

Appendix D

Noise Impact Analysis



The Exchange

NOISE IMPACT ANALYSIS

CITY OF RIVERSIDE

PREPARED BY:

Bill Lawson, PE, INCE
blawson@urbanxroads.com
(949) 336-5979

Alex Wolfe, INCE
awolfe@urbanxroads.com
(949) 336-5977

JULY 26, 2018

TABLE OF CONTENTS

TABLE OF CONTENTS.....	III
APPENDICES.....	IV
LIST OF EXHIBITS.....	V
LIST OF TABLES	V
LIST OF ABBREVIATED TERMS	VI
 EXECUTIVE SUMMARY	 1
Off-Site Traffic Noise Analysis.....	1
On-Site Traffic Noise Analysis	1
Operational Noise Analysis	3
Construction Noise Analysis	4
Construction Vibration Analysis	4
Summary of CEQA Significance Findings	4
 1 INTRODUCTION.....	 7
1.1 Site Location.....	7
1.2 Project Description.....	7
 2 FUNDAMENTALS	 11
2.1 Range of Noise	11
2.2 Noise Descriptors	12
2.3 Sound Propagation.....	12
2.4 Noise Control	13
2.5 Noise Barrier Attenuation	13
2.6 Land Use Compatibility With Noise	14
2.7 Community Response to Noise	14
2.8 Vibration	15
 3 REGULATORY SETTING	 17
3.1 State of California Noise Requirements.....	17
3.2 State of California Building Code	17
3.3 City of Riverside General Plan.....	18
3.4 Operational Noise Standards	20
3.5 Construction Noise Standards.....	21
3.6 Construction Vibration Standards.....	21
 4 SIGNIFICANCE CRITERIA	 23
4.1 Noise-Sensitive Receivers	23
4.2 Significance Criteria Summary	24
 5 EXISTING NOISE LEVEL MEASUREMENTS	 27
5.1 Measurement Procedure and Criteria	27
5.2 Noise Measurement Locations	27
5.3 Noise Measurement Results	28
 6 METHODS AND PROCEDURES.....	 33
6.1 FHWA Traffic Noise Prediction Model	33
6.2 Construction Vibration Assessment Methodology	37

7	OFF-SITE TRANSPORTATION NOISE IMPACTS	39
7.1	Traffic Noise Contours	39
7.2	Existing Condition Project Traffic Noise Level Contributions.....	46
7.3	Opening Year 2022 Project Traffic Noise Level Contributions.....	47
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	RECEIVER LOCATIONS.....	55
10	OPERATIONAL IMPACTS.....	57
10.1	Reference Noise Levels	57
10.2	Operational Noise Levels	62
10.3	Unmitigated Operational Noise Level Compliance	65
10.4	Mitigated Operational Noise Level Compliance	65
10.5	Unmitigated Project Operational Noise Contribution	67
10.6	Operational Noise Mitigation Measures.....	68
11	CONSTRUCTION IMPACTS	69
11.1	Construction Noise Levels.....	69
11.2	Construction Vibration Impacts	69
12	REFERENCES.....	73
13	CERTIFICATION.....	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	20
TABLE 4-1: SIGNIFICANCE OF NOISE IMPACTS AT NOISE-SENSITIVE RECEIVERS.....	24
TABLE 4-2: SIGNIFICANCE CRITERIA SUMMARY	26
TABLE 5-1: 24-HOUR AMBIENT NOISE LEVEL MEASUREMENTS	30
TABLE 6-1: OFF-SITE ROADWAY PARAMETERS.....	34
TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES	35
TABLE 6-3: TIME OF DAY VEHICLE SPLITS	35
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	41
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)	53
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.....	63
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

TABLE 10-6: UNMITIGATED DAYTIME OPERATIONAL NOISE LEVEL CONTRIBUTIONS	67
TABLE 10-7: UNMITIGATED NIGHTTIME OPERATIONAL NOISE LEVEL CONTRIBUTIONS	68
TABLE 11-1: CONSTRUCTION EQUIPMENT VIBRATION LEVELS	71

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_{eq}	Equivalent continuous (average) sound level
L_{min}	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:

- Windows:
 - 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 standard 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)
- Walls: 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.
- Residential Roofs: 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.
- Ventilation:
 - 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 6-foot high noise barrier is required as a Project operational noise mitigation measure. With the 6-foot 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;
- 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.

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS

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

EXHIBIT ES-A: SUMMARY OF ON-SITE MITIGATION MEASURES



LEGEND:

- Buildings requiring upgraded windows and sliding glass doors (all windows on all floors) with 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.

EXHIBIT 2-A: TYPICAL NOISE LEVELS

COMMON OUTDOOR ACTIVITIES	COMMON INDOOR ACTIVITIES	A - WEIGHTED SOUND LEVEL dBA	SUBJECTIVE LOUDNESS	EFFECTS OF NOISE
THRESHOLD OF PAIN		140	INTOLERABLE OR DEAFENING	HEARING LOSS
NEAR JET ENGINE		130		
		120		
JET FLY-OVER AT 300m (1000 ft)	ROCK BAND	110		
LOUD AUTO HORN		100	VERY NOISY	
GAS LAWN MOWER AT 1m (3 ft)		90		
DIESEL TRUCK AT 15m (50 ft), at 80 km/hr (50 mph)	FOOD BLENDER AT 1m (3 ft)	80		
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 DISTURBANCE
QUIET URBAN NIGHTTIME	THEATER, LARGE CONFERENCE ROOM (BACKGROUND)	40		
QUIET SUBURBAN NIGHTTIME	LIBRARY	30	FAINT	NO EFFECT
QUIET RURAL NIGHTTIME	BEDROOM AT NIGHT, CONCERT HALL (BACKGROUND)	20		
	BROADCAST/RECORDING STUDIO	10	VERY FAINT	
LOWEST THRESHOLD OF HUMAN HEARING	LOWEST THRESHOLD OF HUMAN HEARING	0		

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

2.1 RANGE OF NOISE

Since the range of intensities that the human ear can detect is so large, the scale frequently used to measure intensity is a scale based on multiples of 10, the logarithmic scale. The scale for measuring intensity is the decibel scale. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud. (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 addition of 10 decibels to dBA L_{eq} sound levels at night between 10:00 p.m. and 7:00 a.m. These additions are made to account for the noise sensitive time periods during the evening and night hours when sound appears louder. CNEL does not represent the actual sound level heard at any time, but rather represents the total sound exposure. The 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

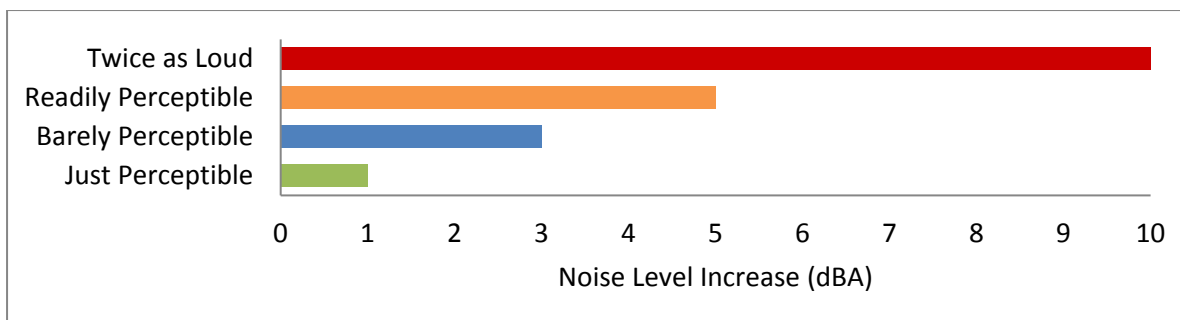
Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches, and residences are more sensitive to noise intrusion than are commercial or industrial developments and related activities. As ambient noise levels affect the perceived amenity or livability of a development,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

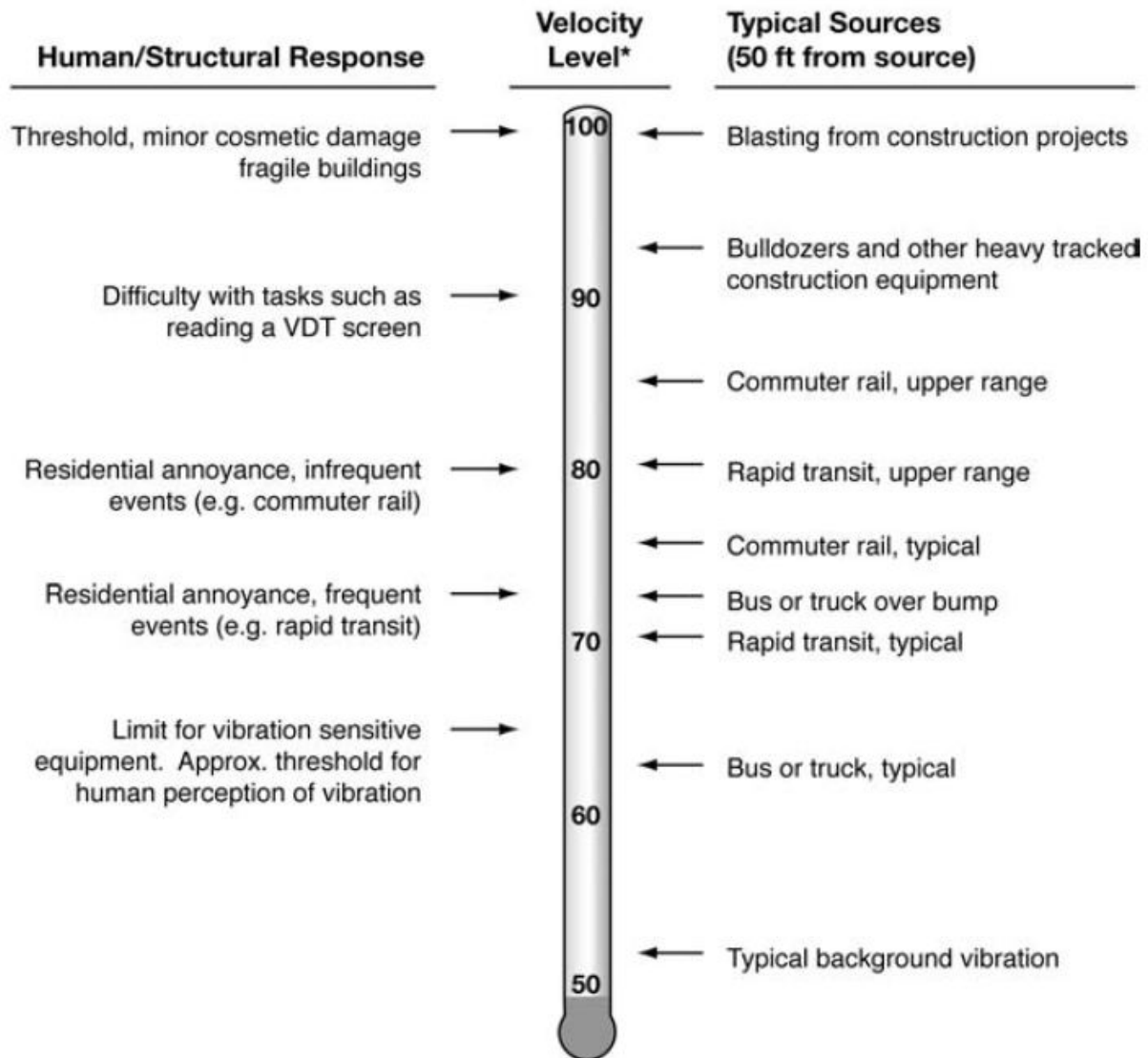
2.8 VIBRATION

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^{-6} 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_{eq} 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 policies 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 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.

EXHIBIT 3-A: NOISE/LAND USE NOISE COMPATIBILITY CRITERIA

Land Use Category	Community Noise Equivalent Level (CNEL) or Day-Night Level (Ldn), dB						Nature of the noise environment where the CNEL or Ldn level is:
	55	60	65	70	75	80	
Single Family Residential*							Below 55 dB Relatively quiet suburban or urban areas, no arterial streets within 1 block, no freeways within 1/4 mile.
Infill Single Family Residential*							
Commercial- Motels, Hotels, Transient Lodging							55-65 dB Most somewhat noisy urban areas, near but not directly adjacent to high volumes of traffic.
Schools, Libraries, Churches, Hospitals, Nursing Homes							
Amphitheaters, Concert Hall, Auditorium, Meeting Hall							65-75 dB Very noisy urban areas near arterials, freeways or airports.
Sports Arenas, Outdoor Spectator Sports							
Playgrounds, Neighborhood Parks							75+ dB Extremely noisy urban areas adjacent to freeways or under airport traffic patterns. Hearing damage with constant exposure outdoors.
Golf Courses, Riding Stables, Water Rec., Cemeteries							
Office Buildings, Business, Commercial, Professional							
Industrial, Manufacturing Utilities, Agriculture							
Freeway Adjacent Commercial, Office, and Industrial Uses.							

 **Normally Acceptable**

Specific land use is satisfactory, based on the assumption that any building is of normal conventional construction, without any special noise insulation requirements.

 **Conditionally Acceptable**

New construction or development should be undertaken only after a detailed analysis of noise reduction requirements is made and needed noise insulation features included in design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice.

 **Normally Unacceptable**

New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in design.

 **Conditionally Unacceptable**

New construction or development should generally not be undertaken, unless it can be demonstrated that noise reduction requirements can be employed to reduce noise impacts to an acceptable level. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in the design.

The Community Noise Equivalent Level (CNEL) and Day-Night Noise Level (Ldn) are measures of the 24-hour 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_8), or the standard plus 15 dBA for a cumulative period of more than 1 minute 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.

TABLE 3-1: OPERATIONAL NOISE STANDARDS

Jurisdiction	Land Use	Time Period	Exterior Noise Level Standards (dBA) ¹			
			L_{50} (30 mins)	L_{25} (15 mins)	L_8 (5 mins)	L_2 (1 min)
City of Riverside ²	Residential	Daytime	55	60	65	70
		Nighttime	45	50	55	60
	Community Support	Anytime	60	65	70	75

¹ The percent noise level is the level exceeded "n" percent of the time during the measurement period. L_{50} is the noise level exceeded 50% of the time.

² 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.

This page intentionally left blank

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.

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

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_{50} daytime or 45 dBA L_{50} nighttime noise level standards for sensitive residential land uses, or 60 dBA L_{50} for community support uses. These standards shall not be exceeded for a cumulative period of 30 minutes (L_{50}), or plus 5 dBA cannot be exceeded for a cumulative period of more than 15 minutes (L_{25}) in any hour, or the standard plus 10 dBA for a cumulative period of more than 5 minutes (L_8) in any hour, or the standard plus 15 dBA for a cumulative period of more than 1 minute (L_2) 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:
 - are less than 60 dBA L_{50} and the Project creates a *readily perceptible* 5 dBA L_{50} or greater Project-related noise level increase; or
 - range from 60 to 65 dBA L_{50} and the Project creates a *barely perceptible* 3 dBA L_{50} or greater Project-related noise level increase; or
 - 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.

TABLE 4-2: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Receiving Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
Off-Site Traffic	Noise-Sensitive ¹	If ambient is < 60 dBA CNEL	≥ 5 dBA CNEL Project increase	
		If ambient is 60 - 65 dBA CNEL	≥ 3 dBA CNEL Project increase	
		If ambient is > 65 dBA CNEL	≥ 1.5 dBA CNEL Project increase	
On-Site Traffic ²	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 ³	See Table 3-1	
	Noise-Sensitive ¹	if ambient is < 60 dBA L ₅₀	≥ 5 dBA L ₅₀ Project increase	
		if ambient is 60 - 65 dBA L ₅₀	≥ 3 dBA L ₅₀ Project increase	
		if ambient is > 65 dBA L ₅₀	≥ 1.5 dBA L ₅₀ Project increase	
Construction ⁴	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 ⁵	80 VdB	

¹ Source: FICON, 1992.² Source: City of Riverside General Plan Noise Element, Figure N-10 and the State of California Building Code standards (Section 3.2).³ Source: City of Riverside Municipal Code, Title 7 Noise Control, Section 7.25.010 (A) (Appendix 3.1).⁴ Source: City of Riverside Municipal Code, Section 7.35.020 consistent with direction from the City of Riverside Planning Department.⁵ 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 18th, 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_{eq} during the daytime hours and from 54.2 to 59.9 dBA L_{eq} during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 58.6 dBA L_{eq} with an average nighttime noise level of 57.2 dBA L_{eq} .
- 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_{eq} during the daytime hours and from 56.1 to 65.2 dBA L_{eq} during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 66.0 dBA L_{eq} with an average nighttime noise level of 61.5 dBA L_{eq} .
- 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_{eq} during the daytime hours to levels of 53.2 to 60.6 dBA L_{eq} during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 65.7 dBA L_{eq} with an average nighttime noise level of 57.3 dBA L_{eq} .
- 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_{eq} during the daytime hours and from 52.2 to 62.4 dBA L_{eq} during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 64.2 dBA L_{eq} with an average nighttime noise level of 58.2 dBA L_{eq} .
- 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_{eq} during the daytime hours and from 64.2 to 70.1 dBA L_{eq} during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 68.2 dBA L_{eq} with an average nighttime noise level of 67.2 dBA L_{eq} .

- 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_{eq} during the daytime hours and from 61.2 to 67.0 dBA L_{eq} during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 66.3 dBA L_{eq} with an average nighttime noise level of 64.2 dBA L_{eq} .
- 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_{eq} during the daytime hours and from 70.9 to 77.7 dBA L_{eq} during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 78.1 dBA L_{eq} with an average nighttime noise level of 75.0 dBA L_{eq} .

Table 5-1 provides the (energy average) noise levels used to describe the daytime and nighttime ambient conditions. These daytime and nighttime energy average noise levels represent the average of all hourly noise levels observed during these time periods expressed as a single number. Appendix 5.2 provides summary worksheets of the noise levels for each hour as well as the minimum, maximum, L_1 , L_2 , L_5 , L_8 , L_{25} , L_{50} , L_{90} , L_{95} , and L_{99} percentile noise levels observed during the daytime and nighttime periods.

The background ambient noise levels in the Project study area are dominated by the transportation-related noise associated 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.

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

Location ¹	Distance to Project Boundary (Feet)	Description	Energy Average Hourly Noise Level (dBA L _{eq}) ²		Average Median Noise Level (dBA L ₅₀) ²		CNEL
			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

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

² 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



This page intentionally left blank

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.

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Adjacent Land Use ¹	Distance from Centerline to Nearest Adjacent Land Use (Feet) ²	Vehicle Speed (mph) ³
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

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

² 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.

³ Source: The Exchange Traffic Impact Analysis, June 2018.

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic (1,000's) ¹					
			Existing		Opening Year 2020		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

¹ Source: The Exchange Traffic Impact Analysis, June 2018.**TABLE 6-3: TIME OF DAY VEHICLE SPLITS**

Vehicle Type	Time of Day Splits ¹			Total of Time of Day Splits
	Daytime	Evening	Nighttime	
Autos	77.50%	12.90%	9.60%	100.00%
Medium Trucks	84.80%	4.90%	10.30%	100.00%
Heavy Trucks	86.50%	2.70%	10.80%	100.00%

¹ 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.

TABLE 6-4: DISTRIBUTION OF TRAFFIC FLOW BY VEHICLE TYPE (VEHICLE MIX)

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

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

² 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.

TABLE 6-5: ON-SITE ROADWAY PARAMETERS

Roadway Segment	Lanes	Classification	Future ADT Volume ¹	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

¹ 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.

² 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: $L_{VdB}(D) = L_{VdB}(25 \text{ ft}) - 30\log(D/25)$

TABLE 6-6: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

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.

This page intentionally left blank

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:

- Existing Conditions Without / With Project: This scenario refers to the existing present-day noise conditions without and with the proposed Project.
- Opening Year 2022 Without / With Buildout of the Project: 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.
- Horizon Year 2040 Without / With Project: 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.

TABLE 7-1: EXISTING WITHOUT PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Land Use ¹	CNEL at Nearest Adjacent Land Use (dBA) ²	Distance to Contour from Centerline (Feet)		
					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

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

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

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

TABLE 7-2: EXISTING WITH PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Land Use ¹	CNEL at Nearest Adjacent Land Use (dBA) ²	Distance to Contour from Centerline (Feet)		
					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

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

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

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

TABLE 7-3: OPENING YEAR 2022 WITHOUT PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Land Use ¹	CNEL at Nearest Adjacent Land Use (dBA) ²	Distance to Contour from Centerline (Feet)		
					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

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

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

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

TABLE 7-4: OPENING YEAR 2022 WITH PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Land Use ¹	CNEL at Nearest Adjacent Land Use (dBA) ²	Distance to Contour from Centerline (Feet)		
					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	66.8	RW	44	94
12	Orange St.	n/o Russell St.	Residential	66.3	RW	40	86
13	Orange St.	s/o Russell St.	Residential	63.3	RW	RW	54
14	Primer St.	n/o Columbia Av.	Commercial	70.5	36	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

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

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

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

TABLE 7-5: HORIZON YEAR 2040 WITHOUT PROJECT CONDITIONS NOISE CONTOURS

ID	Road	Segment	Adjacent Land Use ¹	CNEL at Nearest Adjacent Land Use (dBA) ²	Distance to Contour from Centerline (Feet)		
					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	RW	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

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

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

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

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

ID	Road	Segment	Adjacent Land Use ¹	CNEL at Nearest Adjacent Land Use (dBA) ²	Distance to Contour from Centerline (Feet)		
					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	67.1	RW	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

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

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

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

7.2 EXISTING 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.

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

ID	Road	Segment	Adjacent Land Use ¹	CNEL at Adjacent Land Use (dBA) ²			Threshold Exceeded? ³
				No Project	With Project	Project Addition	
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

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

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

³ Significance Criteria (Section 4).

7.3 OPENING YEAR 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.

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

ID	Road	Segment	Adjacent Land Use ¹	CNEL at Adjacent Land Use (dBA) ¹			Threshold Exceeded? ²
				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

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

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

³ Significance Criteria (Section 4).

7.4 HORIZON YEAR 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.

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

ID	Road	Segment	Adjacent Land Use ¹	CNEL at Adjacent Land Use (dBA) ¹			Threshold Exceeded? ²
				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

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

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

³ Significance Criteria (Section 4).

8 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)

TABLE 8-1: EXTERIOR TRANSPORTATION NOISE LEVELS

Receiver Location	Land Use ¹	Traffic Noise Source	Unmitigated Exterior Noise Level (dBA CNEL)		Noise/Land Use Compatibility Criteria (dBA CNEL) ²			Land Use Compatibility	Compatibility Requirements ²
			Individual	Combined	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable		
East Apartment Buildings	Residential	SR-91/I-215	61.2	61.7	< 60	60 - 65	65 - 70	Conditionally Acceptable	Interior Analysis & Mech. Ventilation
		SR-60	51.5						
East Hotel Building	Commercial (Hotel)	SR-91/I-215	52.2	71.5	< 60	60 - 70	70 - 80	Normally Unacceptable	Interior Analysis & Mech. Ventilation
		SR-60	71.4						
South Hotel Building	Commercial (Hotel)	SR-91/I-215	50.1	78.2	< 60	60 - 70	70 - 80	Normally Unacceptable	Interior Analysis & Mech. Ventilation
		SR-60	78.2						
Fast Food Building	Commercial (Business)	SR-60	65.4	65.4	< 65	65 - 75	> 75	Conditionally Acceptable	Interior Analysis & Mech. Ventilation
		SR-60	57.2						
West Commercial Building	Commercial (Business)	Orange St.	61.4	62.8	< 65	65 - 75	> 75	Normally Acceptable	Standard Construction
		Orange St.	62.9						
West Apartment Building	Residential	Orange St.	62.9	62.9	< 60	60 - 65	65 - 70	Conditionally Acceptable	Interior Analysis & Mech. Ventilation

¹ Based on the categories found in Figure N-10 of the City of Riverside General Plan Noise Element.² Source: Figure N-10 of the City of Riverside General Plan Noise Element.

"Mech. " = Mechanical

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 assemblies 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.

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

Receiver Location	Noise Level at Façade ¹	Required Interior NR ²	Estimated Interior NR ³	Upgraded Windows ⁴	Interior Noise Level ⁵	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

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

² 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.

³ A minimum of 25 dBA noise reduction is assumed with standard building construction.

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

⁵ Estimated interior noise level with minimum STC rating for all windows.

"NR" = Noise Reduction

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

Receiver Location	Noise Level at Façade ¹	Required Interior NR ²	Estimated Interior NR ³	Upgraded Windows ⁴	Interior Noise Level ⁵	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	— ⁶	— ⁶	— ⁶	— ⁶	— ⁶	— ⁶	— ⁶
West Commercial Building	— ⁶	— ⁶	— ⁶	— ⁶	— ⁶	— ⁶	— ⁶
West Apartment Building	62.8	17.8	25.0	No	37.8	45	No

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

² 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.

³ A minimum of 25 dBA noise reduction is assumed with standard building construction.

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

⁵ Estimated interior noise level with minimum STC rating for all windows.

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

"NR" = Noise Reduction

TABLE 8-4: THIRD-FLOOR INTERIOR NOISE IMPACTS (CNEL)

Receiver Location	Noise Level at Façade ¹	Required Interior NR ²	Estimated Interior NR ³	Upgraded Windows ⁴	Interior Noise Level ⁵	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

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

² 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.

³ A minimum of 25 dBA noise reduction is assumed with standard building construction.

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

⁵ Estimated interior noise level with minimum STC rating for all windows.

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

"NR" = Noise Reduction

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

Receiver Location	Noise Level at Façade ¹	Required Interior NR ²	Estimated Interior NR ³	Upgraded Windows ⁴	Interior Noise Level ⁵	Threshold	Threshold Exceeded?
East Apartment Buildings	— ⁶	— ⁶	— ⁶	— ⁶	— ⁶	— ⁶	— ⁶
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

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

² 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.

³ A minimum of 25 dBA noise reduction is assumed with standard building construction.

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

⁵ Estimated interior noise level with minimum STC rating for all windows.

⁶ 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 27th, 2015. Located at 170 Town Center Parkway in the City of Santee, the noise level measurements describe a single mechanical roof-top air conditioning unit on the roof of an existing Walmart store. The reference noise level represents a Lennox SCA120 series 10-ton model packaged air conditioning unit. Using a uniform reference distance of 50 feet, the reference noise level noise level is 54.4 dBA L₅₀. 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 29th, 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 L₅₀ 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 19th, 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 L₅₀ 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 10th, 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 24th, 2016. The reference 1-hour noise level measurement is based on the peak hour of activity over a total measurement duration of 24-hours and indicates that the parking lot vehicle movements generates noise levels of 44.0 dBA L₅₀ 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 L₅₀ 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 8th, 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 5th, 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 16th, 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 26th, 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 distance of 50 feet, the reference noise level is 45.6 dBA L_{50} .

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 19th, 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_{eq} . This equates to a reference noise level of 53.1 dBA L_{eq} at 50 feet from the noise source. Outdoor event activities are expected to occur for the full hour under Project operational conditions (60 minutes).

TABLE 10-1: REFERENCE NOISE LEVEL MEASUREMENTS

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

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

² 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.

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

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

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

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

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

⁸ 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.

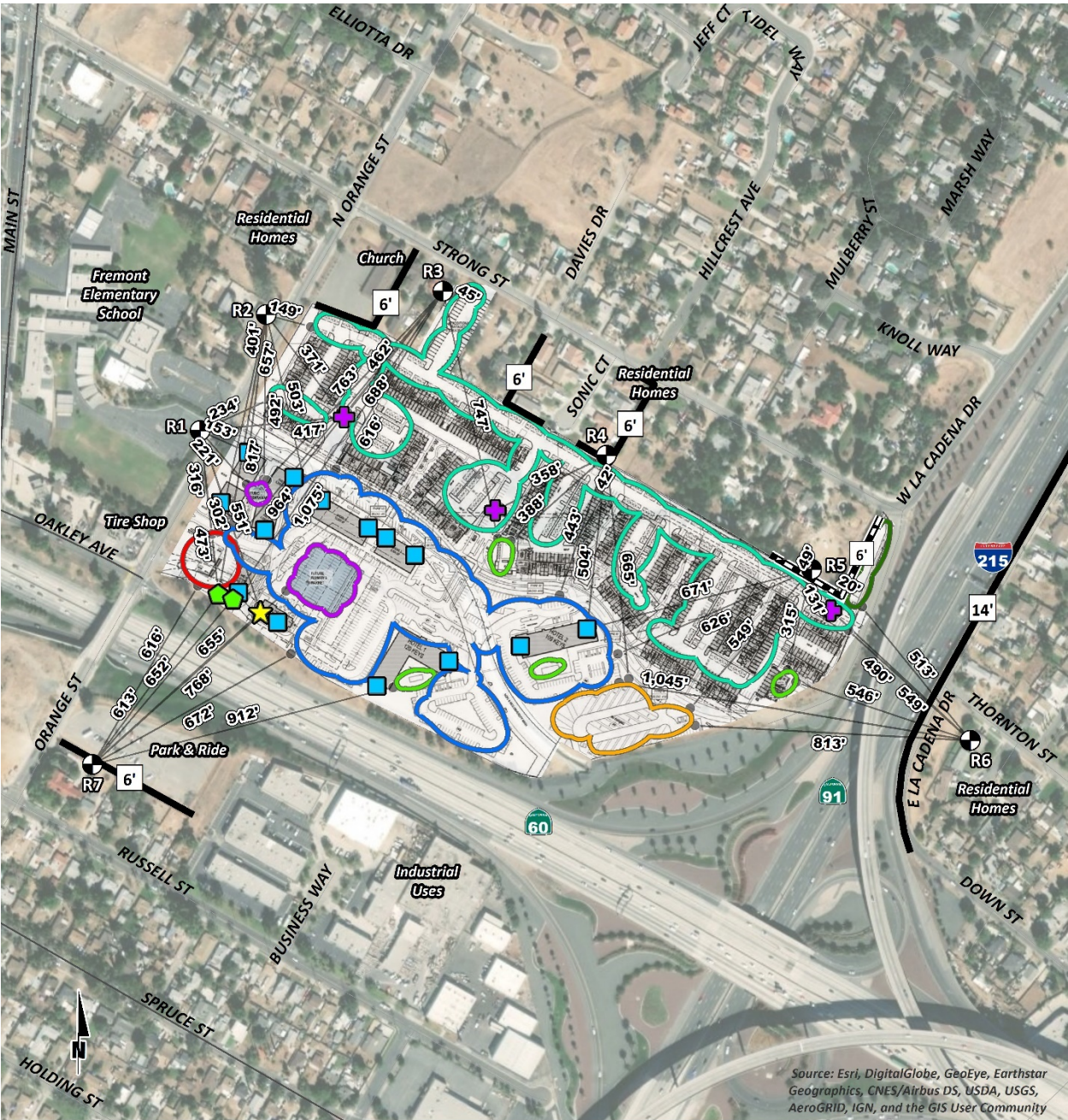
⁹ As measured by Urban Crossroads, Inc. on 9/16/2015 at the Giant RV located at 41150 Juniper Street in the City of Murrieta.

¹⁰ 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.

¹¹ 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.

¹² 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



LEGEND:

- | | | |
|--------------------------------|---|--|
| Receiver Locations | Residential Parking Lot Vehicle Movements | Distance from receiver to noise source (in feet) |
| Barrier Height (in feet) | Commercial Parking Lot Vehicle Movements | Operational Noise Barrier Mitigation |
| Existing Barrier | Dog Park Activity | |
| Roof-Top Air Conditioning Unit | Outdoor Pool/Spa Activity | |
| Entry Gate | RV Parking Lot Activity | |
| Drive-Through Speakerphone | Gas Station Activity | |
| Car Wash Tunnel | 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 (SPL_1):

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

Where SPL_2 is the resulting noise level after attenuation, SPL_1 is the source noise level, D_2 is the distance to the reference sound pressure level (SPL_1), and D_1 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_{50} 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.

TABLE 10-2: UNMITIGATED PROJECT OPERATIONAL NOISE LEVELS

Receiver Location ¹	Noise Source ²	Project Operational Noise Levels (dBA) ³			
		L ₅₀ (30 mins)	L ₂₅ (15 mins)	L ₈ (5 mins)	L ₂ (1 min)
R1	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
	Commercial Parking Lot Vehicle Movements	30.0	34.0	37.0	40.4
	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
R2	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
	Commercial Parking Lot Vehicle Movements	26.7	30.7	33.7	37.1
	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
R3	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
	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
R4	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
	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

Receiver Location ¹	Noise Source ²	Project Operational Noise Levels (dBA) ³			
		L ₅₀ (30 mins)	L ₂₅ (15 mins)	L ₈ (5 mins)	L ₂ (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
R5	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
	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
R6	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
	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
R7	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
	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

¹ See Exhibit 10-A for the receiver and noise source locations.² Reference noise sources as shown on Table 10-1.³ Operational noise level calculations are provided in Appendix 10.1.⁴ 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.

TABLE 10-3: UNMITIGATED OPERATIONAL NOISE LEVEL COMPLIANCE

Receiver Location ¹	Land Use	Noise Level at Receiver Locations (dBA) ²				Threshold Exceeded? ³
		L ₅₀ (30 mins)	L ₂₅ (15 mins)	L ₈ (5 mins)	L ₂ (1 min)	
Daytime	Residential Standards	55	60	65	70	-
Nighttime		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

¹ See Exhibit 10-A for the receiver and noise source locations.

² Estimated unmitigated Project operational noise levels as shown on Table 10-2.

³ 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 L₅₀ at receiver location R5 with the required noise barrier mitigation.

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

Receiver Location ¹	Noise Source ²	Project Operational Noise Levels (dBA) ³			
		L ₅₀ (30 mins)	L ₂₅ (15 mins)	L ₈ (5 mins)	L ₂ (1 min)
R5	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
	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

¹ See Exhibit 10-A for the receiver and noise source locations.

² Reference noise sources as shown on Table 10-1.

³ Mitigated operational noise level calculations are provided in Appendix 10.1.

⁴ 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.

TABLE 10-5: MITIGATED OPERATIONAL NOISE LEVEL COMPLIANCE (RECEIVER LOCATION R5)

Receiver Location ¹	Land Use	Noise Level at Receiver Locations (dBA) ²				Threshold Exceeded? ³
		L ₅₀ (30 mins)	L ₂₅ (15 mins)	L ₈ (5 mins)	L ₂ (1 min)	
Daytime	Residential Standards	55	60	65	70	-
Nighttime		45	50	55	60	-
R5	Residential	43.4	45.5	49.7	55.4	No

¹ See Exhibit 10-A for the receiver and noise source locations.

² Mitigated Project operational noise levels as shown on Table 10-4.

³ 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:

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

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 L₅₀ and during the nighttime hours of up to 1.0 dBA L₅₀. The Project-related operational noise level contributions of up to 1.0 dBA L₅₀ 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*.

TABLE 10-6: UNMITIGATED DAYTIME OPERATIONAL NOISE LEVEL CONTRIBUTIONS

Receiver Location ¹	Total Project Operational Noise Level (dBA L ₅₀) ²	Measurement Location ³	Reference Ambient Noise Levels (dBA L ₅₀) ⁴	Combined Project and Ambient (dBA L ₅₀) ⁵	Project Contribution (dBA L ₅₀) ⁶	Threshold Exceeded? ⁷
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

¹ See Exhibit 10-A for the sensitive receiver locations.

² Unmitigated Project operational noise levels as shown on Table 10-3.

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

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

⁵ Represents the combined ambient conditions plus the Project activities.

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

⁷ Significance Criteria as defined in Section 4.

TABLE 10-7: UNMITIGATED NIGHTTIME OPERATIONAL NOISE LEVEL CONTRIBUTIONS

Receiver Location ¹	Total Project Operational Noise Level (dBA L ₅₀) ²	Measurement Location ³	Reference Ambient Noise Levels (dBA L ₅₀) ⁴	Combined Project and Ambient (dBA L ₅₀) ⁵	Project Contribution (dBA L ₅₀) ⁶	Threshold Exceeded? ⁷
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

¹ See Exhibit 10-A for the sensitive receiver locations.

² Unmitigated Project operational noise levels as shown on Table 10-3.

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

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

⁵ Represents the combined ambient conditions plus the Project activities.

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

⁷ Significance 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;
 - 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



LEGEND:

- Receiver Locations
- Existing Barrier Height (in feet)
- Existing Barrier
- Construction Activity
- Distance from receiver to construction activity (in feet)

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.

TABLE 11-1: CONSTRUCTION EQUIPMENT VIBRATION LEVELS

Receiver Location ¹	Distance to Property Line (Feet)	Receiver Vibration Levels (VdB) ²					Threshold Exceeded? ³
		Small Bulldozer	Jackhammer	Loaded Trucks	Large Bulldozer	Highest Vibration Level	
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

¹ Noise receiver locations are shown on Exhibit 11-A.

² 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?

This page intentionally left blank

12 REFERENCES

1. **State of California.** *California Environmental Quality Act, Appendix G.* 2016.
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.
5. **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/design03.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.
8. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning, Noise and Air Quality Branch.** *Highway Traffic Noise Analysis and Abatement Policy and Guidance.* June, 1995.
9. **U.S. Department of Transportation, Federal Highway Administration.** *Highway Traffic Noise in the United States, Problem and Response.* April 2000. p. 3.
10. **U.S. Environmental Protection Agency Office of Noise Abatement and Control.** *Noise Effects Handbook-A Desk Reference to Health and Welfare Effects of Noise.* October 1979 (revised July 1981). EPA 550/9/82/106.
11. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment.* May 2006. FTA-VA-90-1003-06.
12. **Office of Planning and Research.** *State of California General Plan Guidelines 2003.* October 2003.
13. **State of California.** *2013 California Green Building Standards Code.* January 2014.
14. **City of Riverside.** *Municipal Code, Title 7 Noise Control.*
15. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment.* May 2006. FTA-VA-90-1003-06.
16. **California Court of Appeal.** *Gray v. County of Madera, F053661.* 167 Cal.App.4th 1099; - Cal.Rptr.3d, October 2008.
17. **Federal Interagency Committee on Noise.** *Federal Agency Review of Selected Airport Noise Analysis Issues.* August 1992.
18. **American National Standards Institute (ANSI).** *Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.*
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

This page intentionally left blank

APPENDIX 3.1:

CITY OF RIVERSIDE MUNICIPAL CODE

This page intentionally left blank

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

Chapter 7.05**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)

Chapter 7.10**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 dissipative 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-weighting 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 dissipative device.

"Muffler or sound dissipative 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)

Chapter 7.15**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)

Chapter 7.20**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-weighting 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)

Chapter 7.23**AMBIENT NOISE LEVELS****Sections:**

- 7.23.010 Ambient Sound Levels.**
- 7.23.020 Mixed Use Development.**
- 7.23.030 Infill 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)

Chapter 7.25**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)

Chapter 7.30

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)

Chapter 7.35**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)

Chapter 7.40**VARIANCE PROCEDURE****Sections:****7.40.010 Variance procedure.****7.40.020 Appeals.****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)

Chapter 7.45**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

This page intentionally left blank

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"



L1_W

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"

JN:11145 Northgate



L2_S

33, 59' 52.930000", 117, 21' 42.790000"



L2_W

33, 59' 52.780000", 117, 21' 42.840000"



L3_E

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



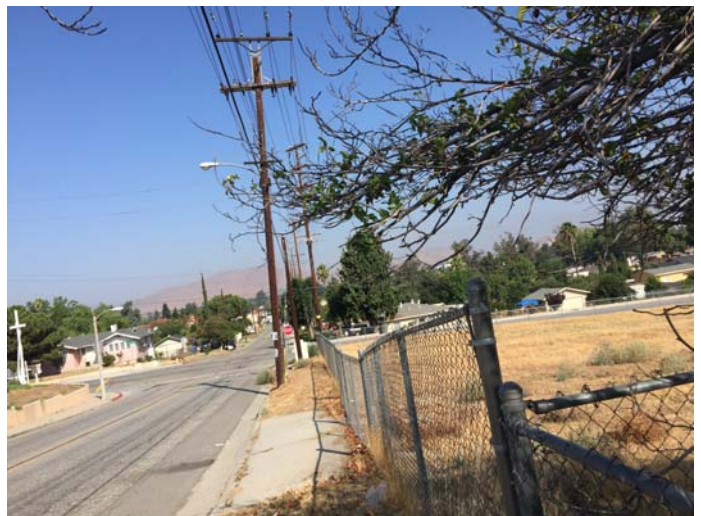
L3_N

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



L3_S

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



L3_W

33, 59' 56.720000", 117, 21' 38.250000"

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"

JN:11145 Northgate



L5_W
33, 59' 45.110000", 117, 21' 23.370000"



L6_N
33, 59' 42.370000", 117, 21' 19.250000"



L6_S
33, 59' 42.200000", 117, 21' 19.300000"



L6_W
33, 59' 42.200000", 117, 21' 19.300000"



L7_E
33, 59' 42.060000", 117, 21' 53.850000"



L7_N
33, 59' 41.850000", 117, 21' 54.510000"

JN:11145 Northgate



L7_S

33, 59' 41.940000", 117, 21' 54.270000"



L7_W

33, 59' 41.780000", 117, 21' 54.680000"

This page intentionally left blank

APPENDIX 5.2:

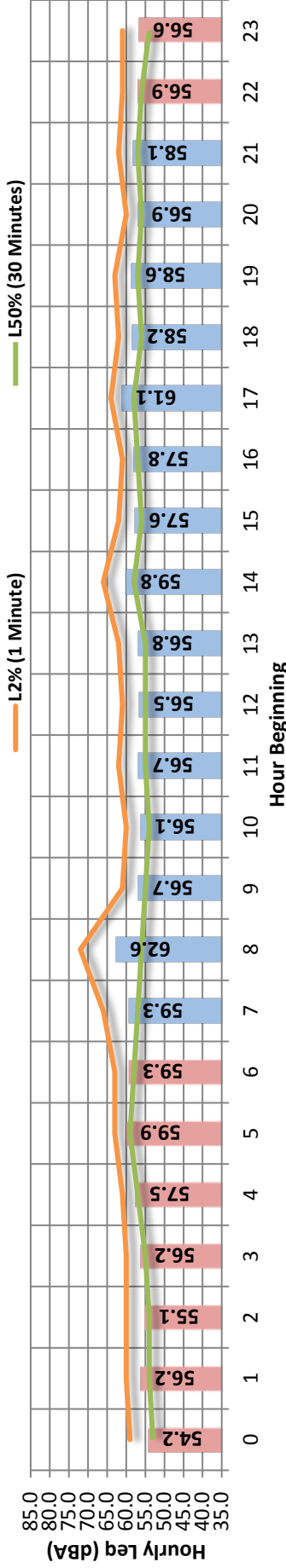
NOISE LEVEL MEASUREMENT WORKSHEETS

This page intentionally left blank

24-Hour Noise Level Measurement Summary

Project Name: Northgate Center	JN: 11145		24-Hour	
	Analyst: A. Wolfe		CNEL	
	Date: 8/8/2017		64.2	
Location: L1- Located at the Fremont Elementary School across Orange Street from the Project site.	Energy Average Leq		57.2	
	Day		58.6	

Hourly Leq dBA Readings (unadjusted)



Time Period	Hour	Leq	Lmax	Lmin	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	56.1	67.4	50.4	61.0	60.0	59.0	58.0	56.0	54.0	53.0	52.0	51.0
	Max	62.6	87.4	54.4	72.0	72.0	70.0	63.0	60.0	58.0	56.0	56.0	55.0
	Energy Average:	58.6		Average:	64.4	62.9	61.1	59.9	57.8	56.1	53.9	53.5	52.7
Night	Min	54.2	67.8	49.1	60.0	59.0	57.0	55.0	54.0	53.0	51.0	51.0	50.0
	Max	59.9	79.4	56.0	65.0	63.0	62.0	61.0	60.0	59.0	57.0	57.0	56.0
	Energy Average:	57.2		Average:	62.3	60.9	59.0	58.3	56.7	55.6	53.6	53.3	52.4

Hourly Summary

Night	0	54.2	69.5	49.3	60.0	59.0	57.0	55.0	54.0	53.0	51.0	51.0	50.0
	1	56.2	79.4	50.3	64.0	60.0	57.0	57.0	55.0	54.0	52.0	52.0	51.0
	2	55.1	70.9	50.5	62.0	60.0	57.0	56.0	55.0	54.0	52.0	52.0	51.0
	3	56.2	68.3	52.5	61.0	60.0	58.0	57.0	56.0	55.0	53.0	53.0	53.0
	4	57.5	67.8	52.7	62.0	61.0	60.0	59.0	58.0	57.0	54.0	54.0	53.0
	5	59.9	72.9	56.0	65.0	63.0	62.0	61.0	60.0	59.0	57.0	57.0	56.0
	6	59.3	71.3	54.0	63.0	63.0	61.0	61.0	59.0	58.0	55.0	55.0	55.0
Day	7	59.3	76.4	51.1	68.0	66.0	63.0	62.0	59.0	57.0	53.0	52.0	52.0
	8	62.6	87.4	51.6	72.0	72.0	70.0	63.0	58.0	56.0	54.0	53.0	52.0
	9	56.7	67.4	50.4	62.0	61.0	60.0	59.0	57.0	55.0	53.0	53.0	51.0
	10	56.1	72.4	50.8	61.0	60.0	59.0	56.0	56.0	54.0	53.0	52.0	51.0
	11	56.7	74.6	51.2	64.0	62.0	60.0	58.0	56.0	55.0	53.0	52.0	52.0
	12	56.5	67.7	51.4	62.0	61.0	59.0	58.0	57.0	55.0	53.0	52.0	52.0
	13	56.8	70.9	51.8	64.0	62.0	59.0	58.0	57.0	55.0	53.0	52.0	52.0
	14	59.8	78.4	52.4	68.0	66.0	63.0	62.0	59.0	58.0	55.0	54.0	53.0
	15	57.6	67.6	51.9	63.0	62.0	60.0	60.0	58.0	56.0	54.0	54.0	53.0
	16	57.8	70.8	52.9	62.0	61.0	60.0	60.0	58.0	57.0	54.0	54.0	53.0
	17	61.1	83.9	54.4	67.0	64.0	62.0	61.0	60.0	58.0	56.0	56.0	55.0
	18	58.2	79.7	52.2	65.0	62.0	60.0	60.0	58.0	56.0	54.0	54.0	53.0
	19	58.6	72.2	54.1	64.0	63.0	61.0	61.0	59.0	57.0	55.0	55.0	54.0
	20	56.9	71.9	52.7	61.0	60.0	59.0	58.0	57.0	56.0	54.0	54.0	53.0
	21	58.1	69.9	53.0	63.0	62.0	61.0	60.0	58.0	57.0	55.0	55.0	54.0
Night	22	56.9	69.5	52.4	62.0	61.0	59.0	59.0	57.0	56.0	54.0	54.0	53.0
	23	56.6	72.9	49.1	62.0	61.0	60.0	60.0	56.0	54.0	52.0	52.0	50.0

24-Hour Noise Level Measurement Summary

Project Name: Northgate Center

JN: 11145

24-Hour

Location: L2- Located on Orange Street at the western Project site boundary near existing residential homes.

Analyst: A. Wolfe

Energy Average Leq

Day

Night

CNEL

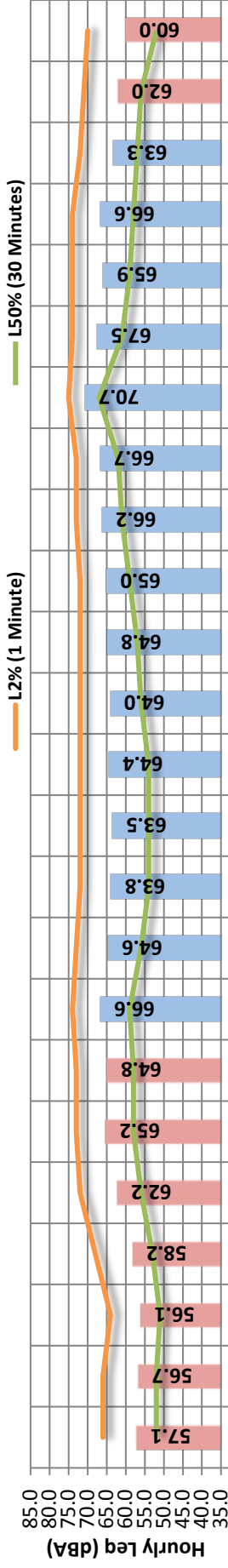
Date: 8/8/2017

66.0

61.5

69.4

Hourly Leq dBA Readings (unadjusted)



Hour Beginning

Time Period	Hour	Leq	Lmax	Lmin	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	63.3	78.8	48.1	73.0	72.0	70.0	68.0	60.0	54.0	50.0	50.0	49.0
	Max	70.7	98.9	54.2	76.0	75.0	73.0	72.0	70.0	67.0	58.0	57.0	55.0
	Energy Average:	66.0	Average:		74.1	72.9	71.1	70.1	64.7	58.3	53.4	52.7	51.7
Night	Min	56.1	76.2	47.8	69.0	64.0	57.0	55.0	52.0	51.0	50.0	50.0	49.0
	Max	65.2	89.2	55.6	74.0	73.0	71.0	69.0	62.0	58.0	57.0	56.0	56.0
	Energy Average:	61.5	Average:		71.8	69.2	64.6	61.9	56.0	54.2	52.4	52.0	51.1

Hourly Summary

Night	0	57.1	77.5	48.3	70.0	66.0	60.0	57.0	53.0	52.0	50.0	50.0	49.0
	1	56.7	76.5	47.8	70.0	66.0	58.0	55.0	53.0	52.0	50.0	50.0	49.0
	2	56.1	76.2	48.5	69.0	64.0	57.0	55.0	52.0	51.0	50.0	50.0	49.0
	3	58.2	78.3	49.7	71.0	68.0	62.0	58.0	54.0	53.0	51.0	51.0	50.0
	4	62.2	81.7	51.7	73.0	72.0	69.0	66.0	58.0	56.0	54.0	53.0	52.0
	5	65.2	89.2	55.6	74.0	73.0	70.0	68.0	60.0	58.0	57.0	56.0	56.0
	6	64.8	84.3	53.4	74.0	73.0	71.0	69.0	62.0	58.0	55.0	55.0	54.0
Day	7	66.6	82.9	49.0	76.0	74.0	72.0	71.0	66.0	59.0	52.0	51.0	50.0
	8	64.6	78.8	50.1	74.0	73.0	71.0	70.0	64.0	56.0	52.0	51.0	51.0
	9	63.8	79.1	48.1	73.0	72.0	70.0	69.0	62.0	54.0	51.0	50.0	49.0
	10	63.5	81.1	49.0	73.0	72.0	70.0	69.0	62.0	54.0	50.0	50.0	49.0
	11	64.4	89.7	48.7	73.0	72.0	70.0	69.0	62.0	54.0	50.0	50.0	49.0
	12	64.0	79.7	50.0	73.0	72.0	70.0	69.0	63.0	56.0	52.0	51.0	50.0
	13	64.8	85.7	49.8	73.0	72.0	71.0	69.0	64.0	57.0	52.0	52.0	51.0
	14	65.0	84.2	51.4	74.0	72.0	70.0	69.0	65.0	59.0	54.0	53.0	52.0
	15	66.2	81.4	50.3	74.0	73.0	71.0	71.0	67.0	61.0	54.0	53.0	51.0
	16	66.7	80.1	52.8	74.0	73.0	72.0	71.0	68.0	62.0	55.0	55.0	54.0
	17	70.7	98.9	54.2	76.0	75.0	73.0	72.0	70.0	67.0	58.0	57.0	55.0
	18	67.5	85.4	53.1	76.0	74.0	73.0	72.0	68.0	61.0	56.0	55.0	54.0
	19	65.9	87.2	53.6	75.0	74.0	72.0	71.0	65.0	59.0	56.0	55.0	54.0
	20	66.6	89.5	52.5	75.0	74.0	72.0	71.0	65.0	58.0	54.0	54.0	53.0
	21	63.3	82.0	53.2	73.0	72.0	70.0	68.0	60.0	57.0	55.0	54.0	53.0
Night	22	62.0	82.4	51.5	73.0	71.0	68.0	66.0	58.0	56.0	54.0	53.0	52.0
	23	60.0	81.1	48.3	72.0	70.0	66.0	63.0	54.0	52.0	51.0	50.0	49.0

24-Hour Noise Level Measurement Summary

Project Name: Northgate Center

JN: 11145

24-Hour

Location: L3- Located on Strong Street north of Project site by near existing residential homes and a church.

Analyst: A. Wolfe

Energy Average Leq

Day

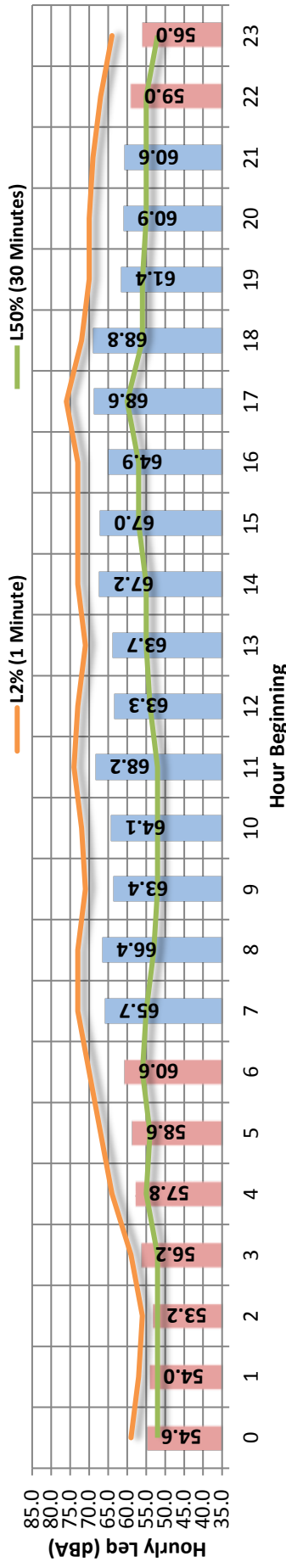
CNEL

Date: 8/8/2017

Night

66.7

Hourly Leq dBA Readings (unadjusted)



Time Period	Hour	Leq	Lmax	Lmin	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	60.6	78.6	47.5	71.0	69.0	64.0	61.0	55.0	52.0	49.0	48.0	48.0
	Max	68.8	98.5	52.8	79.0	72.2	73.0	71.0	66.0	60.0	55.0	54.0	53.0
	Energy Average:	65.7	Average:	Average:	74.5	72.2	69.1	66.9	58.8	54.9	52.2	51.6	50.9
Night	Min	53.2	71.9	47.6	59.0	56.0	55.0	54.0	53.0	52.0	50.0	49.0	48.0
	Max	60.6	80.8	53.6	72.0	70.0	65.0	61.0	57.0	56.0	54.0	54.0	54.0
	Energy Average:	57.3	Average:	Average:	66.8	62.6	58.3	56.7	54.4	53.3	51.7	51.2	50.6

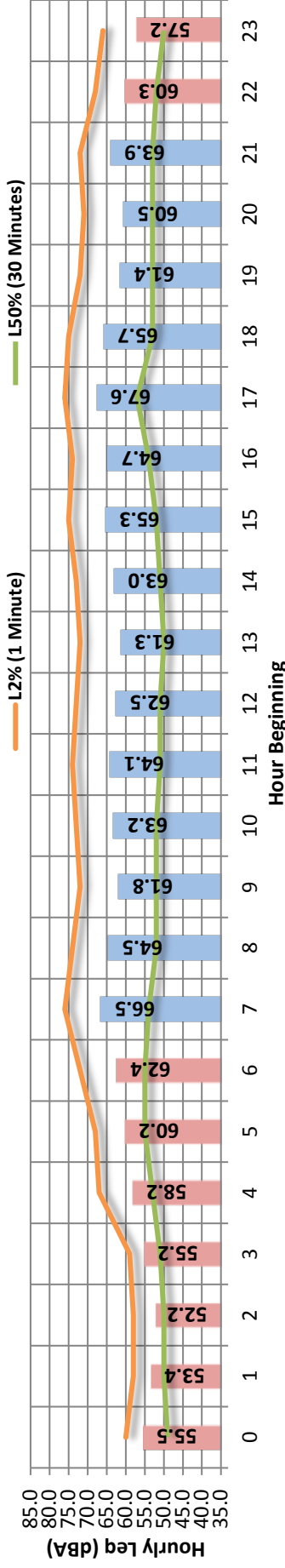
Hourly Summary

Night	0	54.6	74.5	47.8	65.0	59.0	55.0	55.0	53.0	52.0	50.0	49.0	49.0
	1	54.0	73.9	47.6	61.0	57.0	55.0	54.0	53.0	52.0	51.0	50.0	49.0
	2	53.2	71.9	48.9	59.0	56.0	55.0	54.0	53.0	52.0	50.0	50.0	49.0
	3	56.2	80.8	48.0	67.0	59.0	56.0	55.0	53.0	52.0	50.0	49.0	48.0
	4	57.8	76.4	51.3	69.0	64.0	58.0	57.0	56.0	55.0	53.0	53.0	52.0
	5	58.6	77.8	52.0	70.0	67.0	62.0	59.0	56.0	54.0	53.0	53.0	52.0
Day	6	60.6	79.4	53.6	72.0	70.0	65.0	61.0	57.0	56.0	54.0	54.0	54.0
	7	65.7	92.4	48.8	75.0	73.0	71.0	69.0	60.0	55.0	51.0	51.0	50.0
	8	66.4	95.2	48.7	74.0	73.0	70.0	68.0	57.0	53.0	50.0	50.0	49.0
	9	63.4	88.6	48.0	74.0	71.0	68.0	65.0	55.0	52.0	50.0	49.0	48.0
	10	64.1	88.0	47.6	75.0	72.0	69.0	67.0	56.0	52.0	49.0	48.0	48.0
	11	68.2	94.5	47.5	78.0	74.0	70.0	67.0	57.0	52.0	49.0	48.0	48.0
	12	63.3	86.9	49.4	74.0	73.0	69.0	67.0	58.0	54.0	51.0	51.0	50.0
	13	63.7	92.3	49.8	73.0	71.0	68.0	66.0	58.0	55.0	53.0	52.0	51.0
	14	67.2	95.0	50.2	76.0	73.0	70.0	68.0	60.0	55.0	53.0	52.0	51.0
	15	67.0	95.1	51.0	75.0	73.0	71.0	69.0	62.0	57.0	53.0	53.0	52.0
	16	64.9	85.0	51.4	75.0	73.0	73.0	69.0	62.0	57.0	54.0	53.0	52.0
	17	68.6	94.9	52.7	79.0	76.0	73.0	71.0	66.0	60.0	55.0	54.0	53.0
	18	68.8	98.5	51.3	75.0	72.0	70.0	68.0	60.0	56.0	53.0	53.0	53.0
	19	61.4	78.6	52.8	72.0	70.0	67.0	65.0	58.0	56.0	54.0	54.0	53.0
	20	60.9	81.1	51.5	72.0	70.0	66.0	64.0	56.0	55.0	53.0	53.0	52.0
	21	60.6	86.3	52.2	71.0	69.0	64.0	61.0	57.0	55.0	53.0	53.0	52.0
Night	22	59.0	80.5	51.5	70.0	67.0	62.0	59.0	56.0	55.0	53.0	53.0	52.0
	23	56.0	75.7	48.8	68.0	64.0	57.0	56.0	53.0	52.0	51.0	50.0	50.0

24-Hour Noise Level Measurement Summary

Project Name: Northgate Center		JN: 11145		24-Hour	
Location: L4- Located on Strong Street north of Project site by near existing residential homes.		Analyst: A. Wolfe		Energy Average Leq	
				Day	Night
		Date: 8/8/2017		64.2	58.3
				CNEL	
				66.7	

Hourly Leq dBA Readings (unadjusted)



Time Period	Hour	Leq	Lmax	Lmin	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	60.5	79.2	46.9	73.0	71.0	65.0	61.0	53.0	50.0	48.0	48.0	47.0
	Max	67.6	89.7	50.4	78.0	76.0	74.0	73.0	66.0	57.0	52.0	51.0	51.0
	Energy Average:	64.2	Average:	Average:	75.4	73.5	69.8	67.2	56.9	52.5	49.9	49.5	48.8
Night	Min	52.2	71.5	46.5	61.0	58.0	53.0	52.0	50.0	49.0	48.0	48.0	47.0
	Max	62.4	82.4	52.1	74.0	72.0	67.0	67.0	58.0	55.0	53.0	53.0	52.0
	Energy Average:	58.3	Average:	Average:	67.6	64.0	58.7	57.1	52.8	51.7	50.0	49.6	49.1

Hourly Summary

Night	0	55.5	82.2	47.5	66.0	60.0	53.0	52.0	50.0	49.0	48.0	48.0	48.0
	1	53.4	78.0	46.8	61.0	58.0	53.0	52.0	51.0	50.0	48.0	48.0	48.0
	2	52.2	71.5	46.5	61.0	58.0	54.0	52.0	51.0	50.0	48.0	48.0	47.0
	3	55.2	82.0	48.1	62.0	59.0	55.0	53.0	51.0	51.0	50.0	49.0	49.0
	4	58.2	79.0	49.2	71.0	67.0	59.0	57.0	54.0	53.0	51.0	50.0	49.0
	5	60.2	82.4	52.1	72.0	68.0	62.0	60.0	56.0	55.0	53.0	53.0	52.0
	6	62.4	80.1	51.4	74.0	72.0	67.0	66.0	59.0	55.0	53.0	52.0	52.0
Day	7	66.5	87.2	48.5	78.0	76.0	73.0	71.0	59.0	54.0	51.0	50.0	49.0
	8	64.5	88.0	49.2	76.0	74.0	71.0	68.0	56.0	52.0	50.0	50.0	50.0
	9	61.8	83.3	48.3	74.0	72.0	67.0	64.0	55.0	52.0	49.0	49.0	49.0
	10	63.2	84.6	47.4	75.0	73.0	69.0	66.0	56.0	52.0	49.0	48.0	48.0
	11	64.1	85.9	47.2	77.0	74.0	70.0	67.0	54.0	51.0	48.0	48.0	47.0
	12	62.5	83.2	46.9	75.0	73.0	70.0	66.0	55.0	51.0	48.0	48.0	47.0
	13	61.3	82.1	47.0	74.0	72.0	68.0	65.0	53.0	50.0	48.0	48.0	47.0
	14	63.0	80.9	47.0	75.0	73.0	70.0	68.0	56.0	51.0	48.0	48.0	47.0
	15	65.3	87.3	47.6	76.0	75.0	72.0	71.0	60.0	52.0	49.0	49.0	48.0
	16	64.7	80.6	48.3	76.0	74.0	72.0	70.0	60.0	54.0	51.0	50.0	49.0
	17	67.6	86.4	50.4	78.0	76.0	74.0	73.0	66.0	57.0	52.0	51.0	51.0
	18	65.7	88.4	49.5	76.0	75.0	72.0	70.0	58.0	53.0	50.0	50.0	50.0
	19	61.4	80.7	50.0	74.0	72.0	67.0	64.0	55.0	53.0	51.0	51.0	50.0
	20	60.5	79.2	50.2	73.0	71.0	65.0	61.0	54.0	53.0	51.0	51.0	50.0
	21	63.9	89.7	50.3	74.0	72.0	67.0	64.0	55.0	53.0	51.0	51.0	50.0
Night	22	60.3	78.3	47.9	71.0	68.0	67.0	67.0	53.0	52.0	50.0	48.0	49.0
	23	57.2	78.6	47.5	70.0	66.0	58.0	55.0	51.0	50.0	48.0	48.0	48.0

24-Hour Noise Level Measurement Summary

Project Name: Northgate Center

JN: 11145

24-Hour

Location: L5- Located at the northeastern Project site boundary on La Cadena Drive near existing residential homes and Interstate 215.

Analyst: A. Wolfe

Energy Average Leq

Day

Night

CNEL

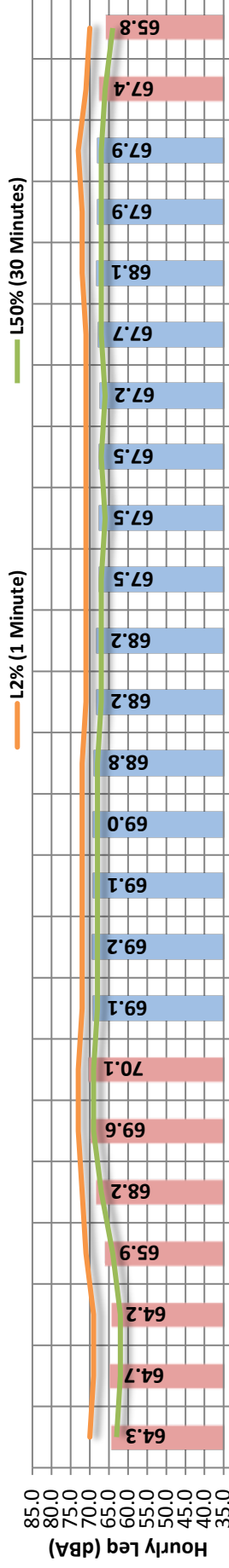
Date: 8/8/2017

68.2

67.2

74.1

Hourly Leq dBA Readings (unadjusted)



Hour Beginning

Time Period	Hour	Leq	Lmax	Lmin	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	67.2	76.6	60.6	72.0	71.0	69.0	69.0	67.0	66.0	64.0	63.0	62.0
	Max	69.2	84.6	64.4	74.0	73.0	71.0	71.0	69.0	68.0	67.0	66.0	65.0
	Energy Average:	68.2	Average:	Average:	72.5	71.6	70.3	69.8	68.3	67.2	65.3	64.7	63.7
Night	Min	64.2	75.5	52.1	71.0	69.0	68.0	67.0	64.0	62.0	58.0	57.0	55.0
	Max	70.1	89.2	64.8	75.0	73.0	72.0	71.0	70.0	69.0	67.0	67.0	66.0
	Energy Average:	67.2	Average:	Average:	72.2	70.9	69.7	68.7	66.8	65.1	62.0	61.1	59.2

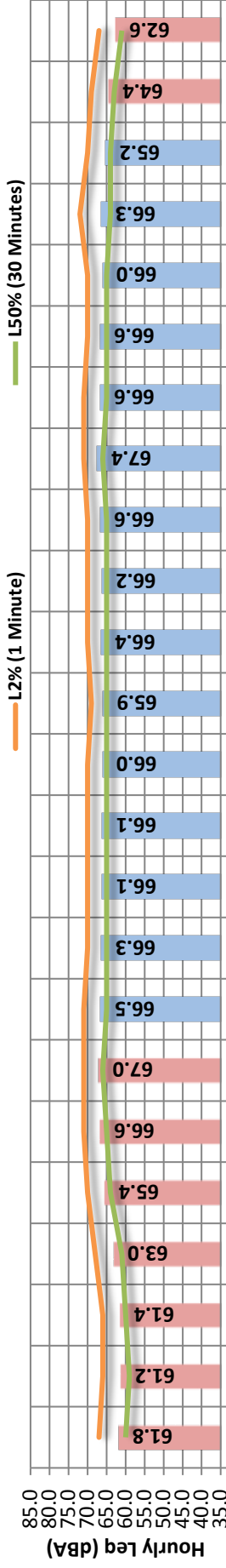
Hourly Summary

Night	0	64.3	75.5	52.1	71.0	70.0	68.0	67.0	65.0	63.0	59.0	58.0	55.0
	1	64.7	88.1	54.2	71.0	69.0	68.0	67.0	64.0	62.0	58.0	57.0	55.0
	2	64.2	76.7	53.2	71.0	69.0	68.0	67.0	64.0	62.0	58.0	57.0	55.0
	3	65.9	79.2	55.2	72.0	71.0	69.0	68.0	66.0	64.0	61.0	60.0	57.0
	4	68.2	80.1	59.5	73.0	72.0	71.0	70.0	69.0	67.0	64.0	63.0	62.0
	5	69.6	79.8	62.8	74.0	73.0	72.0	71.0	70.0	69.0	67.0	66.0	64.0
Day	6	70.1	82.6	64.8	75.0	73.0	72.0	71.0	70.0	69.0	67.0	67.0	66.0
	7	69.1	78.6	63.6	73.0	72.0	71.0	71.0	69.0	68.0	67.0	66.0	65.0
	8	69.2	76.6	64.4	73.0	72.0	71.0	71.0	69.0	68.0	67.0	66.0	65.0
	9	69.1	82.6	62.8	73.0	72.0	71.0	70.0	69.0	68.0	66.0	66.0	65.0
	10	69.0	83.1	63.3	74.0	72.0	71.0	70.0	69.0	68.0	66.0	66.0	65.0
	11	68.8	84.6	62.6	72.0	72.0	71.0	70.0	69.0	68.0	66.0	65.0	64.0
	12	68.2	77.1	61.2	72.0	71.0	70.0	70.0	68.0	67.0	65.0	65.0	63.0
	13	68.2	77.3	62.6	72.0	71.0	70.0	70.0	68.0	67.0	65.0	64.0	64.0
	14	67.5	76.8	60.6	72.0	71.0	70.0	69.0	68.0	67.0	65.0	64.0	63.0
	15	67.5	79.2	60.8	72.0	71.0	70.0	69.0	68.0	66.0	64.0	64.0	63.0
	16	67.5	82.8	62.6	72.0	71.0	70.0	69.0	68.0	66.0	64.0	64.0	63.0
	17	67.2	83.0	60.7	72.0	71.0	69.0	69.0	67.0	66.0	64.0	64.0	63.0
	18	67.7	77.9	61.9	72.0	71.0	70.0	69.0	68.0	67.0	65.0	64.0	63.0
	19	68.1	77.6	62.1	72.0	72.0	70.0	70.0	68.0	67.0	65.0	65.0	64.0
	20	67.9	77.5	61.3	73.0	72.0	70.0	70.0	68.0	67.0	65.0	64.0	63.0
	21	67.9	78.8	60.6	74.0	73.0	71.0	70.0	68.0	67.0	64.0	63.0	62.0
Night	22	67.4	89.2	58.9	72.0	71.0	70.0	69.0	67.0	66.0	63.0	62.0	61.0
	23	65.8	83.4	56.1	71.0	70.0	69.0	68.0	66.0	64.0	61.0	60.0	58.0

24-Hour Noise Level Measurement Summary

Project Name: Northgate Center	JN: 11145		24-Hour	
	Analyst: A. Wolfe		Energy Average Leq	
	Date: 8/8/2017		Day	Night
Location: L6- Located east of the Project site across Interstate 215 on Thornton Street near existing residential homes.			66.3	64.2
				71.3

Hourly Leq dBA Readings (unadjusted)



Hour Beginning

Time Period	Hour	Leq	Lmax	Lmin	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	65.2	73.8	57.9	70.0	69.0	68.0	67.0	65.0	64.0	61.0	61.0	59.0
	Max	67.4	86.9	62.3	74.0	72.0	70.0	69.0	67.0	66.0	64.0	64.0	63.0
	Energy Average:	66.3	Average:	Average:	71.5	70.3	68.8	68.0	66.1	64.9	63.2	62.6	61.8
Night	Min	61.2	75.3	51.1	67.0	66.0	65.0	64.0	61.0	59.0	56.0	55.0	53.0
	Max	67.0	81.9	61.6	72.0	71.0	69.0	69.0	67.0	66.0	64.0	64.0	63.0
	Energy Average:	64.2	Average:	Average:	69.7	68.3	66.7	66.0	63.9	62.1	59.1	58.7	56.9

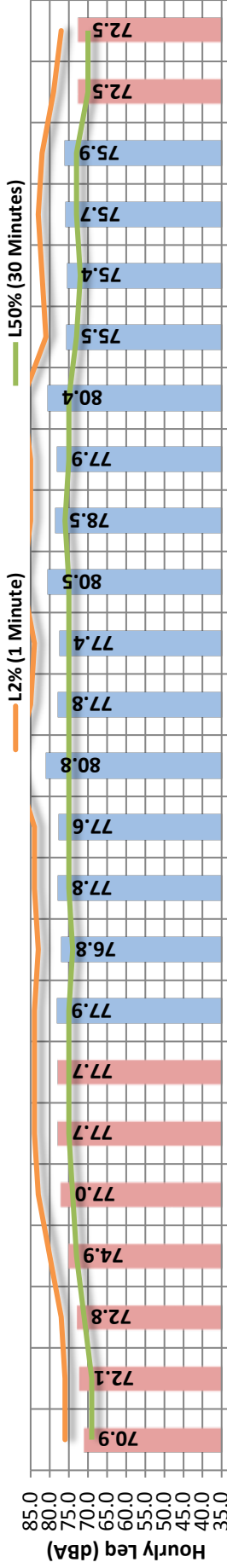
Hourly Summary

Night	0	61.8	76.2	51.1	69.0	67.0	65.0	64.0	62.0	60.0	56.0	56.0	53.0
	1	61.2	77.8	51.3	67.0	66.0	65.0	64.0	61.0	59.0	56.0	55.0	53.0
	2	61.4	77.7	51.1	68.0	66.0	65.0	64.0	62.0	60.0	56.0	55.0	53.0
	3	63.0	75.3	53.6	69.0	68.0	66.0	65.0	63.0	61.0	58.0	57.0	55.0
	4	65.4	81.9	57.8	71.0	70.0	68.0	67.0	65.0	64.0	61.0	61.0	59.0
	5	66.6	77.7	59.7	72.0	71.0	69.0	69.0	67.0	65.0	63.0	63.0	62.0
	6	67.0	79.1	61.6	72.0	71.0	69.0	69.0	67.0	66.0	64.0	64.0	63.0
Day	7	66.5	77.9	61.1	73.0	71.0	69.0	68.0	66.0	65.0	63.0	63.0	62.0
	8	66.3	75.5	61.4	71.0	70.0	69.0	68.0	66.0	65.0	64.0	63.0	62.0
	9	66.1	75.9	60.1	71.0	70.0	69.0	68.0	66.0	65.0	63.0	63.0	62.0
	10	66.1	76.4	60.8	72.0	70.0	69.0	68.0	66.0	65.0	63.0	62.0	62.0
	11	66.0	79.2	61.3	71.0	70.0	68.0	68.0	66.0	65.0	63.0	63.0	62.0
	12	65.9	73.8	59.6	70.0	69.0	68.0	68.0	66.0	65.0	63.0	62.0	61.0
	13	66.4	75.1	61.4	71.0	70.0	69.0	68.0	66.0	65.0	64.0	63.0	62.0
	14	66.2	75.2	60.5	70.0	70.0	68.0	68.0	66.0	65.0	63.0	63.0	62.0
	15	66.6	77.2	61.8	71.0	70.0	69.0	68.0	67.0	65.0	64.0	63.0	62.0
	16	67.4	83.9	62.3	73.0	71.0	70.0	69.0	67.0	66.0	64.0	64.0	63.0
	17	66.6	79.4	62.2	72.0	71.0	69.0	68.0	66.0	65.0	64.0	63.0	62.0
	18	66.6	80.3	61.5	71.0	70.0	69.0	68.0	67.0	65.0	64.0	63.0	62.0
	19	66.0	80.0	60.8	71.0	70.0	69.0	68.0	66.0	65.0	63.0	62.0	62.0
	20	66.3	86.9	59.4	74.0	72.0	69.0	68.0	66.0	64.0	62.0	61.0	61.0
	21	65.2	79.9	57.9	72.0	70.0	68.0	67.0	65.0	64.0	61.0	61.0	59.0
Night	22	64.4	79.7	57.4	70.0	69.0	67.0	67.0	65.0	63.0	60.0	60.0	58.0
	23	62.6	75.7	54.7	69.0	67.0	66.0	65.0	63.0	61.0	58.0	57.0	56.0

24-Hour Noise Level Measurement Summary

Project Name: Northgate Center		JN: 11145		24-Hour	
Location: L7- Located south of the Project site on Russell Street near existing residential homes and commercial uses.		Analyst: A. Wolfe		Energy Average Leq	
Date: 8/8/2017				Day	Night
				78.1	75.0
				CNEL	
				82.2	

Hourly Leq dBA Readings (unadjusted)



Hour Beginning

Time Period	Hour	Leq	Lmax	Lmin	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	75.4	92.4	66.7	84.0	81.0	78.0	77.0	74.0	72.0	70.0	69.0	68.0
	Max	80.8	105.1	70.3	92.0	89.0	86.0	85.0	78.0	76.0	73.0	73.0	72.0
	Energy Average:	78.1	Average:		86.5	84.3	81.3	79.9	76.5	74.4	71.9	71.2	70.1
Night	Min	70.9	83.9	63.6	78.0	76.0	74.0	73.0	71.0	69.0	66.0	66.0	65.0
	Max	77.7	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:		82.0	79.6	76.9	75.8	73.4	71.8	69.4	68.9	67.9

Hourly Summary

Night	0	70.9	83.9	63.6	78.0	76.0	74.0	73.0	71.0	69.0	67.0	66.0	65.0
	1	72.1	94.9	64.3	81.0	83.0	80.0	79.0	76.0	74.0	72.0	71.0	70.0
	2	72.8	92.3	64.6	79.0	84.0	82.0	80.0	77.0	75.0	72.0	72.0	71.0
	3	74.9	92.2	67.6	81.0	80.0	77.0	76.0	75.0	73.0	71.0	71.0	69.0
	4	77.0	99.6	70.4	85.0	83.0	79.0	78.0	75.0	74.0	72.0	72.0	71.0
	5	77.7	99.3	70.1	87.0	84.0	81.0	79.0	76.0	75.0	72.0	72.0	72.0
	6	77.7	95.5	71.0	87.0	84.0	81.0	80.0	77.0	75.0	73.0	72.0	72.0
Day	7	77.9	97.2	70.0	86.0	84.0	81.0	80.0	77.0	75.0	73.0	72.0	71.0
	8	76.8	93.8	68.8	85.0	83.0	80.0	79.0	76.0	74.0	72.0	71.0	70.0
	9	77.8	92.6	70.1	86.0	84.0	82.0	80.0	77.0	75.0	72.0	72.0	71.0
	10	77.6	95.5	69.0	86.0	84.0	81.0	80.0	77.0	75.0	73.0	72.0	70.0
	11	80.8	102.5	69.0	92.0	89.0	84.0	81.0	77.0	75.0	72.0	72.0	70.0
	12	77.8	98.7	68.4	87.0	85.0	81.0	80.0	77.0	75.0	72.0	71.0	70.0
	13	77.4	94.5	69.3	86.0	84.0	81.0	80.0	77.0	75.0	72.0	71.0	70.0
	14	80.5	99.0	69.5	89.0	87.0	86.0	85.0	78.0	75.0	73.0	72.0	71.0
	15	78.5	96.4	70.3	87.0	85.0	82.0	81.0	78.0	76.0	73.0	73.0	72.0
	16	77.9	95.8	70.1	87.0	85.0	82.0	80.0	77.0	75.0	72.0	72.0	71.0
	17	80.4	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	84.0	81.0	78.0	77.0	75.0	73.0	71.0	70.0	69.0
	19	75.4	92.4	67.6	84.0	82.0	80.0	78.0	74.0	72.0	70.0	70.0	69.0
	20	75.7	95.6	67.0	85.0	83.0	79.0	78.0	75.0	73.0	70.0	69.0	68.0
	21	75.9	93.2	66.7	84.0	82.0	80.0	79.0	75.0	73.0	70.0	69.0	68.0
Night	22	72.5	88.4	64.8	80.0	79.0	76.0	75.0	72.0	70.0	68.0	67.0	66.0
	23	72.5	92.3	65.0	80.0	77.0	75.0	74.0	72.0	70.0	68.0	67.0	66.0

This page intentionally left blank

APPENDIX 7.1:

OFF-SITE TRAFFIC NOISE LEVEL CONTOURS

This page intentionally left blank

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing Without Project Road Name: Main St. Road Segment: s/o Placentia Ln.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 14,700 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 1,470 vehicles Vehicle Speed: 50 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
					Vehicle Type	Day	Evening	Night	Daily
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					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				
FHWA Noise Model Calculations									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 70.20 -0.74 0.31 -1.20 -4.65 0.000 0.000									
Medium Trucks: 81.00 -17.97 0.34 -1.20 -4.87 0.000 0.000									
Heavy Trucks: 85.38 -21.93 0.34 -1.20 -5.43 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 68.6 66.7 64.9 58.9 67.5 68.1									
Medium Trucks: 62.2 60.7 54.3 52.8 61.2 61.4									
Heavy Trucks: 62.6 61.2 52.1 53.4 61.7 61.9									
Vehicle Noise: 70.3 68.5 65.5 60.7 69.2 69.7									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				45	96	207	446		
CNEL:				48	103	222	479		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing Without Project Road Name: Main St. Road Segment: n/o Columbia Av.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 16,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 1,600 vehicles Vehicle Speed: 50 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 70.20 -0.37 0.31 -1.20 -4.65 0.000 0.000									
Medium Trucks: 81.00 -17.61 0.34 -1.20 -4.87 0.000 0.000									
Heavy Trucks: 85.38 -21.56 0.34 -1.20 -5.43 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 68.9 67.0 65.3 59.2 67.9 68.5									
Medium Trucks: 62.5 61.0 54.7 53.1 61.6 61.8									
Heavy Trucks: 63.0 61.5 52.5 53.7 62.1 62.2									
Vehicle Noise: 70.6 68.9 65.8 61.1 69.6 70.1									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				47	102	219	471		
CNEL:				51	109	235	506		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing Without Project Road Name: Main St. Road Segment: s/o Columbia Av.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 13,500 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 1,350 vehicles Vehicle Speed: 50 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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				
FHWA Noise Model Calculations									
VehicleType	REMED	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	70.20	-1.11	0.31	-1.20	-4.65	0.000	0.000		
Medium Trucks:	81.00	-18.34	0.34	-1.20	-4.87	0.000	0.000		
Heavy Trucks:	85.38	-22.30	0.34	-1.20	-5.43	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	68.2	66.3	64.5	58.5	67.1	67.7			
Medium Trucks:	61.8	60.3	53.9	52.4	60.8	61.1			
Heavy Trucks:	62.2	60.8	51.8	53.0	61.4	61.5			
Vehicle Noise:	69.9	68.2	65.1	60.3	68.9	69.3			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				42	91	195	421		
CNEL:				45	97	210	452		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing Without Project Road Name: Main St. Road Segment: n/o Strong St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 14,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 1,400 vehicles Vehicle Speed: 45 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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				
FHWA Noise Model Calculations									
VehicleType	REMEF	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 68.46 -0.49 0.31 -1.20 -4.65 0.000 0.000									
Medium Trucks: 79.45 -17.73 0.34 -1.20 -4.87 0.000 0.000									
Heavy Trucks: 84.25 -21.68 0.34 -1.20 -5.43 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 67.1 65.2 63.4 57.4 66.0 66.6									
Medium Trucks: 60.9 59.4 53.0 51.4 59.9 60.1									
Heavy Trucks: 61.7 60.3 51.2 52.5 60.9 61.0									
Vehicle Noise: 68.9 67.2 64.0 59.4 67.9 68.4									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				36	78	168	362		
CNEL:				39	84	180	388		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL								
Scenario: Existing Without Project Road Name: Main St. Road Segment: s/o Strong St.				Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA				NOISE MODEL INPUTS				
Highway Data				Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 13,800 vehicles				Autos: 15				
Peak Hour Percentage: 10%				Medium Trucks (2 Axles): 15				
Peak Hour Volume: 1,380 vehicles				Heavy Trucks (3+ Axles): 15				
Vehicle Speed: 25 mph								
Near/Far Lane Distance: 36 feet				Vehicle Mix				
				Vehicle Type	Day	Evening	Night	Daily
				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%				
Site Data				Noise Source Elevations (in feet)				
Barrier Height: 0.0 feet				Autos: 0.000				
Barrier Type (0-Wall, 1-Berm): 0.0				Medium Trucks: 2.297				
Centerline Dist. to Barrier: 50.0 feet				Heavy Trucks: 8.006				
Centerline Dist. to Observer: 50.0 feet				Grade Adjustment: 0.0				
Barrier Distance to Observer: 0.0 feet								
Observer Height (Above Pad): 5.0 feet								
Pad Elevation: 0.0 feet								
Road Elevation: 0.0 feet								
Road Grade: 0.0%								
Left View: -90.0 degrees								
Right View: 90.0 degrees								
				Lane Equivalent Distance (in feet)				
				Autos: 46.915				
				Medium Trucks: 46.726				
				Heavy Trucks: 46.744				
FHWA Noise Model Calculations								
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten	
Autos:	58.73	2.00	0.31	-1.20	-4.65	0.000	0.000	
Medium Trucks:	70.80	-15.24	0.34	-1.20	-4.87	0.000	0.000	
Heavy Trucks:	77.97	-19.19	0.34	-1.20	-5.43	0.000	0.000	
Unmitigated Noise Levels (without Topo and barrier attenuation)								
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL		
Autos:	59.8	57.9	56.2	50.1	58.7	59.4		
Medium Trucks:	54.7	53.2	46.8	45.3	53.7	54.0		
Heavy Trucks:	57.9	56.5	47.5	48.7	57.1	57.2		
Vehicle Noise:	62.7	61.1	57.2	53.2	61.7	62.1		
Centerline Distance to Noise Contour (in feet)								
				70 dBA	65 dBA	60 dBA	55 dBA	
Ldn:				14	30	65	141	
CNEL:				15	32	69	150	

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL										
Scenario: Existing Without Project Road Name: Main St. Road Segment: n/o Russell St.					Project Name: Northgate Job Number: 11145					
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS					
Highway Data					Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt): 12,500 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 1,250 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15					
Site Data					Vehicle Mix					
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType		Day	Evening	Night	Daily
					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	
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)					
					Autos:		46.915			
					Medium Trucks:		46.726			
					Heavy Trucks:		46.744			
FHWA Noise Model Calculations										
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten			
Autos: 64.30 0.11 0.31 -1.20 -4.65 0.000 0.000										
Medium Trucks: 75.75 -17.13 0.34 -1.20 -4.87 0.000 0.000										
Heavy Trucks: 81.57 -21.08 0.34 -1.20 -5.43 0.000 0.000										
Unmitigated Noise Levels (without Topo and barrier attenuation)										
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL				
Autos: 63.5 61.6 59.9 53.8 62.4 63.0										
Medium Trucks: 57.8 56.3 49.9 48.3 56.8 57.0										
Heavy Trucks: 59.6 58.2 49.2 50.4 58.8 58.9										
Vehicle Noise: 65.8 64.0 60.6 56.2 64.7 65.2										
Centerline Distance to Noise Contour (in feet)										
				70 dBA	65 dBA	60 dBA	55 dBA			
Ldn:				22	48	104	223			
CNEL:				24	51	111	238			

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL										
Scenario: Existing Without Project Road Name: Main St. Road Segment: s/o Russell St.					Project Name: Northgate Job Number: 11145					
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS					
Highway Data					Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt): 10,300 vehicles					Autos: 15					
Peak Hour Percentage: 10%					Medium Trucks (2 Axles): 15					
Peak Hour Volume: 1,030 vehicles					Heavy Trucks (3+ Axles): 15					
Vehicle Speed: 35 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					Lane Equivalent Distance (in feet)					
Road Elevation: 0.0 feet					Autos: 46.915					
Road Grade: 0.0%					Medium Trucks: 46.726					
Left View: -90.0 degrees					Heavy Trucks: 46.744					
Right View: 90.0 degrees										
FHWA Noise Model Calculations										
VehicleType	REMEF	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten			
Autos:	64.30	-0.73	0.31	-1.20	-4.65	0.000	0.000			
Medium Trucks:	75.75	-17.97	0.34	-1.20	-4.87	0.000	0.000			
Heavy Trucks:	81.57	-21.93	0.34	-1.20	-5.43	0.000	0.000			
Unmitigated Noise Levels (without Topo and barrier attenuation)										
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL				
Autos:	62.7	60.8	59.0	53.0	61.6	62.2				
Medium Trucks:	56.9	55.4	49.0	47.5	56.0	56.2				
Heavy Trucks:	58.8	57.4	48.3	49.6	57.9	58.1				
Vehicle Noise:	64.9	63.2	59.8	55.4	63.9	64.3				
Centerline Distance to Noise Contour (in feet)										
			70 dBA	65 dBA	60 dBA	55 dBA				
Ldn:			20	42	91	196				
CNEL:			21	45	97	209				

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing Without Project Road Name: Orange St. Road Segment: n/o Columbia Av.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 3,700 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 370 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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: 32.833 Medium Trucks: 32.562 Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEF	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 64.30 -5.18 2.64 -1.20 -4.52 0.000 0.000									
Medium Trucks: 75.75 -22.42 2.69 -1.20 -4.86 0.000 0.000									
Heavy Trucks: 81.57 -26.37 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 60.6 58.7 56.9 50.8 59.5 60.1									
Medium Trucks: 54.8 53.3 47.0 45.4 53.9 54.1									
Heavy Trucks: 56.7 55.3 46.2 47.5 55.8 56.0									
Vehicle Noise: 62.8 61.1 57.6 53.3 61.8 62.2									
Centerline Distance to Noise Contour (in feet)									
					70 dBA	65 dBA	60 dBA	55 dBA	
Ldn:					9	20	43	94	
CNEL:					10	22	46	100	

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing Without Project Road Name: Orange St. Road Segment: s/o Columbia Av.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 4,300 vehicles					Autos: 15				
Peak Hour Percentage: 10%					Medium Trucks (2 Axles): 15				
Peak Hour Volume: 430 vehicles					Heavy Trucks (3+ Axles): 15				
Vehicle Speed: 35 mph									
Near/Far Lane Distance: 12 feet					Vehicle Mix				
					VehicleType	Day	Evening	Night	Daily
Site Data					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: 32.833				
					Medium Trucks: 32.562				
					Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 64.30 -4.52 2.64 -1.20 -4.52 0.000 0.000									
Medium Trucks: 75.75 -21.76 2.69 -1.20 -4.86 0.000 0.000									
Heavy Trucks: 81.57 -25.72 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 61.2 59.3 57.5 51.5 60.1 60.7									
Medium Trucks: 55.5 54.0 47.6 46.1 54.5 54.8									
Heavy Trucks: 57.3 55.9 46.9 48.1 56.5 56.6									
Vehicle Noise: 63.5 61.7 58.3 53.9 62.4 62.9									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn: 10				22	48	103			
CNEL: 11				24	51	110			

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing Without Project Road Name: Orange St. Road Segment: n/o Strong St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 5,100 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 510 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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: 32.833 Medium Trucks: 32.562 Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 64.30 -3.78 2.64 -1.20 -4.52 0.000 0.000									
Medium Trucks: 75.75 -21.02 2.69 -1.20 -4.86 0.000 0.000									
Heavy Trucks: 81.57 -24.98 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 62.0 60.1 58.3 52.2 60.9 61.5									
Medium Trucks: 56.2 54.7 48.3 46.8 55.3 55.5									
Heavy Trucks: 58.1 56.7 47.6 48.9 57.2 57.3									
Vehicle Noise: 64.2 62.5 59.0 54.7 63.2 63.6									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				12	25	54	116		
CNEL:				12	27	57	124		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing Without Project Road Name: Orange St. Road Segment: s/o Strong St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 6,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 600 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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: 32.833 Medium Trucks: 32.562 Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEF	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	-3.08	2.64	-1.20	-4.52	0.000	0.000		
Medium Trucks:	75.75	-20.32	2.69	-1.20	-4.86	0.000	0.000		
Heavy Trucks:	81.57	-24.27	2.69	-1.20	-5.69	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	62.7	60.8	59.0	52.9	61.6	62.2			
Medium Trucks:	56.9	55.4	49.1	47.5	56.0	56.2			
Heavy Trucks:	58.8	57.4	48.3	49.6	57.9	58.1			
Vehicle Noise:	64.9	63.2	59.7	55.4	63.9	64.3			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				13	28	60	129		
CNEL:				14	30	64	138		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing Without Project Road Name: Orange St. Road Segment: n/o Russell St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 5,800 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 580 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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: 32.833 Medium Trucks: 32.562 Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEF	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 64.30 -3.23 2.64 -1.20 -4.52 0.000 0.000									
Medium Trucks: 75.75 -20.46 2.69 -1.20 -4.86 0.000 0.000									
Heavy Trucks: 81.57 -24.42 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 62.5 60.6 58.8 52.8 61.4 62.0									
Medium Trucks: 56.8 55.3 48.9 47.4 55.8 56.1									
Heavy Trucks: 58.6 57.2 48.2 49.4 57.8 57.9									
Vehicle Noise: 64.8 63.0 59.6 55.2 63.7 64.2									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				13	27	59	126		
CNEL:				13	29	63	135		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing Without Project Road Name: Orange St. Road Segment: s/o Russell St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 3,700 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 370 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
					VehicleType	Day	Evening	Night	Daily
					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: 32.833				
					Medium Trucks: 32.562				
					Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 64.30 -5.18 2.64 -1.20 -4.52 0.000 0.000									
Medium Trucks: 75.75 -22.42 2.69 -1.20 -4.86 0.000 0.000									
Heavy Trucks: 81.57 -26.37 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 60.6 58.7 56.9 50.8 59.5 60.1									
Medium Trucks: 54.8 53.3 47.0 45.4 53.9 54.1									
Heavy Trucks: 56.7 55.3 46.2 47.5 55.8 56.0									
Vehicle Noise: 62.8 61.1 57.6 53.3 61.8 62.2									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				9	20	43	94		
CNEL:				10	22	46	100		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing Without Project Road Name: Primer St. Road Segment: n/o Columbia Av.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 8,700 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 870 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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: 32.833 Medium Trucks: 32.562 Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 64.30 -1.46 2.64 -1.20 -4.52 0.000 0.000									
Medium Trucks: 75.75 -18.70 2.69 -1.20 -4.86 0.000 0.000									
Heavy Trucks: 81.57 -22.66 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 64.3 62.4 60.6 54.6 63.2 63.8									
Medium Trucks: 58.5 57.0 50.7 49.1 57.6 57.8									
Heavy Trucks: 60.4 59.0 49.9 51.2 59.5 59.7									
Vehicle Noise: 66.5 64.8 61.4 57.0 65.5 65.9									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				17	36	77	165		
CNEL:				18	38	82	177		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing Without Project Road Name: La Cadena Dr. Road Segment: n/o I-215 Ramps					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 5,100 vehicles					Autos: 15				
Peak Hour Percentage: 10%					Medium Trucks (2 Axles): 15				
Peak Hour Volume: 510 vehicles					Heavy Trucks (3+ Axles): 15				
Vehicle Speed: 40 mph					Vehicle Mix				
Near/Far Lane Distance: 12 feet					VehicleType				
Site Data					Day				
Barrier Height: 0.0 feet					Evening				
Barrier Type (0-Wall, 1-Berm): 0.0					Night				
Centerline Dist. to Barrier: 33.0 feet					Daily				
Centerline Dist. to Observer: 33.0 feet					Autos: 77.5% 12.9% 9.6% 97.42%				
Barrier Distance to Observer: 0.0 feet					Medium Trucks: 84.8% 4.9% 10.3% 1.84%				
Observer Height (Above Pad): 5.0 feet					Heavy Trucks: 86.5% 2.7% 10.8% 0.74%				
Pad Elevation: 0.0 feet					Noise Source Elevations (in feet)				
Road Elevation: 0.0 feet					Autos: 0.000				
Road Grade: 0.0%					Medium Trucks: 2.297				
Left View: -90.0 degrees					Heavy Trucks: 8.006 Grade Adjustment: 0.0				
Right View: 90.0 degrees					Lane Equivalent Distance (in feet)				
					Autos: 32.833				
					Medium Trucks: 32.562				
					Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMED	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	66.51	-4.36	2.64	-1.20	-4.52	0.000	0.000		
Medium Trucks:	77.72	-21.60	2.69	-1.20	-4.86	0.000	0.000		
Heavy Trucks:	82.99	-25.56	2.69	-1.20	-5.69	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	63.6	61.7	59.9	53.9	62.5	63.1			
Medium Trucks:	57.6	56.1	49.7	48.2	56.7	56.9			
Heavy Trucks:	58.9	57.5	48.5	49.7	58.1	58.2			
Vehicle Noise:	65.6	63.9	60.6	56.1	64.6	65.0			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				14	31	67	144		
CNEL:				15	33	71	154		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing Without Project Road Name: La Cadena Dr. Road Segment: s/o I-215 Ramps					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 2,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 200 vehicles Vehicle Speed: 40 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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: 32.833 Medium Trucks: 32.562 Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 66.51 -8.43 2.64 -1.20 -4.52 0.000 0.000									
Medium Trucks: 77.72 -25.67 2.69 -1.20 -4.86 0.000 0.000									
Heavy Trucks: 82.99 -29.62 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 59.5 57.6 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 54.1									
Vehicle Noise: 61.5 59.8 56.5 52.0 60.5 61.0									
Centerline Distance to Noise Contour (in feet)									
			70 dBA	65 dBA	60 dBA	55 dBA			
Ldn:			8	17	36	77			
CNEL:			8	18	38	82			

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing Without Project Road Name: La Cadena Dr. Road Segment: n/o Strong St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 2,000 vehicles					Autos: 15				
Peak Hour Percentage: 10%					Medium Trucks (2 Axles): 15				
Peak Hour Volume: 200 vehicles					Heavy Trucks (3+ Axles): 15				
Vehicle Speed: 40 mph									
Near/Far Lane Distance: 12 feet									
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet					Autos: 77.5% 12.9% 9.6% 97.42%				
Barrier Type (0-Wall, 1-Berm): 0.0					Medium Trucks: 84.8% 4.9% 10.3% 1.84%				
Centerline Dist. to Barrier: 33.0 feet					Heavy Trucks: 86.5% 2.7% 10.8% 0.74%				
Centerline Dist. to Observer: 33.0 feet									
Barrier Distance to Observer: 0.0 feet									
Observer Height (Above Pad): 5.0 feet									
Pad Elevation: 0.0 feet									
Road Elevation: 0.0 feet									
Road Grade: 0.0%									
Left View: -90.0 degrees									
Right View: 90.0 degrees									
FHWA Noise Model Calculations					Noise Source Elevations (in feet)				
VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berm Atten					Autos: 0.000				
Autos: 66.51 -8.43 2.64 -1.20 -4.52 0.000 0.000					Medium Trucks: 2.297				
Medium Trucks: 77.72 -25.67 2.69 -1.20 -4.86 0.000 0.000					Heavy Trucks: 8.006 Grade Adjustment: 0.0				
Heavy Trucks: 82.99 -29.62 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)					Lane Equivalent Distance (in feet)				
VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL					Autos: 59.5 57.6 55.9 49.8 58.4 59.0				
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				
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 54.1				
Heavy Trucks: 54.9 53.4 44.4 45.6 54.0 54.1					Vehicle Noise: 61.5 59.8 56.5 52.0 60.5 61.0				
Vehicle Noise: 61.5 59.8 56.5 52.0 60.5 61.0									
Centerline Distance to Noise Contour (in feet)									
					70 dBA 65 dBA 60 dBA 55 dBA				
Ldn: 8 17 36 77									
CNEL: 8 18 38 82									
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing Without Project Road Name: Placentia Ln. Road Segment: e/o Main St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 3,200 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 320 vehicles Vehicle Speed: 25 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 44.0 feet Centerline Dist. to Observer: 44.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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: 40.460				
					Medium Trucks: 40.241				
					Heavy Trucks: 40.262				
FHWA Noise Model Calculations									
VehicleType	REMEF	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 58.73 -4.35 1.28 -1.20 -4.61 0.000 0.000									
Medium Trucks: 70.80 -21.59 1.31 -1.20 -4.87 0.000 0.000									
Heavy Trucks: 77.97 -25.54 1.31 -1.20 -5.50 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos: 54.5 52.6 50.8 44.7 53.4 54.0									
Medium Trucks: 49.3 47.8 41.5 39.9 48.4 48.6									
Heavy Trucks: 52.5 51.1 42.1 43.3 51.7 51.8									
Vehicle Noise: 57.4 55.7 51.8 47.9 56.4 56.8									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				5	12	25	54		
CNEL:				6	12	27	58		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing Without Project Road Name: Columbia Av. Road Segment: e/o Orange St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 9,500 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 950 vehicles Vehicle Speed: 45 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
					Vehicle Type	Day	Evening	Night	Daily
					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: 40.460				
					Medium Trucks: 40.241				
					Heavy Trucks: 40.262				
FHWA Noise Model Calculations									
Vehicle Type	REMODEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 68.46 -2.17 1.28 -1.20 -4.61 0.000 0.000									
Medium Trucks: 79.45 -19.41 1.31 -1.20 -4.87 0.000 0.000									
Heavy Trucks: 84.25 -23.37 1.31 -1.20 -5.50 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 66.4 64.5 62.7 56.6 65.3 65.9									
Medium Trucks: 60.1 58.6 52.3 50.7 59.2 59.4									
Heavy Trucks: 61.0 59.6 50.5 51.8 60.1 60.3									
Vehicle Noise: 68.2 66.5 63.3 58.6 67.2 67.6									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				29	61	132	285		
CNEL:				31	66	142	306		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing Without Project Road Name: Columbia Av. Road Segment: e/o Primer St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 16,800 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 1,680 vehicles Vehicle Speed: 45 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 44.0 feet Centerline Dist. to Observer: 44.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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%				
FHWA Noise Model Calculations					Noise Source Elevations (in feet)				
					Autos: 0.000				
					Medium Trucks: 2.297				
					Heavy Trucks: 8.006 Grade Adjustment: 0.0				
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)				
					Autos: 40.460				
					Medium Trucks: 40.241				
					Heavy Trucks: 40.262				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	68.46	0.30	1.28	-1.20	-4.61	0.000	0.000		
Medium Trucks:	79.45	-16.94	1.31	-1.20	-4.87	0.000	0.000		
Heavy Trucks:	84.25	-20.89	1.31	-1.20	-5.50	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	68.8	66.9	65.2	59.1	67.7	68.3			
Medium Trucks:	62.6	61.1	54.8	53.2	61.7	61.9			
Heavy Trucks:	63.5	62.0	53.0	54.3	62.6	62.7			
Vehicle Noise:	70.7	68.9	65.8	61.1	69.7	70.1			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				42	90	194	417		
CNEL:				45	96	208	448		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing Without Project Road Name: Strong St. Road Segment: w/o Main St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 2,700 vehicles					Autos: 15				
Peak Hour Percentage: 10%					Medium Trucks (2 Axles): 15				
Peak Hour Volume: 270 vehicles					Heavy Trucks (3+ Axles): 15				
Vehicle Speed: 25 mph					Vehicle Mix				
Near/Far Lane Distance: 12 feet					VehicleType				
Site Data					Day				
Barrier Height: 0.0 feet					Evening				
Barrier Type (0-Wall, 1-Berm): 0.0					Night				
Centerline Dist. to Barrier: 33.0 feet					Daily				
Centerline Dist. to Observer: 33.0 feet					Autos: 77.5% 12.9% 9.6% 97.42%				
Barrier Distance to Observer: 0.0 feet					Medium Trucks: 84.8% 4.9% 10.3% 1.84%				
Observer Height (Above Pad): 5.0 feet					Heavy Trucks: 86.5% 2.7% 10.8% 0.74%				
Pad Elevation: 0.0 feet					Noise Source Elevations (in feet)				
Road Elevation: 0.0 feet					Autos: 0.000				
Road Grade: 0.0%					Medium Trucks: 2.297				
Left View: -90.0 degrees					Heavy Trucks: 8.006				
Right View: 90.0 degrees					Grade Adjustment: 0.0				
					Lane Equivalent Distance (in feet)				
					Autos: 32.833				
					Medium Trucks: 32.562				
					Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 58.73 -5.08 2.64 -1.20 -4.52 0.000 0.000									
Medium Trucks: 70.80 -22.32 2.69 -1.20 -4.86 0.000 0.000									
Heavy Trucks: 77.97 -26.28 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 55.1 53.2 51.4 45.4 54.0 54.6									
Medium Trucks: 50.0 48.5 42.1 40.5 49.0 49.2									
Heavy Trucks: 53.2 51.8 42.7 44.0 52.3 52.5									
Vehicle Noise: 58.0 56.3 52.4 48.5 57.0 57.4									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				4	10	21	45		
CNEL:				5	10	22	48		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing Without Project Road Name: Strong St. Road Segment: e/o Main St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 2,500 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 250 vehicles Vehicle Speed: 25 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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: 32.833 Medium Trucks: 32.562 Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	58.73	-5.42	2.64	-1.20	-4.52	0.000	0.000		
Medium Trucks:	70.80	-22.66	2.69	-1.20	-4.86	0.000	0.000		
Heavy Trucks:	77.97	-26.61	2.69	-1.20	-5.69	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	54.8	52.9	51.1	45.0	53.7	54.3			
Medium Trucks:	49.6	48.1	41.8	40.2	48.7	48.9			
Heavy Trucks:	52.8	51.4	42.4	43.6	52.0	52.1			
Vehicle Noise:	57.7	56.0	52.1	48.2	56.7	57.1			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				4	9	20	43		
CNEL:				5	10	21	45		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing Without Project Road Name: Russell St. Road Segment: e/o Main St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 3,100 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 310 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 44.0 feet Centerline Dist. to Observer: 44.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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: 40.460 Medium Trucks: 40.241 Heavy Trucks: 40.262				
FHWA Noise Model Calculations									
VehicleType	REMEF	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	-5.95	1.28	-1.20	-4.61	0.000	0.000	0.000	
Medium Trucks:	75.75	-23.18	1.31	-1.20	-4.87	0.000	0.000	0.000	
Heavy Trucks:	81.57	-27.14	1.31	-1.20	-5.50	0.000	0.000	0.000	
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	58.4	56.5	54.8	48.7	57.3	57.9			
Medium Trucks:	52.7	51.2	44.8	43.3	51.7	52.0			
Heavy Trucks:	54.5	53.1	44.1	45.3	53.7	53.8			
Vehicle Noise:	60.7	59.0	55.5	51.1	59.7	60.1			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				9	19	42	90		
CNEL:				10	21	45	96		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing With Project Road Name: Main St. Road Segment: s/o Placentia Ln.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 15,600 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 1,560 vehicles Vehicle Speed: 50 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 70.20 -0.48 0.31 -1.20 -4.65 0.000 0.000									
Medium Trucks: 81.00 -17.72 0.34 -1.20 -4.87 0.000 0.000									
Heavy Trucks: 85.38 -21.67 0.34 -1.20 -5.43 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 68.8 66.9 65.2 59.1 67.7 68.3									
Medium Trucks: 62.4 60.9 54.6 53.0 61.5 61.7									
Heavy Trucks: 62.8 61.4 52.4 53.6 62.0 62.1									
Vehicle Noise: 70.5 68.8 65.7 61.0 69.5 70.0									
Centerline Distance to Noise Contour (in feet)									
			70 dBA	65 dBA	60 dBA	55 dBA			
Ldn:			46	100	215	464			
CNEL:			50	107	231	498			

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing With Project Road Name: Main St. Road Segment: n/o Columbia Av.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 17,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 1,700 vehicles Vehicle Speed: 50 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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			
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	70.20	-0.10	0.31	-1.20	-4.65	0.000	0.000		
Medium Trucks:	81.00	-17.34	0.34	-1.20	-4.87	0.000	0.000		
Heavy Trucks:	85.38	-21.30	0.34	-1.20	-5.43	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	69.2	67.3	65.5	59.5	68.1	68.7			
Medium Trucks:	62.8	61.3	54.9	53.4	61.8	62.1			
Heavy Trucks:	63.2	61.8	52.8	54.0	62.4	62.5			
Vehicle Noise:	70.9	69.2	66.1	61.3	69.9	70.3			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				49	106	228	491		
CNEL:				53	114	245	527		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing With Project Road Name: Main St. Road Segment: s/o Columbia Av.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 14,800 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 1,480 vehicles Vehicle Speed: 50 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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				
FHWA Noise Model Calculations									
VehicleType	REMEF	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	70.20	-0.71	0.31	-1.20	-4.65	0.000	0.000		
Medium Trucks:	81.00	-17.94	0.34	-1.20	-4.87	0.000	0.000		
Heavy Trucks:	85.38	-21.90	0.34	-1.20	-5.43	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	68.6	66.7	64.9	58.9	67.5	68.1			
Medium Trucks:	62.2	60.7	54.3	52.8	61.2	61.5			
Heavy Trucks:	62.6	61.2	52.2	53.4	61.8	61.9			
Vehicle Noise:	70.3	68.6	65.5	60.7	69.3	69.7			
Centerline Distance to Noise Contour (in feet)									
			70 dBA	65 dBA	60 dBA	55 dBA			
Ldn:			45	96	208	448			
CNEL:			48	104	223	481			
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing With Project Road Name: Main St. Road Segment: n/o Strong St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 15,300 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 1,530 vehicles Vehicle Speed: 45 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					Vehicle Type	Day	Evening	Night	Daily
					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				
FHWA Noise Model Calculations									
Vehicle Type	REMMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 68.46 -0.10 0.31 -1.20 -4.65 0.000 0.000									
Medium Trucks: 79.45 -17.34 0.34 -1.20 -4.87 0.000 0.000									
Heavy Trucks: 84.25 -21.30 0.34 -1.20 -5.43 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 67.5 65.6 63.8 57.7 66.4 67.0									
Medium Trucks: 61.2 59.7 53.4 51.8 60.3 60.5									
Heavy Trucks: 62.1 60.7 51.6 52.9 61.2 61.4									
Vehicle Noise: 69.3 67.6 64.4 59.7 68.3 68.7									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				38	83	178	384		
CNEL:				41	89	191	412		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing With Project Road Name: Main St. Road Segment: s/o Strong St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 14,300 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 1,430 vehicles Vehicle Speed: 25 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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				
FHWA Noise Model Calculations									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 58.73 2.16 0.31 -1.20 -4.65 0.000 0.000									
Medium Trucks: 70.80 -15.08 0.34 -1.20 -4.87 0.000 0.000									
Heavy Trucks: 77.97 -19.04 0.34 -1.20 -5.43 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 60.0 58.1 56.3 50.3 58.9 59.5									
Medium Trucks: 54.9 53.3 47.0 45.4 53.9 54.1									
Heavy Trucks: 58.1 56.6 47.6 48.9 57.2 57.3									
Vehicle Noise: 62.9 61.2 57.3 53.4 61.9 62.3									
Centerline Distance to Noise Contour (in feet)									
			70 dBA	65 dBA	60 dBA	55 dBA			
Ldn:			14	31	67	144			
CNEL:			15	33	71	153			
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing With Project Road Name: Main St. Road Segment: n/o Russell St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 14,300 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 1,430 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
					VehicleType	Day	Evening	Night	Daily
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					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				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 64.30 0.69 0.31 -1.20 -4.65 0.000 0.000									
Medium Trucks: 75.75 -16.54 0.34 -1.20 -4.87 0.000 0.000									
Heavy Trucks: 81.57 -20.50 0.34 -1.20 -5.43 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 64.1 62.2 60.4 54.4 63.0 63.6									
Medium Trucks: 58.3 56.8 50.5 48.9 57.4 57.6									
Heavy Trucks: 60.2 58.8 49.7 51.0 59.3 59.5									
Vehicle Noise: 66.3 64.6 61.2 56.8 65.3 65.8									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				24	53	113	244		
CNEL:				26	56	121	261		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing With Project Road Name: Main St. Road Segment: s/o Russell St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 11,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 1,100 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	-0.45	0.31	-1.20	-4.65	0.000	0.000		
Medium Trucks:	75.75	-17.68	0.34	-1.20	-4.87	0.000	0.000		
Heavy Trucks:	81.57	-21.64	0.34	-1.20	-5.43	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	63.0	61.1	59.3	53.2	61.9	62.5			
Medium Trucks:	57.2	55.7	49.3	47.8	56.2	56.5			
Heavy Trucks:	59.1	57.6	48.6	49.9	58.2	58.3			
Vehicle Noise:	65.2	63.5	60.0	55.7	64.2	64.6			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				20	44	95	205		
CNEL:				22	47	102	219		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL										
Scenario: Existing With Project Road Name: Orange St. Road Segment: n/o Columbia Av.					Project Name: Northgate Job Number: 11145					
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS					
Highway Data					Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):		3,900 vehicles			Autos: 15					
Peak Hour Percentage:		10%			Medium Trucks (2 Axles): 15					
Peak Hour Volume:		390 vehicles			Heavy Trucks (3+ Axles): 15					
Vehicle Speed:		35 mph			Vehicle Mix					
Near/Far Lane Distance:		12 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:		33.0 feet			Noise Source Elevations (in feet)					
Centerline Dist. to Observer:		33.0 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)					
Road Elevation:		0.0 feet			Autos:		32.833			
Road Grade:		0.0%			Medium Trucks:		32.562			
Left View:		-90.0 degrees			Heavy Trucks:		32.589			
Right View:		90.0 degrees								
FHWA Noise Model Calculations										
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten			
Autos:	64.30	-4.95	2.64	-1.20	-4.52	0.000	0.000		0.000	
Medium Trucks:	75.75	-22.19	2.69	-1.20	-4.86	0.000	0.000		0.000	
Heavy Trucks:	81.57	-26.14	2.69	-1.20	-5.69	0.000	0.000		0.000	
Unmitigated Noise Levels (without Topo and barrier attenuation)										
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL				
Autos:	60.8	58.9	57.1	51.1	59.7	60.3				
Medium Trucks:	55.1	53.5	47.2	45.6	54.1	54.3				
Heavy Trucks:	56.9	55.5	46.5	47.7	56.1	56.2				
Vehicle Noise:	63.0	61.3	57.9	53.5	62.0	62.4				
Centerline Distance to Noise Contour (in feet)										
				70 dBA	65 dBA	60 dBA	55 dBA			
Ldn:				10	21	45	97			
CNEL:				10	22	48	104			

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing With Project Road Name: Orange St. Road Segment: s/o Columbia Av.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 5,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 500 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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: 32.833 Medium Trucks: 32.562 Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	-3.87	2.64	-1.20	-4.52	0.000	0.000		0.000
Medium Trucks:	75.75	-21.11	2.69	-1.20	-4.86	0.000	0.000		0.000
Heavy Trucks:	81.57	-25.06	2.69	-1.20	-5.69	0.000	0.000		0.000
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	61.9	60.0	58.2	52.1	60.8	61.4			
Medium Trucks:	56.1	54.6	48.3	46.7	55.2	55.4			
Heavy Trucks:	58.0	56.6	47.5	48.8	57.1	57.3			
Vehicle Noise:	64.1	62.4	58.9	54.6	63.1	63.5			
Centerline Distance to Noise Contour (in feet)									
			70 dBA	65 dBA	60 dBA	55 dBA			
Ldn:			11	25	53	114			
CNEL:			12	26	57	122			

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing With Project Road Name: Orange St. Road Segment: n/o Strong St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 6,100 vehicles					Autos: 15				
Peak Hour Percentage: 10%					Medium Trucks (2 Axles): 15				
Peak Hour Volume: 610 vehicles					Heavy Trucks (3+ Axles): 15				
Vehicle Speed: 35 mph									
Near/Far Lane Distance: 12 feet					Vehicle Mix				
					VehicleType	Day	Evening	Night	Daily
Site Data					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: 32.833				
					Medium Trucks: 32.562				
					Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 64.30 -3.01 2.64 -1.20 -4.52 0.000 0.000									
Medium Trucks: 75.75 -20.24 2.69 -1.20 -4.86 0.000 0.000									
Heavy Trucks: 81.57 -24.20 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 62.7 60.8 59.1 53.0 61.6 62.2									
Medium Trucks: 57.0 55.5 49.1 47.6 56.0 56.3									
Heavy Trucks: 58.9 57.4 48.4 49.6 58.0 58.1									
Vehicle Noise: 65.0 63.3 59.8 55.4 64.0 64.4									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				13	28	61	131		
CNEL:				14	30	65	140		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing With Project Road Name: Orange St. Road Segment: s/o Strong St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 8,500 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 850 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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: 32.833 Medium Trucks: 32.562 Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 64.30 -1.57 2.64 -1.20 -4.52 0.000 0.000									
Medium Trucks: 75.75 -18.80 2.69 -1.20 -4.86 0.000 0.000									
Heavy Trucks: 81.57 -22.76 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 64.2 62.3 60.5 54.5 63.1 63.7									
Medium Trucks: 58.4 56.9 50.6 49.0 57.5 57.7									
Heavy Trucks: 60.3 58.9 49.8 51.1 59.4 59.6									
Vehicle Noise: 66.4 64.7 61.3 56.9 65.4 65.8									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				16	35	76	163		
CNEL:				17	37	81	174		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing With Project Road Name: Orange St. Road Segment: n/o Russell St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 8,100 vehicles					Autos: 15				
Peak Hour Percentage: 10%					Medium Trucks (2 Axles): 15				
Peak Hour Volume: 810 vehicles					Heavy Trucks (3+ Axles): 15				
Vehicle Speed: 35 mph					Vehicle Mix				
Near/Far Lane Distance: 12 feet					VehicleType				
Site Data					Day				
Barrier Height: 0.0 feet					Evening				
Barrier Type (0-Wall, 1-Berm): 0.0					Night				
Centerline Dist. to Barrier: 33.0 feet					Daily				
Centerline Dist. to Observer: 33.0 feet					Autos: 77.5% 12.9% 9.6% 97.42%				
Barrier Distance to Observer: 0.0 feet					Medium Trucks: 84.8% 4.9% 10.3% 1.84%				
Observer Height (Above Pad): 5.0 feet					Heavy Trucks: 86.5% 2.7% 10.8% 0.74%				
Pad Elevation: 0.0 feet					Noise Source Elevations (in feet)				
Road Elevation: 0.0 feet					Autos: 0.000				
Road Grade: 0.0%					Medium Trucks: 2.297				
Left View: -90.0 degrees					Heavy Trucks: 8.006 Grade Adjustment: 0.0				
Right View: 90.0 degrees					Lane Equivalent Distance (in feet)				
					Autos: 32.833				
					Medium Trucks: 32.562				
					Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEF	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	-1.77	2.64	-1.20	-4.52	0.000	0.000		
Medium Trucks:	75.75	-19.01	2.69	-1.20	-4.86	0.000	0.000		
Heavy Trucks:	81.57	-22.97	2.69	-1.20	-5.69	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	64.0	62.1	60.3	54.2	62.9	63.5			
Medium Trucks:	58.2	56.7	50.4	48.8	57.3	57.5			
Heavy Trucks:	60.1	58.7	49.6	50.9	59.2	59.4			
Vehicle Noise:	66.2	64.5	61.0	56.7	65.2	65.6			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				16	34	73	158		
CNEL:				17	36	78	169		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing With Project Road Name: Orange St. Road Segment: s/o Russell St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 4,200 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 420 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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: 32.833 Medium Trucks: 32.562 Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 64.30 -4.63 2.64 -1.20 -4.52 0.000 0.000									
Medium Trucks: 75.75 -21.87 2.69 -1.20 -4.86 0.000 0.000									
Heavy Trucks: 81.57 -25.82 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 61.1 59.2 57.4 51.4 60.0 60.6									
Medium Trucks: 55.4 53.9 47.5 46.0 54.4 54.7									
Heavy Trucks: 57.2 55.8 46.8 48.0 56.4 56.5									
Vehicle Noise: 63.4 61.6 58.2 53.8 62.3 62.8									
Centerline Distance to Noise Contour (in feet)									
			70 dBA	65 dBA	60 dBA	55 dBA			
Ldn:			10	22	47	102			
CNEL:			11	23	50	109			

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing With Project Road Name: Primer St. Road Segment: n/o Columbia Av.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 9,500 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 950 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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%
FHWA Noise Model Calculations					Noise Source Elevations (in feet)				
					Autos:	0.000			
					Medium Trucks:	2.297			
					Heavy Trucks:	8.006	Grade Adjustment:	0.0	
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)				
					Autos:	32.833			
					Medium Trucks:	32.562			
					Heavy Trucks:	32.589			
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	-1.08	2.64	-1.20	-4.52	0.000	0.000		
Medium Trucks:	75.75	-18.32	2.69	-1.20	-4.86	0.000	0.000		
Heavy Trucks:	81.57	-22.28	2.69	-1.20	-5.69	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	64.7	62.8	61.0	54.9	63.6	64.2			
Medium Trucks:	58.9	57.4	51.0	49.5	58.0	58.2			
Heavy Trucks:	60.8	59.4	50.3	51.6	59.9	60.0			
Vehicle Noise:	66.9	65.2	61.7	57.4	65.9	66.3			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				18	38	81	175		
CNEL:				19	40	87	187		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing With Project Road Name: La Cadena Dr. Road Segment: n/o I-215 Ramps					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 5,300 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 530 vehicles Vehicle Speed: 40 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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%				
FHWA Noise Model Calculations					Noise Source Elevations (in feet)				
					Autos: 0.000				
					Medium Trucks: 2.297				
					Heavy Trucks: 8.006 Grade Adjustment: 0.0				
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)				
					Autos: 32.833				
					Medium Trucks: 32.562				
					Heavy Trucks: 32.589				
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	66.51	-4.20	2.64	-1.20	-4.52	0.000	0.000		
Medium Trucks:	77.72	-21.44	2.69	-1.20	-4.86	0.000	0.000		
Heavy Trucks:	82.99	-25.39	2.69	-1.20	-5.69	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	63.8	61.9	60.1	54.0	62.7	63.3			
Medium Trucks:	57.8	56.3	49.9	48.4	56.8	57.0			
Heavy Trucks:	59.1	57.7	48.6	49.9	58.2	58.4			
Vehicle Noise:	65.8	64.0	60.8	56.2	64.8	65.2			
Centerline Distance to Noise Contour (in feet)									
			70 dBA	65 dBA	60 dBA	55 dBA			
Ldn:			15	32	68	148			
CNEL:			16	34	73	158			
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing With Project Road Name: La Cadena Dr. Road Segment: s/o I-215 Ramps					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 3,700 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 370 vehicles Vehicle Speed: 40 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					Vehicle Type	Day	Evening	Night	Daily
					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:	32.833			
					Medium Trucks:	32.562			
					Heavy Trucks:	32.589			
FHWA Noise Model Calculations									
Vehicle Type	REMODEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	66.51	-5.76	2.64	-1.20	-4.52	0.000	0.000		
Medium Trucks:	77.72	-23.00	2.69	-1.20	-4.86	0.000	0.000		
Heavy Trucks:	82.99	-26.95	2.69	-1.20	-5.69	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	62.2	60.3	58.5	52.5	61.1	61.7			
Medium Trucks:	56.2	54.7	48.3	46.8	55.3	55.5			
Heavy Trucks:	57.5	56.1	47.1	48.3	56.7	56.8			
Vehicle Noise:	64.2	62.5	59.2	54.7	63.2	63.6			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				12	25	54	116		
CNEL:				12	27	58	124		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing With Project Road Name: La Cadena Dr. Road Segment: n/o Strong St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 3,700 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 370 vehicles Vehicle Speed: 40 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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%				
FHWA Noise Model Calculations					Noise Source Elevations (in feet)				
					Autos: 0.000				
					Medium Trucks: 2.297				
					Heavy Trucks: 8.006 Grade Adjustment: 0.0				
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)				
					Autos: 32.833				
					Medium Trucks: 32.562				
					Heavy Trucks: 32.589				
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 66.51 -5.76 2.64 -1.20 -4.52 0.000 0.000									
Medium Trucks: 77.72 -23.00 2.69 -1.20 -4.86 0.000 0.000									
Heavy Trucks: 82.99 -26.95 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 62.2 60.3 58.5 52.5 61.1 61.7									
Medium Trucks: 56.2 54.7 48.3 46.8 55.3 55.5									
Heavy Trucks: 57.5 56.1 47.1 48.3 56.7 56.8									
Vehicle Noise: 64.2 62.5 59.2 54.7 63.2 63.6									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				12	25	54	116		
CNEL:				12	27	58	124		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL										
Scenario: Existing With Project Road Name: Placentia Ln. Road Segment: e/o Main St.					Project Name: Northgate Job Number: 11145					
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS					
Highway Data					Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):		3,400 vehicles			Autos:		15			
Peak Hour Percentage:		10%			Medium Trucks (2 Axles):		15			
Peak Hour Volume:		340 vehicles			Heavy Trucks (3+ Axles):		15			
Vehicle Speed:		25 mph			Vehicle Mix					
Near/Far Lane Distance:		36 feet								
Site Data					Vehicle Type		Day	Evening	Night	Daily
Barrier Height:		0.0 feet			Autos:		77.5%	12.9%	9.6%	97.42%
Barrier Type (0-Wall, 1-Berm):		0.0			Medium Trucks:		84.8%	4.9%	10.3%	1.84%
Centerline Dist. to Barrier:		44.0 feet			Heavy Trucks:		86.5%	2.7%	10.8%	0.74%
Centerline Dist. to Observer:		44.0 feet			Noise Source Elevations (in feet)					
Barrier Distance to Observer:		0.0 feet								
Observer Height (Above Pad):		5.0 feet			Autos:		0.000			
Pad Elevation:		0.0 feet			Medium Trucks:		2.297			
Road Elevation:		0.0 feet			Heavy Trucks:		8.006			
Road Grade:		0.0%			Lane Equivalent Distance (in feet)					
Left View:		-90.0 degrees								
Right View:		90.0 degrees			Autos:		40.460			
					Medium Trucks:		40.241			
					Heavy Trucks:		40.262			
FHWA Noise Model Calculations										
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten			
Autos:		58.73	-4.08	1.28	-1.20	-4.61	0.000	0.000		
Medium Trucks:		70.80	-21.32	1.31	-1.20	-4.87	0.000	0.000		
Heavy Trucks:		77.97	-25.28	1.31	-1.20	-5.50	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)										
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL				
Autos:		54.7	52.8	51.1	45.0	53.6	54.2			
Medium Trucks:		49.6	48.1	41.7	40.2	48.6	48.9			
Heavy Trucks:		52.8	51.4	42.3	43.6	51.9	52.1			
Vehicle Noise:		57.6	55.9	52.0	48.1	56.6	57.0			
Centerline Distance to Noise Contour (in feet)										
				70 dBA	65 dBA	60 dBA	55 dBA			
Ldn:				6	12	26	57			
CNEL:				6	13	28	60			

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing With Project Road Name: Columbia Av. Road Segment: e/o Primer St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 18,100 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 1,810 vehicles Vehicle Speed: 45 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
					VehicleType	Day	Evening	Night	Daily
					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: 40.460				
					Medium Trucks: 40.241				
					Heavy Trucks: 40.262				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Attten	Berm Attten		
Autos: 68.46 0.63 1.28 -1.20 -4.61 0.000 0.000									
Medium Trucks: 79.45 -16.61 1.31 -1.20 -4.87 0.000 0.000									
Heavy Trucks: 84.25 -20.57 1.31 -1.20 -5.50 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 69.2 67.3 65.5 59.4 68.1 68.7									
Medium Trucks: 62.9 61.4 55.1 53.5 62.0 62.2									
Heavy Trucks: 63.8 62.4 53.3 54.6 62.9 63.1									
Vehicle Noise: 71.0 69.3 66.1 61.4 70.0 70.4									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				44	95	204	439		
CNEL:				47	101	218	471		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL								
Scenario: Existing With Project Road Name: Columbia Av. Road Segment: e/o Orange St.				Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA				NOISE MODEL INPUTS				
Highway Data				Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 10,100 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 1,010 vehicles Vehicle Speed: 45 mph Near/Far Lane Distance: 36 feet				Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data				Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 44.0 feet Centerline Dist. to Observer: 44.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees				VehicleType	Day	Evening	Night	Daily
				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:	40.460			
				Medium Trucks:	40.241			
				Heavy Trucks:	40.262			
FHWA Noise Model Calculations								
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten	
Autos:	68.46	-1.91	1.28	-1.20	-4.61	0.000	0.000	
Medium Trucks:	79.45	-19.15	1.31	-1.20	-4.87	0.000	0.000	
Heavy Trucks:	84.25	-23.10	1.31	-1.20	-5.50	0.000	0.000	
Unmitigated Noise Levels (without Topo and barrier attenuation)								
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL		
Autos:	66.6	64.7	63.0	56.9	65.5	66.1		
Medium Trucks:	60.4	58.9	52.5	51.0	59.5	59.7		
Heavy Trucks:	61.3	59.8	50.8	52.1	60.4	60.5		
Vehicle Noise:	68.5	66.7	63.6	58.9	67.4	67.9		
Centerline Distance to Noise Contour (in feet)								
			70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:			30	64	138	297		
CNEL:			32	69	148	319		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing With Project Road Name: Strong St. Road Segment: w/o Main St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 3,400 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 340 vehicles Vehicle Speed: 25 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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: 32.833				
					Medium Trucks: 32.562				
					Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	58.73	-4.08	2.64	-1.20	-4.52	0.000	0.000		
Medium Trucks:	70.80	-21.32	2.69	-1.20	-4.86	0.000	0.000		
Heavy Trucks:	77.97	-25.28	2.69	-1.20	-5.69	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	56.1	54.2	52.4	46.4	55.0	55.6			
Medium Trucks:	51.0	49.5	43.1	41.6	50.0	50.2			
Heavy Trucks:	54.2	52.8	43.7	45.0	53.3	53.5			
Vehicle Noise:	59.0	57.3	53.4	49.5	58.0	58.4			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				5	11	24	52		
CNEL:				6	12	26	56		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing With Project Road Name: Strong St. Road Segment: e/o Main St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 4,000 vehicles					Autos: 15				
Peak Hour Percentage: 10%					Medium Trucks (2 Axles): 15				
Peak Hour Volume: 400 vehicles					Heavy Trucks (3+ Axles): 15				
Vehicle Speed: 25 mph									
Near/Far Lane Distance: 12 feet					Vehicle Mix				
					Vehicle Type	Day	Evening	Night	Daily
Site Data					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				
Barrier Height: 0.0 feet					Medium Trucks: 2.297				
Barrier Type (0-Wall, 1-Berm): 0.0					Heavy Trucks: 8.006				
Centerline Dist. to Barrier: 33.0 feet					Grade Adjustment: 0.0				
Centerline Dist. to Observer: 33.0 feet									
Barrier Distance to Observer: 0.0 feet									
Observer Height (Above Pad): 5.0 feet									
Pad Elevation: 0.0 feet									
Road Elevation: 0.0 feet									
Road Grade: 0.0%					Lane Equivalent Distance (in feet)				
Left View: -90.0 degrees					Autos: 32.833				
Right View: 90.0 degrees					Medium Trucks: 32.562				
					Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
Vehicle Type	REMED	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 58.73 -3.38 2.64 -1.20 -4.52 0.000 0.000									
Medium Trucks: 70.80 -20.62 2.69 -1.20 -4.86 0.000 0.000									
Heavy Trucks: 77.97 -24.57 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 56.8 54.9 53.1 47.1 55.7 56.3									
Medium Trucks: 51.7 50.2 43.8 42.3 50.7 50.9									
Heavy Trucks: 54.9 53.5 44.4 45.7 54.0 54.2									
Vehicle Noise: 59.7 58.0 54.1 50.2 58.7 59.1									
Centerline Distance to Noise Contour (in feet)									
			70 dBA	65 dBA	60 dBA	55 dBA			
Ldn:			6	13	27	58			
CNEL:			6	13	29	62			

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: Existing With Project Road Name: Russell St. Road Segment: e/o Main St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 4,900 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 490 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 44.0 feet Centerline Dist. to Observer: 44.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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:	40.460			
					Medium Trucks:	40.241			
					Heavy Trucks:	40.262			
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	-3.96	1.28	-1.20	-4.61	0.000	0.000		
Medium Trucks:	75.75	-21.20	1.31	-1.20	-4.87	0.000	0.000		
Heavy Trucks:	81.57	-25.15	1.31	-1.20	-5.50	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	60.4	58.5	56.8	50.7	59.3	59.9			
Medium Trucks:	54.7	53.2	46.8	45.3	53.7	53.9			
Heavy Trucks:	56.5	55.1	46.1	47.3	55.7	55.8			
Vehicle Noise:	62.7	60.9	57.5	53.1	61.6	62.1			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				12	26	57	122		
CNEL:				13	28	60	130		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 Without Project Road Name: Main St. Road Segment: s/o Placentia Ln.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 42,700 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 4,270 vehicles Vehicle Speed: 50 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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				
FHWA Noise Model Calculations									
VehicleType	REMED	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	70.20	3.90	0.31	-1.20	-4.65	0.000	0.000		
Medium Trucks:	81.00	-13.34	0.34	-1.20	-4.87	0.000	0.000		
Heavy Trucks:	85.38	-17.30	0.34	-1.20	-5.43	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	73.2	71.3	69.5	63.5	72.1	72.7			
Medium Trucks:	66.8	65.3	58.9	57.4	65.8	66.1			
Heavy Trucks:	67.2	65.8	56.8	58.0	66.4	66.5			
Vehicle Noise:	74.9	73.2	70.1	65.3	73.9	74.3			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				91	195	421	907		
CNEL:				97	210	452	974		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL								
Scenario: OY 2019 Without Project Road Name: Main St. Road Segment: n/o Columbia Av.				Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA				NOISE MODEL INPUTS				
Highway Data				Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 42,500 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 4,250 vehicles Vehicle Speed: 50 mph Near/Far Lane Distance: 36 feet				Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data				Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees				VehicleType	Day	Evening	Night	Daily
				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				
FHWA Noise Model Calculations								
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten	
Autos: 70.20 3.88 0.31 -1.20 -4.65 0.000 0.000								
Medium Trucks: 81.00 -13.36 0.34 -1.20 -4.87 0.000 0.000								
Heavy Trucks: 85.38 -17.32 0.34 -1.20 -5.43 0.000 0.000								
Unmitigated Noise Levels (without Topo and barrier attenuation)								
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL		
Autos: 73.2 71.3 69.5 63.5 72.1 72.7								
Medium Trucks: 66.8 65.3 58.9 57.4 65.8 66.1								
Heavy Trucks: 67.2 65.8 56.7 58.0 66.3 66.5								
Vehicle Noise: 74.9 73.1 70.1 65.3 73.9 74.3								
Centerline Distance to Noise Contour (in feet)								
			70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:			90	195	420	904		
CNEL:			97	209	451	971		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 Without Project Road Name: Main St. Road Segment: s/o Columbia Av.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 40,800 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 4,080 vehicles Vehicle Speed: 50 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
					Vehicle Type	Day	Evening	Night	Daily
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					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				
FHWA Noise Model Calculations									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 70.20 3.70 0.31 -1.20 -4.65 0.000 0.000									
Medium Trucks: 81.00 -13.54 0.34 -1.20 -4.87 0.000 0.000									
Heavy Trucks: 85.38 -17.50 0.34 -1.20 -5.43 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 73.0 71.1 69.3 63.3 71.9 72.5									
Medium Trucks: 66.6 65.1 58.7 57.2 65.6 65.9									
Heavy Trucks: 67.0 65.6 56.6 57.8 66.2 66.3									
Vehicle Noise: 74.7 73.0 69.9 65.1 73.7 74.1									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				88	190	408	880		
CNEL:				95	204	439	945		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 Without Project Road Name: Main St. Road Segment: n/o Strong St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 40,800 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 4,080 vehicles Vehicle Speed: 45 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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			
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	68.46	4.16	0.31	-1.20	-4.65	0.000	0.000		
Medium Trucks:	79.45	-13.08	0.34	-1.20	-4.87	0.000	0.000		
Heavy Trucks:	84.25	-17.04	0.34	-1.20	-5.43	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	71.7	69.8	68.1	62.0	70.6	71.2			
Medium Trucks:	65.5	64.0	57.6	56.1	64.6	64.8			
Heavy Trucks:	66.3	64.9	55.9	57.1	65.5	65.6			
Vehicle Noise:	73.6	71.8	68.7	64.0	72.5	73.0			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				74	159	343	739		
CNEL:				79	171	368	792		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 Without Project Road Name: Main St. Road Segment: s/o Strong St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 40,400 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 4,040 vehicles Vehicle Speed: 25 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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				
FHWA Noise Model Calculations									
VehicleType	REML	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	58.73	6.67	0.31	-1.20	-4.65	0.000	0.000		
Medium Trucks:	70.80	-10.57	0.34	-1.20	-4.87	0.000	0.000		
Heavy Trucks:	77.97	-14.53	0.34	-1.20	-5.43	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	64.5	62.6	60.8	54.8	63.4	64.0			
Medium Trucks:	59.4	57.9	51.5	49.9	58.4	58.6			
Heavy Trucks:	62.6	61.2	52.1	53.4	61.7	61.9			
Vehicle Noise:	67.4	65.7	61.8	57.9	66.4	66.8			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				29	62	134	288		
CNEL:				31	66	142	306		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 Without Project Road Name: Main St. Road Segment: n/o Russell St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 21,600 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 2,160 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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				
FHWA Noise Model Calculations									
VehicleType	REMEI	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 64.30 2.48 0.31 -1.20 -4.65 0.000 0.000									
Medium Trucks: 75.75 -14.75 0.34 -1.20 -4.87 0.000 0.000									
Heavy Trucks: 81.57 -18.71 0.34 -1.20 -5.43 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 65.9 64.0 62.2 56.2 64.8 65.4									
Medium Trucks: 60.1 58.6 52.3 50.7 59.2 59.4									
Heavy Trucks: 62.0 60.6 51.5 52.8 61.1 61.3									
Vehicle Noise: 68.1 66.4 63.0 58.6 67.1 67.5									
Centerline Distance to Noise Contour (in feet)									
			70 dBA	65 dBA	60 dBA	55 dBA			
Ldn:			32	69	149	321			
CNEL:			34	74	159	343			

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 Without Project Road Name: Main St. Road Segment: s/o Russell St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 21,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 2,100 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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%
FHWA Noise Model Calculations					Noise Source Elevations (in feet)				
					Autos:	0.000			
					Medium Trucks:	2.297			
					Heavy Trucks:	8.006 Grade Adjustment: 0.0			
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)				
					Autos:	46.915			
					Medium Trucks:	46.726			
					Heavy Trucks:	46.744			
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	2.36	0.31	-1.20	-4.65	0.000	0.000		
Medium Trucks:	75.75	-14.88	0.34	-1.20	-4.87	0.000	0.000		
Heavy Trucks:	81.57	-18.83	0.34	-1.20	-5.43	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	65.8	63.9	62.1	56.1	64.7	65.3			
Medium Trucks:	60.0	58.5	52.1	50.6	59.1	59.3			
Heavy Trucks:	61.9	60.4	51.4	52.7	61.0	61.1			
Vehicle Noise:	68.0	66.3	62.9	58.5	67.0	67.4			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				32	68	146	315		
CNEL:				34	73	156	337		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 Without Project Road Name: Orange St. Road Segment: n/o Columbia Av.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 4,600 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 460 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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%				
FHWA Noise Model Calculations					Noise Source Elevations (in feet)				
					Autos: 0.000				
					Medium Trucks: 2.297				
					Heavy Trucks: 8.006 Grade Adjustment: 0.0				
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)				
					Autos: 32.833				
					Medium Trucks: 32.562				
					Heavy Trucks: 32.589				
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	-4.23	2.64	-1.20	-4.52	0.000	0.000		
Medium Trucks:	75.75	-21.47	2.69	-1.20	-4.86	0.000	0.000		
Heavy Trucks:	81.57	-25.43	2.69	-1.20	-5.69	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	61.5	59.6	57.8	51.8	60.4	61.0			
Medium Trucks:	55.8	54.3	47.9	46.4	54.8	55.0			
Heavy Trucks:	57.6	56.2	47.2	48.4	56.8	56.9			
Vehicle Noise:	63.7	62.0	58.6	54.2	62.7	63.2			
Centerline Distance to Noise Contour (in feet)									
			70 dBA	65 dBA	60 dBA	55 dBA			
Ldn:			11	23	50	108			
CNEL:			12	25	54	116			
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 Without Project Road Name: Orange St. Road Direction: s/o Columbia Av.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 7,800 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 780 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					Vehicle Type	Day	Evening	Night	Daily
					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:	32.833			
					Medium Trucks:	32.562			
					Heavy Trucks:	32.589			
FHWA Noise Model Calculations									
Vehicle Type	REMODEL	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	-4.86	0.000	0.000		
Heavy Trucks:	81.57	-23.13	2.69	-1.20	-5.69	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	63.8	61.9	60.1	54.1	62.7	63.3			
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	59.2			
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			
Ldn:			15	33	71	154			
CNEL:			16	35	76	164			
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 Without Project Road Name: Orange St. Road Segment: n/o Strong St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 7,700 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 770 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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%				
FHWA Noise Model Calculations					Noise Source Elevations (in feet)				
					Autos: 0.000				
					Medium Trucks: 2.297				
					Heavy Trucks: 8.006 Grade Adjustment: 0.0				
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)				
					Autos: 32.833				
					Medium Trucks: 32.562				
					Heavy Trucks: 32.589				
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm 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 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 63.7 61.8 60.1 54.0 62.6 63.3									
Medium Trucks: 58.0 56.5 50.1 48.6 57.1 57.3									
Heavy Trucks: 59.9 58.4 49.4 50.7 59.0 59.1									
Vehicle Noise: 66.0 64.3 60.8 56.4 65.0 65.4									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				15	33	71	153		
CNEL:				16	35	76	163		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 Without Project Road Name: Orange St. Road Segment: s/o Strong St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 8,300 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 830 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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%
FHWA Noise Model Calculations					Noise Source Elevations (in feet)				
					Autos:	0.000			
					Medium Trucks:	2.297			
					Heavy Trucks:	8.006	Grade Adjustment:	0.0	
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)				
					Autos:	32.833			
					Medium Trucks:	32.562			
					Heavy Trucks:	32.589			
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	64.1	62.2	60.4	54.4	63.0	63.6			
Medium Trucks:	58.3	56.8	50.5	48.9	57.4	57.6			
Heavy Trucks:	60.2	58.8	49.7	51.0	59.3	59.5			
Vehicle Noise:	66.3	64.6	61.1	56.8	65.3	65.7			
Centerline Distance to Noise Contour (in feet)									
					70 dBA	65 dBA	60 dBA	55 dBA	
Ldn:					16	35	74	160	
CNEL:					17	37	80	171	
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 Without Project Road Name: Orange St. Road Segment: n/o Russell St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 7,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 700 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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%
FHWA Noise Model Calculations					Noise Source Elevations (in feet)				
					Autos:	0.000			
					Medium Trucks:	2.297			
					Heavy Trucks:	8.006	Grade Adjustment:	0.0	
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)				
					Autos:	32.833			
					Medium Trucks:	32.562			
					Heavy Trucks:	32.589			
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	63.3	61.4	59.7	53.6	62.2	62.8			
Medium Trucks:	57.6	56.1	49.7	48.2	56.6	56.9			
Heavy Trucks:	59.4	58.0	49.0	50.2	58.6	58.7			
Vehicle Noise:	65.6	63.9	60.4	56.0	64.6	65.0			
Centerline Distance to Noise Contour (in feet)									
					70 dBA	65 dBA	60 dBA	55 dBA	
Ldn:					14	31	66	143	
CNEL:					15	33	71	153	
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 Without Project Road Name: Orange St. Road Segment: s/o Russell St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 4,200 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 420 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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%
FHWA Noise Model Calculations					Noise Source Elevations (in feet)				
					Autos:	0.000			
					Medium Trucks:	2.297			
					Heavy Trucks:	8.006	Grade Adjustment:	0.0	
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)				
					Autos:	32.833			
					Medium Trucks:	32.562			
					Heavy Trucks:	32.589			
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	61.1	59.2	57.4	51.4	60.0	60.6			
Medium Trucks:	55.4	53.9	47.5	46.0	54.4	54.7			
Heavy Trucks:	57.2	55.8	46.8	48.0	56.4	56.5			
Vehicle Noise:	63.4	61.6	58.2	53.8	62.3	62.8			
Centerline Distance to Noise Contour (in feet)									
					70 dBA	65 dBA	60 dBA	55 dBA	
Ldn:					10	22	47	102	
CNEL:					11	23	50	109	
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 Without Project Road Name: Primer St. Road Segment: n/o Columbia Av.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 24,300 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 2,430 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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%
FHWA Noise Model Calculations					Noise Source Elevations (in feet)				
					Autos:	0.000			
					Medium Trucks:	2.297			
					Heavy Trucks:	8.006	Grade Adjustment:	0.0	
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)				
					Autos:	32.833			
					Medium Trucks:	32.562			
					Heavy Trucks:	32.589			
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	68.7	66.8	65.1	59.0	67.6	68.2			
Medium Trucks:	63.0	61.5	55.1	53.6	62.0	62.3			
Heavy Trucks:	64.9	63.4	54.4	55.6	64.0	64.1			
Vehicle Noise:	71.0	69.3	65.8	61.4	70.0	70.4			
Centerline Distance to Noise Contour (in feet)									
					70 dBA	65 dBA	60 dBA	55 dBA	
Ldn:					33	71	152	328	
CNEL:					35	76	163	351	
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 Without Project Road Name: La Cadena Dr. Road Segment: n/o I-215 Ramps					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 5,500 vehicles					Autos: 15				
Peak Hour Percentage: 10%					Medium Trucks (2 Axles): 15				
Peak Hour Volume: 550 vehicles					Heavy Trucks (3+ Axles): 15				
Vehicle Speed: 40 mph									
Near/Far Lane Distance: 12 feet									
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet					Autos: 77.5% 12.9% 9.6% 97.42%				
Barrier Type (0-Wall, 1-Berm): 0.0					Medium Trucks: 84.8% 4.9% 10.3% 1.84%				
Centerline Dist. to Barrier: 33.0 feet					Heavy Trucks: 86.5% 2.7% 10.8% 0.74%				
Centerline Dist. to Observer: 33.0 feet									
Barrier Distance to Observer: 0.0 feet									
Observer Height (Above Pad): 5.0 feet									
Pad Elevation: 0.0 feet									
Road Elevation: 0.0 feet									
Road Grade: 0.0%									
Left View: -90.0 degrees									
Right View: 90.0 degrees									
FHWA Noise Model Calculations					Noise Source Elevations (in feet)				
VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berm Atten					Autos: 0.000				
Autos: 66.51 -4.04 2.64 -1.20 -4.52 0.000 0.000					Medium Trucks: 2.297				
Medium Trucks: 77.72 -21.27 2.69 -1.20 -4.86 0.000 0.000					Heavy Trucks: 8.006 Grade Adjustment: 0.0				
Heavy Trucks: 82.99 -25.23 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)					Lane Equivalent Distance (in feet)				
VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL					Autos: 63.9 62.0 60.2 54.2 62.8 63.4				
Autos: 63.9 62.0 60.2 54.2 62.8 63.4					Medium Trucks: 57.9 56.4 50.1 48.5 57.0 57.2				
Medium Trucks: 57.9 56.4 50.1 48.5 57.0 57.2					Heavy Trucks: 59.2 57.8 48.8 50.0 58.4 58.5				
Heavy Trucks: 59.2 57.8 48.8 50.0 58.4 58.5					Vehicle Noise: 65.9 64.2 60.9 56.4 64.9 65.4				
Vehicle Noise: 65.9 64.2 60.9 56.4 64.9 65.4									
Centerline Distance to Noise Contour (in feet)									
					70 dBA 65 dBA 60 dBA 55 dBA				
Ldn: 15 33 70 151									
CNEL: 16 35 75 162									
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 Without Project Road Name: La Cadena Dr. Road Segment: s/o I-215 Ramps					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 2,200 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 220 vehicles Vehicle Speed: 40 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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				
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)				
					Autos: 32.833				
					Medium Trucks: 32.562				
					Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 66.51 -8.02 2.64 -1.20 -4.52 0.000 0.000									
Medium Trucks: 77.72 -25.25 2.69 -1.20 -4.86 0.000 0.000									
Heavy Trucks: 82.99 -29.21 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 59.9 58.0 56.3 50.2 58.8 59.4									
Medium Trucks: 54.0 52.4 46.1 44.5 53.0 53.2									
Heavy Trucks: 55.3 53.8 44.8 46.1 54.4 54.5									
Vehicle Noise: 62.0 60.2 56.9 52.4 60.9 61.4									
Centerline Distance to Noise Contour (in feet)									
			70 dBA	65 dBA	60 dBA	55 dBA			
Ldn:			8	18	38	82			
CNEL:			9	19	41	88			
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 Without Project Road Name: La Cadena Dr. Road Segment: n/o Strong St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):		2,000 vehicles			Autos:		15		
Peak Hour Percentage:		10%			Medium Trucks (2 Axles):		15		
Peak Hour Volume:		200 vehicles			Heavy Trucks (3+ Axles):		15		
Vehicle Speed:		40 mph							
Near/Far Lane Distance:		12 feet							
Site Data					Vehicle Mix				
Barrier Height:		0.0 feet			Autos:		77.5%		12.9%
Barrier Type (0-Wall, 1-Berm):		0.0			Medium Trucks:		84.8%		4.9%
Centerline Dist. to Barrier:		33.0 feet			Heavy Trucks:		86.5%		2.7%
Centerline Dist. to Observer:		33.0 feet					10.8%		0.74%
Barrier Distance to Observer:		0.0 feet							
Observer Height (Above Pad):		5.0 feet							
Pad Elevation:		0.0 feet							
Road Elevation:		0.0 feet							
Road Grade:		0.0%							
Left View:		-90.0 degrees							
Right View:		90.0 degrees							
FHWA Noise Model Calculations					Noise Source Elevations (in feet)				
Vehicle Type		REMMEL		Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:		66.51		-8.43	2.64	-1.20	-4.52	0.000	0.000
Medium Trucks:		77.72		-25.77	2.69	-1.20	-4.86	0.000	0.000
Heavy Trucks:		82.99		-29.62	2.69	-1.20	-5.69	0.000	0.000
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type		Leq Peak Hour		Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
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	54.1	
Vehicle Noise:		61.5		59.8	56.5	52.0	60.5	61.0	
Centerline Distance to Noise Contour (in feet)									
					70 dBA	65 dBA	60 dBA	55 dBA	
Ldn:					8	17	36	77	
CNEL:					8	18	38	82	
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 Without Project Road Name: Placentia Ln. Road Segment: e/o Main St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 9,100 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 910 vehicles Vehicle Speed: 25 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 44.0 feet Centerline Dist. to Observer: 44.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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%				
FHWA Noise Model Calculations					Noise Source Elevations (in feet)				
					Autos: 0.000				
					Medium Trucks: 2.297				
					Heavy Trucks: 8.006 Grade Adjustment: 0.0				
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)				
					Autos: 40.460				
					Medium Trucks: 40.241				
					Heavy Trucks: 40.262				
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 58.73 0.19 1.28 -1.20 -4.61 0.000 0.000									
Medium Trucks: 70.80 -17.05 1.31 -1.20 -4.87 0.000 0.000									
Heavy Trucks: 77.97 -21.00 1.31 -1.20 -5.50 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 59.0 57.1 55.3 49.3 57.9 58.5									
Medium Trucks: 53.9 52.4 46.0 44.4 52.9 53.1									
Heavy Trucks: 57.1 55.7 46.6 47.9 56.2 56.4									
Vehicle Noise: 61.9 60.2 56.3 52.4 60.9 61.3									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				11	23	51	109		
CNEL:				12	25	54	116		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 Without Project Road Name: Columbia Av. Road Segment: e/o Orange St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 28,900 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 2,890 vehicles Vehicle Speed: 45 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 44.0 feet Centerline Dist. to Observer: 44.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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:	40.460			
					Medium Trucks:	40.241			
					Heavy Trucks:	40.262			
FHWA Noise Model Calculations									
VehicleType	REMED	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	68.46	2.66	1.28	-1.20	-4.61	0.000	0.000		
Medium Trucks:	79.45	-14.58	1.31	-1.20	-4.87	0.000	0.000		
Heavy Trucks:	84.25	-18.54	1.31	-1.20	-5.50	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	71.2	69.3	67.5	61.5	70.1	70.7			
Medium Trucks:	65.0	63.5	57.1	55.6	64.0	64.3			
Heavy Trucks:	65.8	64.4	55.4	56.6	65.0	65.1			
Vehicle Noise:	73.0	71.3	68.1	63.5	72.0	72.5			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				60	129	278	599		
CNEL:				64	138	298	643		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 Without Project Road Name: Columbia Av. Road Segment: e/o Primer St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 31,300 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 3,130 vehicles Vehicle Speed: 45 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 44.0 feet Centerline Dist. to Observer: 44.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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%				
FHWA Noise Model Calculations					Noise Source Elevations (in feet)				
					Autos: 0.000				
					Medium Trucks: 2.297				
					Heavy Trucks: 8.006 Grade Adjustment: 0.0				
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)				
					Autos: 40.460				
					Medium Trucks: 40.241				
					Heavy Trucks: 40.262				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 68.46 3.00 1.28 -1.20 -4.61 0.000 0.000									
Medium Trucks: 79.45 -14.23 1.31 -1.20 -4.87 0.000 0.000									
Heavy Trucks: 84.25 -18.19 1.31 -1.20 -5.50 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos: 71.5 69.6 67.9 61.8 70.4 71.0									
Medium Trucks: 65.3 63.8 57.5 55.9 64.4 64.6									
Heavy Trucks: 66.2 64.7 55.7 57.0 65.3 65.4									
Vehicle Noise: 73.4 71.6 68.5 63.8 72.4 72.8									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				63	136	293	632		
CNEL:				68	146	315	678		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL										
Scenario: OY 2019 W/out Project Road Name: Strong St. Road Segment: w/o Main St.					Project Name: Northgate Job Number: 11145					
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS					
Highway Data					Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):		3,200 vehicles			Autos:		15			
Peak Hour Percentage:		10%			Medium Trucks (2 Axles):		15			
Peak Hour Volume:		320 vehicles			Heavy Trucks (3+ Axles):		15			
Vehicle Speed:		25 mph								
Near/Far Lane Distance:		12 feet								
Site Data					Vehicle Mix					
Barrier Height:		0.0 feet			Autos:		77.5%	12.9%	9.6%	97.42%
Barrier Type (0-Wall, 1-Berm):		0.0			Medium Trucks:		84.8%	4.9%	10.3%	1.84%
Centerline Dist. to Barrier:		33.0 feet			Heavy Trucks:		86.5%	2.7%	10.8%	0.74%
Centerline Dist. to Observer:		33.0 feet								
Barrier Distance to Observer:		0.0 feet								
Observer Height (Above Pad):		5.0 feet								
Pad Elevation:		0.0 feet								
Road Elevation:		0.0 feet								
Road Grade:		0.0%								
Left View:		-90.0 degrees								
Right View:		90.0 degrees								
FHWA Noise Model Calculations					Noise Source Elevations (in feet)					
Vehicle Type		REMODEL		Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten	
Autos:		58.73		-4.35	2.64	-1.20	-4.52	0.000	0.000	
Medium Trucks:		70.80		-21.59	2.69	-1.20	-4.86	0.000	0.000	
Heavy Trucks:		77.97		-25.54	2.69	-1.20	-5.69	0.000	0.000	
Unmitigated Noise Levels (without Topo and barrier attenuation)										
Vehicle Type		Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos:		55.8	53.9	52.2	46.1	54.7		55.3		
Medium Trucks:		50.7	49.2	42.8	41.3	49.7		50.0		
Heavy Trucks:		53.9	52.5	43.5	44.7	53.1		53.2		
Vehicle Noise:		58.7	57.1	53.1	49.2	57.7		58.1		
Centerline Distance to Noise Contour (in feet)										
				70 dBA	65 dBA	60 dBA	55 dBA			
Ldn:				5	11	23	50			
CNEL:				5	11	25	53			
Monday, June 18, 2018										

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 Without Project Road Name: Strong St. Road Segment: e/o Main St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 3,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 300 vehicles Vehicle Speed: 25 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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%				
FHWA Noise Model Calculations					Noise Source Elevations (in feet)				
					Autos: 0.000				
					Medium Trucks: 2.297				
					Heavy Trucks: 8.006 Grade Adjustment: 0.0				
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)				
					Autos: 32.833				
					Medium Trucks: 32.562				
					Heavy Trucks: 32.589				
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 58.73 -4.63 2.64 -1.20 -4.52 0.000 0.000									
Medium Trucks: 70.80 -21.87 2.69 -1.20 -4.86 0.000 0.000									
Heavy Trucks: 77.97 -25.82 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 55.5 53.6 51.9 45.8 54.4 55.1									
Medium Trucks: 50.4 48.9 42.6 41.0 49.5 49.7									
Heavy Trucks: 53.6 52.2 43.2 44.4 52.8 52.9									
Vehicle Noise: 58.4 56.8 52.9 49.0 57.5 57.8									
Centerline Distance to Noise Contour (in feet)									
			70 dBA	65 dBA	60 dBA	55 dBA			
Ldn:			5	10	22	48			
CNEL:			5	11	24	51			
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 Without Project Road Name: Russell St. Road Segment: e/o Main St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 3,900 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 390 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 44.0 feet Centerline Dist. to Observer: 44.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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%
FHWA Noise Model Calculations					Noise Source Elevations (in feet)				
					Autos:	0.000			
					Medium Trucks:	2.297			
					Heavy Trucks:	8.006	Grade Adjustment: 0.0		
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)				
					Autos:	40.460			
					Medium Trucks:	40.241			
					Heavy Trucks:	40.262			
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	REMODEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	-4.95	1.28	-1.20	-4.61	0.000	0.000		
Medium Trucks:	75.75	-22.19	1.31	-1.20	-4.87	0.000	0.000		
Heavy Trucks:	81.57	-26.14	1.31	-1.20	-5.50	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	59.4	57.5	55.8	49.7	58.3	58.9			
Medium Trucks:	53.7	52.2	45.8	44.3	52.7	53.0			
Heavy Trucks:	55.5	54.1	45.1	46.3	54.7	54.8			
Vehicle Noise:	61.7	60.0	56.5	52.1	60.7	61.1			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				10	23	49	105		
CNEL:				11	24	52	112		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 With Project Road Name: Main St. Road Segment: s/o Placentia Ln.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 43,600 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 4,360 vehicles Vehicle Speed: 50 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 70.20 3.99 0.31 -1.20 -4.65 0.000 0.000									
Medium Trucks: 81.00 -13.25 0.34 -1.20 -4.87 0.000 0.000									
Heavy Trucks: 85.38 -17.21 0.34 -1.20 -5.43 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 73.3 71.4 69.6 63.6 72.2 72.8									
Medium Trucks: 66.9 65.4 59.0 57.5 65.9 66.2									
Heavy Trucks: 67.3 65.9 56.8 58.1 66.5 66.6									
Vehicle Noise: 75.0 73.3 70.2 65.4 74.0 74.4									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				92	198	427	920		
CNEL:				99	213	459	988		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 With Project Road Name: Main St. Road Segment: n/o Columbia Av.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 43,400 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 4,340 vehicles Vehicle Speed: 50 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					Vehicle Type	Day	Evening	Night	Daily
					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			
FHWA Noise Model Calculations									
Vehicle Type	REMODEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	70.20	3.97	0.31	-1.20	-4.65	0.000	0.000		
Medium Trucks:	81.00	-13.27	0.34	-1.20	-4.87	0.000	0.000		
Heavy Trucks:	85.38	-17.23	0.34	-1.20	-5.43	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	73.3	71.4	69.6	63.6	72.2	72.8			
Medium Trucks:	66.9	65.4	59.0	57.5	65.9	66.1			
Heavy Trucks:	67.3	65.9	56.8	58.1	66.4	66.6			
Vehicle Noise:	75.0	73.2	70.2	65.4	74.0	74.4			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				92	198	426	917		
CNEL:				99	212	457	985		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 With Project Road Name: Main St. Road Segment: s/o Columbia Av.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 42,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 4,200 vehicles Vehicle Speed: 50 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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%				
FHWA Noise Model Calculations					Noise Source Elevations (in feet)				
					Autos: 0.000				
					Medium Trucks: 2.297				
					Heavy Trucks: 8.006 Grade Adjustment: 0.0				
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)				
					Autos: 46.915				
					Medium Trucks: 46.726				
					Heavy Trucks: 46.744				
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 70.20 3.82 0.31 -1.20 -4.65 0.000 0.000									
Medium Trucks: 81.00 -13.41 0.34 -1.20 -4.87 0.000 0.000									
Heavy Trucks: 85.38 -17.37 0.34 -1.20 -5.43 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 73.1 71.2 69.5 63.4 72.0 72.6									
Medium Trucks: 66.7 65.2 58.9 57.3 65.8 66.0									
Heavy Trucks: 67.1 65.7 56.7 57.9 66.3 66.4									
Vehicle Noise: 74.8 73.1 70.0 65.3 73.8 74.3									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				90	193	416	897		
CNEL:				96	208	447	964		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 With Project Road Name: Main St. Road Segment: n/o Strong St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 42,100 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 4,210 vehicles Vehicle Speed: 45 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
					VehicleType	Day	Evening	Night	Daily
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					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				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 68.46 4.29 0.31 -1.20 -4.65 0.000 0.000									
Medium Trucks: 79.45 -12.95 0.34 -1.20 -4.87 0.000 0.000									
Heavy Trucks: 84.25 -16.90 0.34 -1.20 -5.43 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 71.9 70.0 68.2 62.1 70.8 71.4									
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 65.8									
Vehicle Noise: 73.7 72.0 68.8 64.1 72.7 73.1									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				75	163	350	754		
CNEL:				81	174	376	809		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 With Project Road Name: Main St. Road Segment: s/o Strong St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 41,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 4,100 vehicles Vehicle Speed: 25 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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			
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	58.73	6.73	0.31	-1.20	-4.65	0.000	0.000		
Medium Trucks:	70.80	-10.51	0.34	-1.20	-4.87	0.000	0.000		
Heavy Trucks:	77.97	-14.46	0.34	-1.20	-5.43	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	64.6	62.7	60.9	54.9	63.5	64.1			
Medium Trucks:	59.4	57.9	51.6	50.0	58.5	58.7			
Heavy Trucks:	62.6	61.2	52.2	53.4	61.8	61.9			
Vehicle Noise:	67.5	65.8	61.9	58.0	66.5	66.9			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				29	63	135	291		
CNEL:				31	67	143	309		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 With Project Road Name: Main St. Road Segment: n/o Russell St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 23,300 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 2,330 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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				
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)				
					Autos: 46.915 Medium Trucks: 46.726 Heavy Trucks: 46.744				
FHWA Noise Model Calculations									
VehicleType	REMED	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	2.81	0.31	-1.20	-4.65	0.000	0.000		
Medium Trucks:	75.75	-14.42	0.34	-1.20	-4.87	0.000	0.000		
Heavy Trucks:	81.57	-18.38	0.34	-1.20	-5.43	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	66.2	64.3	62.6	56.5	65.1	65.7			
Medium Trucks:	60.5	59.0	52.6	51.0	59.5	59.7			
Heavy Trucks:	62.3	60.9	51.9	53.1	61.5	61.6			
Vehicle Noise:	68.5	66.7	63.3	58.9	67.4	67.9			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				34	73	157	338		
CNEL:				36	78	168	361		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 With Project Road Name: Main St. Road Segment: s/o Russell St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 21,600 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 2,160 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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				
FHWA Noise Model Calculations									
VehicleType	REMEF	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 64.30 2.48 0.31 -1.20 -4.65 0.000 0.000									
Medium Trucks: 75.75 -14.75 0.34 -1.20 -4.87 0.000 0.000									
Heavy Trucks: 81.57 -18.71 0.34 -1.20 -5.43 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 65.9 64.0 62.2 56.2 64.8 65.4									
Medium Trucks: 60.1 58.6 52.3 50.7 59.2 59.4									
Heavy Trucks: 62.0 60.6 51.5 52.8 61.1 61.3									
Vehicle Noise: 68.1 66.4 63.0 58.6 67.1 67.5									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				32	69	149	321		
CNEL:				34	74	159	343		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 With Project Road Name: Orange St. Road Segment: n/o Columbia Av.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 4,800 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 480 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
					VehicleType	Day	Evening	Night	Daily
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					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: 32.833				
					Medium Trucks: 32.562				
					Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	-4.05	2.64	-1.20	-4.52	0.000	0.000		
Medium Trucks:	75.75	-21.29	2.69	-1.20	-4.86	0.000	0.000		
Heavy Trucks:	81.57	-25.24	2.69	-1.20	-5.69	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	61.7	59.8	58.0	52.0	60.6	61.2			
Medium Trucks:	56.0	54.4	48.1	46.5	55.0	55.2			
Heavy Trucks:	57.8	56.4	47.4	48.6	57.0	57.1			
Vehicle Noise:	63.9	62.2	58.8	54.4	62.9	63.4			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				11	24	52	111		
CNEL:				12	26	55	119		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 With Project Road Name: Orange St. Road Segment: s/o Columbia Av.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 8,500 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 850 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
					VehicleType	Day	Evening	Night	Daily
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					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: 32.833				
					Medium Trucks: 32.562				
					Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	-1.57	2.64	-1.20	-4.52	0.000	0.000		
Medium Trucks:	75.75	-18.80	2.69	-1.20	-4.86	0.000	0.000		
Heavy Trucks:	81.57	-22.76	2.69	-1.20	-5.69	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	64.2	62.3	60.5	54.5	63.1	63.7			
Medium Trucks:	58.4	56.9	50.6	49.0	57.5	57.7			
Heavy Trucks:	60.3	58.9	49.8	51.1	59.4	59.6			
Vehicle Noise:	66.4	64.7	61.3	56.9	65.4	65.8			
Centerline Distance to Noise Contour (in feet)									
		70 dBA	65 dBA	60 dBA	55 dBA				
Ldn:		16	35	76	163				
CNEL:		17	37	81	174				
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 With Project Road Name: Orange St. Road Segment: n/o Strong St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 8,700 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 870 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
					Vehicle Type	Day	Evening	Night	Daily
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					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: 32.833				
					Medium Trucks: 32.562				
					Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	-1.46	2.64	-1.20	-4.52	0.000	0.000		
Medium Trucks:	75.75	-18.70	2.69	-1.20	-4.86	0.000	0.000		
Heavy Trucks:	81.57	-22.66	2.69	-1.20	-5.69	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	64.3	62.4	60.6	54.6	63.2	63.8			
Medium Trucks:	58.5	57.0	50.7	49.1	57.6	57.8			
Heavy Trucks:	60.4	59.0	49.9	51.2	59.5	59.7			
Vehicle Noise:	66.5	64.8	61.4	57.0	65.5	65.9			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				17	36	77	165		
CNEL:				18	38	82	177		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 With Project Road Name: Orange St. Road Segment: s/o Strong St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 10,700 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 1,070 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
					VehicleType	Day	Evening	Night	Daily
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					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: 32.833				
					Medium Trucks: 32.562				
					Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	-0.57	2.64	-1.20	-4.52	0.000	0.000		
Medium Trucks:	75.75	-17.80	2.69	-1.20	-4.86	0.000	0.000		
Heavy Trucks:	81.57	-21.76	2.69	-1.20	-5.69	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	65.2	63.3	61.5	55.5	64.1	64.7			
Medium Trucks:	59.4	57.9	51.6	50.0	58.5	58.7			
Heavy Trucks:	61.3	59.9	50.8	52.1	60.4	60.6			
Vehicle Noise:	67.4	65.7	62.3	57.9	66.4	66.8			
Centerline Distance to Noise Contour (in feet)									
			70 dBA	65 dBA	60 dBA	55 dBA			
Ldn:			19	41	88	190			
CNEL:			20	44	94	203			
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 With Project Road Name: Orange St. Road Segment: n/o Russell St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 9,400 vehicles					Autos: 15				
Peak Hour Percentage: 10%					Medium Trucks (2 Axles): 15				
Peak Hour Volume: 940 vehicles					Heavy Trucks (3+ Axles): 15				
Vehicle Speed: 35 mph					Vehicle Mix				
Near/Far Lane Distance: 12 feet					VehicleType				
Site Data					Day				
Barrier Height: 0.0 feet					Evening				
Barrier Type (0-Wall, 1-Berm): 0.0					Night				
Centerline Dist. to Barrier: 33.0 feet					Daily				
Centerline Dist. to Observer: 33.0 feet					Autos: 77.5% 12.9% 9.6% 97.42%				
Barrier Distance to Observer: 0.0 feet					Medium Trucks: 84.8% 4.9% 10.3% 1.84%				
Observer Height (Above Pad): 5.0 feet					Heavy Trucks: 86.5% 2.7% 10.8% 0.74%				
Pad Elevation: 0.0 feet					Noise Source Elevations (in feet)				
Road Elevation: 0.0 feet					Autos: 0.000				
Road Grade: 0.0%					Medium Trucks: 2.297				
Left View: -90.0 degrees					Heavy Trucks: 8.006 Grade Adjustment: 0.0				
Right View: 90.0 degrees					Lane Equivalent Distance (in feet)				
					Autos: 32.833				
					Medium Trucks: 32.562				
					Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	-1.13	2.64	-1.20	-4.52	0.000	0.000		
Medium Trucks:	75.75	-18.37	2.69	-1.20	-4.86	0.000	0.000		
Heavy Trucks:	81.57	-22.32	2.69	-1.20	-5.69	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	64.6	62.7	60.9	54.9	63.5	64.1			
Medium Trucks:	58.9	57.4	51.0	49.5	57.9	58.2			
Heavy Trucks:	60.7	59.3	50.3	51.5	59.9	60.0			
Vehicle Noise:	66.9	65.1	61.7	57.3	65.8	66.3			
Centerline Distance to Noise Contour (in feet)									
			70 dBA	65 dBA	60 dBA	55 dBA			
Ldn:			17	38	81	174			
CNEL:			19	40	86	186			
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 With Project Road Name: Orange St. Road Segment: s/o Russell St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 4,700 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 470 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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%				
FHWA Noise Model Calculations					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: 32.833 Medium Trucks: 32.562 Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	-4.14	2.64	-1.20	-4.52	0.000	0.000		
Medium Trucks:	75.75	-21.38	2.69	-1.20	-4.86	0.000	0.000		
Heavy Trucks:	81.57	-25.33	2.69	-1.20	-5.69	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	61.6	59.7	57.9	51.9	60.5	61.1			
Medium Trucks:	55.9	54.4	48.0	46.4	54.9	55.1			
Heavy Trucks:	57.7	56.3	47.3	48.5	56.9	57.0			
Vehicle Noise:	63.8	62.1	58.7	54.3	62.8	63.3			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				11	24	51	110		
CNEL:				12	25	54	117		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 With Project Road Name: Primer St. Road Segment: n/o Columbia Av.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 25,100 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 2,510 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					Vehicle Type	Day	Evening	Night	Daily
					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: 32.833				
					Medium Trucks: 32.562				
					Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	3.14	2.64	-1.20	-4.52	0.000	0.000		
Medium Trucks:	75.75	-14.10	2.69	-1.20	-4.86	0.000	0.000		
Heavy Trucks:	81.57	-18.06	2.69	-1.20	-5.69	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	68.9	67.0	65.2	59.2	67.8	68.4			
Medium Trucks:	63.1	61.6	55.3	53.7	62.2	62.4			
Heavy Trucks:	65.0	63.6	54.5	55.8	64.1	64.3			
Vehicle Noise:	71.1	69.4	66.0	61.6	70.1	70.5			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				34	72	156	335		
CNEL:				36	77	166	358		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 With Project Road Name: La Cadena Dr. Road Segment: n/o I-215 Ramps					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 5,800 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 580 vehicles Vehicle Speed: 40 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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: 32.833 Medium Trucks: 32.562 Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	66.51	-3.81	2.64	-1.20	-4.52	0.000	0.000		
Medium Trucks:	77.72	-21.04	2.69	-1.20	-4.86	0.000	0.000		
Heavy Trucks:	82.99	-25.00	2.69	-1.20	-5.69	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	64.1	62.2	60.5	54.4	63.0	63.7			
Medium Trucks:	58.2	56.7	50.3	48.7	57.2	57.4			
Heavy Trucks:	59.5	58.1	49.0	50.3	58.6	58.8			
Vehicle Noise:	66.2	64.4	61.1	56.6	65.1	65.6			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				16	34	73	157		
CNEL:				17	36	78	168		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 With Project Road Name: La Cadena Dr. Road Segment: s/o I-215 Ramps					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 3,900 vehicles					Autos: 15				
Peak Hour Percentage: 10%					Medium Trucks (2 Axles): 15				
Peak Hour Volume: 390 vehicles					Heavy Trucks (3+ Axles): 15				
Vehicle Speed: 40 mph									
Near/Far Lane Distance: 12 feet									
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet					Autos: 77.5% 12.9% 9.6% 97.42%				
Barrier Type (0-Wall, 1-Berm): 0.0					Medium Trucks: 84.8% 4.9% 10.3% 1.84%				
Centerline Dist. to Barrier: 33.0 feet					Heavy Trucks: 86.5% 2.7% 10.8% 0.74%				
Centerline Dist. to Observer: 33.0 feet									
Barrier Distance to Observer: 0.0 feet									
Observer Height (Above Pad): 5.0 feet									
Pad Elevation: 0.0 feet									
Road Elevation: 0.0 feet									
Road Grade: 0.0%									
Left View: -90.0 degrees									
Right View: 90.0 degrees									
FHWA Noise Model Calculations					Noise Source Elevations (in feet)				
VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berm Atten					Autos: 0.000				
Autos: 66.51 -5.53 2.64 -1.20 -4.52 0.000 0.000					Medium Trucks: 2.297				
Medium Trucks: 77.72 -22.77 2.69 -1.20 -4.86 0.000 0.000					Heavy Trucks: 8.006 Grade Adjustment: 0.0				
Heavy Trucks: 82.99 -26.72 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)					Lane Equivalent Distance (in feet)				
VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL					Autos: 62.4 60.5 58.8 52.7 61.3 61.9				
Autos: 62.4 60.5 58.8 52.7 61.3 61.9					Medium Trucks: 56.4 54.9 48.6 47.0 55.5 55.7				
Medium Trucks: 56.4 54.9 48.6 47.0 55.5 55.7					Heavy Trucks: 57.8 56.3 47.3 48.5 56.9 57.0				
Heavy Trucks: 57.8 56.3 47.3 48.5 56.9 57.0					Vehicle Noise: 64.4 62.7 59.4 54.9 63.4 63.9				
Vehicle Noise: 64.4 62.7 59.4 54.9 63.4 63.9									
Centerline Distance to Noise Contour (in feet)									
					70 dBA 65 dBA 60 dBA 55 dBA				
Ldn: 12 26 56 120									
CNEL: 13 28 60 129									
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 With Project Road Name: La Cadena Dr. Road Segment: n/o Strong St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 3,900 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 390 vehicles Vehicle Speed: 40 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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%				
FHWA Noise Model Calculations					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: 32.833				
					Medium Trucks: 32.562				
					Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 66.51 -5.53 2.64 -1.20 -4.52 0.000 0.000									
Medium Trucks: 77.72 -22.77 2.69 -1.20 -4.86 0.000 0.000									
Heavy Trucks: 82.99 -26.72 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos: 62.4 60.5 58.8 52.7 61.3 61.9									
Medium Trucks: 56.4 54.9 48.6 47.0 55.5 55.7									
Heavy Trucks: 57.8 56.3 47.3 48.5 56.9 57.0									
Vehicle Noise: 64.4 62.7 59.4 54.9 63.4 63.9									
Centerline Distance to Noise Contour (in feet)									
			70 dBA	65 dBA	60 dBA	55 dBA			
Ldn:			12	26	56	120			
CNEL:			13	28	60	129			
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 With Project Road Name: Placentia Ln. Road Segment: e/o Main St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt):		9,400 vehicles			Autos:		15		
Peak Hour Percentage:		10%			Medium Trucks (2 Axles):		15		
Peak Hour Volume:		940 vehicles			Heavy Trucks (3+ Axles):		15		
Vehicle Speed:		25 mph							
Near/Far Lane Distance:		36 feet							
Site Data					Vehicle Mix				
Barrier Height:		0.0 feet			Autos:		77.5%		12.9%
Barrier Type (0-Wall, 1-Berm):		0.0			Medium Trucks:		84.8%		4.9%
Centerline Dist. to Barrier:		44.0 feet			Heavy Trucks:		86.5%		2.7%
Centerline Dist. to Observer:		44.0 feet					10.8%		0.74%
Barrier Distance to Observer:		0.0 feet							
Observer Height (Above Pad):		5.0 feet							
Pad Elevation:		0.0 feet							
Road Elevation:		0.0 feet							
Road Grade:		0.0%							
Left View:		-90.0 degrees							
Right View:		90.0 degrees							
FHWA Noise Model Calculations					Noise Source Elevations (in feet)				
Vehicle Type		REMEEL		Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:		58.73		0.33	1.28	-1.20	-4.61	0.000	0.000
Medium Trucks:		70.80		-16.91	1.31	-1.20	-4.87	0.000	0.000
Heavy Trucks:		77.97		-20.86	1.31	-1.20	-5.50	0.000	0.000
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type		Leq Peak Hour		Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:		59.1		57.2	55.5	49.4	58.0	58.7	
Medium Trucks:		54.0		52.5	46.1	44.6	53.0	53.3	
Heavy Trucks:		57.2		55.8	46.8	48.0	56.4	56.5	
Vehicle Noise:		62.0		60.4	56.4	52.5	61.0	61.4	
Centerline Distance to Noise Contour (in feet)									
					70 dBA	65 dBA	60 dBA	55 dBA	
Ldn:					11	24	52	111	
CNEL:					12	25	55	118	
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 With Project Road Name: Columbia Av. Road Segment: e/o Orange St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 29,400 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 2,940 vehicles Vehicle Speed: 45 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 44.0 feet Centerline Dist. to Observer: 44.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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%				
FHWA Noise Model Calculations					Noise Source Elevations (in feet)				
					Autos: 0.000				
					Medium Trucks: 2.297				
					Heavy Trucks: 8.006 Grade Adjustment: 0.0				
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)				
					Autos: 40.460				
					Medium Trucks: 40.241				
					Heavy Trucks: 40.262				
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 68.46 2.73 1.28 -1.20 -4.61 0.000 0.000									
Medium Trucks: 79.45 -14.51 1.31 -1.20 -4.87 0.000 0.000									
Heavy Trucks: 84.25 -18.46 1.31 -1.20 -5.50 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 71.3 69.4 67.6 61.5 70.2 70.8									
Medium Trucks: 65.1 63.5 57.2 55.6 64.1 64.3									
Heavy Trucks: 65.9 64.5 55.4 56.7 65.0 65.2									
Vehicle Noise: 73.1 71.4 68.2 63.5 72.1 72.5									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				61	131	281	606		
CNEL:				65	140	302	650		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 With Project Road Name: Columbia Av. Road Segment: e/o Primer St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 32,600 vehicles					Autos: 15				
Peak Hour Percentage: 10%					Medium Trucks (2 Axles): 15				
Peak Hour Volume: 3,260 vehicles					Heavy Trucks (3+ Axles): 15				
Vehicle Speed: 45 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: 44.0 feet					Noise Source Elevations (in feet)				
Centerline Dist. to Observer: 44.0 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)				
Road Elevation: 0.0 feet					Autos: 40.460				
Road Grade: 0.0%					Medium Trucks: 40.241				
Left View: -90.0 degrees					Heavy Trucks: 40.262				
Right View: 90.0 degrees									
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 68.46 3.18 1.28 -1.20 -4.61 0.000 0.000									
Medium Trucks: 79.45 -14.06 1.31 -1.20 -4.87 0.000 0.000									
Heavy Trucks: 84.25 -18.01 1.31 -1.20 -5.50 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 71.7 69.8 68.1 62.0 70.6 71.2									
Medium Trucks: 65.5 64.0 57.6 56.1 64.6 64.8									
Heavy Trucks: 66.3 64.9 55.9 57.1 65.5 65.6									
Vehicle Noise: 73.6 71.8 68.7 64.0 72.5 73.0									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				65	140	301	649		
CNEL:				70	150	323	697		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 With Project Road Name: Strong St. Road Segment: w/o Main St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 3,900 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 390 vehicles Vehicle Speed: 25 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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: 32.833 Medium Trucks: 32.562 Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 58.73 -3.49 2.64 -1.20 -4.52 0.000 0.000									
Medium Trucks: 70.80 -20.73 2.69 -1.20 -4.86 0.000 0.000									
Heavy Trucks: 77.97 -24.68 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 56.7 54.8 53.0 47.0 55.6 56.2									
Medium Trucks: 51.6 50.1 43.7 42.1 50.6 50.8									
Heavy Trucks: 54.8 53.4 44.3 45.6 53.9 54.0									
Vehicle Noise: 59.6 57.9 54.0 50.1 58.6 59.0									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				6	12	27	57		
CNEL:				6	13	28	61		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 With Project Road Name: Strong St. Road Segment: e/o Main St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 4,500 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 450 vehicles Vehicle Speed: 25 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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: 32.833				
					Medium Trucks: 32.562				
					Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMED	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	58.73	-2.87	2.64	-1.20	-4.52	0.000	0.000	0.000	
Medium Trucks:	70.80	-20.10	2.69	-1.20	-4.86	0.000	0.000	0.000	
Heavy Trucks:	77.97	-24.06	2.69	-1.20	-5.69	0.000	0.000	0.000	
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	57.3	55.4	53.6	47.6	56.2	56.8			
Medium Trucks:	52.2	50.7	44.3	42.8	51.2	51.5			
Heavy Trucks:	55.4	54.0	44.9	46.2	54.5	54.7			
Vehicle Noise:	60.2	58.5	54.6	50.7	59.2	59.6			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				6	14	29	63		
CNEL:				7	14	31	67		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: OY 2019 With Project Road Name: Russell St. Road Segment: e/o Main St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 5,700 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 570 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 44.0 feet Centerline Dist. to Observer: 44.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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: 40.460 Medium Trucks: 40.241 Heavy Trucks: 40.262				
FHWA Noise Model Calculations									
VehicleType	REMEF	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 64.30 -3.30 1.28 -1.20 -4.61 0.000 0.000									
Medium Trucks: 75.75 -20.54 1.31 -1.20 -4.87 0.000 0.000									
Heavy Trucks: 81.57 -24.49 1.31 -1.20 -5.50 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 61.1 59.2 57.4 51.4 60.0 60.6									
Medium Trucks: 55.3 53.8 47.5 45.9 54.4 54.6									
Heavy Trucks: 57.2 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 Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				13	29	63	135		
CNEL:				14	31	67	144		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 Without Project Road Name: Main St. Road Segment: s/o Placentia Ln.					Project Name: Northgate Job Number: 11145				
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 Percentage: 10%					Medium Trucks (2 Axles): 15				
Peak Hour Volume: 4,470 vehicles					Heavy Trucks (3+ Axles): 15				
Vehicle Speed: 50 mph									
Near/Far Lane Distance: 36 feet					Vehicle Mix				
					VehicleType	Day	Evening	Night	Daily
Site Data					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				
Barrier Height: 0.0 feet					Medium Trucks: 2.297				
Barrier Type (0-Wall, 1-Berm): 0.0					Heavy Trucks: 8.006				
Centerline Dist. to Barrier: 50.0 feet					Grade Adjustment: 0.0				
Centerline Dist. to Observer: 50.0 feet									
Barrier Distance to Observer: 0.0 feet									
Observer Height (Above Pad): 5.0 feet									
Pad Elevation: 0.0 feet									
Road Elevation: 0.0 feet									
Road Grade: 0.0%									
Left View: -90.0 degrees									
Right View: 90.0 degrees									
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 0.000									
Medium Trucks: 81.00 -13.14 0.34 -1.20 -4.87 0.000 0.000									
Heavy Trucks: 85.38 -17.10 0.34 -1.20 -5.43 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 73.4 71.5 69.7 63.7 72.3 72.9									
Medium Trucks: 67.0 65.5 59.1 57.6 66.0 66.3									
Heavy Trucks: 67.4 66.0 57.0 58.2 66.6 66.7									
Vehicle Noise: 75.1 73.4 70.3 65.5 74.1 74.5									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				94	201	434	935		
CNEL:				100	216	466	1,005		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL								
Scenario: HY 2040 Without Project Road Name: Main St. Road Segment: n/o Columbia Av.				Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA				NOISE MODEL INPUTS				
Highway Data				Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 44,600 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 4,460 vehicles Vehicle Speed: 50 mph Near/Far Lane Distance: 36 feet				Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data				Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees				VehicleType	Day	Evening	Night	Daily
				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	
FHWA Noise Model Calculations				Lane Equivalent Distance (in feet)				
				Autos:	46.915			
				Medium Trucks:	46.726			
				Heavy Trucks:	46.744			
FHWA Noise Model Calculations								
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten	
Autos:	70.20	4.08	0.31	-1.20	-4.65	0.000	0.000	
Medium Trucks:	81.00	-13.15	0.34	-1.20	-4.87	0.000	0.000	
Heavy Trucks:	85.38	-17.11	0.34	-1.20	-5.43	0.000	0.000	
Unmitigated Noise Levels (without Topo and barrier attenuation)								
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL		
Autos:	73.4	71.5	69.7	63.7	72.3	72.9		
Medium Trucks:	67.0	65.5	59.1	57.6	66.0	66.3		
Heavy Trucks:	67.4	66.0	56.9	58.2	66.6	66.7		
Vehicle Noise:	75.1	73.3	70.3	65.5	74.1	74.5		
Centerline Distance to Noise Contour (in feet)								
			70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:			93	201	433	934		
CNEL:			100	216	466	1,003		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 Without Project Road Name: Main St. Road Segment: s/o Columbia Av.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 42,900 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 4,290 vehicles Vehicle Speed: 50 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
					VehicleType	Day	Evening	Night	Daily
					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				
FHWA Noise Model Calculations									
VehicleType	REMED	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 70.20 3.92 0.31 -1.20 -4.65 0.000 0.000									
Medium Trucks: 81.00 -13.32 0.34 -1.20 -4.87 0.000 0.000									
Heavy Trucks: 85.38 -17.28 0.34 -1.20 -5.43 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 73.2 71.3 69.6 63.5 72.1 72.7									
Medium Trucks: 66.8 65.3 58.9 57.4 65.9 66.1									
Heavy Trucks: 67.2 65.8 56.8 58.0 66.4 66.5									
Vehicle Noise: 74.9 73.2 70.1 65.4 73.9 74.4									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				91	196	422	910		
CNEL:				98	211	454	978		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL								
Scenario: HY 2040 Without Project Road Name: Main St. Road Segment: n/o Strong St.				Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA				NOISE MODEL INPUTS				
Highway Data				Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 42,900 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 4,290 vehicles Vehicle Speed: 45 mph Near/Far Lane Distance: 36 feet				Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data				Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees				VehicleType	Day	Evening	Night	Daily
				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				
FHWA Noise Model Calculations								
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten	
Autos: 68.46 4.37 0.31 -1.20 -4.65 0.000 0.000								
Medium Trucks: 79.45 -12.86 0.34 -1.20 -4.87 0.000 0.000								
Heavy Trucks: 84.25 -16.82 0.34 -1.20 -5.43 0.000 0.000								
Unmitigated Noise Levels (without Topo and barrier attenuation)								
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL		
Autos: 71.9 70.0 68.3 62.2 70.8 71.5								
Medium Trucks: 65.7 64.2 57.9 56.3 64.8 65.0								
Heavy Trucks: 66.6 65.1 56.1 57.4 65.7 65.8								
Vehicle Noise: 73.8 72.0 68.9 64.2 72.8 73.2								
Centerline Distance to Noise Contour (in feet)								
			70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:			76	165	355	764		
CNEL:			82	177	380	819		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 Without Project Road Name: Main St. Road Segment: s/o Strong St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 42,600 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 4,260 vehicles Vehicle Speed: 25 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
					VehicleType	Day	Evening	Night	Daily
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					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				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:		58.73	6.90	0.31	-1.20	-4.65	0.000	0.000	
Medium Trucks:		70.80	-10.34	0.34	-1.20	-4.87	0.000	0.000	
Heavy Trucks:		77.97	-14.30	0.34	-1.20	-5.43	0.000	0.000	
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:		64.7	62.8	61.1	55.0	63.6	64.3		
Medium Trucks:		59.6	58.1	51.7	50.2	58.6	58.9		
Heavy Trucks:		62.8	61.4	52.4	53.6	62.0	62.1		
Vehicle Noise:		67.6	66.0	62.0	58.1	66.6	67.0		
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				30	64	139	299		
CNEL:				32	68	147	317		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 Without Project Road Name: Main St. Road Segment: n/o Russell St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 23,100 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 2,310 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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			
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	2.78	0.31	-1.20	-4.65	0.000	0.000		
Medium Trucks:	75.75	-14.46	0.34	-1.20	-4.87	0.000	0.000		
Heavy Trucks:	81.57	-18.42	0.34	-1.20	-5.43	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	66.2	64.3	62.5	56.5	65.1	65.7			
Medium Trucks:	60.4	58.9	52.6	51.0	59.5	59.7			
Heavy Trucks:	62.3	60.9	51.8	53.1	61.4	61.6			
Vehicle Noise:	68.4	66.7	63.3	58.9	67.4	67.8			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				34	72	156	336		
CNEL:				36	77	167	359		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 Without Project Road Name: Main St. Road Segment: s/o Russell St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 23,100 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 2,310 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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				
FHWA Noise Model Calculations									
VehicleType	REMEF	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	2.78	0.31	-1.20	-4.65	0.000	0.000	0.000	
Medium Trucks:	75.75	-14.46	0.34	-1.20	-4.87	0.000	0.000	0.000	
Heavy Trucks:	81.57	-18.42	0.34	-1.20	-5.43	0.000	0.000	0.000	
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	66.2	64.3	62.5	56.5	65.1	65.7			
Medium Trucks:	60.4	58.9	52.6	51.0	59.5	59.7			
Heavy Trucks:	62.3	60.9	51.8	53.1	61.4	61.6			
Vehicle Noise:	68.4	66.7	63.3	58.9	67.4	67.8			
Centerline Distance to Noise Contour (in feet)									
			70 dBA	65 dBA	60 dBA	55 dBA			
Ldn:			34	72	156	336			
CNEL:			36	77	167	359			

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 Without Project Road Name: Orange St. Road Segment: n/o Columbia Av.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 4,800 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 480 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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: 32.833 Medium Trucks: 32.562 Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 64.30 -4.05 2.64 -1.20 -4.52 0.000 0.000									
Medium Trucks: 75.75 -21.29 2.69 -1.20 -4.86 0.000 0.000									
Heavy Trucks: 81.57 -25.24 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 61.7 59.8 58.0 52.0 60.6 61.2									
Medium Trucks: 56.0 54.4 48.1 46.5 55.0 55.2									
Heavy Trucks: 57.8 56.4 47.4 48.6 57.0 57.1									
Vehicle Noise: 63.9 62.2 58.8 54.4 62.9 63.4									
Centerline Distance to Noise Contour (in feet)									
			70 dBA	65 dBA	60 dBA	55 dBA			
Ldn:			11	24	52	111			
CNEL:			12	26	55	119			

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 Without Project Road Name: Orange St. Road Segment: s/o Columbia Av.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 10,700 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 1,070 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
					VehicleType	Day	Evening	Night	Daily
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					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: 32.833				
					Medium Trucks: 32.562				
					Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 64.30 -0.57 2.64 -1.20 -4.52 0.000 0.000									
Medium Trucks: 75.75 -17.80 2.69 -1.20 -4.86 0.000 0.000									
Heavy Trucks: 81.57 -21.76 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 65.2 63.3 61.5 55.5 64.1 64.7									
Medium Trucks: 59.4 57.9 51.6 50.0 58.5 58.7									
Heavy Trucks: 61.3 59.9 50.8 52.1 60.4 60.6									
Vehicle Noise: 67.4 65.7 62.3 57.9 66.4 66.8									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				19	41	88	190		
CNEL:				20	44	94	203		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 Without Project Road Name: Orange St. Road Segment: n/o Strong St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 8,600 vehicles					Autos: 15				
Peak Hour Percentage: 10%					Medium Trucks (2 Axles): 15				
Peak Hour Volume: 860 vehicles					Heavy Trucks (3+ Axles): 15				
Vehicle Speed: 35 mph					Vehicle Mix				
Near/Far Lane Distance: 12 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: 33.0 feet					Noise Source Elevations (in feet)				
Centerline Dist. to Observer: 33.0 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)				
Road Elevation: 0.0 feet					Autos: 32.833				
Road Grade: 0.0%					Medium Trucks: 32.562				
Left View: -90.0 degrees					Heavy Trucks: 32.589				
Right View: 90.0 degrees									
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 64.30 -1.51 2.64 -1.20 -4.52 0.000 0.000									
Medium Trucks: 75.75 -18.75 2.69 -1.20 -4.86 0.000 0.000									
Heavy Trucks: 81.57 -22.71 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 64.2 62.3 60.6 54.5 63.1 63.7									
Medium Trucks: 58.5 57.0 50.6 49.1 57.5 57.8									
Heavy Trucks: 60.3 58.9 49.9 51.1 59.5 59.6									
Vehicle Noise: 66.5 64.8 61.3 56.9 65.5 65.9									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				16	35	76	164		
CNEL:				18	38	81	175		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 Without Project Road Name: Orange St. Road Segment: s/o Strong St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 8,900 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 890 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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: 32.833 Medium Trucks: 32.562 Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMED	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	-1.37	2.64	-1.20	-4.52	0.000	0.000		
Medium Trucks:	75.75	-18.60	2.69	-1.20	-4.86	0.000	0.000		
Heavy Trucks:	81.57	-22.56	2.69	-1.20	-5.69	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	64.4	62.5	60.7	54.7	63.3	63.9			
Medium Trucks:	58.6	57.1	50.8	49.2	57.7	57.9			
Heavy Trucks:	60.5	59.1	50.0	51.3	59.6	59.8			
Vehicle Noise:	66.6	64.9	61.5	57.1	65.6	66.0			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				17	36	78	168		
CNEL:				18	39	83	179		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 Without Project Road Name: Orange St. Road Segment: n/o Russell St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 9,100 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 910 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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: 32.833 Medium Trucks: 32.562 Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEF	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 64.30 -1.27 2.64 -1.20 -4.52 0.000 0.000									
Medium Trucks: 75.75 -18.51 2.69 -1.20 -4.86 0.000 0.000									
Heavy Trucks: 81.57 -22.46 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 64.5 62.6 60.8 54.7 63.4 64.0									
Medium Trucks: 58.7 57.2 50.9 49.3 57.8 58.0									
Heavy Trucks: 60.6 59.2 50.1 51.4 59.7 59.9									
Vehicle Noise: 66.7 65.0 61.5 57.2 65.7 66.1									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				17	37	79	171		
CNEL:				18	39	85	182		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 Without Project Road Name: Orange St. Road Segment: s/o Russell St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 5,800 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 580 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					Vehicle Mix				
					VehicleType	Day	Evening	Night	Daily
					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:	32.833			
					Medium Trucks:	32.562			
					Heavy Trucks:	32.589			
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	-3.23	2.64	-1.20	-4.52	0.000	0.000		
Medium Trucks:	75.75	-20.46	2.69	-1.20	-4.86	0.000	0.000		
Heavy Trucks:	81.57	-24.42	2.69	-1.20	-5.69	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	62.5	60.6	58.8	52.8	61.4	62.0			
Medium Trucks:	56.8	55.3	48.9	47.4	55.8	56.1			
Heavy Trucks:	58.6	57.2	48.2	49.4	57.8	57.9			
Vehicle Noise:	64.8	63.0	59.6	55.2	63.7	64.2			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				13	27	59	126		
CNEL:				13	29	63	135		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 Without Project Road Name: Primer St. Road Segment: n/o Columbia Av.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 26,500 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 2,650 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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%
FHWA Noise Model Calculations					Noise Source Elevations (in feet)				
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	3.37	2.64	-1.20	-4.52	0.000	0.000		
Medium Trucks:	75.75	-13.87	2.69	-1.20	-4.86	0.000	0.000		
Heavy Trucks:	81.57	-17.82	2.69	-1.20	-5.69	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	69.1	67.2	65.4	59.4	68.0	68.6			
Medium Trucks:	63.4	61.9	55.5	54.0	62.4	62.7			
Heavy Trucks:	65.2	63.8	54.8	56.0	64.4	64.5			
Vehicle Noise:	71.4	69.6	66.2	61.8	70.3	70.8			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				35	75	161	348		
CNEL:				37	80	172	371		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 Without Project Road Name: La Cadena Dr. Road Segment: n/o I-215 Ramps					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 7,600 vehicles					Autos: 15				
Peak Hour Percentage: 10%					Medium Trucks (2 Axles): 15				
Peak Hour Volume: 760 vehicles					Heavy Trucks (3+ Axles): 15				
Vehicle Speed: 40 mph									
Near/Far Lane Distance: 12 feet									
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet					Autos: 77.5% 12.9% 9.6% 97.42%				
Barrier Type (0-Wall, 1-Berm): 0.0					Medium Trucks: 84.8% 4.9% 10.3% 1.84%				
Centerline Dist. to Barrier: 33.0 feet					Heavy Trucks: 86.5% 2.7% 10.8% 0.74%				
Centerline Dist. to Observer: 33.0 feet									
Barrier Distance to Observer: 0.0 feet									
Observer Height (Above Pad): 5.0 feet									
Pad Elevation: 0.0 feet									
Road Elevation: 0.0 feet									
Road Grade: 0.0%									
Left View: -90.0 degrees									
Right View: 90.0 degrees									
FHWA Noise Model Calculations					Noise Source Elevations (in feet)				
Vehicle Type					Autos: 0.000				
Autos: 66.51					Medium Trucks: 2.297				
Medium Trucks: 77.72					Heavy Trucks: 8.006				
Heavy Trucks: 82.99					Grade Adjustment: 0.0				
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)				
Vehicle Type					Autos: 32.833				
Autos: 66.51					Medium Trucks: 32.562				
Medium Trucks: 77.72					Heavy Trucks: 32.589				
Heavy Trucks: 82.99									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type		Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL		
Autos:		65.3	63.4	61.7	55.6	64.2	64.8		
Medium Trucks:		59.3	57.8	51.5	49.9	58.4	58.6		
Heavy Trucks:		60.7	59.2	50.2	51.4	59.8	59.9		
Vehicle Noise:		67.3	65.6	62.3	57.8	66.3	66.8		
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				19	40	87	188		
CNEL:				20	43	93	201		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 Without Project Road Name: La Cadena Dr. Road Segment: s/o I-215 Ramps					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 2,600 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 260 vehicles Vehicle Speed: 40 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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%				
FHWA Noise Model Calculations					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: 32.833				
					Medium Trucks: 32.562				
					Heavy Trucks: 32.589				
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	66.51	-7.29	2.64	-1.20	-4.52	0.000	0.000		
Medium Trucks:	77.72	-24.53	2.69	-1.20	-4.86	0.000	0.000		
Heavy Trucks:	82.99	-28.48	2.69	-1.20	-5.69	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	60.7	58.8	57.0	50.9	59.6	60.2			
Medium Trucks:	54.7	53.2	46.8	45.3	53.7	54.0			
Heavy Trucks:	56.0	54.6	45.5	46.8	55.1	55.3			
Vehicle Noise:	62.7	61.0	57.7	53.1	61.7	62.1			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				9	20	43	92		
CNEL:				10	21	46	98		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL											
Scenario: HY 2040 Without Project Road Name: La Cadena Dr. Road Segment: n/o Strong St.					Project Name: Northgate Job Number: 11145						
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS						
Highway Data					Site Conditions (Hard = 10, Soft = 15)						
Average Daily Traffic (Adt):		2,400 vehicles			Autos:		15				
Peak Hour Percentage:		10%			Medium Trucks (2 Axles):		15				
Peak Hour Volume:		240 vehicles			Heavy Trucks (3+ Axles):		15				
Vehicle Speed:		40 mph									
Near/Far Lane Distance:		12 feet									
Site Data					Vehicle Mix						
Barrier Height:		0.0 feet			Autos:		77.5%		12.9%	9.6%	97.42%
Barrier Type (0-Wall, 1-Berm):		0.0			Medium Trucks:		84.8%		4.9%	10.3%	1.84%
Centerline Dist. to Barrier:		33.0 feet			Heavy Trucks:		86.5%		2.7%	10.8%	0.74%
Centerline Dist. to Observer:		33.0 feet									
Barrier Distance to Observer:		0.0 feet									
Observer Height (Above Pad):		5.0 feet									
Pad Elevation:		0.0 feet									
Road Elevation:		0.0 feet									
Road Grade:		0.0%									
Left View:		-90.0 degrees									
Right View:		90.0 degrees									
FHWA Noise Model Calculations					Noise Source Elevations (in feet)						
VehicleType	REMEF	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten				
Autos:	66.51	-7.64	2.64	-1.20	-4.52	0.000	0.000				
Medium Trucks:	77.72	-24.88	2.69	-1.20	-4.86	0.000	0.000				
Heavy Trucks:	82.99	-28.83	2.69	-1.20	-5.69	0.000	0.000				
Unmitigated Noise Levels (without Topo and barrier attenuation)											
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL					
Autos:	60.3	58.4	56.6	50.6	59.2	59.8					
Medium Trucks:	54.3	52.8	46.5	44.9	53.4	53.6					
Heavy Trucks:	55.6	54.2	45.2	46.4	54.8	54.9					
Vehicle Noise:	62.3	60.6	57.3	52.8	61.3	61.8					
Centerline Distance to Noise Contour (in feet)											
				70 dBA	65 dBA	60 dBA	55 dBA				
Ldn:				9	19	40	87				
CNEL:				9	20	43	93				
Monday, June 18, 2018											

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 Without Project Road Name: Placentia Ln. Road Segment: e/o Main St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 14,700 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 1,470 vehicles Vehicle Speed: 25 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 44.0 feet Centerline Dist. to Observer: 44.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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: 40.460				
					Medium Trucks: 40.241				
					Heavy Trucks: 40.262				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	58.73	2.27	1.28	-1.20	-4.61	0.000	0.000		
Medium Trucks:	70.80	-14.96	1.31	-1.20	-4.87	0.000	0.000		
Heavy Trucks:	77.97	-18.92	1.31	-1.20	-5.50	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	61.1	59.2	57.4	51.4	60.0	60.6			
Medium Trucks:	55.9	54.4	48.1	46.5	55.0	55.2			
Heavy Trucks:	59.2	57.7	48.7	50.0	58.3	58.4			
Vehicle Noise:	64.0	62.3	58.4	54.5	63.0	63.4			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				15	32	70	150		
CNEL:				16	34	74	159		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 Without Project Road Name: Columbia Av. Road Direction: e/o Orange St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 31,400 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 3,140 vehicles Vehicle Speed: 45 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 44.0 feet Centerline Dist. to Observer: 44.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					Vehicle Type	Day	Evening	Night	Daily
					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: 40.460 Medium Trucks: 40.241 Heavy Trucks: 40.262				
FHWA Noise Model Calculations									
Vehicle Type	REMODEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 68.46 3.02 1.28 -1.20 -4.61 0.000 0.000									
Medium Trucks: 79.45 -14.22 1.31 -1.20 -4.87 0.000 0.000									
Heavy Trucks: 84.25 -18.18 1.31 -1.20 -5.50 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 71.6 69.7 67.9 61.8 70.5 71.1									
Medium Trucks: 65.3 63.8 57.5 55.9 64.4 64.6									
Heavy Trucks: 66.2 64.8 55.7 57.0 65.3 65.5									
Vehicle Noise: 73.4 71.7 68.5 63.8 72.4 72.8									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				63	136	294	633		
CNEL:				68	146	315	679		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 Without Project Road Name: Columbia Av. Road Segment: e/o Primer St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 34,600 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 3,460 vehicles Vehicle Speed: 45 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 44.0 feet Centerline Dist. to Observer: 44.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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%				
FHWA Noise Model Calculations					Noise Source Elevations (in feet)				
					Autos: 0.000				
					Medium Trucks: 2.297				
					Heavy Trucks: 8.006 Grade Adjustment: 0.0				
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)				
					Autos: 40.460				
					Medium Trucks: 40.241				
					Heavy Trucks: 40.262				
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	68.46	3.44	1.28	-1.20	-4.61	0.000	0.000		
Medium Trucks:	79.45	-13.80	1.31	-1.20	-4.87	0.000	0.000		
Heavy Trucks:	84.25	-17.75	1.31	-1.20	-5.50	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	72.0	70.1	68.3	62.3	70.9	71.5			
Medium Trucks:	65.8	64.3	57.9	56.3	64.8	65.0			
Heavy Trucks:	66.6	65.2	56.1	57.4	65.8	65.9			
Vehicle Noise:	73.8	72.1	68.9	64.3	72.8	73.3			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				68	146	314	676		
CNEL:				72	156	336	725		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 Without Project Road Name: Strong St. Road Segment: w/o Main St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 5,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 500 vehicles Vehicle Speed: 25 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
					VehicleType	Day	Evening	Night	Daily
					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: 32.833				
					Medium Trucks: 32.562				
					Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 58.73 -2.41 2.64 -1.20 -4.52 0.000 0.000									
Medium Trucks: 70.80 -19.65 2.69 -1.20 -4.86 0.000 0.000									
Heavy Trucks: 77.97 -23.60 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 57.8 55.9 54.1 48.0 56.7 57.3									
Medium Trucks: 52.6 51.1 44.8 43.2 51.7 51.9									
Heavy Trucks: 55.9 54.4 45.4 46.6 55.0 55.1									
Vehicle Noise: 60.7 59.0 55.1 51.2 59.7 60.1									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				7	15	31	68		
CNEL:				7	15	33	72		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 Without Project Road Name: Strong St. Road Segment: e/o Main St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 4,800 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 480 vehicles Vehicle Speed: 25 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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: 32.833 Medium Trucks: 32.562 Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 58.73 -2.59 2.64 -1.20 -4.52 0.000 0.000									
Medium Trucks: 70.80 -19.82 2.69 -1.20 -4.86 0.000 0.000									
Heavy Trucks: 77.97 -23.78 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 57.6 55.7 53.9 47.9 56.5 57.1									
Medium Trucks: 52.5 51.0 44.6 43.0 51.5 51.7									
Heavy Trucks: 55.7 54.3 45.2 46.5 54.8 55.0									
Vehicle Noise: 60.5 58.8 54.9 51.0 59.5 59.9									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				7	14	31	66		
CNEL:				7	15	32	70		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 Without Project Road Name: Russell St. Road Segment: e/o Main St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 5,100 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 510 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 44.0 feet Centerline Dist. to Observer: 44.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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: 40.460 Medium Trucks: 40.241 Heavy Trucks: 40.262				
FHWA Noise Model Calculations									
VehicleType	REMEF	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	-3.78	1.28	-1.20	-4.61	0.000	0.000	0.000	
Medium Trucks:	75.75	-21.02	1.31	-1.20	-4.87	0.000	0.000	0.000	
Heavy Trucks:	81.57	-24.98	1.31	-1.20	-5.50	0.000	0.000	0.000	
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	60.6	58.7	56.9	50.9	59.5	60.1	60.1		
Medium Trucks:	54.8	53.3	47.0	45.4	53.9	54.1	54.1		
Heavy Trucks:	56.7	55.3	46.2	47.5	55.8	56.0	56.0		
Vehicle Noise:	62.8	61.1	57.7	53.3	61.8	62.2	62.2		
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				13	27	58	125		
CNEL:				13	29	62	134		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL								
Scenario: HY 2040 With Project Road Name: Main St. Road Segment: s/o Placentia Ln.				Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA				NOISE MODEL INPUTS				
Highway Data				Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 45,600 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 4,560 vehicles Vehicle Speed: 50 mph Near/Far Lane Distance: 36 feet				Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data				Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees				VehicleType	Day	Evening	Night	Daily
				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				
FHWA Noise Model Calculations								
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten	
Autos: 70.20 4.18 0.31 -1.20 -4.65 0.000 0.000								
Medium Trucks: 81.00 -13.06 0.34 -1.20 -4.87 0.000 0.000								
Heavy Trucks: 85.38 -17.01 0.34 -1.20 -5.43 0.000 0.000								
Unmitigated Noise Levels (without Topo and barrier attenuation)								
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL		
Autos: 73.5 71.6 69.8 63.8 72.4 73.0								
Medium Trucks: 67.1 65.6 59.2 57.7 66.1 66.4								
Heavy Trucks: 67.5 66.1 57.0 58.3 66.6 66.8								
Vehicle Noise: 75.2 73.4 70.4 65.6 74.2 74.6								
Centerline Distance to Noise Contour (in feet)								
				70 dBA	65 dBA	60 dBA	55 dBA	
Ldn:				95	204	440	948	
CNEL:				102	219	473	1,018	

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 With Project Road Name: Main St. Road Segment: n/o Columbia Av.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 45,500 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 4,550 vehicles Vehicle Speed: 50 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					Vehicle Mix				
					VehicleType	Day	Evening	Night	Daily
					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									
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	70.20	4.17	0.31	-1.20	-4.65	0.000	0.000		
Medium Trucks:	81.00	-13.07	0.34	-1.20	-4.87	0.000	0.000		
Heavy Trucks:	85.38	-17.02	0.34	-1.20	-5.43	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	73.5	71.6	69.8	63.8	72.4	73.0			
Medium Trucks:	67.1	65.6	59.2	57.7	66.1	66.4			
Heavy Trucks:	67.5	66.1	57.0	58.3	66.6	66.8			
Vehicle Noise:	75.2	73.4	70.4	65.6	74.2	74.6			
Centerline Distance to Noise Contour (in feet)									
	70 dBA	65 dBA	60 dBA	55 dBA					
Ldn:	95	204	439	946					
CNEL:	102	219	472	1,017					

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 With Project Road Name: Main St. Road Segment: s/o Columbia Av.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 44,100 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 4,410 vehicles Vehicle Speed: 50 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					Vehicle Mix				
					VehicleType	Day	Evening	Night	Daily
					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									
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	70.20	4.04	0.31	-1.20	-4.65	0.000	0.000		
Medium Trucks:	81.00	-13.20	0.34	-1.20	-4.87	0.000	0.000		
Heavy Trucks:	85.38	-17.16	0.34	-1.20	-5.43	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	73.4	71.5	69.7	63.6	72.3	72.9			
Medium Trucks:	66.9	65.4	59.1	57.5	66.0	66.2			
Heavy Trucks:	67.4	65.9	56.9	58.1	66.5	66.6			
Vehicle Noise:	75.1	73.3	70.3	65.5	74.0	74.5			
Centerline Distance to Noise Contour (in feet)									
	70 dBA	65 dBA	60 dBA	55 dBA					
Ldn:	93	200	430	927					
CNEL:	100	215	462	996					

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 With Project Road Name: Main St. Road Segment: n/o Strong St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 44,200 vehicles					Autos: 15				
Peak Hour Percentage: 10%					Medium Trucks (2 Axles): 15				
Peak Hour Volume: 4,420 vehicles					Heavy Trucks (3+ Axles): 15				
Vehicle Speed: 45 mph					Vehicle Mix				
Near/Far Lane Distance: 36 feet					VehicleType				
Site Data					Day				
Barrier Height: 0.0 feet					Evening				
Barrier Type (0-Wall, 1-Berm): 0.0					Night				
Centerline Dist. to Barrier: 50.0 feet					97.42%				
Centerline Dist. to Observer: 50.0 feet					Autos: 77.5%				
Barrier Distance to Observer: 0.0 feet					Medium Trucks: 84.8%				
Observer Height (Above Pad): 5.0 feet					Heavy Trucks: 86.5%				
Pad Elevation: 0.0 feet					Grade Adjustment: 0.0				
Road Elevation: 0.0 feet					Noise Source Elevations (in feet)				
Road Grade: 0.0%					Autos: 0.000				
Left View: -90.0 degrees					Medium Trucks: 2.297				
Right View: 90.0 degrees					Heavy Trucks: 8.006				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	68.46	4.50	0.31	-1.20	-4.65	0.000	0.000		
Medium Trucks:	79.45	-12.74	0.34	-1.20	-4.87	0.000	0.000		
Heavy Trucks:	84.25	-16.69	0.34	-1.20	-5.43	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	72.1	70.2	68.4	62.4	71.0	71.6			
Medium Trucks:	65.9	64.3	58.0	56.4	64.9	65.1			
Heavy Trucks:	66.7	65.3	56.2	57.5	65.8	66.0			
Vehicle Noise:	73.9	72.2	69.0	64.3	72.9	73.3			
Centerline Distance to Noise Contour (in feet)									
	70 dBA	65 dBA	60 dBA	55 dBA					
Ldn:	78	168	362	779					
CNEL:	84	180	388	836					

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 With Project Road Name: Main St. Road Segment: s/o Strong St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 43,200 vehicles					Autos: 15				
Peak Hour Percentage: 10%					Medium Trucks (2 Axles): 15				
Peak Hour Volume: 4,320 vehicles					Heavy Trucks (3+ Axles): 15				
Vehicle Speed: 25 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					Lane Equivalent Distance (in feet)				
Road Elevation: 0.0 feet					Autos: 46.915				
Road Grade: 0.0%					Medium Trucks: 46.726				
Left View: -90.0 degrees					Heavy Trucks: 46.744				
Right View: 90.0 degrees									
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	58.73	6.96	0.31	-1.20	-4.65	0.000	0.000		0.000
Medium Trucks:	70.80	-10.28	0.34	-1.20	-4.87	0.000	0.000		0.000
Heavy Trucks:	77.97	-14.24	0.34	-1.20	-5.43	0.000	0.000		0.000
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	64.8	62.9	61.1	55.1	63.7	64.3			
Medium Trucks:	59.7	58.1	51.8	50.2	58.7	58.9			
Heavy Trucks:	62.9	61.4	52.4	53.7	62.0	62.1			
Vehicle Noise:	67.7	66.0	62.1	58.2	66.7	67.1			
Centerline Distance to Noise Contour (in feet)									
	70 dBA	65 dBA	60 dBA	55 dBA					
Ldn:	30	65	140	301					
CNEL:	32	69	149	320					

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 With Project Road Name: Main St. Road Segment: n/o Russell St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 24,900 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 2,490 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
					Vehicle Type	Day	Evening	Night	Daily
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					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				
FHWA Noise Model Calculations									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	3.10	0.31	-1.20	-4.65	0.000	0.000		
Medium Trucks:	75.75	-14.14	0.34	-1.20	-4.87	0.000	0.000		
Heavy Trucks:	81.57	-18.09	0.34	-1.20	-5.43	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	66.5	64.6	62.9	56.8	65.4	66.0			
Medium Trucks:	60.8	59.2	52.9	51.3	59.8	60.0			
Heavy Trucks:	62.6	61.2	52.2	53.4	61.8	61.9			
Vehicle Noise:	68.7	67.0	63.6	59.2	67.7	68.2			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				35	76	164	353		
CNEL:				38	81	175	377		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 With Project Road Name: Main St. Road Segment: s/o Russell St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 23,700 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 2,370 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 36 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					Vehicle Mix				
					VehicleType	Day	Evening	Night	Daily
					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			
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	2.89	0.31	-1.20	-4.65	0.000	0.000		
Medium Trucks:	75.75	-14.35	0.34	-1.20	-4.87	0.000	0.000		
Heavy Trucks:	81.57	-18.31	0.34	-1.20	-5.43	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	66.3	64.4	62.6	56.6	65.2	65.8			
Medium Trucks:	60.5	59.0	52.7	51.1	59.6	59.8			
Heavy Trucks:	62.4	61.0	51.9	53.2	61.5	61.7			
Vehicle Noise:	68.5	66.8	63.4	59.0	67.5	68.0			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				34	74	159	342		
CNEL:				37	79	169	365		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 With Project Road Name: Orange St. Road Segment: n/o Columbia Av.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 5,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 500 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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: 32.833 Medium Trucks: 32.562 Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	-3.87	2.64	-1.20	-4.52	0.000	0.000		0.000
Medium Trucks:	75.75	-21.11	2.69	-1.20	-4.86	0.000	0.000		0.000
Heavy Trucks:	81.57	-25.06	2.69	-1.20	-5.69	0.000	0.000		0.000
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night		Ldn		CNEL	
Autos:	61.9	60.0	58.2	52.1		60.8		61.4	
Medium Trucks:	56.1	54.6	48.3	46.7		55.2		55.4	
Heavy Trucks:	58.0	56.6	47.5	48.8		57.1		57.3	
Vehicle Noise:	64.1	62.4	58.9	54.6		63.1		63.5	
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				11	25	53	114		
CNEL:				12	26	57	122		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 With Project Road Name: Orange St. Road Segment: s/o Columbia Av.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 11,400 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 1,140 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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: 32.833 Medium Trucks: 32.562 Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 64.30 -0.29 2.64 -1.20 -4.52 0.000 0.000									
Medium Trucks: 75.75 -17.53 2.69 -1.20 -4.86 0.000 0.000									
Heavy Trucks: 81.57 -21.48 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 65.4 63.5 61.8 55.7 64.4 65.0									
Medium Trucks: 59.7 58.2 51.8 50.3 58.8 59.0									
Heavy Trucks: 61.6 60.1 51.1 52.4 60.7 60.8									
Vehicle Noise: 67.7 66.0 62.5 58.2 66.7 67.1									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				20	43	92	198		
CNEL:				21	46	98	212		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL							
Scenario: HY 2040 With Project Road Name: Orange St. Road Segment: n/o Strong St.				Project Name: Northgate Job Number: 11145			
SITE SPECIFIC INPUT DATA				NOISE MODEL INPUTS			
Highway Data				Site Conditions (Hard = 10, Soft = 15)			
Average Daily Traffic (Adt):		9,600 vehicles		Autos:		15	
Peak Hour Percentage:		10%		Medium Trucks (2 Axles):		15	
Peak Hour Volume:		960 vehicles		Heavy Trucks (3+ Axles):		15	
Vehicle Speed:		35 mph		Vehicle Mix			
Near/Far Lane Distance:		12 feet					
Site Data				VehicleType			
Barrier Height:		0.0 feet		Autos:		77.5%	
Barrier Type (0-Wall, 1-Berm):		0.0		Medium Trucks:		77.5% 12.9% 9.6% 97.42%	
Centerline Dist. to Barrier:		33.0 feet		Heavy Trucks:		84.8% 4.9% 10.3% 1.84%	
Centerline Dist. to Observer:		33.0 feet				86.5% 2.7% 10.8% 0.74%	
Barrier Distance to Observer:		0.0 feet		Noise Source Elevations (in feet)			
Observer Height (Above Pad):		5.0 feet					
Pad Elevation:		0.0 feet		Autos:		0.000	
Road Elevation:		0.0 feet		Medium Trucks:		2.297	
Road Grade:		0.0%		Heavy Trucks:		8.006	
Left View:		-90.0 degrees		Grade Adjustment: 0.0			
Right View:		90.0 degrees		Lane Equivalent Distance (in feet)			
				Autos:		32.833	
				Medium Trucks:		32.562	
				Heavy Trucks:		32.589	
FHWA Noise Model Calculations							
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	-1.04	2.64	-1.20	-4.52	0.000	0.000
Medium Trucks:	75.75	-18.28	2.69	-1.20	-4.86	0.000	0.000
Heavy Trucks:	81.57	-22.23	2.69	-1.20	-5.69	0.000	0.000
Unmitigated Noise Levels (without Topo and barrier attenuation)							
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	64.7	62.8	61.0	55.0	63.6	64.2	
Medium Trucks:	59.0	57.5	51.1	49.6	58.0	58.2	
Heavy Trucks:	60.8	59.4	50.4	51.6	60.0	60.1	
Vehicle Noise:	66.9	65.2	61.8	57.4	65.9	66.4	
Centerline Distance to Noise Contour (in feet)							
				70 dBA	65 dBA	60 dBA	55 dBA
Ldn:				18	38	82	177
CNEL:				19	41	88	189

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 With Project Road Name: Orange St. Road Segment: s/o Strong St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 11,400 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 1,140 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
					VehicleType	Day	Evening	Night	Daily
					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: 32.833 Medium Trucks: 32.562 Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	-0.29	2.64	-1.20	-4.52	0.000	0.000		
Medium Trucks:	75.75	-17.53	2.69	-1.20	-4.86	0.000	0.000		
Heavy Trucks:	81.57	-21.48	2.69	-1.20	-5.69	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	65.4	63.5	61.8	55.7	64.4	65.0			
Medium Trucks:	59.7	58.2	51.8	50.3	58.8	59.0			
Heavy Trucks:	61.6	60.1	51.1	52.4	60.7	60.8			
Vehicle Noise:	67.7	66.0	62.5	58.2	66.7	67.1			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				20	43	92	198		
CNEL:				21	46	98	212		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 With Project Road Name: Orange St. Road Segment: n/o Russell St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 11,400 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 1,140 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
					VehicleType	Day	Evening	Night	Daily
					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%				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: -90.0 degrees					Noise 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: 32.833 Medium Trucks: 32.562 Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	-0.29	2.64	-1.20	-4.52	0.000	0.000		
Medium Trucks:	75.75	-17.53	2.69	-1.20	-4.86	0.000	0.000		
Heavy Trucks:	81.57	-21.48	2.69	-1.20	-5.69	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	65.4	63.5	61.8	55.7	64.4			65.0	
Medium Trucks:	59.7	58.2	51.8	50.3	58.8			59.0	
Heavy Trucks:	61.6	60.1	51.1	52.4	60.7			60.8	
Vehicle Noise:	67.7	66.0	62.5	58.2	66.7			67.1	
Centerline Distance to Noise Contour (in feet)									
			70 dBA	65 dBA	60 dBA	55 dBA			
Ldn:			20	43	92	198			
CNEL:			21	46	98	212			

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL								
Scenario: HY 2040 With Project Road Name: Orange St. Road Segment: s/o Russell St.				Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA				NOISE MODEL INPUTS				
Highway Data				Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 6,300 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 630 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet				Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data				Vehicle Mix				
				VehicleType	Day	Evening	Night	Daily
				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: 32.833 Medium Trucks: 32.562 Heavy Trucks: 32.589				
FHWA Noise Model Calculations								
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten	
Autos:	64.30	-2.87	2.64	-1.20	-4.52	0.000	0.000	
Medium Trucks:	75.75	-20.10	2.69	-1.20	-4.86	0.000	0.000	
Heavy Trucks:	81.57	-24.06	2.69	-1.20	-5.69	0.000	0.000	
Unmitigated Noise Levels (without Topo and barrier attenuation)								
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL		
Autos:	62.9	61.0	59.2	53.2	61.8	62.4		
Medium Trucks:	57.1	55.6	49.3	47.7	56.2	56.4		
Heavy Trucks:	59.0	57.6	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 Contour (in feet)								
			70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:			13	29	62	133		
CNEL:			14	31	66	143		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 With Project Road Name: Primer St. Road Segment: n/o Columbia Av.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 27,300 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 2,730 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
					VehicleType	Day	Evening	Night	Daily
					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: 32.833				
					Medium Trucks: 32.562				
					Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:		64.30	3.50	2.64	-1.20	-4.52	0.000	0.000	
Medium Trucks:		75.75	-13.74	2.69	-1.20	-4.86	0.000	0.000	
Heavy Trucks:		81.57	-17.69	2.69	-1.20	-5.69	0.000	0.000	
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:		69.2	67.3	65.6	59.5	68.1	68.7		
Medium Trucks:		63.5	62.0	55.6	54.1	62.6	62.8		
Heavy Trucks:		65.4	63.9	54.9	56.2	64.5	64.6		
Vehicle Noise:		71.5	69.8	66.3	61.9	70.5	70.9		
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				35	76	165	355		
CNEL:				38	82	176	379		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL										
Scenario: HY 2040 With Project Road Name: La Cadena Dr. Road Segment: n/o I-215 Ramps					Project Name: Northgate Job Number: 11145					
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS					
Highway Data					Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):		7,900 vehicles			Autos:		15			
Peak Hour Percentage:		10%			Medium Trucks (2 Axles):		15			
Peak Hour Volume:		790 vehicles			Heavy Trucks (3+ Axles):		15			
Vehicle Speed:		40 mph			Vehicle Mix					
Near/Far Lane Distance:		12 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:		33.0 feet			Noise Source Elevations (in feet)					
Centerline Dist. to Observer:		33.0 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)					
Road Elevation:		0.0 feet			Autos:		32.833			
Road Grade:		0.0%			Medium Trucks:		32.562			
Left View:		-90.0 degrees			Heavy Trucks:		32.589			
Right View:		90.0 degrees								
FHWA Noise Model Calculations										
VehicleType	REIML	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten			
Autos:		66.51	-2.46	2.64	-1.20	-4.52	0.000	0.000		
Medium Trucks:		77.72	-19.70	2.69	-1.20	-4.86	0.000	0.000		
Heavy Trucks:		82.99	-23.66	2.69	-1.20	-5.69	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)										
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL				
Autos:		65.5	63.6	61.8	55.8	64.4	65.0			
Medium Trucks:		59.5	58.0	51.6	50.1	58.6	58.8			
Heavy Trucks:		60.8	59.4	50.4	51.6	60.0	60.1			
Vehicle Noise:		67.5	65.8	62.5	58.0	66.5	66.9			
Centerline Distance to Noise Contour (in feet)										
				70 dBA	65 dBA	60 dBA	55 dBA			
Ldn:				19	41	89	193			
CNEL:				21	44	96	206			
Monday, June 18, 2018										

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 With Project Road Name: La Cadena Dr. Road Segment: s/o I-215 Ramps					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 4,300 vehicles					Autos: 15				
Peak Hour Percentage: 10%					Medium Trucks (2 Axles): 15				
Peak Hour Volume: 430 vehicles					Heavy Trucks (3+ Axles): 15				
Vehicle Speed: 40 mph									
Near/Far Lane Distance: 12 feet									
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet					Autos: 77.5% 12.9% 9.6% 97.42%				
Barrier Type (0-Wall, 1-Berm): 0.0					Medium Trucks: 84.8% 4.9% 10.3% 1.84%				
Centerline Dist. to Barrier: 33.0 feet					Heavy Trucks: 86.5% 2.7% 10.8% 0.74%				
Centerline Dist. to Observer: 33.0 feet									
Barrier Distance to Observer: 0.0 feet									
Observer Height (Above Pad): 5.0 feet									
Pad Elevation: 0.0 feet									
Road Elevation: 0.0 feet									
Road Grade: 0.0%									
Left View: -90.0 degrees					Grade Adjustment: 0.0				
Right View: 90.0 degrees									
FHWA Noise Model Calculations					Noise Source Elevations (in feet)				
Vehicle Type					Autos: 0.000				
Autos: 66.51					Medium Trucks: 2.297				
Medium Trucks: 77.72					Heavy Trucks: 8.006				
Heavy Trucks: 82.99									
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)				
Vehicle Type					Autos: 32.833				
Autos: 66.51					Medium Trucks: 32.562				
Medium Trucks: 77.72					Heavy Trucks: 32.589				
Heavy Trucks: 82.99									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	REMODEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 66.51 -5.10 2.64 -1.20 -4.52 0.000 0.000									
Medium Trucks: 77.72 -22.34 2.69 -1.20 -4.86 0.000 0.000									
Heavy Trucks: 82.99 -26.30 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 62.8 60.9 59.2 53.1 61.7 62.4									
Medium Trucks: 56.9 55.4 49.0 47.4 55.9 56.1									
Heavy Trucks: 58.2 56.8 47.7 49.0 57.3 57.5									
Vehicle Noise: 64.9 63.1 59.9 55.3 63.8 64.3									
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				13	28	60	128		
CNEL:				14	30	64	137		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 With Project Road Name: La Cadena Dr. Road Segment: n/o Strong St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 4,300 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 430 vehicles Vehicle Speed: 40 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 33.0 feet Centerline Dist. to Observer: 33.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					VehicleType	Day	Evening	Night	Daily
					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: 32.833				
					Medium Trucks: 32.562				
					Heavy Trucks: 32.589				
FHWA Noise Model Calculations									
VehicleType	REMIEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 66.51 -5.10 2.64 -1.20 -4.52 0.000 0.000									
Medium Trucks: 77.72 -22.34 2.69 -1.20 -4.86 0.000 0.000									
Heavy Trucks: 82.99 -26.30 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 62.8 60.9 59.2 53.1 61.7 62.4									
Medium Trucks: 56.9 55.4 49.0 47.4 55.9 56.1									
Heavy Trucks: 58.2 56.8 47.7 49.0 57.3 57.5									
Vehicle Noise: 64.9 63.1 59.9 55.3 63.8 64.3									
Centerline Distance to Noise Contour (in feet)									
			70 dBA	65 dBA	60 dBA	55 dBA			
Ldn:			13	28	60	128			
CNEL:			14	30	64	137			
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 With Project Road Name: Placentia Ln. Road Segment: e/o Main St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 14,900 vehicles					Autos: 15				
Peak Hour Percentage: 10%					Medium Trucks (2 Axles): 15				
Peak Hour Volume: 1,490 vehicles					Heavy Trucks (3+ Axles): 15				
Vehicle Speed: 25 mph					Vehicle Mix				
Near/Far Lane Distance: 36 feet					VehicleType	Day	Evening	Night	Daily
Site Data Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 44.0 feet Centerline Dist. to Observer: 44.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees					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: 40.460				
					Medium Trucks: 40.241				
Heavy Trucks: 40.262									
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	58.73	2.33	1.28	-1.20	-4.61	0.000	0.000		
Medium Trucks:	70.80	-14.90	1.31	-1.20	-4.87	0.000	0.000		
Heavy Trucks:	77.97	-18.86	1.31	-1.20	-5.50	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	61.1	59.2	57.5	51.4	60.0	60.7			
Medium Trucks:	56.0	54.5	48.1	46.6	55.0	55.3			
Heavy Trucks:	59.2	57.8	48.8	50.0	58.4	58.5			
Vehicle Noise:	64.0	62.4	58.5	54.5	63.0	63.4			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				15	33	70	151		
CNEL:				16	35	75	161		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 With Project Road Name: Columbia Av. Road Segment: e/o Orange St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 31,900 vehicles					Autos: 15				
Peak Hour Percentage: 10%					Medium Trucks (2 Axles): 15				
Peak Hour Volume: 3,190 vehicles					Heavy Trucks (3+ Axles): 15				
Vehicle Speed: 45 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: 44.0 feet					Noise Source Elevations (in feet)				
Centerline Dist. to Observer: 44.0 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)				
Road Elevation: 0.0 feet					Autos: 40.460				
Road Grade: 0.0%					Medium Trucks: 40.241				
Left View: -90.0 degrees					Heavy Trucks: 40.262				
Right View: 90.0 degrees									
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	68.46	3.09	1.28	-1.20	-4.61	0.000	0.000		
Medium Trucks:	79.45	-14.15	1.31	-1.20	-4.87	0.000	0.000		
Heavy Trucks:	84.25	-18.11	1.31	-1.20	-5.50	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos:	71.6	69.7	68.0	61.9	70.5		71.1		
Medium Trucks:	65.4	63.9	57.5	56.0	64.5		64.7		
Heavy Trucks:	66.3	64.8	55.8	57.0	65.4		65.5		
Vehicle Noise:	73.5	71.7	68.6	63.9	72.4		72.9		
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				64	138	297	640		
CNEL:				69	148	319	687		
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 With Project Road Name: Columbia Av. Road Segment: e/o Primer St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 35,900 vehicles					Autos: 15				
Peak Hour Percentage: 10%					Medium Trucks (2 Axles): 15				
Peak Hour Volume: 3,590 vehicles					Heavy Trucks (3+ Axles): 15				
Vehicle Speed: 45 mph					Vehicle Mix				
Near/Far Lane Distance: 36 feet					VehicleType				
Site Data					Day				
Barrier Height: 0.0 feet					Evening				
Barrier Type (0-Wall, 1-Berm): 0.0					Night				
Centerline Dist. to Barrier: 44.0 feet					97.42%				
Centerline Dist. to Observer: 44.0 feet					Autos: 77.5%				
Barrier Distance to Observer: 0.0 feet					Medium Trucks: 84.8%				
Observer Height (Above Pad): 5.0 feet					Heavy Trucks: 86.5%				
Pad Elevation: 0.0 feet					2.7%				
Road Elevation: 0.0 feet					10.8%				
Road Grade: 0.0%					0.74%				
Left View: -90.0 degrees					Noise Source Elevations (in feet)				
Right View: 90.0 degrees					Autos: 0.000				
					Medium Trucks: 2.297				
					Heavy Trucks: 8.006				
					Grade Adjustment: 0.0				
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)				
VehicleType					Autos: 40.460				
REMED					Medium Trucks: 40.241				
Traffic Flow					Heavy Trucks: 40.262				
Distance									
Finite Road									
Fresnel									
Barrier Atten									
Berm Atten									
Autos: 68.46					3.60				
Medium Trucks: 79.45					-13.64				
Heavy Trucks: 84.25					-17.59				
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType									
Leq Peak Hour									
Leq Day									
Leq Evening									
Leq Night									
Ldn									
CNEL									
Autos: 72.1									
70.2									
68.5									
62.4									
71.0									
71.6									
Medium Trucks: 65.9									
64.4									
58.1									
56.5									
65.0									
65.2									
Heavy Trucks: 66.8									
65.3									
56.3									
57.6									
65.9									
66.0									
Vehicle Noise: 74.0									
72.2									
69.1									
64.4									
73.0									
73.4									
Centerline Distance to Noise Contour (in feet)									
70 dBA									
65 dBA									
60 dBA									
55 dBA									
Ldn: 69									
149									
321									
692									
CNEL: 74									
160									
345									
743									
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 With Project Road Name: Strong St. Road Segment: w/o Main St.					Project Name: Northgate Job Number: 11145				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 5,700 vehicles					Autos: 15				
Peak Hour Percentage: 10%					Medium Trucks (2 Axles): 15				
Peak Hour Volume: 570 vehicles					Heavy Trucks (3+ Axles): 15				
Vehicle Speed: 25 mph					Vehicle Mix				
Near/Far Lane Distance: 12 feet					VehicleType	Day	Evening	Night	Daily
Site Data					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				
Barrier Height: 0.0 feet					Medium Trucks: 2.297				
Barrier Type (0-Wall, 1-Berm): 0.0					Heavy Trucks: 8.006 Grade Adjustment: 0.0				
Centerline Dist. to Barrier: 33.0 feet					Lane Equivalent Distance (in feet)				
Centerline Dist. to Observer: 33.0 feet									
Barrier Distance to Observer: 0.0 feet									
Observer Height (Above Pad): 5.0 feet									
Pad Elevation: 0.0 feet									
Road Elevation: 0.0 feet					Autos: 32.833				
Road Grade: 0.0%					Medium Trucks: 32.562				
Left View: -90.0 degrees					Heavy Trucks: 32.589				
Right View: 90.0 degrees									
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos: 58.73 -1.84 2.64 -1.20 -4.52 0.000 0.000									
Medium Trucks: 70.80 -19.08 2.69 -1.20 -4.86 0.000 0.000									
Heavy Trucks: 77.97 -23.03 2.69 -1.20 -5.69 0.000 0.000									
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos: 58.3 56.4 54.7 48.6 57.2 57.8									
Medium Trucks: 53.2 51.7 45.3 43.8 52.3 52.5									
Heavy Trucks: 56.4 55.0 46.0 47.2 55.6 55.7									
Vehicle Noise: 61.2 59.6 55.6 51.7 60.2 60.6									
Centerline Distance to Noise Contour (in feet)									
			70 dBA	65 dBA	60 dBA	55 dBA			
Ldn:			7	16	34	74			
CNEL:			8	17	36	78			
Monday, June 18, 2018									

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL										
Scenario: HY 2040 With Project					Project Name: Northgate					
Road Name: Strong St.					Job Number: 11145					
Road Segment: e/o Main St.										
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS					
Highway Data					Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt):		6,200 vehicles			Autos:		15			
Peak Hour Percentage:		10%			Medium Trucks (2 Axles):		15			
Peak Hour Volume:		620 vehicles			Heavy Trucks (3+ Axles):		15			
Vehicle Speed:		25 mph			Vehicle Mix					
Near/Far Lane Distance:		12 feet								
Site Data					VehicleType					
Barrier Height:		0.0 feet			Autos:		77.5%	12.9%	9.6%	97.42%
Barrier Type (0-Wall, 1-Berm):		0.0			Medium Trucks:		84.8%	4.9%	10.3%	1.84%
Centerline Dist. to Barrier:		33.0 feet			Heavy Trucks:		86.5%	2.7%	10.8%	0.74%
Centerline Dist. to Observer:		33.0 feet			Noise Source Elevations (in feet)					
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			
Road Elevation:		0.0 feet					Grade Adjustment: 0.0			
Road Grade:		0.0%			Lane Equivalent Distance (in feet)					
Left View:		-90.0 degrees			Autos:		32.833			
Right View:		90.0 degrees			Medium Trucks:		32.562			
					Heavy Trucks:		32.589			
FHWA Noise Model Calculations										
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten			
Autos:	58.73	-1.47	2.64	-1.20	-4.52	0.000	0.000			
Medium Trucks:	70.80	-18.71	2.69	-1.20	-4.86	0.000	0.000			
Heavy Trucks:	77.97	-22.67	2.69	-1.20	-5.69	0.000	0.000			
Unmitigated Noise Levels (without Topo and barrier attenuation)										
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL				
Autos:	58.7	56.8	55.0	49.0	57.6	58.2				
Medium Trucks:	53.6	52.1	45.7	44.2	52.6	52.9				
Heavy Trucks:	56.8	55.4	46.3	47.6	55.9	56.1				
Vehicle Noise:	61.6	59.9	56.0	52.1	60.6	61.0				
Centerline Distance to Noise Contour (in feet)										
				70 dBA	65 dBA	60 dBA	55 dBA			
Ldn:				8	17	36	78			
CNEL:				8	18	38	83			

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL									
Scenario: HY 2040 With Project					Project Name: Northgate				
Road Name: Russell St.					Job Number: 11145				
Road Segment: e/o Main St.									
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 6,800 vehicles					Autos: 15				
Peak Hour Percentage: 10%					Medium Trucks (2 Axles): 15				
Peak Hour Volume: 680 vehicles					Heavy Trucks (3+ Axles): 15				
Vehicle Speed: 35 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: 44.0 feet					Noise Source Elevations (in feet)				
Centerline Dist. to Observer: 44.0 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)				
Road Elevation: 0.0 feet					Autos: 40.460				
Road Grade: 0.0%					Medium Trucks: 40.241				
Left View: -90.0 degrees					Heavy Trucks: 40.262				
Right View: 90.0 degrees									
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	64.30	-2.53	1.28	-1.20	-4.61	0.000	0.000		
Medium Trucks:	75.75	-19.77	1.31	-1.20	-4.87	0.000	0.000		
Heavy Trucks:	81.57	-23.73	1.31	-1.20	-5.50	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	61.8	59.9	58.2	52.1	60.7	61.4			
Medium Trucks:	56.1	54.6	48.2	46.7	55.1	55.4			
Heavy Trucks:	57.9	56.5	47.5	48.7	57.1	57.2			
Vehicle Noise:	64.1	62.4	58.9	54.5	63.1	63.5			
Centerline Distance to Noise Contour (in feet)									
				70 dBA	65 dBA	60 dBA	55 dBA		
Ldn:				15	33	70	152		
CNEL:				16	35	75	162		

Monday, June 18, 2018

This page intentionally left blank

APPENDIX 8.1:

ON-SITE TRAFFIC NOISE LEVEL CALCULATIONS

This page intentionally left blank

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: First Floor With Wall Road Name: SR-91/I-215 Lot No: East Apartment Buildings					Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 187,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 18,700 vehicles Vehicle Speed: 70 mph Near/Far Lane Distance: 140 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 212.0 feet Centerline Dist. to Observer: 212.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 855.0 feet Road Elevation: 866.2 feet Barrier Elevation: 855.0 feet Road Grade: 0.0%					VehicleType	Day	Evening	Night	Daily
					Autos: 77.5% 12.9% 9.6% 89.10%				
					Medium Trucks: 84.8% 4.9% 10.3% 4.58%				
					Heavy Trucks: 86.5% 2.7% 10.8% 6.32%				
FHWA Noise Model Calculations					Noise Source Elevations (in feet)				
					Autos: 866.200 Medium Trucks: 868.497 Heavy Trucks: 874.206 Grade Adjustment: 0.0				
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)				
					Autos: 205.423 Medium Trucks: 205.565 Heavy Trucks: 206.030				
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	76.79	8.46	-9.31	-1.20	5.09	-15.354	-18.354		
Medium Trucks:	82.53	-4.43	-9.31	-1.20	5.15	-15.390	-18.390		
Heavy Trucks:	85.83	-3.03	-9.33	-1.20	5.28	-15.468	-18.468		

Unmitigated Noise Levels (without Topo and barrier attenuation)							
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	74.7	72.8	71.1	65.0	73.6	74.3	
Medium Trucks:	67.6	66.1	59.7	58.2	66.6	66.9	
Heavy Trucks:	72.3	70.8	61.8	63.1	71.4	71.5	
Vehicle Noise:	77.2	75.5	71.8	67.7	76.2	76.6	

Mitigated Noise Levels (with Topo and barrier attenuation)							
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	59.4	57.5	55.7	49.7	58.3	58.9	
Medium Trucks:	52.2	50.7	44.3	42.8	51.2	51.5	
Heavy Trucks:	56.8	55.4	46.3	47.6	55.9	56.1	
Vehicle Noise:	61.8	60.1	56.5	52.3	60.8	61.2	

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: First Floor With Wall Road Name: SR-60 Lot No: East Apartment Buildings				Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe					
SITE SPECIFIC INPUT DATA				NOISE MODEL INPUTS					
Highway Data				Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt): 187,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 18,700 vehicles Vehicle Speed: 70 mph Near/Far Lane Distance: 160 feet				Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15					
Site Data				Vehicle Mix					
				Vehicle Type	Day	Evening	Night	Daily	
				Autos: 77.5% 12.9% 9.6% 89.00%					
				Medium Trucks: 84.8% 4.9% 10.3% 6.59%					
				Heavy Trucks: 86.5% 2.7% 10.8% 4.41%					
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 893.0 feet Centerline Dist. to Observer: 893.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 855.0 feet Road Elevation: 870.0 feet Barrier Elevation: 855.0 feet Road Grade: 0.0%				Noise Source Elevations (in feet)					
				Autos: 870.000 Medium Trucks: 872.297 Heavy Trucks: 878.006 Grade Adjustment: 0.0					
				Lane Equivalent Distance (in feet)					
				Autos: 894.536 Medium Trucks: 894.578 Heavy Trucks: 894.707					
FHWA Noise Model Calculations									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	76.79	8.46	-18.89	-1.20	4.96	-15.272	-18.272		
Medium Trucks:	82.53	-2.85	-18.89	-1.20	4.97	-15.279	-18.279		
Heavy Trucks:	85.83	-4.59	-18.89	-1.20	5.00	-15.300	-18.300		

Unmitigated Noise Levels (without Topo and barrier attenuation)							
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	65.2	63.3	61.5	55.4	64.1	64.7	
Medium Trucks:	59.6	58.1	51.7	50.2	58.6	58.9	
Heavy Trucks:	61.1	59.7	50.7	51.9	60.3	60.4	
Vehicle Noise:	67.4	65.7	62.2	57.9	66.4	66.8	

Mitigated Noise Levels (with Topo and barrier attenuation)							
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	49.9	48.0	46.2	40.2	48.8	49.4	
Medium Trucks:	44.3	42.8	36.4	34.9	43.4	43.6	
Heavy Trucks:	45.8	44.4	35.4	36.6	45.0	45.1	
Vehicle Noise:	52.1	50.4	47.0	42.6	51.1	51.5	

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: First Floor With Wall Road Name: SR-91/I-215 Lot No: East Hotel Building				Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe					
SITE SPECIFIC INPUT DATA				NOISE MODEL INPUTS					
Highway Data				Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt): 187,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 18,700 vehicles Vehicle Speed: 70 mph Near/Far Lane Distance: 140 feet				Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15					
Site Data				Vehicle Mix					
				VehicleType	Day	Evening	Night	Daily	
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 825.0 feet Centerline Dist. to Observer: 825.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 850.0 feet Road Elevation: 865.3 feet Barrier Elevation: 850.0 feet Road Grade: 0.0%				Autos: 77.5% 12.9% 9.6% 89.10% Medium Trucks: 84.8% 4.9% 10.3% 4.58% Heavy Trucks: 86.5% 2.7% 10.8% 6.32%					
				Noise Source Elevations (in feet)					
				Autos: 865.300 Medium Trucks: 867.597 Heavy Trucks: 873.306 Grade Adjustment: 0.0					
FHWA Noise Model Calculations				Lane Equivalent Distance (in feet)					
				Autos: 827.167 Medium Trucks: 827.213 Heavy Trucks: 827.355					
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	76.79	8.46	-18.38	-1.20	4.97	-15.279	-18.279		
Medium Trucks:	82.53	-4.43	-18.38	-1.20	4.98	-15.286	-18.286		
Heavy Trucks:	85.83	-3.03	-18.38	-1.20	5.02	-15.312	-18.312		

Unmitigated Noise Levels (without Topo and barrier attenuation)							
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	65.7	63.8	62.0	55.9	64.6	65.2	
Medium Trucks:	58.5	57.0	50.7	49.1	57.6	57.8	
Heavy Trucks:	63.2	61.8	52.8	54.0	62.4	62.5	
Vehicle Noise:	68.1	66.4	62.8	58.6	67.1	67.5	

Mitigated Noise Levels (with Topo and barrier attenuation)							
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	50.4	48.5	46.7	40.7	49.3	49.9	
Medium Trucks:	43.2	41.7	35.4	33.8	42.3	42.5	
Heavy Trucks:	47.9	46.5	37.4	38.7	47.0	47.2	
Vehicle Noise:	52.8	51.1	47.5	43.3	51.8	52.2	

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013										
Scenario: First Floor With Wall Road Name: SR-60 Lot No: East Hotel Building					Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe					
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS					
Highway Data					Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt): 187,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 18,700 vehicles Vehicle Speed: 70 mph Near/Far Lane Distance: 160 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15					
Site Data					Vehicle Mix					
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 446.0 feet Centerline Dist. to Observer: 446.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 850.0 feet Road Elevation: 855.0 feet Barrier Elevation: 850.0 feet Road Grade: 0.0%					VehicleType		Day	Evening	Night	Daily
					Autos: 77.5% 12.9% 9.6% 89.00%					
					Medium Trucks: 84.8% 4.9% 10.3% 6.59%					
					Heavy Trucks: 86.5% 2.7% 10.8% 4.41%					
FHWA Noise Model Calculations					Noise Source Elevations (in feet)					
					Autos: 855.000 Medium Trucks: 857.297 Heavy Trucks: 863.006 Grade Adjustment: 0.0					
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)					
					Autos: 438.766 Medium Trucks: 438.772 Heavy Trucks: 438.839					
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten			
Autos:	76.79	8.46	-14.25	-1.20	-4.92	0.000	0.000			
Medium Trucks:	82.53	-2.85	-14.25	-1.20	-4.94	0.000	0.000			
Heavy Trucks:	85.83	-4.59	-14.25	-1.20	-5.01	0.000	0.000			

Unmitigated Noise Levels (without Topo and barrier attenuation)						
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.8	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	65.1
Vehicle Noise:	72.0	70.3	66.9	62.5	71.0	71.4

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013							
Scenario: First Floor With Wall Road Name: SR-91/I-215 Lot No: South Hotel Building				Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe			
SITE SPECIFIC INPUT DATA				NOISE MODEL INPUTS			
Highway Data				Site Conditions (Hard = 10, Soft = 15)			
Average Daily Traffic (Adt): 187,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 18,700 vehicles Vehicle Speed: 70 mph Near/Far Lane Distance: 140 feet				Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15			
Site Data				Vehicle Mix			
				Vehicle Type	Day	Evening	Night
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: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 850.0 feet Road Elevation: 860.0 feet Barrier Elevation: 860.0 feet Road Grade: 0.0%				Autos: 77.5% 12.9% 9.6% 89.10%			
				Medium Trucks: 84.8% 4.9% 10.3% 4.58%			
				Heavy Trucks: 86.5% 2.7% 10.8% 6.32%			
				Noise Source Elevations (in feet)			
				Autos: 860.000			
				Medium Trucks: 862.297			
				Heavy Trucks: 868.006 Grade Adjustment: 0.0			
				Lane Equivalent Distance (in feet)			
				Autos: #####			
				Medium Trucks: #####			
				Heavy Trucks: #####			
FHWA Noise Model Calculations							
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	76.79	8.46	-20.60	-1.20	4.88	-15.216	-18.216
Medium Trucks:	82.53	-4.43	-20.60	-1.20	4.87	-15.209	-18.209
Heavy Trucks:	85.83	-3.03	-20.60	-1.20	4.85	-15.195	-18.195

Unmitigated Noise Levels (without Topo and barrier attenuation)							
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	63.5	61.6	59.8	53.7	62.4	63.0	
Medium Trucks:	56.3	54.8	48.4	46.9	55.4	55.6	
Heavy Trucks:	61.0	59.6	50.5	51.8	60.1	60.3	
Vehicle Noise:	65.9	64.2	60.6	56.4	64.9	65.3	

Mitigated Noise Levels (with Topo and barrier attenuation)							
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	48.2	46.3	44.6	38.5	47.1	47.7	
Medium Trucks:	41.1	39.6	33.2	31.7	40.1	40.4	
Heavy Trucks:	45.8	44.4	35.3	36.6	45.0	45.1	
Vehicle Noise:	50.7	49.0	45.3	41.2	49.7	50.1	

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013							
Scenario: First Floor With Wall Road Name: SR-60 Lot No: South Hotel Building				Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe			
SITE SPECIFIC INPUT DATA				NOISE MODEL INPUTS			
Highway Data				Site Conditions (Hard = 10, Soft = 15)			
Average Daily Traffic (Adt): 187,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 18,700 vehicles Vehicle Speed: 70 mph Near/Far Lane Distance: 160 feet				Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15			
Site Data				Vehicle Mix			
				VehicleType	Day	Evening	Night
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 175.0 feet Centerline Dist. to Observer: 175.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 850.0 feet Road Elevation: 850.0 feet Barrier Elevation: 850.0 feet Road Grade: 0.0%				Autos: 77.5% 12.9% 9.6% 89.00% Medium Trucks: 84.8% 4.9% 10.3% 6.59% Heavy Trucks: 86.5% 2.7% 10.8% 4.41%			
				Noise Source Elevations (in feet)			
				Autos: 850.000 Medium Trucks: 852.297 Heavy Trucks: 858.006 Grade Adjustment: 0.0			
				Lane Equivalent Distance (in feet)			
				Autos: 155.724 Medium Trucks: 155.667 Heavy Trucks: 155.673			
FHWA Noise Model Calculations							
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	76.79	8.46	-7.50	-1.20	-4.82	0.000	0.000
Medium Trucks:	82.53	-2.85	-7.50	-1.20	-4.89	0.000	0.000
Heavy Trucks:	85.83	-4.59	-7.50	-1.20	-5.05	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)							
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	76.5	74.6	72.9	66.8	75.4	76.0	
Medium Trucks:	71.0	69.5	63.1	61.6	70.0	70.3	
Heavy Trucks:	72.5	71.1	62.1	63.3	71.7	71.8	
Vehicle Noise:	78.8	77.1	73.6	69.2	77.8	78.2	

Mitigated Noise Levels (with Topo and barrier attenuation)							
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	76.5	74.6	72.9	66.8	75.4	76.0	
Medium Trucks:	71.0	69.5	63.1	61.6	70.0	70.3	
Heavy Trucks:	72.5	71.1	62.1	63.3	71.7	71.8	
Vehicle Noise:	78.8	77.1	73.6	69.2	77.8	78.2	

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013							
Scenario: First Floor With Wall Road Name: SR-60 Lot No: Fast Food Building				Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe			
SITE SPECIFIC INPUT DATA				NOISE MODEL INPUTS			
Highway Data				Site Conditions (Hard = 10, Soft = 15)			
Average Daily Traffic (Adt): 187,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 18,700 vehicles Vehicle Speed: 70 mph Near/Far Lane Distance: 160 feet				Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15			
Site Data				Vehicle Mix			
				VehicleType	Day	Evening	Night
Barrier Height: 25.0 feet Barrier Type (0-Wall, 1-Berm): 1.0 Centerline Dist. to Barrier: 150.0 feet Centerline Dist. to Observer: 213.0 feet Barrier Distance to Observer: 63.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 855.0 feet Road Elevation: 835.0 feet Barrier Elevation: 835.0 feet Road Grade: 0.0%				Autos: 77.5% 12.9% 9.6% 89.00%			
				Medium Trucks: 84.8% 4.9% 10.3% 6.59%			
				Heavy Trucks: 86.5% 2.7% 10.8% 4.41%			
FHWA Noise Model Calculations				Noise Source Elevations (in feet)			
				Autos: 835.000 Medium Trucks: 837.297 Heavy Trucks: 843.006 Grade Adjustment: 0.0			
				Lane Equivalent Distance (in feet)			
				Autos: 192.325 Medium Trucks: 191.901 Heavy Trucks: 191.019			
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	76.79	8.46	-8.88	-1.20	0.59	-8.950	-11.950
Medium Trucks:	82.53	-2.85	-8.87	-1.20	0.49	-8.450	-11.450
Heavy Trucks:	85.83	-4.59	-8.83	-1.20	0.28	-7.360	-10.360

Unmitigated Noise Levels (without Topo and barrier attenuation)							
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	75.2	73.3	71.5	65.4	74.1	74.7	
Medium Trucks:	69.6	68.1	61.8	60.2	68.7	68.9	
Heavy Trucks:	71.2	69.8	60.7	62.0	70.3	70.5	
Vehicle Noise:	77.4	75.7	72.3	67.9	76.4	76.8	

Mitigated Noise Levels (with Topo and barrier attenuation)							
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	63.2	61.3	59.6	53.5	62.1	62.7	
Medium Trucks:	58.2	56.7	50.3	48.8	57.2	57.4	
Heavy Trucks:	60.8	59.4	50.4	51.6	60.0	60.1	
Vehicle Noise:	66.0	64.3	60.5	56.5	65.0	65.4	

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013								
Scenario: First Floor With Wall Road Name: SR-60 Lot No: West Commercial Building				Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe				
SITE SPECIFIC INPUT DATA				NOISE MODEL INPUTS				
Highway Data				Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 187,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 18,700 vehicles Vehicle Speed: 70 mph Near/Far Lane Distance: 160 feet				Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data				Vehicle Mix				
Barrier Height: 25.0 feet Barrier Type (0-Wall, 1-Berm): 1.0 Centerline Dist. to Barrier: 196.0 feet Centerline Dist. to Observer: 429.0 feet Barrier Distance to Observer: 233.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 830.0 feet Road Elevation: 825.0 feet Barrier Elevation: 825.0 feet Road Grade: 0.0%				VehicleType	Day	Evening	Night	Daily
				Autos: 77.5% 12.9% 9.6% 89.00%				
				Medium Trucks: 84.8% 4.9% 10.3% 6.59%				
				Heavy Trucks: 86.5% 2.7% 10.8% 4.41%				
				Noise Source Elevations (in feet)				
				Autos: 825.000				
				Medium Trucks: 827.297				
				Heavy Trucks: 833.006 Grade Adjustment: 0.0				
				Lane Equivalent Distance (in feet)				
				Autos: 414.151				
				Medium Trucks: 413.847				
				Heavy Trucks: 413.218				
FHWA Noise Model Calculations								
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten	
Autos:	76.79	8.46	-13.88	-1.20	1.91	-12.120	-15.120	
Medium Trucks:	82.53	-2.85	-13.87	-1.20	1.69	-11.680	-14.680	
Heavy Trucks:	85.83	-4.59	-13.86	-1.20	1.19	-10.680	-13.680	

Unmitigated Noise Levels (without Topo and barrier attenuation)							
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	70.2	68.3	66.5	60.4	69.1	69.7	
Medium Trucks:	64.6	63.1	56.7	55.2	63.7	63.9	
Heavy Trucks:	66.2	64.7	55.7	57.0	65.3	65.4	
Vehicle Noise:	72.4	70.7	67.3	62.9	71.4	71.8	

Mitigated Noise Levels (with Topo and barrier attenuation)						
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.0	53.2	51.4	45.3	54.0	54.6
Medium Trucks:	49.9	48.4	42.1	40.5	49.0	49.2
Heavy Trucks:	52.5	51.1	42.0	43.3	51.6	51.8
Vehicle Noise:	57.8	56.1	52.3	48.2	56.8	57.2

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013										
Scenario: First Floor With Wall Road Name: Orange St. Lot No: West Commercial Building					Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe					
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS					
Highway Data					Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt): 12,500 vehicles					Autos: 15					
Peak Hour Percentage: 10%					Medium Trucks (2 Axles): 15					
Peak Hour Volume: 1,250 vehicles					Heavy Trucks (3+ Axles): 15					
Vehicle Speed: 35 mph										
Near/Far Lane Distance: 12 feet										
Site Data					Vehicle Mix					
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 85.0 feet Centerline Dist. to Observer: 85.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 830.0 feet Road Elevation: 830.0 feet Barrier Elevation: 830.0 feet Road Grade: 0.0%					Vehicle Type		Day	Evening	Night	Daily
					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:		830.000			
					Medium Trucks:		832.297			
					Heavy Trucks:		838.006		Grade Adjustment: 0.0	
					Lane Equivalent Distance (in feet)					
					Autos:		84.935			
					Medium Trucks:		84.831			
					Heavy Trucks:		84.841			
FHWA Noise Model Calculations										
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten			
Autos:	65.11	0.11	-3.56	-1.20	-4.75	0.000	0.000			
Medium Trucks:	74.83	-17.13	-3.55	-1.20	-4.88	0.000	0.000			
Heavy Trucks:	80.05	-21.08	-3.55	-1.20	-5.21	0.000	0.000			

Unmitigated Noise Levels (without Topo and barrier attenuation)							
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	60.5	58.6	56.8	50.7	59.4	60.0	
Medium Trucks:	53.0	51.4	45.1	43.5	52.0	52.2	
Heavy Trucks:	54.2	52.8	43.8	45.0	53.4	53.5	
Vehicle Noise:	62.0	60.2	57.3	52.4	60.9	61.4	
Mitigated Noise Levels (with Topo and barrier attenuation)							
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	60.5	58.6	56.8	50.7	59.4	60.0	
Medium Trucks:	53.0	51.4	45.1	43.5	52.0	52.2	
Heavy Trucks:	54.2	52.8	43.8	45.0	53.4	53.5	
Vehicle Noise:	62.0	60.2	57.3	52.4	60.9	61.4	

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: First Floor With Wall Road Name: Orange St. Lot No: West Apartment Building				Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe					
SITE SPECIFIC INPUT DATA				NOISE MODEL INPUTS					
Highway Data				Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt): 12,500 vehicles				Autos:			15		
Peak Hour Percentage: 10%				Medium Trucks (2 Axles):			15		
Peak Hour Volume: 1,250 vehicles				Heavy Trucks (3+ Axles):			15		
Vehicle Speed: 35 mph				Vehicle Mix					
Near/Far Lane Distance: 12 feet				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 (0-Wall, 1-Berm): 0.0				Heavy Trucks:		86.5%	2.7%	10.8%	0.74%
Centerline Dist. to Barrier: 68.0 feet				Noise Source Elevations (in feet)					
Centerline Dist. to Observer: 68.0 feet				Autos:		845.000			
Barrier Distance to Observer: 0.0 feet				Medium Trucks:		847.297			
Observer Height (Above Pad): 5.0 feet				Heavy Trucks:		853.006		Grade Adjustment: 0.0	
Pad Elevation: 845.0 feet				Lane Equivalent Distance (in feet)					
Road Elevation: 845.0 feet				Autos:		67.919			
Barrier Elevation: 845.0 feet				Medium Trucks:		67.789			
Road Grade: 0.0%				Heavy Trucks:		67.801			
FHWA Noise Model Calculations									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	65.11	0.11	-2.10	-1.20	-4.71	0.000	0.000		
Medium Trucks:	74.83	-17.13	-2.09	-1.20	-4.88	0.000	0.000		
Heavy Trucks:	80.05	-21.08	-2.09	-1.20	-5.29	0.000	0.000		

Unmitigated Noise Levels (without Topo and barrier attenuation)							
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	61.9	60.0	58.3	52.2	60.8	61.4	
Medium Trucks:	54.4	52.9	46.5	45.0	53.5	53.7	
Heavy Trucks:	55.7	54.3	45.2	46.5	54.8	54.9	
Vehicle Noise:	63.4	61.7	58.7	53.8	62.4	62.9	
Mitigated Noise Levels (with Topo and barrier attenuation)							
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	61.9	60.0	58.3	52.2	60.8	61.4	
Medium Trucks:	54.4	52.9	46.5	45.0	53.5	53.7	
Heavy Trucks:	55.7	54.3	45.2	46.5	54.8	54.9	
Vehicle Noise:	63.4	61.7	58.7	53.8	62.4	62.9	

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: Second Floor With Wall Road Name: SR-91/I-215 Lot No: East Apartment Buildings					Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 187,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 18,700 vehicles Vehicle Speed: 70 mph Near/Far Lane Distance: 140 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 212.0 feet Centerline Dist. to Observer: 212.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 14.0 feet Pad Elevation: 855.0 feet Road Elevation: 866.2 feet Barrier Elevation: 855.0 feet Road Grade: 0.0%					Vehicle Mix				
					Vehicle Type	Day	Evening	Night	Daily
					Autos: 77.5% 12.9% 9.6% 89.10% Medium Trucks: 84.8% 4.9% 10.3% 4.58% Heavy Trucks: 86.5% 2.7% 10.8% 6.32%				
					Noise Source Elevations (in feet)				
					Autos: 866.200 Medium Trucks: 868.497 Heavy Trucks: 874.206 Grade Adjustment: 0.0				
					Lane Equivalent Distance (in feet)				
					Autos: 200.130 Medium Trucks: 200.111 Heavy Trucks: 200.178				
FHWA Noise Model Calculations									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	76.79	8.46	-9.14	-1.20	-13.97	0.000	0.000		
Medium Trucks:	82.53	-4.43	-9.14	-1.20	-14.12	0.000	0.000		
Heavy Trucks:	85.83	-3.03	-9.14	-1.20	-14.48	0.000	0.000		

Unmitigated Noise Levels (without Topo and barrier attenuation)							
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	74.9	73.0	71.2	65.2	73.8	74.4	
Medium Trucks:	67.8	66.3	59.9	58.4	66.8	67.0	
Heavy Trucks:	72.5	71.0	62.0	63.2	71.6	71.7	
Vehicle Noise:	77.4	75.7	72.0	67.9	76.4	76.8	
Mitigated Noise Levels (with Topo and barrier attenuation)							
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	74.9	73.0	71.2	65.2	73.8	74.4	
Medium Trucks:	67.8	66.3	59.9	58.4	66.8	67.0	
Heavy Trucks:	72.5	71.0	62.0	63.2	71.6	71.7	
Vehicle Noise:	77.4	75.7	72.0	67.9	76.4	76.8	

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: Second Floor With Wall Road Name: SR-60 Lot No: East Apartment Buildings				Project Name: Northgate Job Number: 11145 Analyst: 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%				Medium Trucks (2 Axles):		15			
Peak Hour Volume: 18,700 vehicles				Heavy Trucks (3+ Axles):		15			
Vehicle Speed: 70 mph				Vehicle Mix					
Near/Far Lane Distance: 160 feet				Vehicle Type		Day	Evening	Night	Daily
Site Data				Autos:		77.5%	12.9%	9.6%	89.00%
Barrier Height: 0.0 feet				Medium Trucks:		84.8%	4.9%	10.3%	6.59%
Barrier Type (0-Wall, 1-Berm): 0.0				Heavy Trucks:		86.5%	2.7%	10.8%	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:		872.297			
Observer Height (Above Pad): 14.0 feet				Heavy Trucks:		878.006		Grade Adjustment: 0.0	
Pad Elevation: 855.0 feet				Lane Equivalent Distance (in feet)					
Road Elevation: 870.0 feet				Autos:		903.536			
Barrier Elevation: 855.0 feet				Medium Trucks:		903.578			
Road Grade: 0.0%				Heavy Trucks:		903.707			
FHWA Noise Model Calculations									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	76.79	8.46	-18.96	-1.20	13.82	-17.558	-20.558		
Medium Trucks:	82.53	-2.85	-18.96	-1.20	13.86	-17.563	-20.563		
Heavy Trucks:	85.83	-4.59	-18.96	-1.20	13.94	-17.573	-20.573		

Unmitigated Noise Levels (without Topo and barrier attenuation)							
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	65.1	63.2	61.4	55.4	64.0	64.6	
Medium Trucks:	59.5	58.0	51.7	50.1	58.6	58.8	
Heavy Trucks:	61.1	59.7	50.6	51.9	60.2	60.3	
Vehicle Noise:	67.3	65.6	62.2	57.8	66.3	66.7	
Mitigated Noise Levels (with Topo and barrier attenuation)							
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	47.5	45.6	43.9	37.8	46.4	47.0	
Medium Trucks:	42.0	40.5	34.1	32.6	41.0	41.2	
Heavy Trucks:	43.5	42.1	33.0	34.3	42.6	42.8	
Vehicle Noise:	49.8	48.0	44.6	40.2	48.8	49.2	

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: Second Floor With Wall Road Name: SR-91/I-215 Lot No: East Hotel Building					Project Name: Northgate Job Number: 11145 Analyst: 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%					Medium Trucks (2 Axles): 15				
Peak Hour Volume: 18,700 vehicles					Heavy Trucks (3+ Axles): 15				
Vehicle Speed: 70 mph									
Near/Far Lane Distance: 140 feet									
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 825.0 feet Centerline Dist. to Observer: 825.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 14.0 feet Pad Elevation: 850.0 feet Road Elevation: 865.3 feet Barrier Elevation: 850.0 feet Road Grade: 0.0%					Vehicle Type	Day	Evening	Night	Daily
					Autos: 77.5% 12.9% 9.6% 89.10%				
					Medium Trucks: 84.8% 4.9% 10.3% 4.58%				
					Heavy Trucks: 86.5% 2.7% 10.8% 6.32%				
					Noise Source Elevations (in feet)				
					Autos: 865.300				
					Medium Trucks: 867.597				
					Heavy Trucks: 873.306 Grade Adjustment: 0.0				
					Lane Equivalent Distance (in feet)				
					Autos: 836.167				
					Medium Trucks: 836.213				
					Heavy Trucks: 836.355				
FHWA Noise Model Calculations									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	76.79	8.46	-18.45	-1.20	13.84	-17.561	-20.561		
Medium Trucks:	82.53	-4.43	-18.45	-1.20	13.87	-17.564	-20.564		
Heavy Trucks:	85.83	-3.03	-18.45	-1.20	13.97	-17.576	-20.576		

Unmitigated Noise Levels (without Topo and barrier attenuation)						
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.6	63.7	61.9	55.9	64.5	65.1
Medium Trucks:	58.5	56.9	50.6	49.0	57.5	57.7
Heavy Trucks:	63.1	61.7	52.7	53.9	62.3	62.4
Vehicle Noise:	68.1	66.4	62.7	58.5	67.1	67.5
Mitigated Noise Levels (with Topo and barrier attenuation)						
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	48.0	46.1	44.4	38.3	46.9	47.5
Medium Trucks:	40.9	39.4	33.0	31.5	39.9	40.2
Heavy Trucks:	45.6	44.1	35.1	36.4	44.7	44.8
Vehicle Noise:	50.5	48.8	45.1	41.0	49.5	49.9

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: Second Floor With Wall Road Name: SR-60 Lot No: East Hotel Building				Project Name: Northgate Job Number: 11145 Analyst: 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%				Medium Trucks (2 Axles):		15			
Peak Hour Volume: 18,700 vehicles				Heavy Trucks (3+ Axles):		15			
Vehicle Speed: 70 mph				Vehicle Mix					
Near/Far Lane Distance: 160 feet				Vehicle Type		Day	Evening	Night	Daily
Site Data				Autos:		77.5%	12.9%	9.6%	89.00%
Barrier Height: 0.0 feet				Medium Trucks:		84.8%	4.9%	10.3%	6.59%
Barrier Type (0-Wall, 1-Berm): 0.0				Heavy Trucks:		86.5%	2.7%	10.8%	4.41%
Centerline Dist. to Barrier: 446.0 feet				Noise Source Elevations (in feet)					
Centerline Dist. to Observer: 446.0 feet				Autos:		855.000			
Barrier Distance to Observer: 0.0 feet				Medium Trucks:		857.297			
Observer Height (Above Pad): 14.0 feet				Heavy Trucks:		863.006		Grade Adjustment: 0.0	
Pad Elevation: 850.0 feet				Lane Equivalent Distance (in feet)					
Road Elevation: 855.0 feet				Autos:		438.859			
Barrier Elevation: 850.0 feet				Medium Trucks:		438.818			
Road Grade: 0.0%				Heavy Trucks:		438.768			
FHWA Noise Model Calculations									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	76.79	8.46	-14.25	-1.20	-13.64	0.000	0.000		
Medium Trucks:	82.53	-2.85	-14.25	-1.20	-13.71	0.000	0.000		
Heavy Trucks:	85.83	-4.59	-14.25	-1.20	-13.88	0.000	0.000		

Unmitigated Noise Levels (without Topo and barrier attenuation)							
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	69.8	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	65.1	
Vehicle Noise:	72.0	70.3	66.9	62.5	71.0	71.4	
Mitigated Noise Levels (with Topo and barrier attenuation)							
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	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	65.1	
Vehicle Noise:	72.0	70.3	66.9	62.5	71.0	71.4	

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: Second Floor With Wall Road Name: SR-91/I-215 Lot No: South Hotel Building					Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 187,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 18,700 vehicles Vehicle Speed: 70 mph Near/Far Lane Distance: 140 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
					Vehicle Type	Day	Evening	Night	Daily
					Autos: 77.5% 12.9% 9.6% 89.10%				
					Medium Trucks: 84.8% 4.9% 10.3% 4.58%				
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: 0.0 feet Observer Height (Above Pad): 14.0 feet Pad Elevation: 850.0 feet Road Elevation: 860.0 feet Barrier Elevation: 860.0 feet Road Grade: 0.0%					Heavy Trucks: 86.5% 2.7% 10.8% 6.32%				
					Noise Source Elevations (in feet)				
					Autos: 860.000				
					Medium Trucks: 862.297				
					Heavy Trucks: 868.006 Grade Adjustment: 0.0				
					Lane Equivalent Distance (in feet)				
					Autos: #####				
					Medium Trucks: #####				
					Heavy Trucks: #####				
FHWA Noise Model Calculations									
Vehicle Type	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		
Heavy Trucks:	85.83	-3.03	-20.57	-1.20	-3.93	0.000	0.000		

Unmitigated Noise Levels (without Topo and barrier attenuation)							
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	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 Levels (with Topo and barrier attenuation)							
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	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	

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: Second Floor With Wall Road Name: SR-60 Lot No: South Hotel Building				Project Name: Northgate Job Number: 11145 Analyst: 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%				Medium Trucks (2 Axles): 15					
Peak Hour Volume: 18,700 vehicles				Heavy Trucks (3+ Axles): 15					
Vehicle Speed: 70 mph				Vehicle Mix					
Near/Far Lane Distance: 160 feet				Vehicle Type		Day	Evening	Night	Daily
Site Data				Autos: 77.5% 12.9% 9.6% 89.00%					
Barrier Height: 0.0 feet				Medium Trucks: 84.8% 4.9% 10.3% 6.59%					
Barrier Type (0-Wall, 1-Berm): 0.0				Heavy Trucks: 86.5% 2.7% 10.8% 4.41%					
Centerline Dist. to Barrier: 175.0 feet				Noise Source Elevations (in feet)					
Centerline Dist. to Observer: 175.0 feet				Autos: 850.000					
Barrier Distance to Observer: 0.0 feet				Medium Trucks: 852.297					
Observer Height (Above Pad): 14.0 feet				Heavy Trucks: 858.000 Grade Adjustment: 0.0					
Pad Elevation: 850.0 feet				Lane Equivalent Distance (in feet)					
Road Elevation: 850.0 feet				Autos: 156.272					
Barrier Elevation: 850.0 feet				Medium Trucks: 156.083					
Road Grade: 0.0%				Heavy Trucks: 155.759					
FHWA Noise Model Calculations									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	76.79	8.46	-7.53	-1.20	-13.15	0.000	0.000		
Medium Trucks:	82.53	-2.85	-7.52	-1.20	-13.33	0.000	0.000		
Heavy Trucks:	85.83	-4.59	-7.51	-1.20	-13.78	0.000	0.000		

Unmitigated Noise Levels (without Topo and barrier attenuation)						
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	76.5	74.6	72.9	66.8	75.4	76.0
Medium Trucks:	71.0	69.5	63.1	61.6	70.0	70.2
Heavy Trucks:	72.5	71.1	62.1	63.3	71.7	71.8
Vehicle Noise:	78.8	77.0	73.6	69.2	77.8	78.2
Mitigated Noise Levels (with Topo and barrier attenuation)						
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	76.5	74.6	72.9	66.8	75.4	76.0
Medium Trucks:	71.0	69.5	63.1	61.6	70.0	70.2
Heavy Trucks:	72.5	71.1	62.1	63.3	71.7	71.8
Vehicle Noise:	78.8	77.0	73.6	69.2	77.8	78.2

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: Second Floor With Wall Road Name: SR-60 Lot No: Fast Food Building					Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 187,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 18,700 vehicles Vehicle Speed: 70 mph Near/Far Lane Distance: 160 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
					Vehicle Type	Day	Evening	Night	Daily
Barrier Height: 25.0 feet Barrier Type (0-Wall, 1-Berm): 1.0 Centerline Dist. to Barrier: 150.0 feet Centerline Dist. to Observer: 213.0 feet Barrier Distance to Observer: 63.0 feet Observer Height (Above Pad): 14.0 feet Pad Elevation: 855.0 feet Road Elevation: 835.0 feet Barrier Elevation: 835.0 feet Road Grade: 0.0%					Autos: 77.5% 12.9% 9.6% 89.00%				
					Medium Trucks: 84.8% 4.9% 10.3% 6.59%				
					Heavy Trucks: 86.5% 2.7% 10.8% 4.41%				
					Noise Source Elevations (in feet)				
					Autos: 835.000				
					Medium Trucks: 837.297				
Heavy Trucks: 843.006 Grade Adjustment: 0.0									
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)				
					Autos: 192.965				
					Medium Trucks: 192.540				
					Heavy Trucks: 191.658				
FHWA Noise Model Calculations									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	76.79	8.46	-8.90	-1.20	0.01	-5.100	-8.100		
Medium Trucks:	82.53	-2.85	-8.89	-1.20	0.00	-4.900	-7.900		
Heavy Trucks:	85.83	-4.59	-8.86	-1.20	0.02	-5.200	-8.200		

Unmitigated Noise Levels (without Topo and barrier attenuation)							
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	75.1	73.2	71.5	65.4	74.0	74.7	
Medium Trucks:	69.6	68.1	61.7	60.2	68.6	68.9	
Heavy Trucks:	71.2	69.8	60.7	62.0	70.3	70.4	
Vehicle Noise:	77.4	75.7	72.2	67.9	76.4	76.8	
Mitigated Noise Levels (with Topo and barrier attenuation)							
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	67.0	65.1	63.4	57.3	65.9	66.6	
Medium Trucks:	61.7	60.2	53.8	52.3	60.7	61.0	
Heavy Trucks:	63.0	61.6	52.5	53.8	62.1	62.2	
Vehicle Noise:	69.3	67.6	64.1	59.8	68.3	68.7	

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: Second Floor With Wall Road Name: SR-60 Lot No: West Commercial Building					Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 187,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 18,700 vehicles Vehicle Speed: 70 mph Near/Far Lane Distance: 160 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
					Vehicle Type	Day	Evening	Night	Daily
Barrier Height: 25.0 feet Barrier Type (0-Wall, 1-Berm): 1.0 Centerline Dist. to Barrier: 196.0 feet Centerline Dist. to Observer: 429.0 feet Barrier Distance to Observer: 233.0 feet Observer Height (Above Pad): 14.0 feet Pad Elevation: 830.0 feet Road Elevation: 825.0 feet Barrier Elevation: 825.0 feet Road Grade: 0.0%					Autos: 77.5% 12.9% 9.6% 89.00%				
					Medium Trucks: 84.8% 4.9% 10.3% 6.59%				
					Heavy Trucks: 86.5% 2.7% 10.8% 4.41%				
					Noise Source Elevations (in feet)				
					Autos: 825.000				
					Medium Trucks: 827.297				
Heavy Trucks: 833.006 Grade Adjustment: 0.0									
					Lane Equivalent Distance (in feet)				
					Autos: 413.745				
					Medium Trucks: 413.442				
					Heavy Trucks: 412.813				
FHWA Noise Model Calculations									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	76.79	8.46	-13.87	-1.20	1.22	-10.740	-13.740		
Medium Trucks:	82.53	-2.85	-13.87	-1.20	1.04	-10.380	-13.380		
Heavy Trucks:	85.83	-4.59	-13.86	-1.20	0.66	-9.180	-12.180		

Unmitigated Noise Levels (without Topo and barrier attenuation)							
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	70.2	68.3	66.5	60.5	69.1	69.7	
Medium Trucks:	64.6	63.1	56.8	55.2	63.7	63.9	
Heavy Trucks:	66.2	64.8	55.7	57.0	65.3	65.5	
Vehicle Noise:	72.4	70.7	67.3	62.9	71.4	71.8	
Mitigated Noise Levels (with Topo and barrier attenuation)							
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	56.4	54.5	52.8	46.7	55.3	55.9	
Medium Trucks:	51.2	49.7	43.4	41.8	50.3	50.5	
Heavy Trucks:	54.0	52.6	43.5	44.8	53.1	53.3	
Vehicle Noise:	59.2	57.5	53.7	49.7	58.2	58.6	

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013										
Scenario: Second Floor With Wall Road Name: Orange St. Lot No: West Commercial Building					Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe					
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS					
Highway Data					Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt): 12,500 vehicles					Autos: 15					
Peak Hour Percentage: 10%					Medium Trucks (2 Axles): 15					
Peak Hour Volume: 1,250 vehicles					Heavy Trucks (3+ Axles): 15					
Vehicle Speed: 35 mph										
Near/Far Lane Distance: 12 feet										
Site Data					Vehicle Mix					
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 85.0 feet Centerline Dist. to Observer: 85.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 14.0 feet Pad Elevation: 830.0 feet Road Elevation: 830.0 feet Barrier Elevation: 830.0 feet Road Grade: 0.0%					Vehicle Type		Day	Evening	Night	Daily
					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:		830.000			
					Medium Trucks:		832.297			
					Heavy Trucks:		838.006		Grade Adjustment: 0.0	
					Lane Equivalent Distance (in feet)					
					Autos:		85.936			
					Medium Trucks:		85.592			
					Heavy Trucks:		85.000			
FHWA Noise Model Calculations										
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten			
Autos:	65.11	0.11	-3.63	-1.20	-12.58	0.000	0.000			
Medium Trucks:	74.83	-17.13	-3.61	-1.20	-12.94	0.000	0.000			
Heavy Trucks:	80.05	-21.08	-3.56	-1.20	-13.86	0.000	0.000			

Unmitigated Noise Levels (without Topo and barrier attenuation)							
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	60.4	58.5	56.7	50.7	59.3	59.9	
Medium Trucks:	52.9	51.4	45.0	43.5	51.9	52.2	
Heavy Trucks:	54.2	52.8	43.7	45.0	53.3	53.5	
Vehicle Noise:	61.9	60.1	57.2	52.3	60.9	61.3	
Mitigated Noise Levels (with Topo and barrier attenuation)							
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	60.4	58.5	56.7	50.7	59.3	59.9	
Medium Trucks:	52.9	51.4	45.0	43.5	51.9	52.2	
Heavy Trucks:	54.2	52.8	43.7	45.0	53.3	53.5	
Vehicle Noise:	61.9	60.1	57.2	52.3	60.9	61.3	

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013										
Scenario: Second Floor With Wall Road Name: Orange St. Lot No: West Apartment Building				Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe						
SITE SPECIFIC INPUT DATA				NOISE MODEL INPUTS						
Highway Data				Site Conditions (Hard = 10, Soft = 15)						
Average Daily Traffic (Adt): 12,500 vehicles				Autos:		15				
Peak Hour Percentage: 10%				Medium Trucks (2 Axles):		15				
Peak Hour Volume: 1,250 vehicles				Heavy Trucks (3+ Axles):		15				
Vehicle Speed: 35 mph										
Near/Far Lane Distance: 12 feet										
Site Data				Vehicle Mix						
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 68.0 feet Centerline Dist. to Observer: 68.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 14.0 feet Pad Elevation: 845.0 feet Road Elevation: 845.0 feet Barrier Elevation: 845.0 feet Road Grade: 0.0%				Vehicle Type	Day	Evening	Night	Daily		
				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:		845.000				
				Medium Trucks:		847.297				
				Heavy Trucks:		853.006	Grade Adjustment: 0.0			
				Lane Equivalent Distance (in feet)						
				Autos:		69.166				
				Medium Trucks:		68.738				
				Heavy Trucks:		67.999				
FHWA Noise Model Calculations										
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten			
Autos:	65.11	0.11	-2.22	-1.20	-12.30	0.000	0.000			
Medium Trucks:	74.83	-17.13	-2.18	-1.20	-12.76	0.000	0.000			
Heavy Trucks:	80.05	-21.08	-2.11	-1.20	-13.90	0.000	0.000			

Unmitigated Noise Levels (without Topo and barrier attenuation)							
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	61.8	59.9	58.1	52.1	60.7	61.3	
Medium Trucks:	54.3	52.8	46.5	44.9	53.4	53.6	
Heavy Trucks:	55.7	54.2	45.2	46.4	54.8	54.9	
Vehicle Noise:	63.3	61.6	58.6	53.7	62.3	62.8	
Mitigated Noise Levels (with Topo and barrier attenuation)							
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	61.8	59.9	58.1	52.1	60.7	61.3	
Medium Trucks:	54.3	52.8	46.5	44.9	53.4	53.6	
Heavy Trucks:	55.7	54.2	45.2	46.4	54.8	54.9	
Vehicle Noise:	63.3	61.6	58.6	53.7	62.3	62.8	

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: Third Floor With Wall Road Name: SR-91/I-215 Lot No: East Apartment Buildings					Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 187,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 18,700 vehicles Vehicle Speed: 70 mph Near/Far Lane Distance: 140 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 212.0 feet Centerline Dist. to Observer: 212.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 23.0 feet Pad Elevation: 855.0 feet Road Elevation: 866.2 feet Barrier Elevation: 855.0 feet Road Grade: 0.0%					Vehicle Type	Day	Evening	Night	Daily
					Autos: 77.5% 12.9% 9.6% 89.10% Medium Trucks: 84.8% 4.9% 10.3% 4.58% Heavy Trucks: 86.5% 2.7% 10.8% 6.32%				
					Noise Source Elevations (in feet)				
					Autos: 866.200 Medium Trucks: 868.497 Heavy Trucks: 874.206 Grade Adjustment: 0.0				
					Lane Equivalent Distance (in feet)				
					Autos: 200.458 Medium Trucks: 200.335 Heavy Trucks: 200.146				
FHWA Noise Model Calculations									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	76.79	8.46	-9.15	-1.20	-22.47	0.000	0.000		
Medium Trucks:	82.53	-4.43	-9.15	-1.20	-22.72	0.000	0.000		
Heavy Trucks:	85.83	-3.03	-9.14	-1.20	-23.32	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos:	74.9	73.0	71.2	65.2	73.8		74.4		
Medium Trucks:	67.8	66.3	59.9	58.3	66.8		67.0		
Heavy Trucks:	72.5	71.0	62.0	63.2	71.6		71.7		
Vehicle Noise:	77.4	75.7	72.0	67.8	76.4		76.8		
Mitigated Noise Levels (with Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos:	74.9	73.0	71.2	65.2	73.8		74.4		
Medium Trucks:	67.8	66.3	59.9	58.3	66.8		67.0		
Heavy Trucks:	72.5	71.0	62.0	63.2	71.6		71.7		
Vehicle Noise:	77.4	75.7	72.0	67.8	76.4		76.8		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: Third Floor With Wall Road Name: SR-60 Lot No: East Apartment Buildings				Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe					
SITE SPECIFIC INPUT DATA				NOISE MODEL INPUTS					
Highway Data				Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt): 187,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 18,700 vehicles Vehicle Speed: 70 mph Near/Far Lane Distance: 160 feet				Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15					
Site Data				Vehicle Mix					
				Vehicle Type	Day	Evening	Night	Daily	
				Autos: 77.5% 12.9% 9.6% 89.00%					
				Medium Trucks: 84.8% 4.9% 10.3% 6.59%					
				Heavy Trucks: 86.5% 2.7% 10.8% 4.41%					
				Noise Source Elevations (in feet)					
				Autos: 870.000					
				Medium Trucks: 872.297					
				Heavy Trucks: 878.006 Grade Adjustment: 0.0					
				Lane Equivalent Distance (in feet)					
				Autos: 889.445					
				Medium Trucks: 889.428					
				Heavy Trucks: 889.409					
FHWA Noise Model Calculations									
Vehicle Type	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)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
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		
Mitigated Noise Levels (with Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
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		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: Third Floor With Wall Road Name: SR-91/I-215 Lot No: East Hotel Building					Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 187,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 18,700 vehicles Vehicle Speed: 70 mph Near/Far Lane Distance: 140 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 825.0 feet Centerline Dist. to Observer: 825.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 23.0 feet Pad Elevation: 850.0 feet Road Elevation: 865.3 feet Barrier Elevation: 850.0 feet Road Grade: 0.0%					VehicleType	Day	Evening	Night	Daily
					Autos: 77.5% 12.9% 9.6% 89.10% Medium Trucks: 84.8% 4.9% 10.3% 4.58% Heavy Trucks: 86.5% 2.7% 10.8% 6.32%				
					Noise Source Elevations (in feet)				
					Autos: 865.300 Medium Trucks: 867.597 Heavy Trucks: 873.306 Grade Adjustment: 0.0				
					Lane Equivalent Distance (in feet)				
					Autos: 822.061 Medium Trucks: 822.043 Heavy Trucks: 822.025				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	76.79	8.46	-18.34	-1.20	-22.61	0.000	0.000		
Medium Trucks:	82.53	-4.43	-18.34	-1.20	-22.67	0.000	0.000		
Heavy Trucks:	85.83	-3.03	-18.34	-1.20	-22.83	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos:	65.7	63.8	62.0	56.0	64.6		65.2		
Medium Trucks:	58.6	57.1	50.7	49.1	57.6		57.8		
Heavy Trucks:	63.3	61.8	52.8	54.0	62.4		62.5		
Vehicle Noise:	68.2	66.5	62.8	58.7	67.2		67.6		
Mitigated Noise Levels (with Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos:	65.7	63.8	62.0	56.0	64.6		65.2		
Medium Trucks:	58.6	57.1	50.7	49.1	57.6		57.8		
Heavy Trucks:	63.3	61.8	52.8	54.0	62.4		62.5		
Vehicle Noise:	68.2	66.5	62.8	58.7	67.2		67.6		

Monday, June 16, 2018

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: Third Floor With Wall Road Name: SR-60 Lot No: East Hotel Building					Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 187,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 18,700 vehicles Vehicle Speed: 70 mph Near/Far Lane Distance: 160 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 446.0 feet Centerline Dist. to Observer: 446.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 23.0 feet Pad Elevation: 850.0 feet Road Elevation: 855.0 feet Barrier Elevation: 850.0 feet Road Grade: 0.0%					VehicleType	Day	Evening	Night	Daily
					Autos: 77.5% 12.9% 9.6% 89.00%				
					Medium Trucks: 84.8% 4.9% 10.3% 6.59%				
					Heavy Trucks: 86.5% 2.7% 10.8% 4.41%				
FHWA Noise Model Calculations					Noise Source Elevations (in feet)				
					Autos: 855.000				
					Medium Trucks: 857.297				
					Heavy Trucks: 863.006 Grade Adjustment: 0.0				
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)				
					Autos: 439.136				
					Medium Trucks: 439.047				
					Heavy Trucks: 438.880				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	76.79	8.46	-14.26	-1.20	-22.18	0.000	0.000		
Medium Trucks:	82.53	-2.85	-14.26	-1.20	-22.29	0.000	0.000		
Heavy Trucks:	85.83	-4.59	-14.25	-1.20	-22.58	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos:	69.8	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		65.1		
Vehicle Noise:	72.0	70.3	66.9	62.5	71.0		71.4		
Mitigated Noise Levels (with Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	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		65.1		
Vehicle Noise:	72.0	70.3	66.9	62.5	71.0		71.4		

Monday, June 18, 2018

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: Third Floor With Wall Road Name: SR-91/I-215 Lot No: South Hotel Building				Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe					
SITE SPECIFIC INPUT DATA				NOISE MODEL INPUTS					
Highway Data				Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt): 187,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 18,700 vehicles Vehicle Speed: 70 mph Near/Far Lane Distance: 140 feet				Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15					
Site Data				Vehicle Mix					
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: 0.0 feet Observer Height (Above Pad): 23.0 feet Pad Elevation: 850.0 feet Road Elevation: 860.0 feet Barrier Elevation: 860.0 feet Road Grade: 0.0%				Vehicle Type	Day	Evening	Night	Daily	
				Autos: 77.5% 12.9% 9.6% 89.10%					
				Medium Trucks: 84.8% 4.9% 10.3% 4.58%					
				Heavy Trucks: 86.5% 2.7% 10.8% 6.32%					
				Noise Source Elevations (in feet)					
				Autos: 860.000 Medium Trucks: 862.297 Heavy Trucks: 868.006 Grade Adjustment: 0.0					
				Lane Equivalent Distance (in feet)					
				Autos: ##### Medium Trucks: ##### Heavy Trucks: #####					
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	76.79	8.46	-20.57	-1.20	-12.65	0.000	0.000		
Medium Trucks:	82.53	-4.43	-20.57	-1.20	-12.67	0.000	0.000		
Heavy Trucks:	85.83	-3.03	-20.57	-1.20	-12.74	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos:	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		
Vehicle Noise:	65.9	64.2	60.6	56.4	64.9		65.3		
Mitigated Noise Levels (with Topo and barrier attenuation)									
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		
Vehicle Noise:	65.9	64.2	60.6	56.4	64.9		65.3		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: Third Floor With Wall Road Name: SR-60 Lot No: South Hotel Building				Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe					
SITE SPECIFIC INPUT DATA				NOISE MODEL INPUTS					
Highway Data				Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt): 187,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 18,700 vehicles Vehicle Speed: 70 mph Near/Far Lane Distance: 160 feet				Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15					
Site Data				Vehicle Mix					
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 175.0 feet Centerline Dist. to Observer: 175.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 23.0 feet Pad Elevation: 850.0 feet Road Elevation: 850.0 feet Barrier Elevation: 850.0 feet Road Grade: 0.0%				Vehicle Type	Day	Evening	Night	Daily	
				Autos: 77.5% 12.9% 9.6% 89.00%					
				Medium Trucks: 84.8% 4.9% 10.3% 6.59%					
				Heavy Trucks: 86.5% 2.7% 10.8% 4.41%					
				Noise Source Elevations (in feet)					
				Autos: 850.000					
				Medium Trucks: 852.297					
				Heavy Trucks: 858.006		Grade Adjustment: 0.0			
				Lane Equivalent Distance (in feet)					
				Autos: 157.334					
				Medium Trucks: 157.015					
				Heavy Trucks: 156.364					
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	76.79	8.46	-7.57	-1.20	-21.03	0.000	0.000		
Medium Trucks:	82.53	-2.85	-7.56	-1.20	-21.32	0.000	0.000		
Heavy Trucks:	85.83	-4.59	-7.53	-1.20	-22.06	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos:	76.5	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:	72.5	71.1	62.0	63.3	71.6		71.8		
Vehicle Noise:	78.7	77.0	73.6	69.2	77.7		78.1		
Mitigated Noise Levels (with Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos:	76.5	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:	72.5	71.1	62.0	63.3	71.6		71.8		
Vehicle Noise:	78.7	77.0	73.6	69.2	77.7		78.1		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: Third Floor With Wall Road Name: SR-60 Lot No: Fast Food Building				Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe					
SITE SPECIFIC INPUT DATA				NOISE MODEL INPUTS					
Highway Data				Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt): 187,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 18,700 vehicles Vehicle Speed: 70 mph Near/Far Lane Distance: 160 feet				Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15					
Site Data				Vehicle Mix					
				VehicleType	Day	Evening	Night	Daily	
				Autos: 77.5% 12.9% 9.6% 89.00% Medium Trucks: 84.8% 4.9% 10.3% 6.59% Heavy Trucks: 86.5% 2.7% 10.8% 4.41%					
Barrier Height: 25.0 feet Barrier Type (0-Wall, 1-Berm): 1.0 Centerline Dist. to Barrier: 150.0 feet Centerline Dist. to Observer: 213.0 feet Barrier Distance to Observer: 63.0 feet Observer Height (Above Pad): 23.0 feet Pad Elevation: 855.0 feet Road Elevation: 835.0 feet Barrier Elevation: 835.0 feet Road Grade: 0.0%				Noise Source Elevations (in feet)					
				Autos: 835.000 Medium Trucks: 837.297 Heavy Trucks: 843.006 Grade Adjustment: 0.0					
				Lane Equivalent Distance (in feet)					
				Autos: 194.846 Medium Trucks: 194.422 Heavy Trucks: 193.540					
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	76.79	8.46	-8.96	-1.20	0.29	-7.430	-10.430		
Medium Trucks:	82.53	-2.85	-8.95	-1.20	0.37	-7.850	-10.850		
Heavy Trucks:	85.83	-4.59	-8.92	-1.20	0.61	-9.030	-12.030		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos:	75.1	73.2	71.4	65.4	74.0		74.6		
Medium Trucks:	69.5	68.0	61.7	60.1	68.6		68.8		
Heavy Trucks:	71.1	69.7	60.7	61.9	70.3		70.4		
Vehicle Noise:	77.3	75.6	72.2	67.8	76.3		76.7		
Mitigated Noise Levels (with Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos:	64.7	62.8	61.0	54.9	63.6		64.2		
Medium Trucks:	58.7	57.2	50.8	49.3	57.7		58.0		
Heavy Trucks:	59.1	57.7	48.6	49.9	58.2		58.4		
Vehicle Noise:	66.5	64.8	61.6	56.9	65.5		65.9		

Monday, June 18, 2018

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: Third Floor With Wall Road Name: SR-60 Lot No: West Commercial Building				Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe					
SITE SPECIFIC INPUT DATA				NOISE MODEL INPUTS					
Highway Data				Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt): 187,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 18,700 vehicles Vehicle Speed: 70 mph Near/Far Lane Distance: 160 feet				Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15					
Site Data				Vehicle Mix					
				VehicleType		Day	Evening	Night	Daily
				Autos: 77.5% 12.9% 9.6% 89.00% Medium Trucks: 84.8% 4.9% 10.3% 6.59% Heavy Trucks: 86.5% 2.7% 10.8% 4.41%					
				Noise Source Elevations (in feet)					
Barrier Height: 25.0 feet Barrier Type (0-Wall, 1-Berm): 1.0 Centerline Dist. to Barrier: 196.0 feet Centerline Dist. to Observer: 429.0 feet Barrier Distance to Observer: 233.0 feet Observer Height (Above Pad): 23.0 feet Pad Elevation: 830.0 feet Road Elevation: 825.0 feet Barrier Elevation: 825.0 feet Road Grade: 0.0%				Medium Trucks:		827.297			
				Heavy Trucks:		833.006	Grade Adjustment: 0.0		
				Lane Equivalent Distance (in feet)					
				Autos: 413.688 Medium Trucks: 413.384 Heavy Trucks: 412.755					
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	76.79	8.46	-13.87	-1.20	0.68	-9.240	-12.240		
Medium Trucks:	82.53	-2.85	-13.86	-1.20	0.55	-8.750	-11.750		
Heavy Trucks:	85.83	-4.59	-13.85	-1.20	0.28	-7.360	-10.360		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos:	70.2	68.3	66.5	60.5	69.1		69.7		
Medium Trucks:	64.6	63.1	56.8	55.2	63.7		63.9		
Heavy Trucks:	66.2	64.8	55.7	57.0	65.3		65.5		
Vehicle Noise:	72.4	70.7	67.3	62.9	71.4		71.8		
Mitigated Noise Levels (with Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos:	57.9	56.0	54.3	48.2	56.8		57.4		
Medium Trucks:	52.9	51.4	45.0	43.5	51.9		52.2		
Heavy Trucks:	55.8	54.4	45.4	46.6	55.0		55.1		
Vehicle Noise:	60.8	59.1	55.2	51.3	59.8		60.2		

Monday, June 18, 2018

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: Third Floor With Wall Road Name: Orange St. Lot No: West Commercial Building				Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe					
SITE SPECIFIC INPUT DATA				NOISE MODEL INPUTS					
Highway Data				Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt): 12,500 vehicles				Autos: 15					
Peak Hour Percentage: 10%				Medium Trucks (2 Axles): 15					
Peak Hour Volume: 1,250 vehicles				Heavy Trucks (3+ Axles): 15					
Vehicle Speed: 35 mph									
Near/Far Lane Distance: 12 feet									
Site Data				Vehicle Mix					
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 85.0 feet Centerline Dist. to Observer: 85.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 23.0 feet Pad Elevation: 830.0 feet Road Elevation: 830.0 feet Barrier Elevation: 830.0 feet Road Grade: 0.0%				Vehicle Type	Day	Evening	Night	Daily	
				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: 830.000					
				Medium Trucks: 832.297					
				Heavy Trucks: 838.006 Grade Adjustment: 0.0					
				Lane Equivalent Distance (in feet)					
				Autos: 87.852					
				Medium Trucks: 87.279					
				Heavy Trucks: 86.104					
FHWA Noise Model Calculations									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	65.11	0.11	-3.78	-1.20	-19.51	0.000	0.000		
Medium Trucks:	74.83	-17.13	-3.73	-1.20	-20.10	0.000	0.000		
Heavy Trucks:	80.05	-21.08	-3.64	-1.20	-21.59	0.000	0.000		

Unmitigated Noise Levels (without Topo and barrier attenuation)							
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	60.2	58.3	56.6	50.5	59.1	59.8	
Medium Trucks:	52.8	51.3	44.9	43.4	51.8	52.0	
Heavy Trucks:	54.1	52.7	43.7	44.9	53.3	53.4	
Vehicle Noise:	61.8	60.0	57.1	52.2	60.7	61.2	
Mitigated Noise Levels (with Topo and barrier attenuation)							
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	60.2	58.3	56.6	50.5	59.1	59.8	
Medium Trucks:	52.8	51.3	44.9	43.4	51.8	52.0	
Heavy Trucks:	54.1	52.7	43.7	44.9	53.3	53.4	
Vehicle Noise:	61.8	60.0	57.1	52.2	60.7	61.2	

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: Third Floor With Wall Road Name: Orange St. Lot No: West Apartment Building				Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe					
SITE SPECIFIC INPUT DATA				NOISE MODEL INPUTS					
Highway Data				Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt): 12,500 vehicles				Autos:		15			
Peak Hour Percentage: 10%				Medium Trucks (2 Axles):		15			
Peak Hour Volume: 1,250 vehicles				Heavy Trucks (3+ Axles):		15			
Vehicle Speed: 35 mph				Vehicle Mix					
Near/Far Lane Distance: 12 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: 68.0 feet				Noise Source Elevations (in feet)					
Centerline Dist. to Observer: 68.0 feet				Autos:		845.000			
Barrier Distance to Observer: 0.0 feet				Medium Trucks:		847.297			
Observer Height (Above Pad): 23.0 feet				Heavy Trucks:		853.006		Grade Adjustment: 0.0	
Pad Elevation: 845.0 feet				Lane Equivalent Distance (in feet)					
Road Elevation: 845.0 feet				Autos:		71.533			
Barrier Elevation: 845.0 feet				Medium Trucks:		70.828			
Road Grade: 0.0%				Heavy Trucks:		69.374			
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	65.11	0.11	-2.44	-1.20	-18.80	0.000	0.000		
Medium Trucks:	74.83	-17.13	-2.37	-1.20	-19.53	0.000	0.000		
Heavy Trucks:	80.05	-21.08	-2.24	-1.20	-21.36	0.000	0.000		

Unmitigated Noise Levels (without Topo and barrier attenuation)							
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	61.6	59.7	57.9	51.9	60.5	61.1	
Medium Trucks:	54.1	52.6	46.3	44.7	53.2	53.4	
Heavy Trucks:	55.5	54.1	45.1	46.3	54.7	54.8	
Vehicle Noise:	63.1	61.4	58.4	53.5	62.1	62.6	
Mitigated Noise Levels (with Topo and barrier attenuation)							
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	61.6	59.7	57.9	51.9	60.5	61.1	
Medium Trucks:	54.1	52.6	46.3	44.7	53.2	53.4	
Heavy Trucks:	55.5	54.1	45.1	46.3	54.7	54.8	
Vehicle Noise:	63.1	61.4	58.4	53.5	62.1	62.6	

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: Fourth Floor With Wall Road Name: SR-91/I-215 Lot No: East Apartment Buildings					Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 187,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 18,700 vehicles Vehicle Speed: 70 mph Near/Far Lane Distance: 140 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 212.0 feet Centerline Dist. to Observer: 212.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 32.0 feet Pad Elevation: 855.0 feet Road Elevation: 866.2 feet Barrier Elevation: 855.0 feet Road Grade: 0.0%					Vehicle Type	Day	Evening	Night	Daily
					Autos: 77.5% 12.9% 9.6% 89.10%				
					Medium Trucks: 84.8% 4.9% 10.3% 4.58%				
					Heavy Trucks: 86.5% 2.7% 10.8% 6.32%				
					Noise Source Elevations (in feet)				
					Autos: 866.200 Medium Trucks: 868.497 Heavy Trucks: 874.206 Grade Adjustment: 0.0				
					Lane Equivalent Distance (in feet)				
					Autos: 201.188 Medium Trucks: 200.964 Heavy Trucks: 200.519				
FHWA Noise Model Calculations									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	76.79	8.46	-9.17	-1.20	-30.60	0.000	0.000		
Medium Trucks:	82.53	-4.43	-9.17	-1.20	-30.94	0.000	0.000		
Heavy Trucks:	85.83	-3.03	-9.15	-1.20	-31.78	0.000	0.000		

Unmitigated Noise Levels (without Topo and barrier attenuation)							
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	74.9	73.0	71.2	65.2	73.8	74.4	
Medium Trucks:	67.7	66.2	59.9	58.3	66.8	67.0	
Heavy Trucks:	72.4	71.0	62.0	63.2	71.6	71.7	
Vehicle Noise:	77.3	75.6	72.0	67.8	76.3	76.8	
Mitigated Noise Levels (with Topo and barrier attenuation)							
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	74.9	73.0	71.2	65.2	73.8	74.4	
Medium Trucks:	67.7	66.2	59.9	58.3	66.8	67.0	
Heavy Trucks:	72.4	71.0	62.0	63.2	71.6	71.7	
Vehicle Noise:	77.3	75.6	72.0	67.8	76.3	76.8	

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: Fourth Floor With Wall Road Name: SR-60 Lot No: East Apartment Buildings				Project Name: Northgate Job Number: 11145 Analyst: 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%				Medium Trucks (2 Axles):		15			
Peak Hour Volume: 18,700 vehicles				Heavy Trucks (3+ Axles):		15			
Vehicle Speed: 70 mph				Vehicle Mix					
Near/Far Lane Distance: 160 feet				Vehicle Type		Day	Evening	Night	Daily
Site Data				Autos:		77.5%	12.9%	9.6%	89.00%
Barrier Height: 0.0 feet				Medium Trucks:		84.8%	4.9%	10.3%	6.59%
Barrier Type (0-Wall, 1-Berm): 0.0				Heavy Trucks:		86.5%	2.7%	10.8%	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:		872.297			
Observer Height (Above Pad): 32.0 feet				Heavy Trucks:		878.006		Grade Adjustment: 0.0	
Pad Elevation: 855.0 feet				Lane Equivalent Distance (in feet)					
Road Elevation: 870.0 feet				Autos:		889.572			
Barrier Elevation: 855.0 feet				Medium Trucks:		889.531			
Road Grade: 0.0%				Heavy Trucks:		889.455			
FHWA Noise Model Calculations									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	76.79	8.46	-18.86	-1.20	-31.27	0.000	0.000		
Medium Trucks:	82.53	-2.85	-18.86	-1.20	-31.35	0.000	0.000		
Heavy Trucks:	85.83	-4.59	-18.86	-1.20	-31.55	0.000	0.000		

Unmitigated Noise Levels (without Topo and barrier attenuation)							
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
Autos:	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	
Mitigated Noise Levels (with Topo and barrier attenuation)							
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL	
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	

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: Fourth Floor With Wall Road Name: SR-91/I-215 Lot No: East Hotel Building				Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe					
SITE SPECIFIC INPUT DATA				NOISE MODEL INPUTS					
Highway Data				Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt): 187,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 18,700 vehicles Vehicle Speed: 70 mph Near/Far Lane Distance: 140 feet				Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15					
Site Data				Vehicle Mix					
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 825.0 feet Centerline Dist. to Observer: 825.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 32.0 feet Pad Elevation: 850.0 feet Road Elevation: 865.3 feet Barrier Elevation: 850.0 feet Road Grade: 0.0%				Vehicle Type	Day	Evening	Night	Daily	
				Autos: 77.5% 12.9% 9.6% 89.10% Medium Trucks: 84.8% 4.9% 10.3% 4.58% Heavy Trucks: 86.5% 2.7% 10.8% 6.32%					
				Noise Source Elevations (in feet)					
				Autos: 865.300 Medium Trucks: 867.597 Heavy Trucks: 873.306 Grade Adjustment: 0.0					
				Lane Equivalent Distance (in feet)					
				Autos: 822.195 Medium Trucks: 822.151 Heavy Trucks: 822.071					
FHWA Noise Model Calculations									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	76.79	8.46	-18.34	-1.20	-31.28	0.000	0.000		
Medium Trucks:	82.53	-4.43	-18.34	-1.20	-31.37	0.000	0.000		
Heavy Trucks:	85.83	-3.03	-18.34	-1.20	-31.59	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos:	65.7	63.8	62.0	56.0	64.6		65.2		
Medium Trucks:	58.6	57.1	50.7	49.1	57.6		57.8		
Heavy Trucks:	63.3	61.8	52.8	54.0	62.4		62.5		
Vehicle Noise:	68.2	66.5	62.8	58.7	67.2		67.6		
Mitigated Noise Levels (with Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos:	65.7	63.8	62.0	56.0	64.6		65.2		
Medium Trucks:	58.6	57.1	50.7	49.1	57.6		57.8		
Heavy Trucks:	63.3	61.8	52.8	54.0	62.4		62.5		
Vehicle Noise:	68.2	66.5	62.8	58.7	67.2		67.6		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: Fourth Floor With Wall Road Name: SR-60 Lot No: East Hotel Building				Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe					
SITE SPECIFIC INPUT DATA				NOISE MODEL INPUTS					
Highway Data				Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt): 187,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 18,700 vehicles Vehicle Speed: 70 mph Near/Far Lane Distance: 160 feet				Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15					
Site Data				Vehicle Mix					
				VehicleType	Day	Evening	Night	Daily	
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 446.0 feet Centerline Dist. to Observer: 446.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 32.0 feet Pad Elevation: 850.0 feet Road Elevation: 855.0 feet Barrier Elevation: 850.0 feet Road Grade: 0.0%				Autos: 77.5% 12.9% 9.6% 89.00% Medium Trucks: 84.8% 4.9% 10.3% 6.59% Heavy Trucks: 86.5% 2.7% 10.8% 4.41%					
				Noise Source Elevations (in feet)					
				Autos: 855.000 Medium Trucks: 857.297 Heavy Trucks: 863.006 Grade Adjustment: 0.0					
				Lane Equivalent Distance (in feet)					
				Autos: 439.596 Medium Trucks: 439.461 Heavy Trucks: 439.177					
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	76.79	8.46	-14.26	-1.20	-30.54	0.000	0.000		
Medium Trucks:	82.53	-2.85	-14.26	-1.20	-30.70	0.000	0.000		
Heavy Trucks:	85.83	-4.59	-14.26	-1.20	-31.10	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos:	69.8	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 Levels (with Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	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		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: Fourth Floor With Wall Road Name: SR-91/I-215 Lot No: South Hotel Building				Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe					
SITE SPECIFIC INPUT DATA				NOISE MODEL INPUTS					
Highway Data				Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt): 187,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 18,700 vehicles Vehicle Speed: 70 mph Near/Far Lane Distance: 140 feet				Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15					
Site Data				Vehicle Mix					
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: 0.0 feet Observer Height (Above Pad): 32.0 feet Pad Elevation: 850.0 feet Road Elevation: 860.0 feet Barrier Elevation: 860.0 feet Road Grade: 0.0%				VehicleType	Day	Evening	Night	Daily	
				Autos: 77.5% 12.9% 9.6% 89.10% Medium Trucks: 84.8% 4.9% 10.3% 4.58% Heavy Trucks: 86.5% 2.7% 10.8% 6.32%					
				Noise Source Elevations (in feet)					
				Autos: 860.000 Medium Trucks: 862.297 Heavy Trucks: 868.006 Grade Adjustment: 0.0					
				Lane Equivalent Distance (in feet)					
				Autos: ##### Medium Trucks: ##### Heavy Trucks: #####					
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	76.79	8.46	-20.57	-1.20	-21.32	0.000	0.000		
Medium Trucks:	82.53	-4.43	-20.57	-1.20	-21.36	0.000	0.000		
Heavy Trucks:	85.83	-3.03	-20.57	-1.20	-21.47	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos:	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		
Vehicle Noise:	65.9	64.2	60.6	56.4	64.9		65.3		
Mitigated Noise Levels (with Topo and barrier attenuation)									
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		
Vehicle Noise:	65.9	64.2	60.6	56.4	64.9		65.3		

Monday, June 16, 2018

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: Fourth Floor With Wall Road Name: SR-60 Lot No: South Hotel Building					Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 187,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 18,700 vehicles Vehicle Speed: 70 mph Near/Far Lane Distance: 160 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 175.0 feet Centerline Dist. to Observer: 175.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 32.0 feet Pad Elevation: 850.0 feet Road Elevation: 850.0 feet Barrier Elevation: 850.0 feet Road Grade: 0.0%					Vehicle Type	Day	Evening	Night	Daily
					Autos: 77.5% 12.9% 9.6% 89.00%				
					Medium Trucks: 84.8% 4.9% 10.3% 6.59%				
					Heavy Trucks: 86.5% 2.7% 10.8% 4.41%				
					Noise Source Elevations (in feet)				
					Autos: 850.000 Medium Trucks: 852.297 Heavy Trucks: 858.006 Grade Adjustment: 0.0				
					Lane Equivalent Distance (in feet)				
					Autos: 158.899 Medium Trucks: 158.453 Heavy Trucks: 157.482				
FHWA Noise Model Calculations									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	76.79	8.46	-7.64	-1.20	-28.47	0.000	0.000		
Medium Trucks:	82.53	-2.85	-7.62	-1.20	-28.87	0.000	0.000		
Heavy Trucks:	85.83	-4.59	-7.58	-1.20	-29.89	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos:	76.4	74.5	72.7	66.7	75.3		75.9		
Medium Trucks:	70.9	69.4	63.0	61.5	69.9		70.1		
Heavy Trucks:	72.5	71.0	62.0	63.2	71.6		71.7		
Vehicle Noise:	78.7	77.0	73.5	69.1	77.7		78.1		
Mitigated Noise Levels (with Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos:	76.4	74.5	72.7	66.7	75.3		75.9		
Medium Trucks:	70.9	69.4	63.0	61.5	69.9		70.1		
Heavy Trucks:	72.5	71.0	62.0	63.2	71.6		71.7		
Vehicle Noise:	78.7	77.0	73.5	69.1	77.7		78.1		

Monday, June 18, 2018

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: Fourth Floor With Wall Road Name: SR-60 Lot No: Fast Food Building					Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 187,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 18,700 vehicles Vehicle Speed: 70 mph Near/Far Lane Distance: 160 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
					Vehicle Type	Day	Evening	Night	Daily
Barrier Height: 25.0 feet Barrier Type (0-Wall, 1-Berm): 1.0 Centerline Dist. to Barrier: 150.0 feet Centerline Dist. to Observer: 213.0 feet Barrier Distance to Observer: 63.0 feet Observer Height (Above Pad): 32.0 feet Pad Elevation: 855.0 feet Road Elevation: 835.0 feet Barrier Elevation: 835.0 feet Road Grade: 0.0%					Autos: 77.5% 12.9% 9.6% 89.00% Medium Trucks: 84.8% 4.9% 10.3% 6.59% Heavy Trucks: 86.5% 2.7% 10.8% 4.41%				
					Noise Source Elevations (in feet)				
					Autos: 835.000 Medium Trucks: 837.297 Heavy Trucks: 843.006 Grade Adjustment: 0.0				
					Lane Equivalent Distance (in feet)				
					Autos: 197.867 Medium Trucks: 197.443 Heavy Trucks: 196.561				
FHWA Noise Model Calculations									
Vehicle Type	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	76.79	8.46	-9.06	-1.20	1.33	-10.960	-13.960		
Medium Trucks:	82.53	-2.85	-9.05	-1.20	1.50	-11.300	-14.300		
Heavy Trucks:	85.83	-4.59	-9.02	-1.20	1.96	-12.220	-15.220		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos:	75.0	73.1	71.3	65.3	73.9		74.5		
Medium Trucks:	69.4	67.9	61.6	60.0	68.5		68.7		
Heavy Trucks:	71.0	69.6	60.6	61.8	70.2		70.3		
Vehicle Noise:	77.2	75.5	72.1	67.7	76.2		76.6		
Mitigated Noise Levels (with Topo and barrier attenuation)									
Vehicle Type	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos:	61.0	59.1	57.4	51.3	59.9		60.5		
Medium Trucks:	55.1	53.6	47.3	45.7	54.2		54.4		
Heavy Trucks:	55.8	54.4	45.3	46.6	54.9		55.1		
Vehicle Noise:	62.9	61.2	58.0	53.4	61.9		62.4		

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: Fourth Floor With Wall Road Name: SR-60 Lot No: West Commercial Building				Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe					
SITE SPECIFIC INPUT DATA				NOISE MODEL INPUTS					
Highway Data				Site Conditions (Hard = 10, Soft = 15)					
Average Daily Traffic (Adt): 187,000 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 18,700 vehicles Vehicle Speed: 70 mph Near/Far Lane Distance: 160 feet				Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15					
Site Data				Vehicle Mix					
				VehicleType	Day	Evening	Night	Daily	
Barrier Height: 25.0 feet Barrier Type (0-Wall, 1-Berm): 1.0 Centerline Dist. to Barrier: 196.0 feet Centerline Dist. to Observer: 429.0 feet Barrier Distance to Observer: 233.0 feet Observer Height (Above Pad): 32.0 feet Pad Elevation: 830.0 feet Road Elevation: 825.0 feet Barrier Elevation: 825.0 feet Road Grade: 0.0%				Autos: 77.5% 12.9% 9.6% 89.00% Medium Trucks: 84.8% 4.9% 10.3% 6.59% Heavy Trucks: 86.5% 2.7% 10.8% 4.41%					
				Noise Source Elevations (in feet)					
				Autos: 825.000 Medium Trucks: 827.297 Heavy Trucks: 833.006 Grade Adjustment: 0.0					
				Lane Equivalent Distance (in feet)					
				Autos: 413.977 Medium Trucks: 413.674 Heavy Trucks: 413.044					
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	76.79	8.46	-13.87	-1.20	0.30	-7.500	-10.500		
Medium Trucks:	82.53	-2.85	-13.87	-1.20	0.21	-6.870	-9.870		
Heavy Trucks:	85.83	-4.59	-13.86	-1.20	0.06	-5.600	-8.600		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos:	70.2	68.3	66.5	60.5	69.1		69.7		
Medium Trucks:	64.6	63.1	56.7	55.2	63.7		63.9		
Heavy Trucks:	66.2	64.8	55.7	57.0	65.3		65.4		
Vehicle Noise:	72.4	70.7	67.3	62.9	71.4		71.8		
Mitigated Noise Levels (with Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos:	59.7	57.8	56.0	50.0	58.6		59.2		
Medium Trucks:	54.7	53.2	46.9	45.3	53.8		54.0		
Heavy Trucks:	57.6	56.2	47.1	48.4	56.7		56.8		
Vehicle Noise:	62.5	60.9	57.0	53.0	61.6		61.9		

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: Fourth Floor With Wall Road Name: Orange St. Lot No: West Commercial Building					Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 12,500 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 1,250 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 85.0 feet Centerline Dist. to Observer: 85.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 32.0 feet Pad Elevation: 830.0 feet Road Elevation: 830.0 feet Barrier Elevation: 830.0 feet Road Grade: 0.0%					VehicleType	Day	Evening	Night	Daily
					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: 830.000 Medium Trucks: 832.297 Heavy Trucks: 838.006 Grade Adjustment: 0.0				
FHWA Noise Model Calculations					Lane Equivalent Distance (in feet)				
					Autos: 90.626 Medium Trucks: 89.840 Heavy Trucks: 88.118				
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	65.11	0.11	-3.98	-1.20	-25.61	0.000	0.000		
Medium Trucks:	74.83	-17.13	-3.92	-1.20	-26.41	0.000	0.000		
Heavy Trucks:	80.05	-21.08	-3.79	-1.20	-28.43	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos:	60.0	58.1	56.4	50.3	58.9		59.5		
Medium Trucks:	52.6	51.1	44.7	43.2	51.6		51.9		
Heavy Trucks:	54.0	52.5	43.5	44.8	53.1		53.2		
Vehicle Noise:	61.6	59.8	56.9	52.0	60.5		61.0		
Mitigated Noise Levels (with Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn		CNEL		
Autos:	60.0	58.1	56.4	50.3	58.9		59.5		
Medium Trucks:	52.6	51.1	44.7	43.2	51.6		51.9		
Heavy Trucks:	54.0	52.5	43.5	44.8	53.1		53.2		
Vehicle Noise:	61.6	59.8	56.9	52.0	60.5		61.0		

Monday, June 18, 2018

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013									
Scenario: Fourth Floor With Wall Road Name: Orange St. Lot No: West Apartment Building					Project Name: Northgate Job Number: 11145 Analyst: A. Wolfe				
SITE SPECIFIC INPUT DATA					NOISE MODEL INPUTS				
Highway Data					Site Conditions (Hard = 10, Soft = 15)				
Average Daily Traffic (Adt): 12,500 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 1,250 vehicles Vehicle Speed: 35 mph Near/Far Lane Distance: 12 feet					Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15				
Site Data					Vehicle Mix				
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 68.0 feet Centerline Dist. to Observer: 68.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 32.0 feet Pad Elevation: 845.0 feet Road Elevation: 845.0 feet Barrier Elevation: 845.0 feet Road Grade: 0.0%					VehicleType	Day	Evening	Night	Daily
					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: 845.000 Medium Trucks: 847.297 Heavy Trucks: 853.006 Grade Adjustment: 0.0				
					Lane Equivalent Distance (in feet)				
					Autos: 74.913 Medium Trucks: 73.961 Heavy Trucks: 71.859				
FHWA Noise Model Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten		
Autos:	65.11	0.11	-2.74	-1.20	-24.31	0.000	0.000		
Medium Trucks:	74.83	-17.13	-2.65	-1.20	-25.28	0.000	0.000		
Heavy Trucks:	80.05	-21.08	-2.47	-1.20	-27.75	0.000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	61.3	59.4	57.6	51.6	60.2	60.8			
Medium Trucks:	53.8	52.3	46.0	44.4	52.9	53.1			
Heavy Trucks:	55.3	53.9	44.8	46.1	54.4	54.6			
Vehicle Noise:	62.8	61.1	58.1	53.3	61.8	62.3			
Mitigated Noise Levels (with Topo and barrier attenuation)									
VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL			
Autos:	61.3	59.4	57.6	51.6	60.2	60.8			
Medium Trucks:	53.8	52.3	46.0	44.4	52.9	53.1			
Heavy Trucks:	55.3	53.9	44.8	46.1	54.4	54.6			
Vehicle Noise:	62.8	61.1	58.1	53.3	61.8	62.3			
Monday, June 18, 2018									

APPENDIX 10.1:

OPERATIONAL NOISE LEVEL CALCULATIONS

This page intentionally left blank

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

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 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	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 Adjustment		-31.6	42.8	44.5	45.8	46.1	46.6

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

Observer Location: R1

Source: Residential Entry Gate & Speaker
Condition: Operational

Project Name: Northgate

Job Number: 11145

Analyst: A. Wolfe

NOISE MODEL 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 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)	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 Adjustment		-20.4	32.2	34.9	40.3	43.3	45.2

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

Observer Location: R1

Source: Drive-Through Speakerphone
Condition: Operational

Project Name: Northgate

Job Number: 11145

Analyst: A. Wolfe

NOISE MODEL 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 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)	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 Adjustment		-31.3	29.6	30.8	32.3	34.0	35.1

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

Observer Location: R1

Source: Car Wash Tunnel Air Blowers
Condition: Operational

Project Name: Northgate

Job Number: 11145

Analyst: A. Wolfe

NOISE MODEL 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 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	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 Adjustment		-33.5	48.1	58.5	59.1	59.8	60.3

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

Observer Location: R1

Source: Residential Parking Lot Veh. Movements
Condition: Operational

Project Name: Northgate

Job Number: 11145

Analyst: A. Wolfe

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 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	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 Adjustment		-20.5	23.5	26.5	34.5	40.5	48.1

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

Observer Location: R1

Source: Commercial Parking Lot Veh. Movements
Condition: Operational

Project Name: Northgate

Job Number: 11145

Analyst: A. Wolfe

NOISE MODEL 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 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	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 Adjustment		-26.7	30.0	34.0	37.0	40.4	52.8

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

Observer Location: R1

Source: Gas Station Activity
Condition: Operational

Project Name: Northgate

Job Number: 11145

Analyst: A. Wolfe

NOISE 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:	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	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 Adjustment		-36.0	29.6	30.9	33.5	38.4	46.4

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

Observer Location: R2

Source: Air Conditioning Unit (Roof-Top)
Condition: Operational

Project Name: Northgate

Job Number: 11145

Analyst: A. Wolfe

NOISE MODEL 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 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	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 Adjustment		-40.0	34.4	36.1	37.4	37.7	38.2

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

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 distance 15 = 4.5 dBA per doubling of distance	

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 Adjustment		-19.3	33.3	36.0	41.4	44.4	46.3

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

Observer Location: R2

Source: Car Wash Tunnel Air Blowers
Condition: Operational

Project Name: Northgate

Job Number: 11145

Analyst: A. Wolfe

NOISE MODEL 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	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)	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 Adjustment		-46.3	35.3	45.7	46.3	47.0	47.5

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

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 Adjustment		-17.6	26.4	29.4	37.4	43.4	51.0

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

Observer Location: R2

Source: Commercial Parking Lot Veh. Movements
Condition: Operational

Project Name: Northgate

Job Number: 11145

Analyst: A. Wolfe

NOISE MODEL 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 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	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 Adjustment		-30.0	26.7	30.7	33.7	37.1	49.5

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

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 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	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 Adjustment		-42.4	23.2	24.5	27.1	32.0	40.0

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

Observer Location: R3

Source: Air Conditioning Unit (Roof-Top)
Condition: Operational

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 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	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 Adjustment		-44.7	29.7	31.4	32.7	33.0	33.5

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

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 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)	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 Adjustment		-21.3	31.3	34.0	39.4	42.4	44.3

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

Observer Location: R3

Source: Car Wash Tunnel Air Blowers
Condition: Operational

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 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	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 Adjustment		-48.7	32.9	43.3	43.9	44.6	45.1

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

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 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	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 Adjustment		-9.8	34.2	37.2	45.2	51.2	58.8

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

Observer Location: R3

Source: Commercial Parking Lot Veh. Movements
Condition: Operational

Project Name: Northgate

Job Number: 11145

Analyst: A. Wolfe

NOISE MODEL 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 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	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 Adjustment		-31.4	25.3	29.3	32.3	35.7	48.1

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

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 Adjustment		-43.5	25.2	28.2	31.5	34.6	40.0

STATIONARY SOURCE 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 MODEL 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 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	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 Adjustment		-45.7	19.9	21.2	23.8	28.7	36.7

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

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 Adjustment		-47.2	27.2	28.9	30.2	30.5	31.0

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

Observer Location: R4

Source: Residential Entry Gate & Speaker
Condition: Operational

Project Name: Northgate

Job Number: 11145
Analyst: A. Wolfe

NOISE MODEL 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 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)	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 Adjustment		-24.5	28.1	30.8	36.2	39.2	41.1

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

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 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	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 Adjustment		-14.9	29.1	32.1	40.1	46.1	53.7

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

Observer Location: R4

Source: Commercial Parking Lot Veh. Movements
Condition: Operational

Project Name: Northgate

Job Number: 11145

Analyst: A. Wolfe

NOISE MODEL 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 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	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 Adjustment		-34.7	22.0	26.0	29.0	32.4	44.8

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

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 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	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 Adjustment		-43.3	25.4	28.4	31.7	34.8	40.2

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

Observer Location: R4

Source: RV Parking Lot Activity
Condition: Operational

Project Name: Northgate

Job Number: 11145
Analyst: A. Wolfe

NOISE MODEL 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 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	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 Adjustment		-32.8	43.7	44.2	44.9	46.8	48.6

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

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 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	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 Adjustment		-44.5	29.9	31.6	32.9	33.2	33.7

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

Observer Location: R5

Source: Residential Entry Gate & Speaker
Condition: Operational

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 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)	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 Adjustment		-10.3	42.3	45.0	50.4	53.4	55.3

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

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 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	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 Adjustment		-10.4	33.6	36.6	44.6	50.6	58.2

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

Observer Location: R5

Source: Commercial Parking Lot Veh. Movements
Condition: Operational

Project Name: Northgate

Job Number: 11145

Analyst: A. Wolfe

NOISE MODEL 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 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	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 Adjustment		-31.5	25.2	29.2	32.2	35.6	48.0

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

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
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)	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 Adjustment		-12.0	46.5	49.0	53.2	60.6	66.6

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

Observer Location: R5

Source: Outdoor Pool/Spa Activity
Condition: Operational

Project Name: Northgate

Job Number: 11145
Analyst: A. Wolfe

NOISE MODEL 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 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	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 Adjustment		-36.0	32.7	35.7	39.0	42.1	47.5

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

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 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 Adjustment		-38.5	38.0	38.5	39.2	41.1	42.9

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

Observer Location: R6

Source: Residential Entry Gate & Speaker
Condition: Operational

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 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)	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 Adjustment		-30.6	22.0	24.7	30.1	33.1	35.0

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

Observer Location: R6

Source: Residential Parking Lot Veh. Movements
Condition: Operational

Project Name: Northgate

Job Number: 11145

Analyst: A. Wolfe

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 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	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 Adjustment		-33.3	10.7	13.7	21.7	27.7	35.3

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

Observer Location: R6

Source: Commercial Parking Lot Veh. Movements
Condition: Operational

Project Name: Northgate

Job Number: 11145

Analyst: A. Wolfe

NOISE 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 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	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 Adjustment		-42.3	14.4	18.4	21.4	24.8	37.2

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

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 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	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 Adjustment		-48.2	10.3	12.8	17.0	24.4	30.4

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

Observer Location: R6

Source: Outdoor Pool/Spa Activity
Condition: Operational

Project Name: Northgate

Job Number: 11145

Analyst: A. Wolfe

NOISE MODEL 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 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	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 Adjustment		-48.7	20.0	23.0	26.3	29.4	34.8

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

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 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	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 Adjustment		-36.2	40.3	40.8	41.5	43.4	45.2

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

Observer Location: R7

Source: Air Conditioning Unit (Roof-Top)
Condition: Operational

Project Name: Northgate

Job Number: 11145
Analyst: A. Wolfe

NOISE MODEL 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 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	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 Adjustment		-53.4	21.0	22.7	24.0	24.3	24.8

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

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 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)	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 Adjustment		-42.5	18.4	19.6	21.1	22.8	23.9

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

Observer Location: R7

Source: Car Wash Tunnel Air Blowers
Condition: Operational

Project Name: Northgate

Job Number: 11145

Analyst: A. Wolfe

NOISE MODEL 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 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	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 Adjustment		-45.3	36.3	46.7	47.3	48.0	48.5

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

Observer Location: R7

Project Name: Northgate

Source: Commercial Parking Lot Veh. Movements Job Number: 11145

Condition: Operational

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 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	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 Adjustment		-41.6	15.1	19.1	22.1	25.5	37.9

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

Observer Location: R7

Project Name: Northgate

Source: Outdoor Pool/Spa Activity

Job Number: 11145

Condition: Operational

Analyst: A. Wolfe

NOISE MODEL 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 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	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 Adjustment		-54.9	13.8	16.8	20.1	23.2	28.6

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

Observer Location: R7

Source: Gas Station Activity
Condition: Operational

Project Name: Northgate

Job Number: 11145
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	616.0 feet	Barrier Height:	6.0 feet
Noise Distance to Barrier:	606.0 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:	20.0
Barrier Elevation:	863.0 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	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 Adjustment		-51.5	14.1	15.4	18.0	22.9	30.9

STATIONARY SOURCE 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 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	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 Adjustment		-32.9	40.2	56.3	59.2	61.0	67.5

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

Observer Location: R2

Source: Outdoor Event Activity
Condition: Operational

Project Name: Northgate

Job Number: 11145
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	492.0 feet	Barrier Height:	10.0 feet
Noise Distance to Barrier:	10.0 feet	Noise Source Height:	8.0 feet
Barrier Distance to Observer:	482.0 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	73.1	89.2	92.1	93.9	100.4
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		-46.8	26.3	42.4	45.3	47.1	53.6

STATIONARY SOURCE 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 MODEL INPUTS

Noise Distance to Observer	763.0 feet	Barrier Height:	0.0 feet
Noise Distance to Barrier:	763.0 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 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	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 Adjustment		-43.7	29.4	45.5	48.4	50.2	56.7

STATIONARY SOURCE NOISE PREDICTION MODEL

7/26/2018

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 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	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 Adjustment		-49.2	23.9	40.0	42.9	44.7	51.2

STATIONARY SOURCE NOISE PREDICTION MODEL

1/25/2018

Observer Location: R5

Source: Air Conditioning Unit (Roof-Top)
 Condition: Operational Mitigation R5

Project Name: Northgate

Job Number: 11145
 Analyst: A. Wolfe

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 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	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 Adjustment		-49.7	24.7	26.4	27.7	28.0	28.5

STATIONARY SOURCE NOISE PREDICTION MODEL

1/25/2018

Observer Location: R5

Source: Residential Entry Gate & Speaker
 Condition: Operational Mitigation R5

Project Name: Northgate

Job Number: 11145
 Analyst: A. Wolfe

NOISE MODEL INPUTS

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 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)	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 Adjustment		-15.8	36.8	39.5	44.9	47.9	49.8

STATIONARY SOURCE NOISE PREDICTION MODEL

1/25/2018

Observer Location: R5

Project Name: Northgate

Source: Residential Parking Lot Veh. Movements

Job Number: 11145

Condition: Operational Mitigation R5

Analyst: A. Wolfe

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 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	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 Adjustment		-16.0	28.0	31.0	39.0	45.0	52.6

STATIONARY SOURCE NOISE PREDICTION MODEL

1/25/2018

Observer Location: R5

Project Name: Northgate

Source: Commercial Parking Lot Veh. Movements

Job Number: 11145

Condition: Operational Mitigation R5

Analyst: A. Wolfe

NOISE MODEL 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 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	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 Adjustment		-37.0	19.7	23.7	26.7	30.1	42.5

STATIONARY SOURCE NOISE PREDICTION MODEL

1/25/2018

Observer Location: R5

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 Adjustment		-18.9	39.6	42.1	46.3	53.7	59.7

STATIONARY SOURCE NOISE PREDICTION MODEL

1/25/2018

Observer Location: R5

Source: Outdoor Pool/Spa Activity
Condition: Operational Mitigation R5

Project Name: Northgate

Job Number: 11145
Analyst: A. Wolfe

NOISE 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 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	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 Adjustment		-41.5	27.2	30.2	33.5	36.6	42.0

STATIONARY SOURCE NOISE PREDICTION MODEL

1/25/2018

Observer Location: R5

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 Adjustment		-38.5	38.0	38.5	39.2	41.1	42.9

This page intentionally left blank