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Del Amo Financial Plaza Noise Technical Study

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1. Introduction

This Noise Technical Study evaluates the potential noise and vibration impacts from the construction and operation of the proposed Del Amo Financial Plaza Redevelopment project.

1.1 PROJECT LOCATION AND SETTING

The project site is within the existing business park that is at the southwest quadrant of the intersection of Del Amo Circle and Hawthorne Boulevard. The project site currently consists of a 214,424-square-foot, 12-story California Bank and Trust building in addition to an 80,462-square-foot, 5-story office building. The former is not part of this project, while the latter is proposed to be renovated and converted into a medical office building. Other features at the site include a surface parking lot and roundabout in the northern portion of the site.

The project site is bounded by Del Amo Circle to the north. To the east are Hawthorne Boulevard and the adjacent 2-story and one 1-story circular office buildings to the southeast. Surrounding the project site to the west is landscaping and the existing business park surface parking lots.

1.2 PROJECT DESCRIPTION

Besides the conversion of the 5-story office building to medical suites, the proposed project would construct a 1-story building that would provide 10,000 square feet of restaurant space and a 2-story fitness facility that would provide 46,951 square feet of floor space. The fitness facility would be situated over a two-level parking structure that would have subterranean and at-grade levels of parking. Other improvements include landscaping renovations and the addition of five valet parking spaces (at grade level).

1.2.1 Construction Phase

Construction efforts would include demolition and removal of the existing surface parking lot, as well as grading and removal of the existing landscaping. It is anticipated that development of the proposed project would commence in October 2016 and be completed within 14 months. Construction would also entail interior demolition of the existing five-story office building and removal of the debris; renovation of the office space to medical uses; demolition of existing asphalt; construction of the proposed fitness and restaurant buildings; construction of the parking structure; and application of finishes, architectural coating, and new asphalt paving.

1.2.2 Operations Phase

Following construction, ongoing operations of the renovated site would include business offices (very similar to existing uses), medical offices, and short-term visitors to both the new fitness center and the new

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restaurant. Traffic flows to and from the project site would be generally similar, but of a slightly different composition, as the existing conditions. The changes to both traffic flows and the associated traffic-generated community noise environments will be discussed in detail below.

2. Regulatory Framework

To limit population exposure to physically and/or psychologically damaging as well as intrusive noise levels, the federal, state, and local agencies have established standards and ordinances to control noise. Potential noise and vibration impacts were evaluated based on the City of Torrance Municipal Code and General Plan to determine whether significant adverse noise and vibration impacts would result from construction and operation of the proposed project. The pertinent City documents are included in Appendix A.

2.1 APPLICABLE REGULATIONS

2.1.1 State of California

The State of California's noise insulation standards are codified in the California Code of Regulations, Title 24, Building Standards Administrative Code, Part 2, and the California Building Code. These noise standards are applied to new or renovation construction in California for the purpose of controlling interior noise levels resulting from exterior noise sources. The regulations are intended to mitigate potential noise impacts at noise-sensitive structures—such as residences, schools, or hospitals—that are located near major transportation noise sources and where such traffic-related noise sources create an exterior noise level of 60 dBA CNEL or higher. Since the proposed uses are not noise-sensitive applications, the Title 24 regulations would not apply for this project, and no formal documentation of compliance is needed. However, prudent architectural design—generally in line with the state's standards—should account for exterior-to-interior sound insulation to ensure desirable environments for the proposed office, medical, restaurant, and exercise spaces.

2.1.2 City of Torrance Municipal Code

Operational/Long-Term Noise

The City of Torrance's Noise Element, a component of its General Plan, sets goals and policies to minimize adverse noise impacts and preserve the high quality of life for residents. The goals of the Noise Element are implemented and enforced through the municipal code.

Torrance's noise ordinance is designed to protect people from non-transportation noise sources such as music, construction activity, machinery and pumps, and air conditioners. Enforcement of the ordinance ensures that adjacent properties are not exposed to excessive noise from stationary sources. It is unlawful to produce noise that exceeds the limits in the Municipal Code (specifically, § 46.7.2).

The Municipal Code sets noise limits by (a) receiver type and (b) regions within the city. For receivers on residential properties 500 feet or more from the boundaries of Regions 3 and 4, the noise limits are shown in Table 1. For receivers within 500 feet of the boundary of Region 1 or 2, the limits are 5 dB above the levels

2. Regulatory Framework

in Table 1 or 5 dB above the ambient noise level, whichever is lowest. The regions and the related 500-foot boundary zones are mapped on Exhibit A of Section 46.7.2 of the Municipal Code, which is reproduced in Appendix A to this study. The project site and surrounding areas are in Region 4.

Table 1 Noise Level Limits for Residential Receivers

	Noise Level (dB)1	
Receiver Region	Day (7 AM to 10 PM)	Night (10 PM to 7 AM)
3	50	45
4	55	50

1 While the Sections 46.1 through 46.8 of the Municipal Code intermix "dB" and "dBA", it is assumed that the City intended to specify noise level limits in terms of A-weighted decibels (i.e., "dBA").

Noise sources on industrial and commercial land are prohibited from producing noise levels at their boundaries above the thresholds in Table 2.

Table 2 Noise Limits at Industrial and Commercial Boundaries

	Noise Level (dB)[1]	
Source Region	Day (7 AM to 10 PM)	Night (10 PM to 7 AM)
1	70	65
2	60	55
All Remaining Industrial Land Uses	60	55
All Commercial Land Use	60	55

1 While the Sections 46.1 through 46.8 of the Municipal Code intermix "dB" and "dBA", it is assumed that the City intended to specify noise level limits in terms of A-weighted decibels (i.e., "dBA").

Additionally, noise sources on commercial and industrial land must not produce noise that causes residential receivers to exceed the limits in Table 1. Table 3 shows the adjustments to the limits in Tables 1 and 2 under certain conditions.

Table 3 Corrections to Noise Limits

Noise Conditions	Correction to Limits (dB)
1. Noise contains a steady, audible tone, such as a whine, screech, or hum.	–5
2. Noise is a repetitive impulsive noise, such as hammering or riveting	–5
3. If the noise is not continuous, one of the following corrections to the limits shall be applied:	
a) Noise occurs less than 5 hours per day or less than 1 hour per night	+5
b) Noise occurs less than 90 minutes per day or less than 20 minutes per night	+10
c) Noise occurs less than 30 minutes per day or less than 6 minutes per night	+15
4. Noise occurs on Sunday morning (12:01 AM to 12:01 PM)	–5

In addition, any noise that disturbs the peace or quiet of a neighborhood or causes discomfort or annoyance to residents is prohibited.

Construction Noise

According to Municipal Code Section 46.3.1, construction is allowed from 7:30 AM to 6:00 PM Monday through Friday and 9:00 AM to 5:00 PM on Saturdays. Construction is prohibited on Sundays and holidays, except between the hours of 10:00 AM to 4:00 PM for homeowners who reside at the property. Construction is allowed outside these hours as long as noise levels do not exceed 50 dB,[1] as measured at property lines in or adjacent to a residential area, or a written request has been approved by the community development director. Except for emergencies, heavy construction equipment—pile drivers, mechanical shovels, derricks, hoists, pneumatic hammers, compressors—is prohibited from operating in or adjacent to a residential area without permission from the community development director.

Vibration Standards

The City of Torrance Municipal Code does not include vibration standards. In lieu of such standards, this analysis will use the standards presented in the Federal Transit Administration (FTA) Guideline Manual *Transit Noise and Vibration Impact Assessment* (May 2006). Based on the FTA Guidelines, an impact would occur if construction activities generate vibration that is strong enough to physically damage buildings. The threshold for vibration-induced architectural damage is 0.2 peak particle velocity (PPV) in inches per second (in/sec) for typical wood-framed buildings. The threshold for human annoyance at residential receptors during the daytime is 78 VdB, and 84 VdB at offices.

2.1.3 City of Torrance Noise Element

The Noise Element of the City's General Plan exists to protect public health and welfare by eliminating existing noise problems and by preventing significant degradation of the future acoustic environment. The Noise Element also provides overall goals, policies, and strategies for controlling and/or reducing community-wide noise environments within the city. For example, Policy N.3.2 states: "Review industrial, commercial, or other noise-generating land use proposals for compatibility with nearby noise-sensitive land uses, and require that appropriate mitigation be provided."[2]

The Torrance General Plan's Noise Element also provides land use compatibility and interior and exterior noise standards, which are loosely based on the State of California's Noise Compatibility Guidelines. These land use standards are designed to ensure that proposed new land uses are compatible with the predicted future noise environment. While the State's Noise Compatibility Guidelines use a set of acceptability classifications for each type of land use,[3] the City of Torrance simply presents a table of compatibility

[1] While Sections 46.1 through 46.8 of the Municipal Code intermix "dB" and "dBA", it is assumed that the City intended to specify noise level limits in terms of A-weighted decibels (i.e., "dBA").
[2] City of Torrance General Plan Noise Element, adopted April 6, 2010, page N-17.
[3] The acceptability guidelines are based on exterior noise levels, and individual land uses are classified as "normally acceptable," "conditionally acceptable," "normally unacceptable," or "clearly unacceptable." 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.

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guidelines for land uses versus exterior and interior noise levels for "use in determining whether a new use is appropriate within a given noise environment."[4] In this process of determining acceptability, the Noise Element goes on to state that: "These compatibility criteria serve as guidelines. For example, an acoustical analysis must be prepared when noise-sensitive land uses are proposed within noise impact areas. The analysis must show that the project is designed to attenuate noise to meet the City's noise standards in order to receive approval. If the project design does not meet the noise standards, mitigation can be recommended in the analysis. If the analysis demonstrates that the noise standards can be met by implementing the mitigation measures, the project can be approved conditioned upon implementation of the mitigation measures."[5] Table 4 summarizes the pertinent compatibility guidelines for the subject project.

Table 4 Pertinent Torrance Noise/Land Use Compatibility Guidelines

Type of Use	Maximum Noise Level, Ldn or CNEL, dB(A)[1]	
	Interior	Exterior
Commercial and Office (including General Commercial and Commercial Center Land Use Designations)	--	70
Public and Medical Uses (including Hospital/Medical Land Use Designations)	50	70
Industrial (including Business Park, Light Industrial, and Heavy Industrial)	55	75

Source: City of Torrance General Plan Noise Element, adopted April 6, 2010, Table N-3, page N-12.

[1] For general community/environmental noise, CNEL and L_{dn} values rarely differ by more than 1 dB (with the CNEL being only slightly more restrictive—that is, higher than the L_{dn} value). As a matter of practice, L_{dn} and CNEL values are considered interchangeable and are treated as equivalent in this assessment.

Thus, the pertinent outdoor compatibility threshold for the proposed project is no higher than 70 dBA CNEL, and the pertinent threshold for indoor environments for the medical office spaces is less than or equal to 50 dBA CNEL. There are no specific interior guidelines for the general commercial office space, which is taken herein to apply to the general office uses, as well as to the proposed restaurant and fitness center facilities. In lieu of specific thresholds, this analysis will utilize an interior environment guideline of 50 dBA CNEL for these spaces.

[4] City of Torrance General Plan Noise Element, adopted April 6, 2010, page N-10.
[5] City of Torrance General Plan Noise Element, adopted April 6, 2010, page N-12.

3. Environmental Setting

3.1 NOISE AND VIBRATION SETTING

Noise is most often defined as unwanted sound. Although sound can be easily measured, the perception of noise and the physical response to sound complicate the analysis of its impact on people. People judge the relative magnitude of sound sensation in subjective terms such as "noisiness" or "loudness."

3.1.1 Noise Terminology and Descriptors

The following are brief definitions of terminology used in this chapter:

- **Sound.** A disturbance created by a vibrating object, which, when transmitted by pressure waves through a medium such as air, is capable of being detected by a receiving mechanism, such as the human ear or a microphone.

- **Noise.** Sound that is loud, unpleasant, unexpected, or otherwise undesirable.

- **Decibel (dB).** A unitless measure of sound on a logarithmic scale.

- **A-Weighted Decibel (dBA).** An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.

- **Equivalent Continuous Noise Level (L_{eq}).** The mean of the noise level, energy-averaged over the measurement period.

- **Day-Night Sound Level (Ldn or DNL)**. The energy-average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the sound levels occurring during the period from 10:00 PM to 7:00 AM.

- **Community Noise Equivalent Level (CNEL).** The energy average of the A-weighted sound levels occurring during a 24-hour period with 5 dB added to the sound levels occurring during the period from 7:00 PM to 10:00 PM and 10 dB added to the sound levels occurring during the period from 10:00 PM to 7:00 AM.

  Note: For general community/environmental noise, CNEL and L_{dn} values rarely differ by more than 1 dB (with the CNEL being only slightly more restrictive—that is, higher than the L_{dn} value). As a matter of practice, L_{dn} and CNEL values are considered to be interchangeable and are treated as equivalent in this assessment.

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3.1.2 Characteristics of Sound

When an object vibrates, it radiates part of its energy as acoustical pressure in the form of a sound wave. Sound can be described in terms of amplitude (loudness), frequency (pitch), or duration (time). The human hearing system is not equally sensitive to sound at all frequencies. Therefore, to approximate the human, frequency-dependent response, the A-weighted filter system is used to adjust measured sound levels. The normal range of human hearing extends from approximately 0 dBA (the threshold of detection) to 140 dBA (the threshold of pain).

Unlike linear units such as inches or pounds, decibels are measured on a logarithmic scale. Because of the physical characteristics of noise transmission and perception, the relative loudness of sound does not closely match the actual amounts of sound energy. Table 5 presents the subjective effect of changes in sound pressure levels.

Table 5. Change in Apparent Loudness

± 3 dB	Threshold of human perceptibility
± 5 dB	Clearly noticeable change in noise level
± 10 dB	Half or twice as loud
± 20 dB	Much quieter or louder

Source: Bies and Hansen, 2009.

Perceptible increases in noise levels generally refer to a change of 3 dBA or more, as this level has been found to be the perceptibility threshold for exterior noise environments. Barely perceptible noise increases refer to a change of between 1 and 3 dBA. This range of noise levels was found to be noticeable to sensitive people in laboratory environments. Noise increases of less than 1 dBA are typically inaudible to the human ear except under very quiet conditions in controlled environments.

Sound is generated from a source and the decibel level decreases as the distance from that source increases. Sound dissipates exponentially with distance from the noise source. This phenomenon is known as spreading loss or distance attenuation.

When sound is measured for distinct time intervals, the statistical distribution of the overall sound level during that period can be obtained. For example, L_{50} is the noise level that is exceeded 50 percent of the time: half the time the noise exceeds this level and half the time it is less than this level. From a time perspective, this is the level that is exceeded 30 minutes in any given hour. Similarly, the L_{02}, L_{08}, and L_{25} values are exceeded 2, 8, and 25 percent of the time or 1, 5, and 15 minutes per hour. The energy-equivalent sound level (L_{eq}) is the most common parameter associated with community noise measurements. The L_{eq} metric is a single-number noise descriptor of the energy-average sound level over a given period of time. Other values typically noted during a noise survey are the L_{min} and L_{max}. These values are the minimum and maximum root-mean-square (RMS) noise levels, respectively, obtained over the stated measurement period.

Because community receptors are more sensitive to unwanted noise intrusion during the evening and nighttime hours, state law requires that, for planning purposes and to account for this increased receptiveness

of noise, an artificial decibel increment is to be added to quiet-time noise levels to calculate the 24-hour CNEL noise metric. These adjustment increments are +5 dB for sound levels between 7:00 PM to 10:00 PM and +10 dB between 10:00 PM and the following 7:00 AM.

3.1.3 Psychological and Physiological Effects of Noise

Exposure to high noise levels can affect the entire physiological system, with prolonged noise exposure in excess of 75 dBA increasing tension responses, thereby affecting blood pressure, heart performance, and nervous system functionality. Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dBA. Extended periods of noise exposure above 90 dBA results in permanent cell damage, which is the main driver for employee hearing protection regulations in the workplace. For community environments, the ambient or background noise problem is widespread, through generally worse in urban areas than in outlying, less-developed areas. Elevated ambient noise levels can result in annoyance and interference (e.g., speech interruption/masking, sleep disturbance, hindrance of concentration).

Since most people do not routinely work with decibels or A-weighted sound levels, it is often difficult to appreciate what a given sound pressure level (SPL) number means. To help relate noise level values to common experience, Table 6 shows typical noise levels from common sources.

Table 6. Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock Band
Jet Flyover at 1,000 feet		
	100	
Gas Lawn Mower at three feet		
	90	
Diesel Truck at 50 feet, at 50 mph		Food Blender at 3 feet
	80	Garbage Disposal at 3 feet
Noisy Urban Area, Daytime		
	70	Vacuum Cleaner at 10 feet
Commercial Area		Normal speech at 3 feet
Heavy Traffic at 300 feet	60	
		Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (background)
Quiet Suburban Nighttime		
	30	Library
Quiet Rural Nighttime		Bedroom at Night, Concert Hall (background)
	20	
Very Remote & Unpopulated Area Nighttime		Broadcast/Recording Studio
	10	
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

Source: Caltrans 2009.

3. Environmental Setting

Vibration Terminology and Descriptors

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Vibration is normally associated with activities such as railroads or vibration-intensive stationary sources, but can also be associated with construction equipment such as jackhammers, pile drivers, and hydraulic hammers. Vibration displacement is the distance that a point on a surface moves from its original static position. The instantaneous speed that a point on a surface moves is the velocity, and the rate of change of the speed is the acceleration. Each of these descriptors can be used to correlate vibration to human response, building damage, and acceptable equipment vibration levels. During project construction, the operation of construction equipment can cause groundborne vibration. During the operational phase of a project, receptors may be subject to levels of vibration that can cause annoyance due to noise generated from vibration of a structure or items within a structure. These types of vibration are best measured and described in terms of velocity and acceleration.

Vibration amplitudes are usually described in terms of either the peak particle velocity (PPV) or the root mean square (RMS) velocity. PPV is the maximum instantaneous peak of the vibration signal and RMS is the square root of the average of the squared amplitude of the signal. PPV and RMS are related to each other by the signal's crest factor. PPV is more appropriate for evaluating potential building damage, whereas RMS is typically more suitable for evaluating human response.

The units for PPV and RMS velocity are normally inches per second (in/sec). Often vibration is presented and discussed in dB units in order to compress the range of numbers required to describe the vibration. In this study, all PPV and RMS velocity levels are in in/sec and all vibration levels are in dB relative to one microinch per second (abbreviated as VdB). Typically, groundborne vibration generated by human activities attenuates rapidly with distance from the source of the vibration. Even the more-persistent Rayleigh waves decrease relatively quickly as they move away from the source of the vibration. Man-made vibration problems are, therefore, usually confined to short distances (500 to 600 feet or less) from the source.[6]

Construction operations generally include a wide range of activities that can generate groundborne vibration. In general, blasting and demolition of structures generate the highest vibrations. Vibratory compactors or rollers, pile drivers, and pavement breakers can generate perceptible amounts of vibration at up to 200 feet. Heavy trucks can also generate groundborne vibrations, which can vary, depending on vehicle type, weight, and pavement conditions. Potholes, pavement joints, discontinuities, and differential settlement of pavement all increase the vibration levels from vehicles passing over a road surface. Construction vibration is normally of greater concern than vibration from normal traffic flows on streets and freeways with smooth pavement conditions.[7] Trains generate substantial quantities of vibration due to their wheel-rail interactions, steel wheels, heavy loads, and engine operations.[8]

[6] Federal Transit Administration (FTA). 2006, May. *Transit Noise and Vibration Impact Assessment*. United States Department of Transportation. FTA-VA-90-1003-06.
[7] California Department of Transportation (Caltrans). 2009, November. *Technical Noise Supplement ("TeNS")*. Prepared by ICF International.
[8] Federal Transit Administration (FTA). 2006, May. *Transit Noise and Vibration Impact Assessment*. United States Department of Transportation. FTA-VA-90-1003-06.

3.2 EXISTING NOISE ENVIRONMENT

The dominant noise source in the area is from traffic flows; principally on Hawthorne Boulevard and Carson Street. The existing heating, ventilation, and air conditioning (HVAC) equipment at surrounding industrial/commercial and residential uses is not considered to be important in comparison to the noise generated by traffic. Besides the roadway noise, there are no other known major sources of noise in the vicinity of the project site.

To facilitate the assessment of future traffic-related noise levels, the existing traffic noise conditions were modeled using the Federal Highway Administration's (FHWA) Traffic Noise Prediction computer model. Table 7 lists the calculated existing noise levels on roadways in the vicinity of the project site at various distances from the roadway centerline.

Table 7. Existing Conditions Traffic Noise Levels

Roadway	Segment	Daily Traffic Volumes	Noise Level at 50 Feet (dBA CNEL)	Distance to Noise Contour (ft)		
				70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
Torrance Blvd	west of Anza Ave	22,880	71.2	60	130	280
Torrance Blvd	Anza Ave to Hawthorne Blvd	30,980	72.5	74	159	342
Torrance Blvd	Hawthorne Blvd to Madrona Ave	29,870	75.5	116	251	540
Torrance Blvd	east of Madrona Ave	26,840	73.6	87	188	405
Del Amo Circle W	Village Court to Hawthorne Blvd	3,660	60.3	11	24	52
Del Amo Circle N	Hawthorne Blvd to Fashion Way	3,110	59.6	10	22	47
Carson Street	west of Anza Ave	6,390	63.6	19	40	87
Carson Street	Anza Ave to Del Amo Circle W	13,750	67.6	35	74	160
Carson Street	Del Amo Circle W to Hawthorne Blvd	14,310	67.8	36	76	165
Carson Street	Hawthorne Blvd to Madrona Ave	24,840	73.3	83	179	385
Carson Street	east of Madrona Ave	25,370	73.4	84	181	390
Sepulveda Blvd	west of Anza Ave	21,580	71.0	58	125	269
Sepulveda Blvd	Anza Ave to Hawthorne Blvd	27,580	75.2	110	238	512
Sepulveda Blvd	Hawthorne Blvd to Madrona Ave	34,670	76.1	129	277	597
Anza Ave	north of Torrance Blvd	23,120	69.9	49	105	227
Anza Ave	Torrance Blvd to Carson Street	24,200	70.1	50	109	234
Anza Ave	Carson Street to Sepulveda Blvd	23,820	70.0	50	107	231
Anza Ave	south of Sepulveda Blvd	23,800	70.0	50	107	231
Village Court	Village Lane to Del Amo Circle N	2,720	58.3	8	18	39
Del Amo Circle W	Del Amo Circle N to Carson Street	3,410	60.0	11	23	50
Del Amo Circle W	south of Carson Street	530	51.1	3	6	13
Hawthorne Blvd	north of Torrance Blvd	48,060	81.9	310	667	1437
Hawthorne Blvd	Torrance Blvd to Del Amo Circle N	51,950	82.2	326	703	1514
Hawthorne Blvd	Del Amo Circle N to Carson Street	50,130	82.1	318	686	1478
Hawthorne Blvd	Carson Street to Sepulveda Blvd	50,430	82.1	320	689	1484

Table 7. Existing Conditions Traffic Noise Levels

Roadway	Segment	Daily Traffic Volumes	Noise Level at 50 Feet (dBA CNEL)	Distance to Noise Contour (ft)		
				70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
Hawthorne Blvd	south of Sepulveda Blvd	53,920	82.4	334	720	1552
Madrona Ave	north of Torrance Blvd	32,400	75.9	123	265	570
Madrona Ave	Torrance Blvd to Carson Street	30,540	74.2	95	205	442
Madrona Ave	Carson Street to Sepulveda Blvd	22,770	72.9	78	169	363

Source: FHWA Highway Traffic Noise Prediction Model based on traffic data provided by LLG Engineers, 2015.

According to the noise contour distance results presented in Table 7, Hawthorne Boulevard has an ADT of approximately 50,000 vehicles, and the associated distance to the 65 dBA CNEL contour line is 686 feet (for the segment between Del Amo Circle N and Carson Street). This 65 CNEL contour would be slightly west of the center of the existing parking lot areas. The 70 dBA CNEL contour line (at 318 feet from the Hawthorne Boulevard centerline) would be within the project site at approximately the western edge of the existing 12-story building, through the middle of the proposed restaurant venue, and through the middle of the office-to-medical suites building (neglecting barrier reductions from intervening structures). Traffic-related noise levels at or slightly above 75 dBA CNEL would be expected at the proposed restaurant venue and the eastern façade of the existing 12-story office building. Thus, the majority of the project site would be expected to be within approximately 67 to 77 dBA CNEL.

3.3 SENSITIVE RECEPTORS

Certain land uses are particularly sensitive to noise and vibration, including residential, schools, hospitals, places of worship, and open space/recreation areas where quiet environments are necessary for enjoyment, public health, and safety. The nearest noise- and vibration-sensitive uses are the hotels to the north and west, as well as multi- and single-family residences to the west. Specifically, the Double Tree by Hilton Hotel is approximately 400 feet north of the center of the project site, and the Extended Stay America Hotel is approximately 650 feet north of the center of the project site. Additionally, the Family Court multi-family residential development is approximately 550 feet west of the center of the project site, and single-family, detached homes—fronting onto Ocean Avenue—are approximately 875 feet west of the of the center of the project site. Jefferson Middle School is approximately 1,000 feet to the west and, at this distance, would not be affected by noise or vibration from the proposed project (during either construction or ongoing operations).

4. CEQA Appendix G Thresholds

4.1 NOISE

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would result in:

N-1 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.

N-2 Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

N-3 A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

N-4 A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

N-5 For a project located within an airport land use plan or where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels.

N-6 For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

4. CEQA Appendix G Thresholds

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5. Environmental Impacts

5.1 METHODOLOGY

Noise impacts on the surrounding community are enforced through local noise ordinances, supported by nuisance complaints and subsequent investigation. The second measure of impact used in this analysis is whether the increase in noise above the ambient noise level as a result of a new noise source (either through on-site emissions or through noise generated by project traffic) has the potential to adversely affect noise-sensitive land uses.

Traffic Noise Thresholds

Neither CEQA nor the city defines the magnitude of the increase in the ambient noise level at noise-sensitive receptors that would be considered a substantial increase. The City of Torrance Noise Element simply states that:

> The City's goals and policies regarding noise aim to minimize adverse noise impacts and to preserve the high quality of life for City residents. Torrance will maintain a peaceful environment by identifying noise impacts and mitigating noise problems through acoustical treatments and appropriate land use policies.[9]

In general, people tend to compare intruding noise with the existing background noise. If the new noise is readily identifiable or considerably louder than the background, it has the potential to be objectionable or annoying.[10] In lieu of specific thresholds from the Noise Element, the traffic noise impact thresholds used herein are based on human tolerance to noise (see Table 5) and are widely used for assessing traffic noise impacts. That is, human sound perception is generally such that a change in sound level of 3 dB is just noticeable, a change of 5 dB is clearly noticeable, and a change of 10 dB is perceived as doubling or halving of sound level. Only audible changes of 3 dBA or greater at sensitive receptors are considered potentially significant when noise levels exceed the compatibility criteria. Based on the City of Torrance guidelines for what would be considered *normally compatible* for office, commercial, and medical uses, project-related traffic noise impacts would be substantial when the ambient noise environment along the roadway segments in the project's study area under with-project conditions increases by 3 dB AND exceeds 70 dBA CNEL.

Stationary Noise Thresholds

The stationary noise thresholds are based on a combination of the human awareness to noise (see Table 5) and local criteria for stationary noise sources as established by the City of Torrance for noise control.

[9] City of Torrance General Plan Noise Element, adopted April 6, 2010, page N-16.
[10] California Department of Transportation (Caltrans). 2009, November. *Technical Noise Supplement ("TeNS")*. Prepared by ICF International.

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Pursuant to Municipal Code Section 46.7.2, the City restricts stationary noise levels generated by air conditioning, refrigeration, heating, pumping, and filtering equipment as follows:

For receivers on residential land within Region 4 (which pertains to this project site and vicinity), the noise limits are 55 dBA during the daytime (7 AM to 10 PM) and 50 dBA during the nighttime (10 PM to 7 AM). For receivers on industrial or commercial land, the noise limits are 60 dBA during the daytime (7 AM to 10 PM) and 55 dBA during the nighttime (10PM to 7 AM). In all cases, the limits are the lowest of these values OR 5 dB above the ambient noise level. Additionally, the corrections summarized in Table 3 above would be applied, if appropriate (such as for steady, audible tones, or repetitive impulses noise sources).

A significant impact would occur if the project would cause an exceedance of the City municipal code thresholds.

5.2 ENVIRONMENTAL ASSESSMENTS

This section discusses the project-specific and cumulative impacts related to noise and vibration.

NOISE-1	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. Implementation of the proposed project would have a significant impact if it would expose new and existing receptors to incompatible levels of noise from both the operations and increased traffic resulting from future development of the project. The following describes changes to the noise environment associated with the Project and noise sources affecting the future office workers.

Stationary-Source Noise Impacts

Operation of the project would include use of heating, ventilation, and air conditioning (HVAC) systems and other sources of mechanical noise. Mechanical systems would be installed to comply with the noise limits in the municipal code. Additionally, any mechanical system would generate the same type of noise already present in the general area. Therefore, use of such equipment would not substantially elevate average daytime or nighttime noise levels in the vicinity of the project site, and noise impacts would be less than significant. No mitigation measures are necessary.

Land Use Compatibility

As discussed above in *Existing Conditions*, the majority of the project site would fall in the range of 67 to 77 dBA CNEL with respect to traffic-generated noise from Hawthorne Boulevard. Based on the Land Use Compatibility Guidelines, the maximum acceptable exterior noise levels for General Commercial and Business Park uses would be 70 dBA CNEL and 75 dBA CNEL, respectively. It is important to note, though, these Compatibility Guidelines are primarily aimed at proposed *new* uses. Since the project site is part of an existing office plaza and since the project will not change that basic function, there will be no changes in land use or in exterior noise compatibility due to project implementation.

However, given the specific renovation of general office space to medical suites in the 5-story structure, as well as the addition of the fitness center and restaurant venues (at or near the corner of Del Amo Circle West and Hawthorne Boulevard), consideration should be given to future interior sound environments, which should be 50 dBA CNEL for the medical suites and which should aim to be the same (50 dBA CNEL) for the restaurant and fitness center (per the discussion in Section 2.1.3 above, which assumed the 50 dBA CNEL value in lieu of no specific requirements in the Noise Element for such types of spaces). Fortunately, standard commercial building materials and construction techniques would typically be expected to achieve at least 25 dB of exterior-to-interior sound reduction.[11] Thus, the proposed fitness center and the medical suite renovation should easily achieve 50 dBA CNEL interior environments; given that they both have exterior environments near 70 dBA CNEL (and 70 dBA CNEL minus 25 dB would result in 45 dBA CNEL inside). Given that the proposed restaurant (a) does not have firm interior guidelines, (b) would have short-term usage by patrons, and (c) would be more of a consideration regarding a 'pleasant atmosphere' (as opposed to a workplace setting), it is recommended—rather than required—that a detailed acoustical study be conducted during the detailed design phase so as to thoroughly study the sound insulation aspects of the project's restaurant, fitness center, and medical offices venues to ensure achieving desirable interior sound conditions.

All things considered from a CEQA standpoint, the project would have noise/land use compatibility impacts that would be less than significant, and no mitigation would be required. A detailed acoustical sound insulation study is recommended, though.

Mobile-Source Noise Impacts

The Project would generate noise associated with additional vehicles traveling to and from the Project site on local roadways. The roadway noise modeling was based on average daily trips (ADT) on roadway segments in the vicinity; as analyzed in the Traffic Impact Analysis Report prepared by LLG in November 2015. Traffic noise was evaluated for Existing, Existing-Plus-Project, Future, and Future-Plus-Project conditions. Noise modeling procedures involved the calculation of vehicular noise levels along individual roadway segments. This was accomplished using a version of the Federal Highway Administration Highway Noise Prediction Model.[12] This model calculates the average noise level at specific locations based on traffic volumes, average speeds, roadway geometry, and site conditions. The Project's impact is determined by analysis of off-site traffic noise increases. Traffic noise parameters and modeling results are included in Appendix B.

The Project will be subject to traffic noise from Hawthorne Boulevard, Carson Street, and Del Amo Circle. Due to distance and existing buildings that lie to the south, the Project site is shielded from noise from Carson Street. The traffic on Hawthorne Boulevard will be the dominant roadway noise sources at the Project site. Table 8, *Project Contributions to Traffic Noise Levels*, compares the noise levels of each roadway segment for existing and future conditions.

[11] California Department of Transportation (Caltrans). 2009, November. *Technical Noise Supplement ("TeNS")*. Prepared by ICF International. and
Society of Automotive Engineers, Inc. (SAE). 1971, October. *House Noise—Reduction Measurements for Use in Studies of Aircraft Flyover Noise*. AIR 1081.
[12] Federal Highway Administration (FHWA). 1978, December. *Federal Highway Traffic Noise Prediction Model*, U.S. Dept. of Transportation. Report No. FHWA-RD77-108.

5. Environmental Impacts

Table 8 Project Contributions to Traffic Noise Levels

Roadway	Segment	Existing	2017 + Project	Overall Increase	Project Contribution	Significant Impact?
Torrance Blvd	west of Anza Ave	71.2	71.8	0.6	0.1	no
Torrance Blvd	Anza Ave to Hawthorne Blvd	72.5	73.0	0.5	0.0	no
Torrance Blvd	Hawthorne Blvd to Madrona Ave	75.5	75.9	0.4	0.1	no
Torrance Blvd	east of Madrona Ave	73.6	74.1	0.4	0.1	no
Del Amo Circle W	Village Court to Hawthorne Blvd	60.3	62.4	2.1	2.0	no
Del Amo Circle N	Hawthorne Blvd to Fashion Way	59.6	59.6	0.1	0.0	no
Carson Street	west of Anza Ave	63.6	63.9	0.2	0.1	no
Carson Street	Anza Ave to Del Amo Circle W	67.6	67.9	0.4	0.2	no
Carson Street	Del Amo Circle W to Hawthorne Blvd	67.8	68.2	0.4	0.3	no
Carson Street	Hawthorne Blvd to Madrona Ave	73.3	73.8	0.5	0.0	no
Carson Street	east of Madrona Ave	73.4	73.6	0.2	0.0	no
Sepulveda Blvd	west of Anza Ave	71.0	71.2	0.2	0.0	no
Sepulveda Blvd	Anza Ave to Hawthorne Blvd	75.2	75.3	0.2	0.0	no
Sepulveda Blvd	Hawthorne Blvd to Madrona Ave	76.1	76.4	0.2	0.1	no
Anza Ave	north of Torrance Blvd	69.9	70.3	0.5	0.0	no
Anza Ave	Torrance Blvd to Carson Street	70.1	70.3	0.2	0.0	no
Anza Ave	Carson Street to Sepulveda Blvd	70.0	70.2	0.2	0.0	no
Anza Ave	south of Sepulveda Blvd	70.0	70.2	0.2	0.0	no
Village Court	Village Lane to Del Amo Circle N	58.3	58.4	0.1	0.0	no
Del Amo Circle W	Del Amo Circle N to Carson Street	60.0	60.5	0.5	0.4	no
Hawthorne Blvd	north of Torrance Blvd	81.9	82.2	0.3	0.1	no
Hawthorne Blvd	Torrance Blvd to Del Amo Circle N	82.2	82.7	0.5	0.1	no
Hawthorne Blvd	Del Amo Circle N to Carson Street	82.1	82.6	0.5	0.1	no
Hawthorne Blvd	Carson Street to Sepulveda Blvd	82.1	82.6	0.5	0.1	no
Hawthorne Blvd	south of Sepulveda Blvd	82.4	82.7	0.4	0.0	no
Madrona Ave	north of Torrance Blvd	75.9	76.1	0.2	0.0	no
Madrona Ave	Torrance Blvd to Carson Street	74.2	74.4	0.3	0.0	no
Madrona Ave	Carson Street to Sepulveda Blvd	72.9	73.2	0.3	0.0	no

Source: Federal Highway Administration Highway Noise Prediction Model (FHWA-RD77-108).

As shown in Table 8, traffic noise increases due to project contributions range from 0.0 to 2.0 dB. An increase of less than 3 dBA CNEL is generally not noticeable and is not considered to be significant. Consequently, noise impacts generated by Project-related traffic would be less than significant and no mitigation measures are required.

NOISE-2	Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

Less Than Significant Impact.

Operational Vibration

The operation of the proposed project would not include any long-term vibration sources. Thus, no significant vibration effects or impacts from operations sources would occur and no mitigation measures are required.

Construction Vibration

Project construction, however, can generate varying degrees of ground vibration, depending on the construction procedures, the equipment used, and the proximity to vibration-sensitive uses. Construction equipment generates vibrations that spread through the ground and diminish in amplitude with distance from the source. The effect on buildings near a construction site varies depending on the type and depth of the source, soil type, ground strata, and receptor building construction. The generation of vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibrations at moderate levels, to slight damage at the highest levels. Vibration is typically noticed nearby when objects in a building generate noise from rattling windows or jangling picture frames. It is typically not perceptible outdoors and, therefore, impacts are normally based on the distance to the nearest building (FTA 2006). Table 9, *Construction Equipment Vibration Levels*, lists vibration levels for different types of construction equipment.

Table 9 Construction Equipment Vibration Levels

Equipment	Approximate RMS1 Velocity Level at 25 Feet (VdB)	Approximate PPV Velocity at 25 Feet (in/sec)
Vibratory Roller	94	0.210
Large Bulldozer	87	0.089
Caisson Drilling	87	0.089
Loaded Trucks	86	0.076
Jackhammer	79	0.035
Small Bulldozer	58	0.003

Source: FTA 2006.
1 RMS velocity calculated from vibration level (VdB) using the reference of 1 microinch/second and a crest factor of 4.

Vibration-Induced Architectural Damage

Project-related construction vibration was evaluated for its potential to cause minor architectural damage[13] based on FTA's architectural damage criteria. According to guidelines from the FTA for assessing damage from vibration caused by construction equipment, the worst-case building threshold at which there is a risk

[13] The term architectural damage is typically used to describe effects such as cracked plaster, cracks in drywall seams, sticking doors or windows, loosened baseboard/crown moldings, and the like.

5. Environmental Impacts

of architectural damage is 0.20 peak particle velocity (PPV) in inches per second. According to Caltrans's research and measurements, earthmovers and haul trucks have never exceeded PPV of 0.10 inches per second (in/sec) at 10 feet (Caltrans 2002).

Groundborne vibration generated by construction projects is usually highest during pile driving and rock blasting. No pile driving and rock blasting activities are anticipated to be required during project construction. Because vibration dissipates quickly with distance, and because construction would mostly require the use of small earthmoving equipment that do not generate considerable amounts of vibration, in most cases the maximum construction-related vibration level would be well below the 0.20 PPV in/sec criteria for vibration-induced architectural damage at the nearby structures. Table 10, *Construction Vibration Levels (PPV in/sec) at the Nearest Offsite Buildings,* shows the vibration levels from typical earthmoving construction equipment at the nearest offsite buildings.

Table 10 Construction Vibration Levels (PPV in/sec) at the Nearest Offsite Buildings

Equipment	Barnes and Noble (165 feet)1	Double Tree (250 feet)1	Village Court Senior Apartments (330 feet)1	Extended Stay America (450 feet)1
Vibratory Roller	0.012	0.007	0.004	0.003
Large Bulldozer	0.005	0.003	0.002	0.001
Caisson Drilling	0.005	0.003	0.002	0.001
Loaded Trucks	0.004	0.002	0.002	0.001
Jackhammer	0.002	0.001	0.001	0.000
Small Bulldozer	0.000	0.000	0.000	0.000
Limit	0.200			

Source: PlaceWorks, 2015.
[1] Distance between the receptor and the nearest boundary of the construction site.

As shown in Table 10, construction activities associated with the project would not exceed the FTA's criteria for vibration-induced structural damage of 0.200 PPV in/sec at any off-site buildings.

However, the nearest onsite building (California Bank and Trust) is located immediately adjacent to the construction site. For onsite receptors, a vibration-induced architectural damage analysis is not mandated by CEQA because the project would not affect the outside (off-site) environment. Nonetheless, construction vibration may detrimentally affect the existing office structure. Due to the concentrated activities, the distance required for vibration levels to fall below the 0.2 PPV architectural damage criterion is approximately 15 feet. Since equipment will be operating within 15 feet of existing buildings, it is possible that large equipment could cause the nearest buildings to experience vibration levels above the threshold. Thus, for structures less than 15 feet from large construction equipment, minor architectural/cosmetic damage may be encountered—depending on the intensity of processes and on the soil characteristics—and this would be a potentially significant impact.

The restrictions set forth in Mitigation Measure NOISE-1 will serve to reduce construction vibration impacts with respect to architectural damage to less than significant after mitigation. While the nearest offsite structures would not be exposed to groundborne vibration levels above the threshold for architectural

damage, the nearest onsite buildings may experience levels that are above architectural/cosmetic damage thresholds. With implementation of the mitigation measure below, the project would reduce potential vibration-induced architectural damage impacts to less than significant levels.

Mitigation Measures

NOISE-1:

For construction, grading, and demolition activities that would use vibration-producing equipment including (but not limited to) vibratory rollers, medium/large bulldozers, loaded trucks, hoe rams, and/or jackhammers and that would occur within 25 feet of existing onsite buildings, the following mitigation measures shall be implemented in close coordination with City staff so that alternative construction techniques or scheduling approaches are undertaken. The following controls to reduce potential vibration impacts shall be implemented during construction, as practical:

- Prior to construction, City staff shall meet with the construction contractor to discuss alternative methods of construction for activities within proximity to existing, onsite buildings (i.e., within 25 feet) to reduce vibration impacts. During the pre-construction meeting, the construction contractor shall identify construction methods not involving vibration-intensive equipment or activities. For example: drilled foundation caisson holes that would produce less vibration than impact or sonic pile driving methods.

- The constructor contractor shall implement reduced-vibration alternative methods identified in the pre-construction meeting during excavation, grading, and construction for work conducted within 25 feet of onsite buildings.

- Prior to the start of construction activities, the construction contractor shall document the pre-construction baseline conditions by inspecting and reporting on the then-current foundation and structural condition of the onsite buildings in the immediate vicinity of the construction site (i.e., within 25 feet).

- During construction, if any vibration levels cause cosmetic or structural damage (including, but not limited to cracks in walls or ceilings [particularly around doors and windows], sticking/rubbing doors or openable windows, fallen or displaced ceiling tiles, and/or items displaced from shelving) to the onsite buildings within 25 feet of the project site, City staff shall immediately issue "stop-work" orders to the construction contractor to prevent further damage. Work shall not restart until the building is stabilized and/or preventive measures are implemented to relieve further damage to the building(s).

Vibration Annoyance

While not presenting potential impacts relative to architectural damage, some construction activities may be perceptible at the nearest off-site receptors due to proximity of the activities. However, vibration-related construction activities would occur in the daytime when people are least sensitive to vibration levels (as many people would be away from their residences during the day).

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The FTA limit for vibration annoyance is 78 VdB at residential uses and 84 VdB at office uses. Human annoyance occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time, and construction activities are typically distributed throughout the Project site. Potential for vibration levels to reach the annoyance threshold would only occur for a very limited duration when equipment would be working in close proximity. Table 11, *Construction Vibration Levels (VdB) at the Nearest Buildings,* shows the vibration levels from typical earthmoving construction equipment at the nearest buildings.

Table 11 Construction Vibration Levels (VdB) at the Nearest Buildings

Equipment	California Bank and Trust (100 feet)[1]	Double Tree (390 feet)[1]	Village Court Senior Apartments (525 feet)[1]	Extended Stay America (640 feet)[1]
Vibratory Roller	82	70	68	66
Large Bulldozer	75	63	61	59
Caisson Drilling	75	63	61	59
Loaded Trucks	74	62	60	58
Jackhammer	67	55	53	51
Small Bulldozer	46	34	32	30
Limit	84	78		

Source: PlaceWorks, 2015.
[1] Distance between receptor and the center of the construction site.

As shown in Table 11, vibration levels would be well below the threshold for annoyance at sensitive receptors, and would not be perceptible. Therefore, the impact would be less than significant, and no mitigation measures are required.

NOISE-3	A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

Less Than Significant Impact. As described in Impact Assessment Noise-1 above, increases in noise levels related to stationary noise sources for the proposed project would not substantially elevate the existing ambient noise environment. Similarly, noise from project-related traffic along local roadways would not significantly increase noise levels in the project area and would likewise not result in a significant impact. Therefore, no mitigation measures are required.

NOISE-4	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.

Construction

Sensitivity to noise is based on the location of the equipment relative to sensitive receptors, the time of day, and the duration of the noise-generating activities. Two types of short-term noise impacts could occur during construction: (1) mobile-source noise from the transport of workers, material deliveries, and debris/soil

hauling and (2) on-site noise from use of construction equipment. Construction activities are anticipated to last approximately 16 months. The following discusses construction noise impacts to the off-site sensitive receptors.

Construction Vehicles

The transport of workers and equipment to the construction site would incrementally increase noise levels along site access roadways. The primary access routes for construction vehicles to the Project site would be Hawthorne Boulevard. Project-related construction worker vehicles, haul trucks, and vendor trucks would not pass by sensitive receptors on the way to the Project site. Construction-related trips would result in negligible noise level increases when compared to the traffic flow noise currently generated on the roadways (primarily the 50,000 ADT on Hawthorne Boulevard). In addition, these truck trips would be spread throughout the workday and would primarily occur during non-peak traffic periods. Therefore, noise impacts from construction-related truck traffic would be less than significant at noise-sensitive receptors along the construction routes. No mitigation measures are required.

Construction Equipment

Noise generated during construction is based on the type of equipment used, the location of the equipment relative to sensitive receptors, and the timing and duration of the noise-generating activities. Each stage of construction involves the use of different kinds of construction equipment and, therefore, has its own distinct noise characteristics. Noise levels from construction activities are dominated by the loudest piece of construction equipment. The dominant noise source is typically the engine, although work-piece noise (such as dropping of materials) can also be noticeable. Table 12, *Average Construction Noise Levels (dBA L_{eq}) at Nearest Sensitive Receptors*, compares the existing noise levels and construction noise levels at the Project site boundary.

Table 12 Average Construction Noise Levels (dBA L_{eq}) at Nearest Sensitive Receptors

Construction Phase	California Bank and Trust (100 feet)[1]	Double Tree Hotel (390 feet)[1]	Village Court Senior Apartments (525 feet)[1]	Extended Stay America (640 feet)[1]	Homes on Ocean Ave (870 feet)[1]	Jefferson Middle School (1,200 feet)[1]
Building Interior Demo	78	66	64	62	59	56
Asphalt Demo	79	67	64	63	60	57
Site Prep	78	66	63	62	59	56
Rough Grading	78	66	63	61	59	56
Utility Trenching	71	59	56	55	52	49
Building Construction	75	63	61	59	56	53
Arch Coating	68	56	53	52	49	46
Site Paving	76	64	61	59	57	54

Source: PlaceWorks, 2015.
[1] Distance between receptor and the center of the construction site.

As shown in Table 12, noise levels generated by construction equipment during the demolition, site prep, and grading phases would be in the range of 56 to 79 dBA L_{eq} at the nearest sensitive uses. However, the uses also experience traffic noise due to Hawthorne Boulevard and Carson Street. Still, project construction may result

in noise levels above ambient levels. Other uses in the vicinity of the Project site are commercial and are not noise-sensitive.

According to the City of Torrance Municipal Code, noise sources associated with construction are exempted from the City's Noise Ordinance, provided said activities take place from 7:30 AM to 6:00 PM Monday through Friday, or from 9:00 AM to 5:00 PM on Saturdays. Under the ordinance, construction is prohibited on Sundays and holidays. With the presumption that work hours would comply with the City of Torrance's construction noise hours, construction activities would occur during the least noise sensitive portions of the day. Therefore, Project-related construction noise impacts would be less than significant and no mitigation measures are necessary.

NOISE-5	For a project located within an airport land use plan or where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels.

No Impact. The Project is approximately 2.3 miles southeast of Torrance Airport. However, the Project site is well outside the 60 CNEL contour for the airport. The noise contours for Torrance Airport are included in the City's Noise Element (included in Appendix A). Other nearby public airports include Hawthorne Municipal Airport (6.3 miles north), Compton / Woodley Airport (7.4 miles northeast), and Los Angeles International Airport (7.7 miles northwest). At these distances for airports, the proposed project would not expose residents to excessive noise levels from aircraft noise. No public airport-related noise impacts would occur and no mitigation measures are necessary.

NOISE-6	For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

No Impact. The Project is not located within 2 miles of a private airstrip or heliport. The nearest heliport is Toyota Helistop, approximately 2.8 miles to the northeast. Therefore, the proposed project would not expose residents to excessive noise levels from aircraft noise. No private airstrip-related noise impacts would occur and no mitigation measures are required.

5.2.2 Mitigation Measures

The following Mitigation Measure was found to be needed to reduce construction vibration impacts for potential architectural damage to less than significant levels.

NOISE-1:
For construction, grading, and demolition activities that would use vibration-producing equipment including (but not limited to) vibratory rollers, medium/large bulldozers, loaded trucks, hoe rams, and/or jackhammers and that would occur within 25 feet of existing onsite buildings, the following mitigation measures shall be implemented in close coordination with City staff so that alternative construction techniques or scheduling approaches are undertaken. The following controls to reduce potential vibration impacts shall be implemented during construction, as practical:

- Prior to construction, City staff shall meet with the construction contractor to discuss alternative methods of construction for activities within proximity to existing, onsite buildings (i.e., within 25 feet) to reduce vibration impacts. During the pre-construction meeting, the construction contractor shall identify construction methods not involving vibration-intensive equipment or activities. For example: drilled foundation caisson holes that would produce less vibration than impact or sonic pile driving methods.

- The constructor contractor shall implement reduced-vibration alternative methods identified in the pre-construction meeting during excavation, grading, and construction for work conducted within 25 feet of onsite buildings.

- Prior to the start of construction activities, the construction contractor shall document the pre-construction baseline conditions by inspecting and reporting on the then-current foundation and structural condition of the onsite buildings in the immediate vicinity of the construction site (i.e., within 25 feet).

- During construction, if any vibration levels cause cosmetic or structural damage (including, but not limited to cracks in walls or ceilings [particularly around doors and windows], sticking/rubbing doors or openable windows, fallen or displaced ceiling tiles, and/or items displaced from shelving) to the onsite buildings within 25 feet of the project site, City staff shall immediately issue "stop-work" orders to the construction contractor to prevent further damage. Work shall not restart until the building is stabilized and/or preventive measures are implemented to relieve further damage to the building(s).

5.2.3 Level of Significance After Mitigation

With implementation of the Mitigation Measure NOISE-1, the project would reduce potential vibration-induced architectural damage impacts to less than significant levels.

5. Environmental Impacts

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Appendix A. City of Torrance Noise Element and Noise-Related Municipal Codes

Appendix

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CHAPTER 5

NOISE ELEMENT

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CHAPTER 5

NOISE ELEMENT

INTRODUCTION

Noise that is experienced by people who did not produce it is "second-hand sound," and is among the most pervasive pollutants today. Like second-hand smoke, it has detrimental effects on people who had no part in creating it.
- Noise Pollution Clearinghouse, 2004

Excessive noise can disrupt our lives. Noise can interrupt our conversations, thoughts, and leisure activities. Noise sensitivity varies depending on the time of day, its duration and pitch, and preferences of individuals. Despite this variability, most residents agree that too much noise or the wrong type of noise can be irritating and interfere with sleep, speech, recreation, and tasks that require concentration or coordination. Therefore, noise not only decreases environmental quality but can also adversely affect our physical and mental health.

In Torrance, street and freeway traffic represent the primary source of noise. The I-405 Freeway, which traverses the northeastern portion of the City, presents concerns where it runs adjacent to residential neighborhoods and schools. Other significant sources of noise include arterial roadways and intersections, the Santa Fe Railroad, and Torrance Municipal Airport.

Because Torrance is largely built out and the street system well developed, the City faces challenges in separating noise-sensitive land uses from primary noise sources. Thus, the Noise Element establishes policies to guard against creation of any new noise/land use conflicts and to minimize the impact of existing noise sources on the community.

RELATIONSHIP TO OTHER GENERAL PLAN ELEMENTS

Land use relationships and noise associated with roadways, train traffic, and operations at Torrance Municipal Airport represent the focus of community noise concerns. Therefore, policies in this Noise Element are tied most closely to policies and programs set forth in the Land Use and Circulation Elements. For example, community noise standards affect the location or treatment of proposed new land uses, such as uses within the noise contours of the airport. With regard to the local road network, this Element contains noise contour maps that identify anticipated noise levels associated with future traffic volumes, and includes policies and programs intended to reduce adverse noise conditions.

SCOPE AND REQUIREMENTS OF THE NOISE ELEMENT

In recognition of the adverse health effects associated with excessive noise, the California Government Code, Section 65302(f) very specifically identifies the types of community noise to be addressed in the General Plan. The Noise Element addresses noise sources from:

- Highways and freeways
- Primary arterials and major local streets
- Passenger and freight on-line railroad operations and ground rapid transit systems
- Commercial, general aviation, heliport, and military airport operations, aircraft over-flights, jet engine test stands, and all other ground facilities and maintenance functions related to airport operations
- Local industrial plants, including, but not limited to, railroad classification yards
- Other stationary ground noise sources identified by local agencies as contributing to the community noise environment

1. MEASURING NOISE

Noise is often described as unwanted or irritating sound. Defining noise with a single unit of measure is difficult because noise consists of several components — pitch, loudness, and duration — and because noise includes subjective qualities. At the objective level, scientists have developed the A-weighted sound pressure level, or dB(A), to describe the loudness of a sound or sound environment based on the sensitivity of the human ear. At 60 dB(A), noise

impairs the ability to hear speech, and sound levels over 40 to 45 dB(A) can disturb sleep. A person's likelihood of hearing loss strongly increases at prolonged exposure to sound levels over 85 dB(A). To provide some perspective on the relative loudness of various types of noise, Table N-1 lists common sources of noise and their approximate noise levels.

Table N-1
Typical Noise Levels

Common Outdoor Activities	Noise Level in dB(A)	Common Indoor Activities
	110	Rock Band
Jet Fly-over at 1,000 feet	100	
	90	
Diesel Truck at 50 feet at 50 mph		Food Blender at three feet
	80	Garbage Disposal at three feet
Noisy Urban Area, Daytime		
Gas Lawn Mower at 3 feet	70	Vacuum Cleaner at 10 feet
Commercial Area		Normal speech at 3 feet
Heavy Traffic at 300 feet	60	
		Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (background)
Quiet Suburban Nighttime		
	30	Library
Quiet Rural Nighttime		Bedroom at Night
		Concert Hall (background sound)
	20	
		Broadcast/Recording Studio
	10	
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

Source: Table N-2136.2 of California Department of Transportation's Traffic Noise Analysis Protocol (October 1998).

Table N-2 describes State criteria for minimizing harmful noise effects.

Table N-2
State Criteria for Minimizing Adverse Noise Effects on Humans

Objective	dB(A) Range
Prevent Hearing Loss	75-80
Prevent Physiological Effects (other than hearing loss)	65-75
Prevent Speech Interference	50-60
Address People's Subjective Preference for Noise Control	45-50
Prevent Sleep Interruption	35-45

Source: California General Plan Guidelines, 2000.

Acousticians have developed noise metrics to account for the fact that noise during nighttime hours can be more bothersome than daytime noise. The noise metrics apply a weighted ambient noise level average over a 24-hour period, and assigns "penalties" to noise that occurs between 10:00 P.M. to 7:00 A.M. These metrics are defined as either the Community Equivalent Noise Level (CNEL) or Day-Night Level (Ldn).

Figure N-1 shows common CNEL and Ldn noise exposure levels at different locations. The highest dB(A) level is listed for the area next to a freeway, which has a noise exposure level of 85 dB(A). The lowest dBA level is listed for a farm, which is 40 dB(A). The figure also indicates that 65 dB(A) is the common standard for noise level in outdoor residential areas, and 45 dB(A) is the common standard for the interior of residences

The objectives and policies in this element aim to meet the City's overarching goal for noise regulation in the City of Torrance:

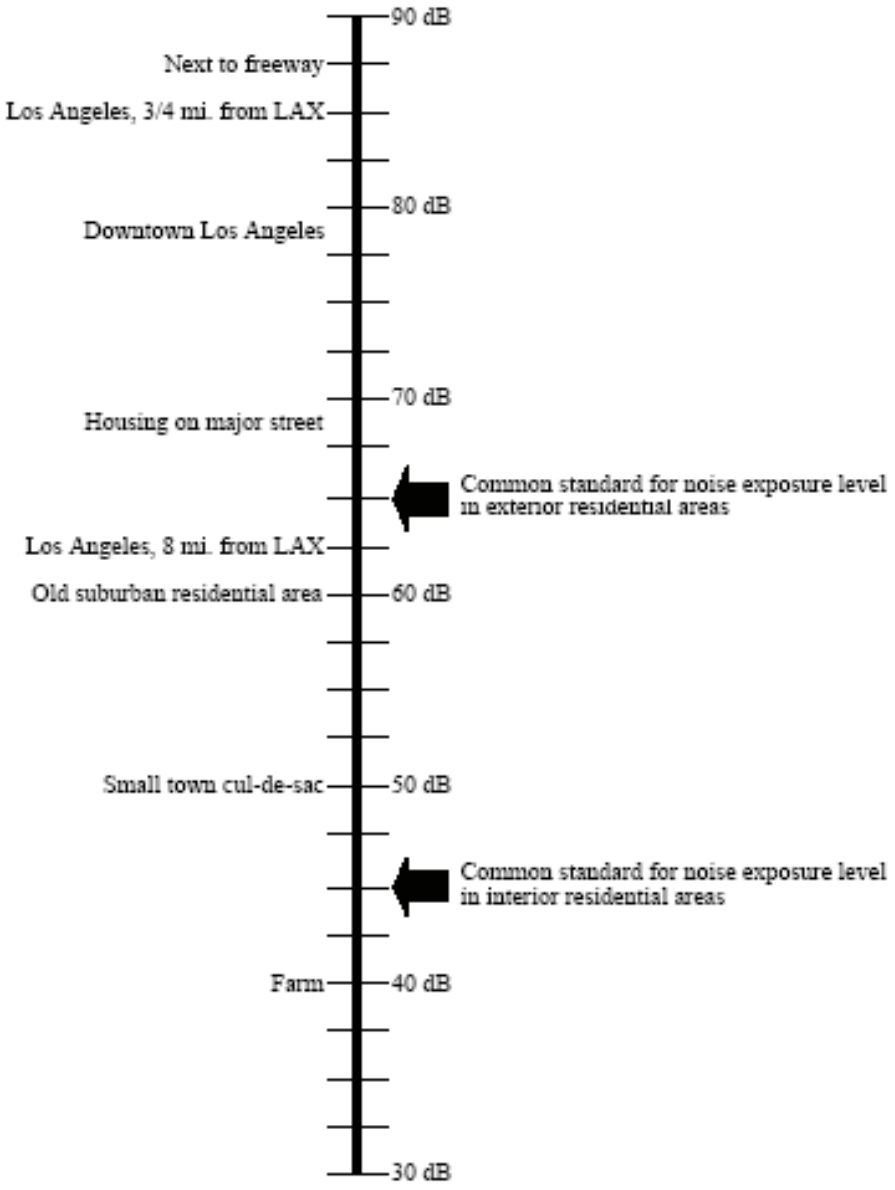
GOAL: Minimize exposure of residents to noise

2. BASELINE NOISE CONDITIONS

The community noise environment can be described using contours derived from monitoring major sources of noise. Noise contours are analogous to topographic contours on a map showing terrain. Just as topographic contours illustrate elevations of the ground surface, noise contours define noise levels at particular locations. The contours generally represent average noise levels, such as the CNEL or Ldn, based on major noise sources in the community. The contours assist in setting policies for distribution of land uses and establishment of development standards.

A study of baseline noise sources and levels was completed in August, 2006. Noise level measurements were collected during a typical weekday at 20 locations throughout Torrance. Criteria for site selection included geographical distribution, land uses suspected of noisy activities, and proximity to transportation facilities and sensitive receptor locations. The primary purpose of noise monitoring was to establish a noise profile for the community that could be used to determine areas of concern.

Figure N-2 shows noise contours for noise conditions in Torrance in 2006. The contours account for the many noise sources in the City, including I-405, arterial and collector roadways, train operations along the Santa Fe Railroad, the Honeywell facility, and Torrance Airport. Each source is described in greater detail in Figure N-1.



Source: Wieland Associates, Inc., July 2006.

Figure N-1:
Common CNEL and Ldn Noise Exposure Levels at Various Locations

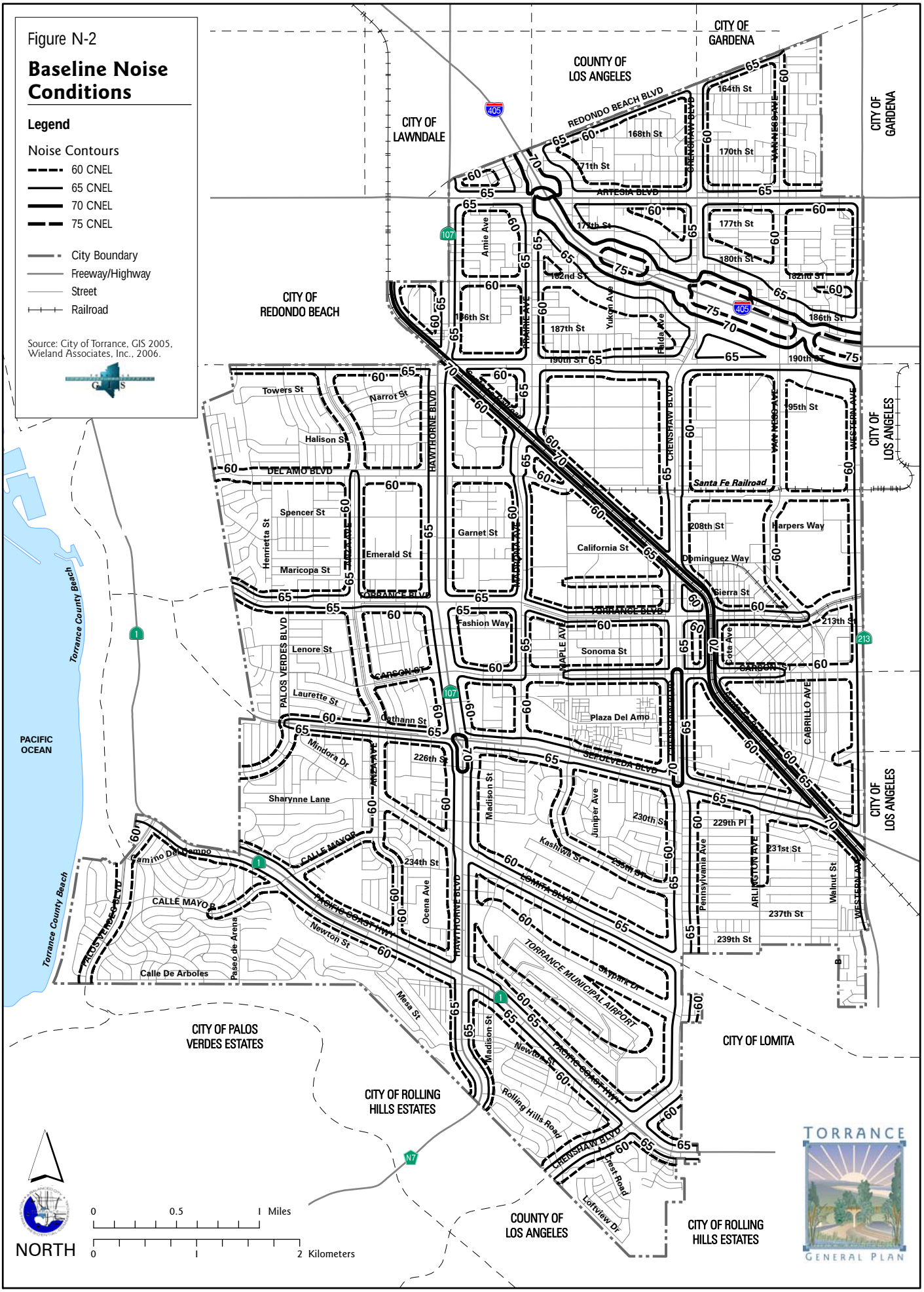


Figure N-2
Baseline Noise Conditions
Legend
Noise Contours
60 CNEL
65 CNEL
70 CNEL
75 CNEL
City Boundary
Freeway/Highway
Street
Railroad
Source: City of Torrance, GIS 2005, Wieland Associates, Inc., 2006.
CITY OF GARDENA
COUNTY OF LOS ANGELES
CITY OF LAWNDALE
CITY OF REDONDO BEACH
CITY OF LOS ANGELES
CITY OF PALOS VERDES ESTATES
CITY OF ROLLING HILLS ESTATES
CITY OF LOMITA
COUNTY OF LOS ANGELES
CITY OF ROLLING HILLS ESTATES
PACIFIC OCEAN
Torrance County Beach
REDONDO BEACH BLVD
ARTESIA BLVD
DEL AMO BLVD
TORRANCE BLVD
SEPULVEDA BLVD
CARSON ST
LOMITA BLVD
PACIFIC COAST HWY
CRENSHAW BLVD
HAWTHORNE BLVD
PALOS VERDES BLVD
NAPLE AVE
ANZA AVE
MADISON ST
Santa Fe Railroad
Fashion Way
Plaza Del Amo
Sonoma St
California St
Garnet St
Emerald St
Maricopa St
Spencer St
Lenore St
Laurette St
Gathann St
Mindora Dr
Sharynne Lane
Towers St
Narrot St
Halison St
Harpers Way
Dominguez Way
Sierra St
213th St
208th St
195th St
190th St
187th St
186th St
182nd St
180th St
177th St
174th St
171th St
170th St
168th St
164th St
Amie Ave
Yukon Ave
Flida Ave
Juniper Ave
Kashiwa St
235th St
230th St
229th Pl
231st St
237th St
239th St
226th St
234th St
Calle De Arboles
Paseo de Arena
Ocena Ave
Newton St
Mesa St
Skypark Dr
TORRANCE MUNICIPAL AIRPORT
Rolling Hills Road
Crest Road
Loftview Dr
Camino Del Campo
CALLE MAYOR
Pennsylvania Ave
ARLINGTON AVE
Walnut St
WESTERN AVE
VAN NESS AVE
CABRILLO AVE
Fota Ave
Henrietta St
Torrance County Beach
0
0.5
1 Miles
0
1
2 Kilometers
NORTH
TORRANCE
GENERAL PLAN

2.1 TRANSPORTATION-RELATED NOISE

2.1.1 I-405 FREEWAY

Interstate 405 crosses the northeastern portion of Torrance and is busy for most daylight hours. Traffic levels create noise conditions in excess of 65 CNEL along the freeway's path. As noted in Figure N-1, this is generally considered the threshold noise level for residential use. Figure N-2 shows that several residential neighborhoods and public facilities are exposed to high noise levels from freeway traffic.

As freeways are under the jurisdiction of Caltrans, this State agency is responsible for addressing noise abatement issues where Caltrans' activities have created adverse noise conditions, pursuant to the Streets and Highway Code. Consistent with Section 216 of the Code, Caltrans has, for example, implemented a School Noise Abatement Program that takes measures to reduce classroom interior noise levels to below 52 dB(A). Yukon Elementary, located immediately north of I-405 between Crenshaw Boulevard and Prairie Avenue, is exposed to noise levels of 75 dB(A) and higher; the school has benefitted from soundproofing and air-conditioning as part of this program.[1] As regional traffic continues to increase, freeway noise mitigation will continue to be a key policy issue for Torrance.

2.1.2 MAJOR ROADWAYS

Residents whose homes either abut or are in proximity to major roadways may experience high noise levels during peak commute hours. Generally, Torrance's historic land use patterns have resulted in commercial and industrial land uses along arterial roadways. Also, the noise contours shown on Figure N-2 indicate that roadway noise generally does not exceed 65 CNEL. As of 2006, the only roadway sections with noise levels at or above 65 CNEL were Crenshaw Boulevard between Carson Street and Sepulveda Boulevard and the intersection of Sepulveda Boulevard and Hawthorne Boulevard.

2.1.3 SANTA FE RAILROAD

In Torrance, noise from the Santa Fe Railroad is sporadic because trains do not run continuously throughout the day. However, when trains do run through the City, they are as noisy as peak hours of automobile and truck traffic. Freight trains pass through Torrance daily in route to and from Long Beach. Figure N-2 indicates that, compared to noise effects of I-405, a limited buffer area surrounding the railroad is exposed to noise levels of 60 CNEL or higher.

[1] Caltrans District 7, Project Information, Soundwalls.
http://www.dot.ca.gov/dist07/aboutdist7/projects/soundwalls_02/index.php?strpg=noise

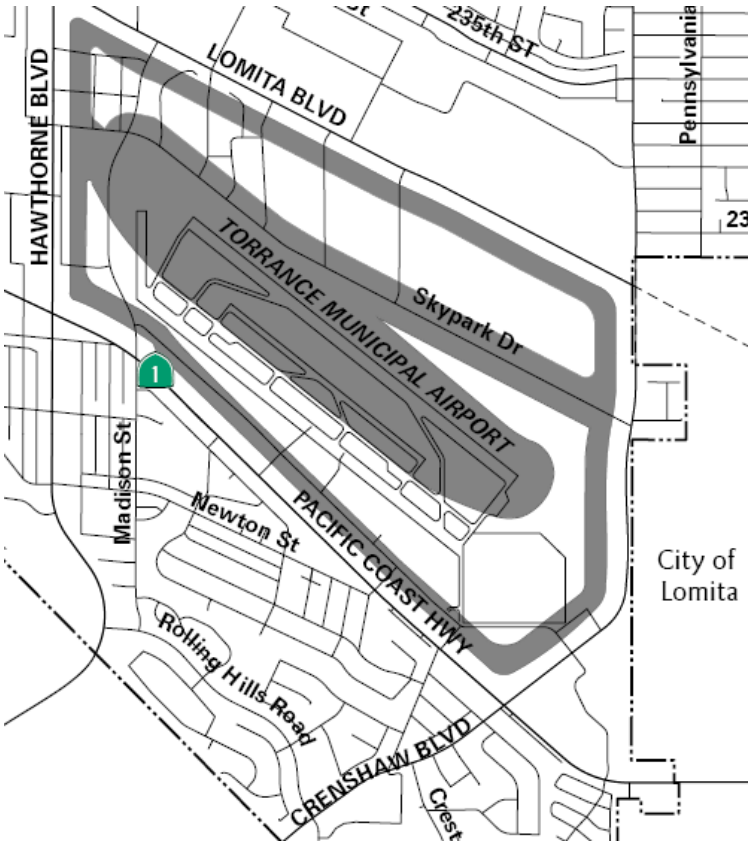


Figure N-3:
Noise Conditions, Torrance Airport

A few residential uses near the intersection of Torrance Boulevard and the railroad line are adversely impacted by railroad noise.

2.1.4 TORRANCE MUNICIPAL AIRPORT (ZAMPERINI FIELD)

Torrance Municipal Airport is a general aviation facility that accommodates both propeller and jet aircraft (although jet traffic is limited by the fact that jet fuel is not sold at the airport). The Torrance Municipal Code includes stringent noise standards intended to make the airport compatible with adjacent land uses. The airport follows the Federal Aviation Administration's (FAA) land use restrictions, which regulate land uses surrounding airports and flight paths. In addition to safety concerns, these restrictions also restrict incompatible land uses near airports because of noise concerns. The City also has adopted a strict Airport Noise Abatement Program. Noise monitors report excessive aircraft noise to City staff, and staff works with pilots to find ways to meet the established noise limits.

The City's Noise Abatement program has resulted in reduced noise complaints from aircraft activity at Torrance Airport.

Figure N-3 indicates that critical noise contours associated with Torrance Airport do not impact any residential neighborhoods. In fact, most of the 60 dBA noise contour is confined to airport property, although properties along the north most sections of Skypark Drive are marginally affected by noise. The majority of noise affecting the rest of Skypark Drive, Hawthorne Boulevard, and Pacific Coast Highway is automobile related.

Adjacent to Torrance Airport, Robinson Helicopter manufactures civil helicopters. Helicopter noise often may be more irritating than noise from other aircraft because helicopters operate at low altitudes and therefore produce more noise. Robinson Helicopter adheres to the City's noise standards to ensure that late-night helicopter operations are limited.

2.2 NON-TRANSPORTATION NOISE

Non-transportation noise sources include various activities in commercial and industrial districts, which may include potential stationary noise sources.

As a matter of practice, the City reviews all development applications to identify issues of concern, including potential noise exposure and generation. An acoustical analysis is required for projects that could have potentially adverse noise effects on sensitive receptors such as schools, hospitals,

churches, and residential neighborhoods. Mitigating features or conditions must be included in a project when significant noise impacts are identified.

Other sources of community noise are often associated with ordinary daily activities such as property maintenance and construction. Excessive noise from lawnmowers, leaf blowers, mechanical equipment, power tools, and the like can generate complaints when noise-generating activities occur in the evening or during restful weekend hours. The City's noise standards will be implemented to help maintain optimal interior and exterior noise levels within residential areas.

3. FUTURE NOISE CONDITIONS

As Torrance is largely developed, new development over time will be limited to the recycling of uses to slightly higher densities and intensities at limited locations. The long-established land use patterns generally will not change. More intense development will be focused along major corridors, such as Hawthorne Boulevard.

Over the long term, noise conditions in Torrance are not anticipated to change significantly from the baseline conditions modeled in 2006. Future noise contours have been developed based on anticipated traffic volumes, rail traffic, airport operations, and general land use activity. These contours assist in the review of land use and development proposals. Figure N-4 presents the projected noise contours and noise impact areas.

Overall, the increase in noise over the life of the General Plan is minimal. The primary stationary noise sources — Torrance Municipal Airport and major industrial operations — will continue to exist. Roadway noise along major roads such as Hawthorne Boulevard and Crenshaw Boulevard will increase slightly due to increase in traffic volumes mostly attributable to regional growth. Small entryway segments of Torrance Boulevard and Carson Street at the east end of the City will also experience minimal increases in noise. A small segment of Prairie Avenue just north and south of the I-405 will also experience an increase in noise levels attributable to expected traffic growth along the I-405. Areas that are expected to experience increased noise levels are primarily limited to non-residential areas. Most residential areas will not experience noise levels above baseline conditions with the exception of two short segments of Palos Verdes Boulevard (the segment from Torrance Boulevard to Sepulveda Boulevard and a segment just north of Calle Mayor).

Table N-3 establishes the noise/land use compatibility criteria Torrance will use in determining whether a new use is appropriate within a given noise environment.

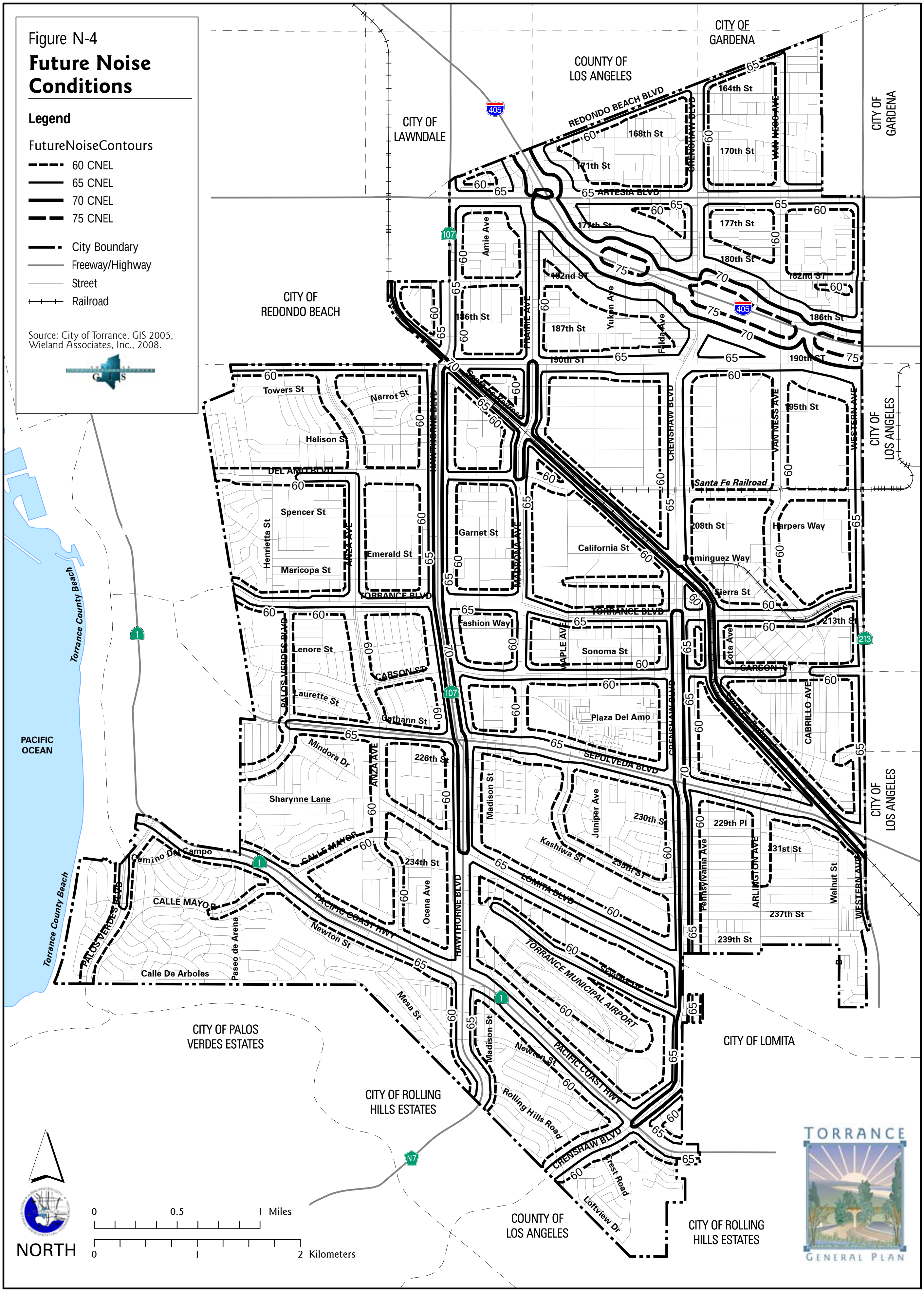


Figure N-4
Future Noise Conditions
Legend
FutureNoiseContours
60 CNEL
65 CNEL
70 CNEL
75 CNEL
City Boundary
Freeway/Highway
Street
Railroad
Source: City of Torrance, GIS 2005, Wieland Associates, Inc., 2008.
CITY OF GARDENA
COUNTY OF LOS ANGELES
CITY OF LAWNDALE
CITY OF REDONDO BEACH
CITY OF LOS ANGELES
PACIFIC OCEAN
Torrance County Beach
CITY OF PALOS VERDES ESTATES
CITY OF ROLLING HILLS ESTATES
CITY OF LOMITA
REDONDO BEACH BLVD
ARTESIA BLVD
HAWTHORNE BLVD
CRENSHAW BLVD
WESTERN AVE
DEL AMO BLVD
TORRANCE BLVD
CARSON ST
SEPULVEDA BLVD
PACIFIC COAST HWY
LOMITA BLVD
PALOS VERDES BLVD
ANZA AVE
PRAIRIE AVE
MADRONA AVE
MAPLE AVE
VAN NESS AVE
CABRILLO AVE
ARLINGTON AVE
Santa Fe Railroad
Plaza Del Amo
TORRANCE MUNICIPAL AIRPORT
0 0.5 1 Miles
0 1 2 Kilometers
NORTH
TORRANCE GENERAL PLAN

Table N-3
Torrance Noise/Land Use Compatibility Guidelines

Property Receiving Noise		Maximum Noise Level Ldn or CNEL, dB(A)	
Type of Use	Land Use Designations	Interior	Exterior
Residential[3]	Low Density Residential Low Medium Density Residential Medium Density Residential	45	60/65[1]
	Medium High Density Residential	45	65 / 70[2]
	High Density Residential	45	70[1]
Commercial and Office	General Commercial Commercial Center	--	70
	Residential Office	50	70
Industrial	Business Park Light Industrial Heavy Industrial	55	75
Public and Medical Uses	Public/Quasi-Public/Open Space	50	65
	Hospital/Medical	50	70
Airport	Airport	--	70

1. The normally acceptable standard is 60 db(A). The higher standard is acceptable subject to inclusion of noise-reduction features in project design and construction.
2. Maximum exterior noise levels up to 70 dB CNEL are allowed for Multiple-Family Housing.
3. Regarding aircraft-related noise, the maximum acceptable exposure for new residential development is 60 dB(A) CNEL.

These compatibility criteria serve as guidelines. For example, an acoustical analysis must be prepared when noise-sensitive land uses are proposed within noise impact areas. The analysis must show that the project is designed to attenuate noise to meet the City's noise standards in order to receive approval. If the project design does not meet the noise standards, mitigation can be recommended in the analysis. If the analysis demonstrates that the noise standards can be met by implementing the mitigation measures, the project can be approved conditioned upon implementation of the mitigation measures.

4. NOISE ABATEMENT

Recognizing the need to protect residents from noise, the City has adopted specific regulations for noise produced by transportation sources, trains, and aircraft. These regulations offer protection to residents and users of facilities like schools and libraries, where noise can have particularly disruptive impacts, while also balancing the need of industry and commuters to make a reasonable amount of noise associated with commerce and industry during a workday.

4.1 NOISE ABATEMENT PROGRAMS

4.1.1 AIRPORT NOISE ABATEMENT PROGRAM

The City's Noise Abatement Program, which is enforced by the Environmental Division of the Community Development Department, provides for on-going monitoring of aircraft noise. City ordinances do not allow aircraft landing on or taking off from the airport to exceed a Single Event Noise Exposure Level (SENEL) of 88 dB(A) or a maximum sound level of 82 dB(A), measured at ground level outside the extended airport boundaries. The program imposes even more restrictive noise limits for night flights.

Established in 1977, the noise abatement program has dramatically decreased noise complaints related to airport operation. The airport program relies on noise monitors in areas of the community under aircraft flight paths. If an aircraft exceeds specified noise limits, pilots are notified by the City. The City also aims to be proactive in stemming aircraft noise complaints by working with pilots to test noise levels and find ways to safely get planes in and out of the airport without exceeding the established noise limits. This type of aircraft noise mitigation is possible for most aircraft using the airport. Since the inception of the noise abatement program, the variety of aircraft using the airport has become noticeably quieter, and the number of noise violations per operations has decreased over the years to well below one percent. The majority of noise violations are made by transient aircraft.

Since its inception almost 20 years ago, the program has become one of the most effective programs in the country, and has been used as a model by other cities and airports. The program significantly decreased aircraft noise violations from between 4.5 to 5 percent of operations in 1976 to less than one percent by 1987.[2] Noise violations have been reduced to less than 0.2 percent of total airport operations. Through this program, the City has successfully balanced the airport's needs with the community's requirements for a livable environment.

[2] "History of Noise Abatement Program" memo, presented to the Airport Commission on April 9, 1987

4.1.2 MUNICIPAL CODE NOISE AND LAND USE COMPATIBILITY REGULATIONS

Quality of life is tied to living in an environment where we can carry out daily activities without the interference and harmful effects from excessive noise. The Municipal Code has noise guidelines that stress the importance of protecting indoor and outdoor noise environments. Protecting sensitive receptors and residential neighborhoods is particularly important, and the City has established maximum acceptable noise levels within noise zones.

Municipal Code, Division 4: Public Health and Welfare (Chapter 6 - Noise Regulation) establishes noise level limits in most residential areas of 50 to 55 db(A) between 7:00 A.M. to 10:00 P.M., and 45-50 db(A) between 10:00 P.M. to 7:00 A.M., depending on location. The regulations establish regions with differing noise regulations, as indicated on Figure N-5.

- Region 1 includes the predominantly industrial areas in and around the refineries and industrial uses on the western edge of the City.
- Region 2 includes the area in and around the airport and includes the commercial and industrial uses south of Lomita Boulevard and north of Pacific Coast Highway.
- Region 3 encompasses the residential neighborhoods south of Pacific Coast Highway and west of Hawthorne Boulevard.
- Region 4 includes the remainder of the City.

Acceptable noise levels are lower for neighborhoods in Region 3. Noise levels in most of the City's industrial and commercial areas cannot exceed 60 dB(A) during the day or 55 dB(A) during the night. The ordinance offers flexibility in the areas surrounding the oil refineries (Region 1), where noise levels cannot exceed 70 dB(A) during the day or 65 dB(A) at night.

Understanding that certain types of noise are more harmful and annoying, the City's noise regulations penalize certain types of noise sources by lowering the permitted decibels allowed. In other cases such as those where noise is not continuous and occurs only during a very limited timeframe or duration, decibel limits can be higher.

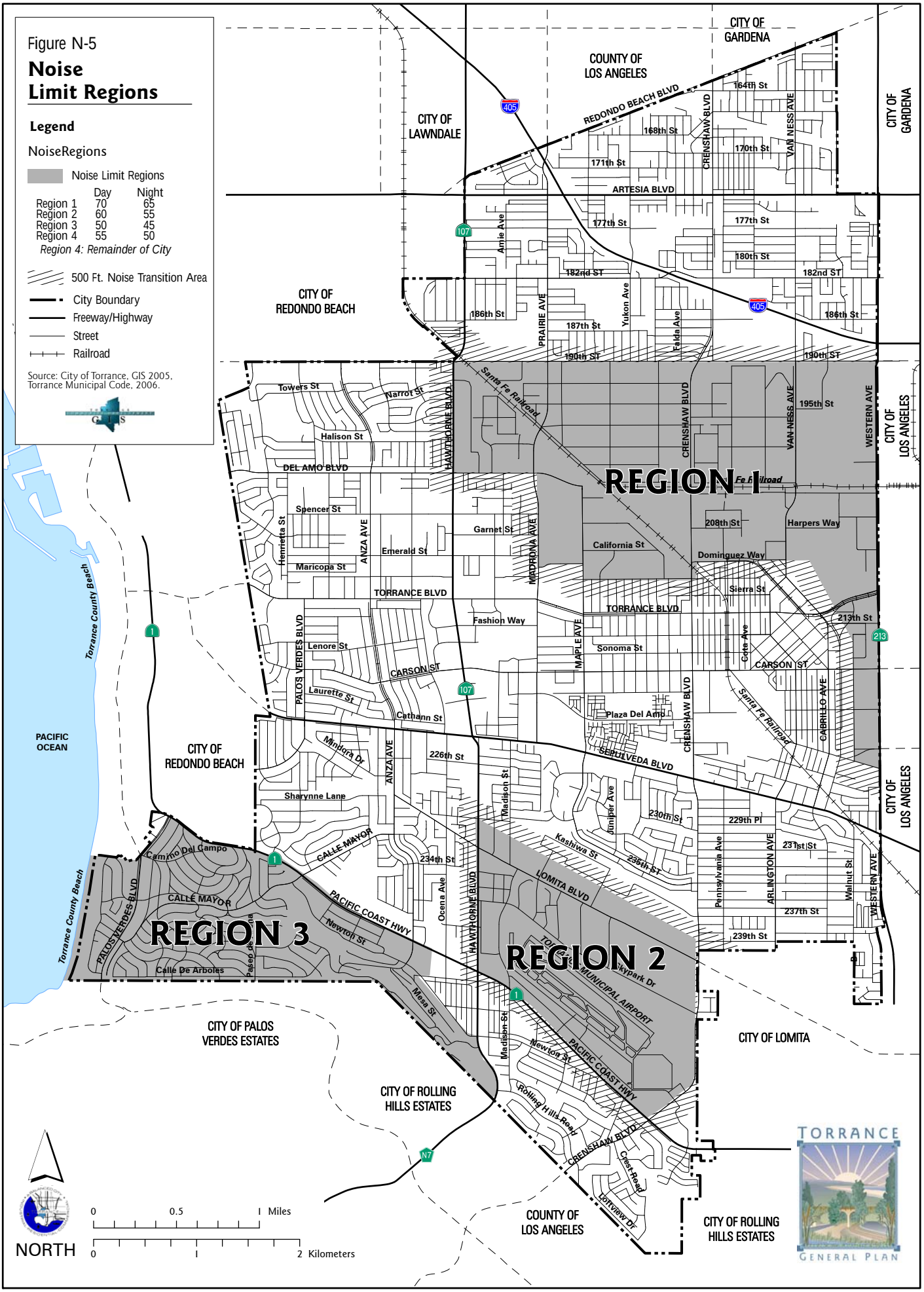


Figure N-5
Noise Limit Regions
Legend
NoiseRegions
Noise Limit Regions
Day Night
Region 1 70 65
Region 2 60 55
Region 3 50 45
Region 4 55 50
Region 4: Remainder of City
500 Ft. Noise Transition Area
City Boundary
Freeway/Highway
Street
Railroad
Source: City of Torrance, GIS 2005, Torrance Municipal Code, 2006.
REGION 1
REGION 2
REGION 3
CITY OF GARDENA
COUNTY OF LOS ANGELES
CITY OF LAWNDALE
CITY OF REDONDO BEACH
CITY OF LOS ANGELES
PACIFIC OCEAN
CITY OF PALOS VERDES ESTATES
CITY OF ROLLING HILLS ESTATES
CITY OF LOMITA
REDONDO BEACH BLVD
ARTESIA BLVD
TORRANCE BLVD
CARSON ST
SEPULVEDA BLVD
LOMITA BLVD
PACIFIC COAST HWY
CRENSHAW BLVD
HAWTHORNE BLVD
PALOS VERDES BLVD
ANZA AVE
MAPLE AVE
VAN NESS AVE
WESTERN AVE
ARLINGTON AVE
Santa Fe Railroad
Torrance County Beach
TORRANCE MUNICIPAL AIRPORT
0 0.5 1 Miles
0 1 2 Kilometers
NORTH
TORRANCE GENERAL PLAN

Table N-4
Noise Conditions Correction to the Limits, (in Decibels)

1	Noise contains a steady, audible tone, such as a whine, screech or hum	-5
2	Noise is a repetitive impulsive noise, such as hammering or riveting	-5
3	If the noise is not continuous, one of the following corrections to the limits shall be applied:	
a	Noise occurs less than 5 hours per day or less than 1 hour per night	+5
b	Noise occurs less than 90 minutes per day or less than 20 minutes per night	+10
c	Noise occurs less than 30 minutes per day or less than 6 minutes per night	+15
4	Noise occurs on Sunday morning (between 12:01 A.M. and 12:01 P.M. Sunday)	-5

City of Torrance Municipal Code

For construction work, the ordinance limits the use of power construction tools or equipment for construction work adjacent to residential areas. With regard to railroad noise, the ordinance places restrictions on night-time operations and the decibel level of train whistles.

4.1.3 MOTOR VEHICLE NOISE

As Figure N-4 indicates, noise from vehicles traveling along Torrance's roadways will continue to represent the primary noise source in the community. The City has very limited ability to abate vehicle-related noise at a local level. The State of California establishes noise limits for vehicles, and at the local level, the City can cite any driver on City streets whose vehicle exceeds the limits. This applies to engine and exhaust system noise, as well as any noise from inside the vehicle that can be heard (or felt) beyond the vehicle.

With regard to freeway noise, as discussed above, Caltrans is responsible for noise abatement. The City's best defense against exposing any additional residents or noise-sensitive uses to I-405 noise is to apply the noise/land use compatibility criteria set forth in Table N-3 in the review of development applications.

4.2 NOISE GOALS AND POLICIES

The City's goals and policies regarding noise aim to minimize adverse noise impacts and to preserve the high quality of life for City residents. Torrance will maintain a peaceful environment by identifying noise impacts and mitigating noise problems through acoustical treatments and appropriate land use policies.

Transportation routes represent the predominant noise source in Torrance. Sounds emitted from automobiles, aircraft, and rail can be mitigated through sound barriers, and with regard to Torrance Municipal Airport and rail activities, strict enforcement of Municipal Code provisions that pertain to noise abatement.

OBJECTIVE N.1:	To identify noise pollution and establish effective noise abatement methods
Policy N.1.1:	Continue to strictly enforce the provisions of the City's Noise Ordinance to ensure that stationary noise, traffic-related noise, railroad noise, airport-related noise, and noise emanating from construction activities and special events are minimized.
Policy N.1.2:	Maintain a workable, reasonable, and effective noise ordinance. Update the ordinance as necessary to respond to community noise issues.
Policy N.1.3:	Seek grants and loans for noise abatement projects.
Policy N.1.4:	Minimize unnecessary outdoor noise through enforcement of the noise ordinance and through permit processes that regulate noise-producing activities.

OBJECTIVE N.2:	To minimize transportation-related noise impacts
Policy N.2.1:	Enforce all local noise regulations pertaining to motor vehicle operations.
Policy N.2.2:	Prioritize locations for implementing noise reduction, such as residential areas near major roads or areas near railroads.
Policy N.2.3:	Require developers and business owners to minimize noise impacts associated with on-site motor vehicle activity through the use of noise-reduction features (e.g., berms, walls, well-designed site plans).
Policy N.2.4:	Ensure that all new development within the identified noise contours of Torrance Municipal Airport will be compatible with existing and projected airport noise levels.
Policy N.2.5:	Minimize airport operations-related noise violations by maintaining the City's Noise Abatement Program.

OBJECTIVE N.3:	To minimize noise incompatibilities between land uses
Policy N.3.1:	Review industrial, commercial, or other noise-generating land use proposals for compatibility with nearby noise-sensitive land uses, and require that appropriate mitigation be provided.
Policy N.3.2:	Require the inclusion of noise-reducing design features for developments near noise-sensitive land uses.

Policy N.3.3:	Encourage dense, attractive landscape planting along roadways and adjacent to other noise sources to increase absorption of noise.
Policy N.3.4:	Work with property and business owners to avoid or resolve noise incompatibilities in commercial or industrial areas.

OBJECTIVE N.4:	To research and implement new means of noise abatement
Policy N.4.1:	Encourage and support efforts by the State of California to abate noise pollution by using stricter quantitative noise standards, shorter compliance time governing operation of all types of motor vehicles, etc.
Policy N.4.2:	Maintain open lines of communication between the City and all federal, State, and County agencies involved in noise abatement.
Policy N.4.3:	Educate residents and businesses of the effects of noise pollution, ways they can assist in noise abatement, and noise abatement programs within the City.
Policy N.4.4:	Support legislation at all levels of government that enhances local authority over noise sources.

Excerpts from the City of Torrance Municipal Code relating to noise

CHAPTER 6
NOISE REGULATION

ARTICLE 1 - GENERAL PROVISIONS

(Added by O-2170; Amended by O-2211)

46.1.1 DECLARATION OF POLICY.

It is hereby declared to be the policy of the City to prohibit unnecessary, excessive and annoying noises from all sources subject to its police power. At certain levels noises are detrimental to the health and welfare of the citizenry and in the public interests shall be systematically proscribed.

46.1.2 DEFINITIONS.

(Amended by O-2466)

As used in this Chapter, unless the context otherwise clearly indicates, the words and phrases used in this Chapter are defined as follows:

a) Ambient noise is the all encompassing noise associated with a given environment, being usually a composite of sounds from many sources near and far, without inclusion of intruding noises from isolated identifiable sources.

b) Decibel (db) shall mean a unit of level which denotes the ratio between two (2) quantities which are proportional to power; the number of decibels corresponding to the ratio to two (2) amounts of power is ten (10) times the logarithm to the base ten (10) of this ratio.

c) Emergency work shall mean work made necessary to restore property to a safe condition following a public calamity or work required to protect persons or property from an imminent exposure to danger.

d) Noise level, in decibels, is the A-weighted sound pressure level as measured using the slow dynamic characteristic for sound level meters specified in ASA S1.4-1961, American Standard Specification for General Purpose Sound Level Meters, or latest revision thereof. The reference pressure is twenty (20) micronewtons/square meter (2 x 10-4 microbar).

e) Person shall mean a person, firm, association, copartnership, joint venture, corporation or any entity, public or private in nature.

f) Sound level meter shall mean an instrument including a microphone, an amplifier, an output meter, and frequency weighting networks for the measurement of noise and sound levels in a specified manner as specified in ASA S1.4-1961, American Standard Specification for General Purpose Sound Level Meters, or latest revision thereof.

g) Sound pressure level, in decibels (db) of a sound is twenty (20) times the logarithm to the base ten (10) of the ratio of the pressure of this sound to the reference pressure. For the purpose of this Chapter the reference pressure shall be twenty (20) micronewtons/square meter (2 x 10-4 microbar).

h) Impulsive sound means a short duration sound (such as might be produced by the impact of a drophammer or pile driver) with one (1) second or less duration.

i) Motor vehicles shall include, but not be limited to, minibikes and go carts.

j) Sound amplifying equipment shall mean any machine or device for the amplification of the human voice, music, or any other sound. Sound amplifying equipment shall not include standard automobile radios when used and heard only by the occupants of the vehicle in which the automobile radio is installed. Sound amplifying equipment, as used in this Chapter, shall not include warning devices on authorized emergency vehicles or horns or other warning devices on any vehicle used only for traffic safety purposes.

k) Sound truck shall mean any motor vehicle, or any other vehicle regardless of motive power, whether in motion or stationary, having mounted thereon, or attached thereto, any sound amplifying equipment.

l) Commercial purpose shall mean and include the use, operation or maintenance of any sound amplifying equipment for the purpose of advertising any business or any goods or any services, or for the purpose of attracting the attention of the public to, or advertising for, or soliciting patronage or customers to or for any performance, show, entertainment, exhibition, or event, or for the purpose of demonstrating any such sound equipment.

m) Noncommercial purpose shall mean the use, operation or maintenance of any sound equipment for other than a commercial purpose. Noncommercial purposes shall mean and include, but shall not be limited to, philanthropic, political, patriotic and charitable purposes.

n) Residential land shall mean that land which is utilized for residential purposes or zoned for residential purposes.

o) Residential purpose means any purpose involving routine and relatively permanent use of a building as a dwelling, as opposed to relatively transient uses such as hotels and motels.

p) Day means the time period from 7:00 A.M. to 10:00 P.M.

q) Night means the time period from 10:00 P.M. to 7:00 A.M.

46.1.3 MEASUREMENTS.

Noise levels shall be measured with a sound level meter satisfying the requirements of ASA S1.4-1961, American Standard Specification for General Purpose Sound Level Meters, or latest revision thereof. Noise level of steady or slowly varying sounds shall be measured using the slow dynamic characteristic of the sound level meter and by reading the central tendency of the needle. Noise level of impulse sounds shall be measured using the fast dynamic characteristic of the sound level meter and by reading the maximum indication of the needle.

ARTICLE 2 - SPECIAL NOISE SOURCES

46.2.1 RADIOS, TELEVISION SETS AND SIMILAR DEVICES.

a) Use Restricted. It shall be unlawful for any person within the City of Torrance to use or operate any radio receiving set, musical instrument, phonograph, television set, or other machine or device for the producing or reproducing of sound at any time in such a manner as to produce noise levels on residential land which would disturb the peace, quiet and comfort of neighboring residents or any reasonable person of normal sensitiveness residing in the area.

b) Prima Facie Violation. Any noise exceeding the ambient noise level at the property line of any residential land (or if a condominium or apartment house, within any adjoining apartment) by more than five (5) decibels shall be deemed to be prima facie evidence of a violation of the provisions of this Section.

46.2.2 HAWKERS AND PEDDLERS.

It shall be unlawful for any person within the City to sell anything by outcry within any area of the City utilized for residential purposes. The provisions of this Section shall not be construed to prohibit the selling by outcry of merchandise, food and beverages at licensed sporting events, parades, fairs, circuses and other similar licensed public entertainment events.

46.2.3 DRUMS.

It shall be unlawful for any person to use any drum or other instrument or device of any kind for the purpose of attracting attention by the creation of noise within the City. This Section shall not apply to any person who is a participant in a school band or duly licensed parade or who has been otherwise duly authorized by the City to engage in such conduct.

46.2.4 SCHOOLS, HOSPITALS AND CHURCHES.

It shall be unlawful for any person to create any noise on any street, sidewalk or public place adjacent to any school, institution of learning or church while the same is in use or adjacent to any hospital, which noise 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, sidewalks or public place indicating the presence of a school, church or hospital.

46.2.5 ANIMALS AND FOWL.

No person shall keep or maintain, or permit the keeping of upon any premises owned, occupied or controlled by such person, any animal or fowl otherwise permitted to be kept which, by any sound, cry or behavior shall cause annoyance or discomfort to a reasonable person of normal sensitiveness on any residential land.

46.2.6 MACHINERY, EQUIPMENT, FANS AND AIR CONDITIONING.

It shall be unlawful for any person to operate any machinery, equipment, pump, fan, air conditioning apparatus or similar mechanical device in any manner so as to create any noise which would cause the

noise level at the property line of any residential land to exceed the ambient noise level by more than five (5) decibels.

46.2.7 OIL PRODUCTION EQUIPMENT.

(Added by O-2528)

It shall be unlawful for any person to operate, or cause to be operated any oil production equipment in any manner so as to create any noise which would cause the noise level at the nearest property line of any residential land to exceed the ambient noise level by more than five (5) decibels; provided, however, that the aforesaid provisions of this Section shall not apply to oil production equipment being used in the drilling, redrilling, deepening, repair, maintenance or abandonment of an oil well.

ARTICLE 3 - CONSTRUCTION

46.3.1 CONSTRUCTION OF BUILDINGS AND PROJECTS.

(Amended by O-3712)

a) It shall be unlawful for any person within the City of Torrance to operate power construction tools, equipment, or engage in the performance of any outside construction or repair work on buildings, structures, or projects in or adjacent to a residential area involving the creation of noise beyond 50 decibels (db) as measured at property lines, except between the hours of 7:30 A.M. to 6:00 P.M. Monday through Friday and 9:00 A.M. to 5:00 P.M. on Saturdays. Construction shall be prohibited on Sundays and Holidays observed by City Hall. An exception exists between the hours of 10:00 A.M. to 4:00 P.M. for homeowners that reside at the property.

b) The Community Development Director may allow expanded hours and days of construction if unusual circumstances and conditions exist. Such requests must be made in writing and must receive approval by the Director prior to any expansion of the hour and day restrictions listed above.

c) Every construction project requiring Planning Commission review or considered to be a significant remodel as defined by Section 231.1.2, shall be required to post an information board along the front property line that displays the property owner's name and contact number, contractor's name and contact number, a copy of TMC Section 46.3.1, a list of any special conditions, and the Code Enforcement phone number where violations can be reported.

d) Properties zoned as commercial, industrial or within an established redevelopment District, are exempted from the above day and hour restrictions if a minimum buffer of 300 feet is maintained from the subject property's property line to the closest residential property. The Community Development Director, may, however, revoke such exemption for a particular project if the noise level exceeds 50 decibels (db) at the property line of a residential property beyond the 300 linear foot buffer.

e) Heavy construction equipment such as pile drivers, mechanical shovels, derricks, hoists, pneumatic hammers, compressors or similar devices shall not be operated at any time, within or adjacent to a

residential area, without first obtaining from the Community Development Director permission to do so. Such request for permission shall include a list and type of equipment to be used, the requested hours and locations of its use, and the applicant shall be required to show that the selection of equipment and construction techniques has been based on minimization of noise within the limitations of such equipment as is commercially available or combinations of such equipment and auxiliary sound barriers. Such permission to operate heavy construction equipment will be revoked if operation of such equipment is not in accordance to approval. No permission shall be required to perform emergency work as defined in Article 1 of this Chapter.

46.3.2 OPERATION OF OIL EQUIPMENT.

(Added by O-2528)

a) It shall be unlawful for any person to operate machinery or power tools for the repair, maintenance or abandonment of oil well equipment on Sundays and legal holidays and, except between the hours of 7:00 A.M. and 8:00 P.M., on any other day; provided, however, that the provisions of this subsection shall not apply to any well, the surface of which is three hundred (300) or more feet from any dwelling.

b) It shall be unlawful for any person to conduct oil drilling or redrilling operations other than circulation of mud, on Sundays and legal holidays and, except between the hours of 7:00 A.M. and 9:00 P.M., on any other day; provided, however, that the provisions of this subsection shall not apply to any well the surface of which is three hundred (300) or more feet from any dwelling.

c) It shall be unlawful for any person to operate machinery or power tools for the repair, maintenance or abandonment of oil well equipment or to conduct oil well drilling or redrilling operations at any time within three hundred (300) feet of any dwelling without first obtaining from the Director of Building and Safety permission to do so. Such request for permission shall include a list and type of equipment to be used, the requested hours and locations of its use. The Director of Building and Safety shall issue such permit only if the applicant demonstrates to the reasonable satisfaction of the Director that the selection of equipment and construction techniques has been based on minimization of noise within the limitations of such equipment as is commercially available or combinations of such equipment and auxiliary sound barriers or acoustical sound blankets as provided in Section 46.3.3. Such permission to operate oil well equipment shall be revoked if such equipment is not operated and construction is not accomplished in accordance with the conditions of approval. No permission shall be required to perform emergency work as defined in Article 1 of this Chapter. The person performing such emergency work shall first notify the occupants of adjacent residences and the Torrance Police Department as to the nature and extent of the work to be performed.

46.3.3 ACOUSTICAL BLANKETS.

(Added by O-2528)

Acoustical blankets shall be made of fibrous glass insulation 1-1/2 inches thick, 0.50 pounds per cubic foot density, 0.63 pounds per square foot weight, .00010 to .00015 fibre diameter (inches) with phenolic

binder having a temperature limit of 450 degrees F. sewed between layers of fire retardant vinyl fibre glass cloth, 15-17 ounces per square yard sewed with dacron thread D-92 with stitches not more than six (6) to the inch. The lacing cord shall be flat vinyl coated tape composed of fibrous glass yard braided, heat set and bonded. The tape shall have a 90 pound tensile strength. Grommets shall be No. 4 brass. Provided, however, that there may be substituted for the aforesaid specifications an acoustical blanket which in the opinion of the Director of Building and Safety is equal to sound-proofing ability and fire resistive qualities to the aforesaid specifications.

ARTICLE 4 - VEHICLES

46.4.1 VEHICLE REPAIRS.

It shall be unlawful for any person within the City of Torrance to repair, rebuild or test any motor vehicle at any time in such a manner that a reasonable person of normal sensitiveness located on residential land is caused discomfort or annoyance by reason of the noise produced therefrom.

46.4.2 MOTOR DRIVEN VEHICLES.

It shall be unlawful for any person to operate any motor driven vehicle within the City in such a manner that a reasonable person of normal sensitiveness residing in the area is caused discomfort or annoyance; provided, however, that any such vehicle which is operated upon any public highway, street or right-of-way shall be excluded from the provisions of this Section, provided the provisions of the California Motor Vehicle Code, Sections 23130, 27150 and 27151 are complied with.

ARTICLE 5 - AMPLIFIED SOUND

(Amended by O-3360)

46.5.1 PURPOSE.

The Council enacts the provisions of this Article for the sole purpose of securing and promoting the public health, comfort, safety, and welfare for its citizenry. While recognizing that the use of sound amplifying equipment is protected by the constitutional rights of freedom of speech and assembly, the Council nevertheless feels obligated to reasonably regulate the use of sound amplifying equipment in order to protect the correlative constitutional rights of the citizens of this community to privacy and freedom from public nuisance of loud and unnecessary noise.

46.5.2 APPLICATION REQUIRED.

It shall be unlawful for any person, other than personnel of law enforcement or governmental agencies, to install, use or operate within the City a loudspeaker or sound amplifying equipment in a fixed or movable position or mounted upon any sound truck for the purposes of giving instructions, directions, talks, addresses, lectures or transmitting music to any persons or assemblages of persons in or upon any street, alley, sidewalk, park, place or public property without first filing an application and obtaining a permit therefor as set forth in Division 3 of this Code.

46.5.3 REGULATIONS.

The commercial and noncommercial use of sound amplifying equipment shall be subject to the following regulations:

a) The only sounds permitted shall be either music or human speech, or both.

b) The operation of sound amplifying equipment shall only occur between the hours of 9:00 A.M. and 9:00 P.M. each day except on Sundays and legal holidays. The operation of sound amplifying equipment for noncommercial purposes on Sundays and legal holidays shall only occur between the hours of 10:00 A.M. and 6:00 P.M.

c) No sound emanating from sound amplifying equipment shall exceed fifteen (15) dBA above the ambient as measured at any property line.

d) Notwithstanding the provisions of subsection c) of this Section, sound amplifying equipment shall not be operated within two hundred (200) feet of churches, schools or hospitals.

e) In any event, the volume of sound shall be so controlled that it will not be unreasonably loud, raucous, jarring, disturbing or a nuisance to reasonable persons of normal sensitiveness within the area of audibility.

ARTICLE 6 - TRAIN HORNS AND WHISTLES

46.6.1 EXCESSIVE SOUND PROHIBITED.

It shall be unlawful for any person to operate or sound or cause to be operated or sounded, between the hours of 10:00 P.M. of one day and 7:00 A.M. of the next day, a train horn or train whistle which creates noise in excess of ninety (90) db at any place or point three hundred (300) feet or more distant from along a line normal to the direction of travel of the source of such sound.

ARTICLE 7 - GENERAL NOISE REGULATIONS

46.7.1 GENERAL NOISE REGULATIONS.

Notwithstanding any other provision of this Chapter and in addition thereto, it shall be unlawful for any person to willfully make or continue, or cause to be made or continued, any loud, unnecessary or unusual noise which disturbs the peace or quiet of any neighborhood or which causes discomfort or annoyance to any reasonable person of normal sensitiveness residing in the area.

46.7.2 NOISE LIMITS.

To provide for methodical enforcement and to give reasonable notice of the performance standards to be met, the foregoing intent is expressed in the following numerical standards. For purposes of this Chapter, the City is divided into regions as set forth in Exhibit A.

a) Noise Limits on Residential Land. It shall be unlawful for any person within the City of Torrance (wherever located) to produce noise in excess of the following levels as received on residential land owned or occupied by another person within the designated regions. In addition to the noise limits stated herein, the noise limits set forth in Sec. 46.7.2.b) shall also be complied with.

1) For noise receivers located on residential land, for measurement positions five hundred (500) feet or more distant from the boundaries of Regions 1 and 2, the following limits apply:

REGION (in which noise receiver is located)	**NOISE LEVEL, db**	
	Day	**Night**
3	50	45
4	55	50

2) For noise receivers located on residential land, for positions within five hundred (500) feet from the boundary of Region 1 or 2, the following limits apply:

Five (5) dB above the limits set forth in Section 46.7.2.a) 1 above, or 5 dB above the ambient noise level, whichever is the lower number.

b) Noise Limits at Industrial and Commercial Boundaries:

1) Noise Sources in Region 1: It shall be unlawful for any person in Region 1 to produce noise levels at the boundary of Region 1 in excess of 70 dB during the day or 65 dB during the night.

2) Noise Sources in Region 2: It shall be unlawful for any person in Region 2 to produce noise levels at the boundary of Region 2 in excess of 60 dB during the day or 55 dB during the night.

3) Noise Sources in All Remaining Industrial Use Land: It shall be unlawful for any person on industrial use land outside Region 1 and 2 to produce noise levels at his own property boundary in excess of 60 dB during the day or 55 dB during the night.

4) Noise Sources on All Land Use for Commercial Purposes: It shall be unlawful for any person on land used for commercial purposes to produce noise levels at his own property boundary in excess of 60 dB during the day or 55 dB during the night.

In addition to the noise limits set forth herein (Sec. 46.7.2.b), the noise limits set forth in Sec. 46.7.2.(a) shall also be complied with.

c) Corrections to the Noise Limits: The numerical limits given in Sec. 46.7.2.(a) and (b) shall be adjusted by addition of the following corrections where appropriate.

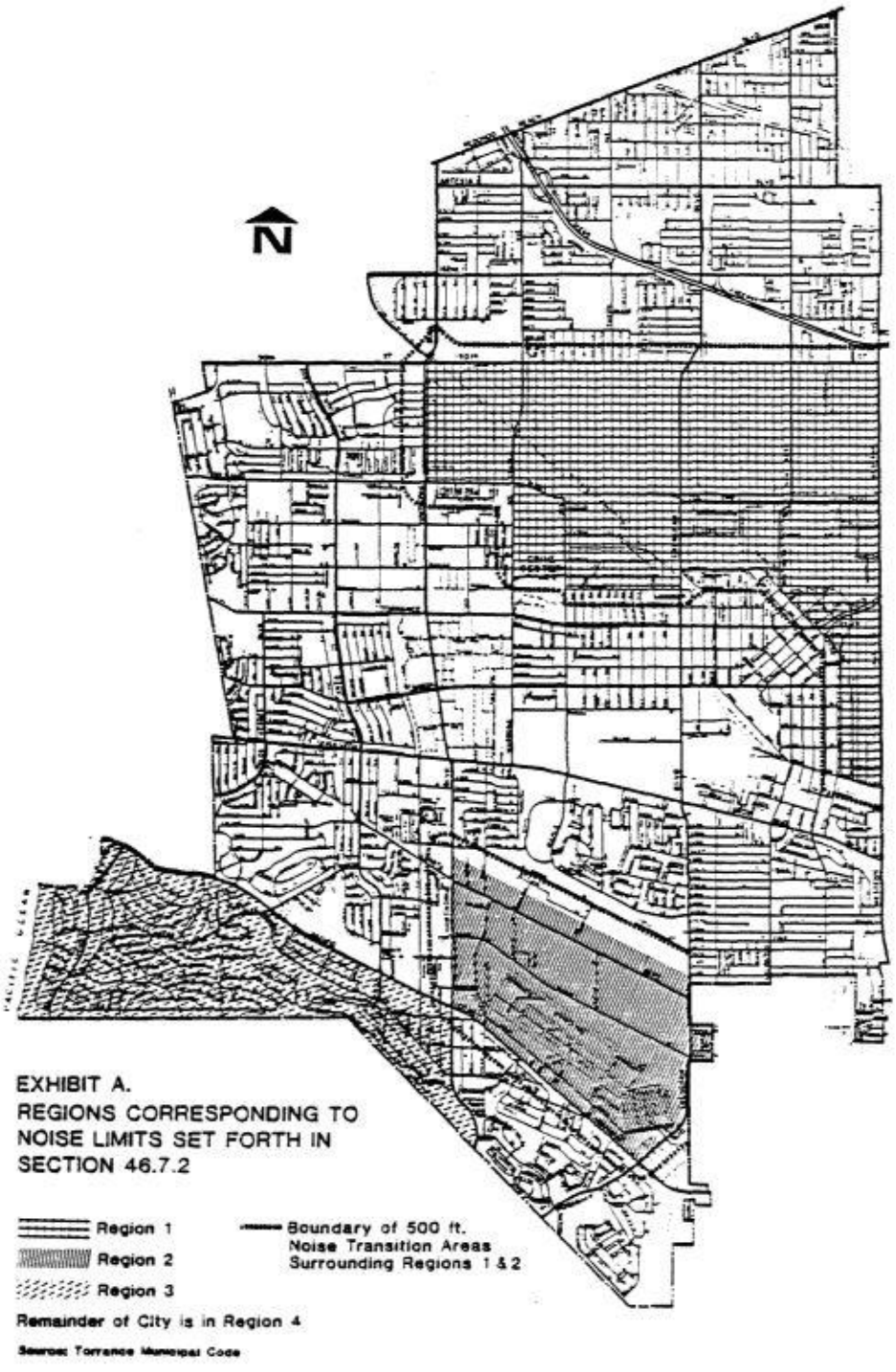
Noise Conditions	Correction to the Limits, decibels
1. Noise contains a steady, audible tone, such as a whine, screech or hum	-5
2. Noise is a repetitive impulsive noise, such as hammering or riveting	-5
3. If the noise is not continuous, one of the following corrections to the limits shall be applied:	
a) Noise occurs less than 5 hours per day or less than 1 hour per night	+5
b) Noise occurs less than 90 minutes per day or less than 20 minutes per night	+10
c) Noise occurs less than 30 minutes per day or less than 6 minutes per night	+15
4. Noise occurs on Sunday morning (between 12:01 A.M. and 12:01 P.M. Sunday)	-5

46.7.3 EXCEPTIONS.

The following noise sources are specifically excluded from the provisions of this Chapter:

1) Aircraft in flight.

2) Motor vehicles operating in accordance with Sec. 46.4.2. and in accordance with all the sections of the California Motor Vehicles Code.



ARTICLE 8 - AIRPORT NOISE LIMITS

(Added by O-2784)

46.8.1 VIOLATIONS UNLAWFUL.

It shall be unlawful for any person to pilot or operate or permit to be piloted or operated an aircraft in violation of the provisions of Sections 46.8.8., 46.8.9. or 46.8.14.

46.8.2 EXTENDED AIRPORT BOUNDARIES DEFINED.

For the purposes of this Article, the term extended airport boundaries shall mean the area enclosed by Lomita Boulevard on the north, Crenshaw Boulevard on the east, Pacific Coast Highway on the south and Hawthorne Boulevard on the west.

46.8.3 TAKE-OFF DEFINED.

(Amended by O-3270)

For the purposes of this Article, take-off shall mean the flight of an aircraft departing Torrance Airport from the time it commences on its departure on the runway.

46.8.4 LANDING DEFINED.

(Amended by O-3270)

For the purposes of this Article, landing shall mean the flight of an aircraft from the time it begins its landing approach until it is taxied from the runway.

46.8.5 SOUND EXPOSURE LEVEL.

For the purposes of this Article, the sound exposure level is the level of sound accumulated during a given event, with reference to a duration of one second. More specifically, sound exposure level, in decibels, is the level of the time-integrated A-weighted squared sound pressure for a stated time interval or event, based on the reference pressure of 20 micronewtons per square meter and reference duration of one second.

46.8.6 SENEL.

For the purposes of this Article, the single event noise exposure level (SENEL), in decibels, is the sound exposure level of a single event, such as an aircraft fly-by, measured over the time interval between the initial and final times for which the sound level of a single event exceeds the threshold sound level. For implementation of the provisions of this Article, the threshold noise level shall be at least 20 decibels below the numerical value of the single event noise exposure level limits specified in Sections 46.8.8. or 46.8.9. as the case may be.

46.8.7 MAXIMUM SOUND LEVEL DEFINED.

For the purposes of this Article, the maximum sound level, in decibels, is the highest sound level reached at any instant of time during the time interval used in measuring the sound exposure level of a single event.

46.8.8 AIRCRAFT NOISE LIMIT.

Except as provided in Section 46.8.10., no aircraft taking off from or landing on the Torrance Municipal Airport may exceed a single event noise exposure level (SENEL) of 88 dBA or a maximum sound level of 82 dBA measured at ground level outside the extended Airport boundaries.

46.8.9 AIRCRAFT NOISE LIMIT AT NIGHT.

(Amended by O-3284)

Notwithstanding the provisions of Section 46.8.8., except as provided in Section 46.8.10., no aircraft taking off from or landing on the Torrance Municipal Airport between the hours of 10:00 P.M. of any day and 7:00 A.M. of the following morning on any Monday through Friday inclusive, nor between the hours of 10:00 P.M. each night and 8:00 A.M. of the following morning on any Saturday or Sunday inclusive, nor on any of the following holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day; provided, however, that if any such holiday falls on a Saturday or Sunday, the observance of which is then moved to the preceding Friday, or the following Monday, then such Friday or Monday shall be considered to be a holiday for purposes of this section, may exceed a single event noise exposure level (SENEL) of 82 dBA or a maximum sound level of 76 dBA measured at ground level outside the extended Airport boundaries.

46.8.10 AIRCRAFT NOISE EXEMPTION.

(Amended by O-3382)

The following categories of aircraft shall be exempt from the provisions of Sections 46.8.8. and 46.8.9.:

1) Aircraft operated by the United States of America or the State of California;

2) Law enforcement, emergency, fire or rescue aircraft operated by any county or city of said state;

3) Aircraft used for emergency purposes during an emergency that has been officially proclaimed by competent authority pursuant to the laws of the United States, said State or the City;

4) Civil Air Patrol aircraft when engaged in actual search and rescue missions;

5) Aircraft engaged in landings or takeoffs while conducting tests under the direction of the Airport Manager in an attempt to rebut the presumption of aircraft noise violation pursuant to the provisions of Section 46.8.13

6) Aircraft while participating in a City-sponsored event approved by City Council.

46.8.11 CULPABILITY OF INSTRUCTOR PILOT.

In the case of any training flight in which both an instructor pilot and a student pilot are in the aircraft which is flown in violation of any of the provisions of this Article, the instructor pilot shall be rebuttably presumed to have caused such violation.

46.8.12 CULPABILITY OF AIRCRAFT OWNER OR LESSEE.

For purposes of this Article, the beneficial owner of an aircraft shall be presumed to be the pilot of the aircraft with authority to control the aircraft's operations, except that where the aircraft is leased, the lessee shall be presumed to be the pilot. Such presumption may be rebutted only if the owner or lessee identifies the person who in fact was the pilot at the time of the asserted violation.

46.8.13 DENIAL OF USE OF AIRPORT.

(See Section 51.7.2. et seq. concerning denial of the use of the Airport for repeated violations of this Article.)

46.8.14 PRESUMPTION OF AIRCRAFT NOISE VIOLATION.

In the event that the Airport Manager determines to his reasonable satisfaction that available published noise measurements for a particular type or class of aircraft indicate that it cannot meet the noise levels set forth in Sections 46.8.8. and 46.8.9., it shall be presumed that operation of such aircraft will result in violation of the provisions of Sections 46.8.8. and 46.8.9. and such aircraft will not be permitted to land on, tie down on, be based at or take off from the Torrance Municipal Airport, except in emergencies as set forth in Section 51.4.2.; provided, however, that the owner or operator of such aircraft shall be entitled to rebut such presumption to the reasonable satisfaction of the Airport Manager by furnishing evidence to the contrary.

46.8.15 DESIGNATED ENFORCEMENT OFFICIAL.

The Director of Building and Safety, the Administrator of Environmental Quality, the Environmental Quality Officers and such other City employees as are designated by the Director of Building and Safety with the approval of the City Manager, all acting under the direction and control of the City Manager, shall have the duty and authority to enforce the provisions of this Article, pursuant to the provisions of Section 836.5 of the State Penal Code.

Appendix B. Traffic Noise Calculation Results

Appendix

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Nadel - Del Amo

EXISTING NO PROJECT

#	ROADWAY	SEGMENT	ADT	POSTED SPEED LIMIT	LANE DISTANCE	SITE CONDITION	LANES	GRADE (%)
1	Torrance Boulevard	west of Anza Avenue	22,880	40	48	Soft	4D	**0%**
2	Torrance Boulevard	Anza Avenue to Hawthorne Boulevard	30,980	40	48	Soft	4D	**0%**
3	Torrance Boulevard	Hawthorne Boulevard to Madrona Avenue	29,870	40	84	Soft	6D	**0%**
4	Torrance Boulevard	east of Madrona Avenue	26,840	35	84	Soft	6D	**0%**
5	Del Amo Circle W	Village Court to Hawthorne Boulevard	3,660	30	48	Soft	4D	**0%**
6	Del Amo Circle N	Hawthorne Boulevard to Fashion Way	3,110	30	48	Soft	4D	**0%**
7	Carson Street	west of Anza Avenue	6,390	35	24	Soft	2D	**0%**
8	Carson Street	Anza Avenue to Del Amo Circle W	13,750	35	48	Soft	4D	**0%**
9	Carson Street	Del Amo Circle W to Hawthorne Boulevard	14,310	35	48	Soft	4D	**0%**
10	Carson Street	Hawthorne Boulevard to Madrona Avenue	24,840	35	84	Soft	6D	**0%**
11	Carson Street	east of Madrona Avenue	25,370	35	84	Soft	6D	**0%**
12	Sepulveda Boulevard	west of Anza Avenue	21,580	40	48	Soft	4D	**0%**
13	Sepulveda Boulevard	Anza Avenue to Hawthorne Boulevard	27,580	40	84	Soft	6D	**0%**
14	Sepulveda Boulevard	Hawthorne Boulevard to Madrona Avenue	34,670	40	84	Soft	6D	**0%**
15	Anza Avenue	north of Torrance Boulevard	23,120	35	48	Soft	4D	**0%**
16	Anza Avenue	Torrance Boulevard to Carson Street	24,200	35	48	Soft	4D	**0%**
17	Anza Avenue	Carson Street to Sepulveda Boulevard	23,820	35	48	Soft	4D	**0%**
18	Anza Avenue	south of Sepulveda Boulevard	23,800	35	48	Soft	4D	**0%**
19	Village Court	Village Lane to Del Amo Circle N	2,720	30	24	Soft	2D	**0%**
20	Del Amo Circle W	Del Amo Circle N to Carson Street	3,410	30	48	Soft	4D	**0%**
21	Del Amo Circle W	south of Carson Street	530	30	12	Soft	2U	**0%**
22	Hawthorne Boulevard	north of Torrance Boulevard	48,060	40	96	Soft	8D	**0%**
23	Hawthorne Boulevard	Torrance Boulevard to Del Amo Circle N	51,950	40	96	Soft	8D	**0%**
24	Hawthorne Boulevard	Del Amo Circle N to Carson Street	50,130	40	96	Soft	8D	**0%**
25	Hawthorne Boulevard	Carson Street to Sepulveda Boulevard	50,430	40	96	Soft	8D	**0%**
26	Hawthorne Boulevard	south of Sepulveda Boulevard	53,920	40	96	Soft	8D	**0%**
27	Madrona Avenue	north of Torrance Boulevard	32,400	40	84	Soft	6D	**0%**
28	Madrona Avenue	Torrance Boulevard to Carson Street	30,540	35	84	Soft	6D	**0%**
29	Madrona Avenue	Carson Street to Sepulveda Boulevard	22,770	35	84	Soft	6D	**0%**

ANALYST
NJF

ROAD CLASSIFICATION	SPEED	LANE DISTANCE
2U	40	12
4U	40	36
4D	45	48
6D	45	84
2D	40	24

		73.6	75.55%
		13.6	13.96%
		10.22	10.49%

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.42%	DAY	75.5%
% MT	1.84%	EVENING	14.0%
% HT	0.74%	NIGHT	10.5%

Source: Riverside, County of, Department of Public Health, Office of Industrial Hygiene. 2009, November. For Determining and Mitigating Traf

Riverside County Fleet Mix: Secondary, Collectors, or Smaller

Vehicle	Overall %	Day (7 AM to	Evening (7	Night (10 PM to 7 AM)
Auto	97%	73.60	13.60	10.22
Medium Truck	2%	0.90	0.04	0.90
Heavy Truck	1%	0.35	0.04	0.35
		74.85	13.68	11.47

Nadel - Del Amo

EXISTING NO PROJECT CONDITIONS NOISE CONTOURS RESULT SUMMARY TABLE

					DISTACE TO NOISE CONTOUR (FT.)		
#	ROADWAY	SEGMENT	TRAFIC VOLUMES	LEVEL AT 50 FT.	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Torrance Boulevard	west of Anza Avenue	22,880	71.2	60	130	280
2	Torrance Boulevard	Anza Avenue to Hawthorne Boulevard	30,980	72.5	74	159	342
3	Torrance Boulevard	Hawthorne Boulevard to Madrona Avenue	29,870	75.5	116	251	540
4	Torrance Boulevard	east of Madrona Avenue	26,840	73.6	87	188	405
5	Del Amo Circle W	Village Court to Hawthorne Boulevard	3,660	60.3	11	24	52
6	Del Amo Circle N	Hawthorne Boulevard to Fashion Way	3,110	59.6	10	22	47
7	Carson Street	west of Anza Avenue	6,390	63.6	19	40	87
8	Carson Street	Anza Avenue to Del Amo Circle W	13,750	67.6	35	74	160
9	Carson Street	Del Amo Circle W to Hawthorne Boulevard	14,310	67.8	36	76	165
10	Carson Street	Hawthorne Boulevard to Madrona Avenue	24,840	73.3	83	179	385
11	Carson Street	east of Madrona Avenue	25,370	73.4	84	181	390
12	Sepulveda Boulevard	west of Anza Avenue	21,580	71.0	58	125	269
13	Sepulveda Boulevard	Anza Avenue to Hawthorne Boulevard	27,580	75.2	110	238	512
14	Sepulveda Boulevard	Hawthorne Boulevard to Madrona Avenue	34,670	76.1	129	277	597
15	Anza Avenue	north of Torrance Boulevard	23,120	69.9	49	105	227
16	Anza Avenue	Torrance Boulevard to Carson Street	24,200	70.1	50	109	234
17	Anza Avenue	Carson Street to Sepulveda Boulevard	23,820	70.0	50	107	231
18	Anza Avenue	south of Sepulveda Boulevard	23,800	70.0	50	107	231
19	Village Court	Village Lane to Del Amo Circle N	2,720	58.3	8	18	39
20	Del Amo Circle W	Del Amo Circle N to Carson Street	3,410	60.0	11	23	50
21	Del Amo Circle W	south of Carson Street	530	51.1	3	6	13
22	Hawthorne Boulevard	north of Torrance Boulevard	48,060	81.9	310	667	1437
23	Hawthorne Boulevard	Torrance Boulevard to Del Amo Circle N	51,950	82.2	326	703	1514
24	Hawthorne Boulevard	Del Amo Circle N to Carson Street	50,130	82.1	318	686	1478
25	Hawthorne Boulevard	Carson Street to Sepulveda Boulevard	50,430	82.1	320	689	1484
26	Hawthorne Boulevard	south of Sepulveda Boulevard	53,920	82.4	334	720	1552
27	Madrona Avenue	north of Torrance Boulevard	32,400	75.9	123	265	570
28	Madrona Avenue	Torrance Boulevard to Carson Street	30,540	74.2	95	205	442
29	Madrona Avenue	Carson Street to Sepulveda Boulevard	22,770	72.9	78	169	363

Scenario: EXISTING NO PROJECT
Roadway: Torrance Boulevard
Segment: west of Anza Avenue

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	22,880
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1403	27	11	1037	20	8	260	5	2
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	0.1	-17.1	-21.0	-1.2	-18.4	-22.4	-7.2	-24.4	-28.4
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.3	60.0	60.9	66.9	58.7	59.5	60.9	52.6	53.5
VEHICULAR NOISE	DAY=	69.5	Leq	EVENING=	68.2	Leq	NIGHT=	62.2	Leq

RESULTS						
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):			**Ldn=**	**70.6**
					CNEL=	**71.2**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**55**	**118**	**254**
			CNEL:	**60**	**130**	**280**

Scenario: EXISTING NO PROJECT
Roadway: Torrance Boulevard
Segment: Anza Avenue to Hawthorne Boulevard

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	30,980
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1900	36	14	1404	27	11	352	7	3
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	1.5	-15.8	-19.7	0.1	-17.1	-21.0	-5.9	-23.1	-27.1
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	69.6	61.3	62.2	68.3	60.0	60.9	62.2	54.0	54.8
VEHICULAR NOISE	DAY=	70.8	Leq	EVENING=	69.5	Leq	NIGHT=	63.5	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 71.9**
CNEL= 72.5

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**67**	**144**	**311**
	CNEL:	**74**	**159**	**342**

Scenario: EXISTING NO PROJECT
Roadway: Torrance Boulevard
Segment: Hawthorne Boulevard to Madrona Avenue

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	29,870
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1832	35	14	1354	26	10	339	6	3
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	1.3	-15.9	-19.9	0.0	-17.2	-21.2	-6.0	-23.3	-27.2
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	72.5	64.3	65.1	71.2	62.9	63.8	65.2	56.9	57.8
VEHICULAR NOISE	DAY=	73.8	Leq	EVENING=	72.5	Leq	NIGHT=	66.5	Leq

RESULTS					
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		**Ldn=**	**74.9**
				CNEL=	**75.5**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**106**	**228**	**491**
			CNEL:	**116**	**251**	**540**

Scenario: EXISTING NO PROJECT
Roadway: Torrance Boulevard
Segment: east of Madrona Avenue

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	26,840
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1646	31	13	1217	23	9	305	6	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	1.4	-15.8	-19.8	0.1	-17.1	-21.1	-5.9	-23.1	-27.1
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	70.4	62.9	64.1	69.1	61.6	62.8	63.1	55.6	56.8
VEHICULAR NOISE	DAY=	71.9	Leq	EVENING=	70.6	Leq	NIGHT=	64.6	Leq

RESULTS					
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		**Ldn=**	**73.0**
				CNEL=	**73.6**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**79**	**171**	**368**
			CNEL:	**87**	**188**	**405**

Scenario: EXISTING NO PROJECT
Roadway: Del Amo Circle W
Segment: Village Court to Hawthorne Boulevard

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	3,660
SPEED (mph)	30
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	224	4	2	166	3	1	42	1	0
Speed in MPH	30	30	30	30	30	30	30	30	30
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	62.5	73.1	78.8	62.5	73.1	78.8	62.5	73.1	78.8
ADJUSTMENTS									
Flow	-6.6	-23.8	-27.8	-7.9	-25.1	-29.1	-13.9	-31.1	-35.1
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	56.7	50.1	51.7	55.4	48.7	50.4	49.4	42.7	44.4
VEHICULAR NOISE	DAY=	58.6	Leq	EVENING=	57.2	Leq	NIGHT=	51.2	Leq

RESULTS					
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		**Ldn=**	**59.7**
				CNEL=	**60.3**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**10**	**22**	**47**
			CNEL:	**11**	**24**	**52**

Scenario: EXISTING NO PROJECT
Roadway: Del Amo Circle N
Segment: Hawthorne Boulevard to Fashion Way

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	3,110
SPEED (mph)	30
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	191	4	1	141	3	1	35	1	0
Speed in MPH	30	30	30	30	30	30	30	30	30
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	62.5	73.1	78.8	62.5	73.1	78.8	62.5	73.1	78.8
ADJUSTMENTS									
Flow	-7.3	-24.5	-28.5	-8.6	-25.8	-29.8	-14.6	-31.8	-35.8
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	56.0	49.4	51.0	54.7	48.0	49.7	48.7	42.0	43.7
VEHICULAR NOISE	DAY=	57.9	Leq	EVENING=	56.5	Leq	NIGHT=	50.5	Leq

RESULTS						
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):			**Ldn=**	**58.9**
					CNEL=	**59.6**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**9**	**20**	**43**
			CNEL:	**10**	**22**	**47**

Scenario: EXISTING NO PROJECT
Roadway: Carson Street
Segment: west of Anza Avenue

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	6,390
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	24
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	392	7	3	290	5	2	73	1	1
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	-4.8	-22.1	-26.0	-6.1	-23.4	-27.3	-12.1	-29.4	-33.3
Distance	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	60.4	52.9	54.1	59.1	51.6	52.8	53.1	45.5	46.8
VEHICULAR NOISE	DAY=	61.9	Leq	EVENING=	60.6	Leq	NIGHT=	54.6	Leq

RESULTS					
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		**Ldn=**	**63.0**
				CNEL=	**63.6**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**17**	**37**	**79**
			CNEL:	**19**	**40**	**87**

Scenario: EXISTING NO PROJECT
Roadway: Carson Street
Segment: Anza Avenue to Del Amo Circle W

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	13,750
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	843	16	6	623	12	5	156	3	1
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	-1.5	-18.7	-22.7	-2.8	-20.0	-24.0	-8.8	-26.0	-30.0
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	64.4	56.9	58.1	63.1	55.5	56.8	57.0	49.5	50.8
VEHICULAR NOISE	DAY=	65.9	Leq	EVENING=	64.6	Leq	NIGHT=	58.5	Leq

RESULTS					
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		**Ldn=**	**67.0**
				CNEL=	**67.6**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**31**	**68**	**146**
			CNEL:	**35**	**74**	**160**

Scenario: EXISTING NO PROJECT
Roadway: Carson Street
Segment: Del Amo Circle W to Hawthorne Boulevard

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	14,310
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	878	17	7	649	12	5	162	3	1
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	-1.3	-18.6	-22.5	-2.6	-19.9	-23.8	-8.6	-25.9	-29.8
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	64.5	57.0	58.3	63.2	55.7	57.0	57.2	49.7	51.0
VEHICULAR NOISE	DAY=	66.0	Leq	EVENING=	64.7	Leq	NIGHT=	58.7	Leq

RESULTS						
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):			**Ldn=**	**67.1**
					CNEL=	**67.8**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**32**	**69**	**150**
			CNEL:	**36**	**76**	**165**

Scenario: EXISTING NO PROJECT
Roadway: Carson Street
Segment: Hawthorne Boulevard to Madrona Avenue

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	24,840
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1524	29	12	1126	21	9	282	5	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	1.1	-16.2	-20.1	-0.2	-17.5	-21.4	-6.2	-23.5	-27.4
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	70.1	62.5	63.8	68.8	61.2	62.5	62.7	55.2	56.5
VEHICULAR NOISE	DAY=	71.6	Leq	EVENING=	70.3	Leq	NIGHT=	64.2	Leq

RESULTS					
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		**Ldn=**	**72.7**
				CNEL=	**73.3**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**75**	**162**	**350**
			CNEL:	**83**	**179**	**385**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING NO PROJECT
Roadway: Carson Street
Segment: east of Madrona Avenue
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	25,370
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1556	29	12	1150	22	9	288	5	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	1.2	-16.1	-20.0	-0.1	-17.4	-21.3	-6.2	-23.4	-27.3
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	70.2	62.6	63.9	68.8	61.3	62.6	62.8	55.3	56.6
VEHICULAR NOISE	DAY=	71.7	Leq	EVENING=	70.4	Leq	NIGHT=	64.3	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 72.8** **CNEL= 73.4**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**76**	**165**	**355**
	CNEL:	**84**	**181**	**390**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING NO PROJECT
Roadway: Sepulveda Boulevard
Segment: west of Anza Avenue

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	21,580
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1324	25	10	978	18	7	245	5	2
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	-0.1	-17.3	-21.3	-1.4	-18.7	-22.6	-7.4	-24.7	-28.6
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.0	59.7	60.6	66.7	58.4	59.3	60.7	52.4	53.3
VEHICULAR NOISE	DAY=	69.2	Leq	EVENING=	67.9	Leq	NIGHT=	61.9	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 70.3** **CNEL= 71.0**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**53**	**113**	**244**
	CNEL:	**58**	**125**	**269**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING NO PROJECT
Roadway: Sepulveda Boulevard
Segment: Anza Avenue to Hawthorne Boulev
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	27,580
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1692	32	13	1250	24	9	313	6	2
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	1.0	-16.3	-20.2	-0.4	-17.6	-21.6	-6.4	-23.6	-27.6
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	72.2	63.9	64.8	70.9	62.6	63.5	64.9	56.6	57.5
VEHICULAR NOISE	DAY=	73.4	Leq	EVENING=	72.1	Leq	NIGHT=	66.1	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 74.5** **CNEL= 75.2**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**100**	**216**	**465**
	CNEL:	**110**	**238**	**512**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING NO PROJECT
Roadway: Sepulveda Boulevard
Segment: Hawthorne Boulevard to Madrona A

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	34,670
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2126	40	16	1572	30	12	394	7	3
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	2.0	-15.3	-19.2	0.6	-16.6	-20.6	-5.4	-22.6	-26.6
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	73.2	64.9	65.8	71.9	63.6	64.5	65.9	57.6	58.5
VEHICULAR NOISE	DAY=	74.4	Leq	EVENING=	73.1	Leq	NIGHT=	67.1	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 75.5** **CNEL= 76.1**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**117**	**251**	**542**
	CNEL:	**129**	**277**	**597**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING NO PROJECT
Roadway: Anza Avenue
Segment: north of Torrance Boulevard
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	23,120
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1418	27	11	1048	20	8	263	5	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	0.8	-16.5	-20.4	-0.5	-17.8	-21.7	-6.6	-23.8	-27.7
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	66.6	59.1	60.4	65.3	57.8	59.1	59.3	51.8	53.0
VEHICULAR NOISE	DAY=	68.1	Leq	EVENING=	66.8	Leq	NIGHT=	60.8	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 69.2** **CNEL= 69.9**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**44**	**96**	**206**
	CNEL:	**49**	**105**	**227**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING NO PROJECT
Roadway: Anza Avenue
Segment: Torrance Boulevard to Carson Stre
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	24,200
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1484	28	11	1097	21	8	275	5	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	1.0	-16.3	-20.2	-0.3	-17.6	-21.5	-6.4	-23.6	-27.6
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	66.8	59.3	60.6	65.5	58.0	59.3	59.5	52.0	53.2
VEHICULAR NOISE	DAY=	68.3	Leq	EVENING=	67.0	Leq	NIGHT=	61.0	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 69.4** **CNEL= 70.1**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**46**	**99**	**212**
	CNEL:	**50**	**109**	**234**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING NO PROJECT
Roadway: Anza Avenue
Segment: Carson Street to Sepulveda Boulev
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	23,820
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1461	28	11	1080	20	8	270	5	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	0.9	-16.3	-20.3	-0.4	-17.7	-21.6	-6.4	-23.7	-27.6
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	66.8	59.2	60.5	65.4	57.9	59.2	59.4	51.9	53.2
VEHICULAR NOISE	DAY=	68.3	Leq	EVENING=	66.9	Leq	NIGHT=	60.9	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 69.4** **CNEL= 70.0**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**45**	**98**	**210**
	CNEL:	**50**	**107**	**231**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING NO PROJECT
Roadway: Anza Avenue
Segment: south of Sepulveda Boulevard
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	23,800
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1460	28	11	1079	20	8	270	5	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	0.9	-16.3	-20.3	-0.4	-17.7	-21.6	-6.4	-23.7	-27.6
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	66.8	59.2	60.5	65.4	57.9	59.2	59.4	51.9	53.2
VEHICULAR NOISE	DAY=	68.3	Leq	EVENING=	66.9	Leq	NIGHT=	60.9	Leq

RESULTS				
NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA):			**Ldn=**	**69.4**
			CNEL=	**70.0**
NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**45**	**98**	**210**
	CNEL:	**50**	**107**	**231**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING NO PROJECT
Roadway: Village Court
Segment: Village Lane to Del Amo Circle N
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	2,720
SPEED (mph)	30
ROAD NEAR-FAR LN. DIST.	24
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	167	3	1	123	2	1	31	1	0
Speed in MPH	30	30	30	30	30	30	30	30	30
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	62.5	73.1	78.8	62.5	73.1	78.8	62.5	73.1	78.8
ADJUSTMENTS									
Flow	-7.9	-25.1	-29.0	-9.2	-26.4	-30.4	-15.2	-32.4	-36.4
Distance	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	54.7	48.1	49.8	53.4	46.8	48.5	47.4	40.8	42.5
VEHICULAR NOISE	DAY=	56.6	Leq	EVENING=	55.3	Leq	NIGHT=	49.3	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 57.7** **CNEL= 58.3**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**8**	**16**	**35**
	CNEL:	**8**	**18**	**39**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING NO PROJECT
Roadway: Del Amo Circle W
Segment: Del Amo Circle N to Carson Street
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	3,410
SPEED (mph)	30
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	209	4	2	155	3	1	39	1	0
Speed in MPH	30	30	30	30	30	30	30	30	30
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	62.5	73.1	78.8	62.5	73.1	78.8	62.5	73.1	78.8
ADJUSTMENTS									
Flow	-6.9	-24.1	-28.1	-8.2	-25.4	-29.4	-14.2	-31.4	-35.4
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	56.4	49.8	51.4	55.1	48.4	50.1	49.1	42.4	44.1
VEHICULAR NOISE	DAY=	58.3	Leq	EVENING=	56.9	Leq	NIGHT=	50.9	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 59.3** **CNEL= 60.0**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**10**	**21**	**45**
	CNEL:	**11**	**23**	**50**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING NO PROJECT
Roadway: Del Amo Circle W
Segment: south of Carson Street

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	530
SPEED (mph)	30
ROAD NEAR-FAR LN. DIST.	12
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	33	1	0	24	0	0	6	0	0
Speed in MPH	30	30	30	30	30	30	30	30	30
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	62.5	73.1	78.8	62.5	73.1	78.8	62.5	73.1	78.8
ADJUSTMENTS									
Flow	-15.0	-32.2	-36.2	-16.3	-33.5	-37.5	-22.3	-39.5	-43.5
Distance	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	47.5	40.9	42.6	46.2	39.5	41.2	40.2	33.5	35.2
VEHICULAR NOISE	DAY=	49.4	Leq	EVENING=	48.1	Leq	NIGHT=	42.0	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 50.5** **CNEL= 51.1**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**2**	**5**	**12**
	CNEL:	**3**	**6**	**13**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING NO PROJECT
Roadway: Hawthorne Boulevard
Segment: north of Torrance Boulevard
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	48,060
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	96
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2948	56	22	2179	41	17	546	10	4
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	3.4	-13.9	-17.8	2.1	-15.2	-19.1	-4.0	-21.2	-25.2
Distance	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	78.9	70.6	71.5	77.6	69.3	70.2	71.6	63.3	64.2
VEHICULAR NOISE	DAY=	80.2	Leq	EVENING=	78.8	Leq	NIGHT=	72.8	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 81.3**
CNEL= 81.9

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**281**	**606**	**1305**
	CNEL:	**310**	**667**	**1437**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING NO PROJECT
Roadway: Hawthorne Boulevard
Segment: Torrance Boulevard to Del Amo Cir
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	51,950
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	96
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	3186	60	24	2355	44	18	590	11	4
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	3.7	-13.5	-17.5	2.4	-14.8	-18.8	-3.6	-20.9	-24.8
Distance	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	79.3	71.0	71.9	77.9	69.7	70.5	71.9	63.6	64.5
VEHICULAR NOISE	DAY=	80.5	Leq	EVENING=	79.2	Leq	NIGHT=	73.2	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 81.6** **CNEL= 82.2**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**296**	**638**	**1375**
	CNEL:	**326**	**703**	**1514**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING NO PROJECT
Roadway: Hawthorne Boulevard
Segment: Del Amo Circle N to Carson Street
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	50,130
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	96
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	3075	58	23	2273	43	17	569	11	4
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	3.6	-13.7	-17.6	2.2	-15.0	-19.0	-3.8	-21.0	-25.0
Distance	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	79.1	70.8	71.7	77.8	69.5	70.4	71.8	63.5	64.4
VEHICULAR NOISE	DAY=	80.3	Leq	EVENING=	79.0	Leq	NIGHT=	73.0	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 81.4**, **CNEL= 82.1**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**289**	**623**	**1343**
	CNEL:	**318**	**686**	**1478**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING NO PROJECT
Roadway: Hawthorne Boulevard
Segment: Carson Street to Sepulveda Boulev
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	50,430
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	96
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	3093	58	23	2286	43	17	573	11	4
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	3.6	-13.7	-17.6	2.3	-15.0	-18.9	-3.7	-21.0	-24.9
Distance	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	79.1	70.8	71.7	77.8	69.5	70.4	71.8	63.5	64.4
VEHICULAR NOISE	DAY=	80.4	Leq	EVENING=	79.1	Leq	NIGHT=	73.0	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 81.5**, **CNEL= 82.1**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**290**	**626**	**1348**
	CNEL:	**320**	**689**	**1484**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING NO PROJECT
Roadway: Hawthorne Boulevard
Segment: south of Sepulveda Boulevard
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	53,920
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	96
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	3307	62	25	2444	46	19	612	12	5
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	3.9	-13.4	-17.3	2.6	-14.7	-18.6	-3.5	-20.7	-24.7
Distance	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	79.4	71.1	72.0	78.1	69.8	70.7	72.1	63.8	64.7
VEHICULAR NOISE	DAY=	80.7	Leq	EVENING=	79.3	Leq	NIGHT=	73.3	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 81.8**
CNEL= 82.4

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**304**	**654**	**1409**
	CNEL:	**334**	**720**	**1552**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING NO PROJECT
Roadway: Madrona Avenue
Segment: north of Torrance Boulevard
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	32,400
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1987	38	15	1469	28	11	368	7	3
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	1.7	-15.6	-19.5	0.3	-16.9	-20.9	-5.7	-22.9	-26.9
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	72.9	64.6	65.5	71.6	63.3	64.2	65.6	57.3	58.2
VEHICULAR NOISE	DAY=	74.1	Leq	EVENING=	72.8	Leq	NIGHT=	66.8	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 75.2** **CNEL= 75.9**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**112**	**240**	**518**
	CNEL:	**123**	**265**	**570**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING NO PROJECT
Roadway: Madrona Avenue
Segment: Torrance Boulevard to Carson Stre
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	30,540
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1873	35	14	1384	26	11	347	7	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	2.0	-15.3	-19.2	0.7	-16.6	-20.5	-5.3	-22.6	-26.5
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	71.0	63.4	64.7	69.7	62.1	63.4	63.6	56.1	57.4
VEHICULAR NOISE	DAY=	72.5	Leq	EVENING=	71.2	Leq	NIGHT=	65.1	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 73.6** **CNEL= 74.2**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**86**	**186**	**401**
	CNEL:	**95**	**205**	**442**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING NO PROJECT
Roadway: Madrona Avenue
Segment: Carson Street to Sepulveda Boulev
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	22,770
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1397	26	11	1032	19	8	259	5	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	0.7	-16.5	-20.5	-0.6	-17.8	-21.8	-6.6	-23.9	-27.8
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	69.7	62.2	63.4	68.4	60.9	62.1	62.4	54.8	56.1
VEHICULAR NOISE	DAY=	71.2	Leq	EVENING=	69.9	Leq	NIGHT=	63.9	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 72.3** **CNEL= 72.9**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**71**	**153**	**330**
	CNEL:	**78**	**169**	**363**

Nadel - Del Amo

EXISTING PLUS PROJECT

#	ROADWAY	SEGMENT	ADT	POSTED SPEED LIMIT	LANE DISTANCE	SITE CONDITION	LANES	GRADE (%)
1	Torrance Boulevard	west of Anza Avenue	23,070	40	48	Soft	4D	**0%**
2	Torrance Boulevard	Anza Avenue to Hawthorne Boulevard	30,980	40	48	Soft	4D	**0%**
3	Torrance Boulevard	Hawthorne Boulevard to Madrona Avenue	30,440	40	84	Soft	6D	**0%**
4	Torrance Boulevard	east of Madrona Avenue	27,290	35	84	Soft	6D	**0%**
5	Del Amo Circle W	Village Court to Hawthorne Boulevard	5,860	30	48	Soft	4D	**0%**
6	Del Amo Circle N	Hawthorne Boulevard to Fashion Way	3,110	30	48	Soft	4D	**0%**
7	Carson Street	west of Anza Avenue	6,500	35	24	Soft	2D	**0%**
8	Carson Street	Anza Avenue to Del Amo Circle W	14,330	35	48	Soft	4D	**0%**
9	Carson Street	Del Amo Circle W to Hawthorne Boulevard	15,470	35	48	Soft	4D	**0%**
10	Carson Street	Hawthorne Boulevard to Madrona Avenue	25,110	35	84	Soft	6D	**0%**
11	Carson Street	east of Madrona Avenue	25,640	35	84	Soft	6D	**0%**
12	Sepulveda Boulevard	west of Anza Avenue	21,690	40	48	Soft	4D	**0%**
13	Sepulveda Boulevard	Anza Avenue to Hawthorne Boulevard	27,580	40	84	Soft	6D	**0%**
14	Sepulveda Boulevard	Hawthorne Boulevard to Madrona Avenue	35,040	40	84	Soft	6D	**0%**
15	Anza Avenue	north of Torrance Boulevard	23,310	35	48	Soft	4D	**0%**
16	Anza Avenue	Torrance Boulevard to Carson Street	24,580	35	48	Soft	4D	**0%**
17	Anza Avenue	Carson Street to Sepulveda Boulevard	24,110	35	48	Soft	4D	**0%**
18	Anza Avenue	south of Sepulveda Boulevard	23,990	35	48	Soft	4D	**0%**
19	Village Court	Village Lane to Del Amo Circle N	2,720	30	24	Soft	2D	**0%**
20	Del Amo Circle W	Del Amo Circle N to Carson Street	3,740	30	48	Soft	4D	**0%**
21	Del Amo Circle W	south of Carson Street	530	30	12	Soft	2U	**0%**
22	Hawthorne Boulevard	north of Torrance Boulevard	48,990	40	96	Soft	8D	**0%**
23	Hawthorne Boulevard	Torrance Boulevard to Del Amo Circle N	53,370	40	96	Soft	8D	**0%**
24	Hawthorne Boulevard	Del Amo Circle N to Carson Street	51,340	40	96	Soft	8D	**0%**
25	Hawthorne Boulevard	Carson Street to Sepulveda Boulevard	51,620	40	96	Soft	8D	**0%**
26	Hawthorne Boulevard	south of Sepulveda Boulevard	54,740	40	96	Soft	8D	**0%**
27	Madrona Avenue	north of Torrance Boulevard	32,510	40	84	Soft	6D	**0%**
28	Madrona Avenue	Torrance Boulevard to Carson Street	30,540	35	84	Soft	6D	**0%**
29	Madrona Avenue	Carson Street to Sepulveda Boulevard	22,770	35	84	Soft	6D	**0%**

ANALYST
NJF

ROAD CLASSIFICATION	SPEED	LANE DISTANCE
2U	40	12
4U	40	36
4D	45	48
6D	45	84
2D	40	24

		73.6	75.55%
		13.6	13.96%
		10.22	10.49%

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.42%	DAY	75.5%
% MT	1.84%	EVENING	14.0%
% HT	0.74%	NIGHT	10.5%

Source: Riverside, County of, Department of Public Health, Office of Industrial Hygiene. 2009, November. For Determining and Mitigating Traf

Riverside County Fleet Mix: Secondary, Collectors, or Smaller

Vehicle	Overall %	Day (7 AM to	Evening (7	Night (10 PM to 7 AM)
Auto	97%	73.60	13.60	10.22
Medium Truck	2%	0.90	0.04	0.90
Heavy Truck	1%	0.35	0.04	0.35
		74.85	13.68	11.47

Nadel - Del Amo

EXISTING PLUS PROJECT CONDITIONS NOISE CONTOURS RESULT SUMMARY TABLE

					DISTACE TO NOISE CONTOUR (FT.)		
#	ROADWAY	SEGMENT	TRAFIC VOLUMES	LEVEL AT 50 FT.	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Torrance Boulevard	west of Anza Avenue	23,070	71.3	61	131	281
2	Torrance Boulevard	Anza Avenue to Hawthorne Boulevard	30,980	72.5	74	159	342
3	Torrance Boulevard	Hawthorne Boulevard to Madrona Avenue	30,440	75.6	118	254	547
4	Torrance Boulevard	east of Madrona Avenue	27,290	73.7	88	190	410
5	Del Amo Circle W	Village Court to Hawthorne Boulevard	5,860	62.3	15	33	71
6	Del Amo Circle N	Hawthorne Boulevard to Fashion Way	3,110	59.6	10	22	47
7	Carson Street	west of Anza Avenue	6,500	63.7	19	41	88
8	Carson Street	Anza Avenue to Del Amo Circle W	14,330	67.8	36	77	165
9	Carson Street	Del Amo Circle W to Hawthorne Boulevard	15,470	68.1	37	81	174
10	Carson Street	Hawthorne Boulevard to Madrona Avenue	25,110	73.3	84	180	388
11	Carson Street	east of Madrona Avenue	25,640	73.4	85	182	393
12	Sepulveda Boulevard	west of Anza Avenue	21,690	71.0	58	125	270
13	Sepulveda Boulevard	Anza Avenue to Hawthorne Boulevard	27,580	75.2	110	238	512
14	Sepulveda Boulevard	Hawthorne Boulevard to Madrona Avenue	35,040	76.2	129	279	601
15	Anza Avenue	north of Torrance Boulevard	23,310	69.9	49	106	228
16	Anza Avenue	Torrance Boulevard to Carson Street	24,580	70.1	51	110	236
17	Anza Avenue	Carson Street to Sepulveda Boulevard	24,110	70.0	50	108	233
18	Anza Avenue	south of Sepulveda Boulevard	23,990	70.0	50	108	233
19	Village Court	Village Lane to Del Amo Circle N	2,720	58.3	8	18	39
20	Del Amo Circle W	Del Amo Circle N to Carson Street	3,740	60.4	11	25	53
21	Del Amo Circle W	south of Carson Street	530	51.1	3	6	13
22	Hawthorne Boulevard	north of Torrance Boulevard	48,990	82.0	314	676	1456
23	Hawthorne Boulevard	Torrance Boulevard to Del Amo Circle N	53,370	82.3	332	715	1541
24	Hawthorne Boulevard	Del Amo Circle N to Carson Street	51,340	82.2	324	697	1502
25	Hawthorne Boulevard	Carson Street to Sepulveda Boulevard	51,620	82.2	325	700	1507
26	Hawthorne Boulevard	south of Sepulveda Boulevard	54,740	82.4	338	728	1567
27	Madrona Avenue	north of Torrance Boulevard	32,510	75.9	123	265	571
28	Madrona Avenue	Torrance Boulevard to Carson Street	30,540	74.2	95	205	442
29	Madrona Avenue	Carson Street to Sepulveda Boulevard	22,770	72.9	78	169	363

Scenario: EXISTING PLUS PROJECT
Roadway: Torrance Boulevard
Segment: west of Anza Avenue

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	23,070
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1415	27	11	1046	20	8	262	5	2
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	0.2	-17.1	-21.0	-1.1	-18.4	-22.3	-7.1	-24.4	-28.3
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.3	60.0	60.9	67.0	58.7	59.6	61.0	52.7	53.6
VEHICULAR NOISE	DAY=	69.5	Leq	EVENING=	68.2	Leq	NIGHT=	62.2	Leq

RESULTS						
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):			**Ldn=**	**70.6**
					CNEL=	**71.3**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**55**	**119**	**255**
			CNEL:	**61**	**131**	**281**

Scenario: EXISTING PLUS PROJECT
Roadway: Torrance Boulevard
Segment: Anza Avenue to Hawthorne Boulevard

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	30,980
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1900	36	14	1404	27	11	352	7	3
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	1.5	-15.8	-19.7	0.1	-17.1	-21.0	-5.9	-23.1	-27.1
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	69.6	61.3	62.2	68.3	60.0	60.9	62.2	54.0	54.8
VEHICULAR NOISE	DAY=	70.8	Leq	EVENING=	69.5	Leq	NIGHT=	63.5	Leq

RESULTS					
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		**Ldn=**	**71.9**
				CNEL=	**72.5**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**67**	**144**	**311**
			CNEL:	**74**	**159**	**342**

Scenario: EXISTING PLUS PROJECT
Roadway: Torrance Boulevard
Segment: Hawthorne Boulevard to Madrona Avenue

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	30,440
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1867	35	14	1380	26	10	346	7	3
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	1.4	-15.9	-19.8	0.1	-17.2	-21.1	-5.9	-23.2	-27.1
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	72.6	64.3	65.2	71.3	63.0	63.9	65.3	57.0	57.9
VEHICULAR NOISE	DAY=	73.9	Leq	EVENING=	72.6	Leq	NIGHT=	66.5	Leq

RESULTS						
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):			**Ldn=**	**75.0**
					CNEL=	**75.6**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**107**	**231**	**497**
			CNEL:	**118**	**254**	**547**

Scenario: EXISTING PLUS PROJECT
Roadway: Torrance Boulevard
Segment: east of Madrona Avenue

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	27,290
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1674	32	13	1237	23	9	310	6	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	1.5	-15.7	-19.7	0.2	-17.1	-21.0	-5.8	-23.1	-27.0
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	70.5	63.0	64.2	69.2	61.6	62.9	63.2	55.6	56.9
VEHICULAR NOISE	DAY=	72.0	Leq	EVENING=	70.7	Leq	NIGHT=	64.7	Leq

RESULTS					
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		**Ldn=**	**73.1**
				CNEL=	**73.7**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**80**	**173**	**372**
			CNEL:	**88**	**190**	**410**

Scenario: EXISTING PLUS PROJECT
Roadway: Del Amo Circle W
Segment: Village Court to Hawthorne Boulevard

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	5,860
SPEED (mph)	30
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	359	7	3	266	5	2	67	1	1
Speed in MPH	30	30	30	30	30	30	30	30	30
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	62.5	73.1	78.8	62.5	73.1	78.8	62.5	73.1	78.8
ADJUSTMENTS									
Flow	-4.5	-21.8	-25.7	-5.8	-23.1	-27.0	-11.8	-29.1	-33.0
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	58.7	52.1	53.8	57.4	50.8	52.5	51.4	44.8	46.5
VEHICULAR NOISE	DAY=	60.6	Leq	EVENING=	59.3	Leq	NIGHT=	53.3	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 61.7**
CNEL= 62.3

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**14**	**30**	**65**
	CNEL:	**15**	**33**	**71**

Scenario: EXISTING PLUS PROJECT
Roadway: Del Amo Circle N
Segment: Hawthorne Boulevard to Fashion Way

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	3,110
SPEED (mph)	30
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	191	4	1	141	3	1	35	1	0
Speed in MPH	30	30	30	30	30	30	30	30	30
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	62.5	73.1	78.8	62.5	73.1	78.8	62.5	73.1	78.8
ADJUSTMENTS									
Flow	-7.3	-24.5	-28.5	-8.6	-25.8	-29.8	-14.6	-31.8	-35.8
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	56.0	49.4	51.0	54.7	48.0	49.7	48.7	42.0	43.7
VEHICULAR NOISE	DAY=	57.9	Leq	EVENING=	56.5	Leq	NIGHT=	50.5	Leq

RESULTS						
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):			**Ldn=**	**58.9**
					CNEL=	**59.6**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**9**	**20**	**43**
			CNEL:	**10**	**22**	**47**

Scenario: EXISTING PLUS PROJECT
Roadway: Carson Street
Segment: west of Anza Avenue

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	6,500
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	24
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	399	8	3	295	6	2	74	1	1
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	-4.7	-22.0	-25.9	-6.1	-23.3	-27.2	-12.1	-29.3	-33.3
Distance	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	60.5	52.9	54.2	59.1	51.6	52.9	53.1	45.6	46.9
VEHICULAR NOISE	DAY=	62.0	Leq	EVENING=	60.6	Leq	NIGHT=	54.6	Leq

RESULTS						
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):			**Ldn=**	**63.1**
					CNEL=	**63.7**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**17**	**37**	**80**
			CNEL:	**19**	**41**	**88**

Scenario: EXISTING PLUS PROJECT
Roadway: Carson Street
Segment: Anza Avenue to Del Amo Circle W

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	14,330
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	879	17	7	650	12	5	163	3	1
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	-1.3	-18.5	-22.5	-2.6	-19.9	-23.8	-8.6	-25.9	-29.8
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	64.6	57.0	58.3	63.2	55.7	57.0	57.2	49.7	51.0
VEHICULAR NOISE	DAY=	66.1	Leq	EVENING=	64.7	Leq	NIGHT=	58.7	Leq

RESULTS					
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		**Ldn=**	**67.1**
				CNEL=	**67.8**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**32**	**70**	**150**
			CNEL:	**36**	**77**	**165**

Scenario: EXISTING PLUS PROJECT
Roadway: Carson Street
Segment: Del Amo Circle W to Hawthorne Boulevard

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	15,470
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	949	18	7	701	13	5	176	3	1
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	-1.0	-18.2	-22.2	-2.3	-19.5	-23.5	-8.3	-25.5	-29.5
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	64.9	57.4	58.6	63.6	56.1	57.3	57.6	50.0	51.3
VEHICULAR NOISE	DAY=	66.4	Leq	EVENING=	65.1	Leq	NIGHT=	59.1	Leq

RESULTS					
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		**Ldn=**	**67.5**
				CNEL=	**68.1**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**34**	**73**	**158**
			CNEL:	**37**	**81**	**174**

Scenario: EXISTING PLUS PROJECT
Roadway: Carson Street
Segment: Hawthorne Boulevard to Madrona Avenue

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	25,110
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1540	29	12	1138	21	9	285	5	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	1.1	-16.1	-20.1	-0.2	-17.4	-21.4	-6.2	-23.4	-27.4
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	70.1	62.6	63.9	68.8	61.3	62.5	62.8	55.3	56.5
VEHICULAR NOISE	DAY=	71.6	Leq	EVENING=	70.3	Leq	NIGHT=	64.3	Leq

RESULTS						
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):			**Ldn=**	**72.7**
					CNEL=	**73.3**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**76**	**163**	**352**
			CNEL:	**84**	**180**	**388**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING PLUS PROJECT
Roadway: Carson Street
Segment: east of Madrona Avenue
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	25,640
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1573	30	12	1162	22	9	291	5	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	1.2	-16.0	-20.0	-0.1	-17.3	-21.3	-6.1	-23.3	-27.3
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	70.2	62.7	63.9	68.9	61.4	62.6	62.9	55.4	56.6
VEHICULAR NOISE	DAY=	71.7	Leq	EVENING=	70.4	Leq	NIGHT=	64.4	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 72.8** **CNEL= 73.4**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**77**	**166**	**357**
	CNEL:	**85**	**182**	**393**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING PLUS PROJECT
Roadway: Sepulveda Boulevard
Segment: west of Anza Avenue
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	21,690
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1330	25	10	983	19	7	246	5	2
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	-0.1	-17.3	-21.3	-1.4	-18.6	-22.6	-7.4	-24.7	-28.6
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.0	59.7	60.6	66.7	58.4	59.3	60.7	52.4	53.3
VEHICULAR NOISE	DAY=	69.3	Leq	EVENING=	67.9	Leq	NIGHT=	61.9	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 70.4** **CNEL= 71.0**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**53**	**114**	**245**
	CNEL:	**58**	**125**	**270**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING PLUS PROJECT
Roadway: Sepulveda Boulevard
Segment: Anza Avenue to Hawthorne Boulev
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	27,580
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1692	32	13	1250	24	9	313	6	2
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	1.0	-16.3	-20.2	-0.4	-17.6	-21.6	-6.4	-23.6	-27.6
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	72.2	63.9	64.8	70.9	62.6	63.5	64.9	56.6	57.5
VEHICULAR NOISE	DAY=	73.4	Leq	EVENING=	72.1	Leq	NIGHT=	66.1	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 74.5** **CNEL= 75.2**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**100**	**216**	**465**
	CNEL:	**110**	**238**	**512**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING PLUS PROJECT
Roadway: Sepulveda Boulevard
Segment: Hawthorne Boulevard to Madrona A
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	35,040
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2149	41	16	1588	30	12	398	8	3
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	2.0	-15.2	-19.2	0.7	-16.6	-20.5	-5.3	-22.6	-26.5
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	73.2	64.9	65.8	71.9	63.6	64.5	65.9	57.6	58.5
VEHICULAR NOISE	DAY=	74.5	Leq	EVENING=	73.2	Leq	NIGHT=	67.1	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 75.6** **CNEL= 76.2**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**118**	**253**	**546**
	CNEL:	**129**	**279**	**601**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING PLUS PROJECT
Roadway: Anza Avenue
Segment: north of Torrance Boulevard
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	23,310
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1430	27	11	1057	20	8	265	5	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	0.8	-16.4	-20.4	-0.5	-17.7	-21.7	-6.5	-23.8	-27.7
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	66.7	59.1	60.4	65.4	57.8	59.1	59.3	51.8	53.1
VEHICULAR NOISE	DAY=	68.2	Leq	EVENING=	66.9	Leq	NIGHT=	60.8	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 69.3** **CNEL= 69.9**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**45**	**96**	**207**
	CNEL:	**49**	**106**	**228**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING PLUS PROJECT
Roadway: Anza Avenue
Segment: Torrance Boulevard to Carson Stre
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	24,580
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1508	28	11	1114	21	8	279	5	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	1.0	-16.2	-20.2	-0.3	-17.5	-21.5	-6.3	-23.5	-27.5
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	66.9	59.4	60.6	65.6	58.1	59.3	59.6	52.0	53.3
VEHICULAR NOISE	DAY=	68.4	Leq	EVENING=	67.1	Leq	NIGHT=	61.1	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 69.5** **CNEL= 70.1**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**46**	**100**	**215**
	CNEL:	**51**	**110**	**236**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING PLUS PROJECT
Roadway: Anza Avenue
Segment: Carson Street to Sepulveda Boulev
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	24,110
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1479	28	11	1093	21	8	274	5	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	1.0	-16.3	-20.2	-0.4	-17.6	-21.6	-6.4	-23.6	-27.6
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	66.8	59.3	60.6	65.5	58.0	59.2	59.5	52.0	53.2
VEHICULAR NOISE	DAY=	68.3	Leq	EVENING=	67.0	Leq	NIGHT=	61.0	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 69.4** **CNEL= 70.0**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**46**	**98**	**212**
	CNEL:	**50**	**108**	**233**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING PLUS PROJECT
Roadway: Anza Avenue
Segment: south of Sepulveda Boulevard
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	23,990
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1471	28	11	1088	21	8	272	5	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	0.9	-16.3	-20.3	-0.4	-17.6	-21.6	-6.4	-23.6	-27.6
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	66.8	59.3	60.5	65.5	58.0	59.2	59.5	51.9	53.2
VEHICULAR NOISE	DAY=	68.3	Leq	EVENING=	67.0	Leq	NIGHT=	61.0	Leq

RESULTS				
NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA):			**Ldn=**	**69.4**
			CNEL=	**70.0**
NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**46**	**98**	**211**
	CNEL:	**50**	**108**	**233**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING PLUS PROJECT
Roadway: Village Court
Segment: Village Lane to Del Amo Circle N
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	2,720
SPEED (mph)	30
ROAD NEAR-FAR LN. DIST.	24
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	167	3	1	123	2	1	31	1	0
Speed in MPH	30	30	30	30	30	30	30	30	30
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	62.5	73.1	78.8	62.5	73.1	78.8	62.5	73.1	78.8
ADJUSTMENTS									
Flow	-7.9	-25.1	-29.0	-9.2	-26.4	-30.4	-15.2	-32.4	-36.4
Distance	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	54.7	48.1	49.8	53.4	46.8	48.5	47.4	40.8	42.5
VEHICULAR NOISE	DAY=	56.6	Leq	EVENING=	55.3	Leq	NIGHT=	49.3	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 57.7** **CNEL= 58.3**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**8**	**16**	**35**
	CNEL:	**8**	**18**	**39**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING PLUS PROJECT
Roadway: Del Amo Circle W
Segment: Del Amo Circle N to Carson Street
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	3,740
SPEED (mph)	30
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	229	4	2	170	3	1	42	1	0
Speed in MPH	30	30	30	30	30	30	30	30	30
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	62.5	73.1	78.8	62.5	73.1	78.8	62.5	73.1	78.8
ADJUSTMENTS									
Flow	-6.5	-23.7	-27.7	-7.8	-25.0	-29.0	-13.8	-31.0	-35.0
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	56.8	50.2	51.8	55.5	48.8	50.5	49.5	42.8	44.5
VEHICULAR NOISE	DAY=	58.7	Leq	EVENING=	57.3	Leq	NIGHT=	51.3	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 59.8** **CNEL= 60.4**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**10**	**22**	**48**
	CNEL:	**11**	**25**	**53**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING PLUS PROJECT
Roadway: Del Amo Circle W
Segment: south of Carson Street

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	530
SPEED (mph)	30
ROAD NEAR-FAR LN. DIST.	12
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	33	1	0	24	0	0	6	0	0
Speed in MPH	30	30	30	30	30	30	30	30	30
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	62.5	73.1	78.8	62.5	73.1	78.8	62.5	73.1	78.8
ADJUSTMENTS									
Flow	-15.0	-32.2	-36.2	-16.3	-33.5	-37.5	-22.3	-39.5	-43.5
Distance	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	47.5	40.9	42.6	46.2	39.5	41.2	40.2	33.5	35.2
VEHICULAR NOISE	DAY=	49.4	Leq	EVENING=	48.1	Leq	NIGHT=	42.0	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 50.5** **CNEL= 51.1**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**2**	**5**	**12**
	CNEL:	**3**	**6**	**13**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING PLUS PROJECT
Roadway: Hawthorne Boulevard
Segment: north of Torrance Boulevard
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	48,990
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	96
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	3005	57	23	2221	42	17	556	11	4
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	3.5	-13.8	-17.7	2.1	-15.1	-19.1	-3.9	-21.1	-25.1
Distance	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	79.0	70.7	71.6	77.7	69.4	70.3	71.7	63.4	64.3
VEHICULAR NOISE	DAY=	80.2	Leq	EVENING=	78.9	Leq	NIGHT=	72.9	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 81.3** **CNEL= 82.0**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**285**	**614**	**1322**
	CNEL:	**314**	**676**	**1456**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING PLUS PROJECT
Roadway: Hawthorne Boulevard
Segment: Torrance Boulevard to Del Amo Cir
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	53,370
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	96
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	3273	62	25	2419	46	18	606	11	5
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	3.8	-13.4	-17.4	2.5	-14.7	-18.7	-3.5	-20.7	-24.7
Distance	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	79.4	71.1	72.0	78.1	69.8	70.7	72.0	63.8	64.7
VEHICULAR NOISE	DAY=	80.6	Leq	EVENING=	79.3	Leq	NIGHT=	73.3	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 81.7**, **CNEL= 82.3**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**302**	**650**	**1400**
	CNEL:	**332**	**715**	**1541**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING PLUS PROJECT
Roadway: Hawthorne Boulevard
Segment: Del Amo Circle N to Carson Street
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	51,340
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	96
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	3149	59	24	2327	44	18	583	11	4
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	3.7	-13.6	-17.5	2.3	-14.9	-18.9	-3.7	-20.9	-24.9
Distance	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	79.2	70.9	71.8	77.9	69.6	70.5	71.9	63.6	64.5
VEHICULAR NOISE	DAY=	80.4	Leq	EVENING=	79.1	Leq	NIGHT=	73.1	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 81.5** **CNEL= 82.2**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**294**	**633**	**1364**
	CNEL:	**324**	**697**	**1502**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING PLUS PROJECT
Roadway: Hawthorne Boulevard
Segment: Carson Street to Sepulveda Boulev
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	51,620
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	96
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	3166	60	24	2340	44	18	586	11	4
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	3.7	-13.6	-17.5	2.4	-14.9	-18.8	-3.6	-20.9	-24.8
Distance	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	79.2	70.9	71.8	77.9	69.6	70.5	71.9	63.6	64.5
VEHICULAR NOISE	DAY=	80.5	Leq	EVENING=	79.2	Leq	NIGHT=	73.1	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 81.6** **CNEL= 82.2**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**295**	**635**	**1369**
	CNEL:	**325**	**700**	**1507**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING PLUS PROJECT
Roadway: Hawthorne Boulevard
Segment: south of Sepulveda Boulevard
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	54,740
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	96
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	3357	63	26	2482	47	19	622	12	5
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	3.9	-13.3	-17.3	2.6	-14.6	-18.6	-3.4	-20.6	-24.6
Distance	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	79.5	71.2	72.1	78.2	69.9	70.8	72.2	63.9	64.8
VEHICULAR NOISE	DAY=	80.7	Leq	EVENING=	79.4	Leq	NIGHT=	73.4	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 81.8** **CNEL= 82.4**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**307**	**661**	**1424**
	CNEL:	**338**	**728**	**1567**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING PLUS PROJECT
Roadway: Madrona Avenue
Segment: north of Torrance Boulevard
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	32,510
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1994	38	15	1474	28	11	369	7	3
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	1.7	-15.6	-19.5	0.4	-16.9	-20.8	-5.7	-22.9	-26.8
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	72.9	64.6	65.5	71.6	63.3	64.2	65.6	57.3	58.2
VEHICULAR NOISE	DAY=	74.1	Leq	EVENING=	72.8	Leq	NIGHT=	66.8	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA):			**Ldn=**	**75.2**
			CNEL=	**75.9**
NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**112**	**241**	**519**
	CNEL:	**123**	**265**	**571**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING PLUS PROJECT
Roadway: Madrona Avenue
Segment: Torrance Boulevard to Carson Stre
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	30,540
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1873	35	14	1384	26	11	347	7	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	2.0	-15.3	-19.2	0.7	-16.6	-20.5	-5.3	-22.6	-26.5
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	71.0	63.4	64.7	69.7	62.1	63.4	63.6	56.1	57.4
VEHICULAR NOISE	DAY=	72.5	Leq	EVENING=	71.2	Leq	NIGHT=	65.1	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 73.6** **CNEL= 74.2**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**86**	**186**	**401**
	CNEL:	**95**	**205**	**442**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: EXISTING PLUS PROJECT
Roadway: Madrona Avenue
Segment: Carson Street to Sepulveda Boulev
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	22,770
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1397	26	11	1032	19	8	259	5	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	0.7	-16.5	-20.5	-0.6	-17.8	-21.8	-6.6	-23.9	-27.8
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	69.7	62.2	63.4	68.4	60.9	62.1	62.4	54.8	56.1
VEHICULAR NOISE	DAY=	71.2	Leq	EVENING=	69.9	Leq	NIGHT=	63.9	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 72.3** **CNEL= 72.9**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**71**	**153**	**330**
	CNEL:	**78**	**169**	**363**

Nadel - Del Amo

2017 No Project

#	ROADWAY	SEGMENT	ADT	POSTED SPEED LIMIT	LANE DISTANCE	SITE CONDITION	LANES	GRADE (%)
1	Torrance Boulevard	west of Anza Avenue	24,530	40	48	Soft	4D	**0%**
2	Torrance Boulevard	Anza Avenue to Hawthorne Boulevard	34,890	40	48	Soft	4D	**0%**
3	Torrance Boulevard	Hawthorne Boulevard to Madrona Avenue	31,900	40	84	Soft	6D	**0%**
4	Torrance Boulevard	east of Madrona Avenue	29,130	35	84	Soft	6D	**0%**
5	Del Amo Circle W	Village Court to Hawthorne Boulevard	3,730	30	48	Soft	4D	**0%**
6	Del Amo Circle N	Hawthorne Boulevard to Fashion Way	3,160	30	48	Soft	4D	**0%**
7	Carson Street	west of Anza Avenue	6,650	35	24	Soft	2D	**0%**
8	Carson Street	Anza Avenue to Del Amo Circle W	14,130	35	48	Soft	4D	**0%**
9	Carson Street	Del Amo Circle W to Hawthorne Boulevard	14,710	35	48	Soft	4D	**0%**
10	Carson Street	Hawthorne Boulevard to Madrona Avenue	27,600	35	84	Soft	6D	**0%**
11	Carson Street	east of Madrona Avenue	26,200	35	84	Soft	6D	**0%**
12	Sepulveda Boulevard	west of Anza Avenue	22,640	40	48	Soft	4D	**0%**
13	Sepulveda Boulevard	Anza Avenue to Hawthorne Boulevard	28,690	40	84	Soft	6D	**0%**
14	Sepulveda Boulevard	Hawthorne Boulevard to Madrona Avenue	36,270	40	84	Soft	6D	**0%**
15	Anza Avenue	north of Torrance Boulevard	23,860	35	48	Soft	4D	**0%**
16	Anza Avenue	Torrance Boulevard to Carson Street	25,090	35	48	Soft	4D	**0%**
17	Anza Avenue	Carson Street to Sepulveda Boulevard	24,700	35	48	Soft	4D	**0%**
18	Anza Avenue	south of Sepulveda Boulevard	24,590	35	48	Soft	4D	**0%**
19	Village Court	Village Lane to Del Amo Circle N	2,780	30	24	Soft	2D	**0%**
20	Del Amo Circle W	Del Amo Circle N to Carson Street	3,480	30	48	Soft	4D	**0%**
21	Del Amo Circle W	south of Carson Street	530	30	12	Soft	2U	**0%**
22	Hawthorne Boulevard	north of Torrance Boulevard	50,740	40	96	Soft	8D	**0%**
23	Hawthorne Boulevard	Torrance Boulevard to Del Amo Circle N	56,800	40	96	Soft	8D	**0%**
24	Hawthorne Boulevard	Del Amo Circle N to Carson Street	54,950	40	96	Soft	8D	**0%**
25	Hawthorne Boulevard	Carson Street to Sepulveda Boulevard	55,150	40	96	Soft	8D	**0%**
26	Hawthorne Boulevard	south of Sepulveda Boulevard	57,910	40	96	Soft	8D	**0%**
27	Madrona Avenue	north of Torrance Boulevard	33,890	40	84	Soft	6D	**0%**
28	Madrona Avenue	Torrance Boulevard to Carson Street	32,390	35	84	Soft	6D	**0%**
29	Madrona Avenue	Carson Street to Sepulveda Boulevard	24,150	35	84	Soft	6D	**0%**

ANALYST
NJF

ROAD CLASSIFICATION	SPEED	LANE DISTANCE
2U	40	12
4U	40	36
4D	45	48
6D	45	84
2D	40	24

		73.6	75.55%
		13.6	13.96%
		10.22	10.49%

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.42%	DAY	75.5%
% MT	1.84%	EVENING	14.0%
% HT	0.74%	NIGHT	10.5%

Source: Riverside, County of, Department of Public Health, Office of Industrial Hygiene. 2009, November. For Determining and Mitigating Traf

Riverside County Fleet Mix: Secondary, Collectors, or Smaller

Vehicle	Overall %	Day (7 AM to	Evening (7	Night (10 PM to 7 AM)
Auto	97%	73.60	13.60	10.22
Medium Truck	2%	0.90	0.04	0.90
Heavy Truck	1%	0.35	0.04	0.35
		74.85	13.68	11.47

Nadel - Del Amo
2017 No Project CONDITIONS NOISE CONTOURS RESULT SUMMARY TABLE

					DISTACE TO NOISE CONTOUR (FT.)		
#	ROADWAY	SEGMENT	TRAFIC VOLUMES	LEVEL AT 50 FT.	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Torrance Boulevard	west of Anza Avenue	24,530	71.5	63	136	293
2	Torrance Boulevard	Anza Avenue to Hawthorne Boulevard	34,890	73.0	80	172	371
3	Torrance Boulevard	Hawthorne Boulevard to Madrona Avenue	31,900	75.8	122	262	564
4	Torrance Boulevard	east of Madrona Avenue	29,130	74.0	92	199	428
5	Del Amo Circle W	Village Court to Hawthorne Boulevard	3,730	60.4	11	25	53
6	Del Amo Circle N	Hawthorne Boulevard to Fashion Way	3,160	59.6	10	22	47
7	Carson Street	west of Anza Avenue	6,650	63.8	19	41	89
8	Carson Street	Anza Avenue to Del Amo Circle W	14,130	67.7	35	76	163
9	Carson Street	Del Amo Circle W to Hawthorne Boulevard	14,710	67.9	36	78	168
10	Carson Street	Hawthorne Boulevard to Madrona Avenue	27,600	73.8	89	192	413
11	Carson Street	east of Madrona Avenue	26,200	73.5	86	185	399
12	Sepulveda Boulevard	west of Anza Avenue	22,640	71.2	60	129	278
13	Sepulveda Boulevard	Anza Avenue to Hawthorne Boulevard	28,690	75.3	113	244	526
14	Sepulveda Boulevard	Hawthorne Boulevard to Madrona Avenue	36,270	76.3	132	285	615
15	Anza Avenue	north of Torrance Boulevard	23,860	70.0	50	108	232
16	Anza Avenue	Torrance Boulevard to Carson Street	25,090	70.2	52	111	240
17	Anza Avenue	Carson Street to Sepulveda Boulevard	24,700	70.1	51	110	237
18	Anza Avenue	south of Sepulveda Boulevard	24,590	70.1	51	110	236
19	Village Court	Village Lane to Del Amo Circle N	2,780	58.4	8	18	39
20	Del Amo Circle W	Del Amo Circle N to Carson Street	3,480	60.1	11	23	50
21	Del Amo Circle W	south of Carson Street	530	51.1	3	6	13
22	Hawthorne Boulevard	north of Torrance Boulevard	50,740	82.1	321	692	1490
23	Hawthorne Boulevard	Torrance Boulevard to Del Amo Circle N	56,800	82.6	346	746	1606
24	Hawthorne Boulevard	Del Amo Circle N to Carson Street	54,950	82.5	339	729	1571
25	Hawthorne Boulevard	Carson Street to Sepulveda Boulevard	55,150	82.5	339	731	1575
26	Hawthorne Boulevard	south of Sepulveda Boulevard	57,910	82.7	351	755	1627
27	Madrona Avenue	north of Torrance Boulevard	33,890	76.1	127	273	588
28	Madrona Avenue	Torrance Boulevard to Carson Street	32,390	74.4	99	213	459
29	Madrona Avenue	Carson Street to Sepulveda Boulevard	24,150	73.2	81	175	378

Scenario: 2017 No Project
Roadway: Torrance Boulevard
Segment: west of Anza Avenue

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	24,530
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1505	28	11	1112	21	8	279	5	2
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	0.4	-16.8	-20.7	-0.9	-18.1	-22.1	-6.9	-24.1	-28.1
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.6	60.3	61.2	67.2	59.0	59.8	61.2	52.9	53.8
VEHICULAR NOISE	DAY=	69.8	Leq	EVENING=	68.5	Leq	NIGHT=	62.5	Leq

RESULTS						
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):			**Ldn=**	**70.9**
					CNEL=	**71.5**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**57**	**124**	**266**
			CNEL:	**63**	**136**	**293**

Scenario: 2017 No Project
Roadway: Torrance Boulevard
Segment: Anza Avenue to Hawthorne Boulevard

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	34,890
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2140	40	16	1582	30	12	396	7	3
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	2.0	-15.3	-19.2	0.7	-16.6	-20.5	-5.3	-22.6	-26.5
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	70.1	61.8	62.7	68.8	60.5	61.4	62.8	54.5	55.4
VEHICULAR NOISE	DAY=	71.3	Leq	EVENING=	70.0	Leq	NIGHT=	64.0	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 72.4**
CNEL= 73.0

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**73**	**156**	**337**
	CNEL:	**80**	**172**	**371**

Scenario: 2017 No Project
Roadway: Torrance Boulevard
Segment: Hawthorne Boulevard to Madrona Avenue

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	31,900
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1957	37	15	1446	27	11	362	7	3
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	1.6	-15.6	-19.6	0.3	-17.0	-20.9	-5.7	-23.0	-26.9
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	72.8	64.5	65.4	71.5	63.2	64.1	65.5	57.2	58.1
VEHICULAR NOISE	DAY=	74.1	Leq	EVENING=	72.8	Leq	NIGHT=	66.7	Leq

RESULTS						
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):			**Ldn=**	**75.2**
					CNEL=	**75.8**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**110**	**238**	**513**
			CNEL:	**122**	**262**	**564**

Scenario: 2017 No Project
Roadway: Torrance Boulevard
Segment: east of Madrona Avenue

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	29,130
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1787	34	14	1321	25	10	331	6	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	1.8	-15.5	-19.4	0.5	-16.8	-20.7	-5.6	-22.8	-26.7
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	70.8	63.2	64.5	69.4	61.9	63.2	63.4	55.9	57.2
VEHICULAR NOISE	DAY=	72.3	Leq	EVENING=	71.0	Leq	NIGHT=	64.9	Leq

RESULTS						
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):			**Ldn=**	**73.4**
					CNEL=	**74.0**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**84**	**180**	**389**
			CNEL:	**92**	**199**	**428**

Scenario: 2017 No Project
Roadway: Del Amo Circle W
Segment: Village Court to Hawthorne Boulevard

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	3,730
SPEED (mph)	30
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	229	4	2	169	3	1	42	1	0
Speed in MPH	30	30	30	30	30	30	30	30	30
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	62.5	73.1	78.8	62.5	73.1	78.8	62.5	73.1	78.8
ADJUSTMENTS									
Flow	-6.5	-23.7	-27.7	-7.8	-25.0	-29.0	-13.8	-31.0	-35.0
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	56.8	50.1	51.8	55.5	48.8	50.5	49.5	42.8	44.5
VEHICULAR NOISE	DAY=	58.6	Leq	EVENING=	57.3	Leq	NIGHT=	51.3	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 59.7**
CNEL= 60.4

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**10**	**22**	**48**
	CNEL:	**11**	**25**	**53**

Scenario: 2017 No Project
Roadway: Del Amo Circle N
Segment: Hawthorne Boulevard to Fashion Way

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	3,160
SPEED (mph)	30
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	194	4	1	143	3	1	36	1	0
Speed in MPH	30	30	30	30	30	30	30	30	30
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	62.5	73.1	78.8	62.5	73.1	78.8	62.5	73.1	78.8
ADJUSTMENTS									
Flow	-7.2	-24.4	-28.4	-8.5	-25.8	-29.7	-14.5	-31.8	-35.7
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	56.1	49.4	51.1	54.7	48.1	49.8	48.7	42.1	43.8
VEHICULAR NOISE	DAY=	57.9	Leq	EVENING=	56.6	Leq	NIGHT=	50.6	Leq

RESULTS						
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):			**Ldn=**	**59.0**
					CNEL=	**59.6**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**9**	**20**	**43**
			CNEL:	**10**	**22**	**47**

Scenario: 2017 No Project
Roadway: Carson Street
Segment: west of Anza Avenue

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	6,650
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	24
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	408	8	3	301	6	2	76	1	1
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	-4.6	-21.9	-25.8	-6.0	-23.2	-27.1	-12.0	-29.2	-33.2
Distance	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	60.6	53.0	54.3	59.2	51.7	53.0	53.2	45.7	47.0
VEHICULAR NOISE	DAY=	62.1	Leq	EVENING=	60.7	Leq	NIGHT=	54.7	Leq

RESULTS

NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		**Ldn=**	**63.2**
				CNEL=	**63.8**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**17**	**38**	**81**
	CNEL:	**19**	**41**	**89**

Scenario: 2017 No Project
Roadway: Carson Street
Segment: Anza Avenue to Del Amo Circle W

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	14,130
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	867	16	7	641	12	5	160	3	1
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	-1.4	-18.6	-22.6	-2.7	-19.9	-23.9	-8.7	-25.9	-29.9
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	64.5	57.0	58.2	63.2	55.7	56.9	57.2	49.6	50.9
VEHICULAR NOISE	DAY=	66.0	Leq	EVENING=	64.7	Leq	NIGHT=	58.7	Leq

RESULTS						
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):			**Ldn=**	**67.1**
					CNEL=	**67.7**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**32**	**69**	**148**
			CNEL:	**35**	**76**	**163**

Scenario: 2017 No Project
Roadway: Carson Street
Segment: Del Amo Circle W to Hawthorne Boulevard

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	14,710
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	902	17	7	667	13	5	167	3	1
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	-1.2	-18.4	-22.4	-2.5	-19.7	-23.7	-8.5	-25.8	-29.7
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	64.7	57.1	58.4	63.4	55.8	57.1	57.3	49.8	51.1
VEHICULAR NOISE	DAY=	66.2	Leq	EVENING=	64.9	Leq	NIGHT=	58.8	Leq

RESULTS						
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):			**Ldn=**	**67.3**
					CNEL=	**67.9**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**33**	**71**	**152**
			CNEL:	**36**	**78**	**168**

Scenario: 2017 No Project
Roadway: Carson Street
Segment: Hawthorne Boulevard to Madrona Avenue

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	27,600
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1693	32	13	1251	24	10	313	6	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	1.5	-15.7	-19.7	0.2	-17.0	-21.0	-5.8	-23.0	-27.0
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	70.5	63.0	64.3	69.2	61.7	63.0	63.2	55.7	56.9
VEHICULAR NOISE	DAY=	72.0	Leq	EVENING=	70.7	Leq	NIGHT=	64.7	Leq

RESULTS					
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		**Ldn=**	**73.1**
				CNEL=	**73.8**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**81**	**174**	**375**
			CNEL:	**89**	**192**	**413**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 No Project
Roadway: Carson Street
Segment: east of Madrona Avenue

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	26,200
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1607	30	12	1188	22	9	298	6	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	1.3	-15.9	-19.9	0.0	-17.2	-21.2	-6.0	-23.2	-27.2
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	70.3	62.8	64.0	69.0	61.5	62.7	63.0	55.5	56.7
VEHICULAR NOISE	DAY=	71.8	Leq	EVENING=	70.5	Leq	NIGHT=	64.5	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 72.9**, **CNEL= 73.5**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**78**	**168**	**362**
	CNEL:	**86**	**185**	**399**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 No Project
Roadway: Sepulveda Boulevard
Segment: west of Anza Avenue

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	22,640
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1389	26	11	1026	19	8	257	5	2
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	0.1	-17.1	-21.1	-1.2	-18.5	-22.4	-7.2	-24.5	-28.4
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.2	59.9	60.8	66.9	58.6	59.5	60.9	52.6	53.5
VEHICULAR NOISE	DAY=	69.4	Leq	EVENING=	68.1	Leq	NIGHT=	62.1	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 70.5** **CNEL= 71.2**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**54**	**117**	**252**
	CNEL:	**60**	**129**	**278**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 No Project
Roadway: Sepulveda Boulevard
Segment: Anza Avenue to Hawthorne Boulev
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	28,690
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1760	33	13	1301	25	10	326	6	2
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	1.1	-16.1	-20.1	-0.2	-17.4	-21.4	-6.2	-23.4	-27.4
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	72.4	64.1	65.0	71.1	62.8	63.7	65.0	56.8	57.6
VEHICULAR NOISE	DAY=	73.6	Leq	EVENING=	72.3	Leq	NIGHT=	66.3	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 74.7**, **CNEL= 75.3**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**103**	**222**	**478**
	CNEL:	**113**	**244**	**526**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 No Project
Roadway: Sepulveda Boulevard
Segment: Hawthorne Boulevard to Madrona A
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	36,270
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2225	42	17	1644	31	12	412	8	3
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	2.1	-15.1	-19.0	0.8	-16.4	-20.4	-5.2	-22.4	-26.4
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	73.4	65.1	66.0	72.1	63.8	64.7	66.1	57.8	58.7
VEHICULAR NOISE	DAY=	74.6	Leq	EVENING=	73.3	Leq	NIGHT=	67.3	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 75.7**, **CNEL= 76.3**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**120**	**259**	**558**
	CNEL:	**132**	**285**	**615**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 No Project
Roadway: Anza Avenue
Segment: north of Torrance Boulevard
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	23,860
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1463	28	11	1082	20	8	271	5	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	0.9	-16.3	-20.3	-0.4	-17.6	-21.6	-6.4	-23.7	-27.6
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	66.8	59.2	60.5	65.5	57.9	59.2	59.4	51.9	53.2
VEHICULAR NOISE	DAY=	68.3	Leq	EVENING=	67.0	Leq	NIGHT=	60.9	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 69.4** **CNEL= 70.0**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**45**	**98**	**210**
	CNEL:	**50**	**108**	**232**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 No Project
Roadway: Anza Avenue
Segment: Torrance Boulevard to Carson Stre
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	25,090
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1539	29	12	1137	21	9	285	5	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	1.1	-16.1	-20.1	-0.2	-17.4	-21.4	-6.2	-23.4	-27.4
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	67.0	59.5	60.7	65.7	58.2	59.4	59.7	52.1	53.4
VEHICULAR NOISE	DAY=	68.5	Leq	EVENING=	67.2	Leq	NIGHT=	61.2	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 69.6** **CNEL= 70.2**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**47**	**101**	**218**
	CNEL:	**52**	**111**	**240**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 No Project
Roadway: Anza Avenue
Segment: Carson Street to Sepulveda Boulev
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	24,700
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1515	29	12	1120	21	9	280	5	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	1.1	-16.2	-20.1	-0.3	-17.5	-21.4	-6.3	-23.5	-27.5
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	66.9	59.4	60.7	65.6	58.1	59.3	59.6	52.1	53.3
VEHICULAR NOISE	DAY=	68.4	Leq	EVENING=	67.1	Leq	NIGHT=	61.1	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 69.5** **CNEL= 70.1**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**46**	**100**	**215**
	CNEL:	**51**	**110**	**237**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 No Project
Roadway: Anza Avenue
Segment: south of Sepulveda Boulevard
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	24,590
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1508	28	11	1115	21	8	279	5	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	1.0	-16.2	-20.2	-0.3	-17.5	-21.5	-6.3	-23.5	-27.5
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	66.9	59.4	60.6	65.6	58.1	59.3	59.6	52.1	53.3
VEHICULAR NOISE	DAY=	68.4	Leq	EVENING=	67.1	Leq	NIGHT=	61.1	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 69.5** **CNEL= 70.1**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**46**	**100**	**215**
	CNEL:	**51**	**110**	**236**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 No Project
Roadway: Village Court
Segment: Village Lane to Del Amo Circle N
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	2,780
SPEED (mph)	30
ROAD NEAR-FAR LN. DIST.	24
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	171	3	1	126	2	1	32	1	0
Speed in MPH	30	30	30	30	30	30	30	30	30
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	62.5	73.1	78.8	62.5	73.1	78.8	62.5	73.1	78.8
ADJUSTMENTS									
Flow	-7.8	-25.0	-29.0	-9.1	-26.3	-30.3	-15.1	-32.3	-36.3
Distance	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	54.8	48.2	49.9	53.5	46.9	48.6	47.5	40.9	42.6
VEHICULAR NOISE	DAY=	56.7	Leq	EVENING=	55.4	Leq	NIGHT=	49.4	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 57.8** **CNEL= 58.4**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**8**	**17**	**36**
	CNEL:	**8**	**18**	**39**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 No Project
Roadway: Del Amo Circle W
Segment: Del Amo Circle N to Carson Street
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	3,480
SPEED (mph)	30
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	213	4	2	158	3	1	40	1	0
Speed in MPH	30	30	30	30	30	30	30	30	30
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	62.5	73.1	78.8	62.5	73.1	78.8	62.5	73.1	78.8
ADJUSTMENTS									
Flow	-6.8	-24.0	-28.0	-8.1	-25.3	-29.3	-14.1	-31.3	-35.3
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	56.5	49.8	51.5	55.2	48.5	50.2	49.2	42.5	44.2
VEHICULAR NOISE	DAY=	58.3	Leq	EVENING=	57.0	Leq	NIGHT=	51.0	Leq

RESULTS				
NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA):			**Ldn=**	**59.4**
			CNEL=	**60.1**
NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**10**	**21**	**46**
	CNEL:	**11**	**23**	**50**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 No Project
Roadway: Del Amo Circle W
Segment: south of Carson Street

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	530
SPEED (mph)	30
ROAD NEAR-FAR LN. DIST.	12
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	33	1	0	24	0	0	6	0	0
Speed in MPH	30	30	30	30	30	30	30	30	30
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	62.5	73.1	78.8	62.5	73.1	78.8	62.5	73.1	78.8
ADJUSTMENTS									
Flow	-15.0	-32.2	-36.2	-16.3	-33.5	-37.5	-22.3	-39.5	-43.5
Distance	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	47.5	40.9	42.6	46.2	39.5	41.2	40.2	33.5	35.2
VEHICULAR NOISE	DAY=	49.4	Leq	EVENING=	48.1	Leq	NIGHT=	42.0	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 50.5**, **CNEL= 51.1**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**2**	**5**	**12**
	CNEL:	**3**	**6**	**13**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 No Project
Roadway: Hawthorne Boulevard
Segment: north of Torrance Boulevard

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	50,740
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	96
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	3112	59	24	2300	43	17	576	11	4
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	3.6	-13.6	-17.6	2.3	-14.9	-18.9	-3.7	-21.0	-24.9
Distance	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	79.2	70.9	71.8	77.8	69.6	70.4	71.8	63.5	64.4
VEHICULAR NOISE	DAY=	80.4	Leq	EVENING=	79.1	Leq	NIGHT=	73.1	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 81.5**, **CNEL= 82.1**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**292**	**628**	**1353**
	CNEL:	**321**	**692**	**1490**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 No Project
Roadway: Hawthorne Boulevard
Segment: Torrance Boulevard to Del Amo Cir
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	56,800
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	96
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	3484	66	26	2575	49	20	645	12	5
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	4.1	-13.1	-17.1	2.8	-14.5	-18.4	-3.2	-20.5	-24.4
Distance	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	79.6	71.4	72.2	78.3	70.0	70.9	72.3	64.0	64.9
VEHICULAR NOISE	DAY=	80.9	Leq	EVENING=	79.6	Leq	NIGHT=	73.6	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 82.0** **CNEL= 82.6**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**314**	**677**	**1459**
	CNEL:	**346**	**746**	**1606**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 No Project
Roadway: Hawthorne Boulevard
Segment: Del Amo Circle N to Carson Street
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	54,950
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	96
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	3370	64	26	2491	47	19	624	12	5
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	4.0	-13.3	-17.2	2.6	-14.6	-18.6	-3.4	-20.6	-24.6
Distance	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	79.5	71.2	72.1	78.2	69.9	70.8	72.2	63.9	64.8
VEHICULAR NOISE	DAY=	80.7	Leq	EVENING=	79.4	Leq	NIGHT=	73.4	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 81.8** **CNEL= 82.5**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**307**	**662**	**1427**
	CNEL:	**339**	**729**	**1571**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 No Project
Roadway: Hawthorne Boulevard
Segment: Carson Street to Sepulveda Boulev
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	55,150
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	96
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	3383	64	26	2500	47	19	626	12	5
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	4.0	-13.3	-17.2	2.7	-14.6	-18.5	-3.4	-20.6	-24.6
Distance	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	79.5	71.2	72.1	78.2	69.9	70.8	72.2	63.9	64.8
VEHICULAR NOISE	DAY=	80.8	Leq	EVENING=	79.4	Leq	NIGHT=	73.4	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA):			**Ldn=**	**81.8**
			CNEL=	**82.5**
NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**308**	**664**	**1431**
	CNEL:	**339**	**731**	**1575**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 No Project
Roadway: Hawthorne Boulevard
Segment: south of Sepulveda Boulevard
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	57,910
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	96
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	3552	67	27	2625	50	20	658	12	5
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	4.2	-13.1	-17.0	2.9	-14.4	-18.3	-3.1	-20.4	-24.3
Distance	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	79.7	71.4	72.3	78.4	70.1	71.0	72.4	64.1	65.0
VEHICULAR NOISE	DAY=	81.0	Leq	EVENING=	79.7	Leq	NIGHT=	73.6	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 82.1**, **CNEL= 82.7**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**318**	**686**	**1478**
	CNEL:	**351**	**755**	**1627**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 No Project
Roadway: Madrona Avenue
Segment: north of Torrance Boulevard

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	33,890
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2079	39	16	1536	29	12	385	7	3
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	1.9	-15.4	-19.3	0.5	-16.7	-20.7	-5.5	-22.7	-26.7
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	73.1	64.8	65.7	71.8	63.5	64.4	65.8	57.5	58.4
VEHICULAR NOISE	DAY=	74.3	Leq	EVENING=	73.0	Leq	NIGHT=	67.0	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 75.4** **CNEL= 76.1**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**115**	**248**	**534**
	CNEL:	**127**	**273**	**588**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 No Project
Roadway: Madrona Avenue
Segment: Torrance Boulevard to Carson Stre
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	32,390
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1987	38	15	1468	28	11	368	7	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	2.2	-15.0	-19.0	0.9	-16.3	-20.3	-5.1	-22.3	-26.3
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	71.2	63.7	65.0	69.9	62.4	63.7	63.9	56.4	57.6
VEHICULAR NOISE	DAY=	72.7	Leq	EVENING=	71.4	Leq	NIGHT=	65.4	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 73.8** **CNEL= 74.4**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**90**	**194**	**417**
	CNEL:	**99**	**213**	**459**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 No Project
Roadway: Madrona Avenue
Segment: Carson Street to Sepulveda Boulev
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	24,150
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1481	28	11	1095	21	8	274	5	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	1.0	-16.3	-20.2	-0.4	-17.6	-21.5	-6.4	-23.6	-27.6
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	69.9	62.4	63.7	68.6	61.1	62.4	62.6	55.1	56.4
VEHICULAR NOISE	DAY=	71.5	Leq	EVENING=	70.1	Leq	NIGHT=	64.1	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 72.5** **CNEL= 73.2**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**74**	**159**	**343**
	CNEL:	**81**	**175**	**378**

Nadel - Del Amo

2017 With Project

#	ROADWAY	SEGMENT	ADT	POSTED SPEED LIMIT	LANE DISTANCE	SITE CONDITION	LANES	GRADE (%)
1	Torrance Boulevard	west of Anza Avenue	26,370	40	48	Soft	4D	**0%**
2	Torrance Boulevard	Anza Avenue to Hawthorne Boulevard	34,890	40	48	Soft	4D	**0%**
3	Torrance Boulevard	Hawthorne Boulevard to Madrona Avenue	32,470	40	84	Soft	6D	**0%**
4	Torrance Boulevard	east of Madrona Avenue	29,580	35	84	Soft	6D	**0%**
5	Del Amo Circle W	Village Court to Hawthorne Boulevard	5,930	30	48	Soft	4D	**0%**
6	Del Amo Circle N	Hawthorne Boulevard to Fashion Way	3,160	30	48	Soft	4D	**0%**
7	Carson Street	west of Anza Avenue	6,760	35	24	Soft	2D	**0%**
8	Carson Street	Anza Avenue to Del Amo Circle W	14,910	35	48	Soft	4D	**0%**
9	Carson Street	Del Amo Circle W to Hawthorne Boulevard	15,870	35	48	Soft	4D	**0%**
10	Carson Street	Hawthorne Boulevard to Madrona Avenue	27,870	35	84	Soft	6D	**0%**
11	Carson Street	east of Madrona Avenue	26,470	35	84	Soft	6D	**0%**
12	Sepulveda Boulevard	west of Anza Avenue	22,750	40	48	Soft	4D	**0%**
13	Sepulveda Boulevard	Anza Avenue to Hawthorne Boulevard	28,690	40	84	Soft	6D	**0%**
14	Sepulveda Boulevard	Hawthorne Boulevard to Madrona Avenue	36,640	40	84	Soft	6D	**0%**
15	Anza Avenue	north of Torrance Boulevard	25,700	35	48	Soft	4D	**0%**
16	Anza Avenue	Torrance Boulevard to Carson Street	25,470	35	48	Soft	4D	**0%**
17	Anza Avenue	Carson Street to Sepulveda Boulevard	24,990	35	48	Soft	4D	**0%**
18	Anza Avenue	south of Sepulveda Boulevard	24,780	35	48	Soft	4D	**0%**
19	Village Court	Village Lane to Del Amo Circle N	2,780	30	24	Soft	2D	**0%**
20	Del Amo Circle W	Del Amo Circle N to Carson Street	3,810	30	48	Soft	4D	**0%**
21	Del Amo Circle W	south of Carson Street	530	30	12	Soft	2U	**0%**
22	Hawthorne Boulevard	north of Torrance Boulevard	51,670	40	96	Soft	8D	**0%**
23	Hawthorne Boulevard	Torrance Boulevard to Del Amo Circle N	58,220	40	96	Soft	8D	**0%**
24	Hawthorne Boulevard	Del Amo Circle N to Carson Street	56,160	40	96	Soft	8D	**0%**
25	Hawthorne Boulevard	Carson Street to Sepulveda Boulevard	56,340	40	96	Soft	8D	**0%**
26	Hawthorne Boulevard	south of Sepulveda Boulevard	58,730	40	96	Soft	8D	**0%**
27	Madrona Avenue	north of Torrance Boulevard	34,000	40	84	Soft	6D	**0%**
28	Madrona Avenue	Torrance Boulevard to Carson Street	32,390	35	84	Soft	6D	**0%**
29	Madrona Avenue	Carson Street to Sepulveda Boulevard	24,150	35	84	Soft	6D	**0%**

ANALYST
NJF

ROAD CLASSIFICATION	SPEED	LANE DISTANCE
2U	40	12
4U	40	36
4D	45	48
6D	45	84
2D	40	24

		73.6	75.55%
		13.6	13.96%
		10.22	10.49%

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.42%	DAY	75.5%
% MT	1.84%	EVENING	14.0%
% HT	0.74%	NIGHT	10.5%

Source: Riverside, County of, Department of Public Health, Office of Industrial Hygiene. 2009, November. For Determining and Mitigating Traf

Riverside County Fleet Mix: Secondary, Collectors, or Smaller

Vehicle	Overall %	Day (7 AM to	Evening (7	Night (10 PM to 7 AM)
Auto	97%	73.60	13.60	10.22
Medium Truck	2%	0.90	0.04	0.90
Heavy Truck	1%	0.35	0.04	0.35
		74.85	13.68	11.47

Nadel - Del Amo
2017 With Project CONDITIONS NOISE CONTOURS RESULT SUMMARY TABLE

					DISTACE TO NOISE CONTOUR (FT.)		
#	ROADWAY	SEGMENT	TRAFIC VOLUMES	LEVEL AT 50 FT.	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Torrance Boulevard	west of Anza Avenue	26,370	71.8	66	143	307
2	Torrance Boulevard	Anza Avenue to Hawthorne Boulevard	34,890	73.0	80	172	371
3	Torrance Boulevard	Hawthorne Boulevard to Madrona Avenue	32,470	75.9	123	265	571
4	Torrance Boulevard	east of Madrona Avenue	29,580	74.1	93	201	432
5	Del Amo Circle W	Village Court to Hawthorne Boulevard	5,930	62.4	16	33	72
6	Del Amo Circle N	Hawthorne Boulevard to Fashion Way	3,160	59.6	10	22	47
7	Carson Street	west of Anza Avenue	6,760	63.9	19	42	90
8	Carson Street	Anza Avenue to Del Amo Circle W	14,910	67.9	36	79	169
9	Carson Street	Del Amo Circle W to Hawthorne Boulevard	15,870	68.2	38	82	177
10	Carson Street	Hawthorne Boulevard to Madrona Avenue	27,870	73.8	90	193	416
11	Carson Street	east of Madrona Avenue	26,470	73.6	87	186	402
12	Sepulveda Boulevard	west of Anza Avenue	22,750	71.2	60	129	279
13	Sepulveda Boulevard	Anza Avenue to Hawthorne Boulevard	28,690	75.3	113	244	526
14	Sepulveda Boulevard	Hawthorne Boulevard to Madrona Avenue	36,640	76.4	133	287	619
15	Anza Avenue	north of Torrance Boulevard	25,700	70.3	52	113	243
16	Anza Avenue	Torrance Boulevard to Carson Street	25,470	70.3	52	112	242
17	Anza Avenue	Carson Street to Sepulveda Boulevard	24,990	70.2	51	111	239
18	Anza Avenue	south of Sepulveda Boulevard	24,780	70.2	51	110	238
19	Village Court	Village Lane to Del Amo Circle N	2,780	58.4	8	18	39
20	Del Amo Circle W	Del Amo Circle N to Carson Street	3,810	60.5	12	25	54
21	Del Amo Circle W	south of Carson Street	530	51.1	3	6	13
22	Hawthorne Boulevard	north of Torrance Boulevard	51,670	82.2	325	700	1508
23	Hawthorne Boulevard	Torrance Boulevard to Del Amo Circle N	58,220	82.7	352	758	1633
24	Hawthorne Boulevard	Del Amo Circle N to Carson Street	56,160	82.6	343	740	1594
25	Hawthorne Boulevard	Carson Street to Sepulveda Boulevard	56,340	82.6	344	742	1598
26	Hawthorne Boulevard	south of Sepulveda Boulevard	58,730	82.7	354	762	1643
27	Madrona Avenue	north of Torrance Boulevard	34,000	76.1	127	273	589
28	Madrona Avenue	Torrance Boulevard to Carson Street	32,390	74.4	99	213	459
29	Madrona Avenue	Carson Street to Sepulveda Boulevard	24,150	73.2	81	175	378

Scenario: 2017 With Project
Roadway: Torrance Boulevard
Segment: west of Anza Avenue

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	26,370
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1617	31	12	1195	23	9	299	6	2
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	0.8	-16.5	-20.4	-0.6	-17.8	-21.7	-6.6	-23.8	-27.8
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.9	60.6	61.5	67.6	59.3	60.2	61.5	53.3	54.2
VEHICULAR NOISE	DAY=	70.1	Leq	EVENING=	68.8	Leq	NIGHT=	62.8	Leq

RESULTS					
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		**Ldn=**	**71.2**
				CNEL=	**71.8**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**60**	**130**	**279**
			CNEL:	**66**	**143**	**307**

Scenario: 2017 With Project
Roadway: Torrance Boulevard
Segment: Anza Avenue to Hawthorne Boulevard

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	34,890
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2140	40	16	1582	30	12	396	7	3
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	2.0	-15.3	-19.2	0.7	-16.6	-20.5	-5.3	-22.6	-26.5
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	70.1	61.8	62.7	68.8	60.5	61.4	62.8	54.5	55.4
VEHICULAR NOISE	DAY=	71.3	Leq	EVENING=	70.0	Leq	NIGHT=	64.0	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 72.4**
CNEL= 73.0

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**73**	**156**	**337**
	CNEL:	**80**	**172**	**371**

Scenario: 2017 With Project
Roadway: Torrance Boulevard
Segment: Hawthorne Boulevard to Madrona Avenue

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	32,470
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1991	38	15	1472	28	11	369	7	3
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	1.7	-15.6	-19.5	0.4	-16.9	-20.8	-5.7	-22.9	-26.9
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	72.9	64.6	65.5	71.6	63.3	64.2	65.6	57.3	58.2
VEHICULAR NOISE	DAY=	74.1	Leq	EVENING=	72.8	Leq	NIGHT=	66.8	Leq

RESULTS						
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):			**Ldn=**	**75.2**
					CNEL=	**75.9**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**112**	**241**	**519**
			CNEL:	**123**	**265**	**571**

Scenario: 2017 With Project
Roadway: Torrance Boulevard
Segment: east of Madrona Avenue

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	29,580
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1814	34	14	1341	25	10	336	6	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	1.8	-15.4	-19.4	0.5	-16.7	-20.7	-5.5	-22.7	-26.7
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	70.8	63.3	64.6	69.5	62.0	63.3	63.5	56.0	57.2
VEHICULAR NOISE	DAY=	72.3	Leq	EVENING=	71.0	Leq	NIGHT=	65.0	Leq

RESULTS						
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):			**Ldn=**	**73.4**
					CNEL=	**74.1**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**85**	**182**	**393**
			CNEL:	**93**	**201**	**432**

Scenario: 2017 With Project
Roadway: Del Amo Circle W
Segment: Village Court to Hawthorne Boulevard

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	5,930
SPEED (mph)	30
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	364	7	3	269	5	2	67	1	1
Speed in MPH	30	30	30	30	30	30	30	30	30
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	62.5	73.1	78.8	62.5	73.1	78.8	62.5	73.1	78.8
ADJUSTMENTS									
Flow	-4.5	-21.7	-25.7	-5.8	-23.0	-27.0	-11.8	-29.0	-33.0
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	58.8	52.2	53.8	57.5	50.8	52.5	51.5	44.8	46.5
VEHICULAR NOISE	DAY=	60.7	Leq	EVENING=	59.3	Leq	NIGHT=	53.3	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 61.8**
CNEL= 62.4

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**14**	**30**	**65**
	CNEL:	**16**	**33**	**72**

Scenario: 2017 With Project
Roadway: Del Amo Circle N
Segment: Hawthorne Boulevard to Fashion Way

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	3,160
SPEED (mph)	30
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	194	4	1	143	3	1	36	1	0
Speed in MPH	30	30	30	30	30	30	30	30	30
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	62.5	73.1	78.8	62.5	73.1	78.8	62.5	73.1	78.8
ADJUSTMENTS									
Flow	-7.2	-24.4	-28.4	-8.5	-25.8	-29.7	-14.5	-31.8	-35.7
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	56.1	49.4	51.1	54.7	48.1	49.8	48.7	42.1	43.8
VEHICULAR NOISE	DAY=	57.9	Leq	EVENING=	56.6	Leq	NIGHT=	50.6	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 59.0**
CNEL= 59.6

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**9**	**20**	**43**
	CNEL:	**10**	**22**	**47**

Scenario: 2017 With Project
Roadway: Carson Street
Segment: west of Anza Avenue

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	6,760
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	24
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	415	8	3	306	6	2	77	1	1
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	-4.6	-21.8	-25.8	-5.9	-23.1	-27.1	-11.9	-29.1	-33.1
Distance	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	60.6	53.1	54.4	59.3	51.8	53.1	53.3	45.8	47.0
VEHICULAR NOISE	DAY=	62.1	Leq	EVENING=	60.8	Leq	NIGHT=	54.8	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 63.2**
CNEL= 63.9

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**18**	**38**	**82**
	CNEL:	**19**	**42**	**90**

Scenario: 2017 With Project
Roadway: Carson Street
Segment: Anza Avenue to Del Amo Circle W

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	14,910
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	914	17	7	676	13	5	169	3	1
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	-1.1	-18.4	-22.3	-2.4	-19.7	-23.6	-8.5	-25.7	-29.7
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	64.7	57.2	58.5	63.4	55.9	57.2	57.4	49.9	51.1
VEHICULAR NOISE	DAY=	66.2	Leq	EVENING=	64.9	Leq	NIGHT=	58.9	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 67.3**
CNEL= 67.9

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**33**	**71**	**154**
	CNEL:	**36**	**79**	**169**

Scenario: 2017 With Project
Roadway: Carson Street
Segment: Del Amo Circle W to Hawthorne Boulevard

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	15,870
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	973	18	7	719	14	5	180	3	1
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	-0.9	-18.1	-22.1	-2.2	-19.4	-23.4	-8.2	-25.4	-29.4
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	65.0	57.5	58.7	63.7	56.2	57.4	57.7	50.1	51.4
VEHICULAR NOISE	DAY=	66.5	Leq	EVENING=	65.2	Leq	NIGHT=	59.2	Leq

RESULTS						
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):			**Ldn=**	**67.6**
					CNEL=	**68.2**
NOISE CONTOUR:				*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			**Ldn:**	**35**	**74**	**160**
			CNEL:	**38**	**82**	**177**

Scenario: 2017 With Project
Roadway: Carson Street
Segment: Hawthorne Boulevard to Madrona Avenue

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	27,870
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1709	32	13	1263	24	10	316	6	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	1.6	-15.7	-19.6	0.3	-17.0	-20.9	-5.7	-23.0	-26.9
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	70.6	63.0	64.3	69.3	61.7	63.0	63.2	55.7	57.0
VEHICULAR NOISE	DAY=	72.1	Leq	EVENING=	70.8	Leq	NIGHT=	64.7	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 73.2**
CNEL= 73.8

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**81**	**175**	**377**
	CNEL:	**90**	**193**	**416**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 With Project
Roadway: Carson Street
Segment: east of Madrona Avenue
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	26,470
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1623	31	12	1200	23	9	301	6	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	1.4	-15.9	-19.8	0.0	-17.2	-21.1	-6.0	-23.2	-27.2
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	70.3	62.8	64.1	69.0	61.5	62.8	63.0	55.5	56.8
VEHICULAR NOISE	DAY=	71.8	Leq	EVENING=	70.5	Leq	NIGHT=	64.5	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 72.9**, **CNEL= 73.6**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**79**	**169**	**365**
	CNEL:	**87**	**186**	**402**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 With Project
Roadway: Sepulveda Boulevard
Segment: west of Anza Avenue

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	22,750
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1395	26	11	1031	19	8	258	5	2
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	0.1	-17.1	-21.1	-1.2	-18.4	-22.4	-7.2	-24.4	-28.4
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.2	59.9	60.8	66.9	58.6	59.5	60.9	52.6	53.5
VEHICULAR NOISE	DAY=	69.5	Leq	EVENING=	68.2	Leq	NIGHT=	62.1	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 70.6** **CNEL= 71.2**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**55**	**117**	**253**
	CNEL:	**60**	**129**	**279**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 With Project
Roadway: Sepulveda Boulevard
Segment: Anza Avenue to Hawthorne Boulev
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	28,690
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1760	33	13	1301	25	10	326	6	2
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	1.1	-16.1	-20.1	-0.2	-17.4	-21.4	-6.2	-23.4	-27.4
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	72.4	64.1	65.0	71.1	62.8	63.7	65.0	56.8	57.6
VEHICULAR NOISE	DAY=	73.6	Leq	EVENING=	72.3	Leq	NIGHT=	66.3	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA):			**Ldn=**	**74.7**
			CNEL=	**75.3**
NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**103**	**222**	**478**
	CNEL:	**113**	**244**	**526**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 With Project
Roadway: Sepulveda Boulevard
Segment: Hawthorne Boulevard to Madrona A
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	36,640
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2247	42	17	1661	31	13	416	8	3
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	2.2	-15.0	-19.0	0.9	-16.4	-20.3	-5.1	-22.4	-26.3
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	73.4	65.1	66.0	72.1	63.8	64.7	66.1	57.8	58.7
VEHICULAR NOISE	DAY=	74.7	Leq	EVENING=	73.4	Leq	NIGHT=	67.3	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 75.8** **CNEL= 76.4**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**121**	**261**	**562**
	CNEL:	**133**	**287**	**619**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 With Project
Roadway: Anza Avenue
Segment: north of Torrance Boulevard
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	25,700
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1576	30	12	1165	22	9	292	6	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	1.2	-16.0	-20.0	-0.1	-17.3	-21.3	-6.1	-23.3	-27.3
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	67.1	59.6	60.8	65.8	58.3	59.5	59.8	52.2	53.5
VEHICULAR NOISE	DAY=	68.6	Leq	EVENING=	67.3	Leq	NIGHT=	61.3	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 69.7**, **CNEL= 70.3**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**48**	**103**	**221**
	CNEL:	**52**	**113**	**243**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 With Project
Roadway: Anza Avenue
Segment: Torrance Boulevard to Carson Stre
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	25,470
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1562	30	12	1155	22	9	289	5	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	1.2	-16.0	-20.0	-0.1	-17.4	-21.3	-6.1	-23.4	-27.3
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	67.0	59.5	60.8	65.7	58.2	59.5	59.7	52.2	53.5
VEHICULAR NOISE	DAY=	68.6	Leq	EVENING=	67.2	Leq	NIGHT=	61.2	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 69.6** **CNEL= 70.3**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**47**	**102**	**220**
	CNEL:	**52**	**112**	**242**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 With Project
Roadway: Anza Avenue
Segment: Carson Street to Sepulveda Boulev
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	24,990
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1533	29	12	1133	21	9	284	5	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	1.1	-16.1	-20.1	-0.2	-17.4	-21.4	-6.2	-23.5	-27.4
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	67.0	59.4	60.7	65.7	58.1	59.4	59.6	52.1	53.4
VEHICULAR NOISE	DAY=	68.5	Leq	EVENING=	67.2	Leq	NIGHT=	61.1	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 69.6** **CNEL= 70.2**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**47**	**101**	**217**
	CNEL:	**51**	**111**	**239**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 With Project
Roadway: Anza Avenue
Segment: south of Sepulveda Boulevard
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	24,780
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1520	29	12	1123	21	9	281	5	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	1.1	-16.2	-20.1	-0.2	-17.5	-21.4	-6.3	-23.5	-27.4
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	66.9	59.4	60.7	65.6	58.1	59.4	59.6	52.1	53.3
VEHICULAR NOISE	DAY=	68.4	Leq	EVENING=	67.1	Leq	NIGHT=	61.1	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 69.5** **CNEL= 70.2**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**47**	**100**	**216**
	CNEL:	**51**	**110**	**238**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 With Project
Roadway: Village Court
Segment: Village Lane to Del Amo Circle N
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	2,780
SPEED (mph)	30
ROAD NEAR-FAR LN. DIST.	24
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	171	3	1	126	2	1	32	1	0
Speed in MPH	30	30	30	30	30	30	30	30	30
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	62.5	73.1	78.8	62.5	73.1	78.8	62.5	73.1	78.8
ADJUSTMENTS									
Flow	-7.8	-25.0	-29.0	-9.1	-26.3	-30.3	-15.1	-32.3	-36.3
Distance	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	54.8	48.2	49.9	53.5	46.9	48.6	47.5	40.9	42.6
VEHICULAR NOISE	DAY=	56.7	Leq	EVENING=	55.4	Leq	NIGHT=	49.4	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 57.8**, **CNEL= 58.4**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**8**	**17**	**36**
	CNEL:	**8**	**18**	**39**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 With Project
Roadway: Del Amo Circle W
Segment: Del Amo Circle N to Carson Street
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	3,810
SPEED (mph)	30
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	234	4	2	173	3	1	43	1	0
Speed in MPH	30	30	30	30	30	30	30	30	30
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	62.5	73.1	78.8	62.5	73.1	78.8	62.5	73.1	78.8
ADJUSTMENTS									
Flow	-6.4	-23.6	-27.6	-7.7	-24.9	-28.9	-13.7	-31.0	-34.9
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	56.9	50.2	51.9	55.6	48.9	50.6	49.5	42.9	44.6
VEHICULAR NOISE	DAY=	58.7	Leq	EVENING=	57.4	Leq	NIGHT=	51.4	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 59.8** **CNEL= 60.5**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**10**	**23**	**49**
	CNEL:	**12**	**25**	**54**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 With Project
Roadway: Del Amo Circle W
Segment: south of Carson Street

Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	530
SPEED (mph)	30
ROAD NEAR-FAR LN. DIST.	12
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	33	1	0	24	0	0	6	0	0
Speed in MPH	30	30	30	30	30	30	30	30	30
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	62.5	73.1	78.8	62.5	73.1	78.8	62.5	73.1	78.8
ADJUSTMENTS									
Flow	-15.0	-32.2	-36.2	-16.3	-33.5	-37.5	-22.3	-39.5	-43.5
Distance	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	47.5	40.9	42.6	46.2	39.5	41.2	40.2	33.5	35.2
VEHICULAR NOISE	DAY=	49.4	Leq	EVENING=	48.1	Leq	NIGHT=	42.0	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 50.5**, **CNEL= 51.1**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**2**	**5**	**12**
	CNEL:	**3**	**6**	**13**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 With Project
Roadway: Hawthorne Boulevard
Segment: north of Torrance Boulevard
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	51,670
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	96
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	3169	60	24	2342	44	18	587	11	4
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	3.7	-13.6	-17.5	2.4	-14.9	-18.8	-3.6	-20.9	-24.8
Distance	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	79.2	70.9	71.8	77.9	69.6	70.5	71.9	63.6	64.5
VEHICULAR NOISE	DAY=	80.5	Leq	EVENING=	79.2	Leq	NIGHT=	73.1	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 81.6**, **CNEL= 82.2**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**295**	**636**	**1370**
	CNEL:	**325**	**700**	**1508**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 With Project
Roadway: Hawthorne Boulevard
Segment: Torrance Boulevard to Del Amo Cir
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	58,220
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	96
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	3571	67	27	2639	50	20	661	12	5
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	4.2	-13.0	-17.0	2.9	-14.3	-18.3	-3.1	-20.4	-24.3
Distance	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	79.7	71.5	72.4	78.4	70.2	71.0	72.4	64.1	65.0
VEHICULAR NOISE	DAY=	81.0	Leq	EVENING=	79.7	Leq	NIGHT=	73.7	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 82.1** **CNEL= 82.7**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**320**	**688**	**1483**
	CNEL:	**352**	**758**	**1633**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 With Project
Roadway: Hawthorne Boulevard
Segment: Del Amo Circle N to Carson Street
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	56,160
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	96
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	3444	65	26	2546	48	19	638	12	5
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	4.0	-13.2	-17.1	2.7	-14.5	-18.5	-3.3	-20.5	-24.5
Distance	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	79.6	71.3	72.2	78.3	70.0	70.9	72.3	64.0	64.9
VEHICULAR NOISE	DAY=	80.8	Leq	EVENING=	79.5	Leq	NIGHT=	73.5	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 81.9** **CNEL= 82.6**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**312**	**672**	**1448**
	CNEL:	**343**	**740**	**1594**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 With Project
Roadway: Hawthorne Boulevard
Segment: Carson Street to Sepulveda Boulev
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	56,340
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	96
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	3456	65	26	2554	48	19	640	12	5
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	4.1	-13.2	-17.1	2.7	-14.5	-18.4	-3.3	-20.5	-24.5
Distance	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	79.6	71.3	72.2	78.3	70.0	70.9	72.3	64.0	64.9
VEHICULAR NOISE	DAY=	80.8	Leq	EVENING=	79.5	Leq	NIGHT=	73.5	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 81.9** **CNEL= 82.6**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**313**	**674**	**1451**
	CNEL:	**344**	**742**	**1598**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 With Project
Roadway: Hawthorne Boulevard
Segment: south of Sepulveda Boulevard
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	58,730
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	96
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	3602	68	27	2662	50	20	667	13	5
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	4.2	-13.0	-17.0	2.9	-14.3	-18.3	-3.1	-20.3	-24.3
Distance	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	79.8	71.5	72.4	78.5	70.2	71.1	72.5	64.2	65.1
VEHICULAR NOISE	DAY=	81.0	Leq	EVENING=	79.7	Leq	NIGHT=	73.7	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 82.1**, **CNEL= 82.7**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**321**	**693**	**1492**
	CNEL:	**354**	**762**	**1643**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 With Project
Roadway: Madrona Avenue
Segment: north of Torrance Boulevard
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	34,000
SPEED (mph)	40
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2085	39	16	1541	29	12	386	7	3
Speed in MPH	40	40	40	40	40	40	40	40	40
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	67.4	76.3	81.2	67.4	76.3	81.2	67.4	76.3	81.2
ADJUSTMENTS									
Flow	1.9	-15.4	-19.3	0.6	-16.7	-20.6	-5.5	-22.7	-26.7
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	73.1	64.8	65.7	71.8	63.5	64.4	65.8	57.5	58.4
VEHICULAR NOISE	DAY=	74.3	Leq	EVENING=	73.0	Leq	NIGHT=	67.0	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 75.4** **CNEL= 76.1**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**115**	**248**	**535**
	CNEL:	**127**	**273**	**589**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 With Project
Roadway: Madrona Avenue
Segment: Torrance Boulevard to Carson Stre
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	32,390
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1987	38	15	1468	28	11	368	7	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	2.2	-15.0	-19.0	0.9	-16.3	-20.3	-5.1	-22.3	-26.3
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	71.2	63.7	65.0	69.9	62.4	63.7	63.9	56.4	57.6
VEHICULAR NOISE	DAY=	72.7	Leq	EVENING=	71.4	Leq	NIGHT=	65.4	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 73.8** **CNEL= 74.4**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**90**	**194**	**417**
	CNEL:	**99**	**213**	**459**

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: 2017 With Project
Roadway: Madrona Avenue
Segment: Carson Street to Sepulveda Boulev
Project: Nadel - Del Amo
Analyst: NJF
Date: 11-Dec-15

ROADWAY INPUTS	
ADT	24,150
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA

	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1481	28	11	1095	21	8	274	5	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	1.0	-16.3	-20.2	-0.4	-17.6	-21.5	-6.4	-23.6	-27.6
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	69.9	62.4	63.7	68.6	61.1	62.4	62.6	55.1	56.4
VEHICULAR NOISE	DAY=	71.5	Leq	EVENING=	70.1	Leq	NIGHT=	64.1	Leq

RESULTS

NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA): **Ldn= 72.5** **CNEL= 73.2**

NOISE CONTOUR:		*70 dBA*	*65 dBA*	*60 dBA*
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	**Ldn:**	**74**	**159**	**343**
	CNEL:	**81**	**175**	**378**

Appendix C. Construction Vibration and Noise Calculations

Appendix

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Construction Generated Vibration

Vibration Annoyance Criteria

Receptor:	Average Vibration Level - California Bank & Trust	Average Distance (feet):	100

Equipment	Approximate Velocity Level at 25 ft, VdB	Approximate Velocity Level, VdB
Vibratory Roller	94	82
Caisson Drill	87	75
Large bulldozer	87	75
Small bulldozer	58	46
Jackhammer	79	67
Loaded trucks	86	74
	Criteria	**84**

Receptor:	Average Vibration Level - DoubleTree	Average Distance (feet):	390

Equipment	Approximate Velocity Level at 25 ft, VdB	Approximate Velocity Level, VdB
Vibratory Roller	94	70
Caisson Drill	87	63
Large bulldozer	87	63
Small bulldozer	58	34
Jackhammer	79	55
Loaded trucks	86	62
	Criteria	**78**

Receptor:	Average Vibration Levels - Village Court Senior Apts	Average Distance (feet):	525

Equipment	Approximate Velocity Level at 25 ft, VdB	Approximate Velocity Level, VdB
Vibratory Roller	94	68
Caisson Drill	87	61
Large bulldozer	87	61
Small bulldozer	58	32
Jackhammer	79	53
Loaded trucks	86	60
	Criteria	**78**

Receptor:	Average Vibration Levels - Extended Stay America	Average Distance (feet):	640

Equipment	Approximate Velocity Level at 25 ft, VdB	Approximate Velocity Level, VdB
Vibratory Roller	94	66
Caisson Drill	87	59
Large bulldozer	87	59
Small bulldozer	58	30
Jackhammer	79	51
Loaded trucks	86	58
	Criteria	**78**

Receptor:	Average Vibration Levels - nearest homes (Ocean Ave)	Average Distance (feet):	870

Equipment	Approximate Velocity Level at 25 ft, VdB	Approximate Velocity Level, VdB
Vibratory Roller	94	63
Caisson Drill	87	56
Large bulldozer	87	56
Small bulldozer	58	27
Jackhammer	79	48
Loaded trucks	86	55
	Criteria	**78**

Construction Generated Vibration

Structural Damage Criteria

Receptor:	Maximum Vibration Levels - Barnes and Noble	Closest Distance (feet):	165
Equipment	Approximate RMS a Velocity at 25 ft, inch/second	Approximate RMS Velocity Level, inch/second	
Vibratory Roller	0.210	0.012	
Caisson Drill	0.089	0.005	
Large bulldozer	0.089	0.005	
Small bulldozer	0.003	0.000	
Jackhammer	0.035	0.002	
Loaded trucks	0.076	0.004	
	Criteria	0.200	

Receptor:	Maximum Vibration Levels - DoubleTree	Closest Distance (feet):	250
Equipment	Approximate RMS a Velocity at 25 ft, inch/second	Approximate RMS Velocity Level, inch/second	
Vibratory Roller	0.210	0.007	
Caisson Drill	0.089	0.003	
Large bulldozer	0.089	0.003	
Small bulldozer	0.003	0.000	
Jackhammer	0.035	0.001	
Loaded trucks	0.076	0.002	
	Criteria	0.200	

Receptor:	Maximum Vibration Levels - Village Court Senior Apts	Closest Distance (feet):	330
Equipment	Approximate RMS a Velocity at 25 ft, inch/second	Approximate RMS Velocity Level, inch/second	
Vibratory Roller	0.210	0.004	
Caisson Drill	0.089	0.002	
Large bulldozer	0.089	0.002	
Small bulldozer	0.003	0.000	
Jackhammer	0.035	0.001	
Loaded trucks	0.076	0.002	
	Criteria	0.200	

Receptor:	Maximum Vibration Levels - Extended Stay America	Closest Distance (feet):	450
Equipment	Approximate RMS a Velocity at 25 ft, inch/second	Approximate RMS Velocity Level, inch/second	
Vibratory Roller	0.210	0.003	
Caisson Drill	0.089	0.001	
Large bulldozer	0.089	0.001	
Small bulldozer	0.003	0.000	
Jackhammer	0.035	0.000	
Loaded trucks	0.076	0.001	
	Criteria	0.200	

[1.] Determined based on use of jackhammers or pneumatic hammers that may be used for pavement demolition at a distance of 25 feet

Notes: RMS velocity calculated from vibration level (VdB) using the reference of one microinch/second.

Source: Based on methodology from the United States Department of Transportation Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*

Noise Levels During Construction

Reference Levels: Construction Noise at 50 Feet (dBA Leq)[1]

Construction Phase	Distance: Receptor to center of activity	Average Level (dBA Leq)[2]	Distance: Receptor to border of site	Maximum Level (dBA Lmax)[3]
Bldg Interior Demo	50	84	50	90
Asphalt Demo		85		90
Site Prep		84		85
Rough Grading		84		85
Utility Trenching		77		81
Bldg Construction		81		81
Arch Coating		74		78
Site Paving		82		80

Drop Off
hard=0;
soft=0.5
0

Construction Noise at California Bank & Trust

Construction Phase	Distance: Receptor to center of activity	Average Level (dBA Leq)[2]	Distance: Receptor to border of site	Maximum Level (dBA Lmax)[3]
Bldg Interior Demo	100	78	N/A	#VALUE!
Asphalt Demo		79		#VALUE!
Site Prep		78		#VALUE!
Rough Grading		78		#VALUE!
Utility Trenching		71		#VALUE!
Bldg Construction		75		#VALUE!
Arch Coating		68		#VALUE!
Site Paving		76		#VALUE!

Construction Noise at Double Tree

Construction Phase	Distance: Receptor to center of activity	Average Level (dBA Leq)[2]	Distance: Receptor to border of site	Maximum Level (dBA Lmax)[3]
Bldg Interior Demo	390	66	250	76
Asphalt Demo		67		76
Site Prep		66		71
Rough Grading		66		71
Utility Trenching		59		67
Bldg Construction		63		67
Arch Coating		56		64
Site Paving		64		66

Construction Noise at Village Court Senior Apts

Construction Phase	Distance: Receptor to center of activity	Average Level (dBA Leq)[2]	Distance: Receptor to border of site	Maximum Level (dBA Lmax)[3]
Bldg Interior Demo	525	64	330	73
Asphalt Demo		64		73
Site Prep		63		69
Rough Grading		63		69
Utility Trenching		56		64
Bldg Construction		61		64
Arch Coating		53		61
Site Paving		61		64

Construction Noise to Extended Stay America

Construction Phase	Distance: Receptor to center of activity	Average Level (dBA Leq)[2]	Distance: Receptor to border of site	Maximum Level (dBA Lmax)[3]
Bldg Interior Demo	640	62	450	71
Asphalt Demo		63		71
Site Prep		62		66
Rough Grading		61		66
Utility Trenching		55		62
Bldg Construction		59		62
Arch Coating		52		59
Site Paving		59		61

Construction Noise at homes on Ocean Ave

Construction Phase	Distance: Receptor to center of activity	Average Level (dBA Leq)[2]	Distance: Receptor to border of site	Maximum Level (dBA Lmax)[3]
Bldg Interior Demo	870	59	670	67
Asphalt Demo		60		67
Site Prep		59		62
Rough Grading		59		62
Utility Trenching		52		58
Bldg Construction		56		58
Arch Coating		49		55
Site Paving		57		57

Construction Noise at Jefferson Middle School

Construction Phase	Distance: Receptor to center of activity	Average Level (dBA Leq)[2]	Distance: Receptor to border of site	Maximum Level (dBA Lmax)[3]
Bldg Interior Demo	1200	56	1000	64
Asphalt Demo		57		64
Site Prep		56		59
Rough Grading		56		59
Utility Trenching		49		55
Bldg Construction		53		55
Arch Coating		46		52
Site Paving		54		54

[1] Calculations based on the Roadway Construction Noise Model with the construction information provided by the applicant.
[2] Average daily noise level including all equipment in use simultaneously considering utilization factors.
[3] Maximum instanteneous noise level from the loudest equipment used during the construction phase.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/09/2015
Case Description: Bldg Interior Demo

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Receptor at 50 ft	Residential	60.0	60.0	60.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	50.0	0.0
Backhoe	No	40		77.6	50.0	0.0
Backhoe	No	40		77.6	50.0	0.0
Backhoe	No	40		77.6	50.0	0.0

Results

Equipment	Calculated (dBA) Lmax	Calculated (dBA) Leq	Noise Limits (dBA) Day Lmax	Noise Limits (dBA) Day Leq	Noise Limits (dBA) Evening Lmax	Noise Limits (dBA) Evening Leq	Noise Limits (dBA) Night Lmax	Noise Limits (dBA) Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Noise Limit Exceedance (dBA) Day Leq	Noise Limit Exceedance (dBA) Evening Lmax	Noise Limit Exceedance (dBA) Evening Leq	Noise Limit Exceedance (dBA) Night Lmax	Noise Limit Exceedance (dBA) Night Leq
Concrete Saw	89.6	82.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	89.6	84.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/09/2015
Case Description: Bldg Interior Demo

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Receptor at 50 ft	Residential	60.0	60.0	60.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	50.0	0.0
Backhoe	No	40		77.6	50.0	0.0
Backhoe	No	40		77.6	50.0	0.0
Backhoe	No	40		77.6	50.0	0.0
Dozer	No	40		81.7	50.0	0.0

Results

	Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw	89.6	82.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	81.7	77.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	89.6	84.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/09/2015
Case Description: Asphalt Demo

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Receptor at 50 ft	Residential	60.0	60.0	60.0

Equipment

Description	Impact Device	Spec Usage (%)	Actual Lmax (dBA)	Receptor Lmax (dBA)	Estimated Distance (feet)	Shielding (dBA)
Grader	No	40	85.0		50.0	0.0
Scraper	No	40	83.6		50.0	0.0
Backhoe	No	40	77.6		50.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)				Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Grader	85.0	81.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	83.6	79.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	85.0	83.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/09/2015
Case Description: Rough grading

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Receptor at 50 ft	Residential	60.0	60.0	60.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85.0		50.0	0.0
Backhoe	No	40		77.6	50.0	0.0
Backhoe	No	40		77.6	50.0	0.0
Dozer	No	40		81.7	50.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)				Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Grader	85.0	81.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	81.7	77.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	85.0	83.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/09/2015
Case Description: Rough grading

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Receptor at 50 ft	Residential	60.0	60.0	60.0

Equipment

Description	Impact Device	Spec Usage (%)	Actual Lmax (dBA)	Receptor Lmax (dBA)	Estimated Distance (feet)	Shielding (dBA)
Excavator	No	40	80.7	50.0		0.0

Results

	Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator	80.7	76.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	80.7	76.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/09/2015
Case Description: Rough grading

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Receptor at 50 ft	Residential	60.0	60.0	60.0

Equipment

Description	Impact Device	Spec Usage (%)	Actual Lmax (dBA)	Receptor Lmax (dBA)	Estimated Distance (feet)	Shielding (dBA)
Excavator	No	40	80.7	50.0		0.0

Results

	Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator	80.7	76.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	80.7	76.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/09/2015
Case Description: Utility Trenching

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Receptor at 50 ft	Residential	60.0	60.0	60.0

Equipment

Description	Impact Device	Spec Usage (%)	Actual Lmax (dBA)	Receptor Lmax (dBA)	Estimated Distance (feet)	Shielding (dBA)
Crane	No	16	80.6	50.0		0.0
Generator	No	50	80.6	50.0		0.0
Backhoe	No	40	77.6	50.0		0.0
Welder / Torch	No	40	74.0	50.0		0.0
Welder / Torch	No	40	74.0	50.0		0.0
Welder / Torch	No	40	74.0	50.0		0.0

Results

	Calculated (dBA)		Noise Limits (dBA)				Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	80.6	72.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	80.6	77.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	74.0	70.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	74.0	70.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	74.0	70.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	80.6	81.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/09/2015
Case Description: Arch Coating

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Receptor at 50 ft	Residential	60.0	60.0	60.0

Equipment

Description	Impact Device	Spec Usage (%)	Actual Lmax (dBA)	Receptor Lmax (dBA)	Estimated Distance (feet)	Shielding (dBA)
Compressor (air)	No	40	77.7	50.0		0.0

Results

	Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)	77.7	73.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	77.7	73.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 12/09/2015
Case Description: Site Paving

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Receptor at 50 ft	Residential	60.0	60.0	60.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	50.0	0.0
Paver	No	50		77.2	50.0	0.0
Paver	No	50		77.2	50.0	0.0
Roller	No	20		80.0	50.0	0.0
Roller	No	20		80.0	50.0	0.0
Backhoe	No	40		77.6	50.0	0.0

Results

Equipment	Calculated (dBA) Lmax	Calculated (dBA) Leq	Noise Limits (dBA) Day Lmax	Noise Limits (dBA) Day Leq	Noise Limits (dBA) Evening Lmax	Noise Limits (dBA) Evening Leq	Noise Limits (dBA) Night Lmax	Noise Limits (dBA) Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Noise Limit Exceedance (dBA) Day Leq	Noise Limit Exceedance (dBA) Evening Lmax	Noise Limit Exceedance (dBA) Evening Leq	Noise Limit Exceedance (dBA) Night Lmax	Noise Limit Exceedance (dBA) Night Leq
Concrete Mixer Truck	78.8	74.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	77.2	74.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	77.2	74.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	80.0	73.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	80.0	73.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	80.0	81.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A