Appendix I: Noise

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NATIONAL ORANGE SHOW INDUSTRIAL
NOISE IMPACT ANALYSIS
CITY OF SAN BERNARDINO, CALIFORNIA

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NATIONAL ORANGE SHOW INDUSTRIAL
NOISE IMPACT ANALYSIS
CITY OF SAN BERNARDINO, CALIFORNIA

1.0 INTRODUCTION

This noise study describes the noise impacts associated with the development of the proposed National Orange Show Industrial development.

1.1 Purpose of Report

This noise study briefly describes the proposed project, provides information regarding noise fundamentals, describes the local noise guidelines, identifies the existing ambient noise environment, provides the study methods and procedures for traffic noise analysis, and evaluates the future off-site stationary exterior noise environment. Included in this study is an analysis of the short-term construction noise impacts, on-site noise impacts, potential off-site project-related stationary source, and the off-site traffic noise impacts associated with the development of the proposed National Orange Show Industrial development.

1.2 Site Location and Surrounding Land-Uses

The project site is located south of Mill Street, east of Arrowhead Avenue, and on either side of Central Avenue in the City of San Bernardino. Exhibit 1-A illustrates the location of the project site within the study area. The project site is currently vacant. The project site is currently exposed to noise from the surrounding industrial uses and traffic noise impacts from Arrowhead Avenue and Central Avenue.

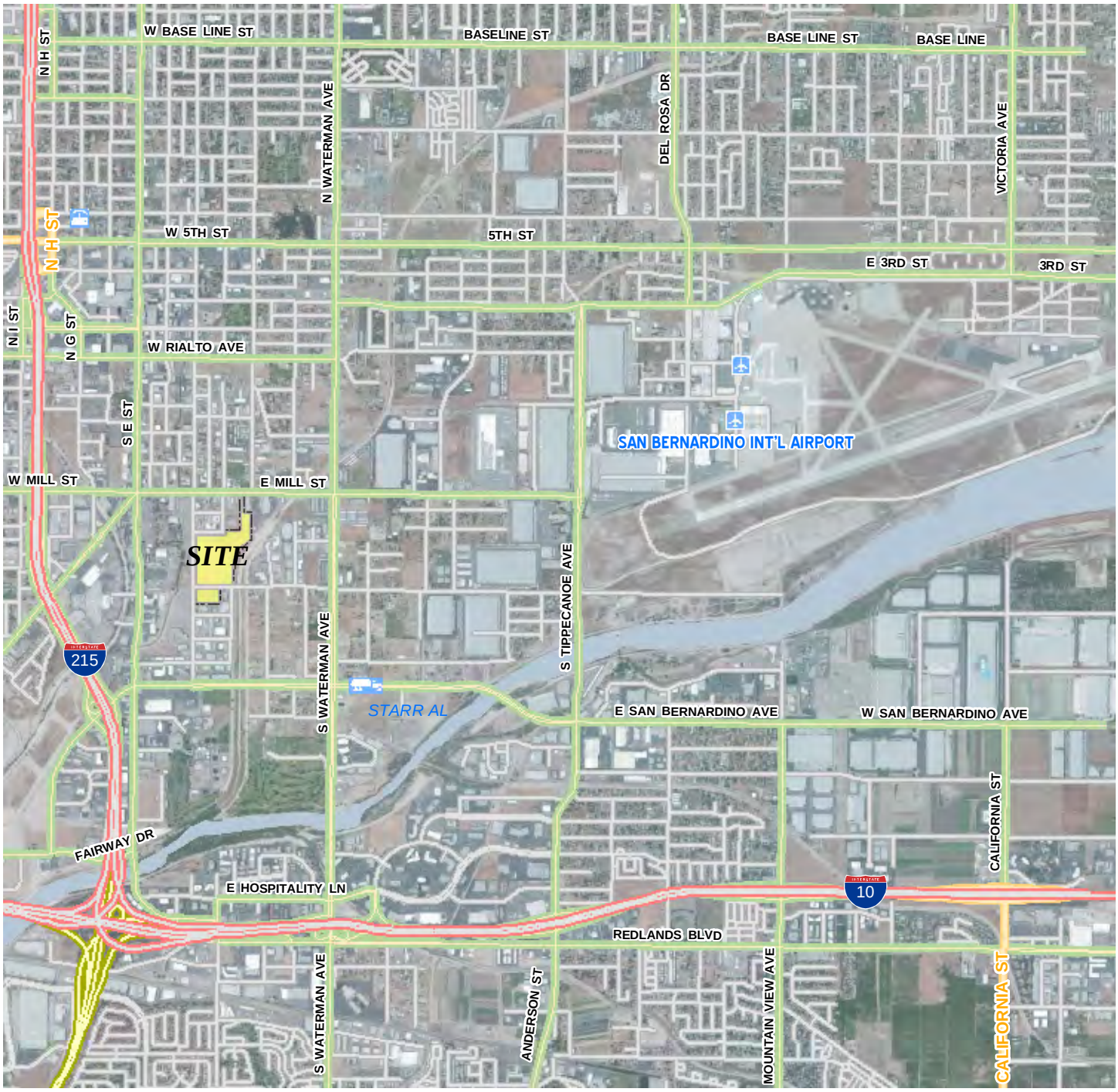
1.3 Proposed Project

The Project includes the development of 752,710 square feet (SF) of general light industrial and warehouse/distribution uses spread across four (4) buildings. The project site is presented on Exhibit 1-B. The proposed land use and building intensity for each of the buildings are listed below:

- Building “A” – 616,000 square feet is assumed to support high-cube/distribution warehouse use with access to Arrowhead Avenue and Central Avenue. Two (2) fire access points are proposed on Esperanza Street.
- Building “B” – 78,960 square feet is assumed to be general warehouse with access to Arrowhead Avenue and Central Avenue.

EXHIBIT 1-A

LOCATION MAP



N

0 1,400 2,800

Feet

National Orange Show Industrial Noise Impact Analysis
City of San Bernardino, CA (JN - 07780:locmap.mxd)

URBAN CROSSROADS

EXHIBIT 1-B

SITE PLAN

- Building “C” – 27,810 square feet is assumed to support general light industrial uses with access to Mill Street.
- Building “D” – 29,940 square feet is assumed to support general light industrial uses with access to Mill Street.

2.0 NOISE 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.

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. 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.

2.2 Noise Descriptors

Environmental noise descriptors are generally based on averages, rather than instantaneous, noise levels. The most commonly used figure is the equivalent level (Leq). Equivalent sound levels are not measured directly but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level (Leq) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. In addition, the hourly Leq is the noise metric used to collect short-term noise level measurement samples and to estimate the 24-hour Community Noise Equivalent Levels (CNEL).

The CNEL is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time of day corrections require the addition of 5 decibels to dBA Leq sound levels in the evening from 7 p.m. to 10 p.m., and the addition of 10 decibels to dBA Leq sound levels at night between 10 p.m. and 7 a.m. These additions are made to account

EXHIBIT 2-A

TYPICAL NOISE LEVELS AND THEIR SUBJECTIVE LOUDNESS AND EFFECTS

COMMON OUTDOOR ACTIVITIES	COMMON INDOOR ACTIVITIES	A - WEIGHTED SOUND LEVEL dBA	SUBJECTIVE LOUDNESS	EFFECTS OF NOISE
THRESHOLD OF PAIN		140	INTOLERABLE OR DEAFENING	HEARING LOSS
NEAR JET ENGINE		130		
		120		
JET FLY-OVER AT 300m (1000 ft)	ROCK BAND	110		
LOUD AUTO HORN		100	VERY NOISY	
GAS LAWN MOWER AT 1m (3 ft)		90		
DIESEL TRUCK AT 15m (50 ft), at 80 km/hr (50 mph)	FOOD BLENDER AT 1m (3 ft)	80		SPEECH INTERFERENCE
NOISY URBAN AREA, DAYTIME	VACUUM CLEANER AT 3m (10 ft)	70	LOUD	
HEAVY TRAFFIC AT 90m (300 ft)	NORMAL SPEECH AT 1m (3 ft)	60		
QUIET URBAN DAYTIME	LARGE BUSINESS OFFICE	50	MODERATE	
QUIET URBAN NIGHTTIME	THEATER, LARGE CONFERENCE ROOM (BACKGROUND)	40		SLEEP DISTURBANCE
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: NOISE TECHNICAL SUPPLEMENT BY CALTRANS

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 particular time, but rather represents the total sound exposure.

2.3 Traffic Noise Prediction

The level of traffic noise depends on three primary factors: (1) the volume of the traffic, (2) the speed of the traffic, and (3) the number of trucks in the flow of traffic. Generally, the loudness of traffic noise is increased by heavier traffic volumes, higher speeds, and a greater number of trucks. A doubling of the traffic volume (assuming that the speed and truck mix do not change) results in a noise level increase of 3 dBA. The truck mix on a given roadway may also have an effect on community noise levels. As the number of heavy trucks increases and becomes a larger percentage of the vehicle mix, adjacent noise levels increase. Vehicle noise is a combination of the noise produced by the engine, exhaust, and tires.

2.4 Noise Control

Noise control is the process of obtaining an acceptable noise environment for a particular 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 any and all of these three elements.

2.5 Ground Absorption

To account for the ground-effect attenuation (absorption), two types of site conditions are commonly used in traffic noise models, soft site and hard site conditions. Soft site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. A drop-off rate of 4.5 dBA per doubling of distance is typically observed over soft ground with landscaping, as compared with a 3.0 dBA drop-off rate over hard ground such as asphalt, concrete, stone and very hard packed earth. Based on our experience, soft site conditions better reflect the predicted noise levels. In addition, Caltrans' research has shown that the use of soft site conditions is more appropriate for the application of the FHWA traffic noise prediction model used in this analysis.

2.6 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 view of the noise source.

2.7 Community Response to Noise

Approximately ten (10) 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 25 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.

Despite this variability in behavior on an individual level, the population as a whole can be expected to exhibit the following responses to changes in noise levels. An increase or decrease of 1.0 dBA cannot be perceived except in carefully controlled laboratory experiments. A 3.0 dBA increase may be perceptible outside of the laboratory. An increase of 5.0 dBA is often necessary before any noticeable change in community response (i.e., complaints) would be expected.

Community responses to noise may range from registering a complaint by telephone or letter, to initiating court action, depending upon each individual'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 of the receptor;
- Noise receptor's perception that they are being unfairly treated;
- Attitudes regarding the usefulness of the noise-producing activity;
- Receptor's belief that the noise source can be controlled.

Studies have shown that changes in long-term noise levels are noticeable, and are responded to by people. For example, about ten (10) percent of the people exposed to traffic noise of 60 dBA will report being highly annoyed with the noise, and each increase of one (1) dBA is associated

with approximately two (2) percent more people being highly annoyed. When traffic noise exceeds 60 dBA or aircraft noise exceeds 55 dBA, people begin complaining. Group or legal actions to stop the noise should be expected to begin at traffic noise levels near 70 dBA and aircraft noise levels near 65 dBA.

2.8 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 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.

3.0 NOISE STANDARDS

The City of San Bernardino has identified two separate types of noise sources: (1) mobile, and (2) stationary. The mobile, or transportation related noise impacts are controlled using the 24-hour Community Noise Equivalent Level (CNEL) to assess the land use compatibility for community noise exposure. To control community noise impacts from stationary (non-transportation) noise sources (such as speakerphones, trash compactors, etc.) the City of San Bernardino has identified the worst-case noise levels for noise sensitive residential uses.

3.1 Transportation Noise Standards

Table N-3 of the City of San Bernardino Noise Element includes standards for land use compatibility for community noise exposure. The standards are derived from standards contained in the *General Plan Guidelines*, a publication of the California Office of Planning and Research. These standards are used by many California cities and counties.

The Noise Element specifies the maximum noise levels allowable for new developments impacted by transportation noise sources such as arterial roads, freeways, airports and railroads. For the purposes of this project, the noise impacts associated with off-site traffic noise impacts are controlled by the City of San Bernardino Noise Element. For noise sensitive residential areas, the exterior noise levels should remain below 65 dBA CNEL, and the interior noise levels should remain below 45 dBA CNEL. Additionally, the City of San Bernardino noise compatibility matrix shows that traffic noise level impacts below 75 dBA CNEL are considered "normally acceptable" for industrial development. The City of San Bernardino Noise Element is included in Appendix 3.1.

3.2 Stationary Noise Standards

The Noise Ordinance of the City of San Bernardino provides performance standards and noise control guidelines for determining and mitigating non-transportation or stationary noise source impacts to residential properties.

Section 19.20.030-15, Noise, shows that the exterior and interior noise level standards for residential land uses are 65 dBA and 45 dBA, respectively. The City of San Bernardino Noise Ordinance is included in Appendix 3.2.

3.3 Off-Site Construction Related Noise Impacts

The City of San Bernardino has set exterior noise limits to control noise impacts associated with the construction of the proposed project. According to Section 8054.070, *Disturbances From Construction Activity*,: "No person shall be engaged or employed, or cause any other person to be engaged or employed, in any work of construction, erection, altercation, repair, addition, movement, demolition or improvement to any building or structure except within the hours of 7:00 a.m. and 8:00 p.m."

3.4 Community Noise Assessment Criteria

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

- 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;
- A substantial permanent increase in ambient noise levels in the Project vicinity above existing levels without the proposed Project; or
- A substantial temporary or periodic increase in ambient noise levels in the Project vicinity above noise levels existing without the proposed Project.

While the CEQA Guidelines and City of San Bernardino noise standards provide direction on noise compatibility and establish noise standards by land use type, they do not define specific levels at which increases above the ambient noise levels are considered substantial. However, the Federal Highway Administration and Caltrans both identify changes in noise levels of greater than 3 dBA as "barely perceptible," while changes of 5 dBA are considered "readily perceptible." This is consistent with the community response to noise characteristics described at Section 3.6 of this report.

In a community situation, the noise exposure is extended over a long time period, and changes in noise levels occur over years rather than the immediate comparison made in a laboratory situation. The level at which changes in community noise levels become discernible is likely to be some value greater than 1 dBA, and 3 dBA appears to be appropriate for most people. On this basis, and for the purposes of this study, a substantial increase in noise levels attributable to operations of the Project would occur if:

1. Ambient conditions are below applicable standards, and project-generated noise at receptor land uses would result in:
    - An exceedance of the suggested land uses/noise compatibility guidelines for surface transportation sources presented in the City of San Bernardino Noise Element (mobile sources); or
    - An exceedance of the exterior noise standards defined in the City of San Bernardino Noise Ordinance (area/stationary sources);

2. If ambient noise conditions exceed applicable Noise Ordinance Standards and project-generated noise would create a “barely perceptible” 3 dBA or greater permanent increase in ambient exterior noise levels.

3. For construction noise, a substantial increase in noise would occur if project-related construction activities occur outside the hours of the hours of 7:00 a.m. and 8:00 p.m.

4.0 EXISTING NOISE LEVEL MEASUREMENTS

To determine the existing noise environment, three (3) long-term, twenty-four hour noise level measurements were taken at locations in the project study area. Exhibit 4-A provides the boundaries of the project study area and the noise level measurement locations. The long-term noise measurements were recorded by Urban Crossroads, Inc. between May 10th and 11th, 2011.

4.1 Measurement Procedure and Criteria

The 24-hour noise readings were recorded using four Quest DL Pro data logging Type 2 noise dosimeters. All noise meters were programmed in "fast" mode to record noise levels in "A" weighted form and equipped with windscreens. The Quest DL noise dosimeters were calibrated using a Quest QC-10 calibrator. All noise level measurement equipment meets American National Standards Institute (ANSI) specifications for sound level meters (S1.4-1983 identified in Chapter 19.68.020.AA).

4.2 Noise Measurement Locations

The location of the noise measurements at the nearby noise sensitive residential uses were chosen based on expected noise impact potential from the proposed project activities. Exhibit 4-A illustrates the the noise monitoring locations.

- Location L1 was located on the northeastern portion of the project site, approximately 300 feet west of the Barr Lumber Company Inc.
- Location L2 was located on the northern portion near the intersection of Mountain View Avenue and Esperanza Street adjacent to existing single-family homes.
- Location L3 was located on the northwestern portion of the proposed project site approximately 200 feet east of Arrowhead Avenue across from Avenger Fab and Supply.

4.3 Noise Measurement Results

The primary source of noise in the study area is operations from the surrounding industrial uses as well as traffic on Arrowhead Avenue and Mill Street. The results of the noise level

EXHIBIT 4-A

NOISE MONITORING LOCATIONS

measurements are presented in Table 4-1 and the noise monitoring results printouts are included in Appendix 4.1.

- Hourly noise levels at location L1 ranged from 47.4 dBA to 68.6 dBA Leq for daytime hours and from 55.7 dBA to 68.9 dBA Leq for nighttime hours.
- Hourly noise levels at location L2 ranged from 49.7 dBA to 57.4 dBA Leq for daytime hours and from 44.9 dBA to 54.2 dBA Leq for nighttime hours with an overall level of 58.1 dBA CNEL.
- Hourly noise levels at location L3 ranged from 53.8 dBA to 62.0 dBA Leq for daytime hours and from 49.7 dBA to 58.4 dBA Leq for nighttime hours with an overall level of 61.9 dBA CNEL.

Based on the data presented above, locations L2 and L3, which are nearest the existing residential land uses, currently experience hourly noise levels that are below the City of San Bernardino operational exterior noise level standard. Additionally, overall daily noise levels at locations L2 and L3 which are also influenced by traffic noise impacts are below the City of San Bernardino traffic noise level standard of 65 dBA CNEL.

Table 4-1

Existing Long-Term (Ambient) Noise Level Measurements[1]

Receptor Location[2]	Description	Time Of Measurement[3]	Primary Noise Source	Hourly Noise Levels (Leq dBA)[4]	Daily Noise Levels (dBA CNEL)[4]
L1	Located on the northeastern portion of the project site, west of the Barr Lumber Company Inc.	May 10-11, 2011	Woodsaws and general lumber yard operations	47.4 - 68.9	70.8
L2	Located on the northern portion near the intersection of Mountain View Avenue and Esperanza Street adjacent to existing single-family homes.	May 10-11, 2011	Ambient noise and traffic on Esperanza Street	44.9 - 57.4	58.1
L3	Located on the northwestern portion of the proposed project site east of Arrowhead Avenue across from Avenger Fab and Supply.	May 10-11, 2011	Traffic from Arrowhead Ave. and steel facility activities	49.7 - 62.0	61.9

[1] Noise measurements taken by Urban Crossroads, Inc. on May 10-11, 2011.

[2] See Exhibit 4-A for the location of the monitoring sites, and Appendix 4.1 for Study Area Photos.

[3] All measurement at locations L1-L3 were monitored for a period of 24 hours.

[4] The long-term noise level measurements printouts are included in Appendix 4.2.

5.0 SHORT-TERM CONSTRUCTION NOISE IMPACTS

Construction noise represents a short-term impact on the ambient noise levels. Noise generated by construction equipment, including dozers, loaders, scrapers and graders can reach high levels. Grading activities typically represent one of the most intense sources of construction noise.

5.1 Existing Conditions

The project site and adjacent properties are designated for industrial land uses under the City General Plan. Consistent with these land use designations, adjacent properties are predominantly vacant or are developed with commercial/industrial uses. Notwithstanding, non-conforming residential land uses also exist north of the project site. As a worst case assessment, this analysis considers likely maximum potential noise impacts at nearby residential land uses, employing the City's residential noise standards.

5.2 City of San Bernardino Construction Noise Standards

The City of San Bernardino has set exterior noise limits to control noise impacts associated with the construction of the proposed project. According to Section 8054.070, *Disturbances From Construction Activity*,: "No person shall be engaged or employed, or cause any other person to be engaged or employed, in any work of construction, erection, altercation, repair, addition, movement, demolition or improvement to any building or structure except within the hours of 7:00 a.m. and 8:00 p.m."

5.3 Construction Noise Levels

In January 2006, the Federal Highway Administration (FHWA) published a national database of construction equipment reference noise emission levels. The database included in Appendix 5.1, provides a comprehensive list of the noise generating characteristics for specific types of construction equipment. In addition, the database provides an acoustical usage factor to estimate the fraction of time each piece of construction equipment is operating at full power (i.e., its loudest condition) during a construction operation.

Noise levels generated by heavy construction equipment can range from approximately 70 dBA to noise levels in excess of 100 dBA when measured at 50 feet. However, these noise levels diminish with distance from the construction site at a rate of 6 dBA per doubling of distance. For example, a noise level of 78 dBA measured at 50 feet from the noise source to the receptor would be reduced to 72 dBA at 100 feet from the source to the receptor, and would be further reduced to 66 dBA at 200 feet from the source to the receptor. Noise levels generated during the stages of construction (site grading and subsequent building/facilities construction) are summarized below.

5.3.1 Grading

Noise impacts from grading activity result from both on-road and off-road heavy equipment operating during this stage of construction. Table 5-1 indicates that during the grading stage of construction, noise levels received at the nearest residential properties are expected to approach 85.0 dBA Leq when activities occur at the northern portion of the project site.

5.3.2 Paving

Noise impacts from paving activity result from heavy equipment operating used to pour a foundation and install parking lots in this stage of construction. Table 5-2 indicates that during the paving stage of construction, noise levels received at the nearest residential properties are expected to approach 83.1 dBA Leq when activities occur at the northern portion of the project site.

5.3.3 Utility Installation

Noise impacts from utility installation activities result from heavy equipment operating used to install utility lines and equipment in this stage of construction. Table 5-3 indicates that during the utility installation stage of construction, noise levels received at the nearest residential properties are expected to approach 81.1 dBA Leq when activities occur at the northern portion of the project site.

5.3.4 Building Construction

Building construction activity will result in noise level impacts from heavy equipment that will be operational during physical building construction. Table 5-4 indicates that during the

EXHIBIT 5-A

CONSTRUCTION NOISE IMPACTS

Table 5-1

Grading Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (dBA)	Cumulative Level @ 50 Feet (dBA)
Rubber Tired Dozers	1	40%	3.2	85.0	81.0
Tractor/Loader/Backhoe	1	40%	3.2	80.0	76.0
Scrapers	6	40%	3.2	85.0	88.8
Water Truck	2	40%	3.2	84.0	83.0
Blade	1	40%	3.2	80.0	76.0
Sweeper/Scrubber	1	40%	3.2	84.0	80.0
Cumulative Noise Levels at Nearest Receptor, 100 Feet (dBA) [4,5]					85.0

[1] Source: FHWA's Roadway Construction Noise Model, January 2006.

[2] Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

[3] Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

[4] Receiver locations are presented on Exhibit 5-A

[5] Distance from the nearest point of construction activity to the nearest receiver.

Table 5-2

Paving Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (dBA)	Cumulative Level @ 50 Feet (dBA)
Pavers	1	50%	4.0	85.0	82.0
Rollers	2	20%	1.6	85.0	81.0
Scrapers	2	40%	3.2	85.0	84.0
Tractors/Loaders/Backhoes	1	40%	3.2	80.0	76.0
Sweeper/Scrubber	1	40%	3.2	84.0	80.0
Blade	1	40%	3.2	80.0	76.0
Water Truck	1	40%	3.2	84.0	80.0
Cumulative Noise Levels at Nearest Receptor, 100 Feet (dBA) [4,5]					83.1

[1] Source: FHWA's Roadway Construction Noise Model, January 2006.

[2] Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

[3] Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

[4] Receiver locations are presented on Exhibit 5-A

[5] Distance from the nearest point of construction activity to the nearest receiver.

Table 5-3

Utility Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (dBA)	Cumulative Level @ 50 Feet (dBA)
Excavator	2	40%	3.2	85.0	84.0
Tractor/Loader/Backhoe	4	40%	3.2	80.0	82.0
Water Truck	1	40%	3.2	84.0	80.0
Cumulative Noise Levels at Nearest Receptor, 100 Feet (dBA) [4,5]					81.1

[1] Source: FHWA's Roadway Construction Noise Model, January 2006.

[2] Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

[3] Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

[4] Receiver locations are presented on Exhibit 5-A

[5] Distance from the nearest point of construction activity to the nearest receiver.

Table 5-4

Building Construction Noise Levels[1]

Equipment Type	Quantity	Usage Factor[2]	Hours Of Operation[3]	Reference Noise Level @ 50 Feet (dBA)	Cumulative Level @ 50 Feet (dBA)
Gradall	2	40%	3.2	85.0	84.0
Tractor/Loader/Backhoe	4	40%	3.2	80.0	82.0
Forklift	4	40%	3.2	85.0	87.0
Water Truck	1	40%	3.2	84.0	80.0
Blade	1	40%	3.2	80.0	76.0
Crane	1	16%	1.3	85.0	77.0
Cumulative Noise Levels at Nearest Receptor, 100 Feet (dBA) [4,5]					84.5

[1] Source: FHWA's Roadway Construction Noise Model, January 2006.

[2] Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

[3] Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

[4] Receiver locations are presented on Exhibit 5-A

[5] Distance from the nearest point of construction activity to the nearest receiver.

building construction stage, noise levels received at the nearest residential properties are expected to approach 84.5 dBA Leq when activities occur at the northern portion of the project site.

5.4 Construction Noise Impacts

Construction noise is temporary, intermittent and of short duration, and will not present any long-term impacts. The following mitigation measures would reduce potentially significant short-term construction impacts to the surrounding community to the extent feasible.

- During all project site excavation and grading on-site, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the project site.
- The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and noise sensitive receptors nearest the project site during all project construction.
- The construction contractor shall limit all construction-related activities that would result in high noise levels according to the construction hours determined by City staff.
- The construction contractor shall limit haul truck deliveries to the same hours specified for construction equipment. To the extent feasible, haul routes shall not pass sensitive land uses or residential dwellings.

5.5 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. Construction vibration is generally associated with pile driving and rock blasting. Occasionally large bulldozers and loaded trucks can cause perceptible vibration levels at close proximity. According to the Transportation and Construction-Induced Vibration Guidance Manual prepared for Caltrans, ground-borne vibration from grading construction equipment such as earthmovers and haul trucks

at distances of 10 feet do not create vibration amplitudes that causes structural damage to nearby structures. Since the residential uses are located 50 feet from the project site, impacts from groundborne vibration will be less than significant.

6.0 OPERATIONAL NOISE IMPACTS

Operational noise impacts result from traffic and stationary sources. The operational noise impacts both onsite and offsite are discussed below.

6.1 Traffic Noise Model Parameters

The following section outlines the parameters used to model and analyze the traffic noise environment.

6.1.1 FHWA Traffic Noise Prediction Model

The projected roadway noise impacts from vehicular traffic were projected using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108 (the "FHWA Model"). The FHWA Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). 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.

6.1.2 Traffic Noise Prediction Model Inputs

Table 6-1 presents the FHWA Traffic Noise Prediction Model roadway parameters used in this analysis. Using the methods stated previously in Section 3, soft site conditions were used to develop the Noise contour boundaries to analyze the traffic noise impacts to the study area. Soft site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. Based on our experience, soft site conditions better reflect the predicted noise levels. In addition, Caltrans' research has shown that the use of soft site conditions is more appropriate for the application of the

Table 6-1

Off-Site Roadway Parameters[1]

Roadway	Segment	Roadway Classification	Vehicle Speed (MPH)	Site Conditions
Mill Street	w/o I St.	Major	45	Soft
Mill Street	I St. to I-215	Major	45	Soft
Mill Street	I-215 to G St.	Major	45	Soft
Mill Street	G St. to E St.	Major	45	Soft
Mill Street	E St. to Arrowhead Ave.	Major	45	Soft
Mill Street	Arrowhead Ave. to Mountain View Ave.	Major	45	Soft
Mill Street	e/o Mountain View Ave.	Major	45	Soft
Central Avenue	Arrowhead Ave. to Sierra Way	Secondary	40	Soft
Central Avenue	e/o Sierra Way	Secondary	40	Soft
Orange Show Road	w/o Camino Real	Major	45	Soft
Orange Show Road	Camino Real to I-215	Major	45	Soft
Orange Show Road	I-215 to E St.	Major	45	Soft
Orange Show Road	E St. to Arrowhead Ave.	Major	45	Soft
Orange Show Road	e/o Arrowhead Ave.	Major	45	Soft
E Street	n/o Mill St.	Major	45	Soft
E Street	Mill St. to Orange Show Rd.	Major	45	Soft
E Street	s/o Orange Show Rd.	Major	45	Soft
Arrowhead Avenue	n/o Mill St.	Major	45	Soft
Arrowhead Avenue	Mill St. to Central Ave.	Major	45	Soft
Arrowhead Avenue	Central Ave. to Orange Show Rd.	Major	45	Soft

[1] According to the National Orange Show Industrial Traffic Impact Analysis by Urban Crossroads in June 2011.

FHWA traffic noise prediction model used in this analysis. This approach is also consistent with the noise contour boundaries included in the currently adopted City of San Bernardino General Plan Noise Element.

The average daily traffic volumes used for this study presented in Table 6-2 were obtained from the National Orange Show Industrial Traffic Impact Analysis prepared by Urban Crossroads, Inc. in June 2011. The traffic noise impacts in the study area were analyzed for the following six (6) conditions:

1. Existing
2. Opening Year 2013 Without Project
3. Opening Year 2013 With Project
4. Horizon Year 2030 Without Project
5. Horizon Year 2030 With Project

Table 6-3 presents the hourly traffic flow distributions (vehicle mix) used for this analysis. The vehicle mix is based on a typical average vehicle axle traffic count observed in cities in Southern California. The vehicle mix provides the hourly distribution percentages of automobile, medium trucks and heavy trucks for input into the FHWA Model.

6.2 On-Site Transportation Noise Impact Analysis

The project site will experience exterior noise level impacts from traffic noise on Arrowhead Avenue and Central Avenue. In order to assess a worst-case on-site transportation noise level impact, the Year 2030 with project traffic related noise contours were used to show that noise levels will range from 60.9 to 66.1 dBA CNEL on site. The transportation related exterior noise level criteria provided in the City of San Bernardino Noise Element does not identify specific on-site noise level limits for industrial land uses. However, the noise compatibility matrix provided in the noise element does provide guidelines for industrial uses according to the predicted noise exposure level. The City of San Bernardino noise compatibility matrix shows that traffic noise level impacts below 75 dBA CNEL are considered "normally acceptable" for industrial development.

Table 6-2

Average Daily Traffic For Existing, Year 2013, And Horizon Year 2030 Conditions

Roadway	Segment	Average Daily Traffic (1,000's)				
		Existing	Year 2013		Year 2030	
			No Project	With Project	No Project	With Project
Mill Street	w/o I St.	21.6	24.4	24.5	28.1	28.2
Mill Street	I St. to I-215	23.8	25.9	26.0	31.7	31.8
Mill Street	I-215 to G St.	16.6	22.5	23.3	30.9	31.7
Mill Street	G St. to E St.	14.9	20.4	21.2	20.6	23.5
Mill Street	E St. to Arrowhead Ave.	15.7	20.9	21.7	25.7	26.5
Mill Street	Arrowhead Ave. to Mountain View Ave.	15.1	19.9	20.2	24.5	24.8
Mill Street	e/o Mountain View Ave.	14.2	19.0	19.3	26.2	26.5
Central Avenue	Arrowhead Ave. to Sierra Way	3.8	4.2	4.9	9.8	10.5
Central Avenue	e/o Sierra Way	4.1	4.5	4.7	10.1	10.3
Orange Show Road	w/o Camino Real	6.0	6.5	6.5	11.5	11.5
Orange Show Road	Camino Real to I-215	7.1	8.3	8.3	14.1	14.4
Orange Show Road	I-215 to E St.	25.5	28.8	30.3	46.5	48.0
Orange Show Road	E St. to Arrowhead Ave.	21.5	23.6	25.1	39.9	41.4
Orange Show Road	e/o Arrowhead Ave.	16.7	18.2	18.2	37.7	37.7
E Street	n/o Mill St.	14.7	17.7	17.7	20.2	20.2
E Street	Mill St. to Orange Show Rd.	17.9	19.2	19.2	27.6	27.6
E Street	s/o Orange Show Rd.	15.4	16.3	16.3	25.0	25.0
Arrowhead Avenue	n/o Mill St.	10.1	11.1	11.2	16.0	16.1
Arrowhead Avenue	Mill St. to Central Ave.	13.0	13.8	14.8	20.4	21.3
Arrowhead Avenue	Central Ave. to Orange Show Rd.	12.8	13.7	15.2	24.0	25.5

[1] According to the National Orange Show Industrial Traffic Impact Analysis by Urban Crossroads in June 2011.

Table 6-3

Hourly Traffic Flow Distribution

Motor-Vehicle Type	Daytime (7 am to 7 pm)	Evening (7 pm to 10 pm)	Night (10 pm to 7 am)	Total % Traffic Flow
Automobiles	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%

[1] Typical Southern California vehicle mix.

6.3 Off-Site Transportation Noise Impact Analysis

To assess the off-site transportation related noise level impacts associated with development of the proposed National Orange Show Industrial, noise contour boundaries were developed for the following traffic scenarios:

Existing: This scenario refers to the existing present-day noise conditions.

Opening Year (2013) Without / With Project: This scenario refers to the background noise conditions at Opening Year (2013) without and with the proposed project.

Horizon Year (2030) Without / With Project: This scenario refers to the background noise conditions at Horizon Year (2030) without and with the proposed project.

6.3.1 Traffic Noise Contour Boundaries

Noise contour boundaries represent the distance to noise levels of a constant value and are measured from the center of the roadway. CNEL noise contour boundaries are determined below for the 55, 60, 65 and 70 dBA noise levels.

The distance from the centerline of the roadway to the CNEL contours for roadways in the proposed project's vicinity are presented in Tables 6-4 through 6-8. The noise contour boundaries do not take into account the effect of any existing noise barriers or topography that may affect ambient noise levels.

6.3.2 Projected Roadway Noise Levels

Table 6-4 presents the Existing conditions noise contour boundaries. Table 6-4 shows existing traffic noise level impacts at some segments currently approach or exceed the City of San Bernardino 65 dBA CNEL standard for noise sensitive residential areas at 100 feet from each roadway's centerline. Tables 6-5 and 6-6 present the Opening Year (2013)

Table 6-4

Existing Conditions Noise Contours

Road	Segment	CNEL at 100 Feet (dBA)	Distance to Contour (Feet)			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
Arrowhead Avenue	n/o Mill St.	62.1	RW	64	138	297
Arrowhead Avenue	Mill St. to Central Ave.	63.2	RW	76	163	352
Arrowhead Avenue	Central Ave. to Orange Show Rd.	63.1	RW	75	162	348
Central Avenue	Arrowhead Ave. to Sierra Way	56.6	RW	RW	59	127
Central Avenue	e/o Sierra Way	56.9	RW	RW	62	134
E Street	n/o Mill St.	63.7	RW	82	177	382
E Street	Mill St. to Orange Show Rd.	64.6	RW	94	202	435
E Street	s/o Orange Show Rd.	63.9	RW	85	183	394
Mill Street	w/o I St.	65.4	49	106	229	494
Mill Street	I St. to I-215	65.8	53	113	244	526
Mill Street	I-215 to G St.	64.3	RW	89	192	414
Mill Street	G St. to E St.	63.8	RW	83	179	385
Mill Street	E St. to Arrowhead Ave.	64.0	RW	86	185	399
Mill Street	Arrowhead Ave. to Mountain View Ave.	63.8	RW	84	180	389
Mill Street	e/o Mountain View Ave.	63.6	RW	80	173	373
Orange Show Road	w/o Camino Real	59.8	RW	RW	98	210
Orange Show Road	Camino Real to I-215	60.6	RW	51	109	235
Orange Show Road	I-215 to E St.	66.1	55	119	256	551
Orange Show Road	E St. to Arrowhead Ave.	65.4	RW	106	228	492
Orange Show Road	e/o Arrowhead Ave.	64.3	RW	90	193	416

[1] "RW" = Location of the respective noise contour falls within the right-of-way of the road

Table 6-5

Year 2013 Without Project Conditions Noise Contours

Road	Segment	CNEL at 100 Feet (dBA)	Distance to Contour (Feet)			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
Arrowhead Avenue	n/o Mill St.	62.5	RW	68	147	317
Arrowhead Avenue	Mill St. to Central Ave.	63.5	RW	79	170	366
Arrowhead Avenue	Central Ave. to Orange Show Rd.	63.4	RW	78	169	364
Central Avenue	Arrowhead Ave. to Sierra Way	57.0	RW	RW	63	136
Central Avenue	e/o Sierra Way	57.3	RW	RW	66	143
E Street	n/o Mill St.	64.5	RW	93	201	432
E Street	Mill St. to Orange Show Rd.	64.9	RW	98	212	456
E Street	s/o Orange Show Rd.	64.2	RW	88	190	409
Mill Street	w/o I St.	65.9	54	115	248	535
Mill Street	I St. to I-215	66.2	56	120	259	557
Mill Street	I-215 to G St.	65.6	51	109	235	507
Mill Street	G St. to E St.	65.2	RW	102	221	475
Mill Street	E St. to Arrowhead Ave.	65.3	RW	104	224	483
Mill Street	Arrowhead Ave. to Mountain View Ave.	65.0	RW	101	217	467
Mill Street	e/o Mountain View Ave.	64.8	RW	98	210	453
Orange Show Road	w/o Camino Real	60.2	RW	RW	103	222
Orange Show Road	Camino Real to I-215	61.2	RW	56	121	261
Orange Show Road	I-215 to E St.	66.6	60	129	277	598
Orange Show Road	E St. to Arrowhead Ave.	65.8	52	113	243	524
Orange Show Road	e/o Arrowhead Ave.	64.7	RW	95	204	440

[1] "RW" = Location of the respective noise contour falls within the right-of-way of the road

Table 6-6

Year 2013 With Project Conditions Noise Contours

Road	Segment	CNEL at 100 Feet (dBA)	Distance to Contour (Feet)			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
Arrowhead Avenue	n/o Mill St.	62.5	RW	69	148	319
Arrowhead Avenue	Mill St. to Central Ave.	63.8	RW	84	180	389
Arrowhead Avenue	Central Ave. to Orange Show Rd.	63.8	RW	83	179	385
Central Avenue	Arrowhead Ave. to Sierra Way	57.7	RW	RW	70	151
Central Avenue	e/o Sierra Way	57.5	RW	RW	68	147
E Street	n/o Mill St.	64.5	RW	93	201	432
E Street	Mill St. to Orange Show Rd.	64.9	RW	98	212	456
E Street	s/o Orange Show Rd.	64.2	RW	88	190	409
Mill Street	w/o I St.	65.9	54	116	249	537
Mill Street	I St. to I-215	66.2	56	120	259	558
Mill Street	I-215 to G St.	65.7	52	112	241	519
Mill Street	G St. to E St.	65.3	RW	105	226	487
Mill Street	E St. to Arrowhead Ave.	65.4	RW	107	230	495
Mill Street	Arrowhead Ave. to Mountain View Ave.	65.1	RW	102	219	472
Mill Street	e/o Mountain View Ave.	64.9	RW	99	213	458
Orange Show Road	w/o Camino Real	60.2	RW	RW	103	222
Orange Show Road	Camino Real to I-215	61.2	RW	56	121	261
Orange Show Road	I-215 to E St.	66.8	61	132	285	614
Orange Show Road	E St. to Arrowhead Ave.	66.0	54	117	251	541
Orange Show Road	e/o Arrowhead Ave.	64.7	RW	95	204	440

[1] "RW" = Location of the respective noise contour falls within the right-of-way of the road

Table 6-7

Horizon Year 2030 Without Project Conditions Noise Contours

Road	Segment	CNEL at 100 Feet (dBA)	Distance to Contour (Feet)			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
Arrowhead Avenue	n/o Mill St.	64.1	RW	87	188	404
Arrowhead Avenue	Mill St. to Central Ave.	65.2	RW	102	221	475
Arrowhead Avenue	Central Ave. to Orange Show Rd.	65.9	53	114	246	529
Central Avenue	Arrowhead Ave. to Sierra Way	60.7	RW	52	111	240
Central Avenue	e/o Sierra Way	60.8	RW	53	114	245
E Street	n/o Mill St.	65.1	RW	102	219	472
E Street	Mill St. to Orange Show Rd.	66.5	58	125	270	581
E Street	s/o Orange Show Rd.	66.0	54	117	253	544
Mill Street	w/o I St.	66.5	59	127	273	588
Mill Street	I St. to I-215	67.1	64	137	296	637
Mill Street	I-215 to G St.	67.0	63	135	291	627
Mill Street	G St. to E St.	65.2	RW	103	222	478
Mill Street	E St. to Arrowhead Ave.	66.2	55	119	257	554
Mill Street	Arrowhead Ave. to Mountain View Ave.	65.9	54	116	249	537
Mill Street	e/o Mountain View Ave.	66.2	56	121	261	561
Orange Show Road	w/o Camino Real	62.7	RW	70	150	324
Orange Show Road	Camino Real to I-215	63.5	RW	80	172	371
Orange Show Road	I-215 to E St.	68.7	82	177	382	823
Orange Show Road	E St. to Arrowhead Ave.	68.1	74	160	345	743
Orange Show Road	I-215 to E St.	68.7	82	177	382	823

[1] "RW" = Location of the respective noise contour falls within the right-of-way of the road

Table 6-8

Horizon Year 2030 With Project Conditions Noise Contours

Road	Segment	CNEL at 100 Feet (dBA)	Distance to Contour (Feet)			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
Arrowhead Avenue	n/o Mill St.	64.1	RW	87	188	406
Arrowhead Avenue	Mill St. to Central Ave.	65.3	RW	105	227	489
Arrowhead Avenue	Central Ave. to Orange Show Rd.	66.1	55	119	256	551
Central Avenue	Arrowhead Ave. to Sierra Way	61.0	RW	54	117	251
Central Avenue	e/o Sierra Way	60.9	RW	53	115	248
E Street	n/o Mill St.	65.1	RW	102	219	472
E Street	Mill St. to Orange Show Rd.	66.5	58	125	270	581
E Street	s/o Orange Show Rd.	66.0	54	117	253	544
Mill Street	w/o I St.	66.6	59	127	274	590
Mill Street	I St. to I-215	67.1	64	138	296	639
Mill Street	I-215 to G St.	67.1	64	137	296	637
Mill Street	G St. to E St.	65.8	52	112	242	522
Mill Street	E St. to Arrowhead Ave.	66.3	57	122	263	566
Mill Street	Arrowhead Ave. to Mountain View Ave.	66.0	54	117	251	541
Mill Street	e/o Mountain View Ave.	66.3	57	122	263	566
Orange Show Road	w/o Camino Real	62.7	RW	70	150	324
Orange Show Road	Camino Real to I-215	63.6	RW	81	175	377
Orange Show Road	I-215 to E St.	68.9	84	181	390	840
Orange Show Road	E St. to Arrowhead Ave.	68.2	76	164	353	761
Orange Show Road	I-215 to E St.	68.9	84	181	390	840

[1] "RW" = Location of the respective noise contour falls within the right-of-way of the road

without and with project noise contour boundaries. Tables 6-7 and 6-8 present the Horizon Year 2030 without and with project noise contour boundaries.

6.3.3 Opening Year (2013) Project Traffic Noise Level Contributions

Table 6-9 presents a comparison of the Opening Year (2013) without and with the proposed project noise levels shown in Tables 6-5 and 6-6. The roadway noise impacts will increase on all segments from 0.0 dBA CNEL to 0.7 dBA CNEL with the development of the proposed project.

6.3.4 Horizon Year 2030 Project Traffic Noise Level Contributions

Table 6-10 presents a comparison of the Year 2030 without and with the proposed project noise levels shown in Tables 6-7 and 6-8. The roadway noise impacts will increase on all segments from 0.0 dBA CNEL to 0.6 dBA CNEL with the development of the proposed project.

6.3.5 Off-Site Transportation Related Project Noise Impacts

Section 3.4 discussed the significance criteria. To be considered a significant impact, the project traffic must create a noise level increase in the area adjacent to the roadway segment of 5 dBA; or a noise level increase of 3 dBA or greater and the resulting noise level must exceed the normally acceptable 65 dBA CNEL exterior noise standard for residential uses.

Tables 6-9 and 6-10 show that for all scenarios that the development of the proposed project will not increase the off-site noise levels by more than 3.0 dBA CNEL. A noise increase of less than 3.0 dBA is considered “barely perceptible”.

In summary, the project will not generate a substantial permanent increase in transportation related ambient noise levels or expose persons to noise levels in excess of the standards established in the City of San Bernardino General Plan. The Off-Site FHWA Traffic Noise Model printouts are presented in Appendix 6.1.

Table 6-9

Year 2013 Off-Site Project Related Traffic Noise Impacts

Roadway	Segment	CNEL at 100 Feet (dBA)			Potential Significant Impact?[1]
		No Project	With Project	Project Contribution	
Arrowhead Avenue	n/o Mill St.	62.5	62.5	0.0	NO
Arrowhead Avenue	Mill St. to Central Ave.	63.5	63.8	0.4	NO
Arrowhead Avenue	Central Ave. to Orange Show Rd.	63.4	63.8	0.4	NO
Central Avenue	Arrowhead Ave. to Sierra Way	57.0	57.7	0.7	NO
Central Avenue	e/o Sierra Way	57.3	57.5	0.2	NO
E Street	n/o Mill St.	64.5	64.5	0.0	NO
E Street	Mill St. to Orange Show Rd.	64.9	64.9	0.0	NO
E Street	s/o Orange Show Rd.	64.2	64.2	0.0	NO
Mill Street	w/o I St.	65.9	65.9	0.0	NO
Mill Street	I St. to I-215	66.2	66.2	0.0	NO
Mill Street	I-215 to G St.	65.6	65.7	0.1	NO
Mill Street	G St. to E St.	65.2	65.3	0.1	NO
Mill Street	E St. to Arrowhead Ave.	65.3	65.4	0.1	NO
Mill Street	Arrowhead Ave. to Mountain View Ave.	65.0	65.1	0.1	NO
Mill Street	e/o Mountain View Ave.	64.8	64.9	0.1	NO
Orange Show Road	w/o Camino Real	60.2	60.2	0.0	NO
Orange Show Road	Camino Real to I-215	61.2	61.2	0.0	NO
Orange Show Road	I-215 to E St.	66.6	66.8	0.3	NO
Orange Show Road	E St. to Arrowhead Ave.	65.8	66.0	0.3	NO
Orange Show Road	e/o Arrowhead Ave.	64.7	64.7	0.0	NO

[1] A significant impact is considered both a level above 65 dBA CNEL and an increase greater than 3.0 dBA.

Table 6-10

Horizon Year 2030 Off-Site Project Related Traffic Noise Impacts

Roadway	Segment	CNEL at 100 Feet (dBA)			Potential Significant Impact?[1]
		No Project	With Project	Project Contribution	
Arrowhead Avenue	n/o Mill St.	64.1	64.1	0.0	NO
Arrowhead Avenue	Mill St. to Central Ave.	65.2	65.3	0.1	NO
Arrowhead Avenue	Central Ave. to Orange Show Rd.	65.9	66.1	0.2	NO
Central Avenue	Arrowhead Ave. to Sierra Way	60.7	61.0	0.3	NO
Central Avenue	e/o Sierra Way	60.8	60.9	0.1	NO
E Street	n/o Mill St.	65.1	65.1	0.0	NO
E Street	Mill St. to Orange Show Rd.	66.5	66.5	0.0	NO
E Street	s/o Orange Show Rd.	66.0	66.0	0.0	NO
Mill Street	w/o I St.	66.5	66.6	0.1	NO
Mill Street	I St. to I-215	67.1	67.1	0.0	NO
Mill Street	I-215 to G St.	67.0	67.1	0.1	NO
Mill Street	G St. to E St.	65.2	65.8	0.6	NO
Mill Street	E St. to Arrowhead Ave.	66.2	66.3	0.1	NO
Mill Street	Arrowhead Ave. to Mountain View Ave.	65.9	66.0	0.1	NO
Mill Street	e/o Mountain View Ave.	66.2	66.3	0.1	NO
Orange Show Road	w/o Camino Real	62.7	62.7	0.0	NO
Orange Show Road	Camino Real to I-215	63.5	63.6	0.1	NO
Orange Show Road	I-215 to E St.	68.7	68.9	0.2	NO
Orange Show Road	E St. to Arrowhead Ave.	68.1	68.2	0.1	NO
Orange Show Road	e/o Arrowhead Ave.	68.7	68.9	0.2	NO

[1] A significant impact is considered both a level above 65 dBA CNEL and an increase greater than 3.0 dBA.

6.3.6 Southern California Logistics Airport Noise Impacts

The San Bernardino International Airport is located 3 miles northeast of the project site. Although over flights are relatively frequent, they occur at heights which generally do not create adverse noise conditions. Exhibit 6-A presents the future airport-related noise contours and shows that the project site is located outside the 65 dBA CNEL noise contours.

6.4 Stationary Noise Impact Analysis

This section examines the potential stationary noise source impacts associated with the development and operation of the proposed National Orange Show Industrial development.

6.4.1 Project Related Stationary Source Noise

The stationary noise impacts associated with the proposed project include truck deliveries, loading/unloading docks, and air conditioning units. The residential noise-sensitive area is the existing single-family residential development to the west of the project site.

6.4.2 Reference Noise Level Impacts

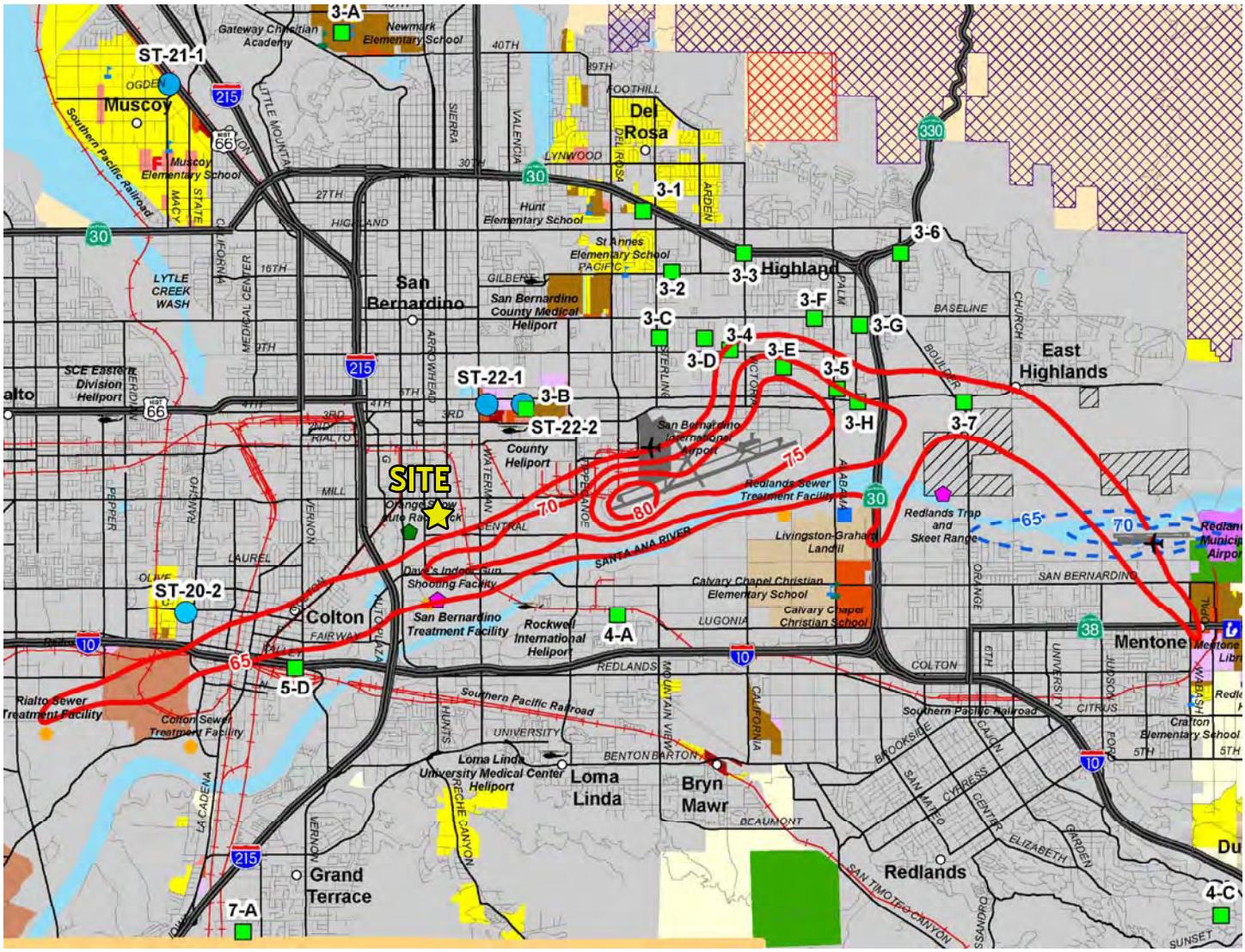
This section provides a detailed description of the reference noise level measurement settings and results shown on Table 6-11 It is important to note that the following projected noise levels assume the worst-case noise environment with the delivery trucks, loading docks and roof-top mounted mechanical ventilation all occurring at the same time. In reality, these noise level impacts will vary throughout the day. The stationary noise source locations are presented in Exhibit 6-B.

6.4.2.1 Loading Dock Activities

In order to evaluate the noise impacts associated with semi-truck unloading/loading activities, reference noise level measurements were taken at a commercial center by Urban Crossroads Inc. on April 14, 2011. The primary noise generated by semi-trucks unloading is the noise of the truck arriving, backing into the dock area, detaching the cab, attaching the cab to the empty

EXHIBIT 6-A

SAN BERNARDINO INTERNATIONAL AIRPORT NOISE CONTOURS



LEGEND:

- DNL (dBA)
- DNL (dBA) Redlands Municipal Airport
- Airport Runway

Noise Measurement Locations
- 1989 Noise Element
- 2004 Short Term (ST X-Y)
- 2004 Long Term (LT X-Y)

Noise Related Locations
- Elementary School
- High School
- Fire Station
- Public Library
- Non-County Landfill (Unincorporated)
- Public Shooting Ranges
- Sewer Treatment Facility
- Auto Racetrack
- Airport
- Heliport

Ownership
- Bureau of Land Management
- Indian Reservation
- U.S. Forestry Service

Land Use
- RC, Resource Conservation
- AG, Agriculture
- RL, Rural Living
- RS, Single Residential
- RM, Multiple Residential
- CO, Office Commercial
- CN, Neighborhood Commercial
- CG, General Commercial
- CS, Service Commercial
- IC, Community Industrial
- IR, Regional Industrial
- IN, Institutional
- PD, Planned Development
- FW, Floodway
- SP, Specific Plan
- CI, City

N

trailer, and exiting the loading dock. The unmitigated noise level was measured at 77.3 dBA Leq at a distance of 20 feet from the semi-truck.

6.4.2.2 Air Conditioning Units

Rooftop mechanical ventilation units will be installed on the proposed stores, restaurants, and commercial buildings located within the project site. To assess the mechanical ventilation system (packaged heat pump) noise impacts, typical outdoor sound power levels were provided by Trane. The noise ratings provided by Trane indicated that the packaged heat pumps will produce unmitigated noise levels ranging from 75 to 82 dBA when measured at a distance of 3 feet.

To predict the worst-case future noise environment, a continuous reference noise level of 82 dBA at 3 feet was used to represent the roof-top mechanical ventilation system. Even though the mechanical ventilation system will cycle on and off throughout the day, this approach presents the worst-case noise condition. In addition, these units have been designed to provide cooling during the peak summer daytime periods, and it is unlikely that all the units will be operating continuously throughout the noise sensitive nighttime periods.

6.4.2.3 Semi-Truck Pass-by

In order to evaluate the noise impacts associated with semi-truck pass-bys along the northern property line, reference noise level measurements were taken at a commercial site by Urban Crossroads Inc. on April 14, 2011. The measurement included the exiting of the semi-truck producing an unmitigated noise level of 69.5 dBA Leq at a distance of 30 feet from the semi-truck.

6.4.3 Project Only Stationary Source Noise Impacts

Based upon the reference noise levels provided on Table 6-11, it is possible to project noise levels from the proposed industrial center to the adjacent single-family homes. The noise level projections were calculated based on the site plan showing the locations of the different noise sources and receptor location. Table 6-12 presents the noise level impacts from the proposed uses to the observer locations north of the project site. These projections include, where appropriate, delivery truck noise and noise from the mechanical ventilation system.

EXHIBIT 6-B

STATIONARY NOISE IMPACTS

Table 6-11

Reference Noise Level Measurements

Noise Source	Duration (mm:ss)	Distance From Source (Feet)	Noise Source Height (Feet)	Drop-Off Rate[4] (Leq dBA)	Noise Level (Leq dBA)
Loading Dock Activites[1]	1:00	20.0	8.0	6.0	77.3
Air Conditioning[2]	2:00	100.0	3.0	6.0	51.8
Semi-Truck Enter/Exiting[3]	1:00	30.0	8.0	6.0	69.5

[1] As measured by Urban Crossroads, Inc. on 4/14/2011

[2] As measured by Urban Crossroads, Inc. on 5/29/2001

[3] As measured by Urban Crossroads, Inc. on 4/14/2011

[4] Noise level (dBA) drop-off rate per doubling of distance.

Table 6-12

Project Only Stationary Source Impact Noise Level Projections

Receptor Location[1]	Noise Source	Distance From Source To Receptor (Feet)	Unmittigated Nosie Level (Leq dBA)
R (Nearest Single-Family Home)	Rooftop A.C. Units	162'	59.1
	Delivery Trucks	396'	39.8
	Truck Movements	103'	58.8
		Overall Unmittigated Noise Level:	**62.0**

[1] See Exhibit 6-A for the noise receptor location.

While additional project noise sources may include parking lot noise and auto movements, these noise levels will be overshadowed by the noise impacts associated with delivery truck noise and noise from the roof-top mechanical ventilation system. The stationary source impact noise level projections show that noise levels from the project site will reach 62.0 dBA Leq at the nearest receptor and will remain below the 65 dBA Leq exterior noise limit.

7.0 CEQA NOISE RELATED TOPICS

CEQA and the CEQA Guidelines state that a significant impact related to noise would occur if a proposed project would result in:

- 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.

Less than significant impact with mitigation. The construction phase of the proposed project may result in the exposure of persons to, or generation of, noise levels in excess of standards established in the City of San Bernardino General Plan and Noise Ordinance. The operational noise level impacts of the proposed project are expected to remain below the City of San Bernardino noise level standards. The project's traffic related noise will not result in significant noise impacts to off-site receptors.

Based on the information provided in this report, the proposed project will have a less than significant impact with the recommended mitigation measures.

- Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels.

No impact. The construction of the proposed project will not require rock blasting and pile driving, nor is it located near a source of vibration; therefore no significant vibration would occur.

- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

No impact. The operational noise level impacts of the proposed project are expected to remain below the City of San Bernardino noise level standards and therefore no significant impacts are expected.

- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Less than significant impact with mitigation incorporated. The proposed project may have a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the proposed project. The development of the proposed project would result in increases in existing noise levels at the residents located approximately 100 feet north of the project site due to: construction activities.

The City of San Bernardino does not provide construction related noise standards but limits the construction to daytime hours to be determined by City staff. Based on the information provided in these sections, the proposed project will have a less than significant impact if construction is limited to the hours to be determined by the City. Potential noise impacts will be reduced with the incorporation of suggested mitigation measures included in this report.

- 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, would the project expose people residing or working in the project area to excessive noise levels?

No impact. The project site is not located within an airport land use plan or within two miles of a public airport or public use airport. The development of the proposed project would not expose people working on the project site to excessive noise levels associated with a public airport.

No impact would occur and no mitigation measures would be required. No further analysis of this issue is necessary.

- For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

No impact. The project site is not located within the vicinity of a private airstrip. The development of the proposed project would not expose people working on the project site to excessive noise levels associated with a private airport.

No impact would occur and no mitigation measures would be required. No further analysis of this issue is necessary.

8.0 FINDINGS AND CONCLUSION

This report evaluated the potential noise impacts associated with the development of the proposed project including project related traffic noise, stationary noise impacts and temporary construction noise impacts. This section summarizes the project noise impacts and the mitigation measures required to reduce the project noise impacts to less than significant.

8.1 Long-Term Transportation Noise Impacts

Section 3.4 discussed the significance criteria. To be considered a significant impact, the project traffic must create a noise level increase in the area adjacent to the roadway segment of 3 dBA or greater and the resulting noise level must exceed the normally acceptable 65 dBA CNEL exterior noise standard for residential uses or 75 dBA CNEL exterior noise standard for industrial uses.

The analysis shows that for all scenarios that the development of the proposed project will not increase the off-site noise levels by more than 3.0 dBA CNEL. A noise level increase of less than 3.0 dBA is considered "barely perceptible". The project will not generate a substantial permanent increase in transportation-related ambient noise levels or expose persons to noise levels in excess of the standards established in the City of San Bernardino General Plan.

The San Bernardino International Airport is located 3 miles northeast of the project site. Although over flights are relatively frequent, they occur at heights which generally do not create adverse noise conditions. The project site is located outside the 65 dBA CNEL noise contours.

8.2 Long-Term Stationary Noise Impacts

Based upon the reference noise levels and the ambient noise level measurements, it is possible to project noise levels from the proposed industrial uses to the adjacent single-family homes. The noise level projections were calculated based on the site plan showing the locations of the different noise sources and receptor location. The analysis presents the noise level impacts from the proposed industrial use to the observer locations north of the project site. These projections include, where appropriate, delivery truck noise and noise from the mechanical ventilation system. The

project only noise level projections are expected to reach 62.0 dBA Leq and will remain below the City of San Bernardinio 65 dBA Leq residential exterior noise limit.

8.3 Temporary Construction Noise Impacts

It is expected that the nearest homes located approximately 50 feet west of the project site may experience temporary noise level increases during the grading phase of construction. Construction noise will be heard and vary according to the location and operations of grading equipment and often will be overshadowed by the surrounding industrial uses and traffic noise from Arrowhead Avenue and Central Avenue.

The following mitigation measures would reduce potentially significant short-term construction noise impacts:

- During all project site excavation and grading on-site, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the project site.
- The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and noise sensitive receptors nearest the project site during all project construction.
- The construction contractor shall limit all construction-related activities that would result in high noise levels according to the construction hours to be determined by City staff.
- The construction contractor shall limit haul truck deliveries to the same hours specified for construction equipment. To the extent feasible, haul routes shall not pass sensitive land uses or residential dwellings.

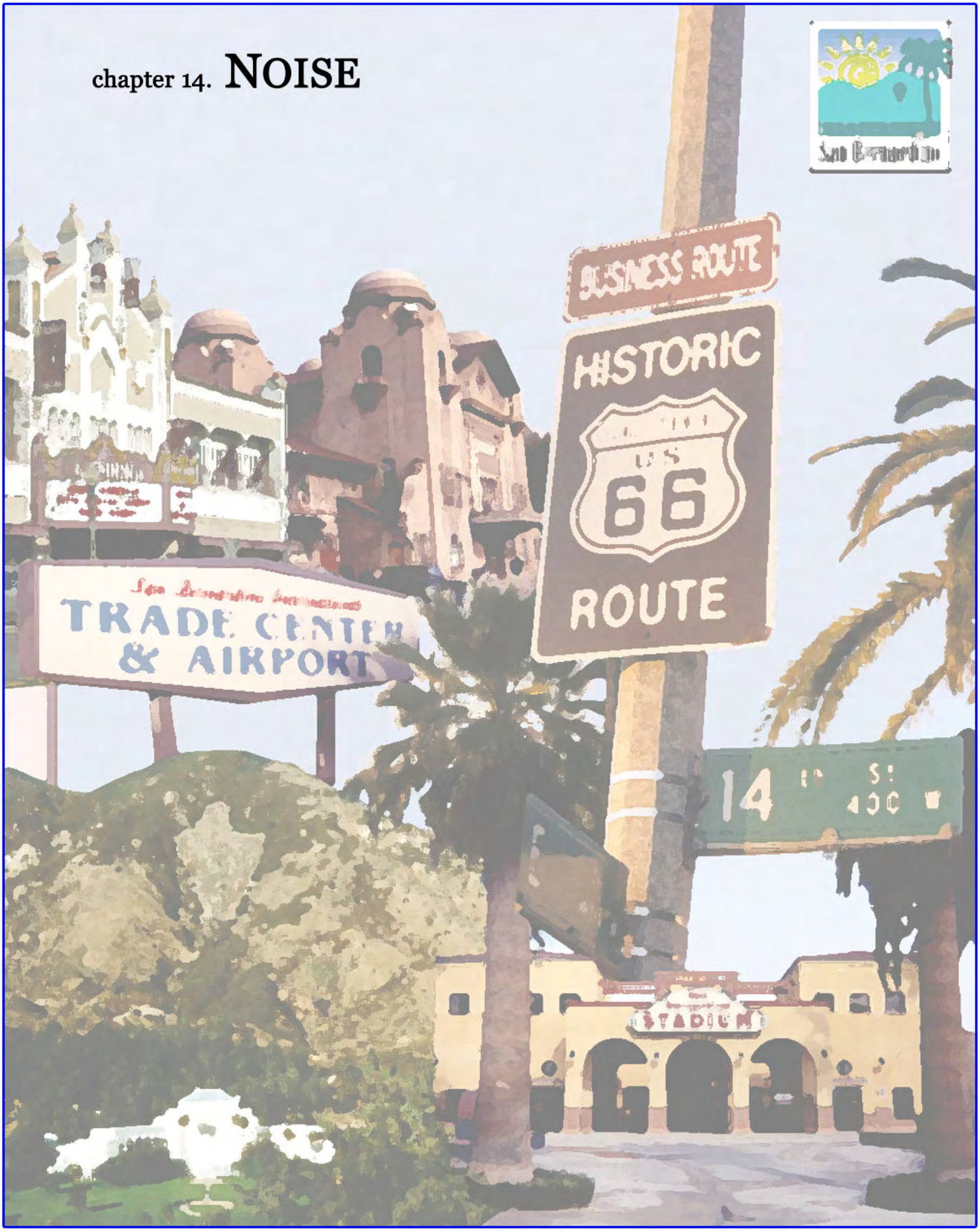
8.4 Vibration Impacts

The proposed project will not create significant long term operational or short-term construction-related vibration impacts to adjacent uses.

APPENDIX 3.1

City Of San Bernardino General Plan Noise Element

chapter 14. NOISE



Chapter 14. Noise

INTRODUCTION

San Bernardino is affected by several different sources of noise, including automobile, rail, and air traffic, sports events, commercial and industrial activity, and periodic nuisances such as construction. Excessive levels of noise can damage our physical health, psychological stability, social cohesion, property values, and economic productivity. The control of noise, therefore, is an essential component in creating a safe, compatible, and productive environment.

Purpose

The Noise Element provides policy guidance that addresses the generation, mitigation, avoidance, and the control of excessive noise. Specifically, this Element addresses the following issues:

- Land use;
- Transportation related noise generated from roadways, passenger and freight railroad operations, and air flights; and
- Spill over noise from activities such as construction, leaf blowers, and commercial/industrial operations.

Relationship to Other Elements

The Noise Element is closely linked with the Land Use and Circulation Elements as well as the Development Code, which contains the City's noise standards. Together, these guidelines and standards provide for the citywide regulation of excessive noise.

It should be recognized that the City does not have the authority to regulate all sources of noise within the City and various other agencies may supercede City authority. A discussion of these agencies and their roles with respect to regulating noise is provided below. Furthermore, various types of project funding (e.g., State Highway projects, HUD

redevelopment, etc.) could be subject to standards that differ from the City's.

1. Federal Highway Administration

Several major transportation routes traverse the City of San Bernardino: State Routes 18, 30, 330, and 66, as well as Interstates 10 and 215. These routes are subject to federal funding and, as such, are under the purview of the Federal Highway Administration (FHWA), which has its own noise standards. These noise standards are based on Leq and L_{10} values. The FHWA design noise levels are included in Table N-1, FHWA Design Noise Levels.

Table N-1
FHWA Design Noise Levels

Activity Category	*Design Noise Levels* [1]		*Description of Activity Category*
	L_{eq} (dBA)	*L_{10} (dBA)*	
A	57 (exterior)	60 (exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (exterior)	70 (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (exterior)	75 (exterior)	Developed lands, properties, or activities not included in Categories A or B, above
D	---	---	Undeveloped lands.
E	52 (interior)	55 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

[1] Either L_{eq} or L_{10} (but not both) design noise levels may be used on a project.

2. U.S. Department of Housing and Urban Development

The Department of Housing and Urban Development (HUD) issues formal requirements related specifically to standards for exterior noise levels along with policies for approving HUD-supported or assisted housing projects in high noise areas. In general, these requirements established three zones. These include:

- 65 dBA L_{dn} or less - an acceptable zone where all projects could be approved,

- Exceeding 65 dBA L_{dn} but not exceeding 75 dBA L_{dn} - a normally unacceptable zone where mitigation measures would be required and each project would have to be individually evaluated for approval or denial. These measures must provide 5 dBA of attenuation above the attenuation provided by standard construction required in a 65 to 70 dBA L_{dn} area and 10 dBA of attenuation in a 70 to 75 dBA L_{dn} area, and
- Exceeding 75 dBA L_{dn} - an unacceptable zone in which projects would not, as a rule, be approved.

HUD's regulations do not include interior noise standards. Rather, a goal of 45 dBA L_{dn} is set forth and attenuation requirements are geared towards achieving that goal. HUD assumes that, using standard construction, any building will provide sufficient attenuation so that if the exterior level is 65 dBA L_{dn} or less, the interior level will be 45 dBA L_{dn} or less. It should be noted, however, that HUD regulations were created solely for residential development requiring government funding and are not related to the operation of other sensitive land uses such as schools or churches.

3. Federal Railroad Administration

The Environmental Protection Agency (EPA) is charged with the regulation of railroad noise under the Noise Control Act. No federal regulations specify absolute levels of acceptable noise that apply directly to railroad noise and compatible land uses along rail lines. While these regulations remain in full force, the EPA Office of Noise Abatement and Control was closed in 1982, leaving the enforcement of EPA regulations to the Federal Railroad Administration (FRA). Table N-2, Summary of EPA/FRA Railroad Noise Standards, summarizes the EPA railroad noise standards that set operating noise standards for railroad equipment and set noise limit standards for new equipment.

Table N-2
Summary of EPA/FRA Railroad Noise Standards

Noise Sources	*Operating Conditions*	*Noise Metric*[1, 2]	*Measured Distance (feet)*	*Standard (dBA)*
Non-Switcher Locomotives built on or before 12/31/79	Stationary	L_{max} (Slow)	100	73
	Idle Stationary	L_{max} (Slow)	100	93
	Non-Idle Moving	L_{ma}x (Fast)	100	95
Switcher Locomotives plus Non-Switcher Locomotives built after 12/31/79	Stationary	L_{max} (Slow)	100	70
	Idle Stationary	L_{max} (Slow)	100	87
	Non-Idle Moving	L_{max} (Fast)	100	90
Rail Cars	Speed $\leq$ 45 mph	L_{max} (Fast)	100	88
	Speed > 45 mph	L_{max} (Fast)	100	93
	Coupling	Adj. Avg. Max.	50	92

[1] Slow and fast exponential-time-weighting is used.
[2] Note that these values are in terms of the Lmax, and can be considerably greater than the Leq typically used in the measurement of obtrusive noise.
Source: United States Environmental Protection Agency Railroad Noise Emission Standard (40 Code of Federal Regulations Part 201).

4. California Department of Health Services

The California Department of Health Services (DHS) Office of Noise Control studied the correlation of noise levels and their effects on various land uses. As a result, the DHS established four categories for judging the severity of noise intrusion on specified land uses.

Figure N-1, Land Use Compatibility for Community Noise Exposure, presents a land use compatibility chart for community noise prepared by the California Office of Noise Control. It identifies “normally acceptable,” “conditionally acceptable,” “normally unacceptable,” and “clearly unacceptable” exterior noise levels for various land uses. A “conditionally acceptable” designation implies new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements for each land use is made and needed noise insulation features are incorporated in the design. By comparison, a “normally acceptable” designation indicates that standard construction can occur with no special noise reduction requirements.

Figure N-1 Land Use Compatibility for Community Noise Exposure

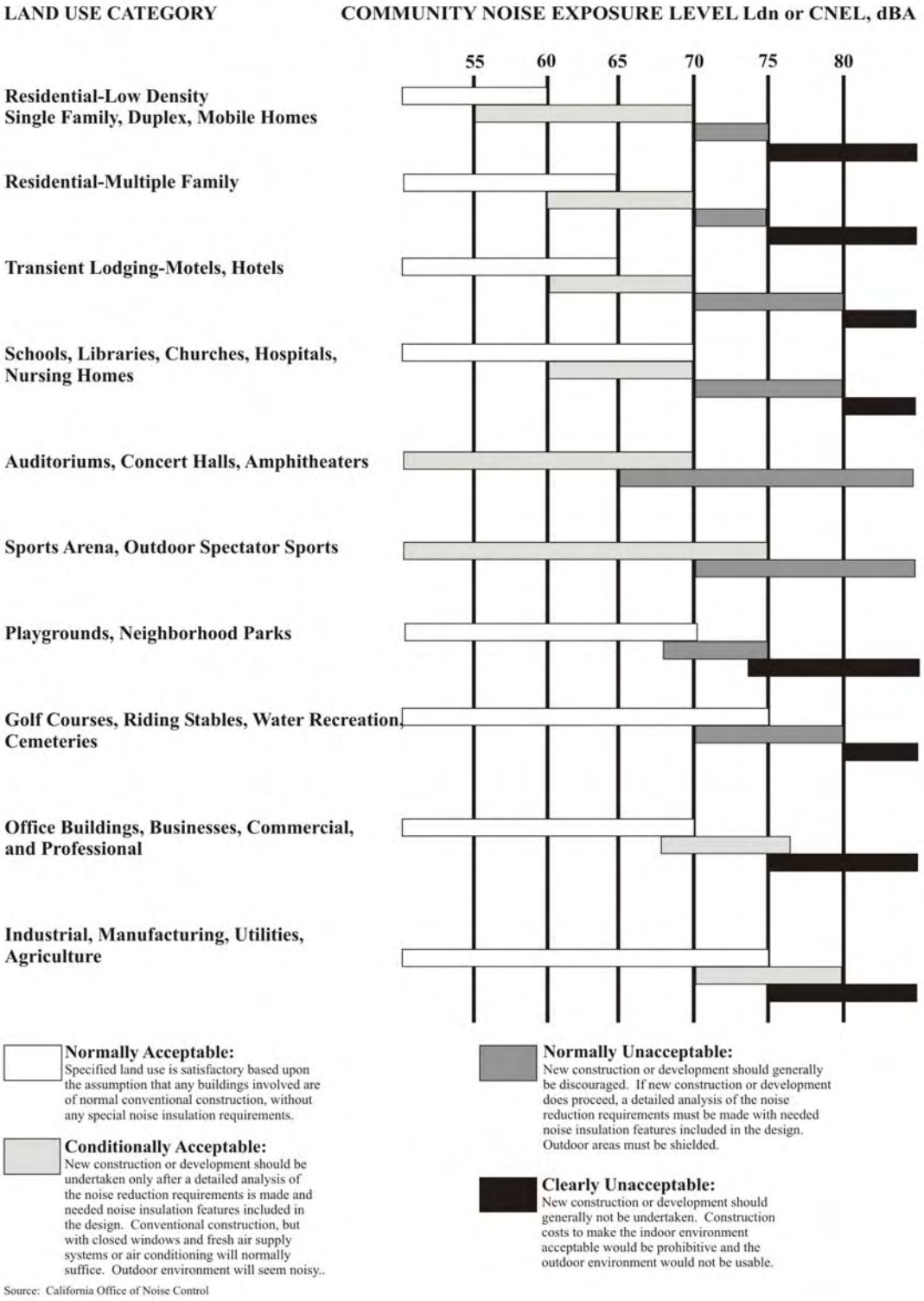


Table N-3, State of California Interior and Exterior Noise Standards, includes the State interior and exterior noise standards for varying land uses. It is important to note that the exterior noise levels are to be attained in "habitable" exterior areas and need not encompass the entirety of a property.

Table N-3
State of California Interior and Exterior Noise Standards

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

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

[2] Outdoor environment limited to:

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

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

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

5. City of San Bernardino Noise Ordinance

The City of San Bernardino Noise Ordinance (Section 19.20.030.15 of the Development Code) specifies the maximum acceptable levels of noise for residential uses in the City. These standards indicate that exterior noise

levels at residential locations should not exceed a CNEL of 65 dB while interior levels shall not exceed an annual CNEL of 45 dB in any habitable room. Chapter 12, Airport Overlay District, of the Development Code provides additional noise standards related to the flight operations of the San Bernardino International Airport and Trade Center within the 65 dB noise contours.

Definitions

The following is a list of commonly used terms and abbreviations that may be found within this element or when discussing the topic of noise. It is important to become familiar with the definitions listed in order to better understand the importance of the Noise Element within the City of San Bernardino General Plan.

- **Ambient Noise** – The composite of noise from all sources near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

- **Intrusive Noise** – That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency and time of occurrence, and tonal or informational content as well as the prevailing noise level.

- **dB (Decibel)** – The unit of measure that denotes the ratio between two quantities that are proportional to power; the number of decibels corresponding to the ratio of the two amounts of power is based on a logarithmic scale.

- **dBA (A-weighted decibel)** – The A-weighted decibel scale discriminates against upper and lower frequencies in a manner approximating the sensitivity of the human ear. The scale is based on a reference pressure level of 20 micropascals (zero dBA). The scale ranges from zero for the average least perceptible sound to about 130 for the average pain level.

- **L_{50}** – The A-weighted sound level that is exceeded 50% of the sample time. Alternatively, the A-weighted sound level that is exceeded 30 minutes in a 60-minute period (similarly, L_{10}, L_{25}, etc.). These values are typically used to demonstrate compliance with noise restrictions included in the City noise ordinance.

- **L_{eq} (Equivalent Energy Level)** – The average acoustic energy content of noise during the time it lasts. The L_{eq} of a time-varying

noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure, no matter what time of day they occur.

- **L_{dn} (Day-Night Average Level)** – The average equivalent A-weighted sound level during a 24-hour day, obtained after the addition of 10 decibels to sound levels in the night from 10:00 p.m. to 7:00 a.m. Note: CNEL and Ldn represent daily levels of noise exposure averaged on an annual or daily basis, while Leq represents the equivalent energy noise exposure for a shorter time period, typically one hour.

- **CNEL (Community Noise Equivalent Level)** – The average equivalent A-weighted sound level during a 24-hour day, obtained after the addition of five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 decibels to sound levels in the night from 10:00 p.m. to 7:00 a.m.

- **Noise Contours** – Lines drawn around a noise source indicating equal levels of noise exposure. CNEL and L_{dn} are the metrics used in this document to describe annoyance due to noise and to establish land use planning criteria for noise.

- **Vibration** – Another community annoyance related to noise is vibration. As with noise, vibration can be described by both its amplitude and frequency. Amplitude may be characterized by displacement, velocity, and/or acceleration. Typically, particle velocity (measured in inches or millimeters per second) and/or acceleration (measured in gravities) are used to describe vibration.

  Vibration can be felt outdoors, but the perceived intensity of vibration impacts are much greater indoors, due to the shaking of the structure. Some of the most common sources of vibration come from trains and/or transit vehicles, construction equipment, airplanes, and large vehicles. Several land uses are especially sensitive to vibration, and therefore have a lower vibration threshold. These uses include, but are not limited to, concert halls, hospitals, libraries, vibration-sensitive research operations, residential areas, schools, and offices.

ACHIEVING THE VISION

As San Bernardino has developed and expanded its boundaries over time, there are numerous areas of the City that are impacted by noise. For instance, many residences are located near industrial areas or adjacent to busy streets or rail lines. The Citizens of San Bernardino are concerned about the effects of noise on their health and serenity and of the need to provide the range of uses needed to maintain a high quality of life.

There are several techniques to deal with noise impacts: applying noise attenuation techniques, limiting certain kinds of development near noise-producing land uses, implementing design and building techniques in site layouts and construction, and setting and enforcing standards for noise-producing land uses.

The Noise Element is responsive to our Vision because it represents our stated desires to:

- Manage and mitigate the impacts from truck traffic to decrease congestion and noise pollution;
- Locate future residential uses and other sensitive receptors away from existing noise sources; and
- Develop and employ measures to decrease the impacts associated with air and rail operations on sensitive receptors such as residences and schools.

GOALS AND POLICIES

The following presents the goals and policies for noise related issues in the City of San Bernardino planning area.

Land Use Planning and Design

As San Bernardino grows, the increases in population, employment, and tourist activity may generate more traffic and attract additional noise producing uses. Additionally, some undeveloped and underdeveloped areas are designated for land uses that may be noise-sensitive and are located in proximity to roadways, railroads, and transit facilities. As a result, land use compatibility in relation to noise is an important consideration in the planning and design process.

To identify potential mitigation to address noise abatement strategies, noise evaluations should be conducted when a proposed project places sensitive land uses and major noise generators within close proximity to each other. The City currently uses the project review process to identify potential noise issues and works with developers or landowners to apply site planning and other strategies to reduce noise impacts. A developer, for example, could take advantage of the natural shape and contours of a site to arrange buildings and other uses in a manner that would reduce, and possibly eliminate, noise impacts. Examples of other site and architectural techniques could include:

- Increasing the distance between noise source and receiver.
- Placing non-noise sensitive land uses such as parking lots, maintenance facilities and utility areas between the noise source and receiver.
- Using non-noise sensitive structures such as garages to shield noise-sensitive areas.
- Orienting buildings to shield outdoor spaces from a noise source.
- Locating bedrooms in residential developments on the side of the house facing away from major roads.

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

Policies:

14.1.1 Minimize, reduce, or prohibit, as may be required, the new development of housing, health care facilities, schools, libraries, religious facilities, and other noise sensitive uses in areas where existing or future noise levels exceed an Ldn of 65 dB(A) exterior and an Ldn of 45 dB(A) interior if the noise cannot be reduced to these levels. (LU-1)

14.1.2 Require that automobile and truck access to commercial properties abutting residential parcels be located at the maximum practical distance from the residential parcel. (LU-1)

14.1.3 Require that all parking for commercial uses abutting residential areas be enclosed within a structure, buffered by walls, and/or limited hours of operation. (LU-1)

14.1.4 Prohibit the development of new or expansion of existing industrial, commercial, or other uses that generate noise impacts on housing, schools, health care facilities or other sensitive uses above a Ldn of 65 dB(A). (LU-1)

Transportation Related Noise Sources

San Bernardino has long been a hub of transportation and includes several major highways (such as State Routes 18, 30, 330, and 66, as well as Interstates 10 and 215), major arterials, railways, and the San Bernardino International Airport and Trade Center. These transportation facilities, while important components to mobility and economic vitality, are the major contributors of noise in San Bernardino. Cost effective strategies to reduce their influence on the community noise environment are an essential part of the Noise Element.

Local government has little direct control of some of the transportation related noise at the source. These levels are set by state and federal agencies. However, the City does have some control over transportation noise that exceeds State and/or federal standards through the enforcement of the Municipal Code.

The most effective method the City has to mitigate transportation noise is through the application of noise barriers and site design review. The effect of a noise barrier is critically dependent on the distance between the noise source and the receiver. A noise barrier effect occurs when the barrier penetrates the "line of sight" between the source and receiver: the greater the penetration or height of the barrier, the greater the noise reduction. Additional attenuation can be achieved depending upon the source of transportation related noise.

1. Roadways

Roadways are a significant source of noise in the City. Sound emanates from vehicle engines and from the tires rolling over the pavement. One way the City can control vehicle noise is through speed reduction. A change of just 5 miles per hour can change the resultant noise by approximately one to two dBA. The difference in noise associated with a reduction of 10 miles per hour reduction could be roughly equivalent to reducing the traffic volume by one-half.

The City also has some control over traffic-generated noise through weight limitations and the designation of truck routes. Medium trucks, (i.e., those with a gross vehicle weight between 5 and 13.25 tons) produce as much acoustical energy as approximately 5 to 16 automobiles depending on the speed, with slower speeds demonstrating greater differential. Similarly, heavy trucks (i.e., those with a gross vehicle weight in excess of 13.25 tons) produce as much acoustical energy as 10 to 60 automobiles.

The City can further reduce traffic-generated noise by ensuring that street paving is maintained and bumps and dips are eliminated. Poor paving causes vehicles to bounce and this bouncing exacerbates the noise due to the rattling of the vehicle. Noise contours for the City's roadways and freeways are presented in Figure N-2, *Future Roadway Noise Contours*.

2. Aircraft

The San Bernardino International Airport (SBIA) accommodates cargo, airlines, and general aviation with the capacity to provide regional air traffic for domestic and international service, both commercial and cargo along with the necessary support facilities for major and smaller airlines.

Airport operations generate noise nuisances that could negatively impact nearby residences and businesses. The number of people exposed to airport noise should be minimized by limiting the development of sensitive land uses, such as residences, hospitals, and schools, within

Airport Noise Contours

As of the writing of this General Plan, the Airport Master Plan and the Comprehensive Land Use Plan (CLUP) for SBIA were in the process of being prepared. As a consequence, the precise noise contours were not available to include in this Plan. However, relative policies have been included in the General Plan. Upon adoption of the Airport Master Plan and CLUP, the new noise contours will be incorporated into Figure LU-4 of this General Plan.

specified noise contours. For planning purposes, federal and state laws have established well-defined regulations for acceptable noise levels with the basic criterion set at a maximum 65 decibel (dB) Community Noise Equivalent Level (CNEL) value. The noise contours for the San Bernardino International Airport are defined in the Comprehensive Land Use Plan (CLUP) for the SBIA and shown in Figure LU-4, San Bernardino International Airport Planning Boundaries. While there are some acceptable mitigation within the noise contours, avoidance by noise sensitive uses is often the best remedy. Conversely, those land uses with the fewest people or those that generate significant noise levels themselves (e.g. industrial uses), are ideally suited to locate within these noise contours.

Overflight creates another noise concern. An overflight is a distinctly visible and audible passage of an aircraft, not necessarily one that is directly overhead. Overflight often extends past the boundary of the defined CNEL contour and creates an annoyance. The SBIA has limited control of overflight impacts but provide policy guidance for minimizing these impacts in the CLUP.

Airport Related Policies in our General Plan

The San Bernardino International Airport (SBIA) influences many aspects of our community: from land use and economics, to circulation, noise, and safety. Accordingly, see related discussions/policies in the Land Use (Chapter 2) and Noise (Chapter 14) Chapters.

In addition, local helicopter air traffic is commonplace throughout the City. News and other helicopters (e.g., freeway traffic report helicopters) fly through the area. Helicopter use for fire and police and at hospitals is considered as an emergency activity and is addressed by FAA regulations. There are currently five heliports in San Bernardino (National Orange Show, Red Dog Properties, San Bernardino Community Hospital, SCE Eastern Division, and in the Tri-City area).

3. Railways

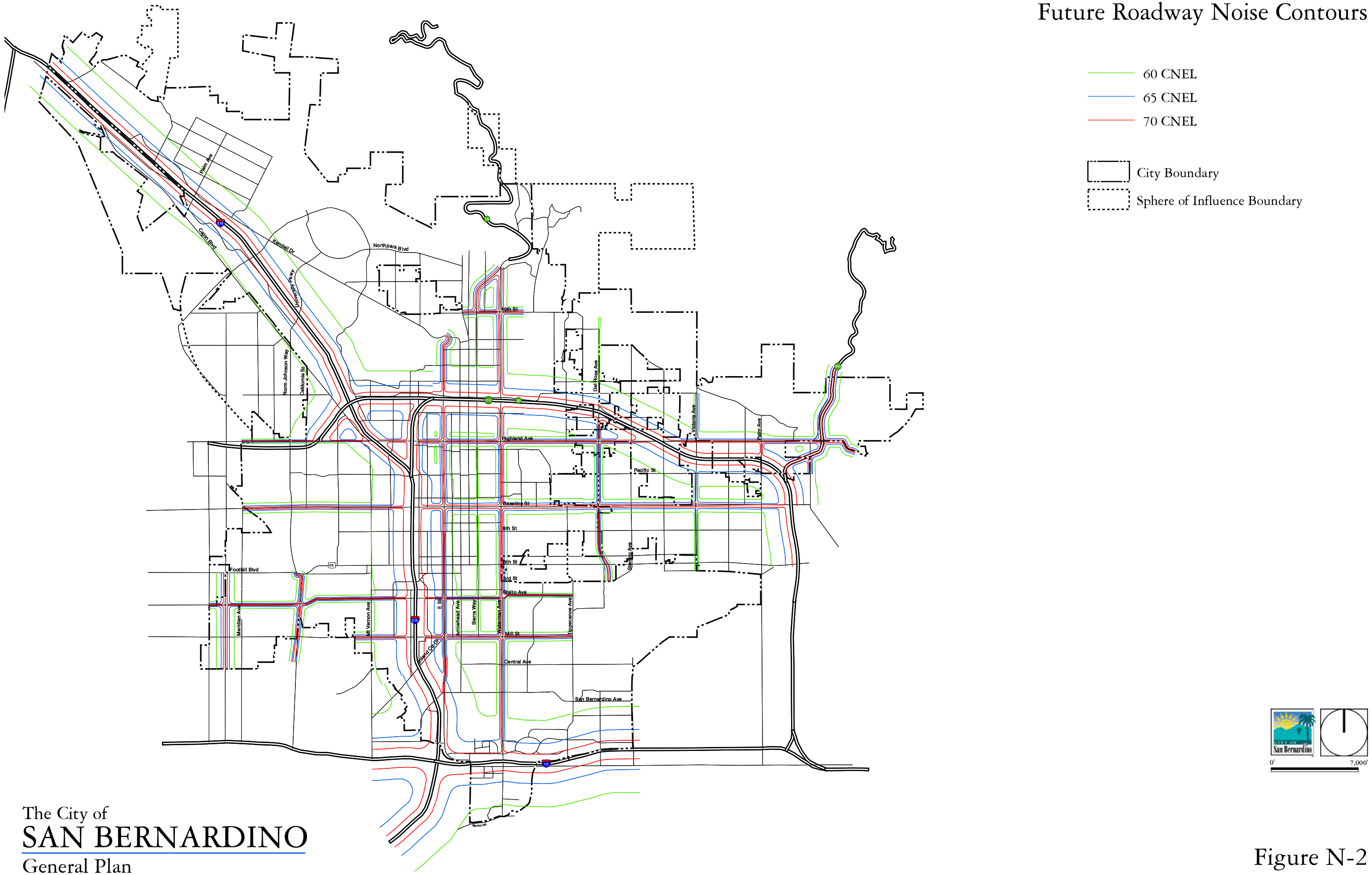
Another prevalent source of noise in the City is from railroad operations. Within the San Bernardino planning area, trains travel on three different rail lines that include: (1) The Cajon Pass Line; (2) The Main Line-Redlands, which extends eastward to the City of Redlands; and, (3) The Main Line-Colton, which extends westward to the City of Colton.

Burlington Northern Santa Fe (BNSF) and Union Pacific (UP) also operate rail lines within the City. These rail lines include: (1) The Santa Fe Subdivision Two Line; (2) The Santa Fe Subdivision Three Line; and, (3) The Santa Fe Cajon Pass Line. Each route contributes a different level of noise to the City resulting from the different volumes of train traffic that occur on each line.

Railroad noise is dependant on a number of factors including the number of operations per day, the times these operations occur, the numbers of

engines and railcars, the speed, the type of rail (i.e., continuous or bolted), and whether at-grade rail crossings exist that require engineers to sound a warning horn. Noise contours for railway operations are presented in Figure N-2, *Future Roadway Noise Contours*.

Future Roadway Noise Contours



The City of
SAN BERNARDINO
General Plan

Figure N-2

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

Policies:

14.2.1 Work with Caltrans to landscape or install mitigation elements along freeways and highways adjacent to existing residential subdivisions or noise-sensitive uses to reduce noise impacts. (N-1)

14.2.2 Employ noise mitigation practices when designing future streets and highways, and when improvements occur along existing road segments. Mitigation measures should emphasize the establishment of natural buffers or setbacks between the arterial roadways and adjoining noise-sensitive areas. (N-1)

14.2.3 Require that development that increases the ambient noise level adjacent to noise-sensitive land uses provide appropriate mitigation measures. (LU-1)

14.2.4 Maintain roadways so that the paving is in good condition and free of cracks, bumps, and potholes. (A-2)

14.2.5 Require sound walls, berms, and landscaping along existing and future highways and railroad right-of-ways to beautify the landscape and reduce noise. (N-1)

14.2.6 Buffer residential neighborhoods from noise caused by train operations and increasing high traffic volumes along major arterials and freeways. (N-1)

14.2.7 Require heliports/helistops to comply with Federal Aviation Administration standards.

14.2.8 Minimize noise attributable to vehicular travel in residential neighborhoods by inhibiting through trips by the use of cul-de-sacs, one-way streets, and other traffic controls.

14.2.9 Enforce sections of the California Vehicle Code related to mufflers and modified exhaust systems.

14.2.10 Provide for the development of alternate transportation modes such as bicycle paths and pedestrian walkways to minimize the number of automobile trips. (LU-1)

14.2.11 Require that new equipment and vehicles purchased by the City comply with noise performance standards consistent with the best available noise reduction technology. (A-3)

14.2.12 Require that commercial and industrial uses implement transportation demand management programs consistent with the Air Quality Management Plan that provide incentives for car pooling, van pools, and the use of public transit to reduce traffic and associated noise levels in the City. (LU-1)

14.2.13 Work with local agencies and businesses to provide public transit services that reduce traffic and associated noise.

14.2.14 Work with public transit agencies to ensure that the buses, vans, and other vehicles used do not generate excessive noise levels.

14.2.15 Work with all railroad operators in the City to properly maintain lines and establish operational restrictions during the early morning and late evening hours to reduce impacts in residential areas and other noise sensitive areas.

14.2.16 Work with all railroad operators to install noise mitigation features where operations impact existing adjacent residential or other noise-sensitive uses.

14.2.17 Ensure that new development is compatible with the noise compatibility criteria and noise contours as defined in the Comprehensive Land Use Plan for the SBIA and depicted in Figure LU-4.

14.2.18 Limit the development of sensitive land uses located within the 65 decibel (dB) Community Noise Equivalent Level (CNEL) contour, as defined in the Comprehensive Land Use Plan for the SBIA and depicted in Figure LU-4.

14.2.19 As may be necessary, require acoustical analysis and ensure the provision of effective noise mitigation measures for sensitive land uses, especially residential uses, in areas significantly impacted by noise.

Non-Transportation Related Noise Sources

The City currently has a diverse collection of land uses, most of which generate their own noise. Industrial facilities generate noise through various processes that involve the use of heavy equipment and machinery. Commercial facilities and residential units can generate noise from the use of heating, ventilating, air conditioning (HVAC) units, pool and spa pumps, as well as landscape maintenance equipment. Additionally, schoolyard activities, barking dogs, and residential parties can also be sources of nuisance noise.

Mixed-use areas that place more sensitive residential uses alongside or above commercial uses can present their own problems. Requiring that the commercial aspect meet a residential standard could make commercial operations difficult and offer an unfair competitive advantage to a similar operation placed in a dedicated commercial zone. Alternatively, applying a commercial standard to a mixed-use project could result in unacceptable noise levels at the residential portion of the structure/site. Still, mixed-use projects offer several advantages from both an air quality and transportation perspective, and should be encouraged.

Another source of noise comes from the operations of trucks and trains within the City. As previously mentioned, the operation of railroad trains and heavy trucks is preempted from local noise regulation while operating on public roads and dedicated right-of-ways. However, noise is also generated by operations (e.g., idling, loading, and unloading) that occur at facilities. Once on private property, these sources are no longer considered preempted and the City has authority to regulate this noise if it "spills" into adjacent areas.

Finally, construction in all land use zones can temporarily elevate noise. The City recognizes that construction is a necessity; still, various measures are available to reduce this nuisance (and potentially hazardous) noise when necessary.

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

Policies:

14.3.1 Require that construction activities adjacent to residential units be limited as necessary to prevent adverse noise impacts. (LU-1)

14.3.2 Require that construction activities employ feasible and practical techniques that minimize the noise impacts on adjacent uses. (LU-1)

14.3.3 Adopt and enforce a standard for exterior noise levels for all commercial uses that prevents adverse levels of discernible noise on adjoining residential properties. (A-1)

14.3.4 Adopt and enforce a standard for exterior noise levels from the use of leaf blowers, motorized lawn mowers, parking lot sweepers, or other high-noise equipment on commercial properties if their activity will result in noise that adversely affects abutting residential parcels. (A-1)

14.3.5 Require that the hours of truck deliveries to commercial properties abutting residential uses be limited unless there is no feasible alternative or there are overriding transportation benefits by scheduling deliveries at another hour. (LU-1)

14.3.6 Ensure that buildings are constructed soundly to prevent adverse noise transmission between differing uses located in the same structure and individual residences in multi-family buildings. (LU-1)

14.3.7 Require that commercial uses in structures containing residences on upper floors not be noise intensive. (LU-1)

14.3.8 Require common walls and floors between commercial and residential uses be constructed to minimize the transmission of noise and vibration. (LU-1)

APPENDIX 3.2

City Of San Bernardino Noise Ordinance

any stationary engine driven by means of internal combustion of gases therein, within the City of San Bernardino without placing upon the exhaust thereof a muffler or other device so as to silence the noise or report caused by the escaping of such gases from and through such exhaust. (Ord. 465 §1, 9-5-11.)

8.51.020 Violation - Penalty.

Any person, firm or corporation violating any provision of this chapter is guilty of an infraction, which upon conviction thereof is punishable in accordance with the provisions of §1.12.010 of this Code. (Ord. MC-460, 5-13-85; Ord. 465 §2, 9-5-11.)

Chapter 8.54
NOISE CONTROL

Sections:

8.54.010 Purpose and Intent.
8.54.020 Prohibited Acts.
8.54.030 Issuance of Written Notice and Impoundment.
8.54.040 Cost Recovery for Second Response.
8.54.050 Controlled Hours of Operation.
8.54.060 Exemptions.
8.54.070 Disturbances From Construction Activity.
8.54.080 Violation - Penalty
8.54.090 Severability.

8.54.010 Purpose and Intent.

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

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

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

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

(Ord. MC-1246, 5-21-07; Ord. 1925 §1, 11-5-51.)

8.54.020 Prohibited Acts.

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

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

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

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

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

1. Plainly audible across property boundaries;

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

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

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

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

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

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

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

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

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

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

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

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

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

1. The level of noise;

2. The level of background noise;

3. The proximity of the noise to sleeping facilities;

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

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

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

7. The duration of the noise;

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

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

(Ord. MC-1246, 5-21-07; Ord. 2102, 1956; Ord. 1925 §2, 1951.)

8.54.030 Issuance of Written Notice and Impoundment.

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

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

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

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

(Ord. MC-1246, 5-21-07; Ord. MC-649, 1-3-89; Ord. 1925 §3, 1951.)

8.54.040 Cost Recovery for Second Response.

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

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

C. The response charge shall be deemed to be a civil debt to the City.
(Ord. MC-1246, 5-21-07; Ord. MC-460, 5-13-85; Ord. 1925 §5, 1951.)

8.54.050 Controlled Hours of Operation.

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

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

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

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

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

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

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

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

H. Repair, rebuild, reconstruct, or dismantle any motor vehicle or other mechanical equipment or devices in a manner so as to be plainly audible across property lines.
(Ord. MC-1246, 5-21-07)

8.54.060 Exemptions.

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

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

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

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

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

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

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

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

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

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

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

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

(Ord. MC-1246, 5-21-07)

8.54.070 Disturbances from Construction Activity.

No person shall be engaged or employed, or cause any other person to be engaged or employed, in any work of construction, erection, alteration, repair, addition, movement, demolition, or improvement to any building or structure except within the hours of 7:00 a.m. and 8:00 p.m. (Ord. MC-1246, 5-21-07)

8.54.080 Violation - Penalty.

Any person violating any of the provisions of this Chapter is guilty of an infraction or a misdemeanor, which upon conviction thereof is punishable in accordance with the provisions of Section 1.12.010 of this code. (Ord. MC-1246, 5-21-07)

8.54.090 Severability.

The provisions of this Chapter are severable, and, if any sentence, section or other part of this Chapter should be found to be invalid, such invalidity shall not affect the remaining provisions, and the remaining provisions shall continue in full force and effect. (Ord. MC-1246, 5-21-07)

Chapter 8.57
SOUND VEHICLES

Sections:

8.57.010 Definitions.
8.57.020 Exclusions and exceptions.
8.57.030 Sound vehicles prohibited in certain places.
8.57.040 Registration required.
8.57.050 Filing changes in application.
8.57.060 Registration and identification.
8.57.070 Regulation for use.
8.57.080 Commercial advertising by sound truck prohibited.
8.57.090 Violation-Penalty.

8.57.010 Definitions.

A. "Person" as used in this Chapter includes the singular and the plural and also means and includes any person, firm, corporation, association, club, partnership, society or any other form of association or organization.

B. "Sound vehicle" means any vehicle which carries or is equipped with any instrument or device for the production or reproduction of music, spoken words or other sounds, or any loudspeaker, or other sound-amplifying device designed to enlarge the volume of sound produced by any instrument or by the human voice, which instrument or device is used or intended to be used for the purpose of advertising or calling attention to any article, thing or event, or for the purpose of addressing the public or of attracting the attention of the public, along or upon the public streets or ways along which such vehicle travels.

(Ord. 2096 §1, 1956.)

8.57.020 Exclusions and exceptions.

The definition set forth in Section 8.57.010 shall not be deemed to include:

A. Vehicles used only in a parade conducted pursuant to a permit issued by the Common Council;

B. A vehicle equipped with a siren or horn designed and used for the purpose of warning traffic because of such equipment or use, nor any vehicle operated

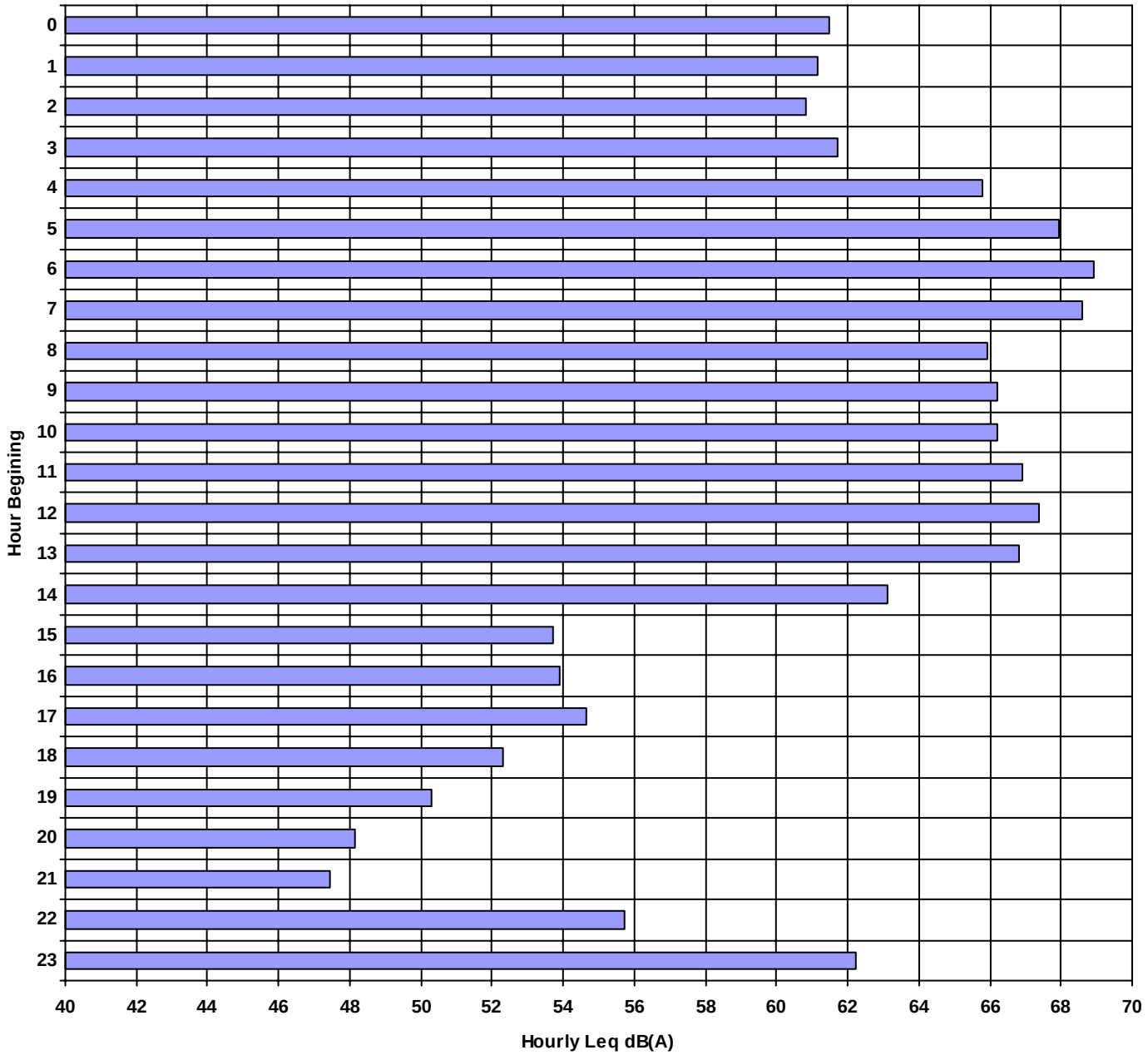
APPENDIX 4.1

Noise Monitoring Data Printouts

24-Hour Noise Level Measurement Summary

Project Name: National Orange Noise Study
Job Number: 07780
Location #: L1
Analyst: J.T. Stephens
Description: L1
Start Date: Tuesday, May 10, 2011

Hourly Leq dB(A) Readings (unadjusted)



Wednesday, July 06, 2011

24-Hour Noise Level Measurement Summary

Project Name: National Orange Noise Study
Job Number: 07780
Location #: L1
Analyst: J.T. Stephens
Description: L1
Start Date: Tuesday, May 10, 2011

Leq To CNEL Noise Calculations

Noise Hour	Hourly Leq	CNEL Penalty	Adjusted Hourly Leq
0	61.5	10	71.5
1	61.1	10	71.1
2	60.8	10	70.8
3	61.7	10	71.7
4	65.8	10	75.8
5	67.9	10	77.9
6	68.9	10	78.9
7	68.6	0	68.6
8	65.9	0	65.9
9	66.2	0	66.2
10	66.2	0	66.2
11	66.9	0	66.9
12	67.4	0	67.4
13	66.8	0	66.8
14	63.1	0	63.1
15	53.7	0	53.7
16	53.9	0	53.9
17	54.7	0	54.7
18	52.3	0	52.3
19	50.3	5	55.3
20	48.2	5	53.2
21	47.4	5	52.4
22	55.7	10	65.7
23	62.2	10	72.2

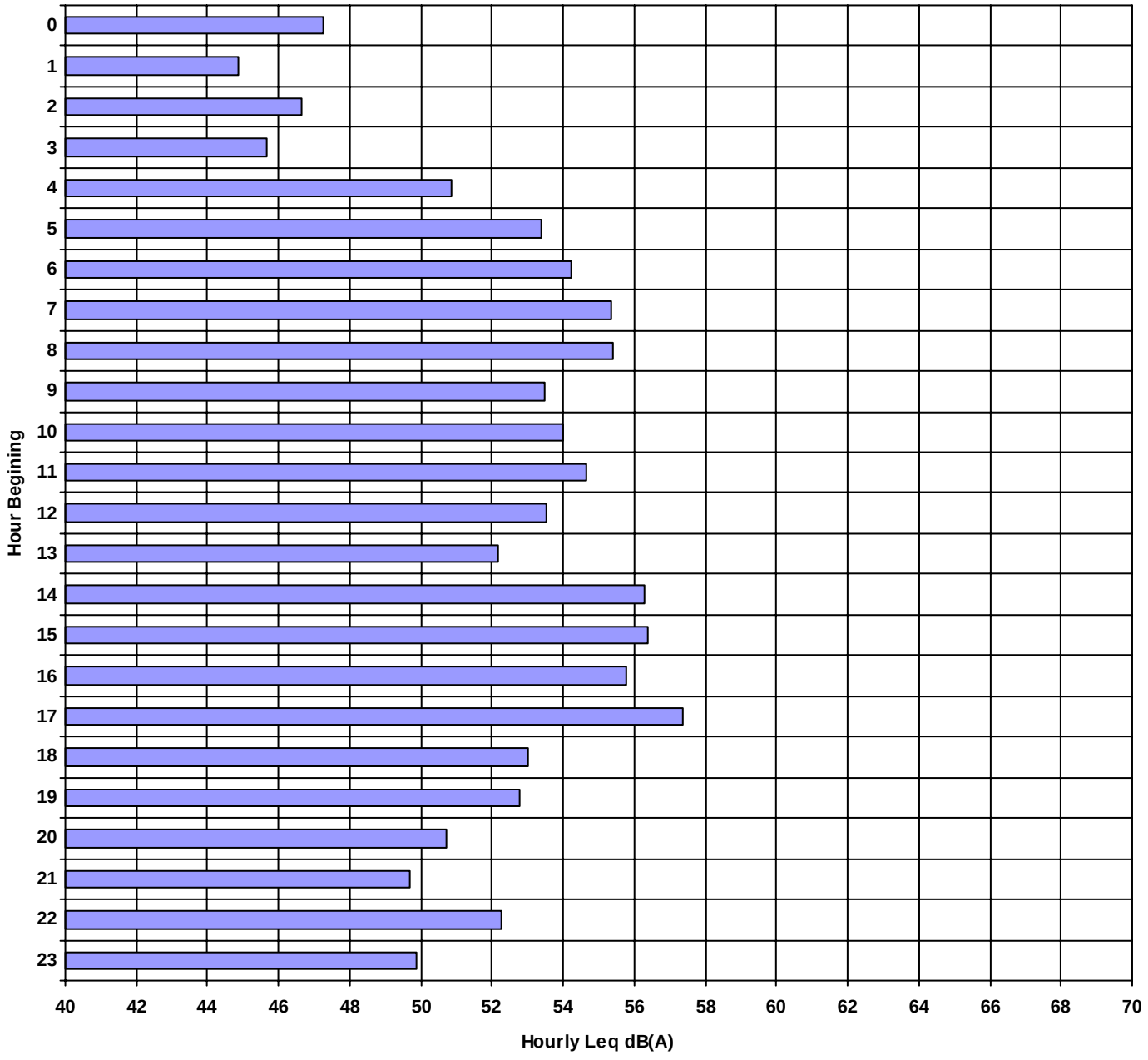
Calculated CNEL: 70.8

24-Hour Noise Level Measurement Summary

Project Name: National Orange Noise Study
Location #: L2
Description: L2
Start Date: Tuesday, May 10, 2011

Job Number: 07780
Analyst: J.T. Stephens

Hourly Leq dB(A) Readings (unadjusted)



Measured Peak Noise Hour: 17

Measured Peak Hour dBA Leq: 57.4

Wednesday, July 06, 2011

24-Hour Noise Level Measurement Summary

Project Name: National Orange Noise Study
Location #: L2
Description: L2
Start Date: Tuesday, May 10, 2011

Job Number: 07780
Analyst: J.T. Stephens

Leq To CNEL Noise Calculations

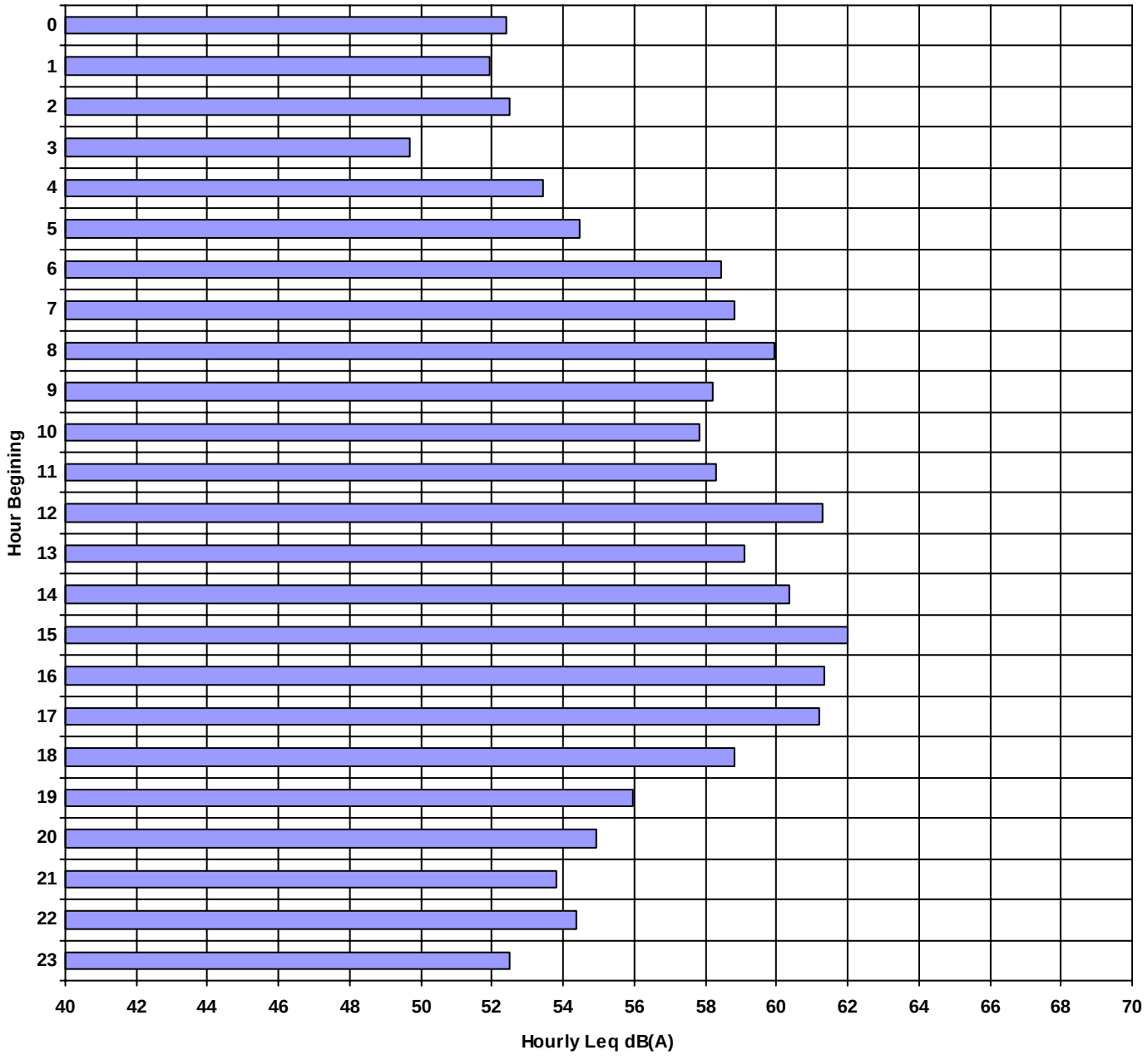
Noise Hour	Hourly Leq	CNEL Penalty	Adjusted Hourly Leq
0	47.3	10	57.3
1	44.9	10	54.9
2	46.6	10	56.6
3	45.7	10	55.7
4	50.9	10	60.9
5	53.4	10	63.4
6	54.2	10	64.2
7	55.3	0	55.3
8	55.4	0	55.4
9	53.5	0	53.5
10	54.0	0	54.0
11	54.7	0	54.7
12	53.5	0	53.5
13	52.2	0	52.2
14	56.3	0	56.3
15	56.4	0	56.4
16	55.8	0	55.8
17	57.4	0	57.4
18	53.0	0	53.0
19	52.8	5	57.8
20	50.7	5	55.7
21	49.7	5	54.7
22	52.3	10	62.3
23	49.9	10	59.9

Calculated CNEL: 58.1

24-Hour Noise Level Measurement Summary

Project Name: National Orange Noise Study
Job Number: 07780
Location #: L3
Analyst: J.T. Stephens
Description: L3
Start Date: Tuesday, May 10, 2011

Hourly Leq dB(A) Readings (unadjusted)



Measured Peak Noise Hour: 15

Measured Peak Hour dBA Leq: 62.0

Wednesday, July 06, 2011

24-Hour Noise Level Measurement Summary

Project Name: National Orange Noise Study
Job Number: 07780
Location #: L3
Analyst: J.T. Stephens
Description: L3
Start Date: Tuesday, May 10, 2011

Leq To CNEL Noise Calculations

Noise Hour	Hourly Leq	CNEL Penalty	Adjusted Hourly Leq
0	52.4	10	62.4
1	51.9	10	61.9
2	52.5	10	62.5
3	49.7	10	59.7
4	53.4	10	63.4
5	54.5	10	64.5
6	58.4	10	68.4
7	58.8	0	58.8
8	59.9	0	59.9
9	58.2	0	58.2
10	57.8	0	57.8
11	58.3	0	58.3
12	61.3	0	61.3
13	59.1	0	59.1
14	60.4	0	60.4
15	62.0	0	62.0
16	61.3	0	61.3
17	61.2	0	61.2
18	58.8	0	58.8
19	56.0	5	61.0
20	54.9	5	59.9
21	53.8	5	58.8
22	54.4	10	64.4
23	52.5	10	62.5

Calculated CNEL: 61.9

APPENDIX 5.1

Roadway Construction Noise Model (RCNM) Database

Table 1. CA/T equipment noise emissions and acoustical usage factors database.

CA/T Noise Emission Reference Levels and Usage Factors					
filename: EQUIPLST.xls					
revised: 7/26/05					
Equipment Description	Impact Device ?	Acoustical Use Factor (%)	Spec 721.560 Lmax @ 50ft (dBA, slow)	Actual Measured Lmax @ 50ft (dBA, slow) (samples averaged)	No. of Actual Data Samples (Count)
All Other Equipment > 5 HP	No	50	85	-- N/A --	0
Auger Drill Rig	No	20	85	84	36
Backhoe	No	40	80	78	372
Bar Bender	No	20	80	-- N/A --	0
Blasting	Yes	-- N/A --	94	-- N/A --	0
Boring Jack Power Unit	No	50	80	83	1
Chain Saw	No	20	85	84	46
Clam Shovel (dropping)	Yes	20	93	87	4
Compactor (ground)	No	20	80	83	57
Compressor (air)	No	40	80	78	18
Concrete Batch Plant	No	15	83	-- N/A --	0
Concrete Mixer Truck	No	40	85	79	40
Concrete Pump Truck	No	20	82	81	30
Concrete Saw	No	20	90	90	55
Crane	No	16	85	81	405
Dozer	No	40	85	82	55
Drill Rig Truck	No	20	84	79	22
Drum Mixer	No	50	80	80	1
Dump Truck	No	40	84	76	31
Excavator	No	40	85	81	170
Flat Bed Truck	No	40	84	74	4
Front End Loader	No	40	80	79	96
Generator	No	50	82	81	19
Generator (<25KVA, VMS signs)	No	50	70	73	74
Gradall	No	40	85	83	70
Grader	No	40	85	-- N/A --	0
Grapple (on backhoe)	No	40	85	87	1
Horizontal Boring Hydr. Jack	No	25	80	82	6
Hydra Break Ram	Yes	10	90	-- N/A --	0
Impact Pile Driver	Yes	20	95	101	11
Jackhammer	Yes	20	85	89	133
Man Lift	No	20	85	75	23
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	212
Pavement Scarafier	No	20	85	90	2
Paver	No	50	85	77	9
Pickup Truck	No	40	55	75	1
Pneumatic Tools	No	50	85	85	90
Pumps	No	50	77	81	17
Refrigerator Unit	No	100	82	73	3
Rivit Buster/chipping gun	Yes	20	85	79	19
Rock Drill	No	20	85	81	3
Roller	No	20	85	80	16
Sand Blasting (Single Nozzle)	No	20	85	96	9
Scraper	No	40	85	84	12
Shears (on backhoe)	No	40	85	96	5
Slurry Plant	No	100	78	78	1
Slurry Trenching Machine	No	50	82	80	75
Soil Mix Drill Rig	No	50	80	-- N/A --	0
Tractor	No	40	84	-- N/A --	0
Vacuum Excavator (Vac-truck)	No	40	85	85	149
Vacuum Street Sweeper	No	10	80	82	19
Ventilation Fan	No	100	85	79	13
Vibrating Hopper	No	50	85	87	1
Vibratory Concrete Mixer	No	20	80	80	1
Vibratory Pile Driver	No	20	95	101	44
Warning Horn	No	5	85	83	12
Welder / Torch	No	40	73	74	5

APPENDIX 6.1

Off-Site FHWA Traffic Noise Model Printouts

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Existing	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	w/o I St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,160	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.39	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-15.84	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.80	-4.51	-1.20	*-5.16*	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	63.6
Medium Trucks:	57.9	56.4	50.0	48.5	56.9	57.2
Heavy Trucks:	58.7	57.3	48.3	49.5	57.9	58.0
Vehicle Noise:	66.0	64.2	61.1	56.4	64.9	65.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	46	99	214	460
CNEL:	49	106	229	494

Wednesday, July 06, 2011

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Existing	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	I St. to I-215	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,380	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.81	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-15.42	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.38	-4.51	-1.20	*-5.16*	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	54.8	63.5	64.1
Medium Trucks:	58.3	56.8	50.4	48.9	57.4	57.6
Heavy Trucks:	59.2	57.7	48.7	50.0	58.3	58.4
Vehicle Noise:	66.4	64.6	61.5	56.8	65.4	65.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	49	106	228	491
CNEL:	53	113	244	526

Wednesday, July 06, 2011

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Existing	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	I-215 to G St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,660	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.25	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-16.99	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-20.94	-4.51	-1.20	*-5.16*	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	53.3	61.9	62.5
Medium Trucks:	56.7	55.2	48.9	47.3	55.8	56.0
Heavy Trucks:	57.6	56.2	47.1	48.4	56.7	56.9
Vehicle Noise:	64.8	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:	39	83	179	386
CNEL:	41	89	192	414

Wednesday, July 06, 2011

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Existing	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	G St. to E St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,490	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.22	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-17.46	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-21.41	-4.51	-1.20	*-5.16*	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	58.9	52.8	61.4	62.0
Medium Trucks:	56.3	54.8	48.4	46.9	55.3	55.6
Heavy Trucks:	57.1	55.7	46.7	47.9	56.3	56.4
Vehicle Noise:	64.4	62.6	59.5	54.8	63.3	63.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	36	77	167	359
CNEL:	39	83	179	385

Wednesday, July 06, 2011

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Existing	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	E St. to Arrowhead Ave.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,570	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.01	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-17.23	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-21.19	-4.51	-1.20	*-5.16*	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	61.7	62.3
Medium Trucks:	56.5	55.0	48.6	47.1	55.6	55.8
Heavy Trucks:	57.4	55.9	46.9	48.1	56.5	56.6
Vehicle Noise:	64.6	62.8	59.7	55.0	63.6	64.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	37	80	173	372
CNEL:	40	86	185	399

Wednesday, July 06, 2011

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Existing	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	Arrowhead Ave. to Mountain View	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,510	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.16	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-17.40	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-21.36	-4.51	-1.20	*-5.16*	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:	62.6	60.7	58.9	52.9	61.5	62.1
Medium Trucks:	56.3	54.8	48.5	46.9	55.4	55.6
Heavy Trucks:	57.2	55.8	46.7	48.0	56.3	56.5
Vehicle Noise:	64.4	62.7	59.5	54.8	63.4	63.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	36	78	168	362
CNEL:	39	84	180	389

Wednesday, July 06, 2011

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Existing	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	e/o Mountain View Ave.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,420	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.43	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-17.67	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-21.62	-4.51	-1.20	*-5.16*	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:	62.3	60.4	58.6	52.6	61.2	61.8
Medium Trucks:	56.1	54.6	48.2	46.7	55.1	55.3
Heavy Trucks:	56.9	55.5	46.5	47.7	56.1	56.2
Vehicle Noise:	64.1	62.4	59.3	54.6	63.1	63.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	35	75	161	348
CNEL:	37	80	173	373

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Existing	*Project Name:*	National Orange Noise
Road Name:	Central Avenue	*Job Number:*	7780
Road Segment:	Arrowhead Ave. to Sierra Way	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	380	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-5.64	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	77.72	-22.88	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	82.99	-26.84	-4.51	-1.20	*-5.16*	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:	55.2	53.3	51.5	45.4	54.1	54.7
Medium Trucks:	49.1	47.6	41.3	39.7	48.2	48.4
Heavy Trucks:	50.4	49.0	40.0	41.2	49.6	49.7
Vehicle Noise:	57.2	55.4	52.2	47.6	56.1	56.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	12	26	55	119
CNEL:	13	27	59	127

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Existing	*Project Name:*	National Orange Noise
Road Name:	Central Avenue	*Job Number:*	7780
Road Segment:	e/o Sierra Way	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	410	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-5.31	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	77.72	-22.55	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	82.99	-26.51	-4.51	-1.20	*-5.16*	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:	55.5	53.6	51.8	45.8	54.4	55.0
Medium Trucks:	49.5	47.9	41.6	40.0	48.5	48.7
Heavy Trucks:	50.8	49.4	40.3	41.6	49.9	50.0
Vehicle Noise:	57.5	55.8	52.5	47.9	56.5	56.9

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

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Existing	*Project Name:*	National Orange Noise
Road Name:	Orange Show Road	*Job Number:*	7780
Road Segment:	w/o Camino Real	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	600	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-4.17	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-21.41	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-25.36	-4.51	-1.20	*-5.16*	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:	58.6	56.7	54.9	48.9	57.5	58.1
Medium Trucks:	52.3	50.8	44.5	42.9	51.4	51.6
Heavy Trucks:	53.2	51.8	42.7	44.0	52.3	52.4
Vehicle Noise:	60.4	58.7	55.5	50.8	59.4	59.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	20	42	91	196
CNEL:	21	45	98	210

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Existing	*Project Name:*	National Orange Noise
Road Name:	Orange Show Road	*Job Number:*	7780
Road Segment:	Camino Real to I-215	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	710	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-3.44	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-20.68	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-24.63	-4.51	-1.20	*-5.16*	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:	59.3	57.4	55.6	49.6	58.2	58.8
Medium Trucks:	53.1	51.6	45.2	43.6	52.1	52.3
Heavy Trucks:	53.9	52.5	43.4	44.7	53.1	53.2
Vehicle Noise:	61.1	59.4	56.2	51.6	60.1	60.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	22	47	102	219
CNEL:	24	51	109	235

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Existing	*Project Name:*	National Orange Noise
Road Name:	Orange Show Road	*Job Number:*	7780
Road Segment:	I-215 to E St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,550	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	2.11	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-15.12	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.08	-4.51	-1.20	*-5.16*	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:	64.9	63.0	61.2	55.1	63.8	64.4
Medium Trucks:	58.6	57.1	50.7	49.2	57.7	57.9
Heavy Trucks:	59.5	58.0	49.0	50.3	58.6	58.7
Vehicle Noise:	66.7	64.9	61.8	57.1	65.7	66.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	51	111	239	514
CNEL:	55	119	256	551

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Existing	*Project Name:*	National Orange Noise
Road Name:	Orange Show Road	*Job Number:*	7780
Road Segment:	E St. to Arrowhead Ave.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,150	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.37	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-15.86	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.82	-4.51	-1.20	*-5.16*	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:	57.9	56.4	50.0	48.5	56.9	57.1
Heavy Trucks:	58.7	57.3	48.3	49.5	57.9	58.0
Vehicle Noise:	65.9	64.2	61.1	56.4	64.9	65.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	46	99	213	459
CNEL:	49	106	228	492

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Existing	*Project Name:*	National Orange Noise
Road Name:	Orange Show Road	*Job Number:*	7780
Road Segment:	e/o Arrowhead Ave.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,670	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.28	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-16.96	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-20.92	-4.51	-1.20	*-5.16*	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	59.4	53.3	61.9	62.5
Medium Trucks:	56.8	55.3	48.9	47.4	55.8	56.1
Heavy Trucks:	57.6	56.2	47.2	48.4	56.8	56.9
Vehicle Noise:	64.9	63.1	60.0	55.3	63.8	64.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	39	83	180	388
CNEL:	42	90	193	416

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Existing	*Project Name:*	National Orange Noise
Road Name:	E Street	*Job Number:*	7780
Road Segment:	n/o Mill St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,470	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.28	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-17.52	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-21.47	-4.51	-1.20	*-5.16*	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	52.7	61.4	62.0
Medium Trucks:	56.2	54.7	48.3	46.8	55.3	55.5
Heavy Trucks:	57.1	55.6	46.6	47.9	56.2	56.3
Vehicle Noise:	64.3	62.6	59.4	54.7	63.3	63.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	36	77	165	356
CNEL:	38	82	177	382

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Existing	*Project Name:*	National Orange Noise
Road Name:	E Street	*Job Number:*	7780
Road Segment:	Mill St. to Orange Show Rd.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,790	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.58	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-16.66	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-20.62	-4.51	-1.20	*-5.16*	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:	63.3	61.4	59.7	53.6	62.2	62.8
Medium Trucks:	57.1	55.6	49.2	47.7	56.1	56.4
Heavy Trucks:	57.9	56.5	47.5	48.7	57.1	57.2
Vehicle Noise:	65.2	63.4	60.3	55.6	64.1	64.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	41	87	188	406
CNEL:	44	94	202	435

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Existing	*Project Name:*	National Orange Noise
Road Name:	E Street	*Job Number:*	7780
Road Segment:	s/o Orange Show Rd.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,540	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.08	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-17.31	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-21.27	-4.51	-1.20	*-5.16*	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:	56.4	54.9	48.6	47.0	55.5	55.7
Heavy Trucks:	57.3	55.8	46.8	48.1	56.4	56.5
Vehicle Noise:	64.5	62.8	59.6	54.9	63.5	63.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	37	79	170	367
CNEL:	39	85	183	394

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Existing	*Project Name:*	National Orange Noise
Road Name:	Arrowhead Avenue	*Job Number:*	7780
Road Segment:	n/o Mill St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

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

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.91	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-19.15	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-23.10	-4.51	-1.20	*-5.16*	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	57.2	51.1	59.7	60.3
Medium Trucks:	54.6	53.1	46.7	45.2	53.6	53.9
Heavy Trucks:	55.4	54.0	45.0	46.2	54.6	54.7
Vehicle Noise:	62.7	60.9	57.8	53.1	61.6	62.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	28	60	129	277
CNEL:	30	64	138	297

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Existing	*Project Name:*	National Orange Noise
Road Name:	Arrowhead Avenue	*Job Number:*	7780
Road Segment:	Mill St. to Central Ave.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,300	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.81	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-18.05	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-22.01	-4.51	-1.20	*-5.16*	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:	55.7	54.2	47.8	46.3	54.7	55.0
Heavy Trucks:	56.5	55.1	46.1	47.3	55.7	55.8
Vehicle Noise:	63.8	62.0	58.9	54.2	62.7	63.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	33	71	152	328
CNEL:	35	76	163	352

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Existing	*Project Name:*	National Orange Noise
Road Name:	Arrowhead Avenue	*Job Number:*	7780
Road Segment:	Central Ave. to Orange Show Rd.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,280	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.88	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-18.12	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-22.07	-4.51	-1.20	*-5.16*	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:	55.6	54.1	47.7	46.2	54.7	54.9
Heavy Trucks:	56.5	55.0	46.0	47.3	55.6	55.7
Vehicle Noise:	63.7	62.0	58.8	54.1	62.7	63.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	32	70	151	325
CNEL:	35	75	162	348

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 No Project	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	w/o I St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,440	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.92	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-15.32	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.27	-4.51	-1.20	*-5.16*	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:	58.4	56.9	50.6	49.0	57.5	57.7
Heavy Trucks:	59.3	57.8	48.8	50.1	58.4	58.5
Vehicle Noise:	66.5	64.8	61.6	56.9	65.5	65.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	50	108	232	499
CNEL:	54	115	248	535

Wednesday, July 06, 2011

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 No Project	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	I St. to I-215	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,590	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	2.18	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-15.06	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.01	-4.51	-1.20	*-5.16*	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:	64.9	63.0	61.3	55.2	63.8	64.4
Medium Trucks:	58.7	57.2	50.8	49.3	57.7	58.0
Heavy Trucks:	59.5	58.1	49.1	50.3	58.7	58.8
Vehicle Noise:	66.8	65.0	61.9	57.2	65.7	66.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	52	112	241	519
CNEL:	56	120	259	557

Wednesday, July 06, 2011

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 No Project	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	I-215 to G St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,250	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.57	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-15.67	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.62	-4.51	-1.20	*-5.16*	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:	58.1	56.6	50.2	48.7	57.1	57.3
Heavy Trucks:	58.9	57.5	48.5	49.7	58.1	58.2
Vehicle Noise:	66.1	64.4	61.3	56.6	65.1	65.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	47	102	219	473
CNEL:	51	109	235	507

Wednesday, July 06, 2011

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 No Project	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	G St. to E St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,040	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.15	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-16.09	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-20.05	-4.51	-1.20	*-5.16*	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:	63.9	62.0	60.2	54.2	62.8	63.4
Medium Trucks:	57.6	56.1	49.8	48.2	56.7	56.9
Heavy Trucks:	58.5	57.1	48.0	49.3	57.6	57.8
Vehicle Noise:	65.7	64.0	60.8	56.2	64.7	65.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	44	95	206	443
CNEL:	48	102	221	475

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 No Project	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	E St. to Arrowhead Ave.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,090	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.25	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-15.99	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.94	-4.51	-1.20	*-5.16*	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	54.3	62.9	63.5
Medium Trucks:	57.7	56.2	49.9	48.3	56.8	57.0
Heavy Trucks:	58.6	57.2	48.1	49.4	57.7	57.9
Vehicle Noise:	65.8	64.1	60.9	56.3	64.8	65.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	45	97	209	450
CNEL:	48	104	224	483

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 No Project	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	Arrowhead Ave. to Mountain View	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,990	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.04	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-16.20	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-20.16	-4.51	-1.20	*-5.16*	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	54.1	62.7	63.3
Medium Trucks:	57.5	56.0	49.7	48.1	56.6	56.8
Heavy Trucks:	58.4	57.0	47.9	49.2	57.5	57.7
Vehicle Noise:	65.6	63.9	60.7	56.0	64.6	65.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	44	94	202	436
CNEL:	47	101	217	467

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 No Project	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	e/o Mountain View Ave.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,900	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.84	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-16.40	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-20.36	-4.51	-1.20	*-5.16*	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:	57.3	55.8	49.5	47.9	56.4	56.6
Heavy Trucks:	58.2	56.8	47.7	49.0	57.3	57.5
Vehicle Noise:	65.4	63.7	60.5	55.8	64.4	64.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	42	91	196	422
CNEL:	45	98	210	453

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 No Project	*Project Name:*	National Orange Noise
Road Name:	Central Avenue	*Job Number:*	7780
Road Segment:	Arrowhead Ave. to Sierra Way	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	420	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-5.21	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	77.72	-22.45	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	82.99	-26.40	-4.51	-1.20	*-5.16*	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:	55.6	53.7	51.9	45.9	54.5	55.1
Medium Trucks:	49.6	48.0	41.7	40.1	48.6	48.8
Heavy Trucks:	50.9	49.5	40.4	41.7	50.0	50.2
Vehicle Noise:	57.6	55.9	52.6	48.0	56.6	57.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	13	27	59	127
CNEL:	14	29	63	136

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 No Project	*Project Name:*	National Orange Noise
Road Name:	Central Avenue	*Job Number:*	7780
Road Segment:	e/o Sierra Way	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	450	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-4.91	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	77.72	-22.15	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	82.99	-26.10	-4.51	-1.20	*-5.16*	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:	55.9	54.0	52.2	46.2	54.8	55.4
Medium Trucks:	49.9	48.3	42.0	40.4	48.9	49.1
Heavy Trucks:	51.2	49.8	40.7	42.0	50.3	50.5
Vehicle Noise:	57.9	56.2	52.9	48.3	56.9	57.3

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

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 No Project	*Project Name:*	National Orange Noise
Road Name:	Orange Show Road	*Job Number:*	7780
Road Segment:	w/o Camino Real	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	650	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-3.82	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-21.06	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-25.02	-4.51	-1.20	*-5.16*	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:	58.9	57.0	55.3	49.2	57.8	58.4
Medium Trucks:	52.7	51.2	44.8	43.3	51.7	52.0
Heavy Trucks:	53.5	52.1	43.1	44.3	52.7	52.8
Vehicle Noise:	60.8	59.0	55.9	51.2	59.7	60.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	21	45	96	207
CNEL:	22	48	103	222

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 No Project	*Project Name:*	National Orange Noise
Road Name:	Orange Show Road	*Job Number:*	7780
Road Segment:	Camino Real to I-215	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	830	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-2.76	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-20.00	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-23.95	-4.51	-1.20	*-5.16*	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	56.3	50.3	58.9	59.5
Medium Trucks:	53.7	52.2	45.9	44.3	52.8	53.0
Heavy Trucks:	54.6	53.2	44.1	45.4	53.7	53.9
Vehicle Noise:	61.8	60.1	56.9	52.2	60.8	61.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	24	52	113	243
CNEL:	26	56	121	261

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 No Project	*Project Name:*	National Orange Noise
Road Name:	Orange Show Road	*Job Number:*	7780
Road Segment:	I-215 to E St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,880	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	2.64	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-14.60	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-18.55	-4.51	-1.20	*-5.16*	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	61.7	55.7	64.3	64.9
Medium Trucks:	59.1	57.6	51.3	49.7	58.2	58.4
Heavy Trucks:	60.0	58.6	49.5	50.8	59.1	59.3
Vehicle Noise:	67.2	65.5	62.3	57.6	66.2	66.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	56	120	259	557
CNEL:	60	129	277	598

Wednesday, July 06, 2011

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 No Project	*Project Name:*	National Orange Noise
Road Name:	Orange Show Road	*Job Number:*	7780
Road Segment:	E St. to Arrowhead Ave.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,360	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.78	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-15.46	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.42	-4.51	-1.20	*-5.16*	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	60.9	54.8	63.4	64.0
Medium Trucks:	58.3	56.8	50.4	48.9	57.3	57.6
Heavy Trucks:	59.1	57.7	48.7	49.9	58.3	58.4
Vehicle Noise:	66.4	64.6	61.5	56.8	65.3	65.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	49	105	227	488
CNEL:	52	113	243	524

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 No Project	*Project Name:*	National Orange Noise
Road Name:	Orange Show Road	*Job Number:*	7780
Road Segment:	e/o Arrowhead Ave.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,820	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.65	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-16.59	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-20.54	-4.51	-1.20	*-5.16*	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:	63.4	61.5	59.7	53.7	62.3	62.9
Medium Trucks:	57.1	55.6	49.3	47.7	56.2	56.4
Heavy Trucks:	58.0	56.6	47.5	48.8	57.1	57.3
Vehicle Noise:	65.2	63.5	60.3	55.7	64.2	64.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	41	88	191	410
CNEL:	44	95	204	440

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 No Project	*Project Name:*	National Orange Noise
Road Name:	E Street	*Job Number:*	7780
Road Segment:	n/o Mill St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,770	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.53	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-16.71	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-20.67	-4.51	-1.20	*-5.16*	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:	63.3	61.4	59.6	53.5	62.2	62.8
Medium Trucks:	57.0	55.5	49.2	47.6	56.1	56.3
Heavy Trucks:	57.9	56.5	47.4	48.7	57.0	57.1
Vehicle Noise:	65.1	63.4	60.2	55.5	64.1	64.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	40	87	187	403
CNEL:	43	93	201	432

Wednesday, July 06, 2011

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 No Project	*Project Name:*	National Orange Noise
Road Name:	E Street	*Job Number:*	7780
Road Segment:	Mill St. to Orange Show Rd.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,920	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.88	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-16.36	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-20.31	-4.51	-1.20	*-5.16*	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	60.0	53.9	62.5	63.1
Medium Trucks:	57.4	55.9	49.5	48.0	56.4	56.7
Heavy Trucks:	58.2	56.8	47.8	49.0	57.4	57.5
Vehicle Noise:	65.5	63.7	60.6	55.9	64.4	64.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	43	92	197	425
CNEL:	46	98	212	456

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 No Project	*Project Name:*	National Orange Noise
Road Name:	E Street	*Job Number:*	7780
Road Segment:	s/o Orange Show Rd.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,630	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.17	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-17.07	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-21.02	-4.51	-1.20	*-5.16*	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:	56.7	55.2	48.8	47.3	55.7	55.9
Heavy Trucks:	57.5	56.1	47.1	48.3	56.7	56.8
Vehicle Noise:	64.7	63.0	59.9	55.2	63.7	64.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	38	82	177	381
CNEL:	41	88	190	409

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 No Project	*Project Name:*	National Orange Noise
Road Name:	Arrowhead Avenue	*Job Number:*	7780
Road Segment:	n/o Mill St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,110	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.50	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-18.74	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-22.69	-4.51	-1.20	*-5.16*	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	57.6	51.5	60.1	60.8
Medium Trucks:	55.0	53.5	47.1	45.6	54.0	54.3
Heavy Trucks:	55.8	54.4	45.4	46.6	55.0	55.1
Vehicle Noise:	63.1	61.3	58.2	53.5	62.1	62.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	30	64	137	295
CNEL:	32	68	147	317

Wednesday, July 06, 2011

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 No Project	*Project Name:*	National Orange Noise
Road Name:	Arrowhead Avenue	*Job Number:*	7780
Road Segment:	Mill St. to Central Ave.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,380	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.55	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-17.79	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-21.75	-4.51	-1.20	*-5.16*	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:	62.2	60.3	58.5	52.5	61.1	61.7
Medium Trucks:	55.9	54.4	48.1	46.5	55.0	55.2
Heavy Trucks:	56.8	55.4	46.3	47.6	55.9	56.1
Vehicle Noise:	64.0	62.3	59.1	54.5	63.0	63.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	34	74	158	341
CNEL:	37	79	170	366

Wednesday, July 06, 2011

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 No Project	*Project Name:*	National Orange Noise
Road Name:	Arrowhead Avenue	*Job Number:*	7780
Road Segment:	Central Ave. to Orange Show Rd.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,370	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.58	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-17.82	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-21.78	-4.51	-1.20	*-5.16*	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:	62.2	60.3	58.5	52.4	61.1	61.7
Medium Trucks:	55.9	54.4	48.0	46.5	55.0	55.2
Heavy Trucks:	56.8	55.3	46.3	47.6	55.9	56.0
Vehicle Noise:	64.0	62.3	59.1	54.4	63.0	63.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	34	73	158	340
CNEL:	36	78	169	364

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 With Project	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	w/o I St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,450	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.94	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-15.30	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.25	-4.51	-1.20	*-5.16*	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:	58.4	56.9	50.6	49.0	57.5	57.7
Heavy Trucks:	59.3	57.9	48.8	50.1	58.4	58.6
Vehicle Noise:	66.5	64.8	61.6	56.9	65.5	65.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	50	108	232	500
CNEL:	54	116	249	537

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 With Project	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	I St. to I-215	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,600	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	2.20	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-15.04	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.00	-4.51	-1.20	*-5.16*	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:	64.9	63.0	61.3	55.2	63.8	64.4
Medium Trucks:	58.7	57.2	50.8	49.3	57.7	58.0
Heavy Trucks:	59.5	58.1	49.1	50.3	58.7	58.8
Vehicle Noise:	66.8	65.0	61.9	57.2	65.7	66.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	52	112	242	521
CNEL:	56	120	259	558

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 With Project	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	I-215 to G St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,330	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.72	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-15.52	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.47	-4.51	-1.20	*-5.16*	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:	58.2	56.7	50.4	48.8	57.3	57.5
Heavy Trucks:	59.1	57.6	48.6	49.9	58.2	58.3
Vehicle Noise:	66.3	64.6	61.4	56.7	65.3	65.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	48	104	225	484
CNEL:	52	112	241	519

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 With Project	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	G St. to E St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,120	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.31	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-15.93	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.88	-4.51	-1.20	*-5.16*	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	54.3	63.0	63.6
Medium Trucks:	57.8	56.3	49.9	48.4	56.9	57.1
Heavy Trucks:	58.7	57.2	48.2	49.4	57.8	57.9
Vehicle Noise:	65.9	64.1	61.0	56.3	64.9	65.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	45	98	211	454
CNEL:	49	105	226	487

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 With Project	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	E St. to Arrowhead Ave.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,170	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.41	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-15.82	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.78	-4.51	-1.20	*-5.16*	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	54.4	63.1	63.7
Medium Trucks:	57.9	56.4	50.0	48.5	57.0	57.2
Heavy Trucks:	58.8	57.3	48.3	49.5	57.9	58.0
Vehicle Noise:	66.0	64.2	61.1	56.4	65.0	65.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	46	99	214	461
CNEL:	50	107	230	495

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 With Project	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	Arrowhead Ave. to Mountain View	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,020	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.10	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-16.14	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-20.09	-4.51	-1.20	*-5.16*	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	60.2	54.1	62.7	63.4
Medium Trucks:	57.6	56.1	49.7	48.2	56.6	56.9
Heavy Trucks:	58.4	57.0	48.0	49.2	57.6	57.7
Vehicle Noise:	65.7	63.9	60.8	56.1	64.7	65.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	44	95	204	440
CNEL:	47	102	219	472

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 With Project	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	e/o Mountain View Ave.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,930	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.90	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-16.33	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-20.29	-4.51	-1.20	*-5.16*	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	60.0	53.9	62.5	63.2
Medium Trucks:	57.4	55.9	49.5	48.0	56.4	56.7
Heavy Trucks:	58.2	56.8	47.8	49.0	57.4	57.5
Vehicle Noise:	65.5	63.7	60.6	55.9	64.5	64.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	43	92	198	427
CNEL:	46	99	213	458

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 With Project	*Project Name:*	National Orange Noise
Road Name:	Central Avenue	*Job Number:*	7780
Road Segment:	Arrowhead Ave. to Sierra Way	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	490	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-4.54	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	77.72	-21.78	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	82.99	-25.73	-4.51	-1.20	*-5.16*	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:	56.3	54.4	52.6	46.5	55.2	55.8
Medium Trucks:	50.2	48.7	42.4	40.8	49.3	49.5
Heavy Trucks:	51.5	50.1	41.1	42.3	50.7	50.8
Vehicle Noise:	58.3	56.5	53.3	48.7	57.2	57.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	14	30	65	141
CNEL:	15	33	70	151

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 With Project	*Project Name:*	National Orange Noise
Road Name:	Central Avenue	*Job Number:*	7780
Road Segment:	e/o Sierra Way	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	470	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-4.72	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	77.72	-21.96	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	82.99	-25.91	-4.51	-1.20	*-5.16*	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:	50.0	48.5	42.2	40.6	49.1	49.3
Heavy Trucks:	51.4	49.9	40.9	42.2	50.5	50.6
Vehicle Noise:	58.1	56.4	53.1	48.5	57.1	57.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	14	30	64	137
CNEL:	15	32	68	147

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 With Project	*Project Name:*	National Orange Noise
Road Name:	Orange Show Road	*Job Number:*	7780
Road Segment:	w/o Camino Real	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	650	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-3.82	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-21.06	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-25.02	-4.51	-1.20	*-5.16*	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:	58.9	57.0	55.3	49.2	57.8	58.4
Medium Trucks:	52.7	51.2	44.8	43.3	51.7	52.0
Heavy Trucks:	53.5	52.1	43.1	44.3	52.7	52.8
Vehicle Noise:	60.8	59.0	55.9	51.2	59.7	60.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	21	45	96	207
CNEL:	22	48	103	222

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 With Project	*Project Name:*	National Orange Noise
Road Name:	Orange Show Road	*Job Number:*	7780
Road Segment:	Camino Real to I-215	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	830	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-2.76	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-20.00	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-23.95	-4.51	-1.20	*-5.16*	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	56.3	50.3	58.9	59.5
Medium Trucks:	53.7	52.2	45.9	44.3	52.8	53.0
Heavy Trucks:	54.6	53.2	44.1	45.4	53.7	53.9
Vehicle Noise:	61.8	60.1	56.9	52.2	60.8	61.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	24	52	113	243
CNEL:	26	56	121	261

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 With Project	*Project Name:*	National Orange Noise
Road Name:	Orange Show Road	*Job Number:*	7780
Road Segment:	I-215 to E St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,000	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	2.82	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-14.42	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-18.37	-4.51	-1.20	*-5.16*	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:	65.6	63.7	61.9	55.8	64.5	65.1
Medium Trucks:	59.3	57.8	51.4	49.9	58.4	58.6
Heavy Trucks:	60.2	58.7	49.7	51.0	59.3	59.4
Vehicle Noise:	67.4	65.7	62.5	57.8	66.4	66.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	57	123	266	573
CNEL:	61	132	285	614

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 With Project	*Project Name:*	National Orange Noise
Road Name:	Orange Show Road	*Job Number:*	7780
Road Segment:	E St. to Arrowhead Ave.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,480	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.99	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-15.24	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.20	-4.51	-1.20	*-5.16*	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	64.2
Medium Trucks:	58.5	57.0	50.6	49.1	57.5	57.8
Heavy Trucks:	59.3	57.9	48.9	50.1	58.5	58.6
Vehicle Noise:	66.6	64.8	61.7	57.0	65.5	66.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	50	109	234	504
CNEL:	54	117	251	541

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 With Project	*Project Name:*	National Orange Noise
Road Name:	Orange Show Road	*Job Number:*	7780
Road Segment:	e/o Arrowhead Ave.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,820	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.65	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-16.59	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-20.54	-4.51	-1.20	*-5.16*	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:	63.4	61.5	59.7	53.7	62.3	62.9
Medium Trucks:	57.1	55.6	49.3	47.7	56.2	56.4
Heavy Trucks:	58.0	56.6	47.5	48.8	57.1	57.3
Vehicle Noise:	65.2	63.5	60.3	55.7	64.2	64.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	41	88	191	410
CNEL:	44	95	204	440

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 With Project	*Project Name:*	National Orange Noise
Road Name:	E Street	*Job Number:*	7780
Road Segment:	n/o Mill St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,770	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.53	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-16.71	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-20.67	-4.51	-1.20	*-5.16*	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:	63.3	61.4	59.6	53.5	62.2	62.8
Medium Trucks:	57.0	55.5	49.2	47.6	56.1	56.3
Heavy Trucks:	57.9	56.5	47.4	48.7	57.0	57.1
Vehicle Noise:	65.1	63.4	60.2	55.5	64.1	64.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	40	87	187	403
CNEL:	43	93	201	432

Wednesday, July 06, 2011

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 With Project	*Project Name:*	National Orange Noise
Road Name:	E Street	*Job Number:*	7780
Road Segment:	Mill St. to Orange Show Rd.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,920	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.88	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-16.36	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-20.31	-4.51	-1.20	*-5.16*	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	60.0	53.9	62.5	63.1
Medium Trucks:	57.4	55.9	49.5	48.0	56.4	56.7
Heavy Trucks:	58.2	56.8	47.8	49.0	57.4	57.5
Vehicle Noise:	65.5	63.7	60.6	55.9	64.4	64.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	43	92	197	425
CNEL:	46	98	212	456

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 With Project	*Project Name:*	National Orange Noise
Road Name:	E Street	*Job Number:*	7780
Road Segment:	s/o Orange Show Rd.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,630	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.17	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-17.07	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-21.02	-4.51	-1.20	*-5.16*	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:	56.7	55.2	48.8	47.3	55.7	55.9
Heavy Trucks:	57.5	56.1	47.1	48.3	56.7	56.8
Vehicle Noise:	64.7	63.0	59.9	55.2	63.7	64.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	38	82	177	381
CNEL:	41	88	190	409

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 With Project	*Project Name:*	National Orange Noise
Road Name:	Arrowhead Avenue	*Job Number:*	7780
Road Segment:	n/o Mill St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,120	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.46	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-18.70	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-22.65	-4.51	-1.20	*-5.16*	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:	55.0	53.5	47.2	45.6	54.1	54.3
Heavy Trucks:	55.9	54.5	45.4	46.7	55.0	55.2
Vehicle Noise:	63.1	61.4	58.2	53.5	62.1	62.5

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

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 With Project	*Project Name:*	National Orange Noise
Road Name:	Arrowhead Avenue	*Job Number:*	7780
Road Segment:	Mill St. to Central Ave.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,510	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.16	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-17.40	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-21.36	-4.51	-1.20	*-5.16*	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:	62.6	60.7	58.9	52.9	61.5	62.1
Medium Trucks:	56.3	54.8	48.5	46.9	55.4	55.6
Heavy Trucks:	57.2	55.8	46.7	48.0	56.3	56.5
Vehicle Noise:	64.4	62.7	59.5	54.8	63.4	63.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	36	78	168	362
CNEL:	39	84	180	389

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2013 With Project	*Project Name:*	National Orange Noise
Road Name:	Arrowhead Avenue	*Job Number:*	7780
Road Segment:	Central Ave. to Orange Show Rd.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,490	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.22	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-17.46	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-21.41	-4.51	-1.20	*-5.16*	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	58.9	52.8	61.4	62.0
Medium Trucks:	56.3	54.8	48.4	46.9	55.3	55.6
Heavy Trucks:	57.1	55.7	46.7	47.9	56.3	56.4
Vehicle Noise:	64.4	62.6	59.5	54.8	63.3	63.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	36	77	167	359
CNEL:	39	83	179	385

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 No Project	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	w/o I St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,810	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	2.54	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-14.70	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-18.66	-4.51	-1.20	*-5.16*	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:	65.3	63.4	61.6	55.6	64.2	64.8
Medium Trucks:	59.0	57.5	51.2	49.6	58.1	58.3
Heavy Trucks:	59.9	58.5	49.4	50.7	59.0	59.2
Vehicle Noise:	67.1	65.4	62.2	57.5	66.1	66.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	55	118	254	548
CNEL:	59	127	273	588

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 No Project	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	I St. to I-215	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,170	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	3.06	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-14.18	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-18.13	-4.51	-1.20	*-5.16*	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:	59.6	58.0	51.7	50.1	58.6	58.8
Heavy Trucks:	60.4	59.0	49.9	51.2	59.6	59.7
Vehicle Noise:	67.6	65.9	62.7	58.1	66.6	67.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	59	128	276	594
CNEL:	64	137	296	637

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 No Project	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	I-215 to G St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,090	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	2.95	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-14.29	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-18.25	-4.51	-1.20	*-5.16*	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:	59.4	57.9	51.6	50.0	58.5	58.7
Heavy Trucks:	60.3	58.9	49.8	51.1	59.4	59.6
Vehicle Noise:	67.5	65.8	62.6	58.0	66.5	67.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	58	126	271	584
CNEL:	63	135	291	627

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 No Project	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	G St. to E St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,060	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.19	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-16.05	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-20.01	-4.51	-1.20	*-5.16*	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:	63.9	62.0	60.3	54.2	62.8	63.4
Medium Trucks:	57.7	56.2	49.8	48.3	56.7	57.0
Heavy Trucks:	58.5	57.1	48.1	49.3	57.7	57.8
Vehicle Noise:	65.8	64.0	60.9	56.2	64.7	65.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	45	96	207	446
CNEL:	48	103	222	478

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 No Project	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	E St. to Arrowhead Ave.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,570	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	2.15	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-15.09	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.05	-4.51	-1.20	*-5.16*	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:	64.9	63.0	61.2	55.2	63.8	64.4
Medium Trucks:	58.6	57.1	50.8	49.2	57.7	57.9
Heavy Trucks:	59.5	58.1	49.0	50.3	58.6	58.8
Vehicle Noise:	66.7	65.0	61.8	57.2	65.7	66.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	52	111	240	517
CNEL:	55	119	257	554

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 No Project	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	Arrowhead Ave. to Mountain View	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,450	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.94	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-15.30	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.25	-4.51	-1.20	*-5.16*	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:	58.4	56.9	50.6	49.0	57.5	57.7
Heavy Trucks:	59.3	57.9	48.8	50.1	58.4	58.6
Vehicle Noise:	66.5	64.8	61.6	56.9	65.5	65.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	50	108	232	500
CNEL:	54	116	249	537

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 No Project	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	e/o Mountain View Ave.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,620	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	2.23	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-15.01	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-18.96	-4.51	-1.20	*-5.16*	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:	65.0	63.1	61.3	55.3	63.9	64.5
Medium Trucks:	58.7	57.2	50.9	49.3	57.8	58.0
Heavy Trucks:	59.6	58.2	49.1	50.4	58.7	58.8
Vehicle Noise:	66.8	65.1	61.9	57.2	65.8	66.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	52	113	243	523
CNEL:	56	121	261	561

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 No Project	*Project Name:*	National Orange Noise
Road Name:	Central Avenue	*Job Number:*	7780
Road Segment:	Arrowhead Ave. to Sierra Way	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	980	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-1.53	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	77.72	-18.77	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	82.99	-22.72	-4.51	-1.20	*-5.16*	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:	59.3	57.4	55.6	49.5	58.2	58.8
Medium Trucks:	53.2	51.7	45.4	43.8	52.3	52.5
Heavy Trucks:	54.6	53.1	44.1	45.4	53.7	53.8
Vehicle Noise:	61.3	59.5	56.3	51.7	60.3	60.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	22	48	104	224
CNEL:	24	52	111	240

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 No Project	*Project Name:*	National Orange Noise
Road Name:	Central Avenue	*Job Number:*	7780
Road Segment:	e/o Sierra Way	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,010	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-1.40	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	77.72	-18.63	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	82.99	-22.59	-4.51	-1.20	*-5.16*	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	55.7	49.7	58.3	58.9
Medium Trucks:	53.4	51.9	45.5	44.0	52.4	52.6
Heavy Trucks:	54.7	53.3	44.2	45.5	53.8	54.0
Vehicle Noise:	61.4	59.7	56.4	51.8	60.4	60.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	23	49	106	228
CNEL:	24	53	114	245

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 No Project	*Project Name:*	National Orange Noise
Road Name:	Orange Show Road	*Job Number:*	7780
Road Segment:	w/o Camino Real	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,150	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.34	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-18.58	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-22.54	-4.51	-1.20	*-5.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	61.4	59.5	57.7	51.7	60.3	60.9
Medium Trucks:	55.2	53.6	47.3	45.7	54.2	54.4
Heavy Trucks:	56.0	54.6	45.5	46.8	55.1	55.3
Vehicle Noise:	63.2	61.5	58.3	53.7	62.2	62.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	30	65	140	302
CNEL:	32	70	150	324

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 No Project	*Project Name:*	National Orange Noise
Road Name:	Orange Show Road	*Job Number:*	7780
Road Segment:	Camino Real to I-215	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,410	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.46	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-17.70	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-21.65	-4.51	-1.20	*-5.16*	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:	62.3	60.4	58.6	52.6	61.2	61.8
Medium Trucks:	56.0	54.5	48.2	46.6	55.1	55.3
Heavy Trucks:	56.9	55.5	46.4	47.7	56.0	56.2
Vehicle Noise:	64.1	62.4	59.2	54.5	63.1	63.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	35	75	161	346
CNEL:	37	80	172	371

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 No Project	*Project Name:*	National Orange Noise
Road Name:	Orange Show Road	*Job Number:*	7780
Road Segment:	I-215 to E St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	46,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	4,650	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	4.72	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-12.51	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-16.47	-4.51	-1.20	*-5.16*	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:	67.5	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	60.6	51.6	52.9	61.2	61.3
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:	77	165	356	767
CNEL:	82	177	382	823

Wednesday, July 06, 2011

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 No Project	*Project Name:*	National Orange Noise
Road Name:	Orange Show Road	*Job Number:*	7780
Road Segment:	E St. to Arrowhead Ave.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	39,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,990	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	4.06	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-13.18	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-17.14	-4.51	-1.20	*-5.16*	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:	66.8	64.9	63.1	57.1	65.7	66.3
Medium Trucks:	60.6	59.0	52.7	51.1	59.6	59.8
Heavy Trucks:	61.4	60.0	50.9	52.2	60.5	60.7
Vehicle Noise:	68.6	66.9	63.7	59.1	67.6	68.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	69	149	321	693
CNEL:	74	160	345	743

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 No Project	*Project Name:*	National Orange Noise
Road Name:	Orange Show Road	*Job Number:*	7780
Road Segment:	e/o Arrowhead Ave.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	37,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,770	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	3.81	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-13.43	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-17.38	-4.51	-1.20	*-5.16*	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	62.9	56.8	65.5	66.1
Medium Trucks:	60.3	58.8	52.4	50.9	59.4	59.6
Heavy Trucks:	61.2	59.7	50.7	51.9	60.3	60.4
Vehicle Noise:	68.4	66.6	63.5	58.8	67.4	67.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	67	144	310	667
CNEL:	72	154	332	715

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 No Project	*Project Name:*	National Orange Noise
Road Name:	E Street	*Job Number:*	7780
Road Segment:	n/o Mill St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,020	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.10	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-16.14	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-20.09	-4.51	-1.20	*-5.16*	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	60.2	54.1	62.7	63.4
Medium Trucks:	57.6	56.1	49.7	48.2	56.6	56.9
Heavy Trucks:	58.4	57.0	48.0	49.2	57.6	57.7
Vehicle Noise:	65.7	63.9	60.8	56.1	64.7	65.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	44	95	204	440
CNEL:	47	102	219	472

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 No Project	*Project Name:*	National Orange Noise
Road Name:	E Street	*Job Number:*	7780
Road Segment:	Mill St. to Orange Show Rd.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,760	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	2.46	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-14.78	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-18.74	-4.51	-1.20	*-5.16*	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:	59.0	57.4	51.1	49.5	58.0	58.2
Heavy Trucks:	59.8	58.4	49.3	50.6	58.9	59.1
Vehicle Noise:	67.0	65.3	62.1	57.5	66.0	66.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	54	117	251	542
CNEL:	58	125	270	581

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 No Project	*Project Name:*	National Orange Noise
Road Name:	E Street	*Job Number:*	7780
Road Segment:	s/o Orange Show Rd.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,500	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	2.03	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-15.21	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.17	-4.51	-1.20	*-5.16*	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	55.0	63.7	64.3
Medium Trucks:	58.5	57.0	50.7	49.1	57.6	57.8
Heavy Trucks:	59.4	58.0	48.9	50.2	58.5	58.6
Vehicle Noise:	66.6	64.9	61.7	57.0	65.6	66.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	51	109	235	507
CNEL:	54	117	253	544

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 No Project	*Project Name:*	National Orange Noise
Road Name:	Arrowhead Avenue	*Job Number:*	7780
Road Segment:	n/o Mill St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,600	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.09	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-17.15	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-21.10	-4.51	-1.20	*-5.16*	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	62.3
Medium Trucks:	56.6	55.1	48.7	47.2	55.6	55.9
Heavy Trucks:	57.4	56.0	47.0	48.2	56.6	56.7
Vehicle Noise:	64.7	62.9	59.8	55.1	63.6	64.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	38	81	175	377
CNEL:	40	87	188	404

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 No Project	*Project Name:*	National Orange Noise
Road Name:	Arrowhead Avenue	*Job Number:*	7780
Road Segment:	Mill St. to Central Ave.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,040	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.15	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-16.09	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-20.05	-4.51	-1.20	*-5.16*	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:	63.9	62.0	60.2	54.2	62.8	63.4
Medium Trucks:	57.6	56.1	49.8	48.2	56.7	56.9
Heavy Trucks:	58.5	57.1	48.0	49.3	57.6	57.8
Vehicle Noise:	65.7	64.0	60.8	56.2	64.7	65.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	44	95	206	443
CNEL:	48	102	221	475

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 No Project	*Project Name:*	National Orange Noise
Road Name:	Arrowhead Avenue	*Job Number:*	7780
Road Segment:	Central Ave. to Orange Show Rd.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,400	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.85	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-15.39	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.34	-4.51	-1.20	*-5.16*	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:	58.3	56.8	50.5	48.9	57.4	57.6
Heavy Trucks:	59.2	57.8	48.7	50.0	58.3	58.5
Vehicle Noise:	66.4	64.7	61.5	56.9	65.4	65.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	49	106	229	494
CNEL:	53	114	246	529

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 With Project	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	w/o I St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,820	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	2.55	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-14.69	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-18.64	-4.51	-1.20	*-5.16*	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:	65.3	63.4	61.6	55.6	64.2	64.8
Medium Trucks:	59.0	57.5	51.2	49.6	58.1	58.3
Heavy Trucks:	59.9	58.5	49.4	50.7	59.0	59.2
Vehicle Noise:	67.1	65.4	62.2	57.6	66.1	66.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	55	118	255	550
CNEL:	59	127	274	590

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 With Project	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	I St. to I-215	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,800	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,180	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	3.07	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-14.17	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-18.12	-4.51	-1.20	*-5.16*	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:	59.6	58.1	51.7	50.2	58.6	58.8
Heavy Trucks:	60.4	59.0	50.0	51.2	59.6	59.7
Vehicle Noise:	67.6	65.9	62.8	58.1	66.6	67.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	60	128	276	595
CNEL:	64	138	296	639

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 With Project	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	I-215 to G St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,170	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	3.06	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-14.18	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-18.13	-4.51	-1.20	*-5.16*	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:	59.6	58.0	51.7	50.1	58.6	58.8
Heavy Trucks:	60.4	59.0	49.9	51.2	59.6	59.7
Vehicle Noise:	67.6	65.9	62.7	58.1	66.6	67.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	59	128	276	594
CNEL:	64	137	296	637

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 With Project	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	G St. to E St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,350	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.76	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-15.48	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.43	-4.51	-1.20	*-5.16*	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:	58.3	56.7	50.4	48.8	57.3	57.5
Heavy Trucks:	59.1	57.7	48.6	49.9	58.3	58.4
Vehicle Noise:	66.3	64.6	61.4	56.8	65.3	65.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	49	105	226	487
CNEL:	52	112	242	522

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 With Project	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	E St. to Arrowhead Ave.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,650	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	2.28	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-14.96	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-18.91	-4.51	-1.20	*-5.16*	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:	65.0	63.1	61.4	55.3	63.9	64.5
Medium Trucks:	58.8	57.3	50.9	49.4	57.8	58.1
Heavy Trucks:	59.6	58.2	49.2	50.4	58.8	58.9
Vehicle Noise:	66.9	65.1	62.0	57.3	65.8	66.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	53	114	245	527
CNEL:	57	122	263	566

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 With Project	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	Arrowhead Ave. to Mountain View	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,900	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,390	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.83	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-15.41	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.36	-4.51	-1.20	*-5.16*	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:	58.3	56.8	50.5	48.9	57.4	57.6
Heavy Trucks:	59.2	57.8	48.7	50.0	58.3	58.5
Vehicle Noise:	66.4	64.7	61.5	56.8	65.4	65.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	49	106	228	492
CNEL:	53	114	245	528

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 With Project	*Project Name:*	National Orange Noise
Road Name:	Mill Street	*Job Number:*	7780
Road Segment:	e/o Mountain View Ave.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,650	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	2.28	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-14.96	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-18.91	-4.51	-1.20	*-5.16*	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:	65.0	63.1	61.4	55.3	63.9	64.5
Medium Trucks:	58.8	57.3	50.9	49.4	57.8	58.1
Heavy Trucks:	59.6	58.2	49.2	50.4	58.8	58.9
Vehicle Noise:	66.9	65.1	62.0	57.3	65.8	66.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	53	114	245	527
CNEL:	57	122	263	566

Wednesday, July 06, 2011

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 With Project	*Project Name:*	National Orange Noise
Road Name:	Central Avenue	*Job Number:*	7780
Road Segment:	Arrowhead Ave. to Sierra Way	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,050	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-1.23	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	77.72	-18.47	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	82.99	-22.42	-4.51	-1.20	*-5.16*	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:	59.6	57.7	55.9	49.8	58.5	59.1
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:	61.6	59.8	56.6	52.0	60.6	61.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	23	51	109	234
CNEL:	25	54	117	251

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 With Project	*Project Name:*	National Orange Noise
Road Name:	Central Avenue	*Job Number:*	7780
Road Segment:	e/o Sierra Way	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,030	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-1.31	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	77.72	-18.55	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	82.99	-22.51	-4.51	-1.20	*-5.16*	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	55.8	49.8	58.4	59.0
Medium Trucks:	53.5	51.9	45.6	44.0	52.5	52.7
Heavy Trucks:	54.8	53.4	44.3	45.6	53.9	54.0
Vehicle Noise:	61.5	59.8	56.5	51.9	60.5	60.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	23	50	107	231
CNEL:	25	53	115	248

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 With Project	*Project Name:*	National Orange Noise
Road Name:	Orange Show Road	*Job Number:*	7780
Road Segment:	w/o Camino Real	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,150	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.34	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-18.58	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-22.54	-4.51	-1.20	*-5.16*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	61.4	59.5	57.7	51.7	60.3	60.9
Medium Trucks:	55.2	53.6	47.3	45.7	54.2	54.4
Heavy Trucks:	56.0	54.6	45.5	46.8	55.1	55.3
Vehicle Noise:	63.2	61.5	58.3	53.7	62.2	62.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	30	65	140	302
CNEL:	32	70	150	324

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 With Project	*Project Name:*	National Orange Noise
Road Name:	Orange Show Road	*Job Number:*	7780
Road Segment:	Camino Real to I-215	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,400	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,440	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.37	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-17.61	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-21.56	-4.51	-1.20	*-5.16*	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	58.7	52.7	61.3	61.9
Medium Trucks:	56.1	54.6	48.3	46.7	55.2	55.4
Heavy Trucks:	57.0	55.6	46.5	47.8	56.1	56.3
Vehicle Noise:	64.2	62.5	59.3	54.6	63.2	63.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	35	76	163	351
CNEL:	38	81	175	377

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 With Project	*Project Name:*	National Orange Noise
Road Name:	Orange Show Road	*Job Number:*	7780
Road Segment:	I-215 to E St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	47,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	4,770	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	4.83	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-12.40	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-16.36	-4.51	-1.20	*-5.16*	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:	67.6	65.7	63.9	57.9	66.5	67.1
Medium Trucks:	61.3	59.8	53.5	51.9	60.4	60.6
Heavy Trucks:	62.2	60.8	51.7	53.0	61.3	61.5
Vehicle Noise:	69.4	67.7	64.5	59.8	68.4	68.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	78	168	362	780
CNEL:	84	180	388	837

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 With Project	*Project Name:*	National Orange Noise
Road Name:	Orange Show Road	*Job Number:*	7780
Road Segment:	E St. to Arrowhead Ave.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	41,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	4,110	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	4.19	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-13.05	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-17.01	-4.51	-1.20	*-5.16*	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:	66.9	65.0	63.3	57.2	65.8	66.4
Medium Trucks:	60.7	59.2	52.8	51.3	59.7	60.0
Heavy Trucks:	61.5	60.1	51.1	52.3	60.7	60.8
Vehicle Noise:	68.8	67.0	63.9	59.2	67.7	68.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	71	152	328	706
CNEL:	76	163	352	758

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 With Project	*Project Name:*	National Orange Noise
Road Name:	Orange Show Road	*Job Number:*	7780
Road Segment:	e/o Arrowhead Ave.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	37,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	3,770	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	3.81	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-13.43	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-17.38	-4.51	-1.20	*-5.16*	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	62.9	56.8	65.5	66.1
Medium Trucks:	60.3	58.8	52.4	50.9	59.4	59.6
Heavy Trucks:	61.2	59.7	50.7	51.9	60.3	60.4
Vehicle Noise:	68.4	66.6	63.5	58.8	67.4	67.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	67	144	310	667
CNEL:	72	154	332	715

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 With Project	*Project Name:*	National Orange Noise
Road Name:	E Street	*Job Number:*	7780
Road Segment:	n/o Mill St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,200	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,020	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.10	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-16.14	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-20.09	-4.51	-1.20	*-5.16*	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	60.2	54.1	62.7	63.4
Medium Trucks:	57.6	56.1	49.7	48.2	56.6	56.9
Heavy Trucks:	58.4	57.0	48.0	49.2	57.6	57.7
Vehicle Noise:	65.7	63.9	60.8	56.1	64.7	65.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	44	95	204	440
CNEL:	47	102	219	472

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 With Project	*Project Name:*	National Orange Noise
Road Name:	E Street	*Job Number:*	7780
Road Segment:	Mill St. to Orange Show Rd.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,600	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,760	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	2.46	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-14.78	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-18.74	-4.51	-1.20	*-5.16*	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:	59.0	57.4	51.1	49.5	58.0	58.2
Heavy Trucks:	59.8	58.4	49.3	50.6	58.9	59.1
Vehicle Noise:	67.0	65.3	62.1	57.5	66.0	66.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	54	117	251	542
CNEL:	58	125	270	581

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 With Project	*Project Name:*	National Orange Noise
Road Name:	E Street	*Job Number:*	7780
Road Segment:	s/o Orange Show Rd.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,000	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,500	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	2.03	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-15.21	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.17	-4.51	-1.20	*-5.16*	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	55.0	63.7	64.3
Medium Trucks:	58.5	57.0	50.7	49.1	57.6	57.8
Heavy Trucks:	59.4	58.0	48.9	50.2	58.5	58.6
Vehicle Noise:	66.6	64.9	61.7	57.0	65.6	66.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	51	109	235	507
CNEL:	54	117	253	544

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 With Project	*Project Name:*	National Orange Noise
Road Name:	Arrowhead Avenue	*Job Number:*	7780
Road Segment:	n/o Mill St.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,100	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	1,610	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.12	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-17.12	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-21.08	-4.51	-1.20	*-5.16*	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	53.1	61.8	62.4
Medium Trucks:	56.6	55.1	48.7	47.2	55.7	55.9
Heavy Trucks:	57.5	56.0	47.0	48.3	56.6	56.7
Vehicle Noise:	64.7	63.0	59.8	55.1	63.7	64.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	38	81	176	378
CNEL:	41	87	188	406

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 With Project	*Project Name:*	National Orange Noise
Road Name:	Arrowhead Avenue	*Job Number:*	7780
Road Segment:	Mill St. to Central Ave.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,300	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,130	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.33	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-15.91	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.86	-4.51	-1.20	*-5.16*	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:	57.8	56.3	50.0	48.4	56.9	57.1
Heavy Trucks:	58.7	57.3	48.2	49.5	57.8	58.0
Vehicle Noise:	65.9	64.2	61.0	56.3	64.9	65.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	46	98	212	456
CNEL:	49	105	227	489

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario:	Year 2030 With Project	*Project Name:*	National Orange Noise
Road Name:	Arrowhead Avenue	*Job Number:*	7780
Road Segment:	Central Ave. to Orange Show Rd.	*Analyst:*	J. Stephens

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,500	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,550	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	36	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	100.0	feet
Centerline Dist. to Observer:	100.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	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:	98.494
Medium Trucks:	98.404
Heavy Trucks:	98.413

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	2.11	-4.52	-1.20	*-4.77*	0.000	0.000
Medium Trucks:	79.45	-15.12	-4.51	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	84.25	-19.08	-4.51	-1.20	*-5.16*	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:	64.9	63.0	61.2	55.1	63.8	64.4
Medium Trucks:	58.6	57.1	50.7	49.2	57.7	57.9
Heavy Trucks:	59.5	58.0	49.0	50.3	58.6	58.7
Vehicle Noise:	66.7	64.9	61.8	57.1	65.7	66.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	51	111	239	514
CNEL:	55	119	256	551

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