei	m Atten
Autos: 66.5	51	-5.53		2.6	4	-1.20		-4.52	0.0	000	0.00
Medium Trucks: 77.3	2	-22.77		2.6	9	-1.20		-4.86	0.0	000	0.00
Heavy Trucks: 82.9	99	-26.72		2.6	9	-1.20		-5.69	0.0	000	0.00
Unmitigated Noise Levels (w	thout	Topo and	barri	er atten	nuation)						
VehicleType Leq Peak F		Leq Day		Leq E	vening	Leq	Night		Ldn		NEL
	62.4		60.5		58.8		52.7		61.3		61.
	56.4		54.9		48.6		47.0		55.5		55.
Heavy Trucks:	57.8	5	56.3		47.3		48.5		56.9	)	57.
Vehicle Noise:	64.4	e	62.7		59.4		54.9	)	63.4	1	63.
Centerline Distance to Noise	Conto	our (in feet)	1								
			L		dBA		dBA		60 dBA		dBA
			dn:		2	2	-		56		20
			IFI :	1			8		60		29

Monday, June 18, 2018

Scenari	o: OY 2019 W	ith Project				Project N	lamo.	Northc	iate		
	e: Placentia I r					Job Nu			Jate		
	nt: e/o Main St.										
SITE S	SPECIFIC IN	PUT DATA							L INPUT	s	
Highway Data				4	Site Con	ditions (l	Hard =	= 10, Se	oft = 15)		
Average Daily	Traffic (Adt):	9,400 vehicles	s					Autos:	15		
Peak Hour	Percentage:	10%			Mee	dium Truc	cks (2	Axles):	15		
Peak He	our Volume:	940 vehicles	5		Hea	avy Truck	(3+	Axles):	15		
Vel	hicle Speed:	25 mph		-	Vehicle I	<i>liv</i>					
Near/Far Lar	ne Distance:	36 feet		-		cleType		Day	Evening	Night	Daily
Site Data						A	itos:	77.5%	12.9%	9.6%	97.42%
Dar	rier Height:	0.0 feet			Ме	dium Tru	icks:	84.8%	4.9%	10.3%	1.84%
Barrier Type (0-Wa		0.0			H	leavy Tru	icks:	86.5%	2.7%	10.8%	0.74%
Centerline Dis	t. to Barrier:	44.0 feet			Noise So	urce Ele	vatior	ıs (in f	eet)		
Centerline Dist. t	to Observer:	44.0 feet				Autos		000			
Barrier Distance t	to Observer:	0.0 feet			Mediur	n Trucks:	2	.297			
Observer Height (/	Above Pad):	5.0 feet				v Trucks:		.006	Grade Ad	liustmen	t: 0.0
Pa	d Elevation:	0.0 feet		Ļ							
Roa	d Elevation:	0.0 feet		1	Lane Equ	ivalent l			feet)		
F	Road Grade:	0.0%				Autos:		.460			
	Left View:	-90.0 degree	es			n Trucks:		.241			
	Right View:	90.0 degree	es		Heav	y Trucks:	40	.262			
FHWA Noise Mode		-									
VehicleType	REMEL	Traffic Flow	Dist	ance	Finite		Fres		Barrier Att		rm Atten
Autos:	58.73	0.33		1.28	-	-1.20		-4.61		000	0.00
Medium Trucks:	70.80	-16.91		1.3		-1.20		-4.87		000	0.00
Heavy Trucks:	77.97	-20.86		1.3		-1.20		-5.50	0.0	000	0.00
Unmitigated Noise					· · ·			_			
	Leq Peak Hou	. ,		Leq E	•	Leq N	<u> </u>		Ldn		NEL
Autos:	59.		57.2		55.5		49.	-	58.		58.
Medium Trucks:	54.	-	52.5		46.1		44.	-	53.	-	53.
Heavy Trucks:	57.	-	55.8		46.8		48.	-	56.4		56.
Vehicle Noise:	62.		60.4		56.4		52.	5	61.	D	61.4
Centerline Distanc	e to Noise Co	ntour (in feet	)	70 (	10.4	65 d	0.4		50 dBA	-	
				100	1BA	65 a	ва	1 0	ou aBA	55	i dBA
			I dn:	1	4	24		-	52	· · · · · ·	111

	FHW	/A-RD-77-108 I	IIGHWA	Y NOISE F	PREDICTI	ON MOI	DEL			
Road Nam	o: OY 2019 Wi e: Columbia A nt: e/o Orange	v. ,				Name: N umber: 1		ate		
SITE	SPECIFIC IN	PUT DATA			N	OISE N	IODE	L INPUTS	5	
Highway Data				Site Co	nditions	(Hard =	10, So	oft = 15)		
Average Daily	• •				T		Autos:	15 15		
	Percentage:	10%			edium Tru	•				
		2,940 vehicles		п	eavy Truc	:KS (3+ A	xies):	15		
	hicle Speed:	45 mph		Vehicle	Mix					
Near/Far Lai	ne Distance:	36 feet		Ve	hicleType		Day	Evening	Night	Daily
Site Data					A	Autos:	77.5%	12.9%	9.6%	97.42%
Bar	rier Height:	0.0 feet		Λ	/ledium Tr	ucks:	84.8%	4.9%	10.3%	1.84%
Barrier Type (0-W	all, 1-Berm):	0.0			Heavy Tr	ucks:	86.5%	2.7%	10.8%	0.74%
Centerline Dis	t. to Barrier:	44.0 feet		Noise S	Source El	evations	s (in fe	et)		
Centerline Dist.	to Observer:	44.0 feet			Autos					
Barrier Distance		0.0 feet		Medi	um Trucks					
Observer Height (.	Above Pad):	5.0 feet		Hea	vy Trucks			Grade Adj	ustment:	0.0
Pa	d Elevation:	0.0 feet								
	d Elevation:	0.0 feet		Lane E	quivalent		-	eet)		
F	Road Grade:	0.0%			Autos					
	Left View:	-90.0 degree:			um Trucks					
	Right View:	90.0 degree	5	Hea	ivy Trucks	s: 40.2	262			
FHWA Noise Mode	el Calculations			1						
VehicleType	REMEL	Traffic Flow	Distand	e Finit	e Road	Fresn	el	Barrier Atte	en Ber	m Atten
Autos:	68.46	2.73		1.28	-1.20		-4.61	0.0	00	0.000
Medium Trucks:	79.45	-14.51		1.31	-1.20		-4.87	0.0	00	0.000
Heavy Trucks:	84.25	-18.46		1.31	-1.20		-5.50	0.0	00	0.000
Unmitigated Noise										
	Leq Peak Hou	1 1		q Evening		Night		Ldn		VEL
Autos:	71.		9.4	67.		61.5		70.2		70.8
Medium Trucks:	65.	•	3.5	57.	-	55.6		64.1		64.3
Heavy Trucks:	65.	96	4.5	55.		56.7		65.0		65.2
				68.		63.5		72.1		72.5
Vehicle Noise:	73.	1 7	1.4	00.	2	03.5		12.1		-
Vehicle Noise: Centerline Distance	73.									
	73.	ntour (in feet)		70 dBA	65 (	dBA	6	0 dBA		dBA
	73.	ntour (in feet)	dn:		65 d		6		6	dBA 06 50

Monday, June 18, 2018

	FH\	WA-RD-77-108	HIGHW	AY NO	DISE PR	EDICTIO	N MODEL			
Scenari	io: OY 2019 W	/ith Project				Project Na	ame: North	gate		
	e: Columbia A					Job Nur	nber: 1114	5		
Road Segmer	nt: e/o Primer	St.								
	SPECIFIC IN	IPUT DATA						EL INPUTS	S	
Highway Data				S	ite Con	ditions (H	ard = 10, S	Soft = 15)		
Average Daily	Traffic (Adt):	32,600 vehicle	s				Autos	: 15		
Peak Hour	Percentage:	10%			Med	dium Truck	(s (2 Axles)	: 15		
Peak H	our Volume:	3,260 vehicle	s		Hea	avy Trucks	(3+ Axles)	: 15		
	hicle Speed:	45 mph		v	ehicle N	lix				
Near/Far Lar	ne Distance:	36 feet		-		cleType	Day	Evening	Night	Daily
Site Data						Aut	os: 77.5	0		97.429
Bar	rier Height:	0.0 feet			Me	dium Truc	ks: 84.89	% 4.9%	10.3%	1.84%
Barrier Type (0-W	•	0.0			н	leavy Truc	ks: 86.5	% 2.7%	10.8%	0.74%
Centerline Dis		44.0 feet		N	loise So	urce Elev	ations (in	feet)		
Centerline Dist.		44.0 feet				Autos:	0.000			
Barrier Distance		0.0 feet			Mediun	n Trucks:	2.297			
Observer Height (J	,	5.0 feet			Heav	Trucks:	8.006	Grade Adj	ustment:	0.0
	ad Elevation:	0.0 feet				di sa la sa l		641		
	ad Elevation:	0.0 feet		L	ane Equ	Autos:	istance (in 40.460	teet)		
ŀ	Road Grade:	0.0%				n Trucks:				
	Left View: Right View:	-90.0 degre 90.0 degre				v Trucks:	40.241 40.262			
FHWA Noise Mode	ů.	•								
VehicleType	REMEL	Traffic Flow	Distar	nce	Finite	Road	Fresnel	Barrier Atte	en Berm	Atten
Autos:	68.46	3.18		1.28		-1.20	-4.61	0.0	100	0.00
Medium Trucks:	79.45	-14.06		1.31		-1.20	-4.87	0.0	00	0.00
Heavy Trucks:	84.25	-18.01		1.31		-1.20	-5.50	0.0	00	0.00
Unmitigated Noise	e Levels (with	out Topo and	barrier a	attenu	uation)					
	Leq Peak Hou			eq Eve		Leq Nig		Ldn	CNI	
Autos:	71		69.8		68.1		62.0	70.6		71.
Medium Trucks:	65		64.0		57.6		56.1	64.6		64.
Heavy Trucks:	66		64.9		55.9		57.1	65.5		65.
Vehicle Noise:	73		71.8		68.7		64.0	72.5	i	73.
Centerline Distance	ce to Noise Co	ontour (in fee	)	70						-
			ட	70 di		65 dB 140	А	60 dBA	55 d	
			I dn:	65				301	64	ч
			VFI :	70		140		323	69	-

	FHV	VA-RD-77-108	HIGH	WAY N	OISE PF	REDICTI	ON MO	DEL			
Scenario: OY Road Name: Stro Road Segment: w/o	ong St.	,				Project I Job Ni	Name: I Imber:		ate		
SITE SPECI	FIC IN	PUT DATA				N	OISE N	/ODE	L INPUT	s	
Highway Data					Site Con	ditions (	(Hard =	10, Sc	oft = 15)		
Average Daily Traffic	(Adt):	3,900 vehicles					,	Autos:	15		
Peak Hour Percer	tage:	10%			Me	dium Tru	cks (2 A	(xles):	15		
Peak Hour Vo	lume:	390 vehicles			Hea	avy Truc	ks (3+ A	(xles)	15		
Vehicle S	peed:	25 mph		1	Vehicle I	Niv					
Near/Far Lane Dist	ance:	12 feet		F		cleType		Dav	Evening	Night	Daily
Site Data					1011			77.5%		9.6%	
Barrier He	ia ht.	0.0 feet			Me	edium Tri		84.8%		10.3%	
Barrier Type (0-Wall, 1-B	•	0.0			F	leavy Tri	ucks:	86.5%	2.7%	10.8%	0.749
Centerline Dist. to B		33.0 feet				,					
Centerline Dist. to Obs		33.0 feet		4	Voise So				eet)		
Barrier Distance to Obs		0.0 feet				Autos		000			
Observer Height (Above		5.0 feet				n Trucks		297	Our de Ad		
Pad Elev		0.0 feet			Heav	y Trucks	: 8.0	006	Grade Ad	ustment.	0.0
Road Elev	ation:	0.0 feet		1	Lane Equ	uivalent	Distand	ce (in i	feet)		
Road G	rade:	0.0%				Autos	: 32.	833			
Left	View:	-90.0 degree	s		Mediur	n Trucks	32.	562			
Right	View:	90.0 degree	s		Heav	y Trucks	32.	589			
FHWA Noise Model Calc	ulations	s		-							
VehicleType REI	ΛEL	Traffic Flow	Dis	tance	Finite	Road	Fresh	el	Barrier Att	en Ber	m Atten
Autos:	58.73	-3.49		2.64	1	-1.20		-4.52	0.0	000	0.00
Medium Trucks:	70.80	-20.73		2.69	9	-1.20		-4.86		000	0.00
Heavy Trucks:	77.97	-24.68		2.69	9	-1.20		-5.69	0.0	000	0.00
Unmitigated Noise Level			barrie	er atten	uation)						
, i i i i i i i i i i i i i i i i i i i	eak Hou	1.7		Leq Ev		Leq I			Ldn		VEL
Autos:	56.		54.8		53.0		47.0		55.6		56.
Medium Trucks:	51.		50.1		43.7		42.1		50.6		50.
Heavy Trucks:	54.	-	53.4		44.3		45.6		53.9		54.
Vehicle Noise:	59.		57.9		54.0		50.1		58.6	3	59
Centerline Distance to N	oise Co	ontour (in feet)		70 c		65 c	ID A		0 dBA	57	dBA
			_dn:	700		05 0		6	27		ава 57
			_an: IFL :	6		14	-		27		57 51
		Ch	ILL.	0	,	1.	0		20		

Monday, June 18, 2018

Scenario	: OY 2019 W	ith Project				Project I	lamo.	Northc	iate		
	Strong St.	iii Fiojeci				Job Nu			Jate		
Road Segmen						000 /10		11140			
SITE S	PECIFIC IN	PUT DATA				N	DISE	MODE	L INPUT	s	
Highway Data				S	Site Con	ditions (	Hard :	= 10, Se	oft = 15)		
Average Daily 1	raffic (Adt):	4,500 vehicles						Autos:	15		
Peak Hour F	Percentage:	10%			Mee	dium True	cks (2	Axles):	15		
Peak Ho	our Volume:	450 vehicles			Hea	avy Truck	ks (3+	Axles):	15		
Veh	icle Speed:	25 mph		1	/ehicle	<i>liy</i>					
Near/Far Lan	e Distance:	12 feet		-		cleType		Day	Evening	Night	Daily
Site Data						A	utos:	77.5%	12.9%	9.6%	97.429
Dar	rier Height:	0.0 feet			Me	dium Tru	icks:	84.8%	4.9%	10.3%	1.849
Barrier Type (0-Wa		0.0			H	leavy Tru	icks:	86.5%	2.7%	10.8%	0.74%
Centerline Dis	t. to Barrier:	33.0 feet			loise So	urce Ele	vatio	ıs (in f	eet)		
Centerline Dist. t	o Observer:	33.0 feet				Autos		000			
Barrier Distance to	o Observer:	0.0 feet			Mediur	n Trucks	. 2	.297			
Observer Height (A	Above Pad):	5.0 feet				v Trucks		.006	Grade Ad	liustmen	t: 0.0
	d Elevation:	0.0 feet		_						·	
Roa	d Elevation:	0.0 feet		L	ane Equ	livalent			feet)		
R	load Grade:	0.0%				Autos:		.833			
	Left View:	-90.0 degree				n Trucks.		.562			
	Right View:	90.0 degree	s		Heav	y Trucks:	32	.589			
FHWA Noise Mode					1					Т	
VehicleType	REMEL	Traffic Flow	Dista		Finite		Fres		Barrier Att		rm Atten
Autos:	58.73	-2.87		2.64		-1.20		-4.52		000	0.00
Medium Trucks:	70.80	-20.10		2.69		-1.20		-4.86		000	0.00
Heavy Trucks:	77.97	-24.06		2.69		-1.20		-5.69	0.0	000	0.00
Unmitigated Noise					· · ·			1		1 2	
	Leq Peak Hou			Leq Ev	•	Leq N		_	Ldn		NEL
Autos:	57. 52.		55.4 50.7		53.6		47. 42	-	56.1 51.1		56.
Medium Trucks:	52. 55	- '	50.7 54.0		44.3 44.9		42.	-	51. 54.	-	51.
Heavy Trucks:								-		-	54.
Vehicle Noise:	60.		58.5		54.6		50.	1	59.3	2	59.
Centerline Distanc	e to Noise Co	ntour (in feet)		70 d	DA	65 d	DA		60 dBA	54	5 dBA
			dn:	700	DA	14			29		63

	FHW	/A-RD-77-108	HIGHW	AY NO	ISE PR	EDICT	ION MOI	DEL			
Road Nam	o: OY 2019 W e: Russell St. nt: e/o Main St.	,					Name: N umber: 1		ate		
SITE	SPECIFIC IN	PUT DATA				N	IOISE N	IODE	L INPUTS	5	
Highway Data				Si	te Con	ditions	(Hard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	5,700 vehicle	6					Autos:	15		
Peak Hour	Percentage:	10%			Med	dium Tru	ucks (2 A	xles):	15		
Peak H	our Volume:	570 vehicles	6		Hea	avy Truc	cks (3+ A	xles):	15		
Vei	hicle Speed:	35 mph		1/4	hicle N	Also .					
Near/Far Lar	ne Distance:	36 feet		Ve		cleType		Day	Evening	Night	Daily
Site Data					Vern			77.5%	•	9.6%	
					Me	, dium Ti		84.8%		10.3%	1.84%
	rier Height:	0.0 feet				leavy Ti		86.5%		10.8%	0.74%
Barrier Type (0-W	. ,	0.0								10.070	0.7 17
Centerline Dis Centerline Dist.		44.0 feet 44.0 feet		No	oise So	urce El	evations	s (in fe	eet)		
Barrier Distance		0.0 feet				Autos	s: 0.0	000			
Observer Height (		5.0 feet			Mediun	n Truck	s: 2.2	97			
	ad Flevation:	0.0 feet			Heav	y Truck	s: 8.0	006	Grade Adj	ustment	0.0
	ad Elevation: ad Elevation:	0.0 feet		La	ne Fai	iivalen	Distanc	e (in	feet)		
	Road Grade:	0.0%			no Equ	Auto					
1	Left View:	-90.0 degree			Modium	n Truck					
	Right View:	90.0 degree				y Truck					
FHWA Noise Mode	el Calculations	;									
VehicleType	REMEL	Traffic Flow	Distar	nce	Finite	Road	Fresn	el	Barrier Atte	en Ber	m Atten
Autos:	64.30	-3.30		1.28		-1.20		4.61	0.0	00	0.000
Medium Trucks:	75.75	-20.54		1.31		-1.20		4.87	0.0	00	0.000
Heavy Trucks:	81.57	-24.49		1.31		-1.20		-5.50	0.0	00	0.000
Unmitigated Noise											
<i>,</i>	Leq Peak Hou	. ,		eq Eve	•	Leq	Night		Ldn	-	VEL
Autos:	61.	-	59.2		57.4		51.4		60.0		60.6
Medium Trucks:	55.		53.8		47.5		45.9		54.4		54.6
Heavy Trucks:	57.	-	55.8		46.7		48.0		56.3		56.5
Vehicle Noise:	63.	3	61.6		58.2		53.8		62.3		62.7
Centerline Distand	e to Noise Co	ntour (in feet	, 	70.15		05	10.4				10.4
Centerline Distand	ce to Noise Co	, ,		70 dB	A		dBA	e	60 dBA		dBA
Centerline Distand	ce to Noise Co		Ldn:	70 dE 13 14	A	2	dBA 9	Ê	60 dBA 63 67	1	dBA 35 44

Monday, June 18, 2018

Average Daily Traffic (Adt): 44,700 vehicles         Autos:         15           Peak Hour Percentage:         10%         Medium Trucks (2 Akles):         15           Peak Hour Percentage:         10%         Medium Trucks (2 Akles):         15           Peak Hour Vencentage:         50 mph         Medium Trucks (2 Akles):         15           Vehicle Speed:         50 mph         Medium Trucks (2 Akles):         15           Site Data         Vehicle Mix         Vehicle Mix         Vehicle Mix           Barrier Height:         0.0 feet         Autos:         7.5%         1.2%         9.6%         97.           Barrier Type (0-Wall, 1-Berm):         0.0         feet         Medium Trucks:         84.8%         4.9%         1.0%         0.1%           Centerline Dist. to Dserver:         0.0 feet         Moles Source Elevations (in feet)         Medium Trucks:         8.006         Grade Adjustment:         0.0           Deserver Height (Move Pad):         5.0 feet         Autos:         6.15         Medium Trucks:         8.006         Grade Adjustment:         0.0           Road Elevation:         0.0 feet         Medium Trucks:         4.74         Medium Trucks:         4.74           Road Grade:         0.0%         Autos:         6.74 <td< th=""><th></th><th>FH\</th><th>WA-RD-77-108</th><th>HIGHWA</th><th>Y NO</th><th>ISE PR</th><th>EDICTIO</th><th>N MOD</th><th>EL</th><th></th><th></th><th></th></td<>		FH\	WA-RD-77-108	HIGHWA	Y NO	ISE PR	EDICTIO	N MOD	EL			
Road Segment: slo Placentia Ln.           SITE SPECIFIC INPUT DATA         NOISE MODEL INPUTS           Highway Data         Site Conditions (Hard = 10, Soft = 15)           Average Daily Traffic (Adt): 44,700 vehicles         Autros: 15           Peak Hour Volume:         4,470 vehicles         Autros: 15           Peak Hour Volume:         4,470 vehicles         Autros: 15           Vehicle Speed:         S0 mph         Medium Trucks (2 Avles):         15           Vehicle Type         Day         Evening         Night         Da           Site Data         Vehicle Type         Day         Evening         Night         Da           Barrier Type (OWall, 1-Berm):         0.0         Centerline Dist. to Desrver:         50.0 feet         Moles Source Elevations (in feet)           Centerline Dist. to Observer:         0.0 feet         Autos:         2.27%         0.3% fl.           Barrier Type (OWall, 1-Berm):         0.0 feet         Autos:         2.27         10.3% fl.           Barrier Stee Weaton:         0.0 feet         Autos:         2.00         Grade Adjustment:         0.0           Road Grade:         0.0%         Edit Weiw:         90.0 degrees         Flinte Road         Fres	Scenar	io: HY 2040 W	Vithout Project				Project Na	ame: N	lorthga	ate		
Site SPECIFIC INPUT DATA         NOISE MODEL INPUTS           Highway Data         Site Conditions (Hard = 10, Soft = 15)           Average Daily Traffic (Adt): 44,700 vehicles         Autos:: 15           Peak Hour Porentage: 10%         Medium Trucks (24 Akels): 15           Peak Hour Volume: 4,470 vehicles         Vehicle Speed: 50 mph           Near/Far Lane Distance: 36 feet         Vehicle Mix           Barrier Height:         0.0 feet           Barrier Type (0-Wall, 1-Berm):         0.0 feet           Barrier Distance to Doserver:         50.0 feet           Barrier Distance to Doserver:         0.0 feet           Barrier Distance to Doserver:         0.0 feet           Barrier Distance to Doserver:         0.0 feet           Road Elevation:         Traffic Flow           Distance         Finite Road           Peak Houry Trucks:         81.00           Left View:         90.0 degrees           Right View:         90.0 degrees           Heavy Trucks:         81.00           Havy Tru							Job Nun	nber: 1	1145			
Highway Data         Site Conditions (Hard = 10, Soft = 15)           Average Daily Traffic (Adt): 44,700 vehicles         Autos:: 15           Peak Hour Percentage: 10%         Medium Trucks (24 Aeks): 15           Peak Hour Volume: 4,470 vehicles         Medium Trucks (24 Aeks): 15           Vehicle Speed: 50 mph         Vehicle Mix           Near/Far Lane Distance: 36 feet         Vehicle Mix           Barrier Height: 0.0 feet         Autos: 77.5% 12.9% 9.6% 97.           Barrier Jype (0-Wall, 1-Berm): 0.0         Centerline Dist. to Barrier: 50.0 feet           Centerline Dist. to Barrier: 50.0 feet         Medium Trucks: 84.8% 4.9% 10.3% 11           Barrier Jistance to Observer: 50.0 feet         Medium Trucks: 80.0%           Road Grade: 0.0%         Left View: -90.0 degrees           Ridd Urbew: 90.0 degrees         Medium Trucks: 46.726           Heavy Trucks: 81.00         -13.14           Autos: 70.20         4.09           VehicleType         Remute           VehicleType         Barrier Atten           VehicleType         Left View: -90.0 degrees           Right View: 90.0 degrees         Frinte Road           Heavy Trucks: 85.38         -17.10           Medium Trucks: 85.38         -12.0           Autos: 70.465         0.000           Medium Trucks: 67.0<	Road Segme	nt: s/o Placent	tia Ln.									
Average Daily Traffic (Ad): 44,700 vehicles Peak Hour Percentage:         Autos:         15           Peak Hour Percentage:         10%         Medium Trucks: (2 Axles):         15           Peak Hour Volume:         4,70 vehicles Vehicle Speed:         50 mph         Medium Trucks: (2 Axles):         15           Near/Far Lane Distance:         36 feet         Vehicle Mix         Vehicle Mix         Vehicle Mix           Barrier Height:         0.0 feet         Autos:         77.5%         12.9%         9.6%         97.           Barrier Type (0-Wall, 1-Berm):         0.0         Centerline Dist. to Barrier:         50.0 feet         Medium Trucks:         84.8%         4.9%         10.3%         1.           Barrier Distance to Observer:         0.0 feet         Medium Trucks:         8.065         2.7%         10.8%         0.           Centerline Dist. to Dsarrier:         5.0 feet         Autos:         0.00         Medium Trucks:         8.006         Grade Adjustment:         0.0           Road Elevation:         0.0 feet         Medium Trucks:         8.006         Grade Adjustment:         0.0           Road Elevation:         0.0 feet         Medium Trucks:         46.915         Medium Trucks:         46.744           FHWA Noise Model Calculations         VehicleType		SPECIFIC IN	NPUT DATA								5	
Preak Hour Percentage:         10%         Medium Trucks (2 Akles):         15           Peak Hour Volume:         4,470 vehicles         Heavy Trucks (3 Akles):         15           Vehicle Speed:         50 mph         Heavy Trucks (3 Akles):         15           Neat/Far Lane Distance:         36 feet         Vehicle Type         Day         Evening         Night         Da           Site Date         Autos:         77.5%         12.9%         9.6%         97.           Barrier Height:         0.0 feet         Autos:         77.5%         12.9%         9.6%         97.           Barrier The Iopht:         50.0 feet         Medium Trucks:         84.8%         4.9%         10.3%         11.           Barrier Theight:         Doserver:         50.0 feet         Moise Source Elevations (in feet)         Medium Trucks:         8.006         Grade Adjustment:         0.0           Barier Distance to Observer:         0.0 feet         Autos:         46.744         46.714         VehicleType         Red Grade:         0.00         Grade Adjustment:         0.0           Road Elevation:         0.0 feet         Autos:         70.0 degrees         Heavy Trucks:         46.744         46.744           FIWA Noise Model Calculations         VehicleType	Highway Data				Si	te Cond	ditions (H	ard = 1	10, So	ft = 15)		
Peak Hour Volume:         4,470 vehicles           Vehicle Speed:         50 mph           Near/Far Lane Distance:         36 feet           Vehicle Type         Day         Evening         Night         Das           Site Data           Barrier Height:         0.0 feet           Barrier Height:         0.0 feet         Autos:         77.5%         12.9%         9.6%         97.           Barrier Jype (0-Wall, 1-Berm):         0.0         feet         Heavy Trucks:         84.8%         4.9%         10.3%         11.           Barrier Dist. to Dserver:         50.0 feet         Medium Trucks:         84.8%         2.7%         10.8%         0.           Centerline Dist. to Dserver:         50.0 feet         Mutos:         0.00         Medium Trucks:         8.006         Grade Adjustment:         0.0           Pad Elevation:         0.0 feet         Road Grade:         0.0%         Heavy Trucks:         46.726         Heavy Trucks:         46.744           FHWA Noise Model Calculations         VehicleType         Barrier Atten         Berm Atten         Berm Atten         Berm Atten         Perm Atten         Perm Atten         Perm Atten         Note           VehicleType         Leq Vais         1.	Average Daily	Traffic (Adt):	44,700 vehicles	3								
Vehicle Speed: Near/Far Lane Distance:         50 mph 36 feet         Vehicle Mix           Site Data         Vehicle Mix         Vehicle Type         Day         Evanig         Night         Do           Barrier Height:         0.0 feet         Autos:         77.5%         12.9%         9.6%         97.           Barrier Type (0-Wall, 1-Berm):         0.0         feet         Medium Trucks:         84.8%         4.9%         10.3%         11.           Barrier Type (0-Wall, 1-Berm):         0.0         feet         Medium Trucks:         84.8%         4.9%         10.3%         11.           Barrier Distance to Observer:         0.0 feet         Molise Source Elevations (in feet)         0.8%         0.000           Barrier Distance to Observer:         0.0 feet         Autos:         0.000         Medium Trucks:         8.006         Grade Adjustment:         0.0           Road Elevation:         0.0 feet         Autos:         46.915         Heavy Trucks:         46.74           FHWA Noise Model Calculations         VehicleType         REMEL         Traffic Flow         Distance         Finite Road         Freenel         Barrier Atten         Berm Atten           VehicleType         REMEL         Traffic Flow         Distance         Finite Road <t< td=""><td>Peak Hour</td><td>Percentage:</td><td>10%</td><td></td><td></td><td></td><td></td><td></td><td></td><td>15</td><td></td><td></td></t<>	Peak Hour	Percentage:	10%							15		
Near/Far Lane Distance:         36 feet         Venicle MiX         Levening         Night         Day           Site Data         Autos:         77.5%         12.9%         9.6%         97.           Barrier Height:         0.0 feet         Medium Trucks:         84.8%         4.9%         10.3%         1.1           Barrier Height:         0.0         Centerline Dist. to Barrier:         50.0 feet         Medium Trucks:         86.5%         2.7%         10.8%         0.2%           Centerline Dist. to Diserver:         50.0 feet         Noise Source Elevations:         (in feet)         Autos:         2.7%         10.8%         0.0           Diserver Height (Above Pad):         5.0 feet         Autos:         8.006         Grade Adjustment:         0.0           Road Grade:         0.0%         Lane Equivalent Distance (in feet)         Autos:         46.915           Road Grade:         0.0%         Lane Equivalent Distance (in feet)         Autos:         46.915           VehicleType         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Berm Atten           VehicleType         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten	Peak H	lour Volume:	4,470 vehicles	6		Hea	ivy Trucks	s (3+ A	kles):	15		
Site Data         Vehicle Type         Day         Left without         Night         L 20%           Site Data         Autos: 7.75%         12.9%         9.6%         97.           Barrier Height:         0.0 feet         Matheward         Night         1.29%         9.6%         97.           Barrier Type (0-Wall, 1-Berm):         0.0         Centerline Dist. to Barrier:         50.0 feet         Medium Trucks:         84.8%         4.9%         10.3%         11.1           Barrier Distance to Observer:         50.0 feet         Moise Source Elevations (in feet)         Notes         Notes         Notes         Centerline Distance to Observer:         0.0 feet         Notes Cource Elevations (in feet)         Notes         Notes         Centerline Cource (in feet)         Notes         Notes         Notes         Centerline Cource (in feet)         Notes		· · · · /	50 mph		Ve	hicle N	lix					
Barrier Height:         0.0 feet         Medium Trucks:         84.8%         4.9%         10.3%         11.1           Barrier Type (0-Wall, 1-Berm):         0.0         1.1         Heavy Trucks:         86.5%         2.7%         10.8%         0.1           Centerline Dist. to Barrier:         50.0 feet         Heavy Trucks:         86.5%         2.7%         10.8%         0.1           Deserver Dist. to Observer:         50.0 feet         Maitos:         0.00         Medium Trucks:         2.297         10.8%         0.0           Pad Elevation:         0.0 feet         Medium Trucks:         8.006         Grade Adjustment:         0.0           Road Grade:         0.0%         Left View:         -90.0 degrees         Medium Trucks:         46.915           FHMA Noise Model Calculations         VehicleType         REMEL         Traffic Flow         Distance         Finite Road         Freesnel         Barrier Atten         Berm Atten           Autos:         81.00         -13.14         0.34         -120         -4.65         0.000         0           Medium Trucks:         85.38         -17.10         0.34         -120         -4.65         0.000         0           Medium Trucks:         85.38         -17.10 <td< td=""><td>Near/Far La</td><td>ne Distance:</td><td>36 feet</td><td></td><td></td><td>Vehi</td><td>cleType</td><td>[</td><td>Day</td><td>Evening</td><td>Night</td><td>Daily</td></td<>	Near/Far La	ne Distance:	36 feet			Vehi	cleType	[	Day	Evening	Night	Daily
Barrier Tregnt:         Utilities           Barrier Tregnt:         Utilities           Barrier Tregnt:         Utilities           Centerline Dist. to Diserver:         50.0 feet           Centerline Dist. to Observer:         0.0 feet           Diserver 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           Rodel Calculations         Distance           VehicleType         REMEL           Values:         81.00           Autos:         70.20           40.9         0.31           -1.20         -4.65           Medium Trucks:         85.38           -17.10         0.34           -1.20         -4.65           Medium Trucks:         85.38           -17.10         0.34           -1.20         -4.65           VehicleType         Leq Peak Hour           Leq Vening         Leq Night           Unmitigated Noise Levels (without Topo and barrier attenuation)           VehicleType         Eq Peak Hour           Leq Day         Leq Night         Ldn<	Site Data						Aut	os: 7	7.5%	12.9%	9.6%	97.429
Barrier Type (0-Wall, 1-Berm):         0.0         Heavy Trucks:         86.5%         2.7%         10.8%         0.0           Centerline Dist. to Dasriver:         50.0 feet         Autos:         0.00         Molse Source Elevations (in feet)         Autos:         0.00           Deserver Height (Above Pad):         5.0 feet         Autos:         0.00         Medium Trucks:         2.297           Pad Elevation:         0.0 feet         Autos:         0.006         Medium Trucks:         2.297           Road Grade:         0.0%         Medium Trucks:         8.006         Grade Adjustment:         0.0           Left View:         -90.0 degrees         Medium Trucks:         46.915         Heavy Trucks:         46.744           FHWA Noise Model Calculations         VenicleType         REIMEL         Traffic Flow         Distance         Friende         Barrier Atten         Berm Atten           Autos:         70.20         4.09         0.31         -1.20         -4.65         0.000         0           Medium Trucks:         81.00         -13.14         0.34         -1.20         -4.65         0.000         0           Medium Trucks:         85.38         -17.10         0.34         -1.20         -6.43         0.000         0 </td <td>Ba</td> <td>rrier Heiaht:</td> <td>0.0 feet</td> <td></td> <td></td> <td>Me</td> <td>dium Truc</td> <td>ks: 8</td> <td>4.8%</td> <td>4.9%</td> <td>10.3%</td> <td>1.84%</td>	Ba	rrier Heiaht:	0.0 feet			Me	dium Truc	ks: 8	4.8%	4.9%	10.3%	1.84%
Centerline Dist. to Observer:         50.0 feet         Noise Source Elevations (in feet)           Barrier Distance to Observer:         0.0 feet         Autos:         0.000           Barrier Distance to Observer:         0.0 feet         Matrix:         0.000           Deserver Height (Above Pad):         5.0 feet         Medium Trucks:         2.297           Pad Elevation:         0.0 feet         Heavy Trucks:         8.006         Grade Adjustment:         0.0           Road Elevation:         0.0 feet         Left View:         -90.0 degrees         Medium Trucks:         46.726           Heavy Trucks:         8.00         Grade Adjustment:         0.0         Medium Trucks:         46.744           FHWA Noise Model Calculations         Finite Road         Fresnel         Barrier Atten         Berm Attal           VehicleType         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Berm Attal           Autos:         70.20         4.09         0.31         -1.20         -4.65         0.000         0           Medium Trucks:         85.38         -17.10         0.34         -1.20         -5.43         0.000         0           Unnitigated Noise Levels (without Topo and barrier attenuation) </td <td>Barrier Type (0-W</td> <td>/all, 1-Berm):</td> <td></td> <td></td> <td></td> <td>н</td> <td>leavy Truc</td> <td>:ks: 8</td> <td>6.5%</td> <td>2.7%</td> <td>10.8%</td> <td>0.74%</td>	Barrier Type (0-W	/all, 1-Berm):				н	leavy Truc	:ks: 8	6.5%	2.7%	10.8%	0.74%
Barrier Distance to Observer:         0.0 feet         Autos:         0.000           Observer Height (Above Pad):         5.0 feet         Medium Trucks:         2.97           Pad Elevation:         0.0 feet         Medium Trucks:         8.006         Grade Adjustment:         0.0           Road Grade:         0.0%         Lane Equivalent Distance (in feet)         Lane Equivalent Distance (in feet)         Lane Equivalent Distance (in feet)           Left View:         90.0 degrees         Medium Trucks:         46.726           WeikleType         REIMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Berner Atten           WeikleType         REIMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Berner					No	oise So	urce Elev	ations	(in fe	et)		
Observer Height (Above Pad):         5.0 feet Pad Elevation:         Madium Trucks:         2.297 Heavy Trucks:         Madium Trucks:         2.09 Autos:         G ade Grade Adjustment:         0.0           FHWA Noise Model Calculations         -90.0 degrees         Madium Trucks:         46.714         Madium Trucks:         46.744           FHWA Noise Model Calculations         VehicleType         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Berm Atten           VehicleType         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Berm Atten           VehicleType         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Berm Atten           Medium Trucks:         81.00         -13.14         0.34         -120         -4.65         0.000         0           Ummitigated Noise Levels (without Topo and barrier attenuation)         Uarge Pasition         Leg Pasition         Sod         Sod         Cone							Autos:	0.0	00			
Pad Elevation:         0.0 feet         Heavy Tracks:         8.006         Grade Adjustment:         0.0           Road Elevation:         0.0 feet         Lane Equivalent Distance (in feet)           Road Florado         .00%         Autos:         46.915         Medium Trucks:         46.726           Wehicle Type         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Berm Attack           Vehicle Type         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Berm Attack           Vehicle Type         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Berm Attack           Unitigated Noise Levels (without Topo and barrier attenuation)         0.000         0         O         O           Unitigated Noise Levels (without Topo and barrier attenuation)         Use Paek Hour         Leq Day         Leq Evening         Leq Night         Ldn         CNEL           Autos:         T3.4         71.5         69.7         63.7         72.3         Medium Trucks:         67.4         66.0         65.5 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td>Mediun</td> <td>1 Trucks:</td> <td>2.2</td> <td>97</td> <td></td> <td></td> <td></td>						Mediun	1 Trucks:	2.2	97			
Road Elevation:         0.0 feet         Lane Equivalent Distance (in feet)           Road Grade:         0.0%         Autos:         46.915           Left View:         90.0 degrees         Medium Trucks:         46.726           WehicleType         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Bern Atten           Autos:         70.20         4.09         0.31         -1.20         -4.65         0.000         0           Medium Trucks:         81.00         -13.14         0.34         -1.20         -4.87         0.000         0           Heavy Trucks:         85.38         -17.10         0.34         -1.20         -5.43         0.000         0           Unnitigated Noise Levels (without Topo and barrier attenuation)         VehicleType         Leq Peak Hour         Leq Evening         Leq Night         Ldn         CNEL           Autos:         73.4         71.5         69.7         63.7         72.3           Medium Trucks:         67.4         65.5         59.1         57.6         66.0           VehicleType         R5.4         67.4         57.0         58.2         66.6           Vehicle Noise:         75.1         73.4		· · · ·				Heavy	/ Trucks:	8.0	06	Grade Adj	ustment	0.0
Road Grade:         0.0%         Autos:         46.915           Left View:         -90.0 degrees         Medium Trucks:         46.726           Right View:         90.0 degrees         Medium Trucks:         46.744           FHWA Noise Model Calculations           VehicleType         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Berm Atten           Autos:         70.20         4.09         0.31         -1.20         -4.65         0.000         0           Medium Trucks:         81.00         -13.14         0.34         -1.20         -4.67         0.000         0           Heavy Trucks:         81.00         -13.14         0.34         -1.20         -4.67         0.000         0           Medium Trucks:         81.00         -13.14         0.34         -1.20         -4.67         0.000         0           Unnitigated Noise Levels (without Topo and barrier attenuation)         VehicleType         Leq Peak Hour         Leq Day         Leq Evening         Leq Night         Lch         CNEL           Autos:         73.4         71.5         69.7         63.7         72.3         Medium Trucks:         67.4         66.0         57.0							de contra de la conte D		- // 4			
Left View:         -90.0 degrees Right View:         Medium Trucks:         46.726 Heavy Trucks:         Medium Trucks:         46.726 Heavy Trucks:           VehicleType         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Berm Att Medium Trucks:           VehicleType         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Berm Att Medium Trucks:           Medium Trucks:         41.09         0.31         -1.20         -4.65         0.000         0           Medium Trucks:         85.38         -17.10         0.34         -1.20         -4.65         0.000         0           Unnitigated Noise Levels (without Topo and barrier attenuation)           VehicleType         Leq Peak Hour         Leq Day         Leq Evening         Leq Night         Ldn         CNEL           Autos:         73.4         71.5         69.7         63.7         72.3         Medium Trucks:         67.4         66.0         57.0         58.2         66.6           Vehicle Noise:         75.1         73.4         70.3         65.5         74.1           CodBA         65 dBA         60 dB					Lä	ine Equ				eet)		
Right View:         90.0 degrees         Heavy Trucks:         46.744           FHWA Noise Model Calculations         VehicleType         REIMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Bern Atten           VehicleType         REIMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Bern Att           Autos:         70.20         4.09         0.31         -1.20         -4.65         0.000         0           Medium Trucks:         85.38         -17.10         0.34         -1.20         -4.67         0.000         0           Unmitigated Noise Levels (without Topo and barrier attenuation)         VehicleType         Leq Peak Hour         Leq Evening         Leq Night         Ldn         CNEL           Autos:         73.4         71.5         69.7         63.7         72.3           Medium Trucks:         67.4         66.0         57.0         58.2         66.6           Vehicle Noise:         75.1         73.4         70.3         65.5         74.1           Centerline Distance to Noise Contour (in feet)						Madium						
VehicleType         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Berrin Atten           Autos:         70.20         4.09         0.31         -1.20         -4.65         0.000         0           Medium Trucks:         81.00         -13.14         0.34         -1.20         -4.65         0.000         0           Heavy Trucks:         85.38         -17.10         0.34         -1.20         -5.43         0.000         0           Unnitigated Noise Levels (without Topo and barrier attenuation)         VehicleType         Leq Peak Hour         Leq Day         Leq Evening         Leq Night         Ldn         CNEL           Autos:         73.4         71.5         69.7         63.7         72.3         Medium Trucks:         67.4         66.0         57.0         58.2         66.6           Vehicle Noise:         75.1         73.4         70.3         65.5         74.1         Centerline Distance to Noise Contour (in feet)           [70 dBA         65 dBA         60 dBA         55 dBA           Ldn:         94         201         434         935												
VehicleType         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Berrin Atten           Autos:         70.20         4.09         0.31         -1.20         -4.65         0.000         0           Medium Trucks:         81.00         -13.14         0.34         -1.20         -4.65         0.000         0           Heavy Trucks:         85.38         -17.10         0.34         -1.20         -5.43         0.000         0           Unnitigated Noise Levels (without Topo and barrier attenuation)         VehicleType         Leq Peak Hour         Leq Day         Leq Evening         Leq Night         Ldn         CNEL           Autos:         73.4         71.5         69.7         63.7         72.3         Medium Trucks:         67.4         66.0         57.0         58.2         66.6           Vehicle Noise:         75.1         73.4         70.3         65.5         74.1         Centerline Distance to Noise Contour (in feet)           [70 dBA         65 dBA         60 dBA         55 dBA           Ldn:         94         201         434         935	FHWA Noise Mod	el Calculation	15									
Medium Trucks:         B1.00         -13.14         0.34         -1.20         -4.87         0.000         0           Heavy Trucks:         85.38         -17.10         0.34         -1.20         -5.43         0.000         0           Unnitigated Noise Levels (without Topo and barrier attenuation)         VehiceType         Leg Peak Hour         Leg Day         Leg Right         Ldn         CNEL           VehiceType         Leg Peak Hour         Leg Day         Leg Night         Ldn         CNEL           Autos:         73.4         71.5         69.7         63.7         72.3           Medium Trucks:         67.4         66.0         57.0         58.2         66.6           Vehice Noise:         75.1         73.4         70.3         65.5         74.1           Centerline Distance to Noise Contour (in feet)           2         70 dBA         65 dBA         60 dBA         55 dBA           Ldn:         94         201         434         935			-	Distanc	е	Finite I	Road	Fresne	2 I	Barrier Atte	en Ber	m Atten
Heavy Trucks:         85.38         -17.10         0.34         -1.20         -5.43         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:         67.4         66.0         57.0         58.2         66.6           Heavy Trucks:         67.4         66.0         57.0         58.2         66.6           Vehicle Noise:         75.1         73.4         70.3         65.5         74.1           Centerline Distance to Noise Contour (in feet)         TO dBA         65 dBA         60 dBA         55 dBA           Ldn:         94         201         434         935	Autos:	70.20	4.09	(	0.31		-1.20	-	4.65	0.0	00	0.00
Unmitigated Noise Levels (without Topo and barrier attenuation)         Leq Night         Ldn         CNEL           VehicleType         Leq Peak Hour         Leq Day         Leq Evening         Leq Night         Ldn         CNEL           Autos:         73.4         71.5         69.7         63.7         72.3           Medium Trucks:         67.4         66.0         57.0         58.2         66.6           Vehicle Noise:         75.1         73.4         70.3         65.5         74.1           Centerline Distance to Noise Contour (in feet)           70 dBA         65 dBA         60 dBA         55 dBA           Ldn:         94         201         434         935	Medium Trucks:	81.00	-13.14	(	0.34		-1.20	-	4.87	0.0	00	0.00
VehicleType         Leq Peak Hour         Leq Day         Leq Evening         Leq Night         Ldn         CNEL           Autos:         73.4         71.5         69.7         63.7         72.3           Medium Trucks:         67.0         65.5         59.1         57.6         66.0           Heavy Trucks:         67.4         66.0         57.0         58.2         66.6           Vehicle Noise:         75.1         73.4         70.3         65.5         74.1           Centerline Distance to Noise Contour (in feet)         70 dBA         65 dBA         60 dBA         55 dBA           Ldn:         94         201         434         935         935	Heavy Trucks:	85.38	-17.10	(	).34		-1.20	-	5.43	0.0	00	0.00
Autos:         73.4         71.5         69.7         63.7         72.3           Medium Trucks:         67.0         65.5         59.1         57.6         66.0           Heavy Trucks:         67.4         66.0         57.0         58.2         66.6           Vehicle Noise:         75.1         73.4         70.3         65.5         74.1           Centerline Distance to Noise Contour (in feet)         TO dBA         65 dBA         60 dBA         55 dBA           Ldn:         94         201         434         935						- <b>(</b> )						
Medium Trucks:         67.0         65.5         59.1         57.6         66.0           Heavy Trucks:         67.4         66.0         57.0         58.2         66.6           Vehicle Noise:         75.1         73.4         70.3         65.5         74.1           Centerline Distance to Noise Contour (in feet)         70.4BA         65.4BA         60.4BA         55.4BA           Ldn:         94         201         434         935	,1				Eve		Leq Ni					
Heavy Trucks:         67.4         66.0         57.0         58.2         66.6           Vehicle Noise:         75.1         73.4         70.3         65.5         74.1           Centerline Distance to Noise Contour (in feet)         70 dBA         65 dBA         60 dBA         55 dBA           Ldn:         94         201         434         935												72.
Vehicle Noise:         75.1         73.4         70.3         65.5         74.1           Centerline Distance to Noise Contour (in feet)         70 dBA         65 dBA         60 dBA         55 dBA           Ldn:         94         201         434         935		•.										66.
Centerline Distance to Noise Contour (in feet)         70 dBA         65 dBA         60 dBA         55 dBA           Ldn:         94         201         434         935	· · ·											66.
TO dBA         65 dBA         60 dBA         55 dBA           Ldn:         94         201         434         935						70.3		65.5		74.1		74.
Ldn: 94 201 434 935	Centerline Distan	ce to Noise C	ontour (in feet		70 dB		65 dB	4	6	0 dBA	55	dBA
						P1		PN .				
CIVEL. 100 210 400 1,003											-	
			Ci	*	100		210			400	1,	000

	FHV	VA-RD-77-108	HIGH	NAY N	OISE PF	REDICTIO	ом мо	DEL			
	io: HY 2040 W e: Main St.	ithout Project				Project I	Vame: N mber: 1		ate		
	nt: n/o Columb	ia Av.				JOD INU	mber:	1145			
SITE	SPECIFIC IN	IPUT DATA							L INPUT	s	
Highway Data				S	Site Con	ditions (	Hard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt): 4	14,600 vehicles					1	Autos:	15		
Peak Hour	Percentage:	10%			Me	dium Tru	cks (2 A	xles):	15		
Peak H	lour Volume:	4,460 vehicles			He	avy Truck	ks (3+ A	xles):	15		
Ve	hicle Speed:	50 mph		1	ehicle l	Mix					
Near/Far La	ne Distance:	36 feet		F		icleTvpe		Dav	Evening	Night	Daily
Site Data								77.5%			97.429
Pa	rrier Height:	0.0 feet			Me	edium Tru	icks:	34.8%	4.9%	10.3%	1.849
Barrier Type (0-W	•	0.0			F	leavy Tru	icks:	36.5%	2.7%	10.8%	0.749
Centerline Di		50.0 feet		-		·					
Centerline Dist.		50.0 feet		^	loise Sc	ource Ele			eet)		
Barrier Distance	to Observer:	0.0 feet				Autos.					
Observer Height (	Above Pad);	5.0 feet				n Trucks.			0		
Pa	ad Elevation:	0.0 feet			Heav	y Trucks.	8.0	06	Grade Ad	jusimeni.	0.0
Roa	ad Elevation:	0.0 feet		L	ane Eq	uivalent	Distand	e (in i	feet)		
	Road Grade:	0.0%				Autos.	46.9	15			
	Left View:	-90.0 degree	s		Mediur	n Trucks.	46.7	26			
	Right View:	90.0 degree	s		Heav	y Trucks.	46.7	44			
FHWA Noise Mod	el Calculation	s									
VehicleType	REMEL	Traffic Flow	Dist	ance	Finite	Road	Fresn	el	Barrier Att	en Ber	m Atten
Autos:	70.20	4.08		0.31		-1.20		4.65	0.0	000	0.00
Medium Trucks:	81.00	-13.15		0.34		-1.20		4.87		000	0.00
Heavy Trucks:	85.38	-17.11		0.34		-1.20		-5.43	0.0	000	0.00
Unmitigated Noise											
VehicleType	Leq Peak Hou			Leq Ev		Leq N			Ldn		VEL
Autos:	73		1.5		69.7		63.7		72.3		72.
Medium Trucks:	67		5.5		59.1		57.6		66.0	-	66.
Heavy Trucks:	67		6.0		56.9		58.2		66.6		66.
Vehicle Noise:	75		3.3		70.3		65.5		74.1	1	74.
Centerline Distant	ce to Noise Co	ontour (in feet)		70 d	DA	65 d	DA	4	0 dBA	55	dBA
			dn:	70 a 93		20		c	433		ава 34
			IEL:	10		20			433		003
		Ch		10	0	21	0		400	1,	000

Monday, June 18, 2018

		NA-RD-77-108	HIGH	WAT	NOISE PR		-				
	rio: HY 2040 W	/ithout Project				Project N			ate		
	ne: Main St. ent: s/o Columb	a Av				Job Nur	nber: 1	11145			
Ŷ	SPECIFIC IN					NC				-	
Highway Data	SPECIFIC IN	PUIDAIA			Site Con	ditions (F				3	
Average Daily	Traffic (Adt):	42,900 vehicle	s				A	Autos:	15		
• •	Percentage:	10%			Me	dium Truc	ks (2 A	xles):	15		
Peak I	Hour Volume:	4,290 vehicle	s		He	avy Truck	s (3+ A	xles):	15		
Ve	ehicle Speed:	50 mph		-	Vehicle I	Niv					
Near/Far La	ane Distance:	36 feet		-		icleType		Day	Evening	Night	Daily
Site Data								77.5%	•	9.6%	
D-	rrier Height:	0.0 feet			Me	dium Tru	cks:	84.8%	4.9%	10.3%	1.84%
Barrier Type (0-V	Vall, 1-Berm):	0.0			ŀ	leavy Tru	cks:	86.5%	2.7%	10.8%	0.74%
	ist. to Barrier:	50.0 feet			Noise Sc	ource Elev	ations	s (in fe	et)		
Centerline Dist.		50.0 feet				Autos:	0.0	00			
Barrier Distance		0.0 feet			Mediur	n Trucks:	2.2	97			
Observer Height	• /	5.0 feet			Heav	y Trucks:	8.0	06	Grade Ad	iustment	: 0.0
	ad Elevation:	0.0 feet		-	1 E		N				
Ro	ad Elevation:	0.0 feet		-	Lane Eq	uivalent L			eet)		
	Road Grade:	0.0%				Autos:	46.9				
	Left View:	-90.0 degre				n Trucks:	46.7 46.7				
	Right View:	90.0 degre	es		Heav	y Trucks:	40.7	44			
FHWA Noise Mod											
VehicleType	REMEL	Traffic Flow	Dist	tance	Finite		Fresn		Barrier Att		rm Atten
Autos		0.02		0.3		-1.20		4.65		000	0.00
Medium Trucks:				0.3		-1.20		4.87		000	0.00
Heavy Trucks:	85.38	-17.28		0.3	4	-1.20		-5.43	0.0	000	0.00
Unmitigated Nois											
VehicleType	Leq Peak Hou	. ,		Leq E	vening	Leq N	·		Ldn		NEL
Autos:			71.3		69.6		63.5		72.1		72.
Medium Trucks:			65.3		58.9		57.4		65.9		66.
Heavy Trucks			65.8		56.8		58.0		66.4		66.
Vehicle Noise.			73.2		70.1		65.4		73.9	)	74.4
Centerline Distan	ce to Noise C	ontour (in feet	)					-			
			L		dBA	65 dE		6	0 dBA		dBA
			Ldn:	0	)1	196			422	ç	910
			NFI :	-	18	211			454		978

	FHW/	A-RD-77-108 HIG	HWAY I	NOISE PI	REDICTIO	N MODE	L		
Road Nam	io: HY 2040 Witl le: Main St. nt: n/o Strong St				Project N Job Nur	ame: No nber: 11			
SITE	SPECIFIC INP	UT DATA			NO	ISE MO	DEL INPUT	s	
Highway Data				Site Con	ditions (H	lard = 10	, Soft = 15)		
Average Daily	Traffic (Adt): 42	,900 vehicles				Au			
Peak Hour	Percentage:	10%		Me	dium Truc	ks (2 Axle	əs): 15		
Peak H	lour Volume: 4	,290 vehicles		He	avy Truck	s (3+ Axle	əs): 15		
Ve	hicle Speed:	45 mph	ŀ	Vehicle I	Mix				
Near/Far La	ne Distance:	36 feet	Ē		icleType	Da	y Evening	Night	Daily
Site Data					Au	tos: 77	.5% 12.9%	9.6%	97.42%
Ba	rier Height:	0.0 feet		Me	edium True	cks: 84	.8% 4.9%	10.3%	1.84%
Barrier Type (0-W		0.0		ŀ	leavy Tru	cks: 86	.5% 2.7%	10.8%	0.74%
Centerline Dis	st. to Barrier:	50.0 feet	-	Noise So	ource Elev	vations (	in feet)		
Centerline Dist.	to Observer:	50.0 feet	ŀ		Autos:	0.000	,		
Barrier Distance		0.0 feet		Mediu	n Trucks:	2.297			
Observer Height (	Above Pad):	5.0 feet		Heav	v Trucks:	8.006		iustment.	0.0
Pa	ad Elevation:	0.0 feet							
Roa	ad Elevation:	0.0 feet		Lane Eq	uivalent D				
1	Road Grade:	0.0%			Autos:	46.915			
		-90.0 degrees			m Trucks:	46.726			
	Right View:	90.0 degrees		Heav	y Trucks:	46.744	1		
FHWA Noise Mod	el Calculations								
VehicleType	REMEL	Traffic Flow D	listance	Finite	Road	Fresnel	Barrier Att	en Ber	m Atten
Autos:	68.46	4.37	0.3	11	-1.20	-4.	65 0.0	000	0.000
Medium Trucks:	79.45	-12.86	0.3	4	-1.20	-4.	87 0.0	000	0.000
Heavy Trucks:	84.25	-16.82	0.3	14	-1.20	-5.	43 0.0	000	0.000
Unmitigated Noise	e Levels (withou	ut Topo and ban	rier atter	nuation)					
VehicleType	Leq Peak Hour		,	vening	Leq Ni	•	Ldn		NEL
Autos:	71.9			68.3		62.2	70.8		71.5
Medium Trucks:	65.7	• · · -		57.9		56.3	64.8	-	65.0
Heavy Trucks:	66.6			56.1		57.4	65.		65.8
Vehicle Noise:	73.8	72.0	)	68.9		64.2	72.8	3	73.2
Centerline Distant	ce to Noise Con	tour (in feet)							
				dBA	65 dE		60 dBA		dBA
		Ldn		76	165		355		64
		CNEL	: 8	32	177		380	8	19

Monday, June 18, 2018

HWAY NOISE PREDICTION MODEL
Project Name: Northgate
Job Number: 11145
NOISE MODEL INPUTS
Site Conditions (Hard = 10, Soft = 15)
Autos: 15
Medium Trucks (2 Axles): 15
Heavy Trucks (3+ Axles): 15
Vehicle Mix
VehicleType Day Evening Night Dail
Autos: 77.5% 12.9% 9.6% 97.42
Medium Trucks: 84.8% 4.9% 10.3% 1.84
Heavy Trucks: 86.5% 2.7% 10.8% 0.74
Noise Source Elevations (in feet)
Autos: 0.000
Medium Trucks: 2.297
Heavy Trucks: 8.006 Grade Adjustment: 0.0
Lane Equivalent Distance (in feet)
Autos: 46.915
Medium Trucks: 46.726
Heavy Trucks: 46.744
stance Finite Road Fresnel Barrier Atten Berm Atte
0.31 -1.20 -4.65 0.000 0.0
0.34 -1.20 -4.87 0.000 0.0
0.34 -1.20 -5.43 0.000 0.0
er attenuation)
Leq Evening Leq Night Ldn CNEL
61.1 55.0 63.6 6
51.7 50.2 58.6 5 52.4 53.6 62.0 6
52.4 53.6 62.0 6 62.0 58.1 66.6 6
02.0 30.1 00.6 0
70 dBA 65 dBA 60 dBA 55 dBA
70 dBA         65 dBA         60 dBA         55 dBA           30         64         139         299

	FH\	WA-RD-77-108	HIGH	WAY N	IOISE PF	REDICTIO	N MO	DEL			
	<i>rio:</i> HY 2040 W ne: Main St.	/ithout Project				Project N Job Nur			ate		
	ne: Main St. ent: n/o Russell	St.				JOD INUI	nber:	11145			
SITE	SPECIFIC IN	IPUT DATA							L INPUT	s	
Highway Data				:	Site Con	ditions (H	lard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	23,100 vehicles	6					Autos:	15		
Peak Hou	Percentage:	10%			Me	dium Truc	:ks (2 /	Axles):	15		
Peak I	Hour Volume:	2,310 vehicles	3		Hea	avy Truck	's (3+ A	Axles):	15		
Ve	ehicle Speed:	35 mph		5	Vehicle I	Mix					
Near/Far La	ane Distance:	36 feet		H		icleType		Dav	Evening	Night	Dailv
Site Data							itos:	77.5%			97.429
P1	rrier Height:	0.0 feet			Me	dium Tru	cks:	84.8%	4.9%	10.3%	1.849
Barrier Type (0-V	•	0.0			F	leavy Tru	cks:	86.5%	2.7%	10.8%	0.749
	ist. to Barrier:	50.0 feet				,					
Centerline Dist.		50.0 feet		1	Noise So	ource Ele			eet)		
Barrier Distance		0.0 feet				Autos:		000			
Observer Height		5.0 feet				n Trucks:		297			
	ad Elevation:	0.0 feet			Heav	y Trucks:	8.	006	Grade Ad	ustment.	0.0
Ro	ad Elevation:	0.0 feet		1	Lane Equ	uivalent L	Distan	ce (in i	feet)		
	Road Grade:	0.0%				Autos:	46.	915			
	Left View:	-90.0 degree	es		Mediur	n Trucks:	46.	726			
	Right View:	90.0 degree	es		Heav	y Trucks:	46.	744			
FHWA Noise Mod	lel Calculation	s									
VehicleType	REMEL	Traffic Flow	Dist	ance	Finite	Road	Fresr	nel	Barrier Att	en Ber	m Atten
Autos:		2.78		0.31		-1.20		-4.65		000	0.00
Medium Trucks:	75.75	-14.46		0.34	4	-1.20		-4.87	0.0	000	0.00
Heavy Trucks:	81.57	-18.42		0.34	4	-1.20		-5.43	0.0	000	0.00
Unmitigated Nois	e Levels (with	out Topo and	barrie	r atten	uation)						
VehicleType	Leq Peak Hou			Leg Ev	vening	Leq N			Ldn		VEL
Autos:			64.3		62.5		56.5		65.1		65.
Medium Trucks:			58.9		52.6		51.0		59.5		59.
Heavy Trucks:		-	60.9		51.8		53.1		61.4		61.
Vehicle Noise:			66.7		63.3		58.9	)	67.4	1	67.
Centerline Distan	ce to Noise C	ontour (in feet,	)	70	104	05. "			0.104		-/04
				70 0		65 dE		e	60 dBA		dBA
			Ldn: VEL:	3-		72 77			156 167		36 59

Monday, June 18, 2018

		VA-RD-77-108	HIGHW	AT N							
	io: HY 2040 W	ithout Project				Project N			ate		
	ne: Main St. nt: s/o Russell	St				Job Nur	nber: 1	1145			
ů	SPECIFIC IN					NC				2	
Highway Data	JECIFIC IN	FUIDAIA		s	ite Con	ditions (F				3	
Average Daily	Traffic (Adt):	23,100 vehicles	5				A	lutos:	15		
Peak Hour	Percentage:	10%			Med	dium Truc	ks (2 A	xles):	15		
Peak H	lour Volume:	2,310 vehicles	6		Hea	avy Truck	s (3+ A	xles):	15		
Ve	hicle Speed:	35 mph		N	ehicle N	Niv					
Near/Far La	ne Distance:	36 feet		F		cleType		Day	Evening	Night	Daily
Site Data								77.5%	•	9.6%	
Ba	rrier Height:	0.0 feet			Me	dium Tru	cks: 8	34.8%	4.9%	10.3%	1.84
Barrier Type (0-V		0.0			H	leavy Tru	cks: 8	36.5%	2.7%	10.8%	0.749
Centerline Di		50.0 feet		٨	loise So	urce Elev	ations	; (in fe	et)		
Centerline Dist.		50.0 feet				Autos:	0.0	00			
Barrier Distance		0.0 feet			Mediun	n Trucks:	2.2	97			
Observer Height	· /	5.0 feet				Trucks:	8.0	06	Grade Adj	ustment	: 0.0
	ad Elevation:	0.0 feet		_							
	ad Elevation:	0.0 feet		L	ane Equ	ivalent L		· ·	eet)		
	Road Grade:	0.0%				Autos:	46.9				
	Left View:	-90.0 degree				n Trucks:	46.7				
	Right View:	90.0 degree	es		Heav	y Trucks:	46.7	44			
FHWA Noise Mod											
VehicleType	REMEL	Traffic Flow	Dista		Finite		Fresn		Barrier Atte		rm Atten
Autos:	64.30	2.78		0.31		-1.20		4.65	0.0		0.00
Medium Trucks:		-14.46		0.34		-1.20		4.87	0.0		0.00
Heavy Trucks:	81.57	-18.42		0.34		-1.20	-	5.43	0.0	00	0.00
Unmitigated Nois											
VehicleType	Leq Peak Hou			.eq Ev	•	Leq N	•		Ldn		NEL
Autos:	66		54.3		62.5		56.5		65.1		65.
Medium Trucks:			58.9		52.6		51.0		59.5		59
Heavy Trucks:		-	60.9		51.8		53.1		61.4		61.
Vehicle Noise:	68	.4	66.7		63.3		58.9		67.4		67.
Centerline Distan	ce to Noise Co	ontour (in feet)	)	-	-						
				70 d		65 dE	3A	6	0 dBA		dBA
			Ldn: JFL :	34 36		72 77			156 167		336 359

	FHV	NA-RD-77-108 H	IIGHWAY	NOISE PI	REDICTI					
Road Nam	io: HY 2040 W ne: Orange St. nt: n/o Columb					Name: N umber: 1				
SITE	SPECIFIC IN	IPUT DATA			N	OISE N	IODE	L INPUT	S	
Highway Data				Site Con	ditions	(Hard =	10, So	oft = 15)		
Average Daily	Traffic (Adt):	4,800 vehicles					Autos:			
Peak Hour	Percentage:	10%			dium Tru	•				
Peak H	lour Volume:	480 vehicles		He	avy Truc	:ks (3+ A	(xles):	15		
Ve	hicle Speed:	35 mph		Vehicle	Mix					
Near/Far La	ne Distance:	12 feet			icleType		Day	Evening	Night	Daily
Site Data							77.5%	•	9.6%	
Bai	rrier Heiaht:	0.0 feet		Me	edium Tr	ucks:	84.8%	4.9%	10.3%	1.84%
Barrier Type (0-W		0.0		ŀ	Heavy Tr	ucks:	86.5%	2.7%	10.8%	0.74%
Centerline Dis	st. to Barrier:	33.0 feet		Noise So	ource El	evations	s (in fi	eet)		
Centerline Dist.	to Observer:	33.0 feet			Autos					
Barrier Distance	to Observer:	0.0 feet		Mediu	m Trucks					
Observer Height (	Above Pad):	5.0 feet			v Trucks			Grade Ad	iustmont	. 0 0
Pa	ad Elevation:	0.0 feet						,	usunon	. 0.0
Roa	ad Elevation:	0.0 feet		Lane Eq	uivalent	Distanc	e (in	feet)		
I	Road Grade:	0.0%			Autos	: 32.8	333			
	Left View:	-90.0 degrees	3	Mediu	m Trucks	s: 32.5	562			
	Right View:	90.0 degrees	6	Heav	y Trucks	: 32.5	589			
FHWA Noise Mode	el Calculation	s								
VehicleType	REMEL	Traffic Flow	Distance	e Finite	Road	Fresn	el	Barrier Att	en Ber	m Atten
VehicleType Autos:		Traffic Flow -4.05		e Finite .64	Road -1.20		el -4.52	Barrier Atte 0.0		
21	REMEL		2				-		000	0.00
Autos:	REMEL 64.30	-4.05	2	.64	-1.20		-4.52	0.0 0.0	000	0.000
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise	REMEL 64.30 75.75 81.57 e Levels (with	-4.05 -21.29 -25.24 out Topo and b	2 2 2	.64 .69 .69	-1.20 -1.20		-4.52 -4.86	0.0 0.0 0.0	000 000 000	0.000 0.000 0.000
Autos: Medium Trucks: Heavy Trucks: <b>Unmitigated Noise</b> VehicleType	REMEL 64.30 75.75 81.57 e Levels (with Leq Peak Hou	-4.05 -21.29 -25.24 out Topo and b r Leq Day	2 2 2 arrier att Leq	.64 .69 .69 enuation) Evening	-1.20 -1.20 -1.20	Night	-4.52 -4.86 -5.69	0.0 0.0 0.0	000 000 000 Ci	0.000 0.000 0.000
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType Autos:	REMEL 64.30 75.75 81.57 e Levels (with Leq Peak Hou 61	-4.05 -21.29 -25.24 out Topo and b r Leq Day .7 5	2 2 arrier att Leq 9.8	.64 .69 .69 <i>enuation)</i> <i>Evening</i> 58.0	-1.20 -1.20 -1.20	Vight 52.0	-4.52 -4.86 -5.69	0.0 0.0 0.0 <i>Ldn</i> 60.6	000 000 000 Ci	0.000 0.000 0.000 NEL 61.2
Autos: Medium Trucks: Heavy Trucks: <b>Unmitigated Noise</b> VehicleType	REMEL 64.30 75.75 81.57 e Levels (with Leq Peak Hou 61 56	-4.05 -21.29 -25.24 out Topo and b rr Leq Day .7 5 .0 5	2 2 2 aarrier att Leq 9.8 4.4	.64 .69 .69 <i>enuation)</i> <i>Evening</i> 58.0 48.1	-1.20 -1.20 -1.20 <i>Leq</i> (	Night 52.0 46.5	-4.52 -4.86 -5.69	0.0 0.0 0.0 <i>Ldn</i> 60.6 55.0	000 000 000 Ci	0.000 0.000 0.000 NEL 61.2 55.2
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noiss VehicleType Autos: Medium Trucks: Heavy Trucks:	REMEL 64.30 75.75 81.57 e Levels (with Leq Peak Hou 61	-4.05 -21.29 -25.24 out Topo and b r Leq Day .7 5 .0 5 .8 5	2 2 2 arrier att Leq 9.8 4.4 6.4	.64 .69 .69 <i>enuation)</i> <i>Evening</i> 58.0	-1.20 -1.20 -1.20 <i>Leq</i> (	Vight 52.0 46.5 48.6	-4.52 -4.86 -5.69	0.0 0.0 <i>Ldn</i> 60.6 55.0 57.0		0.000 0.000 0.000 NEL 61.2 55.2 57.1
Autos: Medium Trucks: Heavy Trucks: <b>Unmitigated Noise</b> VehicleType Autos: Medium Trucks:	REMEL 64.30 75.75 81.57 e Levels (with Leq Peak Hou 61 56	-4.05 -21.29 -25.24 out Topo and b r Leq Day .7 5 .0 5 .8 5	2 2 2 aarrier att Leq 9.8 4.4	.64 .69 .69 <i>enuation)</i> <i>Evening</i> 58.0 48.1	-1.20 -1.20 -1.20	Night 52.0 46.5	-4.52 -4.86 -5.69	0.0 0.0 0.0 <i>Ldn</i> 60.6 55.0		0.000 0.000 0.000 NEL 61.2 55.2 57.1
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks: Heavy Trucks: Vehicle Noise:	REMEL           64.30           75.75           81.57           e Levels (with           Leq Peak Hou           61           56           57           63	-4.05 -21.29 -25.24 out Topo and b rr Leq Day .7 5 .0 5 .8 5 .9 6	2 2 2 aarrier att Leq 9.8 4.4 6.4 2.2	.64 .69 .69 <i>Evening</i> 58.0 48.1 47.4 58.8	-1.20 -1.20 -1.20 <i>Leq</i>	Vight 52.0 46.5 48.6 54.4	-4.52 -4.86 -5.69	0.0 0.0 0.0 55.0 57.0 62.9	000 000 000 000 Ci	0.000 0.000 0.000 NEL 61.2 55.2 57. 63.4
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noiss VehicleType Autos: Medium Trucks: Heavy Trucks:	REMEL           64.30           75.75           81.57           e Levels (with           Leq Peak Hou           61           56           57           63	-4.05 -21.29 -25.24 out Topo and b rr Leq Day .7 5 .0 5 .8 5 .9 6	2 2 2 aarrier att Leq 9.8 4.4 6.4 2.2	.64 .69 .69 <i>enuation)</i> <i>Evening</i> 58.0 48.1 47.4	-1.20 -1.20 -1.20	Vight 52.0 46.5 48.6 54.4	-4.52 -4.86 -5.69	0.0 0.0 <i>Ldn</i> 60.6 55.0 57.0	000 000 000 000 Ci	0.000 0.000 0.000 NEL 61.2 55.2 57.1
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks: Heavy Trucks: Vehicle Noise:	REMEL           64.30           75.75           81.57           e Levels (with           Leq Peak Hou           61           56           57           63	-4.05 -21.29 -25.24 out Topo and b rr Leq Day .7 5 .0 5 .0 5 .9 6 ontour (in feet)	2 2 2 2 2 2 2 2 2 9.8 4.4 6.4 2.2 7 dn:	.64 .69 .69 <i>Evening</i> 58.0 48.1 47.4 58.8	-1.20 -1.20 -1.20 <i>Leq</i>	Night 52.0 46.5 48.6 54.4 1BA 4	-4.52 -4.86 -5.69	0.0 0.0 0.0 55.0 57.0 62.9	000 000 000 000 000 000 000 000 000 00	0.000 0.000 NEL 61.2 55.2 57.7 63.4

Monday, June 18, 2018

F	HWA-RD-77-108	HIGHWA	Y NOISE P	REDICTION	MODEL			
Scenario: HY 2040	Without Project			Project Na	ne: North	gate		
Road Name: Orange S	St.			Job Numi	ber: 11145			
Road Segment: s/o Colur	nbia Av.							
SITE SPECIFIC	INPUT DATA					L INPUT	s	
Highway Data			Site Col	nditions (Ha	rd = 10, S	oft = 15)		
Average Daily Traffic (Adt):	10,700 vehicles	5			Autos.			
Peak Hour Percentage:	10%			edium Trucks				
Peak Hour Volume:		S	He	eavy Trucks	(3+ Axles)	: 15		
Vehicle Speed:			Vehicle	Mix				
Near/Far Lane Distance.	12 feet		Vel	nicleType	Day	Evening	Night	Daily
Site Data				Auto	s: 77.5%	6 12.9%	9.6%	97.42%
Barrier Height	0.0 feet		N	ledium Truck	s: 84.8%	6 4.9%	10.3%	1.84%
Barrier Type (0-Wall, 1-Berm).				Heavy Truck	s: 86.5%	6 2.7%	10.8%	0.74%
Centerline Dist. to Barrier	00.0 1000		Noise S	ource Eleva	tions (in f	eet)		
Centerline Dist. to Observer	00.0 1000			Autos:	0.000	,		
Barrier Distance to Observer	0.0 1001		Mediu	m Trucks:	2.297			
Observer Height (Above Pad)			Hea	vv Trucks:	8.006	Grade Ad	justment	: 0.0
Pad Elevation.	0.0 1001		_					
Road Elevation.	0.0 1001		Lane Ec	uivalent Di	<u> </u>	feet)		
Road Grade.	0.070			Autos:	32.833			
Left View.	00.0 409/00			m Trucks:	32.562			
Right View.	90.0 degree	es	Hea	vy Trucks:	32.589			
FHWA Noise Model Calculation								
VehicleType REMEL	Traffic Flow	Distand			resnel	Barrier Att		m Atten
Autos: 64.3			2.64	-1.20	-4.52		000	0.00
Medium Trucks: 75.7			2.69	-1.20	-4.86		000	0.00
Heavy Trucks: 81.5			2.69	-1.20	-5.69	0.0	000	0.00
Unmitigated Noise Levels (wi		-	,				-	
VehicleType Leq Peak H			g Evening	Leq Nig		Ldn		NEL
		63.3	61.5		55.5	64.1		64.
		57.9	51.6		50.0	58.5	-	58.
		59.9	50.8		52.1	60.4		60.0
		65.7	62.3		57.9	66.4	ł	66.
Centerline Distance to Noise	Contour (in feet		70 dBA	65 dBA		60 dBA		dBA
		Ldn: VFI :	19	41 44		88 94	1	90

F	HWA-RD-77-10	8 HIGH	IWAY NC	ISE PREDICT	ION MODE	L		
Scenario: HY 2040	Without Projec	t		Project	Name: No	rthgate		
Road Name: Orange	St.			Job N	umber: 11	145		
Road Segment: n/o Stro	ng St.							
SITE SPECIFIC	INPUT DATA					DEL INPUT	S	
Highway Data			Si	te Conditions	(Hard = 10	, Soft = 15)		
Average Daily Traffic (Adt)	: 8,600 vehicl	es			Au	tos: 15		
Peak Hour Percentage	: 10%			Medium Tr	ucks (2 Axl	es): 15		
Peak Hour Volume	: 860 vehicl	es		Heavy Tru	cks (3+ Axl	es): 15		
Vehicle Speed	: 35 mph		14	ehicle Mix				
Near/Far Lane Distance	: 12 feet			VehicleType	e Da	evening	Night	Daily
Site Data				,		.5% 12.9%	9.6%	
				Medium T		.8% 4.9%	10.3%	
Barrier Height				Heavy T		.5% 2.7%	10.8%	
Barrier Type (0-Wall, 1-Berm) Centerline Dist, to Barrier							10.070	0.11
Centerline Dist. to Observer			N	oise Source E	levations (	in feet)		
Barrier Distance to Observer				Auto	s: 0.000	)		
Observer Height (Above Pad)				Medium Truck	s: 2.297			
Pad Elevation				Heavy Truck	s: 8.006	6 Grade Ad	ljustment	: 0.0
Road Elevation			1:	ane Equivalen	t Distanco	(in feet)		
Road Grade	0.0 1001		_	Auto		,		
Left View	0.070			Medium Truck				
Right View				Heavy Truck				
Night View	. 90.0 degi	ees		neavy nach	3. 32.30	5		
FHWA Noise Model Calculati								
VehicleType REMEL	Traffic Flow	-	tance	Finite Road	Fresnel	Barrier At		m Atten
Autos: 64.			2.64	-1.20			000	0.00
Medium Trucks: 75.			2.69	-1.20			000	0.00
Heavy Trucks: 81.	57 -22.7	1	2.69	-1.20	-5.	<i>69</i> 0.	000	0.00
Unmitigated Noise Levels (w							-	
VehicleType Leq Peak H			Leq Eve	ΰ,	Night	Ldn		NEL
Autos:	64.2	62.3		60.6	54.5	63.		63.
Medium Trucks:	58.5	57.0		50.6	49.1	57.		57.
Heavy Trucks:	60.3	58.9		49.9	51.1	59.		59.
Vehicle Noise:	66.5	64.8		61.3	56.9	65.	5	65
Centerline Distance to Noise	Contour (in fee	et)						
		. L	70 dE		dBA	60 dBA		dBA
		Ldn:	16	3	15	76	1	64
		ONFL:	18		8	81		75

Monday, June 18, 2018

	FHW	/A-RD-77-108	HIGH	IWAY N	IOISE PF	REDICTI	ON MC	DDEL			
Road Nam	o: HY 2040 W e: Orange St. nt: s/o Strong S	,				Project I Job Nu					
	SPECIFIC IN	PUT DATA							L INPUT	s	
Highway Data					Site Con	ditions (					
Average Daily	Traffic (Adt):	8,900 vehicles						Autos:			
	Percentage:	10%				dium Tru					
Peak H	our Volume:	890 vehicles			Hea	avy Truc	ks (3+	Axles):	15		
Ve	hicle Speed:	35 mph		-	Vehicle I	<i>liv</i>					
Near/Far La	ne Distance:	12 feet		-		cleType		Dav	Evening	Night	Dailv
Site Data							utos:	77.5%	•		97.429
Pa	rier Height:	0.0 feet			Me	dium Tru	ucks:	84.8%	4.9%	10.3%	1.849
Barrier Type (0-W	all, 1-Berm):	0.0			H	leavy Tri	ucks:	86.5%	2.7%	10.8%	0.74
Centerline Dis		33.0 feet		5	Noise So	urce Ele	evatior	ns (in f	eet)		
Centerline Dist.		33.0 feet				Autos	: 0	.000	,		
Barrier Distance	to Observer:	0.0 feet			Mediur	n Trucks	2	297			
Observer Height (	Above Pad):	5.0 feet			Heav	v Trucks	: 8	.006	Grade Ad	iustmen	: 0.0
Pa	ad Elevation:	0.0 feet					-				
Roa	ad Elevation:	0.0 feet			Lane Equ				feet)		
I	Road Grade:	0.0%				Autos	: 32	.833			
	Left View:	-90.0 degree	s		Mediur	n Trucks	: 32	.562			
	Right View:	90.0 degree	s		Heav	y Trucks	: 32	.589			
FHWA Noise Mode					Т	1		1			
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite		Fres		Barrier Att		rm Atter
Autos:	64.30	-1.37		2.6		-1.20		-4.52		000	0.00
Medium Trucks:	75.75	-18.60		2.6	-	-1.20		-4.86	•••	000	0.00
Heavy Trucks:	81.57	-22.56		2.6	-	-1.20		-5.69	0.0	000	0.00
Unmitigated Noise			barrie					1		-	
	Leq Peak Hou			Leq E	vening	Leq I		_	Ldn		NEL
Autos:	64.		2.5		60.7		54.		63.	-	63
Medium Trucks:	58.		7.1		50.8		49.	-	57.		57
Heavy Trucks:	60.		9.1		50.0		51.	-	59.	-	59
Vehicle Noise:	66.		64.9		61.5		57.	1	65.	3	66
Centerline Distand	e to Noise Co	ntour (in feet)		70	10.4						
			, L		dBA	65 0		(	60 dBA		dBA
			.dn: IFI :		7 8	36	-		78 83		168
											179

	FHW	A-RD-77-108 H	IGHWAY	NOISE PR	REDICTI	ON MODE	L	
Road Nam	o: HY 2040 Wi e: Orange St. nt: n/o Russell \$					Name: Noi umber: 111		
SITE S	SPECIFIC INI	PUT DATA			N	OISE MO	DEL INPUTS	
Highway Data				Site Con	ditions (	(Hard = 10	, Soft = 15)	
Average Daily	Traffic (Adt):	9,100 vehicles				Aut	os: 15	
Peak Hour	Percentage:	10%		Me	dium Tru	cks (2 Axle	es): 15	
Peak H	our Volume:	910 vehicles		He	avy Truc	ks (3+ Axle	es): 15	
Vel	nicle Speed:	35 mph		Vehicle I	Mise			
Near/Far Lar	ne Distance:	12 feet			icleType	Da	v Evening	Night Daily
Site Data				Ven			5% 12.9%	9.6% 97.42%
		0.0 feet		M	edium Tr		8% 4.9%	10.3% 1.84%
Barrier Type (0-W	rier Height:	0.0 reet 0.0			Heavy Tr		.5% 2.7%	10.8% 0.74%
Centerline Dis		33.0 feet			,		-	
Centerline Dist. t		33.0 feet		Noise So		evations (i	,	
Barrier Distance		0.0 feet			Autos			
Observer Height (		5.0 feet			m Trucks			
0 1	d Flevation:	0.0 feet		Heav	ry Trucks	8.006	Grade Adju	stment: 0.0
Roa	d Elevation:	0.0 feet		Lane Eq	uivalent	Distance	(in feet)	
	Road Grade:	0.0%			Autos	: 32.833	3	
	Left View:	-90.0 degrees		Mediu	m Trucks	: 32.562	2	
	Right View:	90.0 degrees		Heav	ry Trucks	32.589	)	
FHWA Noise Mode	l Calculations							
VehicleType	REMEL	Traffic Flow	Distance	Finite	Road	Fresnel	Barrier Atte	n Berm Atten
Autos:	64.30	-1.27	2.	64	-1.20	-4.	52 0.00	0.000
Medium Trucks:	75.75	-18.51	2.	69	-1.20	-4.	86 0.00	0.000
Heavy Trucks:	81.57	-22.46	2.	69	-1.20	-5.	69 0.00	00.00
Unmitigated Noise			arrier atte	enuation)				
	Leq Peak Hour			Evening	Leq I	0	Ldn	CNEL
Autos:	64.			60.8		54.7	63.4	64.0
		7 57	.2	50.9		49.3	57.8	58.0
Medium Trucks:	58.		-					
Heavy Trucks:	60.0	6 59		50.1		51.4	59.7	
Heavy Trucks: Vehicle Noise:	60.0 66.1	6 59 7 65	9.2 5.0	50.1 61.5		51.4 57.2	59.7 65.7	
Heavy Trucks: Vehicle Noise:	60.0 66.1	6 59 7 65	5.0	61.5		57.2	65.7	66.1
Heavy Trucks: Vehicle Noise:	60.0 66.1	6 59 7 65 ntour (in feet)	5.0	61.5 0 dBA	65 0	57.2 IBA	65.7 60 dBA	59.9 66.1 55 dBA
Heavy Trucks:	60.0 66.1	6 59 7 65	5.0 70 dn:	61.5		57.2 IBA 7	65.7	66.1

Monday, June 18, 2018

	FH\	WA-RD-77-108	HIGHW	VAY N	OISE PF	REDICTIO	N MOI	DEL			
Scenar	io: HY 2040 W	Vithout Project				Project N	ame: N	Vorthg	ate		
Road Nam	e: Orange St.					Job Nun	nber: 1	1145			
Road Segme	nt: s/o Russell	I St.									
	SPECIFIC IN	NPUT DATA							L INPUT	s	
Highway Data				1	Site Con	ditions (H	lard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	5,800 vehicle	s				A	Autos:	15		
	Percentage:	10%				dium Truci		/	15		
	lour Volume:	580 vehicle	s		Hea	avy Trucks	s (3+ A	xles):	15		
	hicle Speed:	35 mph		1	Vehicle I	/ix					
Near/Far La	ne Distance:	12 feet			Vehi	cleType		Day	Evening	Night	Daily
Site Data						Au	tos:	77.5%	12.9%	9.6%	97.429
Ba	rrier Height:	0.0 feet			Me	dium Truc	cks:	84.8%	4.9%	10.3%	1.849
Barrier Type (0-W	/all, 1-Berm):	0.0			H	leavy Truc	cks:	86.5%	2.7%	10.8%	0.749
Centerline Di		33.0 feet		1	Voise So	urce Elev	ations	s (in fe	et)		
Centerline Dist.		33.0 feet				Autos:	0.0	00			
Barrier Distance		0.0 feet			Mediur	n Trucks:	2.2	97			
Observer Height (	,	5.0 feet			Heav	v Trucks:	8.0	06	Grade Ad	iustment	: 0.0
	ad Elevation:	0.0 feet		H				- (1 )	( 4)		
	ad Elevation:	0.0 feet		-	Lane Equ	ivalent D	32.8		eet)		
	Road Grade: Left View:	0.0%			Madium	n Trucks:	32.6				
	Left View: Right View:	-90.0 degre 90.0 degre				y Trucks:	32.5				
FHWA Noise Mod	el Calculation	•									
VehicleType	REMEL	Traffic Flow	Dista	ance	Finite	Road	Fresn	el	Barrier Att	en Bei	rm Atter
Autos:	64.30	-3.23		2.64	1	-1.20		4.52	0.0	000	0.00
Medium Trucks:	75.75	-20.46		2.69	9	-1.20		4.86	0.0	000	0.00
Heavy Trucks:	81.57	-24.42		2.69	9	-1.20		5.69	0.0	000	0.00
Unmitigated Nois	e Levels (with	out Topo and	barrier	atten	uation)						
VehicleType	Leq Peak Ho			Leq E	/ening	Leq Ni			Ldn		NEL
Autos:	-		60.6		58.8		52.8		61.4		62.
Medium Trucks:		3.8	55.3		48.9		47.4		55.8		56.
Heavy Trucks:		3.6	57.2		48.2		49.4		57.8	-	57.
Vehicle Noise:		1.8	63.0		59.6		55.2		63.7	7	64.
Centerline Distan	ce to Noise C	ontour (in fee	)	70							
			L	70 c		65 dE	8A	6	0 dBA		dBA
			Ldn:	1:	3	27			59	1	26
			NFL:	13		29			63		35

	FHW	/A-RD-77-108	HIGHV	VAY NO	DISE PF	REDICTI	ON MOL	DEL			
Scenario.	: HY 2040 W	ithout Project				Project	Name: N	lorthg	ate		
Road Name.	Primer St.					Job N	umber: 1	1145			
Road Segment.	n/o Columbi	a Av.									
SITE S	PECIFIC IN	PUT DATA								s	
Highway Data				S	ite Con	ditions	(Hard =	10, Sc	ft = 15)		
Average Daily Ti	raffic (Adt): 2	6,500 vehicles					A	utos:	15		
Peak Hour P	ercentage:	10%			Me	dium Tru	icks (2 A	xles):	15		
Peak Ho	ur Volume:	2,650 vehicles			He	avy Truc	:ks (3+ A	xles):	15		
Vehi	cle Speed:	35 mph		V	ehicle l	Mix					
Near/Far Lane	e Distance:	12 feet				icleType		Day	Evening	Night	Daily
Site Data					Ven			77.5%	0	9.6%	
					1.14	, dium Tr		34.8%		10.3%	
	ier Height:	0.0 feet				leavy Tr		36.5%		10.8%	
Barrier Type (0-Wa		0.0			,	icavy ii	uono. (	0.070	2.170	10.070	0.74
Centerline Dist.		33.0 feet		N	oise Sc	ource El	evations	(in fe	et)		
Centerline Dist. to		33.0 feet				Autos	s: 0.0	00			
Barrier Distance to		0.0 feet			Mediur	n Trucks	s: 2.2	97			
Observer Height (A		5.0 feet			Heav	y Trucks	s: 8.0	06	Grade Ad	justment	: 0.0
	Elevation:	0.0 feet				uivalant	Distanc	o (in i	(a.a.t.)		
	Elevation:	0.0 feet		<i>L</i> .	ane Eq	Autos			eel)		
Ro	oad Grade: Left View:	0.0%				n Trucks					
		-90.0 degree									
,	Right View:	90.0 degree	5		Heav	y Trucks	32.5	89			
FHWA Noise Model	Calculations	;									
VehicleType	REMEL	Traffic Flow	Dista	ance	Finite	Road	Fresn	el	Barrier Att	en Ber	m Atter
Autos:	64.30	3.37		2.64		-1.20		4.52	0.0	000	0.00
Medium Trucks:	75.75	-13.87		2.69		-1.20		4.86	0.0	000	0.00
Heavy Trucks:	81.57	-17.82		2.69		-1.20		5.69	0.0	000	0.00
Unmitigated Noise	Levels (witho	out Topo and L	arrier	attenu	ation)						
	eq Peak Hou			Leq Eve		Leq	Night		Ldn		NEL
Autos:	69.		7.2		65.4		59.4		68.0		68
Medium Trucks:	63.		1.9		55.5		54.0		62.4		62
Heavy Trucks:	65.		3.8		54.8		56.0		64.4		64
Vehicle Noise:	71.		9.6		66.2		61.8		70.3	3	70
Centerline Distance	to Noise Co	ntour (in feet)								1	
				70 dl			dBA	6	0 dBA		dBA
			dn: EL:	35 37		7			161 172		48 71

Monday, June 18, 2018

0		little aust Dara i a at				Desired A		I a atta a	-4-		
	<i>io:</i> HY 2040 W ne: La Cadena					Project N Job Nur			ate		
	nt: n/o I-215 R					300 140	nber.	11143			
SITE	SPECIFIC IN					NC	ISE N	IODE		s	
Highway Data					Site Con	ditions (H	lard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	7,600 vehicles					,	Autos:	15		
Peak Hour	Percentage:	10%			Mee	dium Truc	ks (2 A	xles):	15		
Peak I	lour Volume:	760 vehicles			Hea	avy Truck	s (3+ A	xles):	15		
Ve	hicle Speed:	40 mph		F	Vehicle I	Nix					
Near/Far La	ne Distance:	12 feet		F		cleType		Day	Evening	Night	Daily
Site Data						Au	tos:	77.5%	12.9%	9.6%	97.429
Ra	rrier Height:	0.0 feet			Me	dium Tru	cks:	84.8%	4.9%	10.3%	1.84%
Barrier Type (0-V	Vall, 1-Berm):	0.0			H	leavy Tru	cks:	86.5%	2.7%	10.8%	0.74%
	st. to Barrier:	33.0 feet		L.	Noise So	urce Ele	vation	s (in fe	et)		
Centerline Dist.		33.0 feet		Ē		Autos:	0.0	000			
Barrier Distance		0.0 feet			Mediur	n Trucks:	2.2	297			
Observer Height	· /	5.0 feet			Heav	y Trucks:	8.0	006	Grade Ad	iustment	: 0.0
-	ad Elevation:	0.0 feet		H			N-4				
	ad Elevation:	0.0 feet		-	Lane Equ			· ·	eet)		
	Road Grade:	0.0%			A de alla co	Autos:	32.8				
	Left View: Right View:	-90.0 degree 90.0 degree				n Trucks: v Trucks:	32. 32.				
	Right view.	90.0 degree	5		Tieav	y mucks.	52.5	009			
FHWA Noise Mod					1			. 1		-	
VehicleType	REMEL	Traffic Flow -2.63	Dist	ance	Finite	-1.20	Fresn	el -4.52	Barrier Att	en Bei 100	m Atten
Autos:				2.6 2.6		-1.20		-4.52 -4.86			0.00
Medium Trucks: Heavy Trucks:		-19.87 -23.83		2.6	-	-1.20		-4.80 -5.69		000 000	0.00
					-	-1.20		-5.69	0.0	00	0.00
Unmitigated Nois VehicleType	e Levels (with Leg Peak Hou				vening	Leg N	iaht		Ldn		NEL
Autos			3.4	Ley E	61.7	Leq M	9// 55.6		64.2		64.
Medium Trucks:			57.8		51.5		49.9		58.4	-	58.
Heavy Trucks:			59.2		50.2		51.4		59.8		59.
Vehicle Noise:			65.6		62.3		57.8		66.3		66.
Centerline Distan	ce to Noise Co	ontour (in feet)									
			1	70	dBA	65 dE	BA	6	0 dBA	55	dBA
			dn:	4	9	40			87		88
		1	an:		9	40			07		00

	FH	WA-RD-77-108 I	HIGHWAY	NOISE F	REDICTIO	N MODEL			
	e: La Cadena					ame: North nber: 1114			
SITE	SPECIFIC I	NPUT DATA			NO	ISE MOD	EL INPUT	s	
Highway Data				Site Co	nditions (H	ard = 10, S	oft = 15)		
Average Daily	Traffic (Adt):	2,600 vehicles				Autos	: 15		
Peak Hour	Percentage:	10%		М	edium Truci	ks (2 Axles)	: 15		
Peak H	our Volume:	260 vehicles		н	eavy Trucks	s (3+ Axles)	: 15		
Vei	hicle Speed:	40 mph		Vehicle	Mix				
Near/Far Lar	ne Distance:	12 feet			hicleType	Dav	Evening	Night	Daily
Site Data					Au		-	9.6%	
Por	rier Height:	0.0 feet		٨	ledium Truc	ks: 84.8		10.3%	1.84%
Barrier Type (0-W	•	0.0			Heavy Truc	ks: 86.5	6 2.7%	10.8%	0.74%
Centerline Dis	. ,	33.0 feet							
Centerline Dist.		33.0 feet		Noise S	ource Elev		teet)		
Barrier Distance	to Observer:	0.0 feet			Autos: Im Trucks:	0.000			
Observer Height (.	Above Pad):	5.0 feet			vv Trucks:	2.297 8.006	Grade Ad	iustmont	
Pa	ad Elevation:	0.0 feet		nea	vy mucks.	0.000	Grade Au	jusuneni.	0.0
Roa	ad Elevation:	0.0 feet		Lane E	quivalent D	istance (in	feet)		
F	Road Grade:	0.0%			Autos:	32.833			
	Left View:	-90.0 degrees	3		ım Trucks:	32.562			
	Right View:	90.0 degree	6	Hea	vy Trucks:	32.589			
FHWA Noise Mode		-							
VehicleType	REMEL	Traffic Flow	Distance			Fresnel	Barrier Att		m Atten
Autos:	66.51		-	.64	-1.20	-4.52		000	0.00
Medium Trucks:	77.72		-	.69	-1.20	-4.86		000	0.00
Heavy Trucks:	82.99			.69	-1.20	-5.69	0.0	000	0.000
Unmitigated Noise									
,1	Leq Peak Ho	1 1	,	Evening	Leq Ni		Ldn		VEL
Autos:			8.8 3.2	57.0	-	50.9	59.6		60.2
Medium Trucks:			3.2 4.6	46.8 45.9		45.3 46.8	53.7 55.1		54.0
Heavy Trucks: Vehicle Noise:			4.0	45.		46.8	55. 61.7		55.0 62.0
			1.0	37.		33.1	01.1		02.
Centerline Distanc	e to NOISE C	ontour (in feet)	7	0 dBA	65 dE	4	60 dBA	55	dBA
		1	dn:	9	20	••	43		- 
		CN		10	20		46		98
				-			-		

	FHV	VA-RD-77-108	HIGH	WAY N	NOISE PF	REDICTIO	N MODEL			
	e: La Cadena						ame: North nber: 1114			
SITE S	PECIFIC IN	IPUT DATA				NC	ISE MOD	EL INPUT	S	
Highway Data					Site Con	ditions (H	lard = 10, 3	Soft = 15)		
	Percentage: our Volume:	2,400 vehicle 10% 240 vehicle					Autos ks (2 Axles s (3+ Axles	): 15		
	icle Speed:	40 mph		Ē	Vehicle I	Mix				
Near/Far Lar	e Distance:	12 feet		Ē	Vehi	icleType	Day	Evening	Night [	Daily
Site Data						Au	tos: 77.5	% 12.9%	9.6% 9	7.42%
Bar	rier Height:	0.0 feet			Me	dium Tru	cks: 84.8	% 4.9%	10.3%	1.84%
Barrier Type (0-Wa	all, 1-Berm):	0.0			ŀ	leavy Tru	cks: 86.5	% 2.7%	10.8%	0.74%
Centerline Dis		33.0 feet			Noise Sc	ource Elev	vations (in	feet)		
Centerline Dist. t		33.0 feet		Ē		Autos:	0.000			
Barrier Distance t		0.0 feet			Mediur	n Trucks:	2.297			
Observer Height (/ Pa	Above Pad): d Elevation:	5.0 feet 0.0 feet			Heav	y Trucks:	8.006	Grade Ad	justment: 0	.0
Roa	d Elevation:	0.0 feet			Lane Eq	uivalent E	Distance (ir	1 feet)		
F	Road Grade:	0.0%				Autos:	32.833			
	Left View:	-90.0 degre	es		Mediur	n Trucks:	32.562			
	Right View:	90.0 degre	es		Heav	y Trucks:	32.589			
FHWA Noise Mode	l Calculation	s								
VehicleType	REMEL	Traffic Flow	Dist	tance	Finite		Fresnel	Barrier Att		
Autos:	66.51	-7.64		2.6		-1.20	-4.52		000	0.00
Medium Trucks:	77.72	-24.88		2.6	-	-1.20	-4.86		000	0.00
Heavy Trucks:	82.99	-28.83		2.6	-	-1.20	-5.69	9 0.0	000	0.00
Unmitigated Noise	•				<u> </u>				1	
	Leq Peak Hou			Leq E	vening	Leq N		Ldn	CNE	
Autos:	60		58.4		56.6		50.6	59.2	-	59.
Medium Trucks:	54		52.8		46.5		44.9	53.4	-	53.
Heavy Trucks:	55		54.2		45.2		46.4	54.8	-	54.
Vehicle Noise:	62		60.6		57.3		52.8	61.3	3	61.
Centerline Distanc	e to Noise Co	ontour (in fee	)						I	
			L		dBA	65 dE	3A	60 dBA	55 dB	64
			Ldn:		9	19		40	87	
		С	NEL:	9	9	20		43	93	

	FHW	A-RD-77-108 I	IIGHW	AY NO	OISE PF	REDICTI	ON MODE	L		
Scenario: H	IY 2040 Wit	thout Project				Project	Name: No	orthgate		
Road Name: F	Placentia Ln					Job N	umber: 11	145		
Road Segment: e	e/o Main St.									
	CIFIC INF	PUT DATA						del input	'S	
Highway Data				S	ite Con	ditions	(Hard = 10	), Soft = 15)		
Average Daily Traf	fic (Adt): 14	4,700 vehicles					Au	tos: 15		
Peak Hour Per	centage:	10%			Me	dium Tru	icks (2 Axi	les): 15		
Peak Hour	Volume: 1	1,470 vehicles			He	avy Truc	ks (3+ Axi	les): 15		
Vehicle	Speed:	25 mph		v	ehicle l	Mix				
Near/Far Lane D	oistance:	36 feet		-		icleType	Di	ay Evening	Night	Daily
Site Data					1011			.5% 12.9%		% 97.42
	Helmha	0.0 feet			Me	edium Tr		8% 4.9%		
	Height:	0.0 feet				leavy Tr		0.5% 2.7%		
Barrier Type (0-Wall, Centerline Dist. to		0.0 44.0 feet								
Centerline Dist. to O		44.0 feet		N	loise Sc	ource El	evations (	'in feet)		
Barrier Distance to O		0.0 feet				Autos				
Observer Height (Abo		5.0 feet			Mediur	m Trucks	s: 2.29			
0 1	levation:	0.0 feet			Heav	y Trucks	8: 8.00	6 Grade Ad	djustme	nt: 0.0
	levation: levation:	0.0 feet		1	ane Fa	uivalent	Distance	(in feet)		
	d Grade:	0.0%		-	une 24	Autos				
	eft View:	-90.0 degree:			Mediur	n Trucks				
=	ht View:	90.0 degree				v Trucks				
		Solo degree.	,			,	10.20	-		
FHWA Noise Model C										
		Traffic Flow	Distar			Road	Fresnel			erm Atter
Autos:	58.73	2.27		1.28		-1.20			000	0.00
Medium Trucks:	70.80	-14.96		1.31		-1.20			000	0.00
Heavy Trucks:	77.97	-18.92		1.31		-1.20	-5	.50 0.	000	0.00
Unmitigated Noise Le			-		<b>/</b>					
	Peak Hour			eq Ev		Leq	Night	Ldn		CNEL
Autos:	61.1	· •	9.2		57.4		51.4	60.		60
Medium Trucks:	55.9		4.4		48.1		46.5	55.	-	55
Heavy Trucks:	59.2	-	7.7		48.7		50.0	58.	-	58
Vehicle Noise:	64.0		2.3		58.4		54.5	63	.0	63
Centerline Distance to	Noise Cor	ntour (in feet)		=0.						-
				70 d			dBA	60 dBA	5	5 dBA
			dn:	15			2	70		150
		CN		16			4	74		159

Monday, June 18, 2018

	FH\	VA-RD-77-108	HIGHV	VAY N	NOISE PR	REDICTIO	ом мо	DEL			
Road Nan	rio: HY 2040 W ne: Columbia A nt: e/o Orange	۹v.				Project I Job Nu			ate		
	SPECIFIC IN	IPUT DATA							L INPUT	s	
Highway Data					Site Con	ditions (					
Average Daily	Traffic (Adt):	31,400 vehicles						Autos:	15		
	Percentage:	10%				dium True					
Peak H	lour Volume:	3,140 vehicles			Hea	avy Truck	ks (3+ A	(xles)	15		
Ve	hicle Speed:	45 mph			Vehicle I	Nix					
Near/Far La	ne Distance:	36 feet		-		cleType		Dav	Evening	Night	Dailv
Site Data								77.5%	•		97.429
	rrier Height:	0.0 feet			Me	dium Tru		84.8%		10.3%	
Barrier Type (0-V	Vall, 1-Berm):	0.0			H	leavy Tru	icks:	86.5%	2.7%	10.8%	
	st. to Barrier:	44.0 feet		5	Noise So	urce Ele	vation	s (in fe	eet)		
Centerline Dist.		44.0 feet				Autos:	0.0	000	í		
Barrier Distance		0.0 feet			Mediur	n Trucks.	2.2	297			
Observer Height	• /	5.0 feet			Heav	v Trucks	8.0	006	Grade Ad	iustment	: 0.0
-	ad Elevation:	0.0 feet									
Ro	ad Elevation:	0.0 feet			Lane Equ				feet)		
	Road Grade:	0.0%				Autos:					
	Left View:	-90.0 degree	5			n Trucks.					
	Right View:	90.0 degree	5		Heav	y Trucks:	40.	262			
FHWA Noise Mod		-									
VehicleType	REMEL	Traffic Flow	Dista		Finite		Fresr	-	Barrier Att		rm Atten
Autos:		3.02		1.2	-	-1.20		-4.61		000	0.00
Medium Trucks:		-14.22		1.3	•	-1.20		-4.87		000	0.00
Heavy Trucks:		-18.18		1.3		-1.20		-5.50	0.0	000	0.00
Unmitigated Nois										-	
VehicleType	Leq Peak Hou			Leq E	vening	Leq N	<u> </u>		Ldn	-	NEL
Autos:	71		9.7		67.9		61.8		70.5		71
Medium Trucks:			3.8		57.5		55.9		64.4	-	64
Heavy Trucks:		ţ	4.8		55.7		57.0		65.3		65.
Vehicle Noise:			1.7		68.5		63.8	3	72.4	ļ	72.
Centerline Distan	ce to Noise C	ontour (in feet)		70	dBA	65 d	DA		0 dBA		dBA
		,		-	dBA 3	65 a			294		
			dn:	-	13 18		-				333
		CN				14			315	6	579

	FHV	VA-RD-77-108 I	IIGHWA	Y NOISE P	REDICTIO	N MOD	EL		
	o: HY 2040 W				Project N				
	e: Columbia A nt: e/o Primer :				Job Nur	nber: 11	1145		
				1					
	SPECIFIC IN	PUT DATA					ODEL IN		
Highway Data				Site Cor	nditions (F	lard = 1	0, Soft = 1	5)	
• •	. ,	34,600 vehicles					utos: 15		
	Percentage:	10%			dium Truc		,		
	our Volume:	3,460 vehicles		He	avy Truck	s (3+ Ax	des): 15		
	hicle Speed:	45 mph		Vehicle	Mix				
Near/Far La	ne Distance:	36 feet		Veh	icleType	D	ay Ever	ning Ni	ght Dail
Site Data					Au	tos: 7	7.5% 12	.9% 9	9.6% 97.4
Bai	rier Heiaht:	0.0 feet		М	edium Tru	cks: 8	4.8% 4	.9% 10	0.3% 1.8
Barrier Type (0-W		0.0			Heavy Tru	cks: 8	6.5% 2	.7% 10	0.7
Centerline Dis	st. to Barrier:	44.0 feet		Noiso S	ource Ele	ations	(in foot)		
Centerline Dist.	to Observer:	44.0 feet		NUISE S	Autos:	0.00	. /		
Barrier Distance	to Observer:	0.0 feet		Modiu	m Trucks:	2.29			
Observer Height (	Above Pad):	5.0 feet			/v Trucks:	8.00		o Adjust	ment: 0.0
Pa	ad Elevation:	0.0 feet		nea	ly mucks.	0.00	Jo Grau	e Aujusi	nem. 0.0
Roa	ad Elevation:	0.0 feet		Lane Eq	uivalent L	Distance	e (in feet)		
I	Road Grade:	0.0%			Autos:	40.46	50		
	Left View:	-90.0 degrees	6	Mediu	m Trucks:	40.24	41		
	Right View:	90.0 degree:	6	Heav	/y Trucks:	40.26	52		
FHWA Noise Mode	el Calculation	s		1					
VehicleType	REMEL	Traffic Flow	Distanc	e Finite	Road	Fresne	I Barrie	er Atten	Berm Atte
Autos:	68.46	3.44		1.28	-1.20	-4	4.61	0.000	0.0
Medium Trucks:	79.45	-13.80		1.31	-1.20		4.87	0.000	0.0
Heavy Trucks:	84.25	-17.75		1.31	-1.20	-8	5.50	0.000	0.0
Unmitigated Noise	e Levels (with	out Topo and b	arrier at	tenuation)					
		r Leq Day		q Evening	Leq N	•	Ldn		CNEL
,1	Leq Peak Hou			68.3		62.3		70.9	7
Autos:	. 72		0.1						
Autos: Medium Trucks:	72 65	.8 6	4.3	57.9		56.3		64.8	6
Autos: Medium Trucks: Heavy Trucks:	72 65 66	.8 6 .6 6	4.3 5.2	57.9 56.1		57.4		65.8	6
Autos: Medium Trucks:	72 65	.8 6 .6 6	4.3	57.9					
Autos: Medium Trucks: Heavy Trucks:	72 65 66 73	.8 6 .6 6 .8 7	4.3 5.2 2.1	57.9 56.1 68.9		57.4 64.3		65.8 72.8	6
Autos: Medium Trucks: Heavy Trucks: Vehicle Noise:	72 65 66 73	.8 6 .6 6 .8 7 ontour (in feet)	4.3 5.2 2.1	57.9 56.1 68.9 70 dBA	65 dE	57.4 64.3 BA	60 dB/	65.8 72.8	6 7 55 dBA
Autos: Medium Trucks: Heavy Trucks: Vehicle Noise:	72 65 66 73	.8 6 .6 6 .8 7 ontour (in feet)	4.3 5.2 2.1	57.9 56.1 68.9		57.4 64.3 BA	60 dB/ 314 336	65.8 72.8	6

Monday, June 18, 2018

FH\	WA-RD-77-108	B HIGHV	VAY N	NOISE PF	REDICTIO	N MODEL	-		
o: HY 2040 W	Vithout Project				Project Na	ame: Nor	thgate		
e: Strong St.					Job Nun	nber: 111	45		
nt: w/o Main S	St.								
SPECIFIC IN	NPUT DATA							S	
				Site Con	ditions (H	ard = 10,	Soft = 15)		
Traffic (Adt):	- ,	s							
Percentage:	10%						., .		
our Volume:	500 vehicle	s		Hea	avy Trucks	: (3+ Axle	s <i>):</i> 15		
hicle Speed:	25 mph			Vehicle I	Mix				
ne Distance:	12 feet			Vehi	cleType	Day	/ Evening	Night	Daily
					Aut	os: 77.	5% 12.9%	9.6%	97.429
rier Height	0.0 feet			Me	edium Truc	ks: 84.	3% 4.9%	10.3%	1.84%
all, 1-Berm):	0.0			H	leavy Truc	ks: 86.	5% 2.7%	10.8%	0.74%
				Noise So	ource Elev	ations (ii	1 feet)		
					Autos:	0.000			
				Mediur	n Trucks:	2.297			
,				Heav	y Trucks:	8.006	Grade Ac	ljustment	: 0.0
			_						
			-	Lane Equ			in feet)		
Right view:	90.0 degre	es		neav	y mucks.	32.589			
	-	1							
									rm Atten
							- •		0.00
				-					0.00
				-	-1.20	-5.6	i9 0.	000	0.00
				<u> </u>				-	
			Leq E		Leq Ni				NEL
									57.3 51.9
-		54.4		44.8 45.4		43.2 46.6	• · ·		55.
50	0.9					40.0 51.2	59.	-	55. 60.
60	)7	59.0							
	).7 ontour (in fee	59.0		55.1		51.Z		,	00.
	).7 ontour (in fee		70	55.1 dBA	65 dB		60 dBA		dBA
					65 dB 15			55	
	2: HY 2040 V 2: Strong St. 4: wo Main S SPECIFIC II Traffic (Ad): Percentage: our Volume: icle Speed: icle Speed:	2: HY 2040 Without Project 2: Strong St. 4: Wo Main St. SPECIFIC INPUT DATA Fraffic (Adt): 5,000 vehicle Percentage: 10% our Volume: 500 vehicle Percentage: 10% our Volume: 500 vehicle icle Speed: 25 mph ne Distance: 12 feet 	2: HY 2040 Without Project 2: Strong St. 4: wio Main St. SPECIFIC INPUT DATA Fraffic (Adt): 5,000 vehicles Percentage: 10% our Volume: 500 vehicles incle Speed: 25 mph he Distance: 12 feet Trier Height: 0.0 feet all, 1-Berm): 0.0 t. to Barrier: 33.0 feet to Observer: 33.0 feet to Observer: 33.0 feet to Observer: 0.0 feet d Elevation: 0.0 feet Sad Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees Right View: 90.0 degrees REMEL Traffic Flow Dist. 58.73 -2.41 70.80 -19.65 77.97 -23.60 Levels (without Topo and barrier Leq Peak Hour Leq Day 57.8 55.9 52.6 51.1	2: HY 2040 Without Project 2: Strong St. 4: wio Main St. SPECIFIC INPUT DATA Fraffic (Adt): 5,000 vehicles Percentage: 10% 2: Strong St. 2: Strong St. 3: Strong S	2: HY 2040 Without Project 2: Strong St. 3: SPECIFIC INPUT DATA SPECIFIC INPUT DATA SPECIFIC INPUT DATA Site Con rraffic (Adt): 5,000 vehicles Percentage: 10% Meta ur Volume: 500 vehicles Percentage: 10% New Vehicle I to Barrier: 33.0 feet to Barrier: 33.0 feet to Observer: 0.0 feet Above Pad): 5.0 feet d Elevation: 0.0 feet Mediur Heav H	Description         Project Net           2: Strong St.         Job Num           2: Strong St.         Job Num           2: Strong St.         Job Num           3PECIFIC INPUT DATA         NO           Stree Conditions (H         Non           Traffic (Adt):         5,000 vehicles           Percentage:         10%           aut Volume:         500 vehicles           Percentage:         10%           aut Volume:         Medium Truck           nicle Speed:         25 mph           Vehicle Mix         Vehicle Mix           to Barier:         33.0 feet           all, 1-Barm):         0.0           to Observer:         33.0 feet           Above Pad):         5.0 feet           Heavy Trucks:         Heavy Trucks:           d Elevation:         0.0 feet           d Elevation:         0.0 degrees           Right View:         90.0 degrees           Right View:         90.0 degrees           Right View:         90.0 degrees	Description     Project Name: Nor       2: Strong St.     Job Number: 111.       2: Strong St.     Job Number: 111.       2: Strong St.     Job Number: 111.       SPECIFIC INPUT DATA     NOISE MOI       Percentage:     10%       Percentage:     10%       Value Volume:     500 vehicles       Icle Speed:     25 mph       Vehicle Mix     Medium Trucks: (2 Arle       Noise Speed:     25 mph       Vehicle Mix     Despeed:       10 Barmin:     0.0       10 Observer:     33.0 feet       All, 1-Barmin:     0.0       10 Observer:     33.0 feet       Above Pad):     5.0       Aledium Trucks:     2.297       Heavy Trucks:     8.006       Above Pad):     5.0 feet       All filewary Trucks:     8.006       All filewary Trucks:     3.2.562       Heavy Trucks:	e: Strong St. Job Number: 11145 SPECIFIC INPUT DATA NOISE MODEL INPUT Site Conditions (Hard = 10, Soft = 15) Traffic (Adt): 5,000 vehicles Percentage: 10% Site Conditions (Hard = 10, Soft = 15) Traffic (Adt): 5,000 vehicles Site Conditions (Hard = 10, Soft = 15) Medium Trucks (2 Axles): 15 Heavy Trucks (2 Axles): 15 Heavy Trucks (3 Axles): 15 Heavy Trucks (3 Axles): 15 Vehicle Mix Vehicle Mix Vehicle Mix Noise Source Elevations (in feet) Autos: 0.00 Medium Trucks: 84.8% 4.9% Heavy Trucks: 86.5% 2.7% Noise Source Elevations (in feet) Autos: 0.00 Medium Trucks: 2.297 Heavy Trucks: 80.5% 2.7% Noise Source Elevations (in feet) Autos: 32.833 Left View: -90.0 degrees Right View: -90.0 degrees	Project Name: Northgate         a: Strong St.       Job Number: 11145         b: Wio Main St.       Site Conditions (Hard = 10, Soft = 15)         SPECIFIC INPUT DATA       Site Conditions (Hard = 10, Soft = 15)         radific (Adt):       5,000 vehicles       Autos: 15         Percentage:       10%       Medium Trucks (2 Avles): 15         var Volume:       500 vehicles       Heavy Trucks (2 Avles): 15         vehicleType       Day       Evening       Night         icle Speed:       25 mph       Vehicle Mix       9.6%         frier Height:       0.0 feet       Medium Trucks:       84.8%       4.9%       10.3%         all, 1-Barm):       0.0       Heavy Trucks:       8.006       Grade Adjustment         o Observer:       33.0 feet       Moleum Trucks:       2.297       Heavy Trucks:       2.297         Above Padi;       5.0 feet       Heavy Trucks:       8.006       Grade Adjustment         d Elevation:       0.0 feet       Autos:       2.283       Medium Trucks:       32.583         Left View:       90.0 degrees       Medium Trucks:       32.583       Heavy Trucks:       32.69         Right View:       90.0 degrees       Finite Road       Fresnel       Barrier Atten

	FHV	VA-RD-77-108	HIGH	IWAY N	OISE PR	EDICTI	ON MO	ODEL			
Scenario: HY 2 Road Name: Stron Road Segment: e/o M	g St.					Project Job Ni		Northo 11145			
SITE SPECIF	IC IN	IPUT DATA				N	OISE	MODE	L INPUT	s	
Highway Data				S	Site Cond	ditions	(Hard :	= 10, S	oft = 15)		
Average Daily Traffic (A	(dt):	4,800 vehicle	s					Autos:	15		
Peak Hour Percenta	ige:	10%			Med	lium Tru	icks (2	Axles).	15		
Peak Hour Volu	me:	480 vehicle	s		Hea	avy Truc	:ks (3+	Axles).	15		
Vehicle Spe	ed:	25 mph			ehicle N	<b>1</b> 14					
Near/Far Lane Distar	nce:	12 feet				leType		Dav	Evening	Night	Dailv
Site Data					vern		utos:	77.5%	•	9.6%	
					Mo	r dium Tr		84.8%		10.3%	
Barrier Heig		0.0 feet				leavy Tr		86.5%		10.3%	
Barrier Type (0-Wall, 1-Be		0.0				cavy n	uono.	00.07	2.170	10.070	0.747
Centerline Dist. to Bar		33.0 feet		٨	loise So	urce El	evatio	ns (in f	eet)		
Centerline Dist. to Obser		33.0 feet				Autos	s: 0	.000			
Barrier Distance to Obser		0.0 feet			Mediun	n Trucks	s: 2	.297			
Observer Height (Above P		5.0 feet			Heavy	/ Trucks	s: 8	.006	Grade Ad	justment.	0.0
Pad Eleva		0.0 feet			ane Equ	ui ve le nt	Dista	nee (in	faat)		
Road Eleva		0.0 feet		-	апе Еци	Autos		2.833	leel)		
Road Gra Left V		0.0%			Modium	Autos 1 Trucks		2.833			
Right V		-90.0 degree				/ Trucks		2.562			
Right V	iew.	90.0 degree	es		i ieavj	/ ITUCKS	5. 32				
FHWA Noise Model Calcu	ation	s									
VehicleType REM		Traffic Flow	Dis	stance	Finite I		Fres		Barrier At	en Ber	m Atten
Autos:	58.73	-2.59		2.64		-1.20		-4.52	0.0	000	0.00
Medium Trucks:	70.80	-19.82		2.69		-1.20		-4.86	0.0	000	0.00
Heavy Trucks:	77.97	-23.78		2.69		-1.20		-5.69	0.0	000	0.00
Unmitigated Noise Levels	(with	out Topo and	barri	er atteni	uation)						
VehicleType Leq Pea	ik Hou	ir Leq Day	1	Leq Ev	ening	Leq I	Night		Ldn	CI	VEL
Autos:	57	.6	55.7		53.9		47.	.9	56.	5	57.
Medium Trucks:	52		51.0		44.6		43		51.		51.
Heavy Trucks:	55	.7	54.3		45.2		46	.5	54.	3	55.
Vehicle Noise:	60	.5	58.8		54.9		51	.0	59.	5	59.
Centerline Distance to No.	ise Co	ontour (in feet	)								
				70 d	BA	65 0	dBA		60 dBA	55	dBA
				-		-	4		31	-	66
			Ldn:	7		1.	4		31		50

Monday, June 18, 2018

	FHV	VA-RD-77-108	HIGH	IWAY N	IOISE PF	REDICTI	ом мс	DEL			
Road Nam	io: HY 2040 W e: Russell St. nt: e/o Main St	,				Project I Job Nu			jate		
	SPECIFIC IN	PUT DATA							L INPUT	s	
Highway Data					Site Con	ditions (	Hard =	= 10, Se	oft = 15)		
Average Daily	Traffic (Adt):	5,100 vehicles	5					Autos:			
	Percentage:	10%				dium Tru					
Peak H	our Volume:	510 vehicles	5		Hea	avy Truc	ks (3+	Axles):	15		
Ve	hicle Speed:	35 mph			Vehicle I	Nix					
Near/Far La	ne Distance:	36 feet		-		cleType		Dav	Evening	Night	Dailv
Site Data							utos:	77.5%	•		97.42
Ba	rier Height:	0.0 feet			Me	dium Tri	icks:	84.8%	4.9%	10.3%	1.849
Barrier Type (0-W	'all, 1-Berm):	0.0			H	leavy Tri	icks:	86.5%	2.7%	10.8%	0.74
Centerline Dis		44.0 feet			Noise So	urce Ele	vatior	ns (in f	eet)		
Centerline Dist.		44.0 feet				Autos	: 0.	.000			
Barrier Distance		0.0 feet			Mediur	n Trucks	: 2	297			
Observer Height (	,	5.0 feet			Heav	v Trucks	: 8	.006	Grade Ad	justment	t: 0.0
	ad Elevation:	0.0 feet		_							
	ad Elevation:	0.0 feet		1	Lane Equ			· ·	feet)		
1	Road Grade:	0.0%				Autos		.460			
	Left View: Right View:	-90.0 degree 90.0 degree				n Trucks v Trucks		.241 .262			
FHWA Noise Mod	•	•			mour	y muono	. 10				
VehicleType	REMEL	s Traffic Flow	Dis	stance	Finite	Road	Fres	nel	Barrier Att	en Be	rm Atter
Autos	64.30	-3.78	510	1.2		-1.20	1100	-4.61		000	0.00
Medium Trucks:	75.75	-21.02		1.3	-	-1.20		-4.87		000	0.00
Heavy Trucks:	81.57	-24.98		1.3	1	-1.20		-5.50	0.0	000	0.00
Unmitigated Noise	e Levels (with	out Topo and	barrie	er atten	uation)						
VehicleType	Leq Peak Hou	r Leq Day		Leq E	vening	Leq N	light		Ldn	С	NEL
Autos:	60.	.6	58.7		56.9		50.	9	59.5	5	60
Medium Trucks:	54.		53.3		47.0		45.		53.9		54
Heavy Trucks:	56.	.7	55.3		46.2		47.	5	55.8	3	56
Vehicle Noise:	62	.8	51.1		57.7		53.	3	61.8	3	62
Centerline Distant	ce to Noise Co	ontour (in feet)	1								
			L		dBA	65 0			60 dBA		6 dBA
			Ldn: IFI :		3 3	27			58 62		125
											134

	FHV	VA-RD-77-108	HIGHV	VAY N	IOISE PF	REDICTI		EL			
Scenario Road Name Road Segmeni		,					Name: Ni Imber: 11		ate		
SITE S	PECIFIC IN	PUT DATA				N	OISE M	ODE	L INPUTS	5	
Highway Data					Site Con	ditions (	'Hard = 1	0, Sc	oft = 15)		
Average Daily T	raffic (Adt): 4	5,600 vehicle	s				A	utos:	15		
Peak Hour F	Percentage:	10%			Me	dium Tru	cks (2 Ax	les):	15		
Peak Ho	our Volume:	4,560 vehicle	s		Hea	avy Truc	ks (3+ Ax	les):	15		
Veh	icle Speed:	50 mph		- H	Vehicle I	Ai-					
Near/Far Lan	e Distance:	36 feet		-		cleType	D	ay	Evening	Night	Daily
Site Data				-	VCIII			7.5%	•	9.6%	
Born	ier Heiaht:	0.0 feet			Me	dium Tr		4.8%		10.3%	
Barrier Type (0-Wa		0.0			F	leavy Tr	ucks: 8	6.5%	2.7%	10.8%	0.74%
Centerline Dist	. ,	50.0 feet		L.		,					
Centerline Dist. to		50.0 feet		1	Noise So		evations		eet)		
Barrier Distance to		0.0 feet				Autos					
Observer Height (A		5.0 feet				n Trucks			~		
0 1	d Flevation:	0.0 feet			Heav	y Trucks	: 8.00	)6	Grade Adj	ustmen	t: 0.0
Road	d Elevation:	0.0 feet		1	Lane Equ	uivalent	Distance	e (in t	feet)		
R	oad Grade:	0.0%				Autos	: 46.91	5			
	Left View:	-90.0 degree	es		Mediur	n Trucks	: 46.72	26			
	Right View:	90.0 degree	es		Heav	y Trucks	: 46.74	14			
FHWA Noise Mode	I Calculation:	S									
FHWA Noise Model VehicleType	I Calculation: REMEL	s Traffic Flow	Dista	ance	Finite	Road	Fresne	1	Barrier Atte	en Be	rm Atten
			Dista	ance 0.31		Road -1.20		l 1.65	Barrier Atte 0.0		
VehicleType	REMEL	Traffic Flow	Dista		1		-4			00	0.00
VehicleType Autos:	REMEL 70.20	Traffic Flow 4.18	Dista	0.3	1 4	-1.20	-4	1.65	0.0	00	0.000
VehicleType Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise	REMEL 70.20 81.00 85.38 Levels (with	Traffic Flow 4.18 -13.06 -17.01 out Topo and	barrier	0.3 <sup>4</sup> 0.3 <sup>4</sup> 0.3 <sup>4</sup>	1 4 4 uation)	-1.20 -1.20	-4	4.65 4.87	0.0 0.0	00	0.000
VehicleType Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType	REMEL 70.20 81.00 85.38 Levels (with Leg Peak Hou	Traffic Flow           4.18           -13.06           -17.01           Dut Topo and           r         Leq Day	barrier	0.3 <sup>4</sup> 0.3 <sup>4</sup> 0.3 <sup>4</sup> r atten	1 4 4 <i>uation)</i> vening	-1.20 -1.20	-4 -4 -5 Vight	4.65 4.87	0.0 0.0 0.0	00 00 00	0.000 0.000 0.000
VehicleType Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType [ Autos:	REMEL 70.20 81.00 85.38 Levels (with Leq Peak Hou 73	Traffic Flow           4.18           -13.06           -17.01           Dut Topo and           r           Leq Day           5	<b>barrier</b> 71.6	0.3 <sup>4</sup> 0.3 <sup>4</sup> 0.3 <sup>4</sup> r atten	1 4 4 <i>vening</i> 69.8	-1.20 -1.20 -1.20	-4 -4 -5 Vight 63.8	4.65 4.87	0.0 0.0 0.0 <i>Ldn</i> 72.4	00 00 00 C	0.000 0.000 0.000 NEL 73.0
VehicleType Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks:	REMEL 70.20 81.00 85.38 Levels (with Leg Peak Hou 73. 67	Traffic Flow           4.18           -13.06           -17.01           Out Topo and           r           Leq Day           5           1	barrier 71.6 65.6	0.3 <sup>4</sup> 0.3 <sup>4</sup> 0.3 <sup>4</sup> r atten	1 4 4 <i>vening</i> 69.8 59.2	-1.20 -1.20 -1.20	-4 -4 -5 Vight 63.8 57.7	4.65 4.87	0.0 0.0 0.0 <i>Ldn</i> 72.4 66.1	00 00 00	0.000 0.000 0.000 WEL 73.0 66.4
VehicleType Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType I Autos: Medium Trucks: Heavy Trucks:	REMEL 70.20 81.00 85.38 Levels (with Leq Peak Hou 73	Traffic Flow           4.18           -13.06           -17.01           Out Topo and           r           Leq Day           5           1	<b>barrier</b> 71.6	0.3 <sup>4</sup> 0.3 <sup>4</sup> 0.3 <sup>4</sup> r atten	1 4 4 <i>vening</i> 69.8	-1.20 -1.20 -1.20	-4 -4 -5 Vight 63.8	4.65 4.87	0.0 0.0 0.0 <i>Ldn</i> 72.4 66.1 66.6	00 00 00 C	0.000 0.000 0.000 NEL 73.0 66.4 66.8
VehicleType Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks:	REMEL 70.20 81.00 85.38 Levels (with Leg Peak Hou 73. 67	Traffic Flow           4.18           -13.06           -17.01           Out Topo and           r           Leq Day           5           .1           .5	barrier 71.6 65.6	0.3 <sup>4</sup> 0.3 <sup>4</sup> 0.3 <sup>4</sup> r atten	1 4 4 <i>vening</i> 69.8 59.2	-1.20 -1.20 -1.20	-4 -4 -5 Vight 63.8 57.7	4.65 4.87	0.0 0.0 0.0 <i>Ldn</i> 72.4 66.1	00 00 00 C	0.000 0.000 0.000 NEL 73.0 66.4 66.8
VehicleType Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks: Heavy Trucks: Vehicle Noise:	REMEL           70.20           81.00           85.38           Levels (with           Leg Peak Hou           73.           67.           67.           75.	Traffic Flow           4.18           -13.06           -17.01           Dut Topo and           r         Leq Day           5           .1           5           .2	barrier 71.6 65.6 66.1 73.4	0.3 <sup>4</sup> 0.3 <sup>4</sup> 0.3 <sup>4</sup> <i>atten</i> Leq Ev	1 4 4 4 69.8 59.2 57.0 70.4	-1.20 -1.20 -1.20 <i>Leq I</i>		1.65 1.87 5.43	0.0 0.0 0.0 72.4 66.1 66.6 74.2	00 00 00 C	0.000 0.000 0.000 NEL 73.0 66.4 66.3 74.6
VehicleType Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType I Autos: Medium Trucks: Heavy Trucks: Vehicle Noise:	REMEL           70.20           81.00           85.38           Levels (with           Leg Peak Hou           73.           67.           67.           75.	Traffic Flow           4.18           -13.06           -17.01           Dut Topo and           r         Leq Day           5           2           Intour (in feet)	barrier 71.6 65.6 66.1 73.4	0.3 <sup>4</sup> 0.3 <sup>4</sup> 0.3 <sup>4</sup> <i>atten</i> Leq Ev	1 4 4 <i>vening</i> 69.8 59.2 57.0 70.4	-1.20 -1.20 -1.20 Leq I		1.65 1.87 5.43	0.0 0.0 0.0 72.4 66.1 66.6 74.2	00 00 00 C	0.000 0.000 NEL 73.0 66.4 74.0 5 dBA
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType I Autos: Medium Trucks: Heavy Trucks:	REMEL           70.20           81.00           85.38           Levels (with           Leg Peak Hou           73.           67.           67.           75.	Traffic Flow           4.18           -13.06           -17.01           but Topo and           r           Leq Day           5           .1           .2	barrier 71.6 65.6 66.1 73.4	0.3 <sup>4</sup> 0.3 <sup>4</sup> 0.3 <sup>4</sup> <i>atten</i> Leq Ev	1 4 4 <i>vening</i> 69.8 59.2 57.0 70.4 <i>BA</i> 5	-1.20 -1.20 -1.20 <i>Leq I</i>		1.65 1.87 5.43	0.0 0.0 0.0 72.4 66.1 66.6 74.2	00 00 00 C	0.000 0.000 <i>NEL</i> 73.0 66.4 66.8 74.6

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWA	AY NOISE PREDICTION MODEL
Scenario: HY 2040 With Project	Project Name: Northgate
Road Name: Main St.	Job Number: 11145
Road Segment: n/o Columbia Av.	
SITE SPECIFIC INPUT DATA	NOISE MODEL INPUTS
Highway Data	Site Conditions (Hard = 10, Soft = 15)
Average Daily Traffic (Adt): 45,500 vehicles	Autos: 15
Peak Hour Percentage: 10%	Medium Trucks (2 Axles): 15
Peak Hour Volume: 4,550 vehicles	Heavy Trucks (3+ Axles): 15
Vehicle Speed: 50 mph	Vehicle Mix
Near/Far Lane Distance: 36 feet	VehicleType Day Evening Night Daily
Site Data	Autos: 77.5% 12.9% 9.6% 97.42%
Barrier Height: 0.0 feet	Medium Trucks: 84.8% 4.9% 10.3% 1.84%
Barrier Type (0-Wall, 1-Berm): 0.0	Heavy Trucks: 86.5% 2.7% 10.8% 0.74%
Centerline Dist. to Barrier: 50.0 feet	Noise Source Elevations (in feet)
Centerline Dist. to Observer: 50.0 feet	Autos: 0.000
Barrier Distance to Observer: 0.0 feet	Medium Trucks: 2,297
Observer Height (Above Pad): 5.0 feet	Heavy Trucks: 8.006 Grade Adjustment: 0.0
Pad Elevation: 0.0 feet	
Road Elevation: 0.0 feet	Lane Equivalent Distance (in feet)
Road Grade: 0.0%	Autos: 46.915
Left View: -90.0 degrees	Medium Trucks: 46.726
Right View: 90.0 degrees	Heavy Trucks: 46.744
FHWA Noise Model Calculations	
VehicleType REMEL Traffic Flow Distan	
Autos: 70.20 4.17	0.31 -1.20 -4.65 0.000 0.00
Medium Trucks: 81.00 -13.07	0.34 -1.20 -4.87 0.000 0.00
Heavy Trucks: 85.38 -17.02	0.34 -1.20 -5.43 0.000 0.00
Unmitigated Noise Levels (without Topo and barrier a	
	eq Evening Leq Night Ldn CNEL
Autos: 73.5 71.6	69.8 63.8 72.4 73.
Medium Trucks: 67.1 65.6	59.2 57.7 66.1 66.
Heavy Trucks: 67.5 66.1	57.0 58.3 66.6 66.
Vehicle Noise: 75.2 73.4	70.4 65.6 74.2 74.
Centerline Distance to Noise Contour (in feet)	
	70 dBA 65 dBA 60 dBA 55 dBA
Ldn: CNFL:	95 204 439 946 102 219 472 1.017

	FHV	VA-RD-77-108	HIGH	WAY NO	DISE PR	REDICT	ION MC	DEL			
Scenario	: HY 2040 W	ith Project				Project	Name:	Northg	jate		
Road Name	: Main St.					Job N	umber:	11145			
Road Segmen	: s/o Columb	ia Av.									
	PECIFIC IN	PUT DATA							L INPUT	s	
Highway Data				S	ite Con	ditions	(Hard =	: 10, S	oft = 15)		
Average Daily T	raffic (Adt): 4	4,100 vehicle	s					Autos:	15		
Peak Hour F	Percentage:	10%			Med	dium Tri	ucks (2	Axles):	15		
Peak Ho	ur Volume:	4,410 vehicle	s		Hea	avy True	cks (3+ .	Axles):	15		
Veh	icle Speed:	50 mph		V	ehicle N	<i>li</i> v					
Near/Far Lan	e Distance:	36 feet				cleType		Dav	Evening	Night	Dailv
Site Data					Venik		Autos:	77.5%		9.6%	
					Mo	, dium T		84.8%		10.3%	
	ier Height:	0.0 feet					ucks:			10.8%	
Barrier Type (0-Wa		0.0				cuvy n	uono.	00.07	2.170	10.070	0.74
Centerline Dis		50.0 feet		N	loise So	urce E	evation	ns (in f	eet)		
Centerline Dist. to		50.0 feet				Auto	s: 0.	000			
Barrier Distance to		0.0 feet			Mediun	n Truck	s: 2.	297			
Observer Height (A		5.0 feet			Heav	V Truck	s: 8.	006	Grade Ad	justment.	0.0
	d Elevation:	0.0 feet		-				"			
	d Elevation:	0.0 feet		L	ane Equ				feet)		
R	oad Grade:	0.0%				Auto		.915			
	Left View:	-90.0 degree			Mediun			.726			
	Right View:	90.0 degre	es		Heavy	y Truck	s: 46	.744			
FHWA Noise Mode		-									
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite I		Fres		Barrier Att	en Ber	m Atten
Autos:	70.20	4.04		0.31		-1.20		-4.65	0.0	000	0.00
Medium Trucks:	81.00	-13.20		0.34		-1.20		-4.87	0.0	000	0.00
Heavy Trucks:	85.38	-17.16		0.34		-1.20		-5.43	0.0	000	0.00
Unmitigated Noise					<b>/</b>						
	eq Peak Hou			Leq Ev		Leq	Night		Ldn		NEL
Autos:	73.		71.5		69.7		63.		72.3		72.
Medium Trucks:	66.		65.4		59.1		57.	-	66.0		66.
Heavy Trucks:	67.		65.9		56.9		58.		66.		66.
Vehicle Noise:	75	.1	73.3		70.3		65.	5	74.0	0	74
Centerline Distance	e to Noise Co	ontour (in feet	)								
			L	70 d			dBA	1	50 dBA		dBA
			Ldn:	93 100			00 15		430		27
			VEL:						462		96

Monday, June 18, 2018

	FHW	/A-RD-77-108	HIGH	IWAY I	NOISE PE	REDICTIO	ON MO	DEL			
Road Nam	o: HY 2040 W e: Main St. at: n/o Strong \$	,				Project I Job Nu					
	SPECIFIC IN	PUT DATA							L INPUT	s	
Highway Data					Site Con	ditions (	Hard =	10, Se	oft = 15)		
Average Daily	Traffic (Adt): 4	4,200 vehicles						Autos:			
Peak Hour	Percentage:	10%				dium True					
Peak H	our Volume:	4,420 vehicles			He	avy Truck	ks (3+ )	Axles):	15		
	hicle Speed:	45 mph		-	Vehicle I	Nix					
Near/Far Lar	ne Distance:	36 feet				cleType		Day	Evening	Night	Daily
Site Data						A	utos:	77.5%	12.9%	9.6	% 97.429
Bar	rier Heiaht:	0.0 feet			Me	dium Tru	icks:	84.8%	4.9%	10.3	% 1.84%
Barrier Type (0-W	all, 1-Berm):	0.0			ŀ	leavy Tru	icks:	86.5%	2.7%	10.8	% 0.74%
Centerline Dis		50.0 feet		Ē	Noise Sc	urce Ele	vation	s (in f	eet)		
Centerline Dist.		50.0 feet		Ē		Autos:	0.	000			
Barrier Distance		0.0 feet			Mediur	n Trucks.	2.	297			
Observer Height (J	,	5.0 feet			Heav	y Trucks:	8.	006	Grade Ad	ljustme	nt: 0.0
	d Elevation:	0.0 feet		-	1 F		Distan	()	641		
	d Elevation:	0.0 feet		-	Lane Eq				reet)		
ŀ	Road Grade:	0.0%				Autos:		915			
	Left View: Right View:	-90.0 degree 90.0 degree				n Trucks. y Trucks:		726 744			
FHWA Noise Mode	Calculation	:									
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite	Road	Fresi	nel	Barrier At	en B	erm Atten
Autos:	68.46	4.50		0.3	1	-1.20		-4.65	0.	000	0.00
Medium Trucks:	79.45	-12.74		0.3	4	-1.20		-4.87	0.	000	0.00
Heavy Trucks:	84.25	-16.69		0.3	4	-1.20		-5.43	0.	000	0.00
Unmitigated Noise											
,	Leq Peak Hou	. ,		Leq E	vening	Leq N	·		Ldn		CNEL
Autos:	72.		0.2		68.4		62.4	-	71.	-	71.
Medium Trucks:	65.		64.3		58.0		56.4		64.		65.
Heavy Trucks:	66.		65.3		56.2		57.5		65.	-	66.
Vehicle Noise:	73.	9	2.2		69.0		64.3	3	72.	9	73.
Centerline Distanc	e to Noise Co	ntour (in feet)						1			
			_ L		dBA	65 d			60 dBA	5	55 dBA
			.dn:	7	78	16	в		362		779
			IFI :		34	18			388		836

	FH	WA-RD-77-10	8 HIGH\	NAY N	IOISE PR	EDICTI	ON MOD	DEL			
Road Nan	io: HY 2040 V ne: Main St. nt: s/o Strong	,					Name: N umber: 1		ate		
SITE	SPECIFIC II	VPUT DATA				N	OISE N	10DE	L INPUT	5	
Highway Data					Site Cond	ditions	(Hard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	43,200 vehicl	es				A	Autos:	15		
Peak Hour	Percentage:	10%			Med	dium Tru	icks (2 A	xles):	15		
Peak F	lour Volume:	4,320 vehicl	es		Hea	avy Truc	:ks (3+ A	xles):	15		
Ve	hicle Speed:	25 mph			Vehicle N	Also .					
Near/Far La	ne Distance:	36 feet		<u> </u>		n <b>ix</b> cleType		Day	Evening	Night	Daily
Site Data					venii			Day 77.5%	•	9.6%	
					Me	dium Tr		84.8%		10.3%	1.84%
	rrier Height:	0.0 feet 0.0				leavy Tr		B6.5%		10.8%	0.74%
Barrier Type (0-W Centerline Di	. ,	50.0 feet									
Centerline Dist.		50.0 feet		1	Noise So				eet)		
Barrier Distance		0.0 feet				Autos					
Observer Height		5.0 feet			Mediun	n Trucks					
	ad Flevation:	0.0 feet			Heavy	y Trucks	s: 8.0	006	Grade Adj	ustment	: 0.0
	ad Elevation:	0.0 feet		1	Lane Equ	ivalent	Distanc	e (in :	feet)		
	Road Grade:	0.0%		-		Autos			,		
	Left View:	-90.0 degr	200		Mediun	n Trucks					
	Right View:	90.0 degr				y Trucks					
FHWA Noise Mod	el Calculation	15									
VehicleType	REMEL	Traffic Flow	Dist	ance	Finite I	Road	Fresn	el	Barrier Att	en Ber	m Atten
Autos:	58.73	6.96	3	0.31	1	-1.20		4.65	0.0	00	0.000
Medium Trucks:	70.80	-10.28	3	0.34	4	-1.20		-4.87	0.0	00	0.00
Heavy Trucks:	77.97	-14.24	4	0.34	4	-1.20		-5.43	0.0	00	0.00
Unmitigated Nois					,						
VehicleType	Leq Peak Ho	,		Leq Ev		Leq	Night		Ldn	-	NEL
Autos:	-	4.8	62.9		61.1		55.1		63.7		64.3
Medium Trucks:		9.7	58.1		51.8		50.2		58.7		58.9
Heavy Trucks:		2.9	61.4		52.4		53.7		62.0		62.1
Vehicle Noise:		7.7	66.0		62.1		58.2		66.7		67.
Centerline Distan	ce to Noise C	ontour (in fee	et)	70			10.4				
				70 c	1KA	65 (	dBA	6	60 dBA	55	dBA
			ـ						1.10		
			Ldn:	30	0	6	5		140 149		01 20

Monday, June 18, 2018

	FH\	WA-RD-77-108	HIGHWA	Y NOIS	SE PREDIC		EL			
Scenar	io: HY 2040 W	/ith Project				t Name: N		ite		
	e: Main St.				Job I	Vumber: 1	1145			
Road Segmer	nt: n/o Russell	l St.								
	SPECIFIC IN	IPUT DATA				NOISE M			S	
Highway Data				Site	Conditions	s (Hard = 1	10, Sol	ft = 15)		
Average Daily	Traffic (Adt):	24,900 vehicles	5				utos:	15		
	Percentage:	10%				rucks (2 A		15		
	lour Volume:	2,490 vehicles	5		Heavy Tru	icks (3+ A	xles):	15		
	hicle Speed:	35 mph		Veh	icle Mix					
Near/Far La	ne Distance:	36 feet			VehicleTyp	e [	Day	Evening	Night	Daily
Site Data						Autos: 7	7.5%	12.9%	9.6%	97.42%
Bai	rrier Heiaht:	0.0 feet			Medium	Frucks: 8	4.8%	4.9%	10.3%	1.84%
Barrier Type (0-W	/all, 1-Berm):	0.0			Heavy	Trucks: 8	6.5%	2.7%	10.8%	0.74%
Centerline Dis	st. to Barrier:	50.0 feet		Noi	se Source E	lovations	(in for	of)		
Centerline Dist.	to Observer:	50.0 feet		1101	Auto					
Barrier Distance	to Observer:	0.0 feet			ledium Truc					
Observer Height (	,	5.0 feet			Heavy Truc			Grade Adj	ustment	: 0.0
	ad Elevation:	0.0 feet			,					
	ad Elevation:	0.0 feet		Lan	e Equivaler Auto			eet)		
	Road Grade: Left View:	0.0%			Auto Iedium Truc					
	Right View:	-90.0 degree 90.0 degree			Heavy Truck					
	Night view.	90.0 degree	:5		neavy naci					
FHWA Noise Mod		-								
VehicleType	REMEL	Traffic Flow	Distanc		inite Road	Fresne		Barrier Atte		m Atten
Autos:	64.30	3.10		0.31	-1.20		4.65	0.0		0.00
Medium Trucks: Heavy Trucks:	75.75 81.57	-14.14 -18.09		).34 ).34	-1.20 -1.20		4.87 5.43	0.0		0.000
						-	5.43	0.0	100	0.00
Unmitigated Noise					· · ·				_	
VehicleType Autos:	Leq Peak Hou 66		Lec 34.6	l Even	ing Leo 62.9	Night 56.8		Ldn		NEL
Medium Trucks:	60		59.2		62.9 52.9	51.3		65.4 59.8		66.0 60.0
Heavy Trucks:	62		59.2 51.2		52.9	53.4		61.8		61.9
Vehicle Noise:	68		37.0		63.6	59.2		67.7		68.3
					00.0	00.2		01.1		00.
Centerline Distant	Le lo Noise Co	ontour (in feet)		70 dBA	64	dBA	61	) dBA	55	dBA
			_dn:	35		76		164		153
			IEL:	38		81		175		55 577
		0.1				-		-		

F	HWA-RD-77-10	8 HIGH	IWAY NO	DISE PRE	DICTIO	N MODEL			
Scenario: HY 2040	With Project					ame: North			
Road Name: Main St.					Job Nur	nber: 1114	5		
Road Segment: s/o Russ	ell St.								
SITE SPECIFIC	INPUT DATA						EL INPUT	S	
Highway Data			S	ite Condi	tions (H	lard = 10, \$	Soft = 15)		
Average Daily Traffic (Adt)	23,700 vehicl	es				Autos	: 15		
Peak Hour Percentage	10%			Media	ım Truc	ks (2 Axles	): 15		
Peak Hour Volume	2,370 vehicl	es		Heav	y Trucks	s (3+ Axles	): 15		
Vehicle Speed	35 mph		V	ehicle Mi	~				
Near/Far Lane Distance	36 feet		-	Vehicl		Day	Evening	Night	Daily
Site Data				1011101		tos: 77.5		9.6%	
	0.0 feet			Med	ium Truc			10.3%	1.849
Barrier Height Barrier Type (0-Wall, 1-Berm)					avy Truc			10.8%	0.749
Centerline Dist. to Barrier									-
Centerline Dist. to Observer			N	oise Sou	rce Elev	ations (in	feet)		
Barrier Distance to Observer					Autos:	0.000			
Observer Height (Above Pad)	0.0 1001			Medium	Trucks:	2.297			
Pad Elevation				Heavy	Trucks:	8.006	Grade Ad	ljustment.	0.0
Road Elevation			1	ano Faui	/alont F	)istance (ir	foot)		
Road Grade	0.0 1001		-	une Lyur	Autos:	46.915	neety		
Left View	0.070			Medium		46.726			
Right View					Trucks:	46.744			
Ngin view	90.0 degi	ees		neavy	mucho.	40.744			
FHWA Noise Model Calculati									
VehicleType REMEL	Traffic Flow		stance	Finite R		Fresnel	Barrier At		m Atten
Autos: 64.3		-	0.31		1.20	-4.65		000	0.00
Medium Trucks: 75.3			0.34		1.20	-4.87		000	0.00
Heavy Trucks: 81.5	57 -18.3	1	0.34	-	1.20	-5.43	0.0	000	0.00
Unmitigated Noise Levels (w								1	
VehicleType Leq Peak F			Leq Eve		Leq Ni		Ldn		VEL
	66.3	64.4		62.6		56.6	65.		65.
	60.5	59.0		52.7		51.1	59.	-	59.
	62.4	61.0		51.9		53.2	61.	-	61.
	68.5	66.8		63.4		59.0	67.	5	68
Centerline Distance to Noise	Contour (in fee	et)							
		L	70 dl		65 dE	BA	60 dBA		dBA
		Ldn:	34		74		159		42 65
		CNEL:	37		79		169		

Monday, June 18, 2018

Scenario	: HY 2040 W	A-RD-77-108 H				Project N	-		ate		
Road Name	Orange St.					Job Nur			uto		
Road Segment	n/o Columb	a Av.									
	PECIFIC IN	PUT DATA		_	NH- 0	NC ditions (F				S	
Highway Data				3	site Con	aitions (F			,		
Average Daily T	, ,	5,000 vehicles						Autos:	15		
Peak Hour F	•	10%				dium Truc					
	ur Volume:	500 vehicles			Hea	avy Truck	s (3+ A	ixies):	15		
	icle Speed:	35 mph		V	/ehicle I	<i>lix</i>					
Near/Far Lan	e Distance:	12 feet			Vehi	cleType		Day	Evening	Night	Daily
Site Data						Au	tos:	77.5%	12.9%	9.6%	97.42%
Barr	ier Heiaht:	0.0 feet			Me	dium Tru	cks:	84.8%	4.9%	10.3%	1.84%
Barrier Type (0-Wa	II, 1-Berm):	0.0			H	leavy Tru	cks:	86.5%	2.7%	10.8%	0.74%
Centerline Dist		33.0 feet		۸	loise So	urce Ele	vation	s (in fe	eet)		
Centerline Dist. to	Observer:	33.0 feet				Autos:		000	,		
Barrier Distance to	Observer:	0.0 feet			Mediur	n Trucks:		297			
Observer Height (A	bove Pad):	5.0 feet				v Trucks:		006	Grade Ad	ustment	: 0.0
Pad	d Elevation:	0.0 feet				·					
Road	d Elevation:	0.0 feet		L	ane Equ	ivalent L		· ·	feet)		
R	oad Grade:	0.0%				Autos:	32.8				
	Left View:	-90.0 degrees	5			n Trucks:	32.				
	Right View:	90.0 degree:	5		Heav	y Trucks:	32.	589			
FHWA Noise Model											
VehicleType	REMEL	Traffic Flow	Distan		Finite		Fresn	-	Barrier Atte		m Atten
Autos:	64.30	-3.87		2.64		-1.20		-4.52	0.0		0.000
Medium Trucks:	75.75	-21.11		2.69		-1.20		-4.86	0.0		0.000
Heavy Trucks:	81.57	-25.06		2.69		-1.20		-5.69	0.0	00	0.000
Unmitigated Noise											
	.eq Peak Hou			eq Ev	ening	Leq N	<u> </u>		Ldn	-	NEL
Autos:	61.		0.0		58.2		52.1		60.8		61.4
Medium Trucks:	56.		4.6		48.3		46.7		55.2		55.4
Heavy Trucks:	58.	0 5	5.6		47.5		48.8		57.1		57.3
Vehicle Noise:	64.	1 6	2.4		58.9		54.6		63.1		63.5
venicie noise.	N	ntour (in feet)									
Centerline Distance	e to Noise Co						24	E F	0 dBA	55	dBA
	e to Noise Co	, ,		70 d		65 dE	A	, c			
	e to Noise Co	, ,	dn:	70 d 11 12	<u> </u>	25 26			53 57	1	14 22

	FHW.	A-RD-77-108 F	IIGHWA	Y NOISE P	REDICTI	ON MODE	L	
Road Name	<ul> <li>b: HY 2040 Wit</li> <li>c) Orange St.</li> <li>t: s/o Columbia</li> </ul>	,				Name: No umber: 11 <sup>.</sup>		
SITE S	PECIFIC INF	UT DATA		1			DEL INPUT	S
Highway Data				Site Co.	nditions	(Hard = 10	, Soft = 15)	
Average Daily	raffic (Adt): 11	,400 vehicles				Au	tos: 15	
Peak Hour I	Percentage:	10%		M	ədium Tru	icks (2 Axle	es): 15	
Peak Ho	our Volume: 1	1,140 vehicles		He	eavy Truc	ks (3+ Axle	es): 15	
Vel	icle Speed:	35 mph		Vehicle	Mix			
Near/Far Lar	e Distance:	12 feet			hicleType	Da	y Evening	Night Daily
Site Data							.5% 12.9%	9.6% 97.42%
Par	rier Heiaht:	0.0 feet	-	N	ledium Tr	ucks: 84	.8% 4.9%	10.3% 1.84%
Barrier Type (0-Wa		0.0			Heavy Tr	ucks: 86	.5% 2.7%	10.8% 0.74%
Centerline Dis	. ,	33.0 feet		Naine C			(m. fm. m.t.)	
Centerline Dist. t	o Observer:	33.0 feet		Noise S	Autos	evations (	,	
Barrier Distance t	o Observer:	0.0 feet		11-1	Autos Im Trucks			
Observer Height (/	Above Pad):	5.0 feet						justment: 0.0
Pa	d Elevation:	0.0 feet		пеа	vy Trucks	s. 0.000	Grade Au	usiment. 0.0
Roa	d Elevation:	0.0 feet		Lane Ec	quivalent	Distance	(in feet)	
F	load Grade:	0.0%			Autos	s: 32.833	3	
	Left View:	-90.0 degrees	;	Mediu	im Trucks	s: 32.562	2	
	Right View:	90.0 degrees	;	Hea	vy Trucks	32.589	9	
FHWA Noise Mode	I Calculations				-			
VehicleType	REMEL	Traffic Flow	Distanc	e Finite	e Road	Fresnel	Barrier Att	en Berm Atten
Autos:	64.30	-0.29	-	2.64	-1.20	-4.		0.00
Medium Trucks:	75.75	-17.53		2.69	-1.20	-4.		000 0.000
Heavy Trucks:	81.57	-21.48	2	2.69	-1.20	-5.	69 0.0	000.00
Unmitigated Noise				,	-			
,1	Leq Peak Hour			g Evening	,	Night	Ldn	CNEL
Autos:	65.4		3.5	61.8	-	55.7	64.4	
Medium Trucks:	59.7		B.2	51.8	-	50.3	58.8	
Heavy Trucks:	61.6		D.1	51.1		52.4	60.7	
Vehicle Noise:	67.7		6.0	62.5	)	58.2	66.7	67.1
Centerline Distanc	e to Noise Cor	ntour (in feet)						55 104
				70 dBA	65 (		60 dBA	55 dBA
		CNI	dn:	20	4	-	92	198
				21	4		98	212

	FH\	WA-RD-77-108	HIGHW	AY N	DISE PF	REDICTIC	ON MC	DEL			
Scenar	io: HY 2040 W	Vith Project				Project N	lame:	Northg	ate		
Road Nam	e: Orange St.					Job Nu	mber:	11145			
Road Segme	nt: n/o Strong	St.									
	SPECIFIC IN	NPUT DATA							L INPUT	S	
Highway Data				S	ite Con	ditions (l	lard =	= 10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	9,600 vehicle	s					Autos:	15		
Peak Hour	Percentage:	10%				dium Truc			15		
Peak H	lour Volume:	960 vehicle	s		He	avy Truck	:s (3+	Axles):	15		
	hicle Speed:	35 mph		v	ehicle l	Mix					
Near/Far La	ne Distance:	12 feet			Vehi	cleType		Day	Evening	Night	Daily
Site Data						AL	itos:	77.5%	12.9%	9.6%	97.429
Ba	rrier Height:	0.0 feet			Me	edium Tru	cks:	84.8%	4.9%	10.3%	1.849
Barrier Type (0-W	/all, 1-Berm):	0.0			ŀ	leavy Tru	cks:	86.5%	2.7%	10.8%	0.749
Centerline Di		33.0 feet		٨	loise Sc	ource Ele	vatior	ns (in fe	eet)		
Centerline Dist.		33.0 feet				Autos:	0	.000			
Barrier Distance		0.0 feet			Mediur	n Trucks:	2	297			
Observer Height (	,	5.0 feet			Heav	y Trucks:	8	.006	Grade Ad	ljustment	: 0.0
	ad Elevation:	0.0 feet			5		N	(!	(		
	ad Elevation:	0.0 feet		L	ane Eq	uivalent I			reet)		
	Road Grade:	0.0%				Autos: n Trucks:		.833			
	Left View: Right View:	-90.0 degre 90.0 degre				n Trucks: y Trucks:		.562 .589			
FHWA Noise Mod	3	•									
VehicleType	REMEL	Traffic Flow	Distar	nce	Finite	Road	Fres	nel	Barrier Att	en Be	rm Atter
Autos:	64.30			2.64		-1.20		-4.52		000	0.00
Medium Trucks:	75.75	-18.28		2.69		-1.20		-4.86	0.0	000	0.00
Heavy Trucks:	81.57	-22.23		2.69		-1.20		-5.69	0.0	000	0.00
Unmitigated Nois	e Levels (with	out Topo and	barrier a	attenu	uation)						
VehicleType	Leq Peak Hou			eq Ev		Leq N			Ldn		NEL
Autos:	•		62.8		61.0		55.	-	63.6	-	64.
Medium Trucks:		9.0	57.5		51.1		49.	-	58.0	-	58.
Heavy Trucks:		).8	59.4		50.4		51.	-	60.0		60.
Vehicle Noise:			65.2		61.8		57.	4	65.9	9	66.
Centerline Distan	ce to Noise C	ontour (in fee	#)	70 d	RA	65 d	R۵	6	0 dBA	55	dBA
			I dn:	18		38		1	82		177
		C	NFL:	19		41			88		189
		0		15					00		

	FH\	VA-RD-77-108	HIGH	WAY N	OISE PF	REDICTIC	N MO	DEL			
	<i>io:</i> HY 2040 W	ith Project				Project N			ate		
	ne: Orange St.					Job Nu	mber:	11145			
Road Segme	nt: s/o Strong	St.									
SITE	SPECIFIC IN	IPUT DATA							L INPUT	s	
Highway Data			5	Site Con	ditions (F	lard =	10, Sc	oft = 15)			
Average Daily	Traffic (Adt):	11,400 vehicle	s					Autos:	15		
Peak Hour	Percentage:	10%			Me	dium Truc	:ks (2 /	Axles):	15		
Peak H	lour Volume:	1,140 vehicles	s		Hea	avy Truck	s (3+ /	Axles):	15		
Ve	ehicle Speed:	35 mph		1	/ehicle I	Nix					
Near/Far La	ne Distance:	12 feet				cleType		Dav	Evening	Night	Daily
Site Data							itos:	77.5%	•	•	97.429
Ba	rrier Height:	0.0 feet			Me	edium Tru	cks:	84.8%	4.9%	10.3%	1.84%
Barrier Type (0-V		0.0			F	leavy Tru	cks:	86.5%	2.7%	10.8%	0.749
	ist. to Barrier:	33.0 feet		L							
Centerline Dist.	to Observer:	33.0 feet		,	voise So	ource Ele			eet)		
Barrier Distance	to Observer:	0.0 feet				Autos:		000			
Observer Height	(Above Pad):	5.0 feet				n Trucks:		297	Grade Ad	iuotmont	
P	ad Elevation:	0.0 feet			Heav	y Trucks:	8.	006	Grade Adj	usuneni	0.0
Ro	ad Elevation:	0.0 feet		L	ane Equ	uivalent I	Distan	ce (in i	feet)		
	Road Grade:	0.0%				Autos:	32.	833			
	Left View:	-90.0 degree	es		Mediur	n Trucks:	32.	562			
	Right View:	90.0 degree	es		Heav	y Trucks:	32.	589			
FHWA Noise Mod	el Calculation	s									
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite	Road	Fresr	nel	Barrier Att	en Ber	m Atten
Autos:	64.30	-0.29		2.64	Ļ	-1.20		-4.52	0.0	000	0.00
Medium Trucks:	75.75	-17.53		2.69	)	-1.20		-4.86	0.0	000	0.00
Heavy Trucks:	81.57	-21.48		2.69	)	-1.20		-5.69	0.0	000	0.00
Unmitigated Nois	e Levels (with	out Topo and	barrie	r atten	uation)						
VehicleType	Leq Peak Hou			Leq Ev	•	Leq N	·		Ldn		VEL
Autos:			63.5		61.8		55.7		64.4		65.
Medium Trucks:			58.2		51.8		50.3		58.8		59.
Heavy Trucks:		-	60.1		51.1		52.4		60.7		60.
Vehicle Noise:	•••		66.0		62.5		58.2	2	66.7	7	67.
Centerline Distan	ce to Noise Co	ontour (in feet	)	=0				1			
				70 a		65 dl		6	0 dBA		dBA
			Ldn:	20	-	43			92		98
CNEL:			21 46 98 2'								

Monday, June 18, 2018

		/A-RD-77-108					-				
	io: HY 2040 W	ith Project				Project N			ate		
	ne: Orange St.	<b>C</b>				Job Nu	mber:	11145			
Road Segme	nt: n/o Russell	51.									
	SPECIFIC IN	PUT DATA							L INPUT	s	
Highway Data				5	Site Con	ditions (H	lard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt): 1	1,400 vehicles	6					Autos:	15		
Peak Hour	Percentage:	10%				dium Truc					
Peak H	lour Volume:	1,140 vehicles	6		Hea	avy Truck	s (3+ /	Axles):	15		
Ve	hicle Speed:	35 mph		1	/ehicle I	lix					
Near/Far La	ne Distance:	12 feet		F		cleType		Day	Evening	Night	Daily
Site Data				-		AL	itos:	77.5%	12.9%	9.6%	97.42
Pa	rrier Height:	0.0 feet			Ме	dium Tru	cks:	84.8%	4.9%	10.3%	
Barrier Type (0-V		0.0			H	leavy Tru	cks:	86.5%	2.7%	10.8%	0.74
Centerline Di		33.0 feet		1	Voise So	urce Ele	vation	s (in fe	eet)		
Centerline Dist.		33.0 feet				Autos:	0.	000	,		
Barrier Distance		0.0 feet			Mediur	n Trucks:	2.	297			
Observer Height	· · · ·	5.0 feet			Heav	Trucks:	8.	006	Grade Ad	iustmen	t: 0.0
	ad Elevation:	0.0 feet		-							
	ad Elevation:	0.0 feet		-	ane Equ	ivalent L		· ·	reet)		
	Road Grade:	0.0%				Autos:		833			
	Left View:	-90.0 degree				n Trucks:		562			
	Right View:	90.0 degree	es		Heav	y Trucks:	32.	589			
FHWA Noise Mod					1					-	
VehicleType	REMEL	Traffic Flow	Dista		Finite		Fresr		Barrier Att		rm Atter
Autos:	64.30	-0.29		2.64		-1.20		-4.52		000	0.00
Medium Trucks:	75.75	-17.53		2.69		-1.20		-4.86		000	0.00
Heavy Trucks:		-21.48		2.69		-1.20		-5.69	0.0	000	0.00
Unmitigated Nois											
VehicleType	Leq Peak Hou			Leq Ev	~	Leq N	<u> </u>		Ldn	-	NEL
Autos:	65.		53.5		61.8		55.7		64.4		65
Medium Trucks:	59.		58.2		51.8		50.3		58.8		59
Heavy Trucks:	61.	-	50.1		51.1		52.4		60.7		60
Vehicle Noise:			66.0		62.5		58.2	2	66.7		67
Centerline Distan	ce to Noise Co	ntour (in feet,	)	=0							
				70 a	вА	65 di		6	60 dBA		5 dBA
				~							
			Ldn: JFL:	20 21	-	43 46			92 98		198 212

	FHWA-F	RD-77-108 HI	GHWAY	NOISE PI	REDICTI	ON MOE	EL			
Scenario: HY Road Name: Or Road Segment: s/o	ange St.	Project				Name: N umber: 1		ate		
SITE SPEC	CIFIC INPU	T DATA			N	OISE M	ODEL	INPUTS	5	
Highway Data				Site Con	ditions (	(Hard = 1	10, So	ft = 15)		
Average Daily Traffic	c (Adt): 6,3	00 vehicles				A	utos:	15		
Peak Hour Perce	entage:	10%		Me	dium Tru	cks (2 A	xles):	15		
Peak Hour V	olume: 6	30 vehicles		He	avy Truc	ks (3+ A	xles):	15		
Vehicle	Speed:	35 mph		Vehicle	Miv					
Near/Far Lane Dis	stance:	12 feet			icleType		Dav	Evening	Night	Daily
Site Data				VCII			7.5%	12.9%	9.6%	97.42%
				M	edium Tr		4.8%	4.9%	10.3%	1.84%
Barrier H		0.0 feet			Heavy Tr		6.5%	2.7%	10.8%	0.74%
Barrier Type (0-Wall, 1- Centerline Dist, to I	,	0.0 3.0 feet			,					
Centerline Dist. to Ob		3.0 feet		Noise So				et)		
Barrier Distance to Ob		0.0 feet			Autos					
Observer Height (Above		5.0 feet		Mediu	m Trucks					
Pad Fle	,	0.0 feet		Heav	ry Trucks	: 8.0	06	Grade Adj	ustment:	0.0
Road Ele		0.0 feet		Lane Eq	uivalent	Distanc	e (in fe	eet)		
		0.0%			Autos	: 32.8	33			
Lef	t View: -9	0.0 degrees		Mediu	m Trucks	: 32.5	62			
Righ		0.0 degrees		Heav	ry Trucks	: 32.5	89			
FHWA Noise Model Cal										
	-		Distance		Road	Fresne		Barrier Atte		n Atten
Autos:	64.30	-2.87	2.6		-1.20		4.52	0.0		0.000
Medium Trucks:	75.75	-20.10	2.6		-1.20		4.86	0.0		0.000
Heavy Trucks:	81.57	-24.06	2.6	59	-1.20	-	5.69	0.0	00	0.000
Unmitigated Noise Leve			_							
,	Peak Hour	Leq Day		vening	Leq I	•		Ldn		IEL
Autos:	62.9	61		59.2		53.2		61.8		62.4
Medium Trucks:	57.1	55.		49.3		47.7		56.2		56.4
Heavy Trucks:	59.0	57.	-	48.5		49.8		58.1		58.3
Vehicle Noise:	65.1	63	.4	60.0		55.6		64.1		64.5
Centerline Distance to	Noise Conto	ur (in feet)			07					10.4
				dBA	65 0		60	0 dBA		dBA
		1 d	n:	13	2	9		62	13	33
		CNE		14	3			66		13

Monday, June 18, 2018

	FH\	VA-RD-77-108	HIGHWA	NY NO	DISE PF	REDICTIO	и мог	DEL			
Scenari	o: HY 2040 W	/ith Project				Project Na	ame: N	lorthg	ate		
Road Nam	e: Primer St.					Job Nun	nber: 1	1145			
Road Segmer	nt: n/o Columb	bia Av.									
	SPECIFIC IN	IPUT DATA							L INPUTS	5	
Highway Data				S	ite Con	ditions (H	ard =	10, So	ft = 15)		
Average Daily	Traffic (Adt):	27,300 vehicle	s				A	lutos:	15		
Peak Hour	Percentage:	10%			Mee	dium Trucl	ks (2 A	xles):	15		
Peak H	our Volume:	2,730 vehicle	s		Hea	avy Trucks	s (3+ A	xles):	15		
Vel	hicle Speed:	35 mph		v	ehicle I	Mix					
Near/Far Lar	ne Distance:	12 feet		-		cleType		Day	Evening	Night	Daily
Site Data						Aut	os:	77.5%	12.9%	9.6%	97.429
Rar	rier Height:	0.0 feet			Ме	edium Truc	ks:	34.8%	4.9%	10.3%	1.84%
Barrier Type (0-W	all, 1-Berm):	0.0			H	leavy Truc	ks:	36.5%	2.7%	10.8%	0.74%
Centerline Dis		33.0 feet		٨	oise So	ource Elev	ations	; (in fe	et)		
Centerline Dist.		33.0 feet				Autos:	0.0	00	,		
Barrier Distance		0.0 feet			Mediur	n Trucks:	2.2	97			
Observer Height (J	,	5.0 feet			Heav	y Trucks:	8.0	06	Grade Adj	ustment	0.0
	d Elevation:	0.0 feet				, 		- () (			
	ad Elevation:	0.0 feet		Ľ	ane Equ	uivalent D Autos:	32.8		eet)		
ŀ	Road Grade: Left View:	0.0%			Madium	n Trucks:	32.6				
	Right View:	-90.0 degree 90.0 degree				y Trucks:	32.5				
	•	, v	55		neav	y mucho.	52.0	03			
FHWA Noise Mode VehicleType	el Calculation REMEL	s Traffic Flow	Distan	~	Finite	Pood	Fresn	2	Barrier Atte	n Ro	m Atten
Autos:	64.30	3.50	Distan	2.64	1 mile	-1.20		4.52	0.0		0.00
Medium Trucks:	75.75	-13.74		2.69		-1.20		4.86	0.0	00	0.00
Heavy Trucks:	81.57	-17.69		2.69		-1.20		5.69	0.0	00	0.00
Unmitigated Noise	e Levels (with	out Topo and	barrier a	ttenı	ation)						
	Leq Peak Hou			q Ev	ening	Leq Ni			Ldn		NEL
Autos:	69		67.3		65.6		59.5		68.1		68.
Medium Trucks:	63		62.0		55.6		54.1		62.6		62.
Heavy Trucks:	65		63.9		54.9		56.2		64.5		64.
Vehicle Noise:	71		69.8		66.3		61.9		70.5		70.
Centerline Distanc	e to Noise C	ontour (in feet	<u> </u>	70 d	DA I	65 dB		6	0 dBA	55	dBA
			I dn:	70 a. 35		65 dB 76	м	6	165		<i>dBA</i> 155
			Lan: VFL:	35		76			165	-	155 179
		Ci	VĽL.	38		62			170	3	19

	FHV	VA-RD-77-108	HIGHW	VAY N	OISE PF	REDICTI	ON MO	DEL			
Road Nan	Scenario: HY 2040 With Project Road Name: La Cadena Dr. Road Segment: n/o I-215 Ramps SITE SPECIFIC INPUT DATA ay Data					Project Job N	Name: umber:				
Road Segme	<i>nt:</i> n/o I-215 R	amps									
SITE	SPECIFIC IN	IPUT DATA							L INPUT	s	
Highway Data			5	Site Con	ditions	(Hard =	: 10, So	oft = 15)			
Average Daily	Traffic (Adt):	7,900 vehicles	6					Autos:	15		
Peak Hour	Percentage:	10%			Me	dium Tru	icks (2 )	Axles):	15		
Peak H	lour Volume:	790 vehicles	\$		Hea	avy Truc	:ks (3+ )	Axles):	15		
Ve	hicle Speed:	40 mph			/ehicle I	Mix					
Near/Far La	ne Distance:	12 feet		E E		icleType	1	Day	Evening	Night	Daily
Site Data							lutos:	77.5%			97.42
	rrier Height:	0.0 feet			Me	edium Tr		84.8%		10.3%	
ва Barrier Type (0-И		0.0 teet 0.0				leavy Tr		86.5%		10.8%	
	ist. to Barrier:	33.0 feet									
Centerline Dist.		33.0 feet		1	Voise So	ource El	evation	is (in f	eet)		
Barrier Distance		0.0 feet				Autos		000			
Observer Height		5.0 feet				n Trucks		297			
•	ad Flevation:	0.0 feet			Heav	y Trucks	s: 8.	006	Grade Ad	justment.	0.0
	ad Elevation:	0.0 feet		1	ane Equ	uivalent	Distan	ce (in	feet)		
	Road Grade:	0.0%				Autos	s: 32.	833			
	Left View:	-90.0 degree	20		Mediur	n Trucks	32	562			
	Right View:	90.0 degree			Heav	y Trucks	32.	589			
FHWA Noise Mod	lel Calculation	s									
VehicleType	REMEL	Traffic Flow	Dista	ance	Finite	Road	Fresi	nel	Barrier Att	en Ber	m Atter
Autos:	66.51	-2.46		2.64	ł	-1.20		-4.52	0.0	000	0.00
Medium Trucks:	77.72	-19.70		2.69	)	-1.20		-4.86	0.0	000	0.00
Heavy Trucks:	82.99	-23.66		2.69	)	-1.20		-5.69	0.0	000	0.00
Unmitigated Nois	e Levels (with	out Topo and									
VehicleType	Leq Peak Hou			Leq Ev		Leq	Night		Ldn		NEL
Autos:			63.6		61.8		55.8		64.4		65
Medium Trucks:			58.0		51.6		50.1		58.6		58
Heavy Trucks:		-	59.4		50.4		51.6		60.0		60
Vehicle Noise:		-	65.8		62.5		58.0	D	66.	5	66
Centerline Distan	ce to Noise Co	ontour (in feet,	)	70		07	10.4				-10.4
				70 a		65 0	dBA 1		60 dBA		dBA
			Ldn: VEL:						89		93
		Cr	IEL:	21 44 96 206				00			

Monday, June 18, 2018

	FHW	/A-RD-77-108	HIGH	IWAY N	NOISE PR	REDICT	ON MO	DDEL				
	HY 2040 Wi	,				Project						
	La Cadena					Job N	umber:	11145				
Road Segment.	s/o I-215 Ra	imps										
	PECIFIC IN	PUT DATA							L INPU	TS		
Highway Data					Site Con	ditions	(Hard :					
Average Daily Tr	affic (Adt):	4,300 vehicles						Autos				
Peak Hour P	ercentage:	10%				dium Tru						
Peak Ho	ır Volume:	430 vehicles			He	avy Truc	cks (3+	Axles)	: 15			
Vehi	cle Speed:	40 mph		F	Vehicle I	Mix						
Near/Far Lane	Distance:	12 feet		-		cleType		Day	Evening	Nic	aht	Daily
Site Data							Autos:	77.5%	6 12.99	6 9	.6%	97.42%
	er Heiaht:	0.0 feet			Me	edium Tr		84.89	6 4.9%		0.3%	1.84%
Barrier Type (0-Wai		0.0			ŀ	łeavy Tr	ucks:	86.5%	6 2.79	6 10	.8%	0.74%
Centerline Dist.	to Barrier:	33.0 feet		F	Noise So	urce Fl	evatio	ns (in i	eet)			
Centerline Dist. to	Observer:	33.0 feet		F		Autos		.000	000			
Barrier Distance to	Observer:	0.0 feet			Modiur	n Truck		.297				
Observer Height (A	bove Pad):	5.0 feet				y Trucks	. –	.006	Grade A	diustr	nent <sup>.</sup>	0.0
Pad	Elevation:	0.0 feet				·				ajuou	nom.	0.0
Road	Elevation:	0.0 feet			Lane Eq	uivalent	Distar	nce (in	feet)			
Ro	ad Grade:	0.0%				Autos	s: 32	.833				
	Left View:	-90.0 degree	s		Mediur	n Truck	s: 32	.562				
F	Right View:	90.0 degree	s		Heav	y Truck:	s: 32	.589				
FHWA Noise Model												
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite		Fres		Barrier A		Berr	n Atten
Autos:	66.51	-5.10		2.6		-1.20		-4.52		0.000		0.00
Medium Trucks:	77.72	-22.34		2.6	-	-1.20		-4.86		0.000		0.00
Heavy Trucks:	82.99	-26.30		2.6	9	-1.20		-5.69	(	0.000		0.00
Unmitigated Noise			barri									
	eq Peak Hou	, ,		Leq E	vening	Leq	Night		Ldn		C٨	IEL
Autos:	62.		60.9		59.2		53.		-	.7		62.4
Medium Trucks:	56.		55.4		49.0		47.			5.9		56.
Heavy Trucks:	58.	2 5	6.8		47.7		49.	0	57	7.3		57.
Vehicle Noise:	64.	9 6	53.1		59.9		55.	3	63	8.8		64.3
Centerline Distance	to Noise Co	ntour (in feet)										
			L		dBA		dBA		60 dBA			dBA
			dn:		3		8		60		12	
		C1	IFI :	4	4		0		64		13	37

	FHV	/A-RD-77-108	HIGHWA	Y NOISE	PREDICTI	ON MODE	L	
	o: HY 2040 W 9: La Cadena t: n/o Strong \$	Dr.				Name: Noi umber: 111		
SITE S	SPECIFIC IN	PUT DATA			N	OISE MO	DEL INPUT	S
Highway Data				Site Co	onditions	(Hard = 10	, Soft = 15)	
Average Daily 7	Traffic (Adt):	4,300 vehicles	5			Aut	os: 15	
Peak Hour F	Percentage:	10%		N	1edium Tru	icks (2 Axle	es): 15	
Peak Ho	our Volume:	430 vehicles	6	F	leavy Truc	ks (3+ Axle	es): 15	
Veh	nicle Speed:	40 mph		Vehicle	Mix			
Near/Far Lan	e Distance:	12 feet			hicleType	Da	v Evening	Night Daily
Site Data							.5% 12.9%	9.6% 97.42%
Par	rier Heiaht:	0.0 feet		1	Medium Tr	ucks: 84	.8% 4.9%	10.3% 1.84%
Barrier Type (0-Wa		0.0			Heavy Tr	ucks: 86	.5% 2.7%	10.8% 0.74%
Centerline Dis	. ,	33.0 feet			· -			
Centerline Dist. t	o Observer:	33.0 feet		Noise	Source El Autos	evations (i	,	
Barrier Distance t	o Observer:	0.0 feet			um Truck			
Observer Height (A	Above Pad):	5.0 feet						justment: 0.0
Pa	d Elevation:	0.0 feet		пе	avy Trucks	s. 0.000	Grade Au	Jusunenii. 0.0
Roa	d Elevation:	0.0 feet		Lane E	quivalent	Distance	(in feet)	
F	Road Grade:	0.0%			Autos	s: 32.833	3	
	Left View:	-90.0 degree	es	Medi	um Trucks	s: 32.562	2	
	Right View:	90.0 degree	es	He	avy Trucks	32.589	)	
FHWA Noise Mode	Calculation:	5						
VehicleType	REMEL	Traffic Flow	Distan	ce Finit	te Road	Fresnel	Barrier Att	en Berm Atten
Autos:	66.51	-5.10		2.64	-1.20	-4.		0.00 0.00
Medium Trucks:	77.72	-22.34		2.69	-1.20	-4.		0.00 0.00
Heavy Trucks:	82.99	-26.30		2.69	-1.20	-5.	69 0.0	0.00
Unmitigated Noise				ttenuation	)			
	Leq Peak Hou			q Evening		Night	Ldn	CNEL
Autos:	62.		60.9	59.	=	53.1	61.	
Medium Trucks:	56.	-	55.4	49.	-	47.4	55.9	
Heavy Trucks:	58.		56.8	47.		49.0	57.3	
Vehicle Noise:	64.	9	63.1	59.	9	55.3	63.8	8 64.
Centerline Distanc	e to Noise Co	ntour (in feet	)		1			1
				70 dBA	65 (	dBA	60 dBA	55 dBA
			–			-		
			Ldn: VFL:	13 14	-	8 0	60 64	128 137

	FH\	WA-RD-77-108	HIGHW	AY N	OISE PR	EDICTIO	N MODEL		
	io: HY 2040 W						ame: North		
	e: Placentia L					Job Nur	nber: 11145	5	
Road Segmer	nt: e/o Main S	t.							
	SPECIFIC IN	NPUT DATA						EL INPUTS	5
Highway Data				S	Site Cond	litions (H	ard = 10, S	oft = 15)	
Average Daily	Traffic (Adt):	14,900 vehicle	s				Autos	: 15	
Peak Hour	Percentage:	10%					(s (2 Axles)		
	our Volume:	1,490 vehicle	s		Hea	vy Trucks	(3+ Axles)	: 15	
	hicle Speed:	25 mph		v	/ehicle N	lix			
Near/Far La	ne Distance:	36 feet			Vehic	leType	Day	Evening	Night Daily
Site Data						Aut	os: 77.5%		9.6% 97.42
Bai	rier Heiaht:	0.0 feet			Me	dium Truc	ks: 84.8%	6 4.9%	10.3% 1.84
Barrier Type (0-W		0.0			н	eavy Truc	ks: 86.5%	6 2.7%	10.8% 0.74
Centerline Dis	st. to Barrier:	44.0 feet			loise So	urce Elev	ations (in i	foot)	
Centerline Dist.	to Observer:	44.0 feet		-	0130 00	Autos:	0.000	001/	
Barrier Distance	to Observer:	0.0 feet			Medium	Trucks:	2.297		
Observer Height (	,	5.0 feet				Trucks:	8.006	Grade Ad	ustment: 0.0
	ad Elevation:	0.0 feet		-				,	
	ad Elevation:	0.0 feet		L	ane Equ		istance (in	feet)	
	Road Grade:	0.0%			Marthum	Autos: Trucks:	40.460		
	Left View:	-90.0 degre				Trucks: Trucks:	40.241 40.262		
	Right View:	90.0 degre	es		Tieavy	mucks.	40.202		
FHWA Noise Mode	el Calculation	IS							
VehicleType	REMEL	Traffic Flow	Distar		Finite F		Fresnel	Barrier Atte	
Autos:	58.73			1.28		-1.20	-4.61	0.0	
Medium Trucks:	70.80			1.31		-1.20	-4.87		
Heavy Trucks:	77.97	-18.86		1.31		-1.20	-5.50	0.0	0.00
Unmitigated Noise			barrier a	attenu	uation)				
VehicleType	Leq Peak Hou			eq Ev	ening	Leq Nig		Ldn	CNEL
Autos:	61		59.2		57.5		51.4	60.0	
Medium Trucks:		5.0	54.5		48.1		46.6	55.0	
Heavy Trucks:		9.2	57.8		48.8		50.0	58.4	
Vehicle Noise:	64		62.4		58.5		54.5	63.0	) 63
Centerline Distant	ce to Noise C	ontour (in fee	)						
			ட	70 d		65 dB	A	60 dBA	55 dBA
			Ldn:	15		33		70	151
		0	NFI :	16		35		75	161

	FHV	VA-RD-77-108	HIGH	WAY N	OISE PF	REDICT		EL			
Scenar	io: HY 2040 W	ith Project				Project	Name: N	lorthg	ate		
Road Nan	e: Columbia A	.v.				Job N	umber: 1	1145			
Road Segme	nt: e/o Orange	St.									
	SPECIFIC IN	PUT DATA							L INPUT	s	
Highway Data				S	Site Con	ditions	(Hard = 1	10, Sc	oft = 15)		
Average Daily	Traffic (Adt): 3	1,900 vehicles					A	utos:	15		
Peak Hour	Percentage:	10%			Me	dium Tri	ucks (2 A	xles):	15		
Peak H	lour Volume:	3,190 vehicles			He	avy Tru	cks (3+ A	xles):	15		
Ve	hicle Speed:	45 mph		1	/ehicle l	Mix					
Near/Far La	ne Distance:	36 feet		F		icleType		Day	Evening	Night	Daily
Site Data								7.5%	•	9.6%	,
Ba	rrier Height:	0.0 feet			Me	dium T	rucks: 8	84.8%	4.9%	10.3%	1.84
Barrier Type (0-W	•	0.0			F	leavy T	rucks: 8	86.5%	2.7%	10.8%	0.74
Centerline Di		44.0 feet		_							
Centerline Dist.		44.0 feet		^	loise Sc		evations		eet)		
Barrier Distance		0.0 feet				Auto					
Observer Height	Above Pad):	5.0 feet				n Truck			0 d A-4		
	ad Elevation:	0.0 feet			Heav	y Truck	s: 8.0	06	Grade Ad	ustment	: 0.0
Ro	ad Elevation:	0.0 feet		L	ane Eq	uivalen	Distanc	e (in i	feet)		
	Road Grade:	0.0%				Auto	s: 40.4	60			
	Left View:	-90.0 degree	s		Mediur	n Truck	s: 40.2	41			
	Right View:	90.0 degree	s		Heav	y Truck	s: 40.2	62			
FHWA Noise Mod	el Calculation	s									
VehicleType	REMEL	Traffic Flow	Dist	tance	Finite		Fresne		Barrier Att	en Ber	m Attei
Autos:	68.46	3.09		1.28	;	-1.20	-	4.61	0.0	000	0.0
Medium Trucks:	79.45	-14.15		1.31		-1.20		4.87		000	0.0
Heavy Trucks:	84.25	-18.11		1.31		-1.20	-	5.50	0.0	000	0.00
Unmitigated Nois	e Levels (with	out Topo and I	barrie	er atteni	uation)						
VehicleType	Leq Peak Hou			Leq Ev		Leq	Night		Ldn		NEL
Autos:	71		9.7		68.0		61.9		70.8		71
Medium Trucks:	65		3.9		57.5		56.0		64.5		64
Heavy Trucks:	66		64.8		55.8		57.0		65.4		65
Vehicle Noise:			'1.7		68.6		63.9		72.4	1	72
Centerline Distan	ce to Noise Co	ontour (in feet)		70		05	-10.4		0.104		-10.4
			L	70 d			dBA	6	0 dBA		dBA
			.dn: IEL:	64 69			38 48		297		40
									319		87

Monday, June 18, 2018

Scenar	io: HY 2040 W	/A-RD-77-108 H	lion			Project N			ate		
Road Nan	ne: Columbia A nt: e/o Primer \$	v.				Job Nur					
SITE	SPECIFIC IN	PUT DATA								S	
Highway Data				5	Site Con	ditions (F	lard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt): 3	5,900 vehicles						Autos:	15		
Peak Hour	Percentage:	10%			Mee	dium Truc	ks (2 A	xles):	15		
Peak H	lour Volume:	3,590 vehicles			Hea	avy Truck	s (3+ A	xles):	15		
Ve	hicle Speed:	45 mph			/ehicle I	<i>liy</i>					
Near/Far La	ne Distance:	36 feet		-		cleType		Day	Evening	Night	Daily
Site Data						Au	tos:	, 77.5%	12.9%	9.6%	97.42%
Ba	rrier Heiaht:	0.0 feet			Me	dium Tru	cks:	84.8%	4.9%	10.3%	1.84%
Barrier Type (0-W	/all, 1-Berm):	0.0			H	leavy Tru	cks:	86.5%	2.7%	10.8%	0.74%
Centerline Di		44.0 feet		1	Voise So	urce Ele	ation	s (in fe	eet)		
Centerline Dist.		44.0 feet				Autos:	0.0	00			
Barrier Distance		0.0 feet			Mediur	n Trucks:	2.2	97			
Observer Height		5.0 feet			Heav	y Trucks:	8.0	06	Grade Ad	iustment	: 0.0
	ad Elevation:	0.0 feet		-	ana Ea	uivelent l	Votone	o (in i	[0.04]		
	ad Elevation:	0.0 feet		-	.ane Equ	ivalent L			eet)		
	Road Grade:	0.0%				Autos:	40.4				
	Left View:	-90.0 degrees				n Trucks:	40.2				
	Right View:	90.0 degrees	5		Heav	y Trucks:	40.2	262			
FHWA Noise Mod											
VehicleType	REMEL	Traffic Flow	Dista		Finite		Fresn	-	Barrier Att		m Atten
Autos:	68.46	3.60		1.28		-1.20		4.61	0.0		0.000
Medium Trucks:	79.45	-13.64		1.31		-1.20		4.87	0.0		0.000
Heavy Trucks:	84.25	-17.59		1.31		-1.20		-5.50	0.0	00	0.000
Unmitigated Nois											
VehicleType	Leq Peak Hou			Leq Ev	~	Leq N	· ·		Ldn	-	NEL
Autos:	72.		0.2		68.5		62.4		71.0		71.6
Medium Trucks:	65.		4.4		58.1		56.5		65.0	)	65.2
Heavy Trucks:	66.	86	5.3		56.3		57.6		65.9	)	66.0
Vehicle Noise:	74.	0 7	2.2		69.1		64.4		73.0	)	73.4
Centerline Distan	ce to Noise Co	ntour (in feet)									
				70 a		65 dE		6	i0 dBA		dBA
		L	dn:	69 74	-	149 160			321 345		92 43

	FHV	VA-RD-77-108	HIGHWA	Y NOISE	PREDICT	ION MODEL			
	<ul> <li>b: HY 2040 W</li> <li>c: Strong St.</li> <li>c: w/o Main S</li> </ul>					Name: Nort lumber: 1114			
SITE S	PECIFIC IN	IPUT DATA				IOISE MOD		S	
Highway Data				Site C	onditions	(Hard = 10,	Soft = 15)		
Average Daily T	raffic (Adt):	5,700 vehicles	s			Auto	s: 15		
Peak Hour F	Percentage:	10%		/	/ledium Tr	ucks (2 Axles	s): 15		
Peak Ho	our Volume:	570 vehicles	s	1	leavy Tru	cks (3+ Axles	s): 15		
Veh	icle Speed:	25 mph		Vehicl	o Mix				
Near/Far Lan	e Distance:	12 feet			e wiix ehicleType	e Day	Evening	Night	Daily
Site Data						Autos: 77.5	•	9.6%	
Barr	rier Height:	0.0 feet			Medium T	rucks: 84.8	4.9%	10.3%	1.84%
Barrier Type (0-Wa		0.0			Heavy T	rucks: 86.5	i% 2.7%	10.8%	0.74%
Centerline Dis	. ,	33.0 feet		Naiaa	Course E	levations (in	fact		
Centerline Dist. to	o Observer:	33.0 feet		NOISe	Auto		leel)		
Barrier Distance to	o Observer:	0.0 feet		Maa	ium Truck				
Observer Height (A	Above Pad):	5.0 feet			avy Truck		Grade Ad	liustmont	0.0
Pa	d Elevation:	0.0 feet		110	avy muck	3. 0.000	Orade Hu	justinent.	0.0
Roa	d Elevation:	0.0 feet		Lane E	quivalen	t Distance (i	n feet)		
R	load Grade:	0.0%			Auto	s: 32.833			
	Left View:	-90.0 degree	es	Mea	ium Truck	s: 32.562			
	Right View:	90.0 degree	es	He	avy Truck	s: 32.589			
FHWA Noise Mode	I Calculation	s							
VehicleType	REMEL	Traffic Flow	Distan	ce Fini	te Road	Fresnel	Barrier Att	ten Ber	m Atten
Autos:	58.73	-1.84		2.64	-1.20	-4.5	2 0.0	000	0.00
Medium Trucks:	70.80	-19.08		2.69	-1.20	-4.8		000	0.00
Heavy Trucks:	77.97	-23.03		2.69	-1.20	-5.6	9 0.0	000	0.00
Unmitigated Noise			barrier a	ttenuatior	ı)				
VehicleType	Leq Peak Hou			q Evening	,	Night	Ldn	-	VEL
Autos:	58		56.4	54		48.6	57.2		57.
Medium Trucks:	53		51.7	45		43.8	52.3	-	52.
Heavy Trucks:	56		55.0	46		47.2	55.6		55.
Vehicle Noise:	61	.2	59.6	55	.6	51.7	60.2	2	60.6
		ntour lin foot	)						
Centerline Distance	e to Noise Co	nitour (in reel	-						
Centerline Distance	e to Noise Co			70 dBA		dBA	60 dBA		dBA
Centerline Distance	e to Noise Co		Ldn: VFI :	70 dBA 7 8	1	dBA 16 17	60 dBA 34 36	1	dBA 74 78

	FHV	VA-RD-77-108	HIGHW	AY NC	DISE PRE		ODEL			
Scenar	io: HY 2040 W	ith Project			Pi	oject Name	: North	gate		
Road Nam	e: Strong St.					lob Numbei	: 1114	5		
Road Segme	nt: e/o Main St									
SITE	SPECIFIC IN	PUT DATA				NOISE	MOD	EL INPUTS		
Highway Data				Si	ite Condit	ions (Hard	= 10, S	oft = 15)		
Average Daily	Traffic (Adt):	6,200 vehicle	5				Autos	: 15		
Peak Hour	Percentage:	10%			Mediu	m Trucks (2	? Axles)	: 15		
Peak H	lour Volume:	620 vehicle	s		Heavy	/ Trucks (3-	Axles)	: 15		
	hicle Speed:	25 mph		Ve	ehicle Mix					
Near/Far La	ne Distance:	12 feet		-	Vehicle		Day	Evening	Night	Daily
Site Data						Autos:	77.59	•	9.6%	97.42%
Ba	rrier Height:	0.0 feet			Medi	um Trucks:	84.89	6 4.9%	10.3%	1.84%
Barrier Type (0-W	•	0.0			Hea	vy Trucks:	86.5%	6 2.7%	10.8%	0.74%
Centerline Di		33.0 feet		N	laisa Sau	ce Elevatio	ne (in	fact)		
Centerline Dist.	to Observer:	33.0 feet		/**			0.000	eei)		
Barrier Distance	to Observer:	0.0 feet			Medium		2.297			
Observer Height (	Above Pad):	5.0 feet			Heavy 1		3.006	Grade Adju	istment <sup>.</sup>	0.0
Pa	ad Elevation:	0.0 feet			,					0.0
Roa	ad Elevation:	0.0 feet		Lá		alent Dista		feet)		
	Road Grade:	0.0%					2.833			
	Left View:	-90.0 degree	es		Medium 1		2.562			
	Right View:	90.0 degree	es		Heavy	rucks: 3	2.589			
FHWA Noise Mod	el Calculation	s								
VehicleType	REMEL	Traffic Flow	Distar	се	Finite Ro	ad Fre	snel	Barrier Atte	n Berr	n Atten
Autos:	58.73	-1.47		2.64					0	0.000
				2.01	-	1.20	-4.52	0.00	JU	0.000
Medium Trucks:	70.80	-18.71		2.69		1.20 1.20	-4.52 -4.86			
Medium Trucks: Heavy Trucks:	70.80 77.97	-18.71 -22.67			-			0.00	00	0.000
Heavy Trucks:	77.97	-22.67	barrier a	2.69 2.69	-	1.20	-4.86	0.00	00	0.000
Heavy Trucks: Unmitigated Nois VehicleType	77.97 e Levels (with Leq Peak Hou	-22.67 out Topo and r Leq Day	' L	2.69 2.69	- - iation) ening	1.20 1.20 Leq Night	-4.86 -5.69	0.00 0.00 Ldn	00	0.000 0.000
Heavy Trucks: Unmitigated Noise VehicleType Autos:	77.97 e Levels (with Leq Peak Hou 58	-22.67 out Topo and r Leq Day .7	, L 56.8	2.69 2.69	- iation) ening 55.0	1.20 1.20 Leq Night 4§	-4.86 -5.69	0.00 0.00 <i>Ldn</i> 57.6	00	0.000 0.000 IEL 58.2
Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks:	77.97 e Levels (with Leq Peak Hou 58 53	-22.67 out Topo and r Leq Day .7 .6	, L 56.8 52.1	2.69 2.69	- - - - - - - - - - - - - - - - - - -	1.20 1.20 Leq Night 49 44	-4.86 -5.69 0.0	0.00 0.00 <i>Ldn</i> 57.6 52.6	00	0.000 0.000 IEL 58.2 52.9
Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks: Heavy Trucks:	77.97 e Levels (with Leq Peak Hou 58	-22.67 out Topo and r Leq Day .7 .6	, L 56.8	2.69 2.69	- iation) ening 55.0	1.20 1.20 <u>Leq Night</u> 44 44 47	-4.86 -5.69 0.0 1.2 7.6	0.00 0.00 <i>Ldn</i> 57.6 52.6 55.9	00	0.000 0.000 IEL 58.2 52.9 56.1
Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks:	77.97 e Levels (with Leq Peak Hou 58 53	-22.67 <b>Dut Topo and</b> r Leq Day 7 .6 .8	, L 56.8 52.1	2.69 2.69	- - - - - - - - - - - - - - - - - - -	1.20 1.20 <u>Leq Night</u> 44 44 47	-4.86 -5.69 0.0	0.00 0.00 <i>Ldn</i> 57.6 52.6	00	0.000 0.000 IEL 58.2 52.9 56.1
Heavy Trucks: Unmitigated Noiss VehicleType Autos: Medium Trucks: Heavy Trucks: Vehicle Noise:	77.97 e Levels (with Leq Peak Hou 58 53 56 61	-22.67 -22.67 out Topo and r Leq Day .7 .6 .8 .6	56.8 52.1 55.4 59.9	2.69 2.69 attenu	- ening 55.0 45.7 46.3 56.0	1.20 1.20 <u>Leq Night</u> 44 47 52	-4.86 -5.69 0.0 1.2 1.6	0.00 0.00 57.6 52.6 55.9 60.6	00 00 CA	0.000 0.000 IEL 58.2 52.9 56.7 61.0
Heavy Trucks: Unmitigated Noiss VehicleType Autos: Medium Trucks: Heavy Trucks: Vehicle Noise:	77.97 e Levels (with Leq Peak Hou 58 53 56 61	-22.67 Dut Topo and r Leq Day 7 6 8 6 6 5 6 5 6 5 5 5 6 5 5 6 5 6 5 5 6 5 5 6 5 6 5 6 5 6 5 6 5 6 7 6 7 7 7 7 7 7 7 8 7 7 7 7 7 8 7 7 7 7 7 7 7 7 7 7 7 7 7	, L 56.8 52.1 55.4 59.9	2.69 2.69 attenue eq Eve	- ening 55.0 45.7 46.3 56.0	1.20 1.20 Leq Night 45 44 47 52 65 dBA	-4.86 -5.69 0.0 1.2 1.6	0.00 0.00 57.6 52.6 55.9 60.6 60 dBA	00 00 CN 55 (	0.000 0.000 IEL 58.2 52.9 56.1 61.0
Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks: Heavy Trucks:	77.97 e Levels (with Leq Peak Hou 58 53 56 61	-22.67 <b>Dut Topo and</b> r Leq Day 7 6 8 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6	56.8 52.1 55.4 59.9	2.69 2.69 attenu	- ening 55.0 45.7 46.3 56.0	1.20 1.20 <u>Leq Night</u> 44 47 52	-4.86 -5.69 0.0 1.2 1.6	0.00 0.00 57.6 52.6 55.9 60.6	00 00 CN 55 (	0.000 0.000 IEL 58.2 52.9 56.1 61.0 HBA 8

	FHV	/A-RD-77-108 I	HIGH	WAY N	IOISE PF	REDICTI	ON MO	DEL			
	o: HY 2040 W e: Russell St. ht: e/o Main St						Name:   umber:				
SITE S	SPECIFIC IN	PUT DATA				N	OISE N	/IODE	L INPUT	s	
Highway Data					Site Con	ditions	(Hard =	10, S	oft = 15)		
Average Daily	Traffic (Adt):	6,800 vehicles					,	Autos:	15		
Peak Hour	Percentage:	10%			Me	dium Tru	icks (2 A	(xles)	15		
Peak H	our Volume:	680 vehicles			He	avy Truc	:ks (3+ A	(xles)	15		
Vel	nicle Speed:	35 mph		1	Vehicle I	Mix					
Near/Far Lar	ne Distance:	36 feet		H		icleType		Dav	Evening	Night	Daily
Site Data					VCIII			77.5%		9.6%	
	rier Height:	0.0 feet			Me	edium Tr		84.8%		10.3%	1.849
Barrier Type (0-W	•	0.0 reet			F	leavy Tr	ucks:	86.5%	2.7%	10.8%	0.74%
Centerline Dis		44.0 feet									
Centerline Dist. t		44.0 feet		1	Noise So				eet)		
Barrier Distance		0.0 feet				Autos		000			
Observer Height (		5.0 feet				n Trucks		297			
0 1	d Flevation:	0.0 feet			Heav	y Trucks	s: 8.0	006	Grade Ad	justment.	0.0
Roa	d Elevation:	0.0 feet		1	Lane Eq	uivalent	Distan	ce (in	feet)		
F	Road Grade:	0.0%				Autos	s: 40.4	460			
	Left View:	-90.0 degrees	5		Mediur	n Trucks	s: 40.	241			
	Right View:	90.0 degree	S		Heav	y Trucks	s: 40.:	262			
FHWA Noise Mode	Calculation:	5									
VehicleType	REMEL	Traffic Flow	Dist	ance	Finite	Road	Fresn	el	Barrier Att	en Ber	m Atten
Autos:	64.30	-2.53		1.28	3	-1.20		-4.61	0.0	000	0.00
Medium Trucks:	75.75	-19.77		1.31	1	-1.20		-4.87	0.0	000	0.00
Heavy Trucks:	81.57	-23.73		1.31	1	-1.20		-5.50	0.0	000	0.00
Unmitigated Noise	Levels (with	out Topo and b	arrie	r atten	uation)						
	Leq Peak Hou			Leg Ev		Leq	Night		Ldn		VEL
Autos:	61.		9.9		58.2		52.1		60.7		61.
Medium Trucks:	56		4.6		48.2		46.7		55.1		55.
Heavy Trucks:	57.		6.5		47.5		48.7		57.1		57.
Vehicle Noise:	64	-	2.4		58.9		54.5	,	63.1	1	63.
Centerline Distanc	e to Noise Co	ntour (in feet)		70 c	RΔ	65.	dBA		60 dBA	55	dBA
		,	dn:	15			3	<u> </u>	70		52
		CN		16			5		75		52 62
		CN	LL.	10		3	5		15	'	02

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APPENDIX 8.1:

**ON-SITE TRAFFIC NOISE LEVEL CALCULATIONS** 

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F	HWA-RD-77-10	8 HIGHWAY N	OISE PRE	DICTION	MODEL	(CALVE	ENO)	- 6/2/2013		
Road Nan	io: First Floor V ne: SR-91/I-215 lo: East Apartm				Job N	Name: N umber: 1 inalyst: A	11145			
SITE	SPECIFIC IN	PUT DATA			N	OISE N	IODE	L INPUTS	5	
Highway Data				Site Con	ditions	(Hard =	10, So	oft = 15)		
Peak Hour Peak F	Traffic (Adt): 18 Percentage: lour Volume: 1	10% 8,700 vehicles				/ Icks (2 A :ks (3+ A		15		
	hicle Speed:	70 mph		Vehicle I	Mix					
Near/Far La	ne Distance:	140 feet		Veh	icleType		Day	Evening	Night	Daily
Site Data					ŀ	Autos:	77.5%	12.9%	9.6%	89.10%
Ba	rrier Height:	0.0 feet		M	edium Ti	rucks:	84.8%	4.9%	10.3%	4.58%
Barrier Type (0-W	/all, 1-Berm):	0.0		1	Heavy Ti	rucks:	86.5%	2.7%	10.8%	6.32%
Centerline Di	st. to Barrier:	212.0 feet		Noise So	ource El	evations	in fe	eet)		
Centerline Dist.		212.0 feet			Autos		.200	)		
Barrier Distance		0.0 feet		Mediu	n Trucks		.497			
Observer Height	· ,	5.0 feet		Heav	y Trucks	s: 874	.206	Grade Adj	ustmen	: 0.0
	ad Elevation:	855.0 feet								
	ad Elevation:	866.2 feet		Lane Eq		205.4		reet)		
	ier Elevation: Road Grade:	855.0 feet 0.0%		Modiu		s: 205.4 s: 205.5				
	Road Grade:	0.0%				s: 205.0 s: 206.0				
FHWA Noise Mod										
VehicleType	REMEL	Traffic Flow	Distance		Road	Fresn		Barrier Atte		rm Atten
Autos:	76.79	8.46	-9.		-1.20		5.09	-15.3		-18.35
Medium Trucks:		-4.43	-9.		-1.20		5.15	-15.3		-18.39
Heavy Trucks:		-3.03	-9.		-1.20		5.28	-15.4	68	-18.46
Unmitigated Nois										
VehicleType	Leq Peak Hour			Evening	Leq	Night		Ldn		NEL
Autos:	74.		2.8	71.1		65.0		73.6		74.
Medium Trucks:			5.1	59.7		58.2		66.6		66.
Heavy Trucks: Vehicle Noise:			0.8 5.5	61.8 71.8		63.1 67.7		71.4		71.
						1.10		76.2		76.
Mitigated Noise L	· ·			,	1	N li - le t	1	Lata		
VehicleType Autos:	Leq Peak Hour 59.4		Leq 1	Evening 55.7	Leq	Night 49.7		Ldn 58.3		NEL 58.
Autos: Medium Trucks:	52.5		7.5 ).7	55.7 44.3		49.7		58.3 51.2		58. 51.
Heavy Trucks:	52.		5.4	44.3		42.8		51.2		56.1
Vehicle Noise:										
venicle Noise:	61.	5 60	0.1	56.5		52.3		60.8		61.2

F	HWA-RD-77-10	8 HIGHWAY	NOISE PR	EDICTION	MODE		NO)	6/2/2013		
Road Nan	<i>io:</i> First Floor W ne: SR-60 <i>lo:</i> East Apartm				Job N	Name: N lumber: 1 Analyst: F	1145			
SITE	SPECIFIC INF	PUT DATA			ſ	IOISE N	IODE	L INPUTS	S	
Highway Data				Site Con	ditions	(Hard =	10, So	oft = 15)		
Peak Hour Peak F	Traffic (Adt): 18 Percentage: lour Volume: 11	10% 8,700 vehicle				A ucks (2 A cks (3+ A				
	hicle Speed:	70 mph		Vehicle	Mix					
Near/Far La	ne Distance:	160 feet		Veh	icleType		Day	Evening	Night	Daily
Site Data						Autos:	77.5%	12.9%	9.6%	89.00%
Ba	rrier Height:	0.0 feet			edium 1		84.8%		10.3%	
Barrier Type (0-V	/all, 1-Berm):	0.0		1	leavy T	rucks:	86.5%	2.7%	10.8%	4.41%
Centerline Di	st. to Barrier:	893.0 feet		Noise So	ource E	levations	in fe	et)		
Centerline Dist.	to Observer:	893.0 feet			Auto			,		
Barrier Distance		0.0 feet		Mediu	n Truck					
Observer Height	· ,	5.0 feet			v Truck			Grade Adj	ustment	0.0
	ad Elevation:	855.0 feet			,					
	ad Elevation:	870.0 feet		Lane Eq				teet)		
	ier Elevation:	855.0 feet		Marthu		s: 894.5 s: 894.5				
	Road Grade:	0.0%				s: 894.0 s: 894.7				
FHWA Noise Mod	el Calculations									
VehicleType	REMEL	Traffic Flow	Distanc	e Finite	Road	Fresn	el	Barrier Atte	en Bei	m Atten
Autos:	76.79	8.46	-18	8.89	-1.20		4.96	-15.2	72	-18.272
Medium Trucks:		-2.85		3.89	-1.20		4.97	-15.2		-18.279
Heavy Trucks:	85.83	-4.59	-18	3.89	-1.20		5.00	-15.3	00	-18.300
Unmitigated Nois										
VehicleType	e Levels (witho	ut Topo and	barrier at	tenuation)						
venicierype	Leq Peak Hour	Leq Day		tenuation) Evening	Leq	Night		Ldn		NEL
Autos:	Leq Peak Hour 65.2	Leq Day	/ Leq 63.3	Evening 61.5	Leq	55.4		64.1		64.7
Autos: Medium Trucks:	Leq Peak Hour 65.2 59.0	Leq Day 2 3	/ Leq 63.3 58.1	Evening 61.5 51.7	Leq	55.4 50.2		64.1 58.6		64.7 58.9
Autos:	Leq Peak Hour 65.2	Leq Day 2 3	/ Leq 63.3	Evening 61.5	Leq	55.4		64.1		64.7 58.9
Autos: Medium Trucks:	Leq Peak Hour 65.2 59.6 61.	Leq Day 2 3 1	/ Leq 63.3 58.1	Evening 61.5 51.7	Leq	55.4 50.2		64.1 58.6		64.7 58.9 60.4
Autos: Medium Trucks: Heavy Trucks:	Leq Peak Hour 65.2 59.6 61. 67.4	Leq Day 2 5 1	/ Leq 63.3 58.1 59.7 65.7	Evening 61.5 51.7 50.7 62.2	Leq	55.4 50.2 51.9		64.1 58.6 60.3		64.7 58.9 60.4
Autos: Medium Trucks: Heavy Trucks: Vehicle Noise:	Leq Peak Hour 65.2 59.6 61. 67.4	Leq Day Leq Day Leq Day Leq Day Leq Day Leq Day	/ Leq 63.3 58.1 59.7 65.7 r attenuati	Evening 61.5 51.7 50.7 62.2		55.4 50.2 51.9		64.1 58.6 60.3	1	64.7 58.9 60.4
Autos: Medium Trucks: Heavy Trucks: Vehicle Noise: Mitigated Noise L	Leq Peak Hour 65.2 59.6 61.2 67.4 evels (with Top	Leq Day Leq Day Leq Day and barrie Leq Day	/ Leq 63.3 58.1 59.7 65.7 r attenuati	Evening 61.5 51.7 50.7 62.2		55.4 50.2 51.9 57.9		64.1 58.6 60.3 66.4	C	64.7 58.9 60.4 66.8 NEL
Autos: Medium Trucks: Heavy Trucks: Vehicle Noise: <b>Mitigated Noise L</b> VehicleType	Leq Peak Hour 65. 59. 61. 67. evels (with Top Leq Peak Hour	Leq Day 2 5 1 4 <b>1</b> 5 0 0 0 0 0 0 0 0 0 0	/ Leq 63.3 58.1 59.7 65.7 <b>r attenuat</b> i / Leq	Evening 61.5 51.7 50.7 62.2 ion) Evening		55.4 50.2 51.9 57.9 Night		64.1 58.6 60.3 66.4 <i>Ldn</i>	C	64.7 58.9 60.4 66.8 NEL 49.4
Autos: Medium Trucks: Heavy Trucks: Vehicle Noise: Mitigated Noise L VehicleType Autos:	Leq Peak Hour 65.2 59.6 61. 67.4 evels (with Top Leq Peak Hour 49.5	Leq Day 2 3 1 4 <b>1</b> <b>0</b> and barrie 0 1 4 <b>0</b> and barrie 3	Leq           63.3           58.1           59.7           65.7           r attenuation           2000 Leq           48.0	Evening 61.5 51.7 50.7 62.2 ion) (Evening 46.2		55.4 50.2 51.9 57.9 <i>Night</i> 40.2		64.1 58.6 60.3 66.4 <i>Ldn</i> 48.8		64.7 58.9 60.4 66.8 NEL

o: First Floor V e: SR-91/I-215 o: East Hotel B	5				Proiec	t Name: N	Jortha	ate		
	Building					lumber: 1 Analvst: A		fo		
	5									
SPECIFIC IN	PUT DATA			Cito Con		VOISE N			5	
				Sile Com	unions		.,			
• •	37,000 vehicle	S					lutos:	15		
•						,				
	- 1	s		Hea	avy Iru	CKS (3+ A	xies):	15		
			١	Vehicle N	Nix					
e Distance:	140 feet			Vehi	icleTyp			Evening	Night	Daily
						Autos:	77.5%	12.9%	9.6%	89.10%
rier Height:	0.0 feet									
all, 1-Berm):	0.0			F	leavy T	rucks:	86.5%	2.7%	10.8%	6.329
t. to Barrier:	825.0 feet		7	Noise So	ource E	levations	: (in fe	et)		
o Observer:	825.0 feet		F							
o Observer:	0.0 feet			Mediun	n Truck					
	5.0 feet			Heav	v Truck	s: 873	306	Grade Adj	ustment:	0.0
			L.		·					
			-	Lane Equ				eet)		
load Grade:	0.0%									
				Heav	у ттиск	IS: 827.3	50			
						_			-	
		Disi				Fresn				m Atten -18.27
				-						-18.27
				-						-18.28
					-1.20		5.02	-15.3	12	-18.31
			Leq E		Leq	<u> </u>				VEL 65.
										65. 57
										57. 62.
	-	• • • •								67.
						30.0		07.1		07.
1			Leq Ev		Leq				-	VEL 49.
										49. 42.
										42.
Heavy Trucks: 47.9 46.5					<u>37.4</u> <u>38.7</u> <u>47.0</u> <u>47.5</u> <u>43.3</u> <u>51.8</u>					
	Percentage: Percentage: Parce	Percentage:         10%           Percentage:         18,700 vehicle:           fuel vehicle:         70 mph           te Distance:         140 feet           rier Height:         0.0 feet           11, 1-Bern;         0.0           to Barrier:         825.0 feet           0 Observer:         0.0 feet           d Elevation:         850.0 feet           d Elevation:         850.0 feet           d Elevation:         855.3 feet           oodscred:         0.0%           I Calculations         REMEL           REMEL         Traffic Flow           76.79         84.43           85.83         -3.03           Levels (without         Leq Day           65.7         58.5           63.2         68.1           vels (with Topo and Leq Day         68.1           Leq Day         50.4	Decentage:         10%           Derecentage:         10%           ur Volume:         18,700 vehicles           ur Volume:         18,700 vehicles           ide/second         70 mph           e Distance:         140 feet           rier Height:         0.0 feet           id. 1-Bern):         0.0           t. to Barrier:         825.0 feet           o Observer:         0.0 feet           bbove Pad):         5.0 feet           o Observer:         850.0 feet           d Elevation:         850.0 feet           d Elevation:         850.0 feet           d Elevation:         850.0 feet           d Elevation:         853.3 feet           r Elevation:         853.3 -a.03           Levels (without Topo and barrier         Eage Peak Hour           Leq Peak Kour         Leq Day           65.7         63.8           68.1         66.4           vels (with Topo and barrier atter           Leq Paek Hour         Leq Day           50.4         48.5	Percentage:         10%           Percentage:         10% oehicles           uur Volume:         18,700 vehicles           idels Speed:         70 mph           e Distance:         140 feet           rier Height:         0.0 feet           ji .1-Berm):         0.0           t. to Barrier:         825.0 feet           0 Observer:         0.0 feet           bbow Pad):         5.0 feet           0 Observer:         850.0 feet           d Elevation:         850.0 feet           d Elevation:         850.0 feet           d Elevation:         850.3 feet           rt Elevation:         850.0 feet           d Elevation:         853.3 - 4.43           85.83         -3.03           25.53         -4.43           85.83         -3.03           65.7         63.8           58.5         57.0           63.2         61.8           68.1         66.4           vels (with Topo and barrier attenuation           Leq Peak Hour         Leq Day           Leq Eval         65.7           63.2         61.8           68.1         66.4	Percentage:         10%         Mercentage:           Percentage:         10%         Mercentage:           ur Volume:         18,700 vehicles         Mercentage:           ictilice/Speed:         70 mph         Vehicles           ictilice/Speed:         140 feet         Vehicles           ictilice/Speed:         140 feet         Vehicles           ictilice/Speed:         140 feet         Wehicles           ictilice/Speed:         0.0 feet         Mercentage           ist.         0.0 feet         Mercentage         Mercentage           ist.         0.0 feet         Mercentage         Mercentage           blowe Pad):         5.0 feet         Mercentage         Mercentage           blowe Pad):         5.0 feet         Mercentage         Mercentage           ictilice/Speed:         0.0%         Mercentage         Mercentage           ictilice/Speed:         5.5 feet         Lane Equivaliant:         Mercentage           ictilice/Speed:         76.79         8.46         -18.38           855.83         -3.03         -18.38         Eversion           Leq Peak Hour         Leq Day         Leq Evening           65.7         63.8         62.0         52.8	Decentage:         10%         Medium Tr.           Percentage:         10%         Medium Tr.           ur Volume:         18,700 vehicles         Vehicle Max           vehicle Speed:         70 mph         Vehicle Max           vehicle Speed:         70 mph         Vehicle Mix           vehicle Speed:         140 feet         Vehicle Mix           vehicle Speed:         140 feet         Vehicle Mix           vehicle Speed:         140 feet         Vehicle Mix           vehicle Speed:         0.0 feet         Medium Tr.           Medium Truck         Heavy Truck         Heavy Truck           bowe Pad):         5.0 feet         Autr.           bowe Pad):         5.0 feet         Lane Equivalent           r Elevation:         850.0 feet         Autr.           de Carde:         0.0%         Erret Red/ Truck           Taffic Flow         Distance         Finite Road           76.79         8.4.43         -18.38         -1.20           85.83         -3.03         -18.38         -1.20           B5.83         -3.03         18.38         -1.20           Levels (without Top and barrier atternuation)         Leq Peak Howr         Leq Day           Le	Decentage:         10%         Medium Trucks (2 A Heavy Trucks (3 A Heavy Truck	Dercentage:         10%         Medium Trucks (2 Axles): Heavy Trucks (2 Axles): Heav	Dercentage:         10%         Medium Trucks (3 + Akles):         15           Percentage:         10%         Heady Trucks (3 + Akles):         15           Value:         140 feet         Vehicle Mix         Vehicle Mix           Vehicle:         Vehicle:         Vehicle:         Vehicle:           vehicle:         S0:         Vehicle:         Vehicle:         Vehicle:           vehicle:         S0:         S0:         Vehicle:         Vehicle:         Vehicle:           vehicle:         S0:         S0:         Vehicle: <t< td=""><td>Dercentage:         10%         Medium Trucks (2 Axles):         15           Parcentage:         10%         Medium Trucks (2 Axles):         15           Withicle Speed:         70 mph         Parcentage:         15           e Distance:         140 feet         Vehicle Mix         Vehicle Mix           Image: Parcentage:         140 feet         Vehicle Mix         Vehicle Mix           Vehicle Mix         Autos:         77.5%         12.9%         9.6%           Medium Trucks:         84.8%         4.9%         10.3%           Mit J -Berni):         0.0         Heavy Trucks:         86.5%         2.7%         10.8%           Moise Source Elevation:         850.0 feet         Autos:         867.597         Heavy Trucks:         873.306         Grade Adjustment:           d Elevation:         850.0 feet         Autos:         827.167         Medium Trucks:         827.167           Medium Trucks:         827.355         Image: Not Source Elevations:         827.167         Medium Trucks:         827.355           I Calculations         Erevening         Leavitics:         827.167         Medium Trucks:         827.355           I Calculations         Erevening         Leavitics:         827.167         Medium Trucks:</td></t<>	Dercentage:         10%         Medium Trucks (2 Axles):         15           Parcentage:         10%         Medium Trucks (2 Axles):         15           Withicle Speed:         70 mph         Parcentage:         15           e Distance:         140 feet         Vehicle Mix         Vehicle Mix           Image: Parcentage:         140 feet         Vehicle Mix         Vehicle Mix           Vehicle Mix         Autos:         77.5%         12.9%         9.6%           Medium Trucks:         84.8%         4.9%         10.3%           Mit J -Berni):         0.0         Heavy Trucks:         86.5%         2.7%         10.8%           Moise Source Elevation:         850.0 feet         Autos:         867.597         Heavy Trucks:         873.306         Grade Adjustment:           d Elevation:         850.0 feet         Autos:         827.167         Medium Trucks:         827.167           Medium Trucks:         827.355         Image: Not Source Elevations:         827.167         Medium Trucks:         827.355           I Calculations         Erevening         Leavitics:         827.167         Medium Trucks:         827.355           I Calculations         Erevening         Leavitics:         827.167         Medium Trucks:

F	HWA-RD-77-1	108 HIGHWAY	NOISE	E PRE	DICTION	MODE	L (CALV	ENO)	- 6/2/2013		
Road Nam	io: First Floor ne: SR-60 lo: East Hotel					Job I	t Name: Number: Analyst:	11145			
	SPECIFIC IN	NPUT DATA							L INPUTS	;	
Highway Data					Site Con	ditions	; (Hard =	10, Se	oft = 15)		
Average Daily	Traffic (Adt): 1	87,000 vehicle	s					Autos:	15		
Peak Hour	Percentage:	10%			Me	dium T	rucks (2 A	(xles):	15		
Peak H	lour Volume:	18,700 vehicle	s		He	avy Tru	icks (3+ A	(xles):	15		
Ve	hicle Speed:	70 mph		ŀ	Vehicle	Mix					
Near/Far La	ne Distance:	160 feet		ŀ		icleTyp	е	Dav	Evening	Night	Daily
Site Data				-			Autos:	77.5%	•	9.6%	
Pa	rrier Heiaht:	0.0 feet			М	edium	Trucks:	84.8%	6 4.9%	10.3%	6.59%
Barrier Type (0-W		0.0				Heavy	Trucks:	86.5%	6 2.7%	10.8%	4.41%
Centerline Di		446.0 feet		Ļ							
Centerline Dist.		446.0 feet		ŀ	Noise Se		levation		eet)		
Barrier Distance	to Observer:	0.0 feet			1 4 m all 1	Aute m Truci		.000			
Observer Height (	(Above Pad):	5.0 feet						.297	Grade Adj	internet	
Pi	ad Elevation:	850.0 feet			Heat	/y Truci	(S: 803	.000	Grade Adj	isunem.	0.0
Ro	ad Elevation:	855.0 feet			Lane Eq	uivaler	nt Distan	ce (in	feet)		
Barri	ier Elevation:	850.0 feet				Auto	os: 438.	766			
	Road Grade:	0.0%			Mediu	m Truci	ks: 438.	772			
					Heav	/y Truci	ks: 438.	339			
FHWA Noise Mod	el Calculation	IS									
VehicleType	REMEL	Traffic Flow	Dist	tance	Finite	Road	Fresr	el	Barrier Atte	n Ber	m Atten
Autos:	76.79	8.46		-14.2	5	-1.20		-4.92	0.0	00	0.000
Medium Trucks:	82.53	-2.85		-14.2	5	-1.20		-4.94	0.0	00	0.000
Heavy Trucks:	85.83	-4.59		-14.2	5	-1.20		-5.01	0.0	00	0.000
Unmitigated Noise	e Levels (with	out Topo and	barrie	r atter	nuation)						
VehicleType	Leq Peak Ho			Leq E	vening	Leq	Night		Ldn	CI	VEL
Autos:			67.9		66.1		60.1		68.7		69.3
Medium Trucks:	-		62.7		56.4		54.8		63.3		63.5
Heavy Trucks:			64.4		55.3		56.6		64.9		65.1
Vehicle Noise:	72	2.0	70.3		66.9		62.5		71.0		71.4
Mitigated Noise L	evels (with To	po and barrie	r atten	uatio	1)						
VehicleType	Leq Peak Ho			Leq E	vening	Leo	Night		Ldn	CI	VEL
Autos:			67.9		66.1		60.1		68.7		69.3
Medium Trucks:	-		62.7		56.4		54.8		63.3		63.5
Heavy Trucks:			64.4		55.3		56.6		64.9		65.1
Vehicle Noise	70	2.0	70.3		66.9		62.5		71.0		71.4

F	HWA-RD-77-10	8 HIGHWAY	NOISE P	REDICTION	MODEL	(CALVE	ENO)	- 6/2/2013		
Scenar	io: First Floor V	Vith Wall			Project	Name: N	Vorthg	ate		
	ne: SR-91/I-215					imber: 1				
Lot N	Io: South Hotel	Building			A	nalyst: A	4. Wo	lte		
	SPECIFIC IN	PUT DATA						L INPUTS	5	
Highway Data				Site Cor	nditions (	Hard =	10, So	oft = 15)		
Average Daily	Traffic (Adt): 18	7,000 vehicles	s				Autos:	15		
Peak Hour	Percentage:	10%			edium Tru	•				
Peak H	lour Volume: 1	8,700 vehicle:	S	He	eavy Truc	ks (3+ A	xles):	15		
	hicle Speed:	70 mph		Vehicle	Mix					
Near/Far La	ne Distance:	140 feet		Veh	nicleType		Day	Evening	Night	Daily
Site Data					A		77.5%	12.9%	9.6%	89.109
Ra	rrier Height:	0.0 feet		M	ledium Tr	ucks:	84.8%	4.9%	10.3%	4.589
Barrier Type (0-W	•	0.0			Heavy Tr	ucks:	86.5%	2.7%	10.8%	6.329
	st. to Barrier: 1			Noise S	ource Ele	wation	(in f	not)		
Centerline Dist.				NUISE S	Autos			eer)		
Barrier Distance	to Observer:	0.0 feet		Madiu	Autos m Trucks					
Observer Height (	(Above Pad):	5.0 feet			vy Trucks		.006	Grade Adj	ustmont	
P	ad Elevation:	850.0 feet		nea	vy mucks	. 000	.000	Grade Auj	usunon	. 0.0
Ro	ad Elevation:	860.0 feet		Lane Eq	uivalent	Distand	e (in	feet)		
Barn	ier Elevation:	860.0 feet				: \######				
	Road Grade:	0.0%		Mediu	m Trucks	: \######	###			
				Hear	vy Trucks	: \######	###			
FHWA Noise Mod	el Calculations	:								
VehicleType	REMEL	Traffic Flow	Distan	ce Finite	Road	Fresn	el	Barrier Atte	en Ber	m Atten
Autos:	76.79	8.46		20.60	-1.20		4.88	-15.2		-18.21
Medium Trucks:		-4.43		20.60	-1.20		4.87	-15.2		-18.20
Heavy Trucks:	85.83	-3.03	-2	20.60	-1.20		4.85	-15.1	95	-18.19
Unmitigated Nois					1					
VehicleType	Leq Peak Hour			eq Evening	Leq I			Ldn		NEL
Autos:	63.	-	61.6	59.8		53.7		62.4		63.
Medium Trucks:			54.8	48.4		46.9		55.4		55.
Heavy Trucks: Vehicle Noise:	61. 65.		59.6 64.2	50.5 60.6		51.8 56.4		60.1 64.9		60. 65.
						30.4		64.9		65.
Mitigated Noise L	Leg Peak Hou			tion) a Evening	Leg I	liaht	1	Ldn	0	NEL
VehicleType			20	y Lyonny	Leyi	wgnt		Lun	-	
VehicleType Autos:		,	46.3	44.6		38.5		47 1		47
Autos:	48.	2	46.3 39.6	44.6 33.2		38.5 31.7		47.1 40.1		
		2	46.3 39.6 44.4	44.6 33.2 35.3		38.5 31.7 36.6		47.1 40.1 45.0		47. 40. 45.

F	HWA-RD-77-1	08 HIGHWAY	NOISE P	REDICTION	MODE	L (CALVE	NO) - 6	/2/2013		
Road Nan	rio: First Floor \ ne: SR-60 Vo: South Hote				Job N	t Name: N lumber: 1 Analyst: A	1145	e		
SITE	SPECIFIC IN	IPUT DATA				NOISE N			5	
Highway Data				Site Co	nditions	(Hard =	10, Soft	= 15)		
Average Daily	Traffic (Adt): 18	37,000 vehicle	s			A	utos:	15		
	r Percentage:	10%				ucks (2 A		15		
	Hour Volume:	- ,	s	н	eavy Tru	cks (3+ A	xles):	15		
	ehicle Speed:	70 mph		Vehicle	Mix					
Near/Far La	ane Distance:	160 feet		Ve	hicleTyp	э і	Day E	vening	Night	Daily
Site Data						Autos:	77.5%	12.9%	9.6%	89.00%
Ba	rrier Height:	0.0 feet		٨	1edium T	rucks:	84.8%	4.9%	10.3%	6.59%
Barrier Type (0-V	Vall, 1-Berm):	0.0			Heavy T	rucks:	86.5%	2.7%	10.8%	4.41%
Centerline D	ist. to Barrier:	175.0 feet		Noise S	ource E	levations	(in fee	t)		
Centerline Dist.		175.0 feet			Auto			,		
Barrier Distance		0.0 feet		Media	Im Truck					
Observer Height	, ,	5.0 feet		Hea	vy Truck	s: 858.	006 G	rade Adji	ustment	0.0
-	ad Elevation:	850.0 feet		Long E	·	t Distanc	o (in fo	-41		
	ad Elevation: rier Elevation:	850.0 feet 850.0 feet		Lane Lu	Auto			<i>st)</i>		
	Road Grade:	0.0%		Modii	Im Truck					
	Noau Grade.	0.070				is: 155.6				
FHWA Noise Mod	lel Calculation	s								
VehicleType	REMEL	Traffic Flow	Distan	ce Finite	e Road	Fresne	el Ba	arrier Atte	en Ber	m Atten
Autos:	76.79	8.46		-7.50	-1.20	-	4.82	0.0	00	0.000
Medium Trucks:	82.53	-2.85		-7.50	-1.20	-	4.89	0.0	00	0.000
Heavy Trucks:	85.83	-4.59		-7.50	-1.20	-	5.05	0.0	00	0.000
Unmitigated Nois	e Levels (with	out Topo and	barrier a	ttenuation)						
VehicleType	Leq Peak Hou	Ir Leq Day	/ Le	q Evening	Leq	Night	L	dn	CI	VEL
Autos:			74.6	72.9	)	66.8		75.4		76.0
										70.3
Medium Trucks:			69.5	63.1		61.6		70.0		
Heavy Trucks:	72	.5	71.1	62.1		61.6 63.3		70.0 71.7		71.8
	72	.5								71.8
Heavy Trucks: Vehicle Noise:	72	.5	71.1 77.1	62. <sup>-</sup> 73.6		63.3		71.7		71.8
Heavy Trucks:	72	.5 .8 po and barrie	71.1 77.1 r attenua	62. <sup>-</sup> 73.6	3	63.3	L	71.7		71.8
Heavy Trucks: Vehicle Noise: Mitigated Noise L	72 78 evels (with To Leq Peak Hou	.5 .8 <b>po and barrie</b> r Leq Day	71.1 77.1 r attenua	62. 73.6 tion)	) Leq	63.3 69.2	L	71.7 77.8	Ci	71.8 78.2
Heavy Trucks: Vehicle Noise: Mitigated Noise L VehicleType Autos: Medium Trucks:	72 78 evels (with To Leg Peak Hou 76 71	.5 .8 <b>po and barrie</b> ir <u>Leq Day</u> .5 .0	71.1 77.1 / Le	62. 73.6 tion) eq Evening 72.9 63.4	Eeq	63.3 69.2 Night 66.8 61.6	L	71.7 77.8 dn 75.4 70.0	CI	71.8 78.2 VEL
Heavy Trucks: Vehicle Noise: Mitigated Noise L VehicleType Autos:	72 78 evels (with To Leq Peak Hou 76 71 71	.5 .8 <b>po and barrie</b> rr Leq Day .5 .0 .5	71.1 77.1 <i>r attenua</i> / <i>Le</i> 74.6	62. 73.6 tion) q Evening 72.9	E Leq	63.3 69.2 <i>Night</i> 66.8	L	71.7 77.8 dn 75.4	CI	71.8 78.2 VEL 76.0

Monday, June 18, 2018

F	HWA-RD-77-1	08 HIGHWAY	NOISE P	REDICTIC	N MODE	L (CALVE	ENO) -	6/2/2013		
Road Nan	io: First Floor \ ne: SR-60 lo: Fast Food B				Job I	t Name: N Number: 1 Analyst: 7	11145			
SITE	SPECIFIC IN	PUT DATA				NOISE N	IODE	L INPUT	S	
Highway Data				Site C	onditions	; (Hard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt): 18	7,000 vehicle	s			/	Autos:	15		
Peak Hour	Percentage:	10%		1	Medium T	rucks (2 A	xles):	15		
Peak H	lour Volume: 1	8,700 vehicle	s		Heavy Tr.	icks (3+ A	xles):	15		
Ve	hicle Speed:	70 mph		Vehic	e Mix					
Near/Far La	ne Distance:	160 feet			ehicleTyp	e	Dav	Evening	Night	Daily
Site Data				-			77.5%	•	•	89.00
Ba	rrier Heiaht:	25.0 feet			Medium	rucks:	84.8%	4.9%	10.3%	6.599
Barrier Type (0-W		1.0			Heavy	Trucks:	86.5%	2.7%	10.8%	4.419
Centerline Di	. ,	150.0 feet		Noiso	Sourco	levations	(in fr	not)		
Centerline Dist.	to Observer:	213.0 feet		NOISE	Auto		.000	el)		
Barrier Distance	to Observer:	63.0 feet		Mor	lium Truci		.297			
Observer Height	(Above Pad):	5.0 feet			avv Truci			Grade Ad	iustment	0.0
P	ad Elevation:	855.0 feet						,	uoumonia	0.0
Ro	ad Elevation:	835.0 feet		Lane		t Distand		feet)		
	ier Elevation:	835.0 feet				os: 192.3				
	Road Grade:	0.0%				ks: 191.9				
				He	avy Truci	ks: 191.0	)19			
FHWA Noise Mod										
VehicleType	REMEL	Traffic Flow	Distan		ite Road	Fresn		Barrier Atte		m Atten
Autos:	76.79	8.46		-8.88	-1.20		0.59	-8.9		-11.95
Medium Trucks:	82.53	-2.85		-8.87	-1.20		0.49	-8.4		-11.45
Heavy Trucks:	85.83	-4.59		-8.83	-1.20		0.28	-7.3	60	-10.36
Unmitigated Nois					<i>'</i>		•			
VehicleType	Leq Peak Hou			eq Evening		Night		Ldn		VEL
Autos:	75.	-	73.3	71		65.4		74.1		74.
Medium Trucks:	69.	-	68.1	61		60.2		68.7		68.
Heavy Trucks:	71.	-	69.8	60		62.0		70.3		70.
Vehicle Noise:	77.	4	75.7	72	.3	67.9		76.4	l.	76
Mitigated Noise L										
VehicleType	Leq Peak Hou			eq Evening		Night		Ldn		VEL
Autos:	63		61.3	59		53.5		62.1		62.
Medium Trucks:	58	-	56.7	50		48.8		57.2		57.
Heavy Trucks:	60.	8	59.4	50	.4	51.6		60.0	)	60.
Vehicle Noise:	66		64.3	60		56.5		65.0		65.

F	HWA-RD-77-	108 HIGHWAY	NOISE	PRE	DICTION	MODE	L (CALV	ENO)	- 6/2/2013		
Road Nan		With Wall	)			Job I	t Name: Number: Analyst:	11145			
SITE	SPECIFIC II	NPUT DATA							L INPUTS	5	
Highway Data					Site Cor	ditions	; (Hard =	10, S	oft = 15)		
Average Daily	Traffic (Adt): 1	187,000 vehicle	s					Autos:	15		
Peak Hour	Percentage:	10%			Me	dium T	rucks (2 A	(xles)	15		
Peak H	our Volume:	18,700 vehicle	s		He	avy Tru	icks (3+ A	(xles)	15		
Ve	hicle Speed:	70 mph			Vehicle	Mix					
Near/Far La	ne Distance:	160 feet				icleTyp	е	Dav	Evening	Night	Daily
Site Data							Autos:	77.5%	•	9.6%	
Ba	rrier Height:	25.0 feet			М	edium 1	Trucks:	84.8%	6 4.9%	10.3%	6.59%
Barrier Type (0-W		1.0				Heavy T	Trucks:	86.5%	6 2.7%	10.8%	4.41%
Centerline Di	. ,	196.0 feet		-	N-/ 0		levation	- // 4			
Centerline Dist.	to Observer:	429.0 feet		-	NUISE 3	Auto		5 (m) 5 000	eel)		
Barrier Distance	to Observer:	233.0 feet			Madiu	Auto m Trucl		.000			
Observer Height	(Above Pad):	5.0 feet				/y Truci		.297	Grade Adj	ustmont	0.0
P	ad Elevation:	830.0 feet			neat	y muci	(8. 033	.000	Graue Auj	usunen.	0.0
Ro	ad Elevation:	825.0 feet			Lane Eq	uivaler	nt Distan	ce (in	feet)		
Barr	ier Elevation:	825.0 feet					os: 414.				
	Road Grade:	0.0%					ks: 413.				
					Heav	/y Trucl	ks: 413.	218			
FHWA Noise Mod	el Calculation	ns									
VehicleType	REMEL	Traffic Flow	Dista	ance	Finite	Road	Fresr	iel	Barrier Atte	en Ben	m Atten
Autos:	76.79	8.46		-13.8	8	-1.20		1.91	-12.1	20	-15.120
Medium Trucks:	82.53	-2.85		-13.8	7	-1.20		1.69	-11.6	80	-14.680
Heavy Trucks:	85.83	-4.59		-13.8	6	-1.20		1.19	-10.6	80	-13.680
Unmitigated Nois											
VehicleType	Leq Peak Ho			Leq E	vening	Leq	Night		Ldn		VEL
Autos:			68.3		66.5		60.4		69.1		69.7
Medium Trucks:	-		63.1		56.7		55.2		63.7		63.9
Heavy Trucks:	2.		64.7		55.7		57.0		65.3		65.4
Vehicle Noise:	7:	2.4	70.7		67.3		62.9	)	71.4		71.8
Mitigated Noise L											
VehicleType	Leq Peak Ho			Leq E	vening	Leq	Night	I	Ldn		VEL
Autos:	-		53.2		51.4		45.3		54.0		54.6
Medium Trucks:			48.4		42.1		40.5		49.0		49.2
Heavy Trucks:		-	51.1		42.0		43.3		51.6		51.8
Vehicle Noise:	5	7.8	56.1		52.3		48.2	2	56.8		57.2

Fł	WA-RD-77-10	B HIGHWAY N	NOISE PRI	EDICTION	MODE	L (CALV	ENO)	- 6/2/2013		
Scenario	: First Floor W	ith Wall			Proiec	t Name:	Northe	ate		
	e: Orange St.					Number:				
Lot No	p: West Comm	ercial Building				Analyst:	A. Wo	lfe		
	SPECIFIC INP	UT DATA						L INPUTS	S	
Highway Data				Site Cor	nditions	; (Hard =	10, S	oft = 15)		
Average Daily 1	Fraffic (Adt): 12	,500 vehicles					Autos:	15		
Peak Hour F	Percentage:	10%		Me	dium Ti	rucks (2 /	Axles):	15		
Peak Ho	our Volume: 1	,250 vehicles		He	avy Tru	icks (3+ /	Axles):	15		
Veh	nicle Speed:	35 mph		Vehicle	Mix					
Near/Far Lan	e Distance:	12 feet			nicleTyp	e	Dav	Evening	Night	Dailv
Site Data						Autos:	77.5%	•	9.6%	97.42
Ban	rier Height:	0.0 feet		М	edium 1	rucks:	84.8%	6 4.9%	10.3%	1.84
Barrier Type (0-Wa	•	0.0			Heavy T	Trucks:	86.5%	5 2.7%	10.8%	0.74
Centerline Dis		85.0 feet		Noise S	ource F	lovation	s (in f	oot)		
Centerline Dist. t	o Observer:	85.0 feet		10/30 0	Auto		0.000			
Barrier Distance t	o Observer:	0.0 feet		Madiu	m Truck		2.297			
Observer Height (A	Above Pad):	5.0 feet			/y Truck		3.006	Grade Adj	iustmon	+ 0.0
Pa	d Elevation:	830.0 feet		пеа	y muci	(8. 030	5.000	Orade Adj	usunen	. 0.0
Roa	d Elevation:	830.0 feet		Lane Eq	uivaler	t Distan	ce (in	feet)		
Barrie	er Elevation:	830.0 feet			Auto	os: 84.	935			
F	Road Grade:	0.0%		Mediu	m Truck	ks: 84.	831			
				Hear	/y Truck	(S: 84.	841			
FHWA Noise Mode	l Calculations									
VehicleType	REMEL	Traffic Flow	Distance	e Finite	Road	Fresr	nel	Barrier Atte	en Be	rm Atter
Autos:	65.11	0.11	-3	.56	-1.20		-4.75	0.0	000	0.00
Medium Trucks:	74.83	-17.13	-3	.55	-1.20		-4.88	0.0	000	0.00
Heavy Trucks:	80.05	-21.08	-3	.55	-1.20		-5.21	0.0	000	0.00
Unmitigated Noise	Levels (without	ut Topo and L	barrier atte	enuation)						
	Leq Peak Hour	Leq Day		Evening		Night		Ldn		NEL
Autos:	60.5	-	6.6	56.8		50.7		59.4		60
Medium Trucks:	53.0		51.4	45.1		43.5		52.0		52
Heavy Trucks:	54.2		52.8	43.8		45.0		53.4		53
Vehicle Noise:	62.0	6	60.2	57.3		52.4	1	60.9	)	61
Mitigated Noise Le	1 1			,						
	Leq Peak Hour	Leq Day		Evening	,	Night		Ldn		NEL
Autos:	60.5		8.6	56.8		50.7		59.4		60
Medium Trucks:	53.0		51.4	45.1		43.5		52.0		52
Heavy Trucks:	54.2		2.8	43.8		45.0		53.4		53
Vehicle Noise:	62.0	6	60.2	57.3		52.4	ŧ	60.9	,	61.

F	HWA-RD-77-1	08 HIGHWAY	NOISE	PRED	ICTION	MODE	L (CALVE	NO) -	6/2/2013		
Road Nan	io: First Floor ne: Orange St. lo: West Apart					Job N	Name: N lumber: 1 Analyst: P	1145			
SITE	SPECIFIC IN	IPUT DATA				N	IOISE M	IODE	L INPUTS	5	
Highway Data				S	ite Con	ditions	(Hard =	10, So	oft = 15)		
Peak Hour Peak F	Traffic (Adt): Percentage: lour Volume:	10% 1,250 vehicle					A ucks (2 A cks (3+ A		15 15 15		
	hicle Speed:	35 mph		V	ehicle l	<i>lix</i>					
Near/Far La	ne Distance:	12 feet			Vehi	cleType	e i	Day	Evening	Night	Daily
Site Data						÷	Autos:	77.5%	12.9%	9.6%	97.42%
Ba	rrier Height:	0.0 feet				edium T		84.8%		10.3%	1.84%
Barrier Type (0-V	/all, 1-Berm):	0.0			ŀ	łeavy T	rucks:	86.5%	2.7%	10.8%	0.74%
Centerline Di	st. to Barrier:	68.0 feet		Λ	loise Sc	urce E	levations	in fe	et)		
Centerline Dist. Barrier Distance Observer Height P	to Observer:	68.0 feet 0.0 feet 5.0 feet 845.0 feet			Mediur Heav	Auto n Truck y Truck	s: 847.	297	Grade Adji	ustment	0.0
Ro	ad Elevation:	845.0 feet		L	ane Equ	ıivalen	t Distanc	e (in f	'eet)		
	ier Elevation: Road Grade:	845.0 feet 0.0%			Mediur Heav	Auto n Truck y Truck	s: 67.7	89			
FHWA Noise Mod	el Calculation	s									
VehicleType	REMEL	Traffic Flow	Dista	ance	Finite	Road	Fresne	el i	Barrier Atte	en Ber	m Atten
Autos:	65.11	0.11		-2.10		-1.20	-	4.71	0.0	00	0.000
Medium Trucks:	74.83	-17.13		-2.09		-1.20		4.88	0.0		0.000
Heavy Trucks:	80.05	-21.08		-2.09		-1.20	-	5.29	0.0	00	0.000
Unmitigated Nois	e Levels (with	out Topo and	barrier	attenu	uation)						
VehicleType	Leq Peak Hou	ir Leq Day	/ 1	Leq Ev	ening	Leq	Night		Ldn	CI	VEL
Autos:	61	.9	60.0		58.3		52.2		60.8		61.4
Medium Trucks:											
	54		52.9		46.5		45.0		53.5		53.7
Heavy Trucks:	54 55	.7	54.3		46.5 45.2		45.0 46.5		54.8		54.9
	54 55	.7			46.5		45.0				
Heavy Trucks: Vehicle Noise:	54 55 63	.7 .4	54.3 61.7	uation)	46.5 45.2 58.7		45.0 46.5		54.8		54.9
Heavy Trucks:	54 55 63	.7 .4 po and barrie	54.3 61.7 r attenu	uation)	46.5 45.2 58.7	Leq	45.0 46.5		54.8		54.9
Heavy Trucks: Vehicle Noise: Mitigated Noise L	54 55 63 evels (with To	.7 .4 <b>po and barrie</b> r Leq Day	54.3 61.7 r attenu		46.5 45.2 58.7	Leq	45.0 46.5 53.8		54.8 62.4	Ci	54.9 62.9 VEL
Heavy Trucks: Vehicle Noise: Mitigated Noise L VehicleType	54 55 63 evels (with To Leg Peak Hou	.7 .4 po and barrie r Leq Day .9	54.3 61.7 r attenu		46.5 45.2 58.7 ening	Leq	45.0 46.5 53.8 Night		54.8 62.4 Ldn	Ci	54.9 62.9
Heavy Trucks: Vehicle Noise: Mitigated Noise L VehicleType Autos:	54 55 63 evels (with To Leq Peak Hou 61	.7 .4 <b>po and barrie</b> Ir Leq Day .9 .4	54.3 61.7 <i>r attenu</i> / <i>l</i> 60.0		46.5 45.2 58.7 ening 58.3	Leq	45.0 46.5 53.8 Night 52.2		54.8 62.4 Ldn 60.8	Ci	54.9 62.9 VEL 61.4

	HWA-RD-77-1	08 HIGHWAY	NOISE P	PRED		NODE	L (CALVE	NO)	6/2/2013		
Road Nam	io: Second Flo ne: SR-91/I-215 Io: East Apartn	5				Job N	t Name: N lumber: 1 Analyst: P	1145			
SITE	SPECIFIC IN	PUT DATA				ľ	NOISE N	IODE	L INPUT	5	
Highway Data				S	Site Cona	litions	(Hard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt): 18	7,000 vehicle	s				A	Autos:	15		
Peak Hour	Percentage:	10%			Med	lium Tr	ucks (2 A	xles):	15		
Peak H	lour Volume: 1	8,700 vehicle	s		Hea	vy Tru	cks (3+ A	xles):	15		
Ve	hicle Speed:	70 mph		1	Vehicle M	liv					
Near/Far La	ne Distance:	140 feet		-		leType	a	Day	Evening	Night	Daily
Site Data				-	10/110			77.5%	•	9.6%	
					Me			84.8%		10.3%	4.58%
Barrier Type (0-W	rrier Height:	0.0 feet 0.0						86.5%		10.8%	6.329
Centerline Dis	. ,	212.0 feet			Noise Sol						
Centerline Dist.	to Observer:	212.0 feet		'	voise Sol	Auto			el)		
Barrier Distance	to Observer:	0.0 feet			Medium						
Observer Height (	(Above Pad):	14.0 feet			Heavy				Grade Ad	iustmont	0.0
Pa	ad Elevation:	855.0 feet			neavy	TTUCK	8. 074	200	Graue Auj	usunem.	0.0
Roi	ad Elevation:	866.2 feet		L	Lane Equ	ivalen	t Distanc	e (in :	feet)		
Barri	ier Elevation:	855.0 feet				Auto	s: 200.1	30			
	Road Grade:	0.0%			Medium	Truck	s: 200.1	11			
					Heavy	/ Truck	s: 200.1	78			
FHWA Noise Mod		-									
1			Distan								
VehicleType	REMEL	Traffic Flow			Finite F		Fresn		Barrier Att		
Autos:	76.79	8.46		-9.14	1	-1.20	-1	3.97	0.0	000	0.00
Autos: Medium Trucks:	76.79 82.53	8.46 -4.43		-9.14 -9.14	1	-1.20 -1.20	-1 -1	3.97 4.12	0.0	000	0.00
Autos:	76.79	8.46		-9.14	1	-1.20	-1 -1	3.97	0.0	000	0.00
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise	76.79 82.53 85.83 e Levels (witho	8.46 -4.43 -3.03	barrier a	-9.14 -9.14 -9.14 atten	1 1 1 <i>uation)</i>	-1.20 -1.20 -1.20	-1 -1 -1	3.97 4.12	0.0 0.0 0.0	100 100 100	0.00 0.00 0.00
Autos: Medium Trucks: Heavy Trucks: <b>Unmitigated Nois</b> e VehicleType	76.79 82.53 85.83 <b>e Levels (withe</b> Leq Peak Hou	8.46 -4.43 -3.03 <b>Dut Topo and</b> r Leq Day	barrier a	-9.14 -9.14 -9.14 atten	1 1 1 <i>uation)</i> /ening	-1.20 -1.20 -1.20	-1 -1 -1 Night	3.97 4.12	0.0 0.0 0.0	000 000 000 <i>CI</i>	0.00 0.00 0.00
Autos: Medium Trucks: Heavy Trucks: <b>Unmitigated Nois</b> e VehicleType Autos:	76.79 82.53 85.83 e Levels (witho Leq Peak Hou 74.	8.46 -4.43 -3.03 <b>Dut Topo and</b> r Leq Day 9	barrier a	-9.14 -9.14 -9.14 atten	1 1 1 <i>uation)</i> /ening 71.2	-1.20 -1.20 -1.20	-1 -1 -1 <u>Night</u> 65.2	3.97 4.12	0.0 0.0 0.0 <i>Ldn</i> 73.8	000 000 000 <i>CI</i>	74.
Autos: Medium Trucks: Heavy Trucks: Unmitigated Nois VehicleType Autos: Medium Trucks:	76.79 82.53 85.83 e Levels (without Leq Peak Hout 74. 67.	8.46 -4.43 -3.03 <b>Dut Topo and</b> r Leq Day 9 8	<i>barrier a</i> / <i>Le</i> 73.0 66.3	-9.14 -9.14 -9.14 atten	4 4 4 <i>vening</i> 71.2 59.9	-1.20 -1.20 -1.20	-1 -1 -1 Night 65.2 58.4	3.97 4.12 4.48	0.0 0.0 0.0 <i>Ldn</i> 73.8 66.8	000 000 000 <i>C1</i> 3	0.00 0.00 0.00 <u>VEL</u> 74. 67.
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noiss VehicleType Autos: Medium Trucks: Heavy Trucks:	76.79 82.53 85.83 <b>e Levels (with</b> Leq Peak Hou 74. 67. 72.	8.46 -4.43 -3.03 <b>but Topo and</b> r Leq Day 9 8 5	barrier a / Le 73.0 66.3 71.0	-9.14 -9.14 -9.14 atten	4 4 4 <i>vening</i> 71.2 59.9 62.0	-1.20 -1.20 -1.20	-1 -1 -1 Night 65.2 58.4 63.2	3.97 4.12 4.48	0.0 0.0 0.0 <i>Ldn</i> 73.8 66.8 71.6	000 000 000 C/ 3	0.00 0.00 0.00 <u>VEL</u> 74. 67. 71.
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks: Heavy Trucks: Vehicle Noise:	76.79 82.53 85.83 <b>e Levels (witho</b> Leq Peak Hou 74. 67. 72. 77.	8.46 -4.43 -3.03 <b>Dut Topo and</b> r Leq Day 9 8 5 5 4	barrier a 73.0 66.3 71.0 75.7	-9.14 -9.14 -9.14 atteni eq Ev	4 4 4 7 7 7 1.2 5 9.9 6 2.0 7 2.0	-1.20 -1.20 -1.20	-1 -1 -1 Night 65.2 58.4	3.97 4.12 4.48	0.0 0.0 0.0 <i>Ldn</i> 73.8 66.8	000 000 000 C/ 3	0.00 0.00 0.00 <u>VEL</u> 74. 67. 71.
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks: Heavy Trucks: Vehicle Noise Mitigated Noise Lo	76.79 82.53 85.83 e Levels (with Leg Peak Hou 74. 67. 72. 77. evels (with Toj	8.46 -4.43 -3.03 <b>but Topo and</b> r Leq Day 9 8 5 5 4 4 <b>boo and barrie</b>	barrier a 73.0 66.3 71.0 75.7 r attenua	-9.14 -9.14 -9.14 atteni eq Ev	4 4 4 <i>vening</i> 71.2 59.9 62.0 72.0	-1.20 -1.20 -1.20 <i>Leq</i>	-1 -1 Night 65.2 58.4 63.2 67.9	3.97 4.12 4.48	0.0 0.0 0.0 73.8 66.8 71.6 76.4	000 000 000 33 33	0.00 0.00 0.00 <i>VEL</i> 74. 67. 71. 76.
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks: Heavy Trucks: Vehicle Noise Lu VehicleType	76.79 82.53 85.83 e Levels (witho Leq Peak Hou 74. 67. 72. 77. evels (with To Leq Peak Hou	8.46 -4.43 -3.03 <b>but Topo and</b> r Leq Day 9 8 5 4 <b>bo and barrie</b> r Leq Day	barrier a / Le 73.0 66.3 71.0 75.7 r attenua / Le	-9.14 -9.14 -9.14 atteni eq Ev	4 4 4 71.2 59.9 62.0 72.0 ) vening	-1.20 -1.20 -1.20 <i>Leq</i>	-1 -1 -1 -1 65.2 58.4 63.2 67.9 Night	3.97 4.12 4.48	0.0 0.0 0.0 73.8 66.8 71.6 76.4 <i>Ldn</i>	000 000 000 3 3 3 5 4 4 <i>CI</i>	0.00 0.00 0.00 <u>VEL</u> 74. 67. 71. 76. VEL
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise Vehicle Type Autos: Medium Trucks: Heavy Trucks: Vehicle Noise Witigated Noise Lu Vehicle Type Autos: Autos:	76.79 82.53 85.83 e Levels (witho Leq Peak Hou 74. 67. 72. 77. evels (with Top Leq Peak Hou 74.	8.46 -4.43 -3.03 <b>but Topo and</b> r Leq Day 9 8 5 5 4 <b>bo and barrie</b> 7 Leq Day 9	barrier a           73.0           66.3           71.0           75.7           r attenua           73.0           73.3	-9.14 -9.14 -9.14 atteni eq Ev	4 4 4 71.2 59.9 62.0 72.0 ) rening 71.2	-1.20 -1.20 -1.20 <i>Leq</i>	-1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -	3.97 4.12 4.48	0.0 0.0 0.0 73.8 66.8 71.6 76.4 76.4 73.8 73.8	000 000 000 3 3 3 5 4 4 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	0.00 0.00 0.00 <u>VEL</u> 74. 67. 71. 76. <u>VEL</u> 74.
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks: Heavy Trucks: Vehicle Noise Lu VehicleType	76.79 82.53 85.83 <b>e Levels (witho</b> Leq Peak Hou 74. 67. 72. 77. <b>evels (with To</b> Leq Peak Hou	8.46 -4.43 -3.03 <b>but Topo and</b> r Leq Day 9 8 5 4 6 <b>bo and barrie</b> r Leq Day 9 8 8 5 8 8 8	barrier a / Le 73.0 66.3 71.0 75.7 r attenua / Le	-9.14 -9.14 -9.14 atteni eq Ev	4 4 4 71.2 59.9 62.0 72.0 ) vening	-1.20 -1.20 -1.20 <i>Leq</i>	-1 -1 -1 -1 65.2 58.4 63.2 67.9 Night	3.97 4.12 4.48	0.0 0.0 0.0 73.8 66.8 71.6 76.4 <i>Ldn</i>	000 000 000 3 3 3 4 4 <i>CI</i> 3 3	0.00 0.00 0.00 VEL 74. 67. 71. 76.

F	HWA-RD-77-1	08 HIGHWAY I	NOISE PE	REDICTION	MODE	L (CALV	ENO) -	6/2/2013		
Road Nam	rio: Second Flo ne: SR-60 lo: East Apartr				Job I	t Name: lumber: Analyst:	11145			
SITE	SPECIFIC IN	IPUT DATA						L INPUTS		
Highway Data				Site Cor	nditions	(Hard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt): 1	87,000 vehicles					Autos:	15		
Peak Hour	Percentage:	10%		Me	edium Ti	rucks (2 A	Axles):	15		
Peak H	our Volume:	18,700 vehicles		He	eavy Tru	icks (3+ A	Axles):	15		
Ve	hicle Speed:	70 mph		Vehicle	Mix					
Near/Far La	ne Distance:	160 feet			nicleTvp	e	Dav	Evening I	Vight	Dailv
Site Data						Autos:	77.5%	•	•	89.00%
Pa	rrier Height:	0.0 feet		M	ledium 1	rucks:	84.8%	4.9%	10.3%	6.59%
Barrier Type (0-W		0.0			Heavy 1	rucks:	86.5%	2.7%	10.8%	4.419
Centerline Di	. ,	893.0 feet								
Centerline Dist.		893.0 feet		Noise S		levation		et)		
Barrier Distance	to Observer:	0.0 feet			Auto m Trucl		0.000			
Observer Height	(Above Pad):	14.0 feet					.297	Out de Adim		
	ad Elevation:	855.0 feet		Hea	vy Trucl	(S: 878	.006	Grade Adjus	stment: (	0.0
Ro	ad Elevation:	870.0 feet		Lane Eq	uivaler	t Distan	ce (in i	eet)		
Barr	ier Elevation:	855.0 feet			Auto	s: 903.	536			
	Road Grade:	0.0%		Mediu	m Truck	s: 903.	578			
				Hea	vy Trucl	ks: 903.	707			
FHWA Noise Mod	el Calculation	s								
VehicleType	REMEL	Traffic Flow	Distanc		Road	Fresr		Barrier Atter		Atten
Autos:	76.79	8.46		8.96	-1.20		13.82	-17.55		-20.55
Medium Trucks:	82.53	-2.85		8.96	-1.20		13.86	-17.56	-	-20.56
Heavy Trucks:	85.83	-4.59	-14	8.96	-1.20		13.94	-17.57	3.	-20.57
Unmitigated Nois	e Levels (with	out Topo and I	barrier at	tenuation)						
VehicleType	Leq Peak Hou			q Evening		Night		Ldn	CNE	_
Autos:	65		33.2	61.4		55.4		64.0		64.0
Medium Trucks:			58.0	51.7		50.1		58.6		58.
Heavy Trucks:	61		59.7	50.6		51.9		60.2		60.3
Vehicle Noise:	67	.3 6	65.6	62.2		57.8	5	66.3		66.7
Mitigated Noise L										
VehicleType	Leq Peak Hou	1 1		q Evening		Night		Ldn	CNE	
Autos:	47		15.6	43.9		37.8		46.4		47.0
Medium Trucks:	42		10.5	34.1		32.6		41.0		41.3
Heavy Trucks:	43		2.1	33.0		34.3		42.6		42.8
Vehicle Noise:	49	.8 4	18.0	44.6		40.2	•	48.8		49.2

F	HWA-RD-77-10	BHIGHWAT	NUISE PI	REDICTION	MODE		ENU) ·	- 6/2/2013			
Scenar	io: Second Floo	or With Wall			Projec	t Name: N	Northg	ate			
	ne: SR-91/I-215					lumber: 1					
Lot N	lo: East Hotel B	uilding				Analyst: A	A. Wol	fe			
	SPECIFIC INI	PUT DATA						L INPUTS	i		
Highway Data				Site Conditions (Hard = 10, Soft = 15)							
Average Daily	Traffic (Adt): 18	7,000 vehicle	s			-	Autos:	15			
Peak Hour	Percentage:	10%		Me	dium Ti	ucks (2 A	xles):	15			
Peak H	lour Volume: 1	8,700 vehicle	s	He	avy Tru	cks (3+ A	xles):	15			
Ve	hicle Speed:	70 mph		Vehicle	Mix						
Near/Far La	ne Distance:	140 feet			nicleTyp	0	Day	Evening	Night Dail		
Site Data				Ver			77.5%	•	9.6% 89.10		
					edium T		84.8%		10.3% 4.58		
	rrier Height:	0.0 feet			Heavy T		86.5%		10.8% 6.32		
Barrier Type (0-W		0.0			neavy i	ruchs.	00.07	2.170	10.070 0.02		
Centerline Di		825.0 feet		Noise S	ource E	levations	s (in fe	eet)			
Centerline Dist.		825.0 feet			Auto	s: 865	.300				
Barrier Distance		0.0 feet		Mediu	m Truck	s: 867	.597				
Observer Height		14.0 feet		Hea	/y Truck	s: 873	.306	Grade Adj	ustment: 0.0		
	ad Elevation:	850.0 feet		Long Ea	vivalar	t Distand	o (in	fa a 4 )			
	ad Elevation:	865.3 feet		Lane Eq		s: 836.1	<u> </u>	ieel)			
	ier Elevation: Road Grade:	850.0 feet 0.0%		Madia		s: 836.2					
	Road Grade:	0.0%				is: 030.2 is: 836.3					
				i ica	ly much	3. 030.0	500				
FHWA Noise Mod	el Calculations										
VehicleType	REMEL	Traffic Flow	Distanc	e Finite	Road	Fresn	el	Barrier Atte	en Berm Atte		
Autos:	76.79	8.46	-1	8.45	-1.20	î	13.84	-17.5	61 -20.5		
Medium Trucks:	82.53	-4.43	-1	8.45	-1.20	1	13.87	-17.5	64 -20.5		
Heavy Trucks:	85.83	-3.03	-1	8.45	-1.20	1	13.97	-17.5	76 -20.5		
Unmitigated Nois	e Levels (witho	ut Topo and	barrier at	tenuation)							
VehicleType	Leq Peak Hour	Leq Day	/ Leo	g Evening	Leq	Night		Ldn	CNEL		
Autos:	65.	6	63.7	61.9		55.9		64.5	6		
Medium Trucks:	58.	5	56.9	50.6		49.0		57.5	5		
Heavy Trucks:	63.	1	61.7	52.7		53.9		62.3	6		
			66.4	62.7		58.5		67.1	6		
Vehicle Noise:	68.	1									
Vehicle Noise:			r attenuat	ion)							
		o and barrie		<b>ion)</b> q Evening	Leq	Night		Ldn	CNEL		
Vehicle Noise: Mitigated Noise L	evels (with Top	Leq Day		,	Leq	Night 38.3		Ldn 46.9	CNEL 4		
Vehicle Noise: Mitigated Noise L VehicleType	evels (with Top Leq Peak Hour	o and barrie Leq Day	/ Leo	q Evening					4		
Vehicle Noise: Mitigated Noise L VehicleType Autos:	evels (with Top Leq Peak Hour 48.1	oo and barrie Leq Day	/ Leo 46.1	g Evening 44.4		38.3		46.9	4		

NA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

F	HWA-RD-77-10	08 HIGHWAY	NOISE	PRED	ICTION	MODE	L (CALVE	ENO) -	6/2/2013		
Road Nam	io: Second Flo ie: SR-60 lo: East Hotel E					Job I	t Name: N lumber: 1 Analyst: A	1145			
SITE	SPECIFIC IN	PUT DATA								S	
Highway Data				S	ite Cor	ditions	(Hard =	10, So	oft = 15)		
Average Daily	Traffic (Adt): 18	7,000 vehicle	s				A	Autos:	15		
Peak Hour	Percentage:	10%			Me	dium Ti	ucks (2 A	xles):	15		
Peak H	lour Volume: 1	8,700 vehicle	s		He	avy Tru	cks (3+ A	xles):	15		
Ve	hicle Speed:	70 mph		v	ehicle	Mix					
Near/Far La	ne Distance:	160 feet			Veh	icleTyp	e	Day	Evening	Night	Daily
Site Data					-			77.5%		9.6%	
Ba	rrier Height:	0.0 feet			М	edium 1	rucks:	84.8%	4.9%	10.3%	6.59%
Barrier Type (0-W	•	0.0				Heavy T	rucks:	86.5%	2.7%	10.8%	4.41%
Centerline Di		446.0 feet			loise S	ource F	levations	: (in fe	et)		
Centerline Dist.	to Observer:	446.0 feet			0.00 0	Auto			.00		
Barrier Distance	to Observer:	0.0 feet			Madiu	m Truck					
Observer Height (	(Above Pad):	14.0 feet				/v Truck			Grade Adj	ustment	0.0
	ad Elevation:	850.0 feet		_							
	ad Elevation:	855.0 feet		L	ane Eq		t Distanc		eet)		
	ier Elevation:	850.0 feet					s: 438.8				
	Road Grade:	0.0%					ແລ: 438.8 ແລ: 438.7				
					nea	y mucr	.3. 430.1	00			
FHWA Noise Mod											
VehicleType	REMEL	Traffic Flow		ance		Road	Fresn		Barrier Atte		m Atten
Autos:	76.79	8.46		-14.25		-1.20		3.64	0.0		0.000
Medium Trucks:	82.53	-2.85		-14.25		-1.20		3.71	0.0		0.000
Heavy Trucks:	85.83	-4.59		-14.25		-1.20	-1	3.88	0.0	00	0.000
Unmitigated Noise			-								
VehicleType	Leq Peak Hou			Leq Ev		Leq	Night		Ldn		VEL
Autos:	69. 64	-	67.9 62.7		66.1 56.4		60.1 54.8		68.7 63.3		69.3 63.5
Medium Trucks:	64. 65.	-	62.7 64.4		56.4		54.8 56.6		63.3 64.9		63.5 65.1
Heavy Trucks: Vehicle Noise:	65. 72.		70.3		55.3 66.9		50.0 62.5		71.0		71.4
							62.5		71.0	,	71.4
Mitigated Noise L						10-	Night		l de	-	
VehicleType Autos:	Leq Peak Hou 69		67.9	Leq Ev	ening 66.1	Leq	Night 60.1		Ldn 68.7	-	VEL 69.3
Autos: Medium Trucks:	69. 64.	-	62.7		56.4		54.8		63.3		63.5
Heavy Trucks:	65.		64.4		55.3		56.6		64.9		65.1
Vehicle Noise:	72.	-	70.3		66.9		62.5		71.0		71.4
venicle Noise.	12.	U	10.3		00.9		02.5		71.0	,	/ 1.4

Monday, June 18, 2018

Average Daily Traffic (Adi): 187,000 vehicles     Autos:     15       Peak Hour Percentage:     10%     Medium Trucks (2 Axles):     15       Peak Hour Volume:     18,700 vehicles     Heavy Trucks (3+ Axles):     15       Vehicle Speed:     70 mph     Vehicle Mix     Vehicle Trucks (2+ Axles):     15       Near/Far Lane Distance:     140 feet     Vehicle Type     Day     Evening     Night     Daily       Site Data     Autos:     77.5%     12.9%     9.6%     89.10%       Medium Trucks:     84.8%     4.9%     10.3%     4.58%	F	HWA-RD-77-10	8 HIGHWAY	NOISE F	PRED	DICTION	MODE	L (CALVE	ENO)	- 6/2/2013		
Highway Data         Site Conditions (Hard = 10, Soft = 15)           Average Daily Traffic (Ad): 187,000 vehicles Peak Hour Percentage: 10%         Autos: 15           Peak Hour Percentage: 10%         Medium Trucks (2 Axles): 15           Peak Hour Volume: 18,700 vehicles Vehicle Speed: 70 mph         Medium Trucks (2 Axles): 15           Near/Far Lane Distance: 140 feet         Vehicle Mix           Barrier Height: 0.0 feet         0.0 feet           Barrier Type (0-Wall, 1-Berm): 0.0         Medium Trucks: 84.8% 4.9% 10.3% 4.58%           Centerline Dist. to Observer: 1,159.0 feet         Medium Trucks: 86.5% 2.7% 10.8% 6.32%           Centerline Dist. to Observer: 1,159.0 feet         Noise Source Elevations (in feet)           Road Elevation: 860.0 feet         Road Grade: 0.0%           Road Grade: 0.0%         Distance (in feet)           Vehicle Type         Reflex           Vehicle Type         Reflex           Vehicle Type         Reflex           Road Grade: 0.0%         Distance (in feet)           Autos: 76.79         8.46         -20.57           Vehicle Type         Reflex         Traffic Flow           Vehicle Type         Leap Elevations         0.000           Medium Trucks: 85.3         -3.03         -20.57         -1.20         -3.91         0.000	Road Nam	e: SR-91/I-215					Job I	Number: 1	11145			
Average Daily Traffic (Adt): 187,000 vehicles Peak Hour Potenetage:         Autos:         15           Peak Hour Volume:         18,700 vehicles Vehicle Speet         70 mph           Peak Hour Volume:         18,700 vehicles         Heavy Trucks (3+ Axles):         15           Vehicle Speet         70 mph         Heavy Trucks (3+ Axles):         15           Vehicle Speet         70 mph         Heavy Trucks (3+ Axles):         15           Barrier Height:         0.0 feet         Notice State         Notice State         96% 69.10%           Barrier Type (0-Wall, 1-Berm):         0.0         Notes         Notes Source Elevations (in feet)         Autos:         86.0% 4.59%           Centerline Dist. to Doserver:         1.0 feet         Autos:         860.00 feet         Autos:         860.00 feet         Autos:         Wehice Trucks:         862.297           Pad Elevation:         860.0 feet         Autos:         Wehice Trucks:         868.006         Grade Adjustment:         0.0           Pad Elevation:         860.0 feet         Autos:         Heavy Trucks:         868.000         0.000           Road Grade:         0.0%         Distance         Finite Road         Fresnel         Barrier Atten         Bern Atten           Autos:         76.79         8.46	SITE	SPECIFIC IN	PUT DATA								5	
Peak Hour Percentage:         10%         Medium Trucks (2 Axles):         15           Peak Hour Volume:         100 vehicles         Heavy Trucks (3+ Axles):         15           Vehicle Speed:         70 mph         Vehicle Type         Day         Evening         Night         Daly           Site Data         Autos:         77.5%         12.9%         9.6%         89.10%           Barrier Lane Distance:         140 feet         Vehicle Type         Day         Evening         Night         Daly           Barrier Height:         0.0 feet         Autos:         77.5%         12.9%         9.6%         89.10%           Barrier Type (0-Wall, 1-Berm):         0.0         Centerline Dist. to Barrier:         1,159.0 feet         Nolse Source Elevation:         860.000           Barrier Elevation:         860.0 feet         Heavy Trucks:         868.006         Grade Adjustment:         0.0           Road Grade:         0.0%         Distance         Finite Road         Fresnel         Barrier Atten         Berm Atten           Autos:         76.79         8.46         -20.57         -1.20         -3.91         0.000         0.000           Medium Trucks:         82.5         -1.20         -3.91         0.000         0.000 </th <th>Highway Data</th> <th></th> <th></th> <th></th> <th>:</th> <th>Site Con</th> <th>ditions</th> <th>; (Hard =</th> <th>10, So</th> <th>oft = 15)</th> <th></th> <th></th>	Highway Data				:	Site Con	ditions	; (Hard =	10, So	oft = 15)		
Peak Hour Volume:         18,700         vehicles           Vehicle Speed:         70         mph           Near/Far Lane Distance:         140         feet           Ste Data         0.0         feet           Barrier Height:         0.0 feet         Medium Trucks:         84.8%         4.9%         10.3%         4.58%           Barrier Height:         0.0 feet         Medium Trucks:         84.8%         4.9%         10.3%         4.58%           Centerline Dist. to Observer:         1,159.0 feet         Mole Elevation:         860.00         6.32%           Observer Height (Above Pad):         14.0 feet         Mole Elevation:         860.00 feet         Autos:         76.79         8.46         -20.57         -1.20         -3.91         0.000         0.000           Medium Trucks:         85.3         -3.03         -20.57         -1.20         -3.91         0.000         0.000           Medium Trucks:         85.3         -3.03         -20.57         -1.20         -3.91         0.000         0.000           Medium Trucks:         85.3         -3.03         -20.57         -1.20         -3.91         0.000         0.000           Medium Trucks:         85.3         -3.91         0.000<	Average Daily	Traffic (Adt): 18	7,000 vehicle:	s				A	Autos:	15		
Vehicle Speed:         70 mph Near/Far Lane Distance:         70 mph 140 feet         Vehicle Type         Day         Evening         Night         Daily           Site Data         Autos:         77.5%         12.9%         9.6%         89.10%           Barrier Height:         0.0         Netter Height:         0.0         Medium Trucks:         84.5%         4.9%         10.8%         6.32%           Barrier Type (0-Wall, 1-Berm):         0.0         Notes         Notes         50.27%         10.8%         6.32%           Centerline Dist. to Deserver:         1.0 feet         Medium Trucks:         862.297         Notes         Notes         S0.00         Feet         Autos:         860.00         Feet         Autos:         868.006         Grade Adjustment:         0.0           Pad Elevation:         860.0 feet         Autos:         Wethicle Type         Read Grade:         0.0%         Medium Trucks:         868.000         0.000	Peak Hour	Percentage:	10%			Me	dium Ti	rucks (2 A	xles):	15		
Near/Far Lane Distance:         140 feet         VehicleType         Day         Evening         Night         Daily           Site Data         Autos:         77.5%         12.9%         9.6%         89.10%           Barrier Height:         0.0 feet         Autos:         77.5%         12.9%         9.6%         89.10%           Barrier Type (0-Walt, 1-Berm):         0.0 feet         Medium Trucks:         84.8%         4.9%         4.9%         4.5%           Barrier Dist. to Barrier:         1,159.0 feet         Autos:         860.000         6.32%           Deserver Height (Above Pad):         14.0 feet         Autos:         860.006         Grade Elevation:         860.0 feet         Autos:         868.006         Grade Adjustment:         0.0           Barrier Elevation:         860.0 feet         Autos:         Heavy Trucks:         868.006         Grade Adjustment:         0.0           Road Grade:         0.0%         Distance         Finite Road         Fresnel         Barrier Atten         Berm Atten           Medium Trucks:         85.83         -3.03         -20.57         -1.20         -3.91         0.000         0.000           Medium Trucks:         85.83         -3.03         -20.57         -1.20         -3.91 <td>Peak H</td> <td>lour Volume: 1</td> <td>8,700 vehicles</td> <td>s</td> <td></td> <td>He</td> <td>avy Tru</td> <td>icks (3+ A</td> <td>xles):</td> <td>15</td> <td></td> <td></td>	Peak H	lour Volume: 1	8,700 vehicles	s		He	avy Tru	icks (3+ A	xles):	15		
Near/Far Lane Distance:         140 feet         VehicleType         Day         Evening         Night         Daily           Site Data         Autos::         77.5%         12.9%         9.6%         89.1%           Barrier Type (0-Wall, 1-Berm):         0.0         Medium Trucks:         84.8%         4.9%         10.3%         4.58%           Barrier Type (0-Wall, 1-Berm):         0.0         Medium Trucks:         84.65%         2.7%         10.8%         6.32%           Centerline Dist. to Barrier:         1,159.0 feet         Autos::         860.000         Medium Trucks:         860.000           Barrier Elevation:         860.0 feet         Autos::         Waitos::         862.297           Observer Height (Above Pad):         14.0 feet         Autos::         Heavy Trucks::         868.006         Grade Adjustment:         0.0           Road Elevation:         860.0 feet         Autos::         Heavy Trucks::         868.006         Grade Adjustment:         0.0           Medium Trucks:         84.8%         -20.57         -1.20         -3.91         0.000         0.000           Medium Trucks:         82.53         -4.43         -20.57         -1.20         -3.91         0.000         0.000           Medium Trucks:	Ve	hicle Speed:	70 mph		5	Vehicle I	Mix					
Site Data         Autos:         77.5%         12.9%         9.6%         89.10%           Barrier Height:         0.0 feet         Medium Trucks:         84.8%         4.9%         10.3%         4.58%           Barrier Wall, 1-Berm):         0.0         Centerline Dist. to Barrier:         1,159.0 feet         Medium Trucks:         86.5%         2.7%         10.8%         6.32%           Centerline Dist. to Barrier:         1,159.0 feet         Noise Source Elevations (in feet)         Autos:         860.000           Barrier Distance to Observer:         0.0 feet         Medium Trucks:         862.297           Pad Elevation:         860.0 feet         Heavy Trucks:         868.006         Grade Adjustment:         0.0           Barrier Elevation:         860.0 feet         Lane Equivalent Distance (in feet)         Autos:         Heavy Trucks:         Hittim####           Heavy Trucks:         85.83         -3.03         -20.57         -1.20         -3.91         0.000         0.000           Medium Trucks:         85.83         -3.03         -20.57         -1.20         -3.91         0.000         0.000           Medium Trucks:         85.83         -3.03         -20.57         -1.20         -3.91         0.000         0.000	Near/Far La	ne Distance:	140 feet					e	Dav	Evenina	Niaht	Daily
Barrier Height:         0.0 feet           Barrier Type (0-Wall, 1-Berm):         0.0           Centerline Dist. to Barrier:         1,159.0 feet           Centerline Dist. to Observer:         1,159.0 feet           Barrier Distance to Observer:         1,050.0 feet           Barrier Distance to Observer:         0.0 feet           Pad Elevation:         860.0 feet           Road Elevation:         860.0 feet           Barrier Elevation:         860.0 feet           Autos:         Traffic Flow         Distance           VehicleType         REMEL         Traffic Flow         Distance           VehicleType         REMEL         Traffic Flow         Distance           VehicleType         Leap Elevation:         85.3         -3.03           VehicleType         Leap Elevation:         53.8         62.4           Medium Trucks:         65.5         61.6         59.8         53.8         62.4           Medium Trucks:         65.9         64.2         60.5         66.4         64.9         <	Site Data									-	•	
Barrier Type (IV-Wall, 1-Bernier):         0.0         Heavy Trucks:         86.5%         2.7%         10.8%         6.32%           Centerline Dist. to Observer:         1,159.0         feet         Noise Source Elevations (in feet)         Noise Source Elevation:         Noite Elevation:			0.0.6			М	edium T					
Dame         Distance         Finite Road         Finite Road         Finite Road         Finite Road         Finite Road         Finite Road         Barrier Atten         Berri Atten         Berri Atten           Barrier Distance         0.0%         Distance         Finite Road         Finite Road         Finite Road         Finite Road         Finite Road         Canter Atten         Berrier At									86.5%	2.7%		
Centerline Dist. to Observer:         0.150. feet           Barrier Distance to Observer:         0.0 feet           Diserver Height (Above Pad):         14.0 feet           Pad Elevation:         850.0 feet           Road Elevation:         850.0 feet           Barrier Elevation:         860.0 feet           Barrier Elevation:         860.0 feet           Barrier Elevation:         860.0 feet           Barrier Elevation:         860.0 feet           Road Grade:         0.0%           FHWA Noise Model Calcutations         Ustance           VehicleType         REMEL           Traffic Flow         Distance           VehicleType         REMEL           Medium Trucks:         82.5 3           -4.43         -20.57           -1.20         -3.91           Medium Trucks:         82.5 3           -4.43         -20.57           -1.20         -3.91           Medium Trucks:         82.5 3           -61.6         59.8           Medium Trucks:         63.5           61.6         59.8           65.9         64.2           Medium Trucks:         65.9           65.9         64.2	<i>,</i> , , ,	. ,			-				in f	aat)		
Barrier Distance to Observer:         0.0 feet         Medium Trucks:         862.297           Observer Height (Above Pad):         14.0 feet         Heavy Trucks:         868.006         Grade Adjustment:         0.0           Pad Elevation:         850.0 feet         Lane Equivalent Distance (in feet)         Heavy Trucks:         868.006         Grade Adjustment:         0.0           Barrier Elevation:         860.0 feet         Lane Equivalent Distance (in feet)         Lane Equivalent Distance (in feet)           Wehicle Type         RedEL         0.0%         Finite Road         Fresnel         Barrier Atten         Berm Atten           Autos:         76.79         8.46         -20.57         -1.20         -3.91         0.000         0.000           Medium Trucks:         85.3         -3.03         -20.57         -1.20         -3.91         0.000         0.000           Umitigated Noise Levels (without Topo and barrier attenuation)         Vehicle Type         Leq Reak Hour         Leq Day         Leq Revening         Leq Night         Ldn         CNEL           Medium Trucks:         65.3         61.6         59.8         53.8         62.4         63.0           Medium Trucks:         65.3         61.6         59.8         53.8         62.4         63.0 <td>Centerline Dist.</td> <td>to Observer: 1</td> <td>,159.0 feet</td> <td></td> <td>Ľ</td> <td>10/30 00</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Centerline Dist.	to Observer: 1	,159.0 feet		Ľ	10/30 00						
Observer Height (Above Pad):         14.0 feet         Heavy Trucks:         868.006         Grade Adjustment:         0.0           Pad Elevation:         860.0 feet         Lane Equivalent Distance (in feet)         Lane Equivalent Distance (in feet)           Barrier Elevation:         860.0 feet         Autos:         Heavy Trucks:         Road Grade:         0.0%           Vehicle Type         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten           Autos:         76.79         8.46         -20.57         -1.20         -3.91         0.000         0.000           Medium Trucks:         85.83         -3.03         -20.57         -1.20         -3.91         0.000         0.000           Heavy Trucks:         85.83         -3.03         -20.57         -1.20         -3.91         0.000         0.000           Heavy Trucks:         85.83         -3.03         -20.57         -1.20         -3.93         0.000         0.000           Untitigated Noise Levels (without Topo and barrier attenuation)         Leq Rolphi         Ldn         CNEL           Medium Trucks:         56.3         54.8         48.5         46.9         55.4         56.5           Heavy Trucks:         61.0 <td>Barrier Distance</td> <td>to Observer:</td> <td>0.0 feet</td> <td></td> <td></td> <td>Modiu</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Barrier Distance	to Observer:	0.0 feet			Modiu						
Pad Elevation:         860.0 feet         Lane Equivalent Distance (in feet)           Barrier Elevation:         860.0 feet         Autos:         Within Trucks:         Within W	Observer Height (	Above Pad):	14.0 feet							Grade Ad	ustment	0.0
Barrier Elevation:         860.0         feet           Road Grade:         0.0%         Autos:         ####################################	Pa	ad Elevation:	850.0 feet							,	uoumonia	0.0
Read Grade:         0.0%         Medium Trucks:         ####################################	Ro	ad Elevation:	860.0 feet		1	Lane Eq				feet)		
Heavy Trucks: ####################################	Barn	ier Elevation:										
Prival Noise Model Calculations           Vehicle Type         ReMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Bern Atten           Autos:         76.79         8.46         -20.57         -1.20         -3.91         0.000         0.000           Medium Trucks:         82.53         -4.43         -20.57         -1.20         -3.91         0.000         0.000           Heavy Trucks:         85.83         -3.03         -20.57         -1.20         -3.91         0.000         0.000           Umitigated Noise Levels (without Topo and barrier attenuation)         Vehicle Type         Leq Peak Hour         Leq Qay         Leq Evening         Leq Night         Ldn         CNEL           Medium Trucks:         56.3         54.8         48.5         46.9         55.4         56.5           Heavy Trucks:         61.0         59.6         50.6         51.8         60.2         60.3           Vehicle Noise:         65.9         64.2         60.6         56.4         64.9         65.5           Mitigated Noise Levels (with Topo and barrier attenuation)         Vehicle Noise:         65.9         61.6         59.8         53.8         62.4         63.0		Road Grade:	0.0%									
VehicleType         REMEL         Traffic Flow         Distance         Finite Road         Fresnel         Barrier Atten         Berm Atten           Autos:         76.79         8.46         -20.57         -1.20         -3.91         0.000         0.000           Medium Trucks:         82.53         4.43         -20.57         -1.20         -3.91         0.000         0.000           Unitigated Noise Levels (without Topo and barrier attenuation)         -3.93         0.000         0.000           Umitigated Noise Levels (without Topo and barrier attenuation)         Leq Right         Ldn         CNEL           Autos:         63.5         61.6         59.8         53.8         62.4         63.3           Medium Trucks:         56.3         54.8         48.5         46.9         55.4         55.6           Heavy Trucks:         61.0         59.6         50.6         51.8         60.2         60.3           Vehicle Noise:         65.9         64.2         60.6         56.4         64.9         65.4           Witigated Noise Levels (with Topo and barrier attenuation)         Uvehicle Noise:         63.5         61.6         59.8         53.8         62.4         63.0           Wehicle Nype         Leq Reak Hour <td></td> <td></td> <td></td> <td></td> <td></td> <td>Heav</td> <td>y Truck</td> <td>(s: \#####</td> <td>###</td> <td></td> <td></td> <td></td>						Heav	y Truck	(s: \#####	###			
Jutos:         76.79         8.46         -20.57         -1.20         -3.91         0.000         0.000           Medium Trucks:         62.53         -4.43         -20.57         -1.20         -3.91         0.000         0.000           Heavy Trucks:         65.83         -3.03         -20.57         -1.20         -3.91         0.000         0.000           Umitigated Noise Levels (without Topo and barrier attenuation)         Leq Night         Ldn         CNEL           Autos:         63.5         61.6         59.8         53.8         62.4         63.0           Medium Trucks:         65.3         54.8         48.5         46.9         55.4         65.5           Heavy Trucks:         61.0         59.6         50.6         51.8         60.2         60.3           Vehicle Noise:         65.9         64.2         60.6         56.4         64.9         65.5           Mitgated Noise Levels (with Topo and barrier attenuation)         Vehicle Noise:         65.9         64.2         63.0           Vehicle Noise:         65.9         64.2         69.6         51.8         60.2         60.5           Mitgated Noise Levels (with Topo and barrier attenuation)         Vehicle Noise:         63.5 <t< th=""><th>FHWA Noise Mod</th><th>el Calculations</th><th>;</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></t<>	FHWA Noise Mod	el Calculations	;									
Medium Trucks:         82.53         -4.43         -20.57         -1.20         -3.91         0.000         0.000           Heavy Trucks:         85.83         -3.03         -20.57         -1.20         -3.93         0.000         0.000           Umitigated Noise Levels (without Topo and barier attenuation)           Vehicle Type         Leq Peak Hour         Leq Day         Leq Vening         Leq Night         Ldn         CNEL           Autos:         66.5         61.6         59.8         53.8         62.4         63.0           Medium Trucks:         56.3         54.8         48.5         46.9         55.4         56.6           Heavy Trucks:         65.9         60.6         56.4         64.2         60.5           Vehicle Noise:         65.9         64.2         60.6         56.4         64.9         65.3           Mitigated Noise Levels (with Top and barrier attenuation)         Vehicle Type         Leq Peak Hour         Leq Day         Leq Evening         Leq Night         Ldn         CNEL           Mitigated Noise Levels (with Top and barrier attenuation)         Chicle Type         Leq Peak Hour         Leq Day         Leq Evening         Leq Night         Ldn         CNEL           Autos:         65.	VehicleType	REMEL	Traffic Flow	Distar	nce	Finite	Road	Fresn	el	Barrier Att	en Ber	m Atten
Heavy Trucks:         85.83         -3.03         -20.57         -1.20         -3.93         0.000         0.000           Unnitigated Noise Levels (without Topo and barrier attenuation)         Leq Reak Hour         Leq Qay         Leq Vening         Leq Night         Ldn         CNEL           Autos:         63.5         61.6         59.8         53.8         62.4         63.3           Medium Trucks:         56.3         54.8         48.5         46.9         55.4         55.6           Heavy Trucks:         61.0         59.6         50.6         51.8         60.2         60.3           Vehicle Noise:         65.9         64.2         60.6         56.4         64.9         65.4           Whitigated Noise Levels (with Topo and barrier attenuation)         Leq Reak Hour         Leq Day         Leq Evening         Leq Night         Ldn         CNEL           Whice Type         Leq Peak Hour         Leq Day         Leq Evening         Leq Night         Ldn         CNEL           Autos:         63.5         61.6         59.8         53.8         62.4         63.0           Medium Trucks:         56.3         54.8         48.5         46.9         55.4         55.6           Medium Trucks:	Autos:	76.79	8.46	-	20.5	7	-1.20		-3.91	0.0	00	0.000
Unmitigated Noise Levels (without Topo and barrier attenuation)           Vehicle Type         Leq Peak Hour         Leq Day         Leq Vening         Leq Night         Ldn         CNEL           Autos:         63.5         61.6         59.8         53.8         62.4         63.0           Medium Trucks:         65.3         54.8         48.5         46.9         55.4         63.0           Medium Trucks:         65.9         64.2         60.6         51.8         60.2         60.3           Vehicle Noise:         65.9         64.2         60.6         56.4         64.9         65.3           Witigated Noise Levels (with Topo and barrier attenuation)         Vehicle Type         Leq Peak Hour         Leq Day         Leq Revening         Leq Night         Ldn         CNEL           Vehicle Type         Leq Peak Hour         Leq Day         Leq Evening         Leq Night         Ldn         CNEL           Vehicle Type         Leq Peak Hour         Leq Day         Leq Evening         Leq Night         Ldn         CNEL           Autos:         63.5         61.6         59.8         53.8         62.4         63.0           Medium Trucks:         56.3         54.8         48.5         46.9	Medium Trucks:	82.53	-4.43	-	20.5	7			-3.91	0.0	00	0.000
VehicleType         Leq Peak Hour         Leq Day         Leq Vening         Leq Night         Ldn         CNEL           Autos:         63.5         61.6         59.8         53.3         62.4         63.0           Medium Trucks:         65.3         54.8         48.5         46.9         55.4         63.0           Medium Trucks:         61.0         59.6         50.6         51.8         60.2         60.3           Vehicle Noise:         65.9         64.2         60.6         56.4         64.9         65.3           Mitgated Noise Levels (with Topo and barrier attenuation)         Vehiclitype         Leq Day         Leq Evening         Leq Night         Ldn         CNEL           VehicleType         Leq Rek Hour         Leq Day         Leq Evening         Leq Night         Ldn         CNEL           Autos:         63.5         61.6         59.8         53.8         62.4         63.0           Medium Trucks:         63.3         54.8         48.5         46.9         55.4         56.0           Medium Trucks:         56.3         59.6         50.6         51.8         60.2         60.2	Heavy Trucks:	85.83	-3.03	-	20.5	7	-1.20		-3.93	0.0	00	0.000
Autos:         63.5         61.6         59.8         53.8         62.4         63.0           Medium Trucks:         56.3         54.8         48.5         46.9         55.4         55.4           Heavy Trucks:         61.0         59.6         50.6         51.8         60.2         60.3           Vehicle Noise:         65.9         64.2         60.6         56.4         64.9         65.3           Mitigated Noise Levels (with Topo and barrier attenuation)         Vehicle Type         Leq Peak Hour         Leq Day         Leq Vening         Leq Night         Ldn         CNEL           Autos:         63.5         61.6         59.8         53.8         62.4         63.0           Medium Trucks:         63.5         61.6         59.8         53.8         62.4         63.0           Medium Trucks:         63.3         54.8         48.5         46.9         55.4         65.9           Medium Trucks:         56.3         54.6         50.6         51.8         60.2         60.3												
Medium Trucks:         56.3         54.8         48.5         46.9         55.4         55.6           Heavy Trucks:         61.0         59.6         50.6         51.8         60.2         60.3           Vehicle Noise:         65.9         64.2         60.6         56.4         64.9         65.3           Mitigated Noise:         66.9         64.2         60.6         56.4         64.9         65.3           Wehicle Type         Leg Peak Hour         Leg Qay         Leg Vening         Leg Night         Ldn         CNEL           Autos:         63.5         61.6         59.8         53.8         62.4         63.6           Medium Trucks:         56.3         54.8         48.5         46.9         55.4         56.4           Heavy Trucks:         61.0         59.6         50.6         51.8         60.2         60.3	,1	1	,		eq E	•	Leq				-	
Heavy Trucks:         61.0         59.6         50.6         51.8         60.2         60.3           Vehicle Noise:         65.9         64.2         60.6         56.4         64.9         65.3           Mitigated Noise Levels (with Topo and barrier attenuation)         Vehicle Type         Leq Peak Hour         Leq Qay         Leq Evening         Leq Night         Ldn         CNEL           Autos:         63.5         61.6         59.8         53.8         62.4         63.0           Medium Trucks:         56.3         54.8         48.5         46.9         55.4         66.2         60.3           Heavy Trucks:         61.0         59.6         50.6         51.8         60.2         60.3			-									
Vehicle Noise:         65.9         64.2         60.6         56.4         64.9         65.3           Mitigated Noise Levels (with Topo and barrier attenuation)         Vehicle Type         Leq Peak Hour         Leq Day         Leq Veining         Leq Night         Ldn         CNEL           Autos:         63.5         61.6         59.8         53.8         62.4         63.0           Medium Trucks:         56.3         54.8         48.5         46.9         55.4         65.6           Heavy Trucks:         61.0         59.6         50.6         51.8         60.2         60.3			-									
Mitigated Noise Levels (with Topo and barrier attenuation)         Leq Night         Ldn         CNEL           VehicleType         Leq Peak Hour         Leq Day         Leq Evening         Leq Night         Ldn         CNEL           Autos:         63.5         61.6         59.8         53.8         62.4         63.0           Medium Trucks:         56.3         54.8         48.5         46.9         55.4         55.6           Heavy Trucks:         61.0         59.6         50.6         51.8         60.2         60.3	,	-	-									
VehicleType         Leq Peak Hour         Leq Day         Leq Vening         Leq Night         Ldn         CNEL           Autos:         63.5         61.6         59.8         53.8         62.4         63.0           Medium Trucks:         56.3         54.8         48.5         46.9         55.4         55.4           Heavy Trucks:         61.0         59.6         50.6         51.8         60.2         60.2				-				56.4		64.9		65.3
Autos:         63.5         61.6         59.8         53.8         62.4         63.0           Medium Trucks:         56.3         54.8         48.5         46.9         55.4         55.6           Heavy Trucks:         61.0         59.6         50.6         51.8         60.2         60.3									-			
Medium Trucks:         56.3         54.8         48.5         46.9         55.4         55.4           Heavy Trucks:         61.0         59.6         50.6         51.8         60.2         60.3		1	,		eq E	•	Leq				-	
Heavy Trucks: 61.0 59.6 50.6 51.8 60.2 60.3												
			-									
Vehicle Noise: 65.9 64.2 60.6 56.4 64.9 65.3		-	-									
	Vehicle Noise:	65.	a	64.2		60.6		56.4		64.9		65.3

F	HWA-RD-77-	108 HIGHWAY	NOIS	E PRED	ICTION	MODE	L (CALV	ENO) -	6/2/2013		
Road Nan	rio: Second Fle ne: SR-60 lo: South Hote					Job N	t Name: lumber: Analyst:	11145			
	SPECIFIC I	NPUT DATA								S	
Highway Data				5	Site Con	ditions	(Hard =		,		
• •	. ,	87,000 vehicle	s					Autos:	15		
	Percentage:	10%					ucks (2 A		15		
Peak H	lour Volume:	18,700 vehicle	s		He	avy Tru	cks (3+ A	(xles)	15		
	hicle Speed:	70 mph		١	/ehicle	Mix					
Near/Far La	ne Distance:	160 feet			Veh	icleType	э	Day	Evening	Night	Daily
Site Data							Autos:	77.5%	12.9%	9.6%	89.00%
Ba	rrier Heiaht:	0.0 feet			М	edium T	rucks:	84.8%	4.9%	10.3%	6.59%
Barrier Type (0-V		0.0			1	Heavy T	rucks:	86.5%	2.7%	10.8%	4.41%
Centerline D	. ,	175.0 feet			loise Sr	ource F	levation	s (in fe	et)		
Centerline Dist.	to Observer:	175.0 feet		Ē		Auto		000			
Barrier Distance	to Observer:	0.0 feet			Mediu	m Truck		297			
Observer Height	(Above Pad):	14.0 feet				v Truck			Grade Adj	ustment	0.0
P	ad Elevation:	850.0 feet									
	ad Elevation:	850.0 feet		1	.ane Eq		t Distan		eet)		
	ier Elevation:	850.0 feet				Auto					
	Road Grade:	0.0%				m Truck					
					Heav	y Truck	s: 155.	759			
FHWA Noise Mod	el Calculatior	IS									
VehicleType	REMEL	Traffic Flow	Dis	stance		Road	Fresh		Barrier Atte	en Ber	m Atten
Autos:	76.79	8.46		-7.53		-1.20		13.15	0.0		0.000
Medium Trucks:				-7.52		-1.20		13.33	0.0		0.00
Heavy Trucks:	85.83	-4.59		-7.51		-1.20	-	13.78	0.0	00	0.00
Unmitigated Nois			barri	er atten	uation)						
VehicleType	Leq Peak Ho			Leq Ev	•	Leq	Night		Ldn	÷.	NEL
Autos:		3.5	74.6		72.9		66.8		75.4		76.0
Medium Trucks:		.0	69.5		63.1		61.6		70.0		70.2
Heavy Trucks:		2.5	71.1		62.1		63.3		71.7		71.8
Vehicle Noise:	78	3.8	77.0		73.6		69.2	2	77.8	5	78.
Mitigated Noise L										1	
VehicleType	Leq Peak Ho			Leq Ev	•	Leq	Night		Ldn		NEL
Autos:		3.5	74.6		72.9		66.8		75.4		76.0
Medium Trucks:	-	.0	69.5		63.1		61.6		70.0		70.2
Heavy Trucks:		2.5	71.1		62.1		63.3		71.7		71.8
Vehicle Noise:	78	3.8	77.0		73.6		69.2	•	77.8		78.2

FH	WA-RD-77-10	8 HIGHWAY	NOISE P	REDICTION	MODE	L (CALV	ENO)	- 6/2/2013		
Scenario	: Second Floo	r With Wall			Projec	t Name:	Northo	jate		
Road Name						Number:				
Lot No	: Fast Food B	uilding				Analyst:	A. Wo	lte		
	PECIFIC INF	PUT DATA						L INPUTS	5	
Highway Data				Site Cor	ditions	; (Hard =	10, S	oft = 15)		
Average Daily T	raffic (Adt): 18	7,000 vehicles	;			,	Autos:	15		
Peak Hour P	ercentage:	10%				rucks (2 A				
	ur Volume: 18	3,700 vehicles	;	He	avy Tr.	icks (3+ A	(xles)	15		
	icle Speed:	70 mph		Vehicle	Mix					
Near/Far Lan	e Distance:	160 feet		Veh	icleTyp	е	Day	Evening	Night	Daily
Site Data						Autos:	77.5%	6 12.9%	9.6%	
Barr	ier Height:	25.0 feet		М	edium	rucks:	84.8%	6 4.9%	10.3%	6.59%
Barrier Type (0-Wa	•	1.0			Heavy	rucks:	86.5%	5 2.7%	10.8%	4.419
Centerline Dist		150.0 feet		Noise O			- // 6	41		
Centerline Dist. to	Observer:	213.0 feet		Noise S		levation		eet)		
Barrier Distance to	Observer:	63.0 feet			Auto		.000			
Observer Height (A	bove Pad):	14.0 feet			m Truci		.297	Grade Adj		
Pad	Elevation:	855.0 feet		Heat	/y Trucl	(S: 843	.006	Graue Auj	usunen	. 0.0
Road	d Elevation:	835.0 feet		Lane Eq	uivaler	t Distan	ce (in	feet)		
Barrie	r Elevation:	835.0 feet			Auto	os: 192.	965			
R	oad Grade:	0.0%		Mediu	m Truci	ks: 192.	540			
				Hear	/y Trucl	(s: 191.)	658			
FHWA Noise Model	Calculations									
VehicleType		Traffic Flow	Distan	ce Einite	Road	Fresn	el	Barrier Atte	en Ber	m Atten
Autos:	76.79	8.46		8.90	-1.20	11001	0.01	-5.1		-8.10
Medium Trucks:	82.53	-2.85		8.89	-1.20		0.00	-4.9		-7.90
Heavy Trucks:	85.83	-4.59	-	8.86	-1.20		0.02	-5.2	00	-8.20
Unmitigated Noise	Louisla (witho	ut Tono and	horrior	ttonuction)						
	eq Peak Hour			g Evening	Ler	Night	1	Ldn	0	NEL
Autos:	75.1		73.2	71.5	200	65.4		74.0		74.
Medium Trucks:	69.6	3 (	58.1	61.7		60.2		68.6		68.
Heavy Trucks:	71.2	2 (	59.8	60.7		62.0		70.3		70.
Vehicle Noise:	77.4	4	75.7	72.2		67.9	)	76.4		76.
Mitigated Noise Lev	els (with Top	o and barrier	attenua	tion)						
•	eq Peak Hour			q Evening	Leq	Night	1	Ldn	C	NEL
Autos:	67.0	) (	65.1	63.4		57.3		65.9	1	66.
Medium Trucks:	61.7	7 6	60.2	53.8		52.3		60.7		61.
Heavy Trucks:				50 F		50.0				62.2
	63.0	) (	61.6	52.5		53.8		62.1		02

F	HWA-RD-77-1	08 HIGHWAY	NOISE PF	REDICTION	MODE	L (CALVE	NO) - 6/2/2013				
Road Nan	io: Second Flo ne: SR-60 lo: West Comi		g		Job I	t Name: N Number: 1 Analyst: A	1145				
SITE	SPECIFIC IN	IPUT DATA				NOISE M	ODEL INPUT	'S			
Highway Data				Site Conditions (Hard = 10, Soft = 15)							
Peak Hour	Traffic (Adt): 1 Percentage: lour Volume:	10%				A rucks (2 A icks (3+ A	,				
	hicle Speed:	70 mph		Vehicle	Mix						
Near/Far La	ne Distance:	160 feet		Veh	icleTyp	e i	Day Evening	Nig	ht Daily		
Site Data						Autos:	77.5% 12.9%	9	.6% 89.00%		
Ba	rrier Height:	25.0 feet		М	edium 1	Trucks:	34.8% 4.9%	10	.3% 6.59%		
Barrier Type (0-W	•	1.0		1	Heavy T	Frucks:	36.5% 2.7%	10	.8% 4.41%		
Centerline Di		196.0 feet		Noise S	ource F	levations	(in feet)				
Centerline Dist.	to Observer:	429.0 feet		10/30 0	Auto		. ,				
Barrier Distance	to Observer:	233.0 feet		Mediu	m Truck						
Observer Height	(Above Pad):	14.0 feet			/y Trucl			diustrr	nent: 0.0		
	ad Elevation:	830.0 feet									
	ad Elevation:	825.0 feet		Lane Eq			e (in feet)				
	ier Elevation:	825.0 feet 0.0%		14-16-		os: 413.7 ks: 413.4					
	Road Grade:	0.0%				ks: 413.4 ks: 412.8					
FHWA Noise Mod	el Calculation	S									
VehicleType	REMEL	Traffic Flow	Distanc	e Finite	Road	Fresne			Berm Atten		
Autos:	76.79	8.46		3.87	-1.20			740	-13.74		
Medium Trucks:		-2.85		3.87	-1.20			.380	-13.38		
Heavy Trucks:	85.83	-4.59	-13	3.86	-1.20		0.66 -9	180	-12.18		
Unmitigated Nois	e Levels (with	out Topo and	barrier at	tenuation)							
VehicleType	Leq Peak Hou			r Evening	Leq	Night	Ldn		CNEL		
Autos:	70		68.3	66.5		60.5	69		69.		
Medium Trucks:	64		63.1	56.8		55.2	63		63.		
Heavy Trucks:	66		64.8	55.7		57.0	65	-	65.		
Vehicle Noise:	72	.4	70.7	67.3		62.9	71	.4	71.		
Mitigated Noise L	evels (with To	po and barrie	r attenuat	ion)							
VehicleType	Leq Peak Hou			l Evening	Leq	Night	Ldn		CNEL		
Autos:	56		54.5	52.8		46.7	55		55.		
Medium Trucks:	51		49.7	43.4		41.8	50		50.		
Heavy Trucks:	54	-	52.6	43.5		44.8	53		53.3		
Vehicle Noise:	59	.2	57.5	53.7		49.7	58	.2	58.0		

F	HWA-RD-77-10	08 HIGHWAY	NOISE P	REDICTION	MODE	L (CALVE	ENO) -	6/2/2013		
Road Nam	io: Second Floo ne: Orange St. lo: West Comm		9		Job I	t Name: N Number: 1 Analyst: P	11145			
SITE	SPECIFIC IN	PUT DATA			I	NOISE N	IODE	L INPUT	S	
Highway Data				Site Col	nditions	; (Hard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt): 1	2,500 vehicle	s			A	Autos:	15		
Peak Hour	Percentage:	10%		Me	edium T	rucks (2 A	xles):	15		
Peak H	lour Volume:	1,250 vehicle	s	He	eavy Tru	icks (3+ A	xles):	15		
Ve	hicle Speed:	35 mph		Vehicle	Mix					
Near/Far La	ne Distance:	12 feet			nicleTyp	e	Day	Evening	Night	Daily
Site Data					liololyp		77.5%	•	9.6%	
		0.0 feet			ledium		84.8%		10.3%	
Barrier Type (0-W	rrier Height:	0.0			Heavv	rucks:	86.5%	2.7%	10.8%	0.74%
Centerline Di	. ,	85.0 feet				levations	in fa	aat)		-
Centerline Dist.	to Observer:	85.0 feet		NOISE 3	Auto		.000	el)		
Barrier Distance	to Observer:	0.0 feet		Modii	m Truci		.297			
Observer Height (	Above Pad):	14.0 feet			vy Truci			Grade Ad	iustment	0.0
Pa	ad Elevation:	830.0 feet						,	doumoni	0.0
Roa	ad Elevation:	830.0 feet		Lane Eq	· · · · · · · · · · · · · · · · · · ·	t Distanc		feet)		
Barri	ier Elevation:	830.0 feet			Auto					
	Road Grade:	0.0%			ım Truci vy Truci					
FHWA Noise Mod	ol Calculations									
VehicleType	REMEL	Traffic Flow	Distan	ce Finite	Road	Fresn	el	Barrier Att	en Ber	m Atten
Autos:	65.11	0.11		3.63	-1.20	-1	12.58	0.0	000	0.000
Medium Trucks:	74.83	-17.13		3.61	-1.20	-1	12.94	0.0	000	0.000
Heavy Trucks:	80.05	-21.08		3.56	-1.20	-1	13.86	0.0	000	0.000
Unmitigated Noise	e Levels (witho	out Topo and	barrier a	ttenuation)						
VehicleType	Leq Peak Hou			q Evening		Night		Ldn	<b>.</b>	VEL
Autos:	60.	-	58.5	56.7		50.7		59.3		59.9
Medium Trucks:	52.	-	51.4	45.0		43.5		51.9		52.2
Heavy Trucks:	54.		52.8	43.7		45.0		53.3		53.5
Vehicle Noise:	61.	9	60.1	57.2	2	52.3		60.9	)	61.3
Mitigated Noise L										
VehicleType	Leq Peak Hou			q Evening		Night		Ldn	-	VEL
Autos:	60.		58.5	56.7		50.7		59.3		59.9
Medium Trucks:	52.	-	51.4	45.0		43.5		51.9		52.2
Heavy Trucks:	54.	-	52.8	43.7		45.0		53.3		53.5
Vehicle Noise:	61.	9	60.1	57.2	2	52.3		60.9	)	61.3

F	HWA-RD-77-1	08 HIGHWAY	NOIS	E PREC	ICTION	MODE		ENO) -	6/2/2013		
Road Nan	io: Second Flo ne: Orange St. lo: West Apar					Job N	Name: N lumber: 1 Analyst: 1	11145			
	SPECIFIC IN	IPUT DATA							INPUTS	5	
Highway Data				2	Site Con	ditions	(Hard =		,		
Average Daily	Traffic (Adt):	12,500 vehicle	s					Autos:	15		
	Percentage:	10%					ucks (2 A		15		
	lour Volume:	1,250 vehicle	s		He	avy Tru	cks (3+ A	xles):	15		
	hicle Speed:	35 mph		1	/ehicle	Mix					
Near/Far La	ne Distance:	12 feet			Veh	icleType	9	Day	Evening	Night	Daily
Site Data							Autos:	77.5%	12.9%	9.6%	97.42%
Ba	rrier Heiaht:	0.0 feet			М	edium T	rucks:	84.8%	4.9%	10.3%	1.84%
Barrier Type (0-V		0.0				Heavy T	rucks:	86.5%	2.7%	10.8%	0.74%
Centerline D	st. to Barrier:	68.0 feet		-	Voise Sr	ource F	levations	: (in fe	et)		
Centerline Dist.	to Observer:	68.0 feet		-		Auto		.000			
Barrier Distance	to Observer:	0.0 feet			Mediu	m Truck		.297			
Observer Height	(Above Pad):	14.0 feet				v Truck			Grade Adj	ustment	0.0
P	ad Elevation:	845.0 feet									
	ad Elevation:	845.0 feet		1	.ane Eq		t Distand		eet)		
	ier Elevation:	845.0 feet				Auto					
	Road Grade:	0.0%				m Truck					
					Heav	ry Truck	s: 67.9	999			
FHWA Noise Mod	el Calculation										
VehicleType	REMEL	Traffic Flow	Dis	tance		Road	Fresn		Barrier Atte		m Atten
Autos:	65.11	0.11		-2.22		-1.20		12.30	0.0		0.00
Medium Trucks:		-17.13		-2.18		-1.20		12.76	0.0		0.00
Heavy Trucks:	80.05	-21.08		-2.11		-1.20	-1	13.90	0.0	00	0.000
Unmitigated Nois											
VehicleType	Leq Peak Ho			Leq E	•	Leq	Night		Ldn	÷.	VEL
Autos:	61		59.9		58.1		52.1		60.7		61.3
Medium Trucks:	-		52.8		46.5		44.9		53.4		53.6
Heavy Trucks:			54.2		45.2		46.4		54.8		54.9 62.8
Vehicle Noise:	63	.3	61.6		58.6		53.7		62.3		62.8
Mitigated Noise L											
VehicleType	Leq Peak Ho			Leq E	•	Leq	Night		Ldn		VEL
Autos: Medium Trucks:	61		59.9		58.1		52.1		60.7		61.
	54	.3	52.8		46.5		44.9		53.4		53.0
Heavy Trucks:	55	7	54.2		45.2		46.4		54.8		54.9

F	HWA-RD-77-1	08 HIGHWAY	NOISE PF	REDICTION	MODE	L (CALVEN	10) - 6/2/2013	
Road Nan	rio: Third Floor ne: SR-91/I-215	5			Job N	t Name: No lumber: 11	145	
	Vo: East Apartn	÷		1		Analyst: A.		
	SPECIFIC IN	PUT DATA		0/4- 0				S
Highway Data				Site Cor	antions	•	0, Soft = 15)	
• •	Traffic (Adt): 18		s				itos: 15	
	Percentage:	10%				ucks (2 Ax	,	
	Hour Volume: 1		s	не	avy Iru	cks (3+ Ax	les): 15	
	ehicle Speed: ane Distance:	70 mph 140 feet		Vehicle	Mix			
	ine Distance.	140 1661		Veh	icleTyp		ay Evening	Night Daily
Site Data							7.5% 12.9%	9.6% 89.10
Ba	rrier Height:	0.0 feet			edium 1		4.8% 4.9%	10.3% 4.58
Barrier Type (0-V	Vall, 1-Berm):	0.0			Heavy T	rucks: 86	6.5% 2.7%	10.8% 6.32
Centerline Di		212.0 feet		Noise S	ource E	levations	(in feet)	
Centerline Dist.		212.0 feet			Auto	s: 866.2	00	
Barrier Distance		0.0 feet		Mediu	m Truck	s: 868.4	97	
Observer Height	, ,	23.0 feet		Hear	/v Truck	s: 874.2	06 Grade Ad	justment: 0.0
	ad Elevation:	855.0 feet			·			
	ad Elevation:	866.2 feet		Lane Eq		t Distance	, ,	
	ier Elevation:	855.0 feet		14-16-		s: 200.45		
	Road Grade:	0.0%				(s: 200.33 (s: 200.14		
				nea	y much	.8. 200.14	0	
FHWA Noise Mod	lel Calculation:	s						
VehicleType	REMEL	Traffic Flow	Distanc	e Finite	Road	Fresnel	Barrier Att	en Berm Atter
Autos:	76.79	8.46	-9	9.15	-1.20	-22	.47 0.0	0.00
Medium Trucks:	82.53	-4.43	-9	9.15	-1.20	-22	.72 0.0	0.00
Heavy Trucks:	85.83	-3.03	-6	9.14	-1.20	-23	.32 0.0	0.00
Unmitigated Nois	e Levels (with	out Topo and	barrier at	tenuation)				
VehicleType	Leq Peak Hou	r Leq Day	/ Leo	Evening	Leq	Night	Ldn	CNEL
Autos:	74	9	73.0	71.2		65.2	73.8	3 74
710100.	74.	-						
Medium Trucks:			66.3	59.9		58.3	66.8	3 67
	67.	.8	66.3 71.0				66.8 71.6	
Medium Trucks:	67. 72.	8 5		59.9		58.3		6 71
Medium Trucks: Heavy Trucks: Vehicle Noise:	67. 72. 77.	8 5 4	71.0 75.7	59.9 62.0 72.0		58.3 63.2	71.6	6 71
Medium Trucks: Heavy Trucks:	67. 72. 77.	8 5 4 po and barrie	71.0 75.7 r attenuat	59.9 62.0 72.0		58.3 63.2	71.6	6 71
Medium Trucks: Heavy Trucks: Vehicle Noise: Mitigated Noise L	67. 72. 77. evels (with To	8 5 4 po and barrie r Leq Day	71.0 75.7 r attenuat	59.9 62.0 72.0 ion)	Leq	58.3 63.2 67.8	71.6	6 71 4 76 <i>CNEL</i>
Medium Trucks: Heavy Trucks: Vehicle Noise: Mitigated Noise L VehicleType	67 72 77 evels (with To Leg Peak Hou 74	8 5 4 <b>po and barrie</b> r Leq Daj 9	71.0 75.7 rattenuati / Leq	59.9 62.0 72.0 ion) g Evening	Leq	58.3 63.2 67.8 Night	71.6 76.4 Ldn	6 71 4 76 CNEL 3 74
Medium Trucks: Heavy Trucks: Vehicle Noise: Mitigated Noise L VehicleType Autos:	67. 72. 77. evels (with To Leq Peak Hou 74. 67.	8 5 4 <b>po and barrie</b> r Leq Day 9 8	71.0 75.7 r attenuat / Leq 73.0	59.9 62.0 72.0 ion) g Evening 71.2	Leq	58.3 63.2 67.8 Night 65.2	71.6 76.4 Ldn 73.8	6 71 4 76 CNEL 3 74 3 67

Scenario:         Third Floor With Wall         Project Name:         Northgate           Road Name:         SR-60         Job Number:         11145           Lot No:         East Apartment Buildings         Analysi:         A. Wolfe           SITE SPECIFIC INPUT DATA         NOISE MODEL INPUTS           Highway Data         Site Conditions (Hard = 10, Soft = 15)           Average Daily Traffic (Adt):         187,000 vehicles         Autos:         15           Peak Hour Percentage:         10%         Meaium Trucks (2 Axles):         15           Peak Hour Volume:         18,700 vehicles         Heavy Trucks (3 4 Axles):         15	
Highway Data         Site Conditions (Hard = 10, Soft = 15)           Average Daily Traffic (Adt): 187,000 vehicles         Autos: 15           Peak Hour Percentage:         10%           Medium Trucks (2 Axles):         15	
Average Daily Traffic (Adt): 187,000 vehicles         Autos:         15           Peak Hour Percentage:         10%         Medium Trucks (2 Axles):         15	
Peak Hour Percentage: 10% Medium Trucks (2 Axles): 15	
Peak Hour Volume: 18,700 vehicles Heavy Trucks (3+ Axles): 15	
Vehicle Speed: 70 mph Vehicle Mix	
Noar/Earl and Distance: 160 feat	Dailv
	9.00%
Barrier Height: 0.0 feet Medium Trucks: 84.8% 4.9% 10.3%	6.59%
	4.41%
Centerline Dist. to Barrier: 893.0 feet Noise Source Elevations (in feet)	
Centerline Dist. to Observer: 893.0 feet Autos: 870.000	
Barrier Distance to Observer: 0.0 feet Medium Trucks: 870.000 Medium Trucks: 872.297	
Observer Height (Above Pad): 23.0 feet Heavy Trucks: 878.006 Grade Adjustment: 0	0
Pad Elevation: 855.0 feet	.0
Road Elevation: 870.0 feet Lane Equivalent Distance (in feet)	
Barrier Elevation: 855.0 feet Autos: 889.445	
Road Grade: 0.0% Medium Trucks: 889.428	
Heavy Trucks: 889.409	
FHWA Noise Model Calculations	
VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berm	Atten
Autos: 76.79 8.46 -18.86 -1.20 -22.59 0.000	0.000
Medium Trucks: 82.53 -2.85 -18.86 -1.20 -22.65 0.000	0.000
Heavy Trucks: 85.83 -4.59 -18.86 -1.20 -22.79 0.000	0.000
Unmitigated Noise Levels (without Topo and barrier attenuation)	
VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNE	
Autos: 65.2 63.3 61.5 55.5 64.1	64.7
Medium Trucks:         59.6         58.1         51.8         50.2         58.7           Heavy Trucks:         61.2         59.8         50.7         52.0         60.3	58.9 60.5
Heavy Trucks:         61.2         59.8         50.7         52.0         60.3           Vehicle Noise:         67.4         65.7         62.3         57.9         66.4	60.5
	00.8
Mitigated Noise Levels (with Topo and barrier attenuation)           VehicleType         Leg Peak Hour         Leg Day         Leg Evening         Leg Night         Ldn         CNE	,
Autos: 65.2 63.3 61.5 55.5 64.1	64.7
Medium Trucks: 59.6 58.1 51.8 50.2 58.7	58.9
Heavy Trucks: 61.2 59.8 50.7 52.0 60.3	60.5
Vehicle Noise: 67.4 65.7 62.3 57.9 66.4	66.8

F	HWA-RD-77-10	8 HIGHWAY	NOISE PI	REDICTION	MODE	L (CALVI	ENO)	- 6/2/2013					
Road Nan	rio: Third Floor \ ne: SR-91/I-215 lo: East Hotel E				Job I	t Name: 1 Number: 1 Analyst: 7	11145						
SITE	SPECIFIC IN	PUT DATA		NOISE MODEL INPUTS									
Highway Data				Site Conditions (Hard = 10, Soft = 15)									
Average Daily	Traffic (Adt): 18	7,000 vehicles	5			,	Autos:	15					
Peak Hour	Percentage:	10%		Me	dium T	rucks (2 A	xles):	15					
Peak H	Hour Volume: 1	8,700 vehicles	3	He	avy Tru	ıcks (3+ A	xles):	15					
Ve	hicle Speed:	70 mph		Vehicle	Mix								
Near/Far La	ne Distance:	140 feet			nicleTyp	e	Dav	Evening	Night	Daily			
Site Data					поте тур		77.5%	•	9.6%				
					edium		84.8%		10.3%				
	rrier Height:	0.0 feet 0.0					86.5%		10.8%				
Barrier Type (0-V Centerline D		0.0 825.0 feet							10.070	0.0270			
Centerline Dist.		825.0 feet		Noise S		levation	s (in fe	eet)					
Barrier Distance		0.0 feet			Auto		.300						
Observer Height		23.0 feet			m Truci		.597						
•	ad Elevation:	850.0 feet		Hea	/y Trucl	ks: 873	.306	Grade Adj	iustment.	0.0			
	ad Elevation: ad Elevation:	865.3 feet		Lane Eq	uivaler	nt Distand	e (in	feet)					
Barr	ier Elevation:	850.0 feet			Auto	os: 822.0	061						
	Road Grade:	0.0%		Mediu	m Truci	ks: 822.0	043						
				Hea	/y Trucl	ks: 822.0	025						
FHWA Noise Mod	el Calculations	;		-									
VehicleType	REMEL	Traffic Flow	Distand	ce Finite	Road	Fresn	el	Barrier Att	en Ber	m Atten			
Autos:	76.79	8.46	-1	8.34	-1.20	-2	22.61	0.0	000	0.000			
Medium Trucks:	82.53	-4.43	-1	8.34	-1.20	-2	22.67	0.0	000	0.000			
Heavy Trucks:	85.83	-3.03	-1	8.34	-1.20	-2	22.83	0.0	000	0.000			
Unmitigated Nois	e Levels (witho	out Topo and	barrier at	tenuation)									
VehicleType	Leq Peak Hou	r Leq Day	Lei	q Evening	Leq	Night		Ldn	CI	VEL			
Autos:	65.	7 (	53.8	62.0		56.0		64.6	6	65.2			
Medium Trucks:	58.	6	57.1	50.7		49.1		57.6	6	57.8			
Heavy Trucks:	63.	3 (	51.8	52.8		54.0		62.4	Ļ	62.5			
Vehicle Noise:	68.	2	6.5	62.8		58.7		67.2	2	67.6			
Mitigated Noise L	evels (with Top	o and barrie	attenuat	tion)									
VehicleType	Leq Peak Hou	r Leq Day	Le	q Evening	Leq	Night		Ldn	CI	VEL			
Autos:	65.	7	53.8	62.0		56.0		64.6	5	65.2			
Mardiana Taradaa		<u> </u>	57.1	F0 7		40.4		57.6	,	57.8			
Medium Trucks:	58.	0 ;	27.1	50.7		49.1		57.0	)	01.0			
Heavy Trucks:			57.1 51.8	50.7 52.8		49.1 54.0		62.4		62.5			

	HWA-RD-77-1		NOISE F	REDICTIC		•		013	
Road Nan	io: Third Floor ne: SR-60 lo: East Hotel B				Job N	t Name: N lumber: 1 Analvst: A	1145		
		5		1					
Highway Data	SPECIFIC IN	PUIDAIA		Site C			ODEL INP 10, Soft = 1		
	Traffic (Adt): 18	7 000 vehicle		0.10 0	manaromo	•	utos: 15	"	
• •	Percentage:	10%	5		Andium Tr	ucks (2 A			
	lour Volume: 1		e			cks (3+ A	,		
	hicle Speed:	70 mph	5			0110 101 71	100). 10		
	ne Distance:	160 feet		Vehici					
	no Biotanoo.	100 1001		V	ehicleType		Day Even	5	ight Daily
Site Data				_			7.5% 12.		9.6% 89.00%
	rrier Height:	0.0 feet			Medium T				0.3% 6.59% 0.8% 4.41%
Barrier Type (0-V	. ,	0.0			Heavy T	rucks: 8	50.5% Z.	/% 1	0.8% 4.41%
Centerline Di		446.0 feet		Noise	Source E	levations	(in feet)		
Centerline Dist.		446.0 feet			Auto	is: 855.	000		
Barrier Distance		0.0 feet 23.0 feet		Med	ium Truck	s: 857.	297		
Observer Height	(Above Pad): ad Flevation:	23.0 feet		He	avy Truck	s: 863.	006 Grade	Adjust	ment: 0.0
	ad Elevation: ad Elevation:	855.0 feet		Lane	quivalen	t Distanc	e (in feet)		-
	ier Flevation:	850.0 feet				s: 439.1	. ,		
	Road Grade:	0.0%		Mer		s: 439.0			
		0.070				s: 438.8			
FHWA Noise Mod	el Calculation:	5							
VehicleType	REMEL	Traffic Flow	Distar	nce Fin	te Road	Fresne	el Barrie	r Atten	Berm Atten
Autos:	76.79	8.46	-	14.26	-1.20	-2	2.18	0.000	0.000
Medium Trucks:	82.53	-2.85	-	14.26	-1.20	-2	2.29	0.000	0.000
Heavy Trucks:	85.83	-4.59	-	14.25	-1.20	-2	2.58	0.000	0.000
Unmitigated Nois	e Levels (with	out Topo and	barrier a	attenuation	l)				
VehicleType	Leq Peak Hou			eq Evening		Night	Ldn		CNEL
Autos:	69.		67.9	66		60.1		68.7	69.3
Medium Trucks:		-	62.7	56		54.8		63.3	63.5
Heavy Trucks:		-	64.4	55	-	56.6		64.9	65.1
Vehicle Noise:	72.	.0	70.3	66	.9	62.5		71.0	71.4
Mitigated Noise L									
VehicleType	Leq Peak Hou			eq Evening		Night	Ldn		CNEL
Autos:	69.		67.9	66		60.1		68.7	69.3
Medium Trucks:	64.	2	62.7	56	.4	54.8		63.3	63.5
Heavy Trucks:	65		64.4	55		56.6		64.9	65.1

F	HWA-RD-77-1	08 HIGHWAY	NOISE P	REDICTION	MODE	L (CALV	ENO)	- 6/2/2013					
	io: Third Floor					t Name:		ate					
	ne: SR-91/I-21 lo: South Hote					lumber: Analyst: J		lfe					
	SPECIFIC IN	ě				,							
Highway Data	JECIFIC IN	FUIDAIA		NOISE MODEL INPUTS Site Conditions (Hard = 10, Soft = 15)									
Average Daily	Traffic (Adt): 18	37,000 vehicle	s			· .	Autos:	15					
Peak Hour	Percentage:	10%		M	edium Tr	ucks (2 A	(xles):	15					
Peak H	lour Volume: 1	18,700 vehicle	s	H	eavy Tru	cks (3+ A	xles):	15					
Ve	hicle Speed:	70 mph		Vehicle	Mix								
Near/Far La	ne Distance:	140 feet		Vei	hicleTyp	е	Day	Evening	Night	Daily			
Site Data						Autos:	77.5%	12.9%	9.6%				
Ba	rrier Height:	0.0 feet		٨	1edium 7	rucks:	84.8%	4.9%	10.3%	4.589			
Barrier Type (0-V	•	0.0			Heavy 1	rucks:	86.5%	2.7%	10.8%	6.329			
Centerline D	ist. to Barrier:	1,159.0 feet		Noise S	ource F	levation	s (in fi	eet)					
Centerline Dist.	to Observer:	1,159.0 feet			Auto		.000						
Barrier Distance		0.0 feet		Medii	im Truck		297						
Observer Height	, ,	23.0 feet			vy Truck		.006	Grade Ad	iustment	: 0.0			
	ad Elevation:	850.0 feet		Lana Fr		1 Distant		64)					
	ad Elevation:	860.0 feet		Lane Ed		t Distand s: \#####		reet)					
	ier Elevation: Road Grade:	860.0 feet 0.0%		Modiu		(s: \#####							
	Road Grade.	0.0%				(S: \#####							
				1104	<i>y 1100</i>		rnn <sup>-</sup>						
FHWA Noise Mod		-											
VehicleType	REMEL	Traffic Flow	Distan		e Road	Fresn		Barrier Att		rm Atten			
Autos:	76.79	8.46		20.57	-1.20		12.65	0.0		0.00			
Medium Trucks:		-4.43		20.57	-1.20		12.67		000	0.00			
Heavy Trucks:	85.83	-3.03	-4	20.57	-1.20	-	12.74	0.0	000	0.00			
Unmitigated Nois													
VehicleType	Leq Peak Hou			eq Evening		Night		Ldn	-	NEL			
Autos: Medium Trucks:	63 56		61.6 54.8	59.8 48.5		53.8 46.9		62.4 55.4		63. 55.			
Heavy Trucks:			54.8 59.6	48.0		46.9		55.4 60.2		55. 60.			
Vehicle Noise:		-	64.2	60.6		56.4		64.9		65.			
Mitigated Noise L			-			00.1		01.0		00.			
VehicleType	Leg Peak Hou			g Evening	Leg	Night		Ldn	С	NEL			
Autos:	63		61.6	59.8	,	53.8		62.4	-	63.			
Medium Trucks:	56	.3	54.8	48.5	5	46.9		55.4	ļ.	55.			
Heavy Trucks:	61	.0	59.6	50.6	6	51.8		60.2	2	60.			
Vehicle Noise:	65	.9	64.2	60.6	6	56.4		64.9	)	65.			

F	HWA-RD-77-1	108 HIGHWAY	NOISE PF	REDICTION	MODE	L (CALVEN	IO) - 6/2/2013						
Road Nam	io: Third Floor ne: SR-60 lo: South Hote			Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe									
SITE	SPECIFIC IN	IPUT DATA		NOISE MODEL INPUTS									
Highway Data				Site Con			), Soft = 15)						
	Percentage:	87,000 vehicle 10% 18,700 vehicle				Au ucks (2 Axl cks (3+ Axl	,						
	hicle Speed:	70 mph		Vehicle	Mix								
Near/Far La	ne Distance:	160 feet		Veh	icleType	e Da	ay Evening	Night	Daily				
Site Data							.5% 12.9%	9.6%	89.00%				
Ba	rrier Height:	0.0 feet		М	edium T	rucks: 84	4.9%	10.3%	6.59%				
Barrier Type (0-W	•	0.0		1	Heavy T	rucks: 86	6.5% 2.7%	10.8%	4.41%				
Centerline Di		175.0 feet		Noise S	ource F	levations (	in foot)						
Centerline Dist.	to Observer:	175.0 feet		140136 3	Auto		,						
Barrier Distance	to Observer:	0.0 feet		Mediu	Auto m Truck								
Observer Height (	(Above Pad):	23.0 feet			v Truck			liustment	: 0.0				
	ad Elevation:	850.0 feet						,					
	ad Elevation:	850.0 feet		Lane Eq		t Distance							
	ier Elevation:	850.0 feet			Auto								
	Road Grade:	0.0%			m Truck vy Truck	s: 157.01 s: 156.36							
FHWA Noise Mod	el Calculation	IS											
VehicleType	REMEL	Traffic Flow	Distanc	e Finite	Road	Fresnel	Barrier At	ten Ber	m Atten				
Autos:	76.79	8.46	-7	7.57	-1.20	-21	.03 0.	000	0.000				
Medium Trucks:	82.53			7.56	-1.20	-21		000	0.000				
Heavy Trucks:	85.83	-4.59	-7	7.53	-1.20	-22	.06 0.	000	0.000				
Unmitigated Noise	e Levels (with	out Topo and	barrier at	tenuation)									
VehicleType	Leq Peak Ho	ur Leq Day	/ Leo	l Evening	Leq	Night	Ldn		NEL				
Autos:		3.5	74.6	72.8		66.8	75.		76.0				
Medium Trucks:			69.4	63.1		61.5	70.		70.2				
Heavy Trucks:		2.5	71.1	62.0		63.3	71.		71.8				
Vehicle Noise:	78	8.7	77.0	73.6		69.2	77.	7	78.1				
Mitigated Noise L	evels (with To	po and barrie	r attenuat	ion)									
VehicleType	Leq Peak Ho			l Evening	Leq	Night	Ldn		NEL				
Autos:	76	3.5	74.6	72.8		66.8	75.	4	76.0				
Medium Trucks:	70	).9	69.4	63.1		61.5	70.	0	70.2				
Heavy Trucks:	72	2.5	71.1	62.0		63.3	71.	6	71.8				
	Vehicle Noise: 78.7 77.0				73.6 69.2 77.7 78								

F	HWA-RD-77-1	08 HIGHWAY	NOISE P	REDIO		MODE	L (CALVE	ENO) ·	6/2/2013			
Road Nan	io: Third Floor ne: SR-60 lo: Fast Food I					Job I	t Name: N lumber: 1 Analyst: P	11145				
SITE	SPECIFIC IN			NOISE MODEL INPUTS								
Highway Data	SPECIFIC IN	FUIDAIA		Si	te Cond		(Hard =			3		
Average Daily	Traffic (Adt): 18	87.000 vehicle	s					Autos:	15			
	Percentage:	10%	•		Med	lium Ti	ucks (2 A					
	our Volume:	18.700 vehicle	s		Hea	avy Tru	cks (3+ A	xles):	15			
Ve	hicle Speed:	70 mph		1/0	hicle N	-		· ·				
	ne Distance:	160 feet		ve		ux cleTyp		Dav	Evening	Night	Daily	
Site Data				_	vern			Day 77.5%	•	9.6%		
					Ma			77.5% 84.8%		9.0%		
	rrier Height:	25.0 feet 1.0						86.5%		10.3%		
Barrier Type (0-W Centerline Di	. ,	1.0 150.0 feet								10.070		
Centerline Dist.		213.0 feet		No	oise So		levations		eet)			
Barrier Distance		63.0 feet				Auto						
Observer Height		23.0 feet			Mediun							
	ad Elevation:	855.0 feet			Heav	/ Truck	is: 843	.006	Grade Ad	iustment.	0.0	
	ad Elevation:	835.0 feet		La	ne Equ	iivaler	t Distanc	e (in i	feet)			
Barr	ier Elevation:	835.0 feet				Auto	s: 194.8	346				
	Road Grade:	0.0%			Mediun	n Truck	s: 194.4	22				
					Heav	/ Truck	is: 193.5	540				
FHWA Noise Mod												
VehicleType	REMEL	Traffic Flow	Distan		Finite I		Fresn	-	Barrier Att		m Atten	
Autos:	76.79	8.46		-8.96		-1.20		0.29	-7.4		-10.43	
Medium Trucks:		-2.85		-8.95		-1.20		0.37	-7.8		-10.85	
Heavy Trucks:	85.83	-4.59		-8.92		-1.20		0.61	-9.0	030	-12.03	
Unmitigated Nois												
VehicleType	Leq Peak Hou			eq Eve	•	Leq	Night		Ldn	-	VEL	
Autos:	75		73.2		71.4		65.4		74.0		74.	
Medium Trucks:			68.0		61.7		60.1		68.6		68.	
Heavy Trucks:	71		69.7		60.7		61.9		70.3		70.	
Vehicle Noise:	77	.3	75.6		72.2		67.8		76.3	3	76.	
Mitigated Noise L	evels (with To	po and barrie	r attenua	tion)								
VehicleType	Leq Peak Hou			eq Eve		Leq	Night		Ldn		VEL	
Autos:	64		62.8		61.0		54.9		63.6		64.	
Medium Trucks:			57.2		50.8		49.3		57.7		58.	
Heavy Trucks:	59		57.7		48.6		49.9		58.2		58.4	
Vehicle Noise:	66	E	64.8		61.6		56.9		65.5		65.	

F	HWA-RD-77-1	108 HIGHWAY	NOISE	PRED	CTION	MODEL	. (CALV	ENO) -	6/2/2013		
Road Nan	rio: Third Floor ne: SR-60 lo: West Com	With Wall mercial Buildin	g			Job N	Name: umber: Inalyst:	11145			
	SPECIFIC IN	NPUT DATA							L INPUTS	5	
Highway Data				S	ite Con	ditions	(Hard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt): 1	87,000 vehicle	s					Autos:	15		
Peak Hour	Percentage:	10%				dium Tri			15		
Peak H	lour Volume:	18,700 vehicle	s		He	avy Truc	cks (3+ )	Axles):	15		
	hicle Speed:	70 mph		V	ehicle l	Mix					
Near/Far La	ne Distance:	160 feet			Veh	icleType	•	Day	Evening	Night	Daily
Site Data							Autos:	77.5%	12.9%	9.6%	89.00%
Ba	rrier Height:	25.0 feet			M	edium T	rucks:	84.8%	4.9%	10.3%	6.59%
Barrier Type (0-W		1.0			ŀ	Heavy T	rucks:	86.5%	2.7%	10.8%	4.41%
Centerline Di	st. to Barrier:	196.0 feet			oico Se	ource El	ovation	e (in fr	(at)		
Centerline Dist.	to Observer:	429.0 feet		-	0136 30	Auto		5.000	ei)		
Barrier Distance	to Observer:	233.0 feet			Modiu	m Truck		7.297			
Observer Height	(Above Pad):	23.0 feet				v Truck		3.006	Grade Adj	ustment	0.0
P	ad Elevation:	830.0 feet									
	ad Elevation:	825.0 feet		L	ane Eq	uivalen			eet)		
	ier Elevation:	825.0 feet					s: 413.				
	Road Grade:	0.0%				m Truck					
					Heav	y Truck	s: 412.	755			
FHWA Noise Mod	el Calculation	IS									
VehicleType	REMEL	Traffic Flow	Dista	ance	Finite	Road	Fresr	nel	Barrier Atte	en Ber	m Atten
Autos:	76.79	8.46		-13.87		-1.20		0.68	-9.2	40	-12.240
Medium Trucks:	82.53	-2.85		-13.86		-1.20		0.55	-8.7	50	-11.750
Heavy Trucks:	85.83	-4.59		-13.85		-1.20		0.28	-7.3	60	-10.360
Unmitigated Nois	e Levels (with	out Topo and	barrier	attenu	ation)						
VehicleType	Leq Peak Ho	ur Leq Da	V I	Leq Eve	ening	Leq	Night		Ldn	CI	VEL
Autos:	70	).2	68.3		66.5		60.5	5	69.1		69.7
Medium Trucks:	64	1.6	63.1		56.8		55.2	2	63.7		63.9
Heavy Trucks:	66	3.2	64.8		55.7		57.0	)	65.3		65.5
Vehicle Noise:	72	2.4	70.7		67.3		62.9	9	71.4		71.8
Mitigated Noise L	evels (with To	po and barrie	r attenu	uation)							
VehicleType	Leq Peak Ho	ur Leq Daj	V I	Leq Ev	ening	Leq	Night		Ldn	CI	VEL
Autos:	57	<sup>7</sup> .9	56.0		54.3		48.2	2	56.8		57.4
Medium Trucks:	52	2.9	51.4		45.0		43.5	5	51.9		52.2
Heavy Trucks:	55	5.8	54.4		45.4		46.6	6	55.0		55.1
Vehicle Noise:	60		59.1		55.2		51.3		59.8		60.2

F	HWA-RD-77-10	08 HIGHWAY	NOISE PI	REDICTION	IMODE	L (CALVE	ENO) -	6/2/2013		
Road Nan	rio: Third Floor ne: Orange St. lo: West Comn		9		Job I	t Name: N Number: 1 Analyst: A	1145			
SITE	SPECIFIC IN	PUT DATA				NOISE M	IODEL			
Highway Data				Site Col		(Hard =				
Peak Hour	Traffic (Adt): 1 Percentage: Iour Volume:	2,500 vehicle 10% 1,250 vehicle				A rucks (2 A icks (3+ A		15 15 15		
	hicle Speed:	35 mph		Vehicle	Mix					
Near/Far La	ne Distance:	12 feet		Vel	nicleTyp	e l	Day	Evening	Night	Daily
Site Data						Autos:	77.5%	12.9%	9.6%	97.42%
Ba	rrier Height:	0.0 feet			ledium T		84.8%	4.9%	10.3%	1.84%
Barrier Type (0-V	Vall, 1-Berm):	0.0			Heavy T	rucks: 8	86.5%	2.7%	10.8%	0.749
Centerline Di	ist. to Barrier:	85.0 feet		Noise S	ource E	levations	in fe	et)		
Centerline Dist.		85.0 feet			Auto					
Barrier Distance		0.0 feet		Mediu	im Truck	ks: 832.	297			
Observer Height	, ,	23.0 feet		Hea	vv Truck	(s: 838.	006	Grade Adju	stment:	0.0
	ad Elevation:	830.0 feet								
	ad Elevation:	830.0 feet		Lane Eq		t Distanc	<u> </u>	eet)		
	ier Elevation:	830.0 feet		Marth	Auto m Truci					
	Road Grade:	0.0%			vy Truck					
FHWA Noise Mod	el Calculations	5		· .						
VehicleType	REMEL	Traffic Flow	Distan		Road	Fresne		Barrier Atte		m Atten
Autos:		0.11		3.78	-1.20		9.51	0.00		0.00
Medium Trucks:		-17.13		3.73	-1.20		20.10	0.00		0.00
Heavy Trucks:	80.05	-21.08	-	3.64	-1.20	-2	1.59	0.00	00	0.00
Unmitigated Nois	e Levels (witho	out Topo and	barrier a	ttenuation)						
VehicleType	Leq Peak Hou	1 .		q Evening		Night		Ldn	Cl	VEL
Autos:			58.3	56.6		50.5		59.1		59.
Medium Trucks:			51.3	44.9		43.4		51.8		52.
Heavy Trucks:			52.7	43.7		44.9		53.3		53.
Vehicle Noise:	61.	8	60.0	57.1		52.2		60.7		61.
Mitigated Noise L				,						
VehicleType	Leq Peak Hou			q Evening	,	Night		Ldn	CI	VEL
Autos:	60.		58.3	56.6		50.5		59.1		59.
Medium Trucks:			51.3	44.9		43.4		51.8		52.
Heavy Trucks:			52.7	43.7		44.9		53.3		53.4
Vehicle Noise:	61.	8	60.0	57.1		52.2		60.7		61.

FHWA-RD-7	7-108 HIGHWA`	Y NOISE PRE	EDICTION N	NODEL (C.	ALVENO	) - 6/2/2013	
Scenario: Third Fle Road Name: Orange Lot No: West Ap	St.	9	I	Project Nar Job Numb Analj		5	
SITE SPECIFIC	INPUT DATA					EL INPUT	S
Highway Data			Site Cond	litions (Ha	rd = 10, S	Soft = 15)	
Average Daily Traffic (Adt,	: 12,500 vehicl	es			Autos	s: 15	
Peak Hour Percentage	: 10%		Med	ium Trucks	(2 Axles	): 15	
Peak Hour Volume	: 1,250 vehicl	es	Hea	vy Trucks	3+ Axles	): 15	
Vehicle Speed	l: 35 mph		Vehicle M	ix			
Near/Far Lane Distance	: 12 feet			leType	Dav	Evening	Night Daily
Site Data				Auto			9.6% 97.42%
Barrier Heigh	: 0.0 feet		Mee	dium Truck	s: 84.8	% 4.9%	10.3% 1.84%
Barrier Type (0-Wall, 1-Berm			H	eavy Truck	s: 86.5	% 2.7%	10.8% 0.74%
Centerline Dist. to Barrie			Noise Sou	urco Elova	tions (in	foot)	
Centerline Dist. to Observe	: 68.0 feet		NUISE SUL	Autos:	845.000	,	
Barrier Distance to Observe	r: 0.0 feet		Madium	Trucks:	847.297		
Observer Height (Above Pad	23.0 feet			Trucks:	853.006	Grade Ad	iustment: 0.0
Pad Elevation	2: 845.0 feet		neavy	TTUCKS.	655.000	Orade Adj	usanenii. 0.0
Road Elevation	: 845.0 feet		Lane Equ	ivalent Dis	stance (in	1 feet)	
Barrier Elevation	n: 845.0 feet			Autos:	71.533		
Road Grade	e: 0.0%		Medium	Trucks:	70.828		
			Heavy	Trucks:	69.374		
FHWA Noise Model Calculat	ons		1				
VehicleType REMEL	Traffic Flow	Distance	Finite F	Road F	resnel	Barrier Att	en Berm Atten
Autos: 65.	11 0.1	1 -2.	44	-1.20	-18.80	0.0	0.00
Medium Trucks: 74.	83 -17.1	3 -2.	37	-1.20	-19.53	3 0.0	0.00
Heavy Trucks: 80.	05 -21.0	8 -2.	24	-1.20	-21.30	6 0.0	0.00
Unmitigated Noise Levels (w		d barrier atte	enuation)				
VehicleType Leq Peak I			Evening	Leq Nigi		Ldn	CNEL
Autos:	61.6	59.7	57.9		51.9	60.5	
Medium Trucks:	54.1	52.6	46.3		44.7	53.2	
Heavy Trucks:	55.5	54.1	45.1		46.3	54.7	
Vehicle Noise:	63.1	61.4	58.4		53.5	62.1	62.
Mitigated Noise Levels (with							
VehicleType Leq Peak I			Evening	Leq Nigi		Ldn	CNEL
Autos:	61.6	59.7	57.9		51.9	60.5	
Medium Trucks:	54.1	52.6	46.3		44.7	53.2	
	55.5	54.1	45.1		46.3	54.7	54.
Heavy Trucks: Vehicle Noise:	63.1	61.4	58.4		53.5	62.1	

F	HWA-RD-77-10	08 HIGHWAY	NOISE F	REDICTIO		L (CALVI	ENO) ·	- 6/2/2013					
Road Nan	rio: Fourth Floor ne: SR-91/I-215 No: East Apartm				Job I	et Name: 1 Number: 1 Analyst: 1	11145						
SITE	SPECIFIC IN	PUT DATA		NOISE MODEL INPUTS									
Highway Data				Site Co	nditions	s (Hard =	10, Sc	oft = 15)					
Average Daily	Traffic (Adt): 18	7,000 vehicles	6			,	Autos:	15					
Peak Hour	Percentage:	10%		М	edium T	rucks (2 A	(xles):	15					
Peak F	lour Volume: 1	8,700 vehicles	6	Н	eavy Tri	ıcks (3+ A	(xles):	15					
Ve	hicle Speed:	70 mph		Vehicle	Mix								
Near/Far La	ne Distance:	140 feet			hicleTyp	e	Dav	Evening	Night	Daily			
Site Data							77.5%	•	9.6%				
Pa	rrier Height:	0.0 feet		/	/ledium	Trucks:	84.8%	4.9%	10.3%	4.58%			
Barrier Type (0-W		0.0 1001			Heavy	Trucks:	86.5%	2.7%	10.8%	6.32%			
Centerline Di		212.0 feet		Noice	, 	levation	. (in f.	a a 4)					
Centerline Dist.	to Observer:	212.0 feet		NOISe 3	Aut			eel)					
Barrier Distance	to Observer:	0.0 feet		Madi	Auti um Truc		.200						
Observer Height	(Above Pad):	32.0 feet			an Truc avy Truc			Grade Ad	iustmont	0.0			
P	ad Elevation:	855.0 feet		nea	ivy muc	KS. 074	.200	Graue Auj	usunem.	0.0			
Ro	ad Elevation:	866.2 feet		Lane E	quivaler	nt Distand	ce (in i	feet)					
Barr	ier Elevation:	855.0 feet			Aut	os: 201.1	188						
	Road Grade:	0.0%		Media	um Truc	ks: 200.9	964						
				Hea	ivy Truc	ks: 200.5	519						
FHWA Noise Mod	el Calculations	;											
VehicleType	REMEL	Traffic Flow	Distar	nce Finite	e Road	Fresn	el	Barrier Att	en Ber	m Atten			
Autos:	76.79	8.46		-9.17	-1.20		30.60	0.0	000	0.000			
Medium Trucks:	82.53	-4.43		-9.17	-1.20	-:	30.94	0.0	000	0.000			
Heavy Trucks:	85.83	-3.03		-9.15	-1.20	-:	31.78	0.0	000	0.000			
Unmitigated Nois	e Levels (witho	out Topo and	barrier a	attenuation)	)								
VehicleType	Leq Peak Hou	r Leq Day	Le	eq Evening	Leo	n Night		Ldn	CI	VEL			
Autos:	74.	9	73.0	71.2	2	65.2		73.8	3	74.4			
Medium Trucks:	67.	7 (	66.2	59.9	9	58.3		66.8	3	67.0			
Heavy Trucks:	72.	4	71.0	62.0	)	63.2		71.6	6	71.7			
Vehicle Noise:	77.	3	75.6	72.0	C	67.8		76.3	3	76.8			
Mitigated Noise L	evels (with Top	oo and barrie	r attenua	ation)									
VehicleType	Leq Peak Hou			eq Evening		n Night		Ldn		VEL			
Autos:			73.0	71.	-	65.2		73.8		74.4			
Medium Trucks:			66.2	59.9		58.3		66.8		67.0			
Heavy Trucks:			71.0	62.0		63.2		71.6		71.7			
Vehicle Noise:	77.	3	75.6	72.0	D	67.8		76.3	3	76.8			

F	HWA-RD-77-	108 HIGHWAY	NOIS	E PRED	ICTION	MODE	L (CALV	ENO) -	6/2/2013		
Road Nan		or With Wall ment Buildings				Job N	Name: lumber: Analyst:	11145			
	SPECIFIC I	NPUT DATA								S	
Highway Data				2	Site Con	ditions	(Hard =		,		
• •	. ,	87,000 vehicle	s					Autos:	15		
	Percentage:	10%					ucks (2 /		15		
		18,700 vehicle	s		He	avy Tru	cks (3+ /	Axles):	15		
	hicle Speed:	70 mph		1	/ehicle	Mix					
Near/Far La	ne Distance:	160 feet			Veh	icleType	9	Day	Evening	Night	Daily
Site Data							Autos:	77.5%	12.9%	9.6%	89.00%
Ba	rrier Heiaht:	0.0 feet			М	edium T	rucks:	84.8%	4.9%	10.3%	6.59%
Barrier Type (0-V		0.0			I	Heavy T	rucks:	86.5%	2.7%	10.8%	4.41%
Centerline Di	st. to Barrier:	893.0 feet		7	Voise So	ource E	levation	s (in fe	et)		
Centerline Dist.		893.0 feet				Auto		0.000			
Barrier Distance		0.0 feet			Mediu	m Truck	s: 872	2.297			
Observer Height	· ,	32.0 feet			Heav	v Truck	s: 878	3.006	Grade Adj	ustment:	0.0
	ad Elevation:	855.0 feet		L.							
	ad Elevation:	870.0 feet		1	.ane Eq		t Distan		eet)		
	ier Elevation:	855.0 feet				Auto					
	Road Grade:	0.0%					s: 889.				
					Heav	y Truck	s: 889.	455			
FHWA Noise Mod	el Calculatior										
VehicleType	REMEL	Traffic Flow		stance		Road	Fresr		Barrier Atte		m Atten
Autos:	76.79			-18.86		-1.20		31.27	0.0		0.000
Medium Trucks:				-18.86	-	-1.20		31.35	0.0		0.000
Heavy Trucks:	85.83	-4.59		-18.86	3	-1.20	-	31.55	0.0	00	0.000
Unmitigated Nois	e Levels (with	out Topo and	barri	er atten	uation)						
VehicleType	Leq Peak Ho			Leq Ev	•	Leq	Night		Ldn		VEL
Autos:		5.2	63.3		61.5		55.5		64.1		64.7
Medium Trucks:		9.6	58.1		51.8		50.2	-	58.7		58.9
Heavy Trucks:	-	1.2	59.8		50.7		52.0		60.3		60.5
Vehicle Noise:	67	7.4	65.7		62.3		57.9	9	66.4	ł	66.8
Mitigated Noise L			r atte								
VehicleType	Leq Peak Ho			Leq Ev	•	Leq	Night		Ldn	-	VEL
Autos:		5.2	63.3		61.5		55.5		64.1		64.7
Medium Trucks:		9.6	58.1		51.8		50.2	-	58.7		58.9
Heavy Trucks:	-	1.2	59.8		50.7		52.0		60.3		60.5
Vehicle Noise:	67	7 /	65.7		62.3		57.9	2	66.4		66.8

F	HWA-RD-77-10		NUISE PI	<b>LEDICTION</b>	MODE		10) - 6/2/2013	
	io: Fourth Floor	With Wall				Name: No		
	ne: SR-91/I-215					lumber: 11		
Lot N	lo: East Hotel B	uilding				Analyst: A.	Wolfe	
	SPECIFIC INF	PUT DATA					DEL INPUTS	5
Highway Data				Site Con	ditions	(Hard = 10	), Soft = 15)	
Average Daily	Traffic (Adt): 18	7,000 vehicle	s			Au	tos: 15	
Peak Hour	Percentage:	10%		Me	dium Ti	ucks (2 Axl	es): 15	
Peak H	lour Volume: 18	3,700 vehicle	s	He	avy Tr.	cks (3+ Axl	es): 15	
Ve	hicle Speed:	70 mph		Vehicle	Mix			
Near/Far La	ne Distance:	140 feet			icleTyp		ay Evening	Night Daily
Site Data							.5% 12.9%	9.6% 89.10
		0.0 feet		м	edium T		.8% 4.9%	10.3% 4.589
ва Barrier Type (0-И	rrier Height:	0.0 teet 0.0			Heavy T		6.5% 2.7%	10.8% 6.329
Centerline Di					,			
Centerline Dist.		825.0 feet 825.0 feet		Noise Se	ource E	levations (	in feet)	
Barrier Distance		0.0 feet			Auto	s: 865.3	00	
Observer Height		32.0 feet		Mediu	m Truck	s: 867.5	97	
	ad Elevation:	32.0 feet		Heav	y Truck	s: 873.3	06 Grade Adj	ustment: 0.0
	ad Elevation: ad Elevation:	865.3 feet		Lane Fr	uivələr	t Distance	(in foot)	
	ier Elevation:	850.0 feet		Lano Lq		s: 822.19	. ,	
	Road Grade:	0.0%		Mediu		s: 822.15	-	
	Noau Graue.	0.078				s: 822.07		
					<i>y</i> 1100	0. 022.07		
FHWA Noise Mod	el Calculations							
VehicleType	REMEL	Traffic Flow	Distand	ce Finite	Road	Fresnel	Barrier Atte	en Berm Atten
Autos:	76.79	8.46	-1	8.34	-1.20	-31	.28 0.0	00.00
Medium Trucks:	82.53	-4.43	-1	8.34	-1.20	-31	.37 0.0	0.00
Heavy Trucks:	85.83	-3.03	-1	8.34	-1.20	-31	.59 0.0	00.00
Unmitigated Nois	e Levels (witho	ut Topo and	barrier at	tenuation)				
VehicleType	Leq Peak Hour	Leq Day	/ Lei	q Evening	Leq	Night	Ldn	CNEL
Autos:	65.7	7	63.8	62.0		56.0	64.6	65.
Medium Trucks:	58.6	6	57.1	50.7		49.1	57.6	57.
Heavy Trucks:	63.3	3	61.8	52.8		54.0	62.4	62.
Vehicle Noise:	68.2	2	66.5	62.8		58.7	67.2	67.
Mitigated Noise L	evels (with Top	o and barrie	r attenuat	tion)				
	Leg Peak Hour	Leq Day	/ Le	q Evening	Leq	Night	Ldn	CNEL
VehicleType			~~ ~	00.0		56.0	64.6	65.
VehicleType Autos:	65.7	7	63.8	62.0		00.0	01.0	
,1	65.7 58.6		63.8 57.1	62.0 50.7		49.1	57.6	
Autos:		3						57.

VA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

F	HWA-RD-77-10	8 HIGHWAY	NOISE	PREDI	ICTION	MODE	L (CALVE	NO) -	6/2/2013		
Road Nam	io: Fourth Floor le: SR-60 lo: East Hotel B					Job I	t Name: N Jumber: 1 Analyst: A	1145			
SITE	SPECIFIC INF	PUT DATA							INPUTS	s	
Highway Data				S	ite Cor	ditions	(Hard =	10, So	ft = 15)		
Average Daily	Traffic (Adt): 18	7,000 vehicle	s				A	utos:	15		
Peak Hour	Percentage:	10%			Me	dium Ti	rucks (2 A	xles):	15		
Peak H	lour Volume: 1	3,700 vehicle	s		He	avy Tru	cks (3+ A	xles):	15		
Ve	hicle Speed:	70 mph		v	ehicle	Mix					
Near/Far La	ne Distance:	160 feet		- F		icleTyp	e	Dav	Evening	Night	Daily
Site Data								77.5%	12.9%	9.69	
Pa	rrier Height:	0.0 feet			М	edium 1	rucks:	84.8%	4.9%	10.39	6.59%
Barrier Type (0-W	•	0.0				Heavy T	rucks:	86.5%	2.7%	10.89	% 4.41%
Centerline Di		446.0 feet		N	laisa S	ource F	levations	(in fo	ot)		
Centerline Dist.	to Observer:	446.0 feet		-	0130 0	Auto			60		
Barrier Distance	to Observer:	0.0 feet			Modiu	m Truck					
Observer Height (	Above Pad):	32.0 feet				/y Truck			Grade Adj	ustmer	nt: 0.0
Pa	ad Elevation:	850.0 feet									0.0
	ad Elevation:	855.0 feet		L	ane Eq		t Distanc		eet)		
	er Elevation:	850.0 feet					os: 439.5				
	Road Grade:	0.0%					(s: 439.4				
					Hear	/y Truck	(s: 439.1	77			
FHWA Noise Mod	el Calculations										
VehicleType	REMEL	Traffic Flow	Dista	nce	Finite	Road	Fresne	el L	Barrier Atte	en Be	erm Atten
Autos:	76.79	8.46		-14.26		-1.20	-3	0.54	0.0	00	0.000
Medium Trucks:	82.53	-2.85		-14.26		-1.20	-3	0.70	0.0	00	0.000
Heavy Trucks:	85.83	-4.59		-14.26		-1.20	-3	1.10	0.0	00	0.000
Unmitigated Noise				attenu	ation)						
VehicleType	Leq Peak Hour			eq Eve		Leq	Night		Ldn		CNEL
Autos:	69.8		67.9		66.1		60.1		68.7		69.3
Medium Trucks:	64.2	-	62.7		56.4		54.8		63.3		63.5
Heavy Trucks:	65.8		64.4		55.3		56.6		64.9		65.0
Vehicle Noise:	72.0		70.3		66.9		62.5		71.0	)	71.4
Mitigated Noise L											
VehicleType	Leq Peak Hour			eq Eve		Leq	Night		Ldn		CNEL
Autos:	69.8		67.9		66.1		60.1		68.7		69.3
Medium Trucks:	64.2		62.7		56.4		54.8		63.3		63.5
Heavy Trucks:	65.8		64.4		55.3		56.6		64.9		65.0
Vehicle Noise:	72.0	J	70.3		66.9		62.5		71.0	)	71.4

Monday, June 18, 2018

FHWA-RD-77-1	08 HIGHWAY	NOISE P	REDICTION		(CALVI	ENO) -	6/2/2013				
Scenario: Fourth Floo Road Name: SR-91/I-21 Lot No: South Hote	5			Job N	Name: I lumber: ' Analyst: /	11145					
SITE SPECIFIC IN	IPUT DATA		NOISE MODEL INPUTS								
Highway Data			Site Col	nditions	(Hard =	10, Sc	oft = 15)				
Average Daily Traffic (Adt): 1	37,000 vehicles	3				Autos:	15				
Peak Hour Percentage:	10%		Me	edium Tri	ucks (2 A	xles):	15				
Peak Hour Volume:	18,700 vehicles	3	He	avy Tru	cks (3+ A	xles):	15				
Vehicle Speed:	70 mph		Vehicle			-					
Near/Far Lane Distance:	140 feet					Dav	Fuening	Night	Dailu		
Site Data	-		ver	nicleType			Evening	Night	Daily		
Site Data						77.5%		9.6%			
Barrier Height:	0.0 feet			ledium T		84.8%		10.3%			
Barrier Type (0-Wall, 1-Berm):	0.0			Heavy I	rucks:	86.5%	2.7%	10.8%	6.32%		
Centerline Dist. to Barrier:	1		Noise S	ource E	levations	s (in fe	eet)				
Centerline Dist. to Observer:	1			Auto	s: 860	.000					
Barrier Distance to Observer:	0.0 feet		Mediu	m Truck	s: 862	.297					
Observer Height (Above Pad):	32.0 feet		Hea	vy Truck	s: 868	.006	Grade Ad	iustment:	0.0		
Pad Elevation:	850.0 feet			·							
Road Elevation:	860.0 feet		Lane Eq				teet)				
Barrier Elevation:	860.0 feet				s: \#####						
Road Grade:	0.0%				s: \#####						
			Hea	vy Truck	s: \#####	###					
FHWA Noise Model Calculation	s										
VehicleType REMEL	Traffic Flow	Distan	ce Finite	Road	Fresn	el	Barrier Att	en Ber	m Atten		
Autos: 76.79	8.46	-2	0.57	-1.20	-2	21.32	0.0	000	0.000		
Medium Trucks: 82.53	-4.43	-2	0.57	-1.20	-2	21.36	0.0	000	0.000		
Heavy Trucks: 85.83	-3.03	-2	0.57	-1.20	-2	21.47	0.0	000	0.000		
Unmitigated Noise Levels (with	out Topo and	barrier a	ttenuation)								
VehicleType Leq Peak Hou	ır Leq Day	Le	q Evening	Leq	Night		Ldn	CI	VEL		
Autos: 63	.5	51.6	59.8		53.8		62.4	l I	63.0		
Medium Trucks: 56	.3	54.8	48.5		46.9		55.4	l I	55.6		
Heavy Trucks: 61	.0	59.6	50.6		51.8		60.2	2	60.3		
Vehicle Noise: 65	.9	64.2	60.6	i	56.4		64.9	)	65.3		
Mitigated Noise Levels (with To	po and barrie	attenua	tion)								
VehicleType Leq Peak Hou	ır Leq Day	Le	q Evening	Leq	Night		Ldn	CI	VEL		
Autos: 63	.5	51.6	59.8		53.8		62.4	+	63.0		
Medium Trucks: 56	.3	54.8	48.5		46.9		55.4	ļ.	55.6		
Heavy Trucks: 61	.0	59.6	50.6		51.8		60.2	2	60.3		

F	HWA-RD-77-1	108 HIGHWAY	NOIS	E PRED	ICTION	MODE	L (CALV	ENO) -	6/2/2013		
Road Nan	io: Fourth Floo ne: SR-60 lo: South Hote					Job N	Name: lumber: Analyst:	11145			
	SPECIFIC IN	NPUT DATA								S	
Highway Data				5	Site Con	ditions	(Hard =		,		
• •	, ,	87,000 vehicle	s					Autos:	15		
	Percentage:	10%					ucks (2 A		15		
		18,700 vehicle	s		He	avy Tru	cks (3+ A	(xles):	15		
	hicle Speed:	70 mph		۱	/ehicle	Mix					
Near/Far La	ne Distance:	160 feet			Veh	icleType	Э	Day	Evening	Night	Daily
Site Data							Autos:	77.5%	12.9%	9.6%	89.00%
Ba	rrier Heiaht:	0.0 feet			М	edium T	rucks:	84.8%	4.9%	10.3%	6.59%
Barrier Type (0-V		0.0			I	Heavy T	rucks:	86.5%	2.7%	10.8%	4.41%
Centerline Di	st. to Barrier:	175.0 feet		,	loise So	ource E	levation	s (in fe	et)		
Centerline Dist.	to Observer:	175.0 feet		-		Auto		000			
Barrier Distance	to Observer:	0.0 feet			Mediu	m Truck		297			
Observer Height	(Above Pad):	32.0 feet			Heav	v Truck	s: 858	.006	Grade Adj	iustment.	0.0
	ad Elevation:	850.0 feet									
	ad Elevation:	850.0 feet		1	.ane Eq		t Distan		eet)		
	ier Elevation:	850.0 feet				Auto					
	Road Grade:	0.0%				m Truck					
					Heav	y Truck	s: 157.4	182			
FHWA Noise Mod	el Calculation	is									
VehicleType	REMEL	Traffic Flow	Dis	stance		Road	Fresh	el I	Barrier Atte	en Ber	m Atten
Autos:	76.79			-7.64		-1.20		28.47	0.0		0.000
Medium Trucks:				-7.62		-1.20		28.87	0.0		0.00
Heavy Trucks:	85.83	-4.59		-7.58	5	-1.20	-1	29.89	0.0	000	0.00
Unmitigated Nois	e Levels (with	out Topo and	barri	er atten	uation)						
VehicleType	Leq Peak Ho			Leq Ev	•	Leq	Night		Ldn		VEL
Autos:		5.4	74.5		72.7		66.7		75.3		75.9
Medium Trucks:		).9	69.4		63.0		61.5		69.9		70.
Heavy Trucks:		2.5	71.0		62.0		63.2		71.6		71.7
Vehicle Noise:	78	3.7	77.0		73.5		69.1		77.7	7	78.
Mitigated Noise L	evels (with To	opo and barrie	r atte	nuation	)						
VehicleType	Leq Peak Ho			Leq Ev	•	Leq	Night		Ldn		VEL
Autos:		5.4	74.5		72.7		66.7		75.3		75.
Medium Trucks:		).9	69.4		63.0		61.5		69.9		70.1
Heavy Trucks:		2.5	71.0		62.0		63.2		71.6		71.7
Vehicle Noise:	78	3.7	77.0		73.5		69.1		77.7	7	78.1

F	HWA-RD-77-10	08 HIGHWAY	NOISE PI	REDICTION	MODE	L (CALVE	ENO)	- 6/2/2013		
	io: Fourth Floor	r With Wall				t Name: N				
Road Nam		h silalin n				Number: 1				
	lo: Fast Food E	•				Analyst: A				
	SPECIFIC IN	PUT DATA		011 0				L INPUTS	S	
Highway Data				Site Con	ditions	: (Hard =	- ·	,		
• •	Traffic (Adt): 18		6				Autos:			
	Percentage:	10%				rucks (2 A				
	lour Volume: 1		6	He	avy In	icks (3+ A	xles):	15		
	hicle Speed:	70 mph		Vehicle	Mix					
Near/Far La	ne Distance:	160 feet		Veh	icleTyp	е	Day	Evening	Night	Daily
Site Data						Autos:	77.5%	5 12.9%	9.6%	89.00%
Ba	rrier Height:	25.0 feet		М	edium T	rucks:	84.8%	4.9%	10.3%	6.59%
Barrier Type (0-W	•	1.0		1	Heavy T	rucks:	86.5%	5 2.7%	10.8%	4.419
Centerline Di	st. to Barrier:	150.0 feet		Noise Su	ource F	levations	: (in fi	eet)		
Centerline Dist.	to Observer:	213.0 feet		10/30 00	Auto					
Barrier Distance	to Observer:	63.0 feet		Modiu	m Truck		.297			
Observer Height (	Above Pad):	32.0 feet			vy Truck		.006	Grade Adj	iustment	. 0.0
Pi	ad Elevation:	855.0 feet		near	y macr		.000	,		0.0
	ad Elevation:	835.0 feet		Lane Eq		t Distand		feet)		
Barn	ier Elevation:	835.0 feet				os: 197.8				
	Road Grade:	0.0%			m Truck					
				Heav	y Truck	(s: 196.5	561			
FHWA Noise Mod	el Calculations									
VehicleType	REMEL	Traffic Flow	Distan	ce Finite	Road	Fresn	el	Barrier Atte	en Ber	m Atten
Autos:	76.79	8.46		9.06	-1.20		1.33	-10.9	60	-13.96
Medium Trucks:	82.53	-2.85		9.05	-1.20		1.50	-11.3	00	-14.30
Heavy Trucks:	85.83	-4.59	-	9.02	-1.20		1.96	-12.2	20	-15.22
Unmitigated Nois	a Lovels (with	ut Topo and	harrior a	ttenuation)						
VehicleType	Leg Peak Hou			q Evening	Leo	Night		Ldn	C	NEL
Autos:	75.		73.1	71.3		65.3		73.9		74.
Medium Trucks:	69.	4 6	57.9	61.6		60.0		68.5	5	68.
Heavy Trucks:	71.	0 6	59.6	60.6		61.8		70.2	2	70.
Vehicle Noise:	77.	2	75.5	72.1		67.7		76.2	2	76.
Mitigated Noise L	evels (with Top	oo and barrier	attenua	tion)						
VehicleType	Leq Peak Hou			q Evening	Leg	Night		Ldn	C	NEL
Autos:	61.	0 4	59.1	57.4		51.3		59.9	j	60.
Medium Trucks:	55.	1 !	53.6	47.3		45.7		54.2	2	54.
Heavy Trucks:	55.	8 !	54.4	45.3		46.6		54.9	)	55.

F	HWA-RD-77-1	108 HIGHWAY	NOISE PR	EDICTION	MODE	L (CALVE	NO) - 6/2/20 <sup>-</sup>	13	
Road Nan		or With Wall mercial Buildin	g		Job N	t Name: N lumber: 1 Analyst: A	1145		
SITE	SPECIFIC IN	IPUT DATA			ſ	NOISE M	ODEL INPL	JTS	
Highway Data				Site Con	ditions	(Hard = 1	10, Soft = 15)		
	Percentage:	10% 18,700 vehicle				A ucks (2 A cks (3+ A	,		
	hicle Speed:	70 mph		Vehicle	Mix				
Near/Far La	ne Distance:	160 feet		Veh	icleType	e L	Day Evenir	ng N	ight Daily
Site Data						Autos: 7	7.5% 12.9	%	9.6% 89.00%
Ba Barrier Type (0-W	rrier Height: /all_1-Berm):	25.0 feet			edium T Heavy T		34.8% 4.9 36.5% 2.7		0.3% 6.59% 0.8% 4.41%
Centerline Di		196.0 feet		Noine C		levations	(in feet)		
Centerline Dist.	to Observer:	429.0 feet		NOISE SE			. ,		
Barrier Distance		233.0 feet		Mediu	Auto m Truck				
Observer Height	· ,	32.0 feet		Heav	y Truck	s: 833.	006 Grade	Adjust	ment: 0.0
	ad Elevation: ad Elevation:	830.0 feet 825.0 feet		Lane Eq	uivalen	t Distanc	e (in feet)		
	ier Elevation:	825.0 feet				s: 413.9			
	Road Grade:	0.0%				s: 413.6 s: 413.0			
FHWA Noise Mod	el Calculation	IS							
VehicleType	REMEL	Traffic Flow	Distance	e Finite	Road	Fresne	el Barrier	Atten	Berm Atten
Autos:	76.79			3.87	-1.20			7.500	
Medium Trucks:				8.87	-1.20			6.870	
Heavy Trucks:	85.83	-4.59	-13	3.86	-1.20		0.06 -	5.600	-8.600
Unmitigated Nois				,					
VehicleType	Leq Peak Ho			Evening	Leq	Night	Ldn		CNEL
Autos:			68.3	66.5		60.5		9.1	69.7
Medium Trucks:			63.1 64.8	56.7 55.7		55.2		3.7	63.9
Heavy Trucks: Vehicle Noise:			64.8 70.7	67.3		57.0 62.9	-	5.3 1.4	65.4 71.8
			-			02.9	1	1.4	71.0
Mitigated Noise L VehicleType	Leg Peak Ho			on) Evening	100	Night	l dn		CNEL
Autos:	1	0.7	57.8	56.0	Leq	50.0		8.6	59.2
			57.0	46.9		45.3		i3.8	54.0
								0.0	
Medium Trucks: Heavy Trucks:		7.6	56.2	47.1		48.4	5	6.7	56.8

F	HWA-RD-77-10	8 HIGHWAY N	IOISE PR	EDICTION	MODE	L (CALVI	ENO)	- 6/2/2013			
Road Nan	rio: Fourth Floor ne: Orange St. lo: West Comm				Job I	t Name: 1 Number: 1 Analyst: 7	11145				
SITE	SPECIFIC IN	PUT DATA		NOISE MODEL INPUTS Site Conditions (Hard = 10, Soft = 15)							
Highway Data				Site Cor	nditions	s (Hard =	10, So	oft = 15)			
Average Daily	Traffic (Adt): 1	2,500 vehicles					Autos:	15			
Peak Hour	Percentage:	10%		Me	dium T	rucks (2 A	(xles):	15			
Peak H	lour Volume:	1,250 vehicles		He	avy Tru	ıcks (3+ A	(xles):	15			
Ve	hicle Speed:	35 mph		Vehicle	Mix						
Near/Far La	ne Distance:	12 feet			icleTyp	e	Dav	Evening	Night	Daily	
Site Data							77.5%	•	9.6%		
0-		0.0 feet		м	edium	Trucks:	84.8%		10.3%		
ва Barrier Type (0-И	rrier Height:	0.0 reet 0.0					86.5%		10.8%		
	ist. to Barrier:	85.0 feet									
Centerline Dist.		85.0 feet		Noise S		levation	•	eet)			
Barrier Distance	to Observer:	0.0 feet			Auto		.000				
Observer Height	(Above Pad):	32.0 feet			m Truci		.297	0 d- A-4			
•	ad Elevation:	830.0 feet		Heat	/y Trucl	KS: 838	.006	Grade Adj	ustment.	0.0	
Ro	ad Elevation:	830.0 feet		Lane Eq	uivaler	nt Distand	ce (in	feet)			
Barr	ier Elevation:	830.0 feet			Auto	os: 90.6	526				
	Road Grade:	0.0%		Mediu	m Truci	ks: 89.8	340				
				Hear	/y Trucl	ks: 88.1	118				
FHWA Noise Mod	lel Calculations										
VehicleType	REMEL	Traffic Flow	Distance	e Finite	Road	Fresn	el	Barrier Att	en Ber	m Atten	
Autos:	65.11	0.11	-3	.98	-1.20	-2	25.61	0.0	000	0.000	
Medium Trucks:	74.83	-17.13	-3	.92	-1.20	-2	26.41	0.0	000	0.000	
Heavy Trucks:	80.05	-21.08	-3	.79	-1.20	-2	28.43	0.0	000	0.000	
Unmitigated Nois	e Levels (witho	out Topo and L	oarrier att	enuation)							
VehicleType	Leq Peak Hou	r Leq Day	Leq	Evening	Leq	Night		Ldn	CI	VEL	
Autos:	60.	0 5	8.1	56.4		50.3		58.9	)	59.5	
Medium Trucks:	52.	6 5	1.1	44.7		43.2		51.6	5	51.9	
Heavy Trucks:	54.	0 5	2.5	43.5		44.8		53.1		53.2	
Vehicle Noise:	61.	6 5	9.8	56.9		52.0		60.5	5	61.0	
Mitigated Noise L	evels (with Top	o and barrier	attenuati	on)							
VehicleType	Leq Peak Hour	r Leq Day	Leq	Evening	Leq	Night		Ldn	CI	NEL	
Autos:	60.	0 5	8.1	56.4		50.3		58.9	)	59.5	
Medium Trucks:	52.	6 5	1.1	44.7		43.2		51.6	6	51.9	
Heavy Trucks:	54.	0 5	2.5	43.5		44.8		53.1		53.2	
Vehicle Noise:	61.	6 5	9.8	56.9		52.0		60.5	5	61.0	

Road Nam Lot N	io: Fourth Floo	ar Mith Moll									
0175	e: Orange St. lo: West Apar					Job N	t Name: 1 lumber: Analyst: 1	11145			
	SPECIFIC IN	NPUT DATA								5	
Highway Data					Site Con	ditions	(Hard =				
Average Daily	, ,		s					Autos:	15		
	Percentage:	10%					ucks (2 A		15		
	lour Volume:	1,250 vehicle	s		He	avy Tru	cks (3+ A	(xles):	15		
	hicle Speed:	35 mph			Vehicle I	Mix					
Near/Far La	ne Distance:	12 feet			Veh	icleType	э	Day	Evening	Night	Daily
Site Data							Autos:	77.5%	12.9%	9.6%	97.42%
Bai	rrier Heiaht:	0.0 feet			М	edium 1	rucks:	84.8%	4.9%	10.3%	1.84%
Barrier Type (0-W		0.0			1	Heavy T	rucks:	86.5%	2.7%	10.8%	0.74%
Centerline Dis	st. to Barrier:	68.0 feet		H	Noise Sr	ource F	levation	s (in fe	et)		
Centerline Dist.	to Observer:	68.0 feet		-		Auto		000			-
Barrier Distance	to Observer:	0.0 feet			Mediu	m Truck		297			
Observer Height (	Above Pad):	32.0 feet				v Truck			Grade Adj	ustment	0.0
Pa	ad Elevation:	845.0 feet									
Roa	ad Elevation:	845.0 feet		1	Lane Eq		t Distand		eet)		
	er Elevation:	845.0 feet				Auto					
1	Road Grade:	0.0%				m Truck					
					Heav	ry Truck	s: 71.8	359			
FHWA Noise Mode	el Calculation										-
VehicleType	REMEL	Traffic Flow	Dis	stance		Road	Fresn		Barrier Atte		m Atten
Autos:	65.11	0.11		-2.7		-1.20		24.31	0.0		0.000
Medium Trucks:	74.83			-2.6	-	-1.20		25.28	0.0		0.00
Heavy Trucks:	80.05	-21.08		-2.4	7	-1.20	-2	27.75	0.0	00	0.000
Unmitigated Noise					,						
VehicleType	Leq Peak Ho			Leq E	•	Leq	Night		Ldn	÷.	VEL
Autos:	-		59.4		57.6		51.6		60.2		60.8
Medium Trucks:			52.3		46.0		44.4		52.9		53.
Heavy Trucks:	55		53.9		44.8		46.1		54.4		54.0
Vehicle Noise:	62	2.8	61.1		58.1		53.3		61.8		62.3
Mitigated Noise Le											
VehicleType	Leq Peak Ho			Leq E		Leq	Night		Ldn		VEL
Autos:	61		59.4		57.6		51.6		60.2		60.0
Medium Trucks:			52.3		46.0		44.4		52.9		53.1
Heavy Trucks: Vehicle Noise:			53.9 61.1		44.8 58.1		46.1		54.4 61.8		54.6 62.3

APPENDIX 10.1:

**OPERATIONAL NOISE LEVEL CALCULATIONS** 



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**Observer Location:** R1

Source: Air Conditioning Unit (Roof-Top) Condition: Operational Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe

	NOISE	MODEL INPUTS				
Noise Distance to Observer	153.0 feet	Barrier Height:	0.0 feet			
Noise Distance to Barrier:	153.0 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:	20.0 feet	Drop Off Coefficient:	20.0			
Barrier Elevation:	0.0 feet	20 = 6  dBA per doubling of distants 15 = 4.5  dBA per doubling of distants				

	NOISE MODEL PROJECTIONS										
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax				
Reference (Sample)	5.0	0.0	74.4	76.1	77.4	77.7	78.2				
Distance Attenuation	153.0	-29.7	-29.7	-29.7	-29.7	-29.7	-29.7				
Shielding (Barrier Attenuation)	153.0	0.0	0.0	0.0	0.0	0.0	0.0				
Raw (Distance + Barrier)		-29.7	44.7	46.4	47.7	48.0	48.5				
39 Minute Hourly Adjustmen	it	-31.6	42.8	44.5	45.8	46.1	46.6				

S	TATIONARY SOURCE NO	ISE PREDICTION MODEL	7/26/2018
<b>Observer Location:</b> R1 Source: Residentia Condition: Operation	al Entry Gate & Speaker al	Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe	
	NOISE MODE	EL INPUTS	
Noise Distance to Observer	417.0 feet	Barrier Height:	0.0 feet
Noise Distance to Barrier:	417.0 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:	20.0
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling 15 = 4.5 dBA per doublin	

	NOISE MODEL PROJECTIONS										
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax				
Reference (Sample)	40.0	0.0	52.6	55.3	60.7	63.7	65.6				
Distance Attenuation	417.0	-20.4	-20.4	-20.4	-20.4	-20.4	-20.4				
Shielding (Barrier Attenuation)	417.0	0.0	0.0	0.0	0.0	0.0	0.0				
Raw (Distance + Barrier)		-20.4	32.2	34.9	40.3	43.3	45.2				
60 Minute Hourly Adjustmer	nt	-20.4	32.2	34.9	40.3	43.3	45.2				

**Observer Location:** R1

*Source:* Drive-Through Speakerphone *Condition:* Operational

Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe

	NOISE M	ODEL INPUTS	
Noise Distance to Observer	551.0 feet	Barrier Height:	0.0 feet
Noise Distance to Barrier:	551.0 feet	Noise Source Height:	3.0 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 o 15 = 4.5 dBA per doubling	

	NOISE MODEL PROJECTIONS										
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax				
Reference (Sample)	15.0	0.0	60.9	62.1	63.6	65.3	66.4				
Distance Attenuation	551.0	-31.3	-31.3	-31.3	-31.3	-31.3	-31.3				
Shielding (Barrier Attenuation)	551.0	0.0	0.0	0.0	0.0	0.0	0.0				
Raw (Distance + Barrier)		-31.3	29.6	30.8	32.3	34.0	35.1				
60 Minute Hourly Adjustmer	nt	-31.3	29.6	30.8	32.3	34.0	35.1				

S	TATIONARY SOURCE N	OISE PREDICTION MODEL	7/26/2018
<b>Observer Location:</b> R1 Source: Car Wash Condition: Operation	Tunnel Air Blowers al	Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe	
	NOISE MO	DEL INPUTS	
Noise Distance to Observer	473.0 feet	Barrier Height:	0.0 feet
Noise Distance to Barrier:	473.0 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 15 = 4.5 dBA per doublin	

NOISE MODEL PROJECTIONS									
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax		
Reference (Sample)	10.0	0.0	81.6	92.0	92.6	93.3	93.8		
Distance Attenuation	473.0	-33.5	-33.5	-33.5	-33.5	-33.5	-33.5		
Shielding (Barrier Attenuation)	473.0	0.0	0.0	0.0	0.0	0.0	0.0		
Raw (Distance + Barrier)		-33.5	48.1	58.5	59.1	59.8	60.3		
60 Minute Hourly Adjustmer	nt	-33.5	48.1	58.5	59.1	59.8	60.3		

#### **Observer Location:** R1

Source: Residential Parking Lot Veh. Movements Condition: Operational

nts Job Number: 11145 Analyst: A. Wolfe

Project Name: Northgate

NOISE MODEL INPUTS									
Noise Distance to Observer	234.0 feet	Barrier Height:	0.0 feet						
Noise Distance to Barrier:	234.0 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	0.0	44.0	47.0	55.0	61.0	68.6		
Distance Attenuation	234.0	-20.5	-20.5	-20.5	-20.5	-20.5	-20.5		
Shielding (Barrier Attenuation)	234.0	0.0	0.0	0.0	0.0	0.0	0.0		
Raw (Distance + Barrier)		-20.5	23.5	26.5	34.5	40.5	48.1		
60 Minute Hourly Adjustmen	nt	-20.5	23.5	26.5	34.5	40.5	48.1		

STATIONARY SOURCE NOISE PREDICTION MODEL 7/26/2018						
<b>Observer Location:</b> R1 Source: Commerc Condition: Operation	ial Parking Lot Veh. Mo al	Project Name: Northgate vements Job Number: 11145 Analyst: A. Wolfe				
	NOISE N	IODEL INPUTS				
Noise Distance to Observer	302.0 feet	Barrier Height:	0.0 feet			
Noise Distance to Barrier:	302.0 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)	5.0	0.0	56.7	60.7	63.7	67.1	79.5		
Distance Attenuation	302.0	-26.7	-26.7	-26.7	-26.7	-26.7	-26.7		
Shielding (Barrier Attenuation)	302.0	0.0	0.0	0.0	0.0	0.0	0.0		
Raw (Distance + Barrier)		-26.7	30.0	34.0	37.0	40.4	52.8		
60 Minute Hourly Adjustmer	nt	-26.7	30.0	34.0	37.0	40.4	52.8		

<b>Observer Location:</b> R1 Source: Gas Station Activity Condition: Operational		Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe	
	NOIS	E MODEL INPUTS	
Noise Distance to Observer	316.0 feet	Barrier Height: 0.0 feet	
Noise Distance to Barrier:	316.0 feet	Noise Source Height: 5.0 feet	
Barrier Distance to Observer:	0.0 feet	Observer Height: 5.0 feet	
Observer Elevation: Noise Source Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm): 0 Drop Off Coefficient: 20.0	
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)	5.0	0.0	65.6	66.9	69.5	74.4	82.4		
Distance Attenuation	316.0	-36.0	-36.0	-36.0	-36.0	-36.0	-36.0		
Shielding (Barrier Attenuation)	316.0	0.0	0.0	0.0	0.0	0.0	0.0		
Raw (Distance + Barrier)		-36.0	29.6	30.9	33.5	38.4	46.4		
60 Minute Hourly Adjustmer	nt	-36.0	29.6	30.9	33.5	38.4	46.4		

S	TATIONARY SOURCE NO	DISE PREDICTION MODEL	7/26/2018
<b>Observer Location: R2</b> Source: Air Condit Condition: Operation	ioning Unit (Roof-Top) al	Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe	
	NOISE MOD	EL INPUTS	
Noise Distance to Observer	401.0 feet	Barrier Height:	0.0 feet
Noise Distance to Barrier:	401.0 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:	20.0 feet	Drop Off Coefficient:	20.0
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling 15 = 4.5 dBA per doublin	

NOISE MODEL PROJECTIONS									
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax		
Reference (Sample)	5.0	0.0	74.4	76.1	77.4	77.7	78.2		
Distance Attenuation	401.0	-38.1	-38.1	-38.1	-38.1	-38.1	-38.1		
Shielding (Barrier Attenuation)	401.0	0.0	0.0	0.0	0.0	0.0	0.0		
Raw (Distance + Barrier)		-38.1	36.3	38.0	39.3	39.6	40.1		
39 Minute Hourly Adjustmer	nt	-40.0	34.4	36.1	37.4	37.7	38.2		

**Observer Location:** R2

*Source:* Residential Entry Gate & Speaker *Condition:* Operational

Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe

NOISE MODEL INPUTS									
Noise Distance to Observer	371.0 feet	Barrier Height:	0.0 feet						
Noise Distance to Barrier:	371.0 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:	20.0						
Barrier Elevation:	0.0 feet	20 = 6  dBA per doubling of  15 = 4.5  dBA per doubling							

NOISE MODEL PROJECTIONS									
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax		
Reference (Sample)	40.0	0.0	52.6	55.3	60.7	63.7	65.6		
Distance Attenuation	371.0	-19.3	-19.3	-19.3	-19.3	-19.3	-19.3		
Shielding (Barrier Attenuation)	371.0	0.0	0.0	0.0	0.0	0.0	0.0		
Raw (Distance + Barrier)		-19.3	33.3	36.0	41.4	44.4	46.3		
60 Minute Hourly Adjustmen	nt	-19.3	33.3	36.0	41.4	44.4	46.3		

S	TATIONARY SOURCE N	OISE PREDICTION MODEL	7/26/2018
<b>Observer Location: R2</b> Source: Car Wash Condition: Operation	Tunnel Air Blowers al	Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe	
	NOISE MO	DEL INPUTS	
Noise Distance to Observer	817.0 feet	Barrier Height:	20.0 feet
Noise Distance to Barrier:	346.0 feet	Noise Source Height:	8.0 feet
Barrier Distance to Observer:	471.0 feet	Observer Height:	5.0 feet
Observer Elevation:	0.0 feet 0.0 feet 0.0 feet	Barrier Type (0-Wall, 1-Berm):	0
Noise Source Elevation:		Drop Off Coefficient:	20.0
Barrier Elevation:		20 = 6 dBA per doubling 15 = 4.5 dBA per doublin	

NOISE MODEL PROJECTIONS									
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax		
Reference (Sample)	10.0	0.0	81.6	92.0	92.6	93.3	93.8		
Distance Attenuation	817.0	-38.2	-38.2	-38.2	-38.2	-38.2	-38.2		
Shielding (Barrier Attenuation)	346.0	-8.1	-8.1	-8.1	-8.1	-8.1	-8.1		
Raw (Distance + Barrier)		-46.3	35.3	45.7	46.3	47.0	47.5		
60 Minute Hourly Adjustmer	nt	-46.3	35.3	45.7	46.3	47.0	47.5		

#### **Observer Location:** R2

Source: Residential Parking Lot Veh. Movements Condition: Operational

Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe

NOISE MODEL INPUTS								
Noise Distance to Observer	149.0 feet	Barrier Height:	0.0 feet					
Noise Distance to Barrier:	149.0 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	0.0	44.0	47.0	55.0	61.0	68.6			
Distance Attenuation	149.0	-17.6	-17.6	-17.6	-17.6	-17.6	-17.6			
Shielding (Barrier Attenuation)	149.0	0.0	0.0	0.0	0.0	0.0	0.0			
Raw (Distance + Barrier)		-17.6	26.4	29.4	37.4	43.4	51.0			
60 Minute Hourly Adjustmer	nt	-17.6	26.4	29.4	37.4	43.4	51.0			

S	TATIONARY SOURCE	NOISE PREDICTION MODEL	7/26/2018
Observer Location: R2 Source: Commerc Condition: Operation	ial Parking Lot Veh. Move al	Project Name: Northgate ements Job Number: 11145 Analyst: A. Wolfe	
	NOISE MO	DEL INPUTS	
Noise Distance to Observer	503.0 feet	Barrier Height:	0.0 feet
Noise Distance to Barrier:	503.0 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)	5.0	0.0	56.7	60.7	63.7	67.1	79.5		
Distance Attenuation	503.0	-30.0	-30.0	-30.0	-30.0	-30.0	-30.0		
Shielding (Barrier Attenuation)	503.0	0.0	0.0	0.0	0.0	0.0	0.0		
Raw (Distance + Barrier)		-30.0	26.7	30.7	33.7	37.1	49.5		
60 Minute Hourly Adjustmer	nt	-30.0	26.7	30.7	33.7	37.1	49.5		

**Observer Location:** R2

Source: Gas Station Activity Condition: Operational Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe

NOISE MODEL INPUTS								
Noise Distance to Observer	657.0 feet	Barrier Height:	0.0 feet					
Noise Distance to Barrier:	657.0 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:	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	0.0	65.6	66.9	69.5	74.4	82.4		
Distance Attenuation	657.0	-42.4	-42.4	-42.4	-42.4	-42.4	-42.4		
Shielding (Barrier Attenuation)	657.0	0.0	0.0	0.0	0.0	0.0	0.0		
Raw (Distance + Barrier)		-42.4	23.2	24.5	27.1	32.0	40.0		
60 Minute Hourly Adjustmen	it	-42.4	23.2	24.5	27.1	32.0	40.0		

S	TATIONARY SOURCE NO	ISE PREDICTION MODEL	7/26/2018					
<b>Observer Location: R3</b> Source: Air Condit Condition: Operation	ioning Unit (Roof-Top) al	Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe						
NOISE MODEL INPUTS								
Noise Distance to Observer	688.0 feet	Barrier Height:	0.0 feet					
Noise Distance to Barrier:	688.0 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:	20.0 feet	Drop Off Coefficient:	20.0					
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling 15 = 4.5 dBA per doublin						

NOISE MODEL PROJECTIONS									
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax		
Reference (Sample)	5.0	0.0	74.4	76.1	77.4	77.7	78.2		
Distance Attenuation	688.0	-42.8	-42.8	-42.8	-42.8	-42.8	-42.8		
Shielding (Barrier Attenuation)	688.0	0.0	0.0	0.0	0.0	0.0	0.0		
Raw (Distance + Barrier)		-42.8	31.6	33.3	34.6	34.9	35.4		
39 Minute Hourly Adjustmer	nt	-44.7	29.7	31.4	32.7	33.0	33.5		

**Observer Location:** R3

*Source:* Residential Entry Gate & Speaker *Condition:* Operational

Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe

NOISE MODEL INPUTS								
Noise Distance to Observer	462.0 feet	Barrier Height:	0.0 feet					
Noise Distance to Barrier:	462.0 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:	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)	40.0	0.0	52.6	55.3	60.7	63.7	65.6		
Distance Attenuation	462.0	-21.3	-21.3	-21.3	-21.3	-21.3	-21.3		
Shielding (Barrier Attenuation)	462.0	0.0	0.0	0.0	0.0	0.0	0.0		
Raw (Distance + Barrier)		-21.3	31.3	34.0	39.4	42.4	44.3		
60 Minute Hourly Adjustmen	ıt	-21.3	31.3	34.0	39.4	42.4	44.3		

S	TATIONARY SOURCE N	OISE PREDICTION MODEL	7/26/2018					
<b>Observer Location: R3</b> Source: Car Wash Condition: Operation	Tunnel Air Blowers al	Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe						
NOISE MODEL INPUTS								
Noise Distance to Observer	1,075.0 feet	Barrier Height:	20.0 feet					
Noise Distance to Barrier:	750.0 feet	Noise Source Height:	8.0 feet					
Barrier Distance to Observer:	325.0 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 15 = 4.5 dBA per doublin						

NOISE MODEL PROJECTIONS									
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax		
Reference (Sample)	10.0	0.0	81.6	92.0	92.6	93.3	93.8		
Distance Attenuation	1,075.0	-40.6	-40.6	-40.6	-40.6	-40.6	-40.6		
Shielding (Barrier Attenuation)	750.0	-8.1	-8.1	-8.1	-8.1	-8.1	-8.1		
Raw (Distance + Barrier)		-48.7	32.9	43.3	43.9	44.6	45.1		
60 Minute Hourly Adjustmer	nt	-48.7	32.9	43.3	43.9	44.6	45.1		

#### **Observer Location:** R3

Source: Residential Parking Lot Veh. Movements Condition: Operational

Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe

NOISE MODEL INPUTS								
Noise Distance to Observer	45.0 feet	Barrier Height:	0.0 feet					
Noise Distance to Barrier:	45.0 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	0.0	44.0	47.0	55.0	61.0	68.6		
Distance Attenuation	45.0	-9.8	-9.8	-9.8	-9.8	-9.8	-9.8		
Shielding (Barrier Attenuation)	45.0	0.0	0.0	0.0	0.0	0.0	0.0		
Raw (Distance + Barrier)		-9.8	34.2	37.2	45.2	51.2	58.8		
60 Minute Hourly Adjustmer	nt	-9.8	34.2	37.2	45.2	51.2	58.8		

S	TATIONARY SOURCE NO	DISE PREDICTION MODEL	7/26/2018
Observer Location: R3 Source: Commerc Condition: Operation	ial Parking Lot Veh. Moven al	Project Name: Northgate nents Job Number: 11145 Analyst: A. Wolfe	
	NOISE MOD	EL INPUTS	
Noise Distance to Observer	616.0 feet	Barrier Height:	0.0 feet
Noise Distance to Barrier:	616.0 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 15 = 4.5 dBA per doubling	

	NOISE MODEL PROJECTIONS									
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax			
Reference (Sample)	5.0	0.0	56.7	60.7	63.7	67.1	79.5			
Distance Attenuation	616.0	-31.4	-31.4	-31.4	-31.4	-31.4	-31.4			
Shielding (Barrier Attenuation)	616.0	0.0	0.0	0.0	0.0	0.0	0.0			
Raw (Distance + Barrier)		-31.4	25.3	29.3	32.3	35.7	48.1			
60 Minute Hourly Adjustmer	nt	-31.4	25.3	29.3	32.3	35.7	48.1			

**Observer Location:** R3

Source: Outdoor Pool/Spa Activity Condition: Operational

Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe

	NOISE MODEL INPUTS								
Noise Distance to Observer	747.0 feet	Barrier Height:	0.0 feet						
Noise Distance to Barrier:	747.0 feet	Noise Source Height:	4.0 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 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)	5.0	0.0	68.7	71.7	75.0	78.1	83.5		
Distance Attenuation	747.0	-43.5	-43.5	-43.5	-43.5	-43.5	-43.5		
Shielding (Barrier Attenuation)	747.0	0.0	0.0	0.0	0.0	0.0	0.0		
Raw (Distance + Barrier)		-43.5	25.2	28.2	31.5	34.6	40.0		
60 Minute Hourly Adjustmen	nt	-43.5	25.2	28.2	31.5	34.6	40.0		

S	TATIONARY SOURCI	E NOISE PREDICTION MODEL	7/26/2018
Observer Location: R3 Source: Gas Station Activity Condition: Operational		Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe	
	NOISE N	NODEL INPUTS	
Noise Distance to Observer	964.0 feet	Barrier Height:	0.0 feet
Noise Distance to Barrier:	964.0 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:	20.0
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling 15 = 4.5 dBA per doubling	

NOISE MODEL PROJECTIONS									
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax		
Reference (Sample)	5.0	0.0	65.6	66.9	69.5	74.4	82.4		
Distance Attenuation	964.0	-45.7	-45.7	-45.7	-45.7	-45.7	-45.7		
Shielding (Barrier Attenuation)	964.0	0.0	0.0	0.0	0.0	0.0	0.0		
Raw (Distance + Barrier)		-45.7	19.9	21.2	23.8	28.7	36.7		
60 Minute Hourly Adjustmer	nt	-45.7	19.9	21.2	23.8	28.7	36.7		

#### **Observer Location:** R4

Source: Air Conditioning Unit (Roof-Top) Condition: Operational Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe

NOISE MODEL INPUTS								
Noise Distance to Observer	504.0 feet	Barrier Height:	6.0 feet					
Noise Distance to Barrier:	494.0 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:	20.0 feet	Drop Off Coefficient:	20.0					
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)	5.0	0.0	74.4	76.1	77.4	77.7	78.2		
Distance Attenuation	504.0	-40.1	-40.1	-40.1	-40.1	-40.1	-40.1		
Shielding (Barrier Attenuation)	494.0	-5.2	-5.2	-5.2	-5.2	-5.2	-5.2		
Raw (Distance + Barrier)		-45.3	29.1	30.8	32.1	32.4	32.9		
39 Minute Hourly Adjustmen	nt	-47.2	27.2	28.9	30.2	30.5	31.0		

S	TATIONARY SOURCE NO	SE PREDICTION MODEL	7/26/2018
<b>Observer Location:</b> R4 Source: Residentia Condition: Operation	al Entry Gate & Speaker al	Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe	
	NOISE MODE	EL INPUTS	
Noise Distance to Observer	358.0 feet	Barrier Height:	6.0 feet
Noise Distance to Barrier:	348.0 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:	20.0
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling 15 = 4.5 dBA per doublin	

NOISE MODEL PROJECTIONS									
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax		
Reference (Sample)	40.0	0.0	52.6	55.3	60.7	63.7	65.6		
Distance Attenuation	358.0	-19.0	-19.0	-19.0	-19.0	-19.0	-19.0		
Shielding (Barrier Attenuation)	348.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5		
Raw (Distance + Barrier)		-24.5	28.1	30.8	36.2	39.2	41.1		
60 Minute Hourly Adjustmer	nt	-24.5	28.1	30.8	36.2	39.2	41.1		

#### **Observer Location:** R4

Source: Residential Parking Lot Veh. Movements Condition: Operational

Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe

NOISE MODEL INPUTS								
Noise Distance to Observer	42.0 feet	Barrier Height:	6.0 feet					
Noise Distance to Barrier:	32.0 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	0.0	44.0	47.0	55.0	61.0	68.6		
Distance Attenuation	42.0	-9.3	-9.3	-9.3	-9.3	-9.3	-9.3		
Shielding (Barrier Attenuation)	32.0	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6		
Raw (Distance + Barrier)		-14.9	29.1	32.1	40.1	46.1	53.7		
60 Minute Hourly Adjustmer	nt	-14.9	29.1	32.1	40.1	46.1	53.7		

STATIONARY SOURCE NOISE PREDICTION MODEL					
Observer Location: R4 Source: Commerc Condition: Operation	ial Parking Lot Veh. Move al	Project Name: Northgate ements Job Number: 11145 Analyst: A. Wolfe			
	NOISE MO	DEL INPUTS			
Noise Distance to Observer	443.0 feet	Barrier Height:	6.0 feet		
Noise Distance to Barrier:	433.0 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)	5.0	0.0	56.7	60.7	63.7	67.1	79.5		
Distance Attenuation	443.0	-29.2	-29.2	-29.2	-29.2	-29.2	-29.2		
Shielding (Barrier Attenuation)	433.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5		
Raw (Distance + Barrier)		-34.7	22.0	26.0	29.0	32.4	44.8		
60 Minute Hourly Adjustmer	nt	-34.7	22.0	26.0	29.0	32.4	44.8		

**Observer Location:** R4

Source: Outdoor Pool/Spa Activity Condition: Operational Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe

NOISE MODEL INPUTS								
Noise Distance to Observer	388.0 feet	Barrier Height:	6.0 feet					
Noise Distance to Barrier:	378.0 feet	Noise Source Height:	4.0 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:	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	0.0	68.7	71.7	75.0	78.1	83.5		
Distance Attenuation	388.0	-37.8	-37.8	-37.8	-37.8	-37.8	-37.8		
Shielding (Barrier Attenuation)	378.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5		
Raw (Distance + Barrier)		-43.3	25.4	28.4	31.7	34.8	40.2		
60 Minute Hourly Adjustmer	nt	-43.3	25.4	28.4	31.7	34.8	40.2		

STATIONARY SOURCE NOISE PREDICTION MODEL					
<b>Observer Location: R4</b> Source: RV Parking Lot Activity Condition: Operational		Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe			
	NOISE N	10DEL INPUTS			
Noise Distance to Observer	665.0 feet	Barrier Height:	6.0 feet		
Noise Distance to Barrier:	655.0 feet	Noise Source Height:	6.0 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	0.0	76.5	77.0	77.7	79.6	81.4		
Distance Attenuation	665.0	-27.3	-27.3	-27.3	-27.3	-27.3	-27.3		
Shielding (Barrier Attenuation)	655.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5		
Raw (Distance + Barrier)		-32.8	43.7	44.2	44.9	46.8	48.6		
60 Minute Hourly Adjustmer	nt	-32.8	43.7	44.2	44.9	46.8	48.6		

#### **Observer Location:** R5

Source: Air Conditioning Unit (Roof-Top) Condition: Operational Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe

NOISE MODEL INPUTS									
Noise Distance to Observer	671.0 feet	Barrier Height:	0.0 feet						
Noise Distance to Barrier:	671.0 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:	20.0 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	0.0	74.4	76.1	77.4	77.7	78.2		
Distance Attenuation	671.0	-42.6	-42.6	-42.6	-42.6	-42.6	-42.6		
Shielding (Barrier Attenuation)	671.0	0.0	0.0	0.0	0.0	0.0	0.0		
Raw (Distance + Barrier)		-42.6	31.8	33.5	34.8	35.1	35.6		
39 Minute Hourly Adjustmer	nt	-44.5	29.9	31.6	32.9	33.2	33.7		

S	TATIONARY SOURCE NO	SE PREDICTION MODEL	7/26/2018						
Observer Location: R5 Source: Residentia Condition: Operation	al Entry Gate & Speaker al	Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe							
NOISE MODEL INPUTS									
Noise Distance to Observer	131.0 feet	Barrier Height:	0.0 feet						
Noise Distance to Barrier:	131.0 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:	20.0						
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling 15 = 4.5 dBA per doublin							

NOISE MODEL PROJECTIONS									
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax		
Reference (Sample)	40.0	0.0	52.6	55.3	60.7	63.7	65.6		
Distance Attenuation	131.0	-10.3	-10.3	-10.3	-10.3	-10.3	-10.3		
Shielding (Barrier Attenuation)	131.0	0.0	0.0	0.0	0.0	0.0	0.0		
Raw (Distance + Barrier)		-10.3	42.3	45.0	50.4	53.4	55.3		
60 Minute Hourly Adjustmer	nt	-10.3	42.3	45.0	50.4	53.4	55.3		

#### **Observer Location: R5**

Source: Residential Parking Lot Veh. Movements Condition: Operational

Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe

NOISE MODEL INPUTS								
Noise Distance to Observer	49.0 feet	Barrier Height:	0.0 feet					
Noise Distance to Barrier:	49.0 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	0.0	44.0	47.0	55.0	61.0	68.6		
Distance Attenuation	49.0	-10.4	-10.4	-10.4	-10.4	-10.4	-10.4		
Shielding (Barrier Attenuation)	49.0	0.0	0.0	0.0	0.0	0.0	0.0		
Raw (Distance + Barrier)		-10.4	33.6	36.6	44.6	50.6	58.2		
60 Minute Hourly Adjustmer	nt	-10.4	33.6	36.6	44.6	50.6	58.2		

STATIONARY SOURCE NOISE PREDICTION MODEL					
Observer Location: R5 Source: Commerc Condition: Operation	ial Parking Lot Veh. Mover al	Project Name: Northgate ments Job Number: 11145 Analyst: A. Wolfe			
	NOISE MO	DEL INPUTS			
Noise Distance to Observer	626.0 feet	Barrier Height:	0.0 feet		
Noise Distance to Barrier:	626.0 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)	5.0	0.0	56.7	60.7	63.7	67.1	79.5		
Distance Attenuation	626.0	-31.5	-31.5	-31.5	-31.5	-31.5	-31.5		
Shielding (Barrier Attenuation)	626.0	0.0	0.0	0.0	0.0	0.0	0.0		
Raw (Distance + Barrier)		-31.5	25.2	29.2	32.2	35.6	48.0		
60 Minute Hourly Adjustmer	nt	-31.5	25.2	29.2	32.2	35.6	48.0		

**Observer Location: R5** 

Source: Dog Park Activity Condition: Operational Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe

NOISE MODEL INPUTS									
Noise Distance to Observer	20.0 feet	Barrier Height:	0.0 feet						
Noise Distance to Barrier:	20.0 feet	Noise Source Height:	4.0 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 20.0						
Noise Source Elevation:	0.0 feet	Drop Off Coefficient:							
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	0.0	58.5	61.0	65.2	72.6	78.6		
Distance Attenuation	20.0	-12.0	-12.0	-12.0	-12.0	-12.0	-12.0		
Shielding (Barrier Attenuation)	20.0	0.0	0.0	0.0	0.0	0.0	0.0		
Raw (Distance + Barrier)		-12.0	46.5	49.0	53.2	60.6	66.6		
60 Minute Hourly Adjustmen	it	-12.0	46.5	49.0	53.2	60.6	66.6		

S	TATIONARY SOURCE	NOISE PREDICTION MODEL	7/26/2018
<b>Observer Location: R5</b> Source: Outdoor Pool/Spa Activity Condition: Operational		Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe	
	NOISE M	ODEL INPUTS	
Noise Distance to Observer	315.0 feet	Barrier Height:	0.0 feet
Noise Distance to Barrier:	315.0 feet	Noise Source Height:	4.0 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 15 = 4.5  dBA per doubling	

NOISE MODEL PROJECTIONS									
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax		
Reference (Sample)	5.0	0.0	68.7	71.7	75.0	78.1	83.5		
Distance Attenuation	315.0	-36.0	-36.0	-36.0	-36.0	-36.0	-36.0		
Shielding (Barrier Attenuation)	315.0	0.0	0.0	0.0	0.0	0.0	0.0		
Raw (Distance + Barrier)		-36.0	32.7	35.7	39.0	42.1	47.5		
60 Minute Hourly Adjustmer	nt	-36.0	32.7	35.7	39.0	42.1	47.5		

**Observer Location:** R5

Source: RV Parking Lot Activity Condition: Operational Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe

NOISE MODEL INPUTS									
Noise Distance to Observer	549.0 feet	Barrier Height:	20.0 feet						
Noise Distance to Barrier:	50.0 feet	Noise Source Height:	6.0 feet						
Barrier Distance to Observer:	499.0 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  0 15 = 4.5  dBA per doubling							

NOISE MODEL PROJECTIONS									
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax		
Reference (Sample)	10.0	0.0	76.5	77.0	77.7	79.6	81.4		
Distance Attenuation	549.0	-26.1	-26.1	-26.1	-26.1	-26.1	-26.1		
Shielding (Barrier Attenuation)	50.0	-12.4	-12.4	-12.4	-12.4	-12.4	-12.4		
Raw (Distance + Barrier)		-38.5	38.0	38.5	39.2	41.1	42.9		
60 Minute Hourly Adjustmen	it	-38.5	38.0	38.5	39.2	41.1	42.9		

S	TATIONARY SOURCE NO	SE PREDICTION MODEL	7/26/2018						
<b>Observer Location: R6</b> Source: Residentia Condition: Operation	al Entry Gate & Speaker al	Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe							
NOISE MODEL INPUTS									
Noise Distance to Observer	549.0 feet	Barrier Height:	14.0 feet						
Noise Distance to Barrier:	399.0 feet	Noise Source Height:	5.0 feet						
Barrier Distance to Observer:	150.0 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 15 = 4.5 dBA per doublin							

NOISE MODEL PROJECTIONS									
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax		
Reference (Sample)	40.0	0.0	52.6	55.3	60.7	63.7	65.6		
Distance Attenuation	549.0	-22.8	-22.8	-22.8	-22.8	-22.8	-22.8		
Shielding (Barrier Attenuation)	399.0	-7.8	-7.8	-7.8	-7.8	-7.8	-7.8		
Raw (Distance + Barrier)		-30.6	22.0	24.7	30.1	33.1	35.0		
60 Minute Hourly Adjustmer	nt	-30.6	22.0	24.7	30.1	33.1	35.0		

#### **Observer Location: R6**

Source: Residential Parking Lot Veh. Movements Condition: Operational

rements Job Number: 11145 Analyst: A. Wolfe

Project Name: Northgate

NOISE MODEL INPUTS								
Noise Distance to Observer	490.0 feet	Barrier Height:	14.0 feet					
Noise Distance to Barrier:	340.0 feet	Noise Source Height:	5.0 feet					
Barrier Distance to Observer:	150.0 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 ( 15 = 4.5 dBA per doubling)						

NOISE MODEL PROJECTIONS									
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax		
Reference (Sample)	10.0	0.0	44.0	47.0	55.0	61.0	68.6		
Distance Attenuation	490.0	-25.4	-25.4	-25.4	-25.4	-25.4	-25.4		
Shielding (Barrier Attenuation)	340.0	-7.9	-7.9	-7.9	-7.9	-7.9	-7.9		
Raw (Distance + Barrier)		-33.3	10.7	13.7	21.7	27.7	35.3		
60 Minute Hourly Adjustmen	ıt	-33.3	10.7	13.7	21.7	27.7	35.3		

S	TATIONARY SOU	RCE NOISE PREDICTION MODEL	7/26/2018
Observer Location: R6 Source: Commerce Condition: Operation	•	Project Name: Northgate Movements Job Number: 11145 Analyst: A. Wolfe	
	NOIS	E MODEL INPUTS	
Noise Distance to Observer	1,045.0 feet	Barrier Height:	14.0 feet
Noise Distance to Barrier:	895.0 feet	Noise Source Height:	5.0 feet
Barrier Distance to Observer:	150.0 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)	5.0	0.0	56.7	60.7	63.7	67.1	79.5		
Distance Attenuation	1,045.0	-34.8	-34.8	-34.8	-34.8	-34.8	-34.8		
Shielding (Barrier Attenuation)	895.0	-7.5	-7.5	-7.5	-7.5	-7.5	-7.5		
Raw (Distance + Barrier)		-42.3	14.4	18.4	21.4	24.8	37.2		
60 Minute Hourly Adjustmer	nt	-42.3	14.4	18.4	21.4	24.8	37.2		

**Observer Location: R6** 

Source: Dog Park Activity Condition: Operational Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe

NOISE MODEL INPUTS									
Noise Distance to Observer	513.0 feet	Barrier Height:	14.0 feet						
Noise Distance to Barrier:	363.0 feet	Noise Source Height:	4.0 feet						
Barrier Distance to Observer:	150.0 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)	5.0	0.0	58.5	61.0	65.2	72.6	78.6		
Distance Attenuation	513.0	-40.2	-40.2	-40.2	-40.2	-40.2	-40.2		
Shielding (Barrier Attenuation)	363.0	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0		
Raw (Distance + Barrier)		-48.2	10.3	12.8	17.0	24.4	30.4		
60 Minute Hourly Adjustmen	ıt	-48.2	10.3	12.8	17.0	24.4	30.4		

S	TATIONARY SOURCE	NOISE PREDICTION MODEL	7/26/2018
<b>Observer Location: R6</b> Source: Outdoor Pool/Spa Activity Condition: Operational		Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe	
	NOISE M	ODEL INPUTS	
Noise Distance to Observer	546.0 feet	Barrier Height:	14.0 feet
Noise Distance to Barrier:	396.0 feet	Noise Source Height:	4.0 feet
Barrier Distance to Observer:	150.0 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)	5.0	0.0	68.7	71.7	75.0	78.1	83.5		
Distance Attenuation	546.0	-40.8	-40.8	-40.8	-40.8	-40.8	-40.8		
Shielding (Barrier Attenuation)	396.0	-7.9	-7.9	-7.9	-7.9	-7.9	-7.9		
Raw (Distance + Barrier)		-48.7	20.0	23.0	26.3	29.4	34.8		
60 Minute Hourly Adjustmer	nt	-48.7	20.0	23.0	26.3	29.4	34.8		

**Observer Location:** R6

Source: RV Parking Lot Activity Condition: Operational Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe

NOISE MODEL INPUTS								
Noise Distance to Observer	813.0 feet	Barrier Height:	14.0 feet					
Noise Distance to Barrier:	663.0 feet	Noise Source Height:	6.0 feet					
Barrier Distance to Observer:	150.0 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	0.0	76.5	77.0	77.7	79.6	81.4		
Distance Attenuation	813.0	-28.7	-28.7	-28.7	-28.7	-28.7	-28.7		
Shielding (Barrier Attenuation)	663.0	-7.5	-7.5	-7.5	-7.5	-7.5	-7.5		
Raw (Distance + Barrier)		-36.2	40.3	40.8	41.5	43.4	45.2		
60 Minute Hourly Adjustmen	nt	-36.2	40.3	40.8	41.5	43.4	45.2		

S	TATIONARY SOURCE NO	DISE PREDICTION MODEL	7/26/2018
<b>Observer Location: R7</b> Source: Air Condit Condition: Operation	ioning Unit (Roof-Top) al	Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe	
	NOISE MOD	EL INPUTS	
Noise Distance to Observer	652.0 feet	Barrier Height:	6.0 feet
Noise Distance to Barrier:	642.0 feet	Noise Source Height:	5.0 feet
Barrier Distance to Observer:	10.0 feet	Observer Height:	5.0 feet
Observer Elevation:	860.0 feet	Barrier Type (0-Wall, 1-Berm):	0
Noise Source Elevation:	875.0 feet	Drop Off Coefficient:	20.0
Barrier Elevation:	863.0 feet	20 = 6 dBA per doubling 15 = 4.5 dBA per doubling	

NOISE MODEL PROJECTIONS									
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax		
Reference (Sample)	5.0	0.0	74.4	76.1	77.4	77.7	78.2		
Distance Attenuation	652.0	-42.3	-42.3	-42.3	-42.3	-42.3	-42.3		
Shielding (Barrier Attenuation)	642.0	-9.2	-9.2	-9.2	-9.2	-9.2	-9.2		
Raw (Distance + Barrier)		-51.5	22.9	24.6	25.9	26.2	26.7		
39 Minute Hourly Adjustmer	nt	-53.4	21.0	22.7	24.0	24.3	24.8		

**Observer Location:** R7

*Source:* Drive-Through Speakerphone *Condition:* Operational

Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe

NOISE MODEL INPUTS									
Noise Distance to Observer	655.0 feet	Barrier Height:	6.0 feet						
Noise Distance to Barrier:	645.0 feet	Noise Source Height:	3.0 feet						
Barrier Distance to Observer:	10.0 feet	Observer Height:	5.0 feet						
Observer Elevation:	860.0 feet	Barrier Type (0-Wall, 1-Berm):	0						
Noise Source Elevation:	855.0 feet	Drop Off Coefficient:	20.0						
Barrier Elevation:	863.0 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)	15.0	0.0	60.9	62.1	63.6	65.3	66.4		
Distance Attenuation	655.0	-32.8	-32.8	-32.8	-32.8	-32.8	-32.8		
Shielding (Barrier Attenuation)	645.0	-9.7	-9.7	-9.7	-9.7	-9.7	-9.7		
Raw (Distance + Barrier)		-42.5	18.4	19.6	21.1	22.8	23.9		
60 Minute Hourly Adjustmer	nt	-42.5	18.4	19.6	21.1	22.8	23.9		

S	TATIONARY SOURCE N	OISE PREDICTION MODEL	7/26/2018
<b>Observer Location: R7</b> Source: Car Wash Tunnel Air Blowers Condition: Operational		Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe	
	NOISE MOI	DEL INPUTS	
Noise Distance to Observer	613.0 feet	Barrier Height:	6.0 feet
Noise Distance to Barrier:	603.0 feet	Noise Source Height:	8.0 feet
Barrier Distance to Observer:	10.0 feet	Observer Height:	5.0 feet
Observer Elevation:	860.0 feet	Barrier Type (0-Wall, 1-Berm):	0
Noise Source Elevation:	855.0 feet	Drop Off Coefficient:	20.0
Barrier Elevation:	863.0 feet	20 = 6 dBA per doubling 15 = 4.5 dBA per doubling	

NOISE MODEL PROJECTIONS									
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax		
Reference (Sample)	10.0	0.0	81.6	92.0	92.6	93.3	93.8		
Distance Attenuation	613.0	-35.7	-35.7	-35.7	-35.7	-35.7	-35.7		
Shielding (Barrier Attenuation)	603.0	-9.6	-9.6	-9.6	-9.6	-9.6	-9.6		
Raw (Distance + Barrier)		-45.3	36.3	46.7	47.3	48.0	48.5		
60 Minute Hourly Adjustmer	nt	-45.3	36.3	46.7	47.3	48.0	48.5		

**Observer Location:** R7

Condition: Operational

Project Name: Northgate Source: Commercial Parking Lot Veh. Movements Job Number: 11145

Analyst: A. Wolfe

NOISE MODEL INPUTS									
Noise Distance to Observer	672.0 feet	Barrier Height:	6.0 feet						
Noise Distance to Barrier:	662.0 feet	Noise Source Height:	5.0 feet						
Barrier Distance to Observer:	10.0 feet	Observer Height:	5.0 feet						
Observer Elevation:	860.0 feet	Barrier Type (0-Wall, 1-Berm):	0						
Noise Source Elevation:	855.0 feet	Drop Off Coefficient:	15.0						
Barrier Elevation:	863.0 feet	20 = 6  dBA per doubling of 15 = 4.5  dBA per doubling							

NOISE MODEL PROJECTIONS									
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax		
Reference (Sample)	5.0	0.0	56.7	60.7	63.7	67.1	79.5		
Distance Attenuation	672.0	-31.9	-31.9	-31.9	-31.9	-31.9	-31.9		
Shielding (Barrier Attenuation)	662.0	-9.7	-9.7	-9.7	-9.7	-9.7	-9.7		
Raw (Distance + Barrier)		-41.6	15.1	19.1	22.1	25.5	37.9		
60 Minute Hourly Adjustmer	nt	-41.6	15.1	19.1	22.1	25.5	37.9		

S	TATIONARY SOURCE	NOISE PREDICTION MODEL	7/26/2018
Observer Location: R7 Source: Outdoor Pool/Spa Activity Condition: Operational		Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe	
	NOISE M	ODEL INPUTS	
Noise Distance to Observer	912.0 feet	Barrier Height:	6.0 feet
Noise Distance to Barrier:	902.0 feet	Noise Source Height:	4.0 feet
Barrier Distance to Observer:	10.0 feet	Observer Height:	5.0 feet
Observer Elevation:	860.0 feet	Barrier Type (0-Wall, 1-Berm):	0
Noise Source Elevation:	855.0 feet	Drop Off Coefficient:	20.0
Barrier Elevation:	863.0 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	0.0	68.7	71.7	75.0	78.1	83.5		
Distance Attenuation	912.0	-45.2	-45.2	-45.2	-45.2	-45.2	-45.2		
Shielding (Barrier Attenuation)	902.0	-9.7	-9.7	-9.7	-9.7	-9.7	-9.7		
Raw (Distance + Barrier)		-54.9	13.8	16.8	20.1	23.2	28.6		
60 Minute Hourly Adjustmer	nt	-54.9	13.8	16.8	20.1	23.2	28.6		

EL

7/26/2018

**Observer Location: R7** Project Name: Northgate Source: Gas Station Activity Job Number: 11145 Condition: Operational Analyst: A. Wolfe **NOISE MODEL INPUTS** Barrier Height: Noise Distance to Observer 616.0 feet 6.0 feet Noise Source Height: 5.0 feet Noise Distance to Barrier: 606.0 feet **Observer Height:** 5.0 feet Barrier Distance to Observer: 10.0 feet Barrier Type (0-Wall, 1-Berm): 0 Observer Elevation: 860.0 feet Drop Off Coefficient: 20.0 Noise Source Elevation: 855.0 feet 20 = 6 dBA per doubling of distance Barrier Elevation: 863.0 feet 15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS									
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax		
Reference (Sample)	5.0	0.0	65.6	66.9	69.5	74.4	82.4		
Distance Attenuation	616.0	-41.8	-41.8	-41.8	-41.8	-41.8	-41.8		
Shielding (Barrier Attenuation)	606.0	-9.7	-9.7	-9.7	-9.7	-9.7	-9.7		
Raw (Distance + Barrier)		-51.5	14.1	15.4	18.0	22.9	30.9		
60 Minute Hourly Adjustmer	nt	-51.5	14.1	15.4	18.0	22.9	30.9		

S	TATIONARY SOUR	CE NOISE PREDICTION MODEL	7/26/2018
Observer Location: R1 Source: Outdoor Event Activity Condition: Operational		Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe	
	NOISE	MODEL INPUTS	
Noise Distance to Observer	221.0 feet	Barrier Height:	0.0 feet
Noise Distance to Barrier:	221.0 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 o 15 = 4.5 dBA per doubling	

NOISE MODEL PROJECTIONS									
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax		
Reference (Sample)	5.0	0.0	73.1	89.2	92.1	93.9	100.4		
Distance Attenuation	221.0	-32.9	-32.9	-32.9	-32.9	-32.9	-32.9		
Shielding (Barrier Attenuation)	221.0	0.0	0.0	0.0	0.0	0.0	0.0		
Raw (Distance + Barrier)		-32.9	40.2	56.3	59.2	61.0	67.5		
60 Minute Hourly Adjustmer	nt	-32.9	40.2	56.3	59.2	61.0	67.5		

7/26/2018

**Observer Location: R2** Source: Outdoor Event Activity Condition: Operational

		N	
Noise Distance to Observer	492.0	feet	
Noise Distance to Barrier:	10.0	feet	
Barrier Distance to Observer:	482.0	feet	
Observer Elevation:	0.0	feet	
Noise Source Elevation:	0.0	feet	
Barrier Elevation:	0.0	feet	

Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe

NOISE MODEL IN	NPUTS		
t	Barrier Height:	10.0 feet	
t	Noise Source Height:	8.0 feet	
t	Observer Height:	5.0 feet	
t	Barrier Type (0-Wall, 1-Berm):	0	
t	Drop Off Coefficient:	20.0	
t	20 = 6 dBA per doubling 15 = 4.5 dBA per doublin		

NOISE MODEL PROJECTIONS Noise Level L8 L2 Distance (feet) Leq L50 L25 Lmax Reference (Sample) 5.0 0.0 73.1 93.9 100.4 89.2 92.1 **Distance Attenuation** 492.0 -39.9 -39.9 -39.9 -39.9 -39.9 -39.9 Shielding (Barrier Attenuation) 10.0 -6.9 -6.9 -6.9 -6.9 -6.9 -6.9 Raw (Distance + Barrier) -46.8 26.3 42.4 45.3 47.1 53.6 60 Minute Hourly Adjustment 47.1 53.6 -46.8 26.3 42.4 45.3

S	TATIONARY SOURCI	E NOISE PREDICTION MODEL	7/26/2018
Observer Location: R3 Source: Outdoor Event Activity Condition: Operational		Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe	
	NOISE N	10DEL INPUTS	
Noise Distance to Observer	763.0 feet	Barrier Height:	0.0 feet
Noise Distance to Barrier: Barrier Distance to Observer:	763.0 feet 0.0 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 15 = 4.5 dBA per doubling	

NOISE MODEL PROJECTIONS							
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax
Reference (Sample)	5.0	0.0	73.1	89.2	92.1	93.9	100.4
Distance Attenuation	763.0	-43.7	-43.7	-43.7	-43.7	-43.7	-43.7
Shielding (Barrier Attenuation)	763.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		-43.7	29.4	45.5	48.4	50.2	56.7
60 Minute Hourly Adjustmer	nt	-43.7	29.4	45.5	48.4	50.2	56.7

**Observer Location:** R7

Source: Outdoor Event Activity Condition: Operational Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe

NOISE MODEL INPUTS							
Noise Distance to Observer	768.0 feet	Barrier Height:	6.0 feet				
Noise Distance to Barrier:	758.0 feet	Noise Source Height:	8.0 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:	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)	5.0	0.0	73.1	89.2	92.1	93.9	100.4
Distance Attenuation	768.0	-43.7	-43.7	-43.7	-43.7	-43.7	-43.7
Shielding (Barrier Attenuation)	758.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5
Raw (Distance + Barrier)		-49.2	23.9	40.0	42.9	44.7	51.2
60 Minute Hourly Adjustmen	ıt	-49.2	23.9	40.0	42.9	44.7	51.2

#### **Observer Location:** R5

Source: Air Conditioning Unit (Roof-Top) Condition: Operational Mitigation R5 Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe 1/25/2018

NOISE MODEL INPUTS							
Noise Distance to Observer	671.0 feet	Barrier Height:	6.0 feet				
Noise Distance to Barrier:	661.0 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:	20.0 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)	5.0	0.0	74.4	76.1	77.4	77.7	78.2
Distance Attenuation	671.0	-42.6	-42.6	-42.6	-42.6	-42.6	-42.6
Shielding (Barrier Attenuation)	661.0	-5.2	-5.2	-5.2	-5.2	-5.2	-5.2
Raw (Distance + Barrier)		-47.8	26.6	28.3	29.6	29.9	30.4
39 Minute Hourly Adjustmer	it	-49.7	24.7	26.4	27.7	28.0	28.5

S	TATIONARY SOURCE NO	SE PREDICTION MODEL	1/25/2018
Observer Location: R5 Source: Residentia Condition: Operation	al Entry Gate & Speaker al Mitigation R5	Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe	
	NOISE MODE		
Noise Distance to Observer	131.0 feet	Barrier Height:	6.0 feet
Noise Distance to Barrier:	121.0 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:	20.0
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling 15 = 4.5 dBA per doubling	

NOISE MODEL PROJECTIONS							
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax
Reference (Sample)	40.0	0.0	52.6	55.3	60.7	63.7	65.6
Distance Attenuation	131.0	-10.3	-10.3	-10.3	-10.3	-10.3	-10.3
Shielding (Barrier Attenuation)	121.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5
Raw (Distance + Barrier)		-15.8	36.8	39.5	44.9	47.9	49.8
60 Minute Hourly Adjustmer	nt	-15.8	36.8	39.5	44.9	47.9	49.8

#### **Observer Location:** R5

*Source:* Residential Parking Lot Veh. Movements *Condition:* Operational Mitigation R5

Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe 1/25/2018

NOISE MODEL INPUTS							
Noise Distance to Observer	49.0 feet	Barrier Height:	6.0 feet				
Noise Distance to Barrier:	39.0 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	0.0	44.0	47.0	55.0	61.0	68.6
Distance Attenuation	49.0	-10.4	-10.4	-10.4	-10.4	-10.4	-10.4
Shielding (Barrier Attenuation)	39.0	-5.6	-5.6	-5.6	-5.6	-5.6	-5.6
Raw (Distance + Barrier)		-16.0	28.0	31.0	39.0	45.0	52.6
60 Minute Hourly Adjustmer	nt	-16.0	28.0	31.0	39.0	45.0	52.6

S	TATIONARY SOURCE NOIS	SE PREDICTION MODEL	1/25/2018
<b>Observer Location: R5</b> Source: Commerc Condition: Operation	ial Parking Lot Veh. Moveme al Mitigation R5	Project Name: Northgate hts Job Number: 11145 Analyst: A. Wolfe	
	NOISE MODE	L INPUTS	
Noise Distance to Observer	626.0 feet	Barrier Height:	6.0 feet
Noise Distance to Barrier:	616.0 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 15 = 4.5 dBA per doubling	

NOISE MODEL PROJECTIONS							
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax
Reference (Sample)	5.0	0.0	56.7	60.7	63.7	67.1	79.5
Distance Attenuation	626.0	-31.5	-31.5	-31.5	-31.5	-31.5	-31.5
Shielding (Barrier Attenuation)	616.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5
Raw (Distance + Barrier)		-37.0	19.7	23.7	26.7	30.1	42.5
60 Minute Hourly Adjustmer	nt	-37.0	19.7	23.7	26.7	30.1	42.5

#### **Observer Location:** R5

1/25/2018

Source: Dog Park Activity Condition: Operational Mitigation R5 Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe

NOISE MODEL INPUTS							
Noise Distance to Observer	20.0 feet	Barrier Height:	6.0 feet				
Noise Distance to Barrier:	10.0 feet	Noise Source Height:	4.0 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:	20.0				
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)	5.0	0.0	58.5	61.0	65.2	72.6	78.6
Distance Attenuation	20.0	-12.0	-12.0	-12.0	-12.0	-12.0	-12.0
Shielding (Barrier Attenuation)	10.0	-6.9	-6.9	-6.9	-6.9	-6.9	-6.9
Raw (Distance + Barrier)		-18.9	39.6	42.1	46.3	53.7	59.7
60 Minute Hourly Adjustmen	it	-18.9	39.6	42.1	46.3	53.7	59.7

STATIONARY SOURCE NOISE PREDICTION MODEL				
<b>Observer Location: R5</b> Source: Outdoor Pool/Spa Activity Condition: Operational Mitigation R5		Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe		
	NOIS	SE MODEL INPUTS		
Noise Distance to Observer	315.0 feet	Barrier Height:	6.0 feet	
Noise Distance to Barrier:	305.0 feet	Noise Source Height:	4.0 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:	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	0.0	68.7	71.7	75.0	78.1	83.5
Distance Attenuation	315.0	-36.0	-36.0	-36.0	-36.0	-36.0	-36.0
Shielding (Barrier Attenuation)	305.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5
Raw (Distance + Barrier)		-41.5	27.2	30.2	33.5	36.6	42.0
60 Minute Hourly Adjustmer	nt	-41.5	27.2	30.2	33.5	36.6	42.0

#### **Observer Location:** R5

1/25/2018

*Source:* RV Parking Lot Activity *Condition:* Operational Mitigation R5

Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe

NOISE MODEL INPUTS						
Noise Distance to Observer	549.0 feet	Barrier Height:	20.0 feet			
Noise Distance to Barrier:	50.0 feet	Noise Source Height:	6.0 feet			
Barrier Distance to Observer:	499.0 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	0.0	76.5	77.0	77.7	79.6	81.4
Distance Attenuation	549.0	-26.1	-26.1	-26.1	-26.1	-26.1	-26.1
Shielding (Barrier Attenuation)	50.0	-12.4	-12.4	-12.4	-12.4	-12.4	-12.4
Raw (Distance + Barrier)		-38.5	38.0	38.5	39.2	41.1	42.9
60 Minute Hourly Adjustmer	nt	-38.5	38.0	38.5	39.2	41.1	42.9

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