CITY OF RANCHO PALOS VERDES GENERAL PLAN UPDATE

Noise and Vibration Technical Report

Prepared for
City of Rancho Palos Verdes

November 2017

ESA

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General Plan Update

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TABLE OF CONTENTS

City of Rancho Palos Verdes General Plan Update

Page

Introduction **1**

Project Understanding **2**

Environmental Setting **3**
- Noise Principles and Descriptors 3
- Noise Exposure and Community Noise 3
- Effects of Noise on People 3
- Noise Attenuation 5
- Vibration Fundamentals 5
- Existing Conditions 6

Regulatory Setting **18**
- California Department of Transportation 18
- City of Rancho Palos Verdes 19

Project Impacts and Mitigation Measures **23**
- Methodolgy 23
- Thresholds of Significance 23
- Impacts 24
- Mitigation Measures 38
- Level of Significance After Mitigation 40
- Cumulative Impacts 41

References **43**

Attachment

A. Traffic Noise Calculations A-1
:

List of Figures

1 Decibel Scale and Common Noise Sources 4
2 Noise Measurement Locations 9
3 Existing Traffic Noise Contour Map 16
4 Future Traffic Noise Contour Map 36

Page

List of Tables

1 Noise Measurement Locations and Noise Sources 7
2 Noise Measurement Locations 10
3 Existing Traffic Noise Levels 12
4 Caltrans Vibration Damage Potential Threshold Criteria 19
5 Caltrans Vibration Perception Potential Threshold Criteria 19
6 Land Use Compatibility for Community Noise Sources 22
7 Construction Equipment Noise Levels 25
8 Construction Noise Levels by Distance and Construction Stage 26
9 Vibration Source Levels for Typical Heavy Construction Equipment 29
10 Future (2040) Traffic Noise Levels 30

NOISE TECHNICAL REPORT

Introduction

This technical report addresses the potential noise and vibration impacts associated with future development in the City of Rancho Palos Verdes (City), California envisioned in the City's 2015 Draft General Plan Update with a planned build-out year of 2040 (City 2015). This analysis describes the existing noise environment in the project area, identifies applicable noise regulations, and evaluates potential noise and vibration impacts associated with build-out of the Draft General Plan Update. Additionally, this technical report provides a programmatic analysis of the potential noise and vibration impacts associated with the potential future development that could result from the Draft General Plan Update. Where applicable, measures to mitigate or minimize noise impacts associated with the project are included.

Information used to prepare this analysis was obtained from the City's General Plan Noise Element (City 1975), the project's Traffic Impact Analysis (TIA) for the City of Rancho Palos Verdes General Plan Update prepared by Translutions, Inc on April 18, 2017 (Translutions 2017), and other sources identified herein.

This technical report is being prepared to support the environmental review process for the project under the California Environmental Quality Act (CEQA). The City is the proponent and the lead agency for the project.

Project Understanding

The City is located on the Palos Verdes Peninsula at the southwest tip of Los Angeles County. The City encompasses 13.5 square miles of land and 7.5 miles of coastline, bounded by the City of Palos Verdes Estates and the Pacific Ocean to the west, cities of Rolling Hills and Rolling Hills Estates to the north, the City of Los Angeles to the east, and the Pacific Ocean to the south.

The proposed project is a comprehensive update of the City's 1975 General Plan, with a planned build out year of 2040. Since its adoption in 1975, the City's General Plan had never been comprehensively updated. While the proposed General Plan Update does include changes to the existing General Plan's goals and policies, text, and graphics, these changes do not result in significant changes to the City's overall vision of its development pattern, including no changes to the existing development envelopes or intensification of existing land uses that would necessitate additional infrastructure facilities.

As of 2013, the City is nearly built out and there remain limited opportunities for new residential and non-residential development of undeveloped land within the City. Much of the new development activity in the City is expected to be limited to the redevelopment of existing developed areas, but not to more density (i.e., not single-family to multifamily). The amended Land Use Element of the City's Draft General Plan designates approximately 399.48 acres for new residential development primarily as infill lots, with approximately 756 proposed dwelling units by 2030, of which 668 are designated as single family and 88 are designated as multi-family (City 2015).

The proposed dwelling units would generate vehicle traffic, which would add to the existing traffic, and traffic from future growth, on local roadways. However, under the amended Circulation Element of the City's Draft General Plan, planned roadway and intersection improvements such as signalization and turn lanes would mitigate the impacts on the roadway system to maintain an adequate level of service (City 2015). No lane widening or new roadways are planned (City 2015).

Environmental Setting

Noise Principles and Descriptors

The decibel (dB) is a conventional unit for measuring the amplitude of sound, as it accounts for the large variations in sound pressure amplitude, and reflects the way people perceive changes in sound. When describing sound and its effect on humans, A-weighted (dBA) sound levels are typically used to account for the response of the human ear. The term "A-weighted" refers to a filtering of the noise signal in a manner corresponding to the way the human ear perceives sound. Some representative common outdoor and indoor noise sources and their corresponding A-weighted noise levels are shown in **Figure 1**.

Noise Exposure and Community Noise

The following noise descriptors are used to characterize environmental noise levels over time, which are applicable to the proposed project.

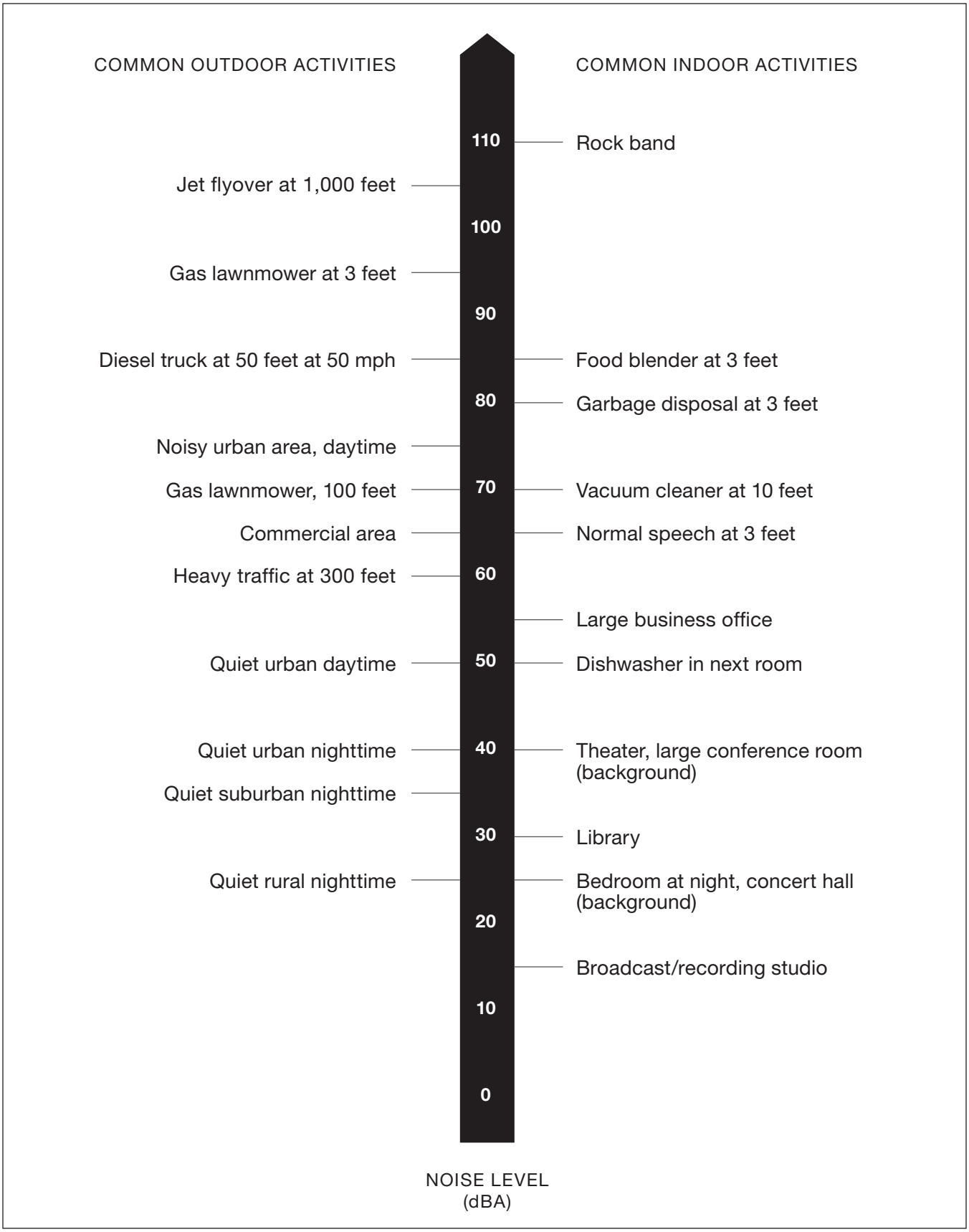
L_{eq}: The equivalent sound level over a specified period of time, typically, 1 hour (i.e., $L_{eq(1)}$). L_{eq} is also referred to as the average sound level.

CNEL: The Community Noise Equivalent Level (CNEL) is the equivalent A-weighted noise level during a 24-hour day, that includes an addition of a 5 dB penalty to noise levels between the hours of 7:00 a.m. to 10:00 p.m., and an addition of 10 dB to noise levels between the hours of 10:00 p.m. to 7:00 a.m., to account for noise sensitivity in the evening and nighttime, respectively.

Effects of Noise on People

People judge the relative magnitude of sound sensation by subjective terms such as "loudness" or "noisiness." A change in sound level of 3 dB is considered "just perceptible," a change in sound level of 5 dB is considered "clearly noticeable," and a change of 10 dB is recognized as "twice as loud."

Because decibels are logarithm values, they cannot be combined by normal algebraic addition. For example, when the decibel values of two sources differ by 0 to 1 dB, combining them would add 3 dB to the higher level for the combined sound level. When the decibel levels of two sources differ by more than 1 dB, combining them would add between 0 to 3 dBA to the higher level, depending on the relative difference. At a difference of 10 dB or more, the higher noise source dominates, and there is no addition to the higher level source (i.e., there is no effective change in the overall decibel value with or without the addition of the lower noise level source).



SOURCE: Caltrans 2013

City of Rancho Palos Verdes General Plan Updates

Figure 1
Decibel Scale and Common Noise Sources

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Noise Attenuation

When noise propagates over a distance, the noise level reduces (i.e., attenuates) with distance, the degree to which depends on the type of noise source and the propagation path. Noise from a localized source (i.e., point source) propagates uniformly outward in a spherical pattern, referred to as "spherical spreading." Stationary point sources of noise, including stationary mobile sources, such as idling vehicles, attenuate at a rate of 6 dBA for acoustically "hard" sites and 7.5 dBA for acoustically "soft" sites, for each doubling of distance from the reference measurement, as their energy is continuously spread out over a spherical surface.

Hard sites are those with a reflective surface between the source and the receiver, such as asphalt or concrete surfaces or smooth bodies of water. No attenuation from the ground surface is assumed for hard sites, and the 6 dBA reduction in noise levels with doubling of distance is only from the geometric spreading of the noise from the source (e.g., for hard sites, 80 dBA at 50 feet attenuates to 74 at 100 feet, 68 dBA at 200 feet). Soft sites are those with an absorptive ground surface, such as soft dirt, grass, or scattered bushes and trees; in addition to the 6 dBA reduction from geometric spreading, soft sites provide an additional attenuation of up to 1.5 dBA per doubling distance from the surface. Typically, in an analysis, the given ground surface is somewhere in between a hard and soft site; therefore, for a conservative estimate, the hard site attenuation rate of 6 dBA for point sources is typically used in analyses, rather than attempt to determine the exact surface conditions between each source and receptor.

Roadways and highways consist of several localized noise sources on a defined path, and hence, are treated as "line" sources, which approximate the effect of several point sources. Noise from a line source propagates over a cylindrical surface, often referred to as "cylindrical spreading." Line sources (e.g., traffic noise from vehicles) attenuate at a rate of between 3 dBA for hard sites and 4.5 dBA for soft sites for each doubling of distance from the reference measurement. Therefore, noise due to a line source attenuates less (about half) with distance than that of a point source.

Vibration Fundamentals

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. The response of humans, buildings, and equipment to vibration is more accurately described using velocity or acceleration. Vibration amplitudes are usually described in terms of peak levels, as in peak particle velocity (PPV). The peak level represents the maximum instantaneous peak of the vibration signal. In addition, vibrations can be measured in the vertical, horizontal longitudinal, or horizontal transverse directions. Ground vibrations are most often greatest, and can damage buildings, when they propagate in the vertical direction. Therefore, the analysis of ground-borne vibration associated with the proposed project was evaluated in the vertical direction. Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Therefore, man-made vibration issues are usually confined to short distances from the source (i.e., 50 feet or less).

Existing Conditions

Noise Sensitive Receptors

Some land uses are considered more sensitive to noise than others due to the amount of noise exposure and the types of activities typically involved at the receptor location. Noise-sensitive receptors are defined as land uses that are considered more sensitive to intrusive noise than others, such as residences, schools, motels and hotels, libraries, and hospitals, due to the land use activities typically occurring at the receptor (i.e., sleeping, concentrating, and convalescing).

Noise-sensitive receptors within the City include single- and multi-family residential housing, schools, parks, libraries, hospitals, churches, habitat, and open space. In general, the City's residential communities are spread throughout the entire City. These sensitive land uses, along with schools, hospitals, nursing homes, and churches, may be potentially affected by the noise associated with construction and operations of the potential future development sites on the 36 traffic impact analysis areas throughout the City.

Noise Sources

Transportation noise sources include automobiles, trucks, motorcycles, buses, trains, helicopters, and planes. The predominant existing noise sources in the City include roadway traffic noise. Traffic on major arterials such as Hawthorne Boulevard, Crenshaw Boulevard, Palos Verdes Drive, Crest Road, Crestridge Road, Silver Spur Road, Western Avenue, Highridge Road, Indian Peak Road, Miraleste Drive, Montemalaga Road is the source of ambient noise in the City. Secondary noise sources include activities related to the operation of commercial businesses in the area including loading area/delivery truck activities, trash compaction, and refuse collection and periodic landscape maintenance and other occasional outdoor noise associated with residential uses.

The City has no railroad lines running through or abutting the City. The Long Beach Municipal Airport is approximately 8 miles to the northeast with a northwest to southeast runway orientation. Additionally, the Torrance Municipal Airport is approximately 1.5 miles to the north with a northwest to southeast runway orientation. Both airports' operations would not have an effect on the City's noise climate. There may be occasional flyovers from small general aviation aircrafts, but no commercial flights are scheduled to fly directly over the City's airspace. The City is outside of the 60 dBA CNEL contours for both airports. Furthermore, air traffic noise was not observed as a contributing factor at any of the monitoring locations. For the above reasons, the effects of train and airplane noise in the City are limited to qualitative analysis only.

Ambient Noise Levels

To characterize the existing ambient noise environment throughout the City, ESA conducted 24 short-term (15-minute duration) ambient noise measurements at various residences along various roadways in the City between 8:00 a.m. and 12:00 p.m. on October 24, 2016. **Table 1** lists the noise measurement locations and the dominant noise sources in the area. **Figure 2** shows the noise measurement locations. **Table 2** lists the noise measurement locations and associated average noise levels, which ranged from 58 to 74.2 dBA L_{eq}. The dominant noise source in the City is traffic noise disseminating from major roadways. The noise levels are the highest in areas adjacent to arterial and major collector streets. Other noise sources that may have contributed to

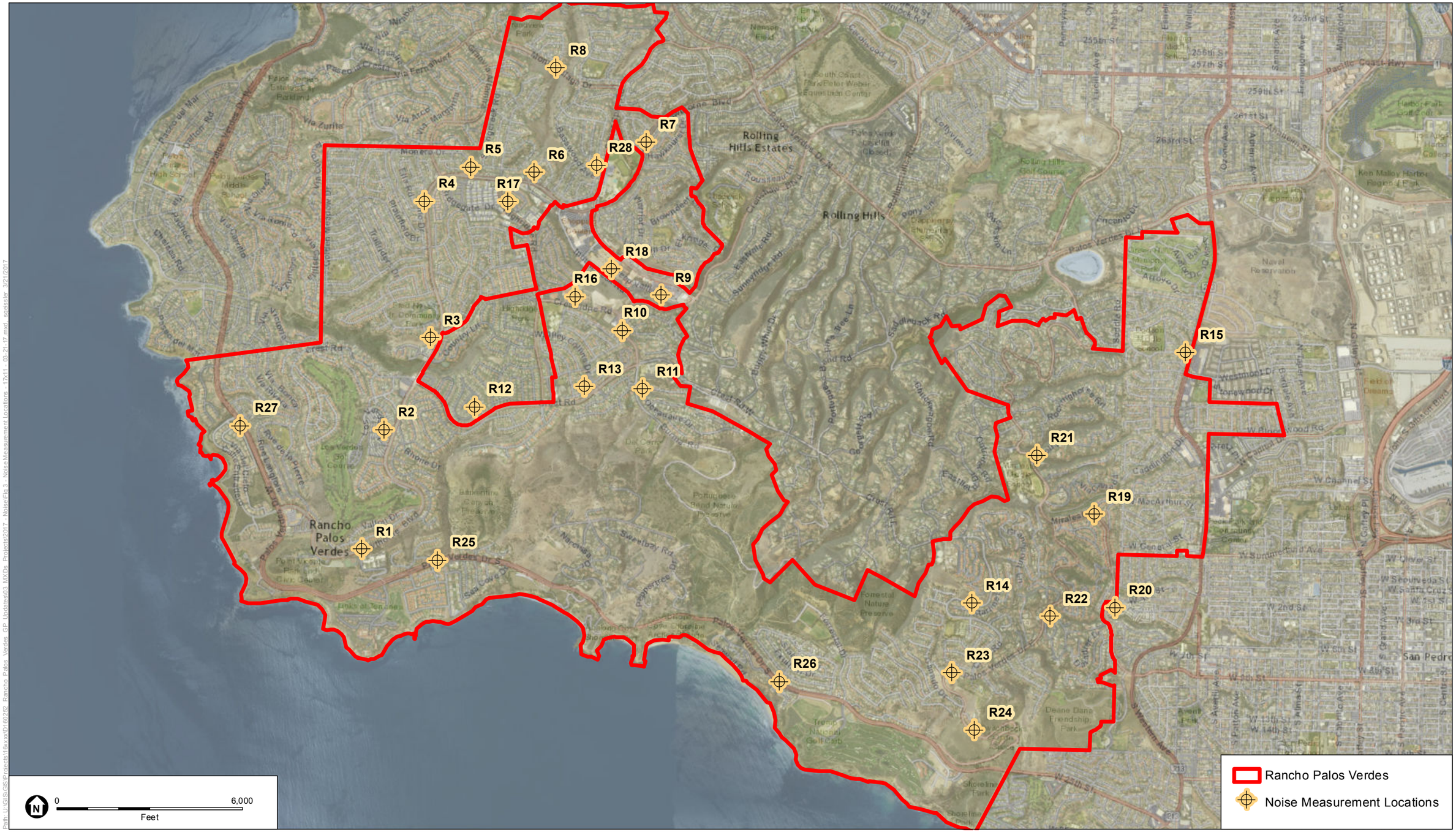
observed ambient noise levels are yard equipment, car alarms, construction activity, emergency vehicle sirens, birds chirping, airplane and helicopter flyovers, and air conditioning units.

TABLE 1
NOISE MEASUREMENT LOCATIONS AND NOISE SOURCES

Monitoring Location	Location Description	Noise Sources
Hawthorne Blvd		
R1	Between Vallon Drive and Palos Verdes Drive West	Traffic between Vallon Drive and Palos Verdes Drive West; lawn mowers from nearby golf course
R2	Between Crest Road and Vallon Drive	Traffic between Crest Road and Vallon Drive; traffic from grocery store parking lot; bus at nearby bus stop
R3	Between Eddinghill Drive/Seamount Drive and Crest Road	Traffic between Eddinghill Drive and Crest Road; yard equipment from homes and nearby community park
R4	Between Granvia Atlamira/Ridgegate Drive and Eddinghill Drive/Seamount Drive	Traffic between Granvia Drive and Eddinghill Drive; noise from 7-Eleven parking lot
R5	Between Grayslake Road/Highridge Road and Granvia Atlamira/Ridgegate Drive	Traffic between Grayslake Road and Granvia Drive; bus at nearby bus stop
R6	Between Indian Peak Road and Grayslake Road/Highridge Road	Traffic between Indian Peak Road and Grayslake Road; traffic at gas station
R7	Between the North City Limit ad and Silver Spur Road	Traffic between the North City Limit and Silver Spur Road; traffic from large commercial area parking lot; bus at nearby bus stops
Montemalaga Road		
R8	Between Silver Spur Road and Rolling Hills Estates City Limits	Traffic between Silver Spur Road and Rolling Hills Eastates City Limits; traffic from nearby elementary school
Crenshaw Blvd		
R9	Between the North City Limit and Indian Peak Road	Traffic between the North City Limit and Indian Peak Road; traffic at large commercial center parking lot; lawnmowers at residences and nearby school
R10	Between Indian Peak Road and Crest Road	Traffic between Indian Peak Road and Crest Road; traffic from nearby commercial center parking lot
R11	Crest Road to Burma Road	Traffic between Crest Road and Burma Road; traffic from church and school parking lot
Crest Road		
R12	Between Hawthorne Boulevard and Highridge Road	Traffic between Hawthorne Boulevard and Highridge Road; lawnmowers from residences
R13	Between Highridge Road Crenshaw Boulevard	Traffic between Highridge Road and Crenshaw Boulevard; lawnmowers at residences; birds chirping
R14	At Ganado Dr	Traffic between Crenshaw Boulevard and Ganado Drive; mostly residential traffic

TABLE 1
NOISE MEASUREMENT LOCATIONS AND NOISE SOURCES

Monitoring Location	Location Description	Noise Sources
Western Avenue		
R15	at Delasonde Drive	Traffic from commercial center parking lot and nearby park
R16	Between Highridge Road and Crenshaw Boulevard	Traffic between Highridge Road and Crenshaw Boulevard; lawnmowers from residences
Highridge Road		
R17	Between Hawthorne Boulevard and the City Limit with Rolling Hills Estates	Traffic between Hawthorne Boulevard and the City Limit with Rolling Hills Estates; traffic from nearby school
Indian Peak Road		
R18	Between Crenshaw Boulevard and the City Limit with Rolling Hills Estates	Traffic between Crenshaw Boulevard and the City Limit with Rolling Hills Estates; traffic from bordering large commercial center
Miraleste Drive		
R19	Between Palos Verdes Drive East and Via Colinita	Traffic between Palos Verdes East and Via Colinita; lawnmowers from nearby residences
R20	Between Via Colinita and City's Limit at 9th Street	Traffic between Via Colinita and City's Limit at 9th Street; birds chirping
Palos Verdes Drive East		
R21	Between the North City Limit and Miraleste Drive	Traffic between the North City Limit and Miraleste Drive; traffic from nearby school and learning academy
R22	Between Miraleste Drive and North of Crest Road	Traffic between Miraleste Drive and North of Crest Road; lawnmowers at residences; traffic from fire station and commercial center on corner of Miraleste Drive
R23	Between North of Crest Road and Ganado Drive	Traffic between North of Crest Road and Ganado Drive; traffic at Marymount California University; birds chirping in nearby open space
R24	Between Ganado Drive and Palos Verdes Drive South	Traffic between Ganado Drive and Palos Verdes Drive South; birds chirping and wind blowing in open space; trees blowing in wind
Palos Verdes Drive South		
R25	Between Palos Verdes Drive West and Narcissa Drive	Traffic between Palos Verdes Drive West and Narcissa Drive; traffic along coastal route; birds chirping and sound of the ocean in background; taffic from golf course and country club
R26	Between Narcissa Drive and Palos Verdes Drive East	Traffic between Narcissa Drive and Palos Verdes Drive East; birds chirping and sound of the ocean in the background; traffic from golf course
Palos Verdes Drive West		
R27	Calle Entradero	Traffic down coastal road; birds chirping and sound of the ocean
Silver Spur Road		
R28	Between the North City Limit and just north of Hawthorne Boulevard	Traffic between the North City Limit and Hawthorne Boulevard; traffic from nearby high school; birds chirping; lawnmowers at nearby residences.



SOURCE: NAIP, 2014 (Aerial).

City of Rancho Palos Verdes General Plan Updates

Figure 2

Noise Measurement Locations

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TABLE 2
NOISE MEASUREMENT LOCATIONS

Monitoring Location	Roadway Segment	Start Time	End Time	dBA L_{eq}
Hawthorne Blvd				
R1	Between Vallon Drive and Palos Verdes Drive West	11:28:00 AM	11:48:00 AM	71.5
R2	Between Crest Road and Vallon Drive	11:00:00 AM	11:20:00 AM	70.9
R3	Between Eddinghill Drive/Seamount Drive and Crest Road	8:37:00 AM	8:57:00 AM	71.2
R4	Between Granvia Atlamira/Ridgegate Drive and Eddinghill Drive/Seamount Drive	9:52:00 AM	10:12:00 AM	71.9
R5	Between Grayslake Road/Highridge Road and Granvia Atlamira/Ridgegate Drive	9:25:00 AM	9:45:00 AM	72.5
R6	Between Indian Peak Road and Grayslake Road/Highridge Road	8:57:00 AM	9:17:00 AM	73.7
R7	Between the North City Limit ad and Silver Spur Road	7:37:00 AM	7:57:00 AM	74.2
Montelmalga Road				
R8	Between Silver Spur Road and Rolling Hills Estates City Limits	6:58:00 AM	7:18:00 AM	67.7
Crenshaw Blvd				
R9	Between the North City Limit and Indian Peak Road	12:10:00 PM	12:30:00 PM	72.5
R10	Between Indian Peak Road and Crest Road	9:10:00 AM	9:30:00 AM	69.4
R11	Crest Road to Burma Road	9:39:00 AM	9:59:00 AM	60.1
Crest Road				
R12	Between Hawthorne Boulevard and Highridge Road	10:33:00 AM	10:54:00 AM	65.7
R13	Between Highridge Road Crenshaw Boulevard	10:05:00 AM	10:25:00 AM	65.6
R14	at Ganado Dr	10:37:00 AM	10:57:00 AM	58

TABLE 2
NOISE MEASUREMENT LOCATIONS

Monitoring Location	Roadway Segment	Start Time	End Time	dBA L_{eq}
Western Avenue				
R15	at Delasonde Drive	8:00:00 AM	8:20:00 AM	71.2
R16	Between Highridge Road and Crenshaw Boulevard	10:53:00 AM	11:13:00 AM	66.7
Highridge Road				
R17	R17 Between Hawthorne Boulevard and the City Limit with Rolling Hills Estates	10:23:00 AM	10:43:00 AM	63.8
Indian Peak Road				
R18	Between Crenshaw Boulevard and the City Limit with Rolling Hills Estates	11:32:00 AM	11:52:00 AM	68.5
Miraleste Drive				
R19	Between Palos Verdes Drive East and Via Colinita	9:10:00 AM	9:30:00 AM	69.9
R20	Between Via Colinita and City's Limit at 9th Street	9:38:00 AM	9:58:00 AM	64.2
Palos Verdes Drive East				
R21	Between the North City Limit and Miraleste Drive	8:40:00 AM	9:00:00 AM	67.4
R22	Between Miraleste Drive and North of Crest Road	10:07:00 AM	10:27:00 AM	67.7
R23	Between North of Crest Road and Ganado Drive	11:06:00 AM	11:26:00 AM	60.8
R24	Between Ganado Drive and Palos Verdes Drive South	11:37:00 AM	11:57:00 AM	66.2
Palos Verdes Drive South				
R25	Between Palos Verdes Drive West and Narcissa Drive	12:00:00 PM	12:20:00 PM	69.5
R26	Between Narcissa Drive and Palos Verdes Drive East	12:10:00 PM	12:30:00 PM	71.3
Palos Verdes Drive West				
R27	Calle Entradero	12:38:00 PM	12:58:00 PM	68.2
Silver Spur Road				
R28	Between the North City Limit and just north of Hawthorne Boulevard	8:07:00 AM	8:27:00 AM	69.5

Roadway Noise Levels

Existing traffic on City roadways generate noise levels which affect exterior noise levels of residential uses adjacent to or near the roadways. Future increases vehicle traffic on roadways in the City due to anticipated regional growth have the potential to increase noise levels in various exterior land use areas that are adjacent to or near the studied roadways.

The Federal Highway Administration (FHWA) highway traffic noise prediction model (FHWA RD-77-108) was used to evaluate the highway traffic-related noise conditions along major arterials within the City limits. This model requires various parameters, including traffic volumes, vehicle mix, vehicle speed, and roadway geometry to compute typical equivalent noise levels during daytime, evening, and nighttime hours. The resultant noise levels are weighted and summed over 24-hour periods to determine the CNEL values.

Table 3 provides the existing traffic noise levels 50 feet from the centerline of the outermost lane of 36 roadway segments with average daily traffic (ADT) volumes provided in the Traffic Impact Analysis prepared for this General Plan Update (Translutions, August 15, 2017). These noise levels represent the worst-case scenario, which assumes that no shielding is provided between the traffic and the location where the noise contours are drawn. The specific assumptions used in developing these noise levels and the model printouts are provided in Appendix A.

Traffic noise would be considered relatively low, if the 70, 65, and 60 dBA CNEL contours are all confined within the roadway right-of-way; moderate, if the 70 dBA CNEL contour is confined within the roadway right-of-way and the 65 and 60 dBA CNEL contours extend to beyond the roadways; and high if the 70, 65, and 60 dBA CNEL contours all extend to beyond the roadways. Table 3 shows that the existing traffic noise levels along the major arterials within the City range from moderate (Highridge Road, Indian Peak Road, Miraleste Drive, Palos Verdes Drive, Silver Spur Road, Crest Road, Crestridge Road, and a portion of Crenshaw Boulevard and Hawthorne Boulevard) to high (Hawthorne Boulevard, the majority of Crenshaw Boulevard, and Western Avenue). Existing roadway noise contours are shown in **Figure 3**.

TABLE 3
EXISTING TRAFFIC NOISE LEVELS

Roadway Segment	ADT	Centerline to 70 CNEL (Feet)	Centerline to 65 CNEL (Feet)	Centerline to 60 CNEL (Feet)	dBA CNEL 50 Feet from Centerline of Outermost Lane
Hawthorne Boulevard					
Between the North City Limit and Blackhorse Road	27,034	43	184	67	69.6
Between Blackhorse Road and Silver Spur Road	25,628	40	174	64	69.3
Between Silver Spur Road and Grayslake Road/Highridge Road	35,252	63	249	89	70.7
Between Grayslake Road/Highridge Road and Granvia Atlamira/Ridgegate Drive	24,804	38	170	62	69.2

TABLE 3
EXISTING TRAFFIC NOISE LEVELS

Roadway Segment	ADT	Centerline to 70 CNEL (Feet)	Centerline to 65 CNEL (Feet)	Centerline to 60 CNEL (Feet)	dBA CNEL 50 Feet from Centerline of Outermost Lane
Between Granvia Atlamira/Ridgegate Drive and Eddinghill Drive/Seamount Drive	18,974	24	123	47	68.0
Between Eddinghill Drive/Seamount Drive and Crest Road	15,821	16	99	38	67.2
Between Crest Road and Vallon Drive	16,591	18	105	40	67.4
Between Vallon Drive and Palos Verdes Drive West	15,766	16	99	38	67.2
Palos Verdes Drive West					
Between the North City Limit and Hawthorne Boulevard	13,071	9	78	32	66.4
Between Hawthorne Boulevard and Palos Verdes Drive South	14,688	13	91	36	66.9
Palos Verdes Drive South					
Between Palos Verdes Drive West and Crestmont Lane/Terranea Way	14,560	21	98	57	67.4
Between Crestmont Lane/Terranea Way and Narcissa Drive	12,809	17	84	49	66.8
Between Narcissa Drive and Palos Verdes Drive East	14,612	17	73	64	66.4
Between Palos Verdes Drive East and the East City Limit	13,797	15	68	59	66.2
Palos Verdes Drive East					
Between the North City Limit and Miraleste Drive	10,078	8	47	42	64.8
Between Miraleste Drive and Crest Road	7,754	4	34	32	63.7
Between Crest Road and Ganado Drive	3,627	-8	6	8	60.0
Between Ganado Drive and Palos Verdes Drive South	2,854	-4	7	11	59.3
Crenshaw Boulevard					
Between the North City Limit and Indian Peak Road	31,439	62	227	123	70.7
Between Indian Peak Road and Crest Road	16,432	18	105	40	67.4
South of Crest Road	7,754	-2	27	18	63.2
Crest Road					
Between Hawthorne Boulevard and Highridge Road	3,627	-14	5	7	60.8
Between Highridge Road and Crenshaw Boulevard	2,854	-11	-1	5	59.8
Ganado Drive and Northern City Limits	31,439	40	160	81	69.3
Palos Verdes Drive East and Ganado Drive	16,432	18	105	40	67.4

TABLE 3
EXISTING TRAFFIC NOISE LEVELS

Roadway Segment	ADT	Centerline to 70 CNEL (Feet)	Centerline to 65 CNEL (Feet)	Centerline to 60 CNEL (Feet)	dBA CNEL 50 Feet from Centerline of Outermost Lane
Crestridge Road					
Between Highridge Road and Crenshaw Boulevard	6,969	-13	14	9	62.2
Highridge Road					
Between Hawthorne Boulevard and the City Limit with Rolling Hills Estates	8,806	0	34	21	63.7
Indian Peak Road					
Between Crenshaw Boulevard and the City Limit with Rolling Hills Estates	6,367	-5	20	15	62.3
Miraleste Drive					
Between Palos Verdes Drive East and Via Colinita	12,997	-2	48	20	64.9
Between Via Colinita and City's Limit at 9th Street	6,310	-14	11	8	61.7
Montemalaga Road					
Between Silver Spur Road and Rolling Hills Estates City Limit	7,756	-12	18	11	62.6
Silver Spur Road					
Between the North City Limit and just north of Hawthorne Boulevard	12,434	-8	40	15	64.4
Between Hawthorne Boulevard and Dry Bank Road	16,898	6	96	27	66.9
Western Avenue					
Between the North City Limit and Dilasonde Drive	34,007	60	237	85	70.6
Between Dilasonde Drive and Trudie Drive	35,575	63	249	89	70.8
Between Trudie Drive and South City Limit	37,152	67	262	93	70.9

[a] Based on noise levels at 50 feet distance from the roadway and residential uses if residential uses are shown along roadways.

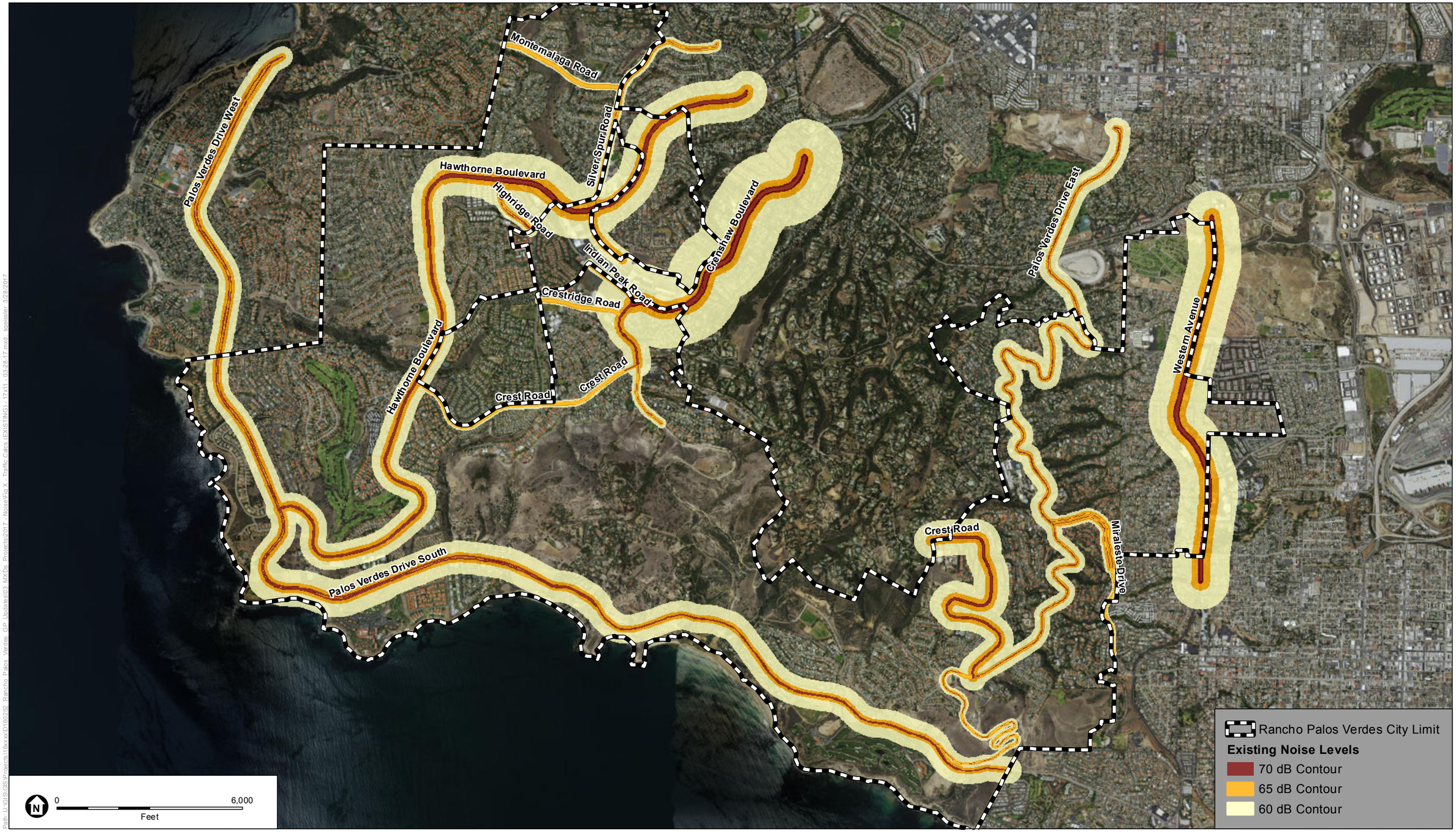
SOURCE: ESA 2017.

Therefore, as shown in Table 3, the existing land uses along the following roadways are potentially exposed to existing traffic noise levels exceeding the City's 65 dBA CNEL exterior residential noise standard:

- Hawthorn Boulevard between the North City Limit and Blackhorse Road;
- Hawthorn Boulevard between Blackhorse Road and Silver Spur Road;
- Hawthorn Boulevard between Silver Spur Road and Grayslake Road/Highridge Road;

- Hawthorn Boulevard between Grayslake Road/Highridge Road and Granvia Atlamira/Ridgegate Drive;
- Hawthorn Boulevard between Granvia Atlamira/Ridgegate Drive and Eddinghill Drive/Seamount Drive;
- Hawthorn Boulevard between Eddinghill Drive/Seamount Drive and Crest Road;
- Hawthorn Boulevard between Crest Road and Vallon Drive;
- Hawthorn Boulevard Vallon Drive and Palos Verdes Drive West;
- Palos Verdes Drive West between the North City Limit and Hawthorne Boulevard;
- Palos Verdes Drive West between Hawthorne Boulevard and Palos Verdes Drive South;
- Palos Verdes Drive South between Palos Verdes Drive West and Crestmont Lane/Terranea Way;
- Palos Verdes Drive South between Crestmont Lane/Terranea Way and Narcissa Drive;
- Palos Verdes Drive South between Narcissa Drive and Palos Verdes Drive East;
- Palos Verdes Drive South between Palos Verdes Drive East and the East City Limit;
- Crenshaw Boulevard between the North City limit and Indian Peak Road;
- Crenshaw Boulevard between Indian Peak Road and Crest Road;
- Crest Road between Ganado Drive and Northern City Limits;
- Crest Road between Palos Verdes Drive East and Ganado Drive;
- Silver Spur Road between Hawthorne Boulevard and Dry Bank Road;
- Western Avenue between the North City Limit and Dilasonde Drive;
- Western Avenue between Dilasonde Drive and Trudie Drive; and
- Western Avenue between Trudie Drive and South City Limit.

The other remaining roadway segments throughout the City are not near any major arterials or collector street segments with relatively high traffic volumes, and therefore, would not be currently exposed to existing traffic noise levels exceeding the City's 65 dBA CNEL exterior residential noise standard.



SOURCE: NAIP, 2014 (Aerial).

City of Rancho Palos Verdes General Plan Updates

Figure 3

Existing Traffic Noise Contour Map

ESA

Path: U:\GIS\GIS\Projects\16xxxx\D160252_Rancho_Palos_Verdes_GP_Updates\03_MXDs_Projects\2017 - Noise\Fig X - Traffic Calcs (EXISTING) - 17x11 - 03-28-17.mxd, sneissler, 3/28/2017

General Plan Update, Noise Element

Under the 2015 Draft General Plan Update, the 1975 General Plan, Urban Environment Element, Sensory Environment, Noise (City 1975) would be amended. In urbanized areas such as the City of Rancho Palos Verdes, the noise environment generally includes two major components: transportation noise and community noise sources. Sensitive noise receptors include residences, schools, medical facilities, and similar uses that are sensitive to noise. In general, the City's residential communities are spread throughout the entire City. These sensitive land uses, along with schools, medical buildings, nursing homes, and churches, may be potentially affected by the noise associated with increased traffic on the City's major arterial roadways, as well as the construction and operation of future development projects in the community.

Under the amended Circulation Element, in relation to traffic noise, there are techniques that can be implemented at the local level to reduce traffic noise impacts. For outdoor activity areas (e.g., yards, patios) within the 65 dBA CNEL contour, a sound wall with a minimum wall height of 5 feet could be provided to reduce the exterior noise levels for residential or other noise-sensitive land uses. To meet the state's 45 dBA CNEL interior noise standard and to achieve the indoor air-exchange ventilation requirements specified in the California Building Code, all residential structures within the 65 dBA CNEL contour along major roadway segments that do not have shielding provided by natural or manmade barriers could have mechanical ventilation to ensure that windows can remain closed for a prolonged period of time. In addition, residential homes proposed within the 65 dBA CNEL contour along major roadway segments that have no natural or manmade barriers providing a shielding effect could have building façade upgrades (e.g., double-paned windows, solid-core wood doors). The Noise Element of the General Plan Update provides a depiction of the 65 dBA CNEL contours and additional information regarding traffic noise impacts and possible efforts to address those impacts.

While the proposed Draft General Plan includes changes to the existing General Plan's Noise Element goals and policies, text, and graphics, these changes do not result in significant changes to the City's overall vision of its development pattern, including no changes to the existing development envelopes or intensification of existing land uses that would necessitate additional infrastructure facilities.

Vibration Sensitive Receptors

Vibration sensitive receptors are considered more sensitive to vibration that others due to the potential damage to structures (e.g., buildings) and/or the perception and annoyance to humans within buildings located in proximity to the vibration source (e.g., construction equipment, and heavy truck or transit traffic). Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receptors for vibration include structures (especially older masonry structures), people (especially residents, the elderly, and sick), and vibration sensitive equipment.

The effects of ground-borne vibration include movement of the building floors, rattling of windows, shaking of items on shelves or hanging on walls, and rumbling sounds. In extreme cases, the vibration can cause damage to buildings. Building damage is not a factor for most projects, with the occasional exception of blasting and pile-driving during construction. Annoyance from

vibration often occurs when the vibration levels exceed the threshold of perception by only a small margin. A vibration level that causes annoyance will be well below the damage threshold for normal buildings. The Federal Transportation Administration (FTA) measure of the threshold of architectural damage for conventional sensitive structures is 0.2 inches per second (in/sec) PPV (FTA, 2006).

Existing Ground-borne Vibration Levels

Aside from periodic construction work that may occur throughout the City, other sources of ground-borne vibration in the project area include heavy-duty vehicular travel (e.g., refuse trucks, delivery trucks) on local roadways. Truck traffic at a distance of 50 feet typically generates ground-borne vibration velocity levels of approximately 63 VdB (approximately 0.006 in/sec PPV). These levels could reach 72 VdB (approximately 0.016 in/sec PPV) where trucks pass over irregularities in the road surface.

In residential areas, the background vibration velocity level is usually around 50 VdB (approximately 0.0013 in/sec PPV), which is below the vibration velocity level threshold of perception for humans of approximately 65 VdB. A vibration velocity level of approximately 75 VdB is considered to be the approximate dividing line between barely perceptible and distinctly perceptible levels for many people (FTA, 2006).

Regulatory Setting

This section presents a discussion of the relevant noise and vibration regulatory setting at the federal, state, and local level, including the noise and vibration regulations, plans, policies, and guidance applicable to the proposed project.

California Department of Transportation

While there are no state or California Department of Transportation (Caltrans) vibration standards, the Caltrans *Transportation and Construction Vibration Guidance Manual* provides guidelines that can be used as screening tools for assessing the potential for adverse vibration effects related to structural damage and human perception. The manual is meant to provide practical guidance to Caltrans engineers, planners, and consultants who must address vibration issues associated with the construction, operation, and maintenance of Caltrans projects. The vibration criteria established by Caltrans for assessing structural damage and human perception are shown in **Table 4** and **Table 5**, respectively.

TABLE 4
CALTRANS VIBRATION DAMAGE POTENTIAL THRESHOLD CRITERIA

	Maximum PPV (in/sec)	
Structure and Condition	**Transient Sources**	**Continuous/Frequent Intermittent Sources**
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

NOTE: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

SOURCE: Caltrans, Transportation and Construction Vibration Guidance Manual. September, 2013.

TABLE 5
CALTRANS VIBRATION PERCEPTION POTENTIAL THRESHOLD CRITERIA

	Maximum PPV (in/sec)	
Structure and Condition	**Transient Sources**	**Continuous/Frequent Intermittent Sources**
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.4

NOTE: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

SOURCE: Caltrans, Transportation and Construction Vibration Guidance Manual. September, 2013.

City of Rancho Palos Verdes

General Plan, Noise Element

The City's current General Plan Urban Environment Element, Sensory Environment, Noise (City 1975) outlines policies of the City related to transportation noise, community noise, and land use planning and noise control. The City's Noise Element includes the following policies:

Transportation Noise

1. Encourage through traffic to existing arterials and collectors so that local roads are not used as by –passes or shortcuts in order to minimize noise.

2. Control traffic flows of heavy construction vehicles en route to and from construction sites to minimize noise.
3. Encourage the state and federal governments to actively control and reduce vehicle noise emissions.
4. Encourage state law enforcement agencies to vigorously enforce all laws that call for the control and/or reduction of noise emissions.

Community Noise

5. Develop an ordinance to control noise commensurate with local ambiance.
6. Maintain current and up-to-date information on noise control measures, on both fixed-point and vehicular noise sources.
7. Coordinate with all public agencies, especially our adjoining jurisdictions to study and/or control noise emissions.

Land Use Planning and Noise Control

8. Mitigate impacts generated by steady state noise intrusion (e.g., with land strip buffers, landscaping, and site design).
9. Regulate land use so that there is a minimal degree of noise impact on adjacent land uses.
10. Require strict noise attenuation measures where appropriate.
11. Review noise attenuation measures applicable to home, apartment, and office building construction, make appropriate proposals for the City zoning ordinance, and make appropriate recommendations for modifying the Los Angeles County Building Code as it applies to the City.
12. Require the minimization of noise emissions from commercial activities by screening and buffering techniques.

Municipal Code

The City of Rancho Palos Verdes Municipal Code (City 2017), Title 17, Chapter 17.12, Section 030 (17.12.030), Development Standards, stated that within the commercial districts, certain restrictions on noise associated with deliveries and mechanical equipment have been identified. It states that "Unless otherwise specified in an approved conditional use permit or other discretionary approval, all deliveries of commercial goods and supplies; trash pick-up, including the use of parking lot trash sweepers; and the operation of machinery or mechanical equipment which emits noise levels in excess of 65 dBA, as measured from the closest property line to the mechanical equipment, shall only be allowed on commercial properties which abut a residential district, between the hours of seven a.m. and seven p.m. Monday through Sunday.

Title 17, Chapter 17.56, Section 020 (17.56.020), Conduct of construction and landscaping activities, states that, "It is unlawful to carry on construction grading or landscaping activities or to operate heavy equipment except between the hours of seven a.m. and six p.m. Monday through Friday and between nine a.m. to five p.m. on Saturday. No such activity shall be permitted on Sunday or the legal holidays listed in Section 17.96.920 (Holiday, Legal) of this code, unless a special construction permit is obtained from the director. Said special construction permit must be

requested at least 48 hours before such work is to begin. Emergency work, as defined in Section 17.96.630 (Emergency Work) of this code, and typical residential activities, such as lawn mowing, gardening (without the use of weed and debris blowers), and minor home repair/maintenance, shall be exempted from these time and day restrictions. The hours of operation for weed and debris blowers are specified in Chapter 8.16 (Weed and Debris Blowers) of this code."

Title 8, Chapter 04, Section 010 (8.04.010) of the City's Municipal Code states that "Except as hereinafter provided, Title 11, entitled 'Health and Safety,' of the Los Angeles County Code, as amended and in effect on September 1, 1998, is adopted by reference as the health code of the City of Rancho Palos Verdes and may be cited as such."

However, because the City has not adopted any quantitative noise level criteria for the CEQA review process, the noise standards recommended in the State's guidelines, as shown in **Table 6**, are used in this Noise Impact Analysis. Typically, residential uses exposed to traffic noise levels exceeding 65 dBA CNEL is considered not acceptable, as typical building construction may only provide enough exterior noise reduction to achieve the State's interior noise standard of 45 dBA CNEL for residential uses. Therefore, in these cases, requiring additional building soundproofing be incorporated to ensure that the interior standard is achieved.

TABLE 6
LAND USE COMPATIBILITY FOR COMMUNITY NOISE SOURCES

Land Use Category	*Noise Exposure (L_{dn} or CNEL, dBA)*						
	55	*60*	*65*	*70*	*75*	*80*	
Residential – Single-Family, Duplex, Mobile Home							
Residential – Multiple Family							
Transient Lodging – Motel, Hotel							
School, Library, Church, Hospital, Nursing Home							
Auditorium, Concert Hall, Amphitheater							
Sports Arena, Outdoor Spectator Sports							
Playground, Neighborhood Park							
Golf Course, Riding Stable, Water Recreation, Cemetery							
Office Building, Business Commercial and Professional							
Industrial, Manufacturing, Utilities, Agriculture							

	NORMALLY ACCEPTABLE: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
	CONDITIONALLY ACCEPTABLE: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.
	NORMALLY UNACCEPTABLE: New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirement must be made and needed noise insulation features included in the design.
	CLEARLY UNACCEPTABLE: New construction or development should generally not be undertaken. Construction costs to make the indoor environmental acceptable would be prohibitive and the outdoor environment would not be usable.

Source: State of California, General Plan Guidelines, Governor's Office of Planning and Research, 2003

Project Impacts and Mitigation Measures

Methodology

Construction Noise

Construction of individual development projects allowed under the General Plan Update would generate noise. However, specific details (such as development locations, construction, schedules and import and export soil quantities) regarding future development projects under the General Plan Update are not known at this time. Nonetheless, the potential construction noise levels associated with future project-level construction can be estimated based on typical noise levels generated at the source by construction equipment and activities, and attenuated by distances to estimate noise levels at potential noise sensitive receptors in proximity to Project construction activities. Construction noise levels, attenuated at these distances, were then compared against the construction noise standards established in the City's General Plan Noise Element and Municipal Code to determine at what distances noise standards would be exceeded at receptors, and whether a substantial temporary increase in ambient noise levels would occur at receptors during construction at these distances.

Construction Vibration

As with noise, construction activity that would occur under the Draft General Plan Update has the potential to generate construction vibration from construction activities operating heavy-duty construction equipment in proximity to vibration sensitive receptors (i.e., structures and people). The locations of future development projects under the General Plan Update are not known at this time. However, the potential construction vibration levels associated with future operation of construction equipment can be estimated at the source using data published by the FTA in its *Transit Noise and Vibration Impact Assessment* document. The vibrations levels at the source were attenuated at distances of potential vibration sensitive locations (i.e., existing structures and humans), and then compared against the vibration impact criteria to determine whether would expose structures or persons to excessive vibration levels.

Off-Site Traffic Noise

The proposed project has the potential to generate vehicle traffic noise on area roadways generated from potential new development under the General Plan Update. Roadway traffic noise impacts have been evaluated using the Caltrans TeNS method based on the roadway traffic volume data provided in the Traffic Impact Analysis (Translutions 2017) prepared for the Project. TeNS method allows for the definition of roadway configurations and receiver locations. Roadway noise attributable to future development was calculated and compared to baseline noise levels that would occur under the existing condition.

Thresholds of Significance

A project is considered to have a significant impact on the surrounding environment if it will substantially increase the ambient noise levels for adjoining areas, or conflict with adopted

environmental plans and policies of the community in which it is proposed. The project would result in a significant noise impact if:

- Project construction occurs outside of the allowable hours of the City's Municipal Code, (7 a.m. through 6 p.m., Monday through Friday, and 9 a.m. – 5 p.m. on Saturdays, with no construction on Sundays or Holidays) (City 2017).
- Project construction results in a substantial temporary increase in ambient noise levels. An increase of 10 dB is perceived by the healthy human ear as "twice as loud"; therefore, an increase of 10 dBA Leq or greater at the nearest noise sensitive receptor can be considered as a substantial increase.
- Project construction results in vibration levels at inhabited structures exceeding Caltrans threshold criteria for human perception of strongly perceptible at 0.1 in/sec PPV.
- The Project's residential uses are exposed to an exterior noise level of greater than 65 dBA CNEL for outdoor living areas (excluding balconies). The Project's residential uses are exposed to an exterior noise level of greater than 70 dBA CNEL for outdoor living areas (excluding balconies) or an interior noise level of greater than 45 dBA CNEL interior noise standard.
- All deliveries of commercial goods and supplies; trash pick-up, including the use of parking lot trash sweepers; and the operation of machinery or mechanical equipment that emits noise levels in excess of 65 dBA.

Impacts

Construction Noise Impacts

The City's Draft General Plan Update would result in an increase in intensity of development within the City. However, the timing of the construction activities of individual projects associated with the project is unknown and cannot be determined at this time. Construction of individual projects would occur as development is warranted, based in large part on the economic market. Additionally, the duration of construction is dependent on individual project types.

Project development construction would require the use of heavy equipment during the demolition, grading, and excavation activities associated with the potential development. During each stage of development, there would be a different mix of equipment. As such, construction activity noise levels at and near the project would fluctuate depending on the particular type, number, and duration of use of the various pieces of construction equipment.

Individual pieces of construction equipment anticipated during project construction could produce maximum noise levels of 77 dBA to 90 dBA L_{max} at a reference distance of 50 feet from the noise source, as shown in **Table 7**. These maximum noise levels would occur when equipment is operating at full power. The estimated usage factors for the equipment are also shown in Table 6, which is based on FHWA's RCNM User's Guide.

TABLE 7
CONSTRUCTION EQUIPMENT NOISE LEVELS

Construction Equipment	Estimated Usage Factor, %	Noise Level at 50 Feet (dBA, Lmax)
Air Compressor	50	78
Backhoe	40	80
Concrete Mixer	40	79
Compactor	20	83
Concrete Saw	20	90
Crane	40	81
Dozer	40	82
Excavator	40	81
Forklift	10	75
Grader	40	85
Paver	50	77
Paving Equipment	20	90
Roller	20	80
Rubber Tired Loader	50	79
Pavement Breaker	20	89
Trencher	50	85

SOURCE: FHWA 2006

However, equipment used on construction sites often operates under less than full power conditions, or part power. To more accurately characterize construction-period noise levels, the average (L_{eq}) noise levels associated with each construction stage is provided in **Table 8**. These average noise levels are based on the quantity, type, and usage factors for each type of equipment that would likely be used during each construction stage, and are typically attributable to multiple pieces of equipment operating simultaneously. Table 8 provides the estimated worst-case construction noise levels per construction stage at the source (i.e., 25 feet) and with attenuation by doubling of distance (i.e., 50, 100, 200, and 400 feet). The estimated noise levels represent a conservative scenario because construction activities are analyzed as occurring closest to the edges of the construction area. However, construction activities would typically be moving throughout the construction area, on average, farther away, which would result in actual lower noise levels.

As shown in Table 8, examples of average temporary construction-period (i.e., various construction stages) noise levels range from approximately 71 to 80 dBA L_{eq} at 100 feet, and from approximately 65 to 74 dBA L_{eq} at 200 feet from construction activities.

TABLE 8
CONSTRUCTION NOISE LEVELS BY DISTANCE AND CONSTRUCTION STAGE

	Sound Level in dBA (L_{eq}) at Various Distances				
Construction Stage	**25 feet**	**50 feet**	**100 feet**	**200 feet**	**400 feet**
Site Preparation/Grading	92	86	80	74	68
Foundation	83	77	71	65	59
Structural	89	83	77	71	65
Finishing	92	86	77	71	65

Assumes a hard surface propagation path drop-off rate of 6 dB per doubling of distance (sound level at distance X = sound level at 50 feet - 20LOG (x/50)), which is appropriate for use in characterizing point-source (such as construction equipment) sound attenuation.

SOURCE: EPA, Noise from Construction Equipment and Operations, Building Equipment and Home Appliances, PB 206717, 1971; ESA 2017.

Construction activities of the development would be required to comply with the City's noise standards. The City's Municipal Code exempts construction noise between 7 a.m. and 6 p.m. on Monday – Friday, and 9 a.m. – 5 p.m. on Saturdays. Consistent with the City's Municipal Code, construction of the development projects under the General Plan Update would occur within the allowable hours and no construction would occur on Sundays. Therefore, noise impacts would be less than significant.

In addition, Project construction activities could result in a substantial temporary increase ambient noise levels at noise sensitive receptors in proximity to the future construction activity at potential development locations within the City. Construction noise is typically temporary and short term (i.e., its effect on the environment ceases upon conclusion of construction activities). A substantial temporary increase in ambient noise levels can be defined as a direct project-related increase of 10 dBA L_{eq} or greater, based on the noise standard that a 10 dBA increase is perceived by the human ear as twice as loud (FTA 2006).

As shown in Table 8, typical construction noise levels would average up to approximately 80 dBA L_{eq} at 100 feet from construction activities, which would temporarily increase existing ambient noise levels at noise sensitive receptors in proximity to construction activity. As shown in **Table 2,** the measured ambient noise levels ranged from approximately 58 to 74 dBA L_{eq} at various residential locations. Therefore, construction noise as high as 80 dBA L_{eq} at 100 feet occurring at the residential locations of the relatively low measured ambient levels of 69 dBA L_{eq} would result in an increase greater than 10 dBA L_{eq}., which can be considered a a substantial temporary increase in ambient noise levels. Therefore, these impacts would be considered potentially significant.

To reduce noise generated by the operation of construction equipment in proximity to noise sensitive receptors the following construction best management practices (BMP)s shall be considered to the extent practicable for development projects.

For individual development projects, the following field techniques shall be implemented by the project construction contractor to reduce construction-related noise at noise-sensitive receptors within 100 feet of construction activity:

a. Unless safety provisions require otherwise, the construction contractor shall adjust all audible back-up alarms to the lowest volume appropriate for safety purposes (i.e., still maintaining adequate signal-to-noise ratio for alarm effectiveness). The contractor shall consider signal persons, strobe lights, or alternative safety equipment and/or processes as allowed, for reducing reliance on high-amplitude sonic alarms.

b. The construction contractor shall place stationary noise sources at the construction site, such as generators and air compressors, as far away as possible from affected noise-sensitive receivers (residential, hospital, and school uses). Non-noise-producing equipment, such as trailers, may be located as a sound barrier between suspected major noise-producing sources and sensitive receptors.

c. Noise producing equipment (e.g., jackhammers and pavement breakers) shall use noise attenuating shields, shrouds, or portable barriers or enclosures, to reduce operating noise.

d. Line or cover hoppers, storage bins, and chutes shall include sound-deadening material (e.g., apply wood or rubber liners to metal bin impact surfaces).

e. To the extent practicable and available, the construction contractor shall use construction equipment manufactured or modified to reduce noise and vibration emissions, such as: electric instead of diesel-powered equipment, hydraulic tools instead of pneumatic tools, and electric saws instead of air- or gasoline-driven saws.

Where feasible, temporary, field-erected noise barriers shall be installed, preferably adjacent to the equipment, prior to construction of the individual development projects to block the line-of-sight between construction equipment and sensitive receptors. Noise barriers could include sound blankets hanging on existing fences, or freestanding portable sound walls. Noise barriers should be a minimum of 8-feet in height and continuous between the source of noise and adjacent or nearby noise-sensitive receptors. Noise barriers are most effective when placed directly adjacent to either the noise source or receptor.

Barrier construction may include, but not necessarily limited to, using appropriately thick wooden panel walls (at least one-half inch thick), which are tall enough to block the line-of-sight between the dominant construction noise source(s) and the noise-sensitive receptor. Such barriers can reduce construction noise by 5 to 15 dBA at nearby noise-sensitive receptor locations, depending on barrier height and length, and the distance between the barrier and the noise-producing equipment or activity. Alternatively, field-erected noise curtain assemblies could be installed around specific equipment sites or zones of anticipated mobile or stationary activity. These techniques are most effective and practical when the construction activity noise source is stationary (e.g., auger or drill operation) and the specific source locations of noise emissions are near the ground and can be placed as close to the equipment/activity-facing side of the noise barrier as possible. Barrier layout and other implementation details would vary by construction site.

Implementation of these BMPs would reduce construction noise levels at the source and at the receptor by approximately 5 to 15 dBA L_{eq}, which would reduce construction noise levels as high as 80 dBA L_{eq} at 100 feet to approximately 75 to 65 dBA L_{eq} at 100 feet. As shown in **Table 2,** the measured ambient noise levels ranged from approximately 58 to 74 dBA L_{eq} at the various residential locations. Therefore, , for future development locations with ambient levels in the upper end of this range, these BMPs would attenuate construction noise to a less than substantial increase in daytime ambient noise levels at adjacent residential uses, and result in a less than significant impact. However, for future development locations with ambient levels in the lower end of this range, nearby construction noise would be more noticeable, and the increase over existing noise levels could exceed 10 dBA. In addition, temporary noise barriers may not be feasible to implement at all locations at all times during construction activities, due to potential physical constraints at a location (i.e. elevation differences, steep grades, etc.) which do not block line-of sight between a noise source and a residence.

It should be noted that approval of development, redevelopment, or modifications to single family residential uses are typically ministerial in nature, and would not individually be subject to CEQA review. Furthermore, construction impacts are temporary in nature. Therefore, if a project proponent agrees to implement the five BMPs above, to the extent feasible, impacts to ambient noise levels are not likely to be substantial. Therefore, impacts would be ***less than significant*** with regard to a temporary substantial increase in ambient noise levels during project-level construction.

Construction Vibration Impacts

Construction of the development project under the Draft General Plan Update would generate ground-borne vibration from the operation of heavy equipment (i.e., backhoe, excavators, grader, loader, and haul trucks, etc.), which propagates though the ground and diminishes in intensity with distance from the source. Ground-borne vibration would be generated primarily during site clearing demolition, and grading activities, and to a lesser degree, by off-site haul-trucks traveling on surface streets. The construction methods and equipment of each potential future development, as well as the locations of sensitive structures to the activity is unknown at this time.

Ground-borne vibrations from typical construction activities very rarely reach the levels at structures that can damage structures, but they may be perceived by humans in buildings very close (i.e., within 25 feet) to a construction activity. The vibration levels for several types of heavy construction equipment that can generate perceptible vibration levels are identified in **Table 9**. Typical heavy equipment is defined as engine size of 600 horsepower or greater, such as large dozers, large excavators, and large loaders.

TABLE 9
VIBRATION SOURCE LEVELS FOR TYPICAL HEAVY CONSTRUCTION EQUIPMENT

	Approximate PPV (in/sec)				
Equipment	**25 Feet**	**50 Feet**	**60 Feet**	**75 Feet**	**100 Feet**
Large Bulldozer	0.089	0.031	0.024	0.017	0.011
Caisson Drilling	0.089	0.031	0.024	0.017	0.011
Loaded Trucks	0.076	0.027	0.020	0.015	0.010
Jackhammer	0.035	0.012	0.009	0.007	0.004
Small Bulldozer	0.003	0.001	0.0008	0.0006	0.0004

SOURCE: FTA, Transit Noise and Vibration Impact Assessment. May, 2006.

Based on the information presented in Table 9, vibration levels could range from 0.003 to 0.089 in/sec PPV at 25 feet from the operation of the equipment. As indicated in Table 9, the highest vibration level of 0.089 in/sec PPV at 25 feet from the operation of a large bulldozer would reduce to 0.031 in/sec PPV at 50 feet. At 100 feet, the vibration level from a large bulldozer would further reduce to 0.011 in/sec PPV.

Pile driving for foundation development of large buildings, and vibratory compaction during surface grading may be required for future development. Vibratory compaction rollers generate vibration levels of 0.210 in/sec PPV at 25 feet (FTA 2006). Pile driving has the greatest potential to generate high groundborne vibration levels, ranging from 1.518 to 0.170 in/sec PPV at 25 feet (FTA 2006) depending upon pile driving method and usage.

As previously shown in Tables 4 and 5, Caltrans provides threshold criteria for potential structural damage to fragile buildings of 0.2 in/sec PPV and human perception of strongly perceptible at 0.1 in/sec PPV, respectively. As the vibration threshold of human perception of 0.1 in/sec PPV is lower than the vibration threshold of potential structural damage of 0.2 in/sec PPV , the threshold distance (i.e., setback distance) between equipment and receptor is greater for the human perception threshold and, and therefore, is more stringent and conservative for vibration impact analysis. Therefore, for a vibration-sensitive receptor to be exposed to the Caltrans vibration threshold of strongly perceptible to humans of 0.1 in/sec PPV, the receptor would need to be located within 25 feet of the construction activity of typical heavy construction equipment, as shown in Table 9 (assuming no pile driving is required for construction). Pile driving would have the potential to exceed the Caltrans human perception vibration threshold of 0.1 in/sec PPV within 150 feet, depending on the site specific soil conditions, and the pile driving methods and equipment used.

Due to the densely developed area within the General Plan boundaries and the inability to know the exact nature of future proposed projects under the Update, development could be adjacent to other properties with existing structures (e.g., residences, commercial businesses, etc.). Depending on the location of the future development projects, there may or may not be residences located in proximity to the development that would be potentially affected by the construction

vibration. Therefore, future construction activities of typical heavy construction equipment (e.g., as detailed in Table 9) could exceed the threshold of human perception of 0.1 in/sec PPV at sensitive receptors, which would result in temporary significant ground-borne vibration impacts.

Sources of ground-borne vibration from the operation of the development (once constructed) would include typical residential and commercial-grade stationary mechanical and electrical equipment such as air handling units, condenser units, exhaust fans, and electrical emergency power generators, which would produce vibration at the source. In addition, vibration would be generated from heavy-duty vehicular travel (e.g., refuse trucks, delivery trucks) on local roadways, which are typically greater than 25 feet from inhabited buildings. Because the sources of ground-borne vibration and distances from receptors would be unchanged from the existing conditions, operational vibration impacts of the improvements at the off-site receptors would be consistent with the existing vibration velocity levels and with the existing ambient vibration velocity levels. The potential vibration impacts from all operation activities at the closest structure locations would be less than the significance threshold for perceptibility. As such, operational vibration impacts would be less than significant.

Traffic Noise Impacts

The City's Draft General Plan Update would result in a future increase in intensity of development within the City, which would generate additional vehicle traffic on area roadways from the proposed 756 new developments by the buildout year of 2040 in the General Plan Update. **Table 10** shows the estimated future traffic noise levels (dBA CNEL) with the project at each monitoring location, based on future traffic volumes in the year 2040 (Translutions, 2017) compared to the existing traffic noise levels. The future traffic noise level estimations were calculated using the FHWA's traffic noise prediction model. All of the measured locations are expected to increase from existing to future levels by between 0.2 and 0.7 dBA CNEL by the year 2040 with the project. This range of traffic noise level change is not considered significant, and thus less significant growth-related traffic noise impacts would occur on existing uses throughout the City. Future (2040) roadway noise contours are shown in **Figure 10** to depict the 70, 65, and 60 dBA CNEL contour distances from the roadways.

TABLE 10
FUTURE (2040) TRAFFIC NOISE LEVELS

Roadway Segment	ADT	Distance from center-line to 70 CNEL contour (Feet)	Distance from center-line to 65 CNEL contour (Feet)	Distance from center-line to 60 CNEL contour (Feet)	Future with project noise level dBA CNEL, 50 Feet from centerline	Noise level increase dBA CNEL from existing (Table 3) to future with project, 50 Feet from centerline
Hawthorne Boulevard						
Between the North City Limit and Blackhorse Road	28,851	47	198	72	69.9	0.3
Between Blackhorse Road and Silver Spur Road	27,350	44	189	68	69.6	0.3
Between Silver Spur Road and Grayslake Road/Highridge Road	37,621	70	269	95	71	0.3

TABLE 10
FUTURE (2040) TRAFFIC NOISE LEVELS

Roadway Segment	ADT	Distance from center-line to 70 CNEL contour (Feet)	Distance from center-line to 65 CNEL contour (Feet)	Distance from center-line to 60 CNEL contour (Feet)	Future with project noise level dBA CNEL, 50 Feet from centerline	Noise level increase dBA CNEL from existing (Table 3) to future with project, 50 Feet from centerline
Between Grayslake Road/Highridge Road and Granvia Atlamira/Ridgegate Drive	26,471	41	179	65	69.5	0.3
Between Granvia Atlamira/Ridgegate Drive and Eddinghill Drive/Seamount Drive	20,249	27	134	50	68.3	0.3
Between Eddinghill Drive/Seamount Drive and Crest Road	16,884	19	108	41	67.5	0.3
Between Crest Road and Vallon Drive	17,706	21	114	43	67.7	0.3
Between Vallon Drive and Palos Verdes Drive West	16,825	19	108	41	67.5	0.3
Palos Verdes Drive West						
Between the North City Limit and Hawthorne Boulevard	13,949	11.6	85.7	33.9	66.7	0.3
Between Hawthorne Boulevard and Palos Verdes Drive South	15,675	15.8	98.9	38.3	67.2	0.3
Palos Verdes Drive South						
Between Palos Verdes Drive West and Crestmont Lane/Terranea Way	15,538	23	104	59	67.7	0.3
Between Crestmont Lane/Terranea Way and Narcissa Drive	13,670	19	91	53	67.1	0.3
Between Narcissa Drive and Palos Verdes Drive East	15,594	18	77	67	66.7	0.3
Between Palos Verdes Drive East and the East City Limit	14,724	17	73	64	66.4	0.2
Palos Verdes Drive East						
Between the North City Limit and Miraleste Drive	10,755	10	51	45	65.1	0.3
Between Miraleste Drive and Crest Road	8,275	5	37	35	63.9	0.2
Between Crest Road and Ganado Drive	3,871	-8	8	9	60.3	0.3
Between Ganado Drive and Palos Verdes Drive South	3,046	-4	8	11	59.6	0.3
Crenshaw Boulevard						
Between the North City Limit and Indian Peak Road	33,552	67	244	132	71	0.3
Between Indian Peak Road and Crest Road	19,186	24	123	47	68.1	0.7
South of Crest Road	8,275	-1	30	20	63.5	0.3

TABLE 10
FUTURE (2040) TRAFFIC NOISE LEVELS

Roadway Segment	ADT	Distance from center-line to 70 CNEL contour (Feet)	Distance from center-line to 65 CNEL contour (Feet)	Distance from center-line to 60 CNEL contour (Feet)	Future with project noise level dBA CNEL, 50 Feet from centerline	Noise level increase dBA CNEL from existing (Table 3) to future with project, 50 Feet from centerline
Crest Road						
Between Hawthorne Boulevard and Highridge Road	3,871	-13	7	8	61.1	0.3
Between Highridge Road and Crenshaw Boulevard	3,046	-9	10	9	60.5	0.7
Ganado Drive and Northern City Limits	33,552	44	173	87	69.6	0.3
Palos Verdes Drive East and Ganado Drive	19,186	24	123	47	68.1	0.7
Crestridge Road						
Between Highridge Road and Crenshaw Boulevard	7,437	-12	17	10	62.4	0.2
Highridge Road						
Between Hawthorne Boulevard and the City Limit with Rolling Hills Estates	9,398	1	37	23	64	0.3
Indian Peak Road						
Between Crenshaw Boulevard and the City Limit with Rolling Hills Estates	6,795	-4	23	16	62.6	0.3
Miraleste Drive						
Between Palos Verdes Drive East and Via Colinita	13,870	-1	53	21	65.1	0.2
Between Via Colinita and City's Limit at 9th Street	6,734	-14	12	9	62	0.3
Montemalaga Road						
Between Silver Spur Road and Rolling Hills Estates City Limit	8,277	-11	21	11	62.9	0.3
Silver Spur Road						
Between the North City Limit and just north of Hawthorne Boulevard	13,270	-6	45	17	64.7	0.3
Between Hawthorne Boulevard and Dry Bank Road	18,680	20	153	40	67.8	0.9
Western Avenue						
Between the North City Limit and Dilasonde Drive	36,292	65	256	91	70.8	0.2
Between Dilasonde Drive and Trudie Drive	37,966	70	269	95	71	0.2
Between Trudie Drive and South City Limit	39,649	74	283	100	71.2	0.3

[a] Based on noise levels at 50 feet distance from the roadway and residential uses if residential uses are shown along roadways.

SOURCE: ESA 2017.

As shown in Table 10, land uses along following roadways would be potentially exposed to traffic noise levels exceeding 65 dBA CNEL:

- Hawthorn Boulevard between the North City Limit and Blackhorse Road;
- Hawthorn Boulevard between Blackhorse Road and Silver Spur Road;
- Hawthorn Boulevard between Silver Spur Road and Grayslake Road/Highridge Road;
- Hawthorn Boulevard between Grayslake Road/Highridge Road and Granvia Atlamira/Ridgegate Drive;
- Hawthorn Boulevard between Granvia Atlamira/Ridgegate Drive and Eddinghill Drive/Seamount Drive;
- Hawthorn Boulevard between Eddinghill Drive/Seamount Drive and Crest Road;
- Hawthorn Boulevard between Crest Road and Vallon Drive;
- Hawthorn Boulevard Vallon Drive and Palos Verdes Drive West;
- Palos Verdes Drive West between the North City Limit and Hawthorne Boulevard;
- Palos Verdes Drive West between Hawthorne Boulevard and Palos Verdes Drive South;
- Palos Verdes Drive South between Palos Verdes Drive West and Crestmont Lane/Terranea Way;
- Palos Verdes Drive South between Crestmont Lane/Terranea Way and Narcissa Drive;
- Palos Verdes Drive South between Narcissa Drive and Palos Verdes Drive East;
- Palos Verdes Drive South between Palos Verdes Drive East and the East City Limit;
- Palos Verdes Drive East between the North City Limit and Miraleste Drive;
- Crenshaw Boulevard between the North City limit and Indian Peak Road;
- Crenshaw Boulevard between Indian Peak Road and Crest Road;
- Crest Road between Ganado Drive and Northern City Limits;
- Crest Road between Palos Verdes Drive East and Ganado Drive;
- Miraleste Drive between Palos Verdes Drive East and Via Colinita;
- Silver Spur Road between Hawthorne Boulevard and Dry Bank Road;
- Western Avenue between the North City Limit and Dilasonde Drive;
- Western Avenue between Dilasonde Drive and Trudie Drive; and
- Western Avenue between Trudie Drive and South City Limit.

The other remaining roadway segments would not be near any major arterials or collector street segments with relatively high traffic volumes, and therefore, would not be exposed to high traffic noise levels reaching the 65 dBA CNEL exterior noise standard.

However, in comparison with the existing land uses exposed to traffic noise levels exceeding 65 dBA CNEL, only the land uses along following roadways would be potentially exposed to future traffic noise levels exceeding 65 dBA CNEL:

- Palos Verdes Drive East between the North City Limit and Miraleste Drive; and
- Miraleste Drive between Palos Verdes Drive East and Via Colinita;

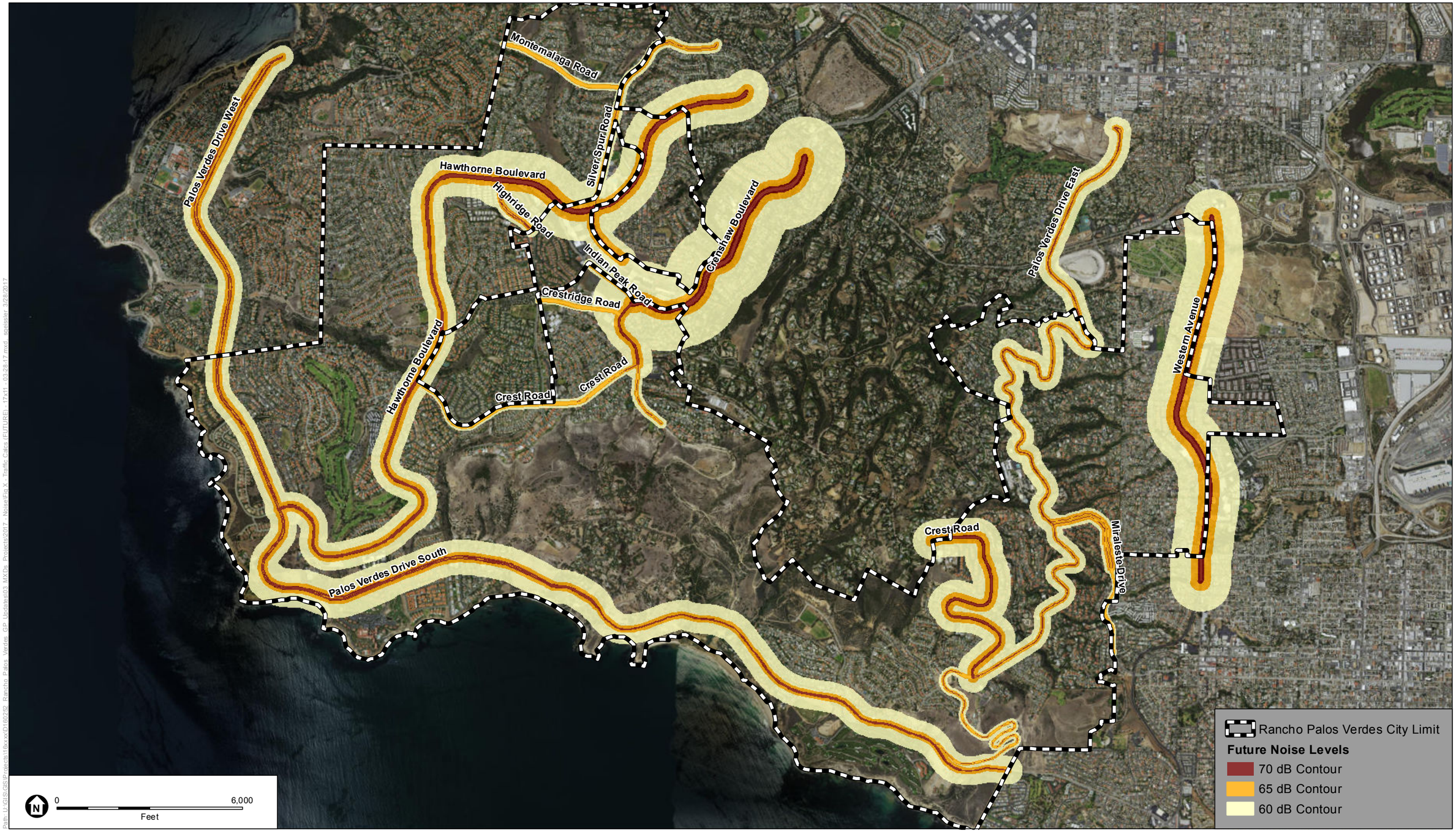
Outdoor Land Uses

As previously shown in Table 3, the existing land uses along some roadways are potentially exposed to existing traffic noise levels exceeding the City's 65 dBA CNEL exterior residential noise standard. As shown in Table 10, the Draft General Plan Update would generate additional vehicle traffic on area roadways, which would increase traffic noise levels and increase exterior noise levels at outdoor land uses of residential uses. The future noise contour map (Figure 4) shows that the future 65 dBA CNEL noise contour along arterials and major collector roads would potentially affect additional outdoor active use areas such as backyards, patios, or balconies along these roadways, as compared to the existing noise contour map (Figure 3). This would be a potentially significant impact.

To address these noise increases, the installation of permanent sound barriers (e.g., sound walls) along outdoor active-use areas proposed within the impact zone of the 65 dBA CNEL contour would potentially ensure that the 65 dBA CNEL exterior noise standard is not exceeded. Therefore, outdoor active use areas, such as backyards, patios, or balconies proposed on these vacant parcels, that are within the following distances from the roadway centerline, may require standalone sound barriers (along the property line for the backyards or along the perimeter of the patios and/or balconies), to reduce the exterior traffic noise at these exterior uses to 65 dBA CNEL or lower:

- 198 feet, Hawthorn Boulevard between the North City Limit and Blackhorse Road;
- 189 feet, Hawthorn Boulevard between Blackhorse Road and Silver Spur Road;
- 269 feet, Hawthorn Boulevard between Silver Spur Road and Grayslake Road/Highridge Road:
- 179 feet, Hawthorn Boulevard between Grayslake Road/Highridge Road and Granvia Atlamira/Ridgegate Drive;
- 134 feet, Hawthorn Boulevard between Granvia Atlamira/Ridgegate Drive and Eddinghill Drive/Seamount Drive;
- 108 feet, Hawthorn Boulevard between Eddinghill Drive/Seamount Drive and Crest Road;
- 114 feet, Hawthorn Boulevard between Crest Road and Vallon Drive;
- 108 feet, Hawthorn Boulevard Vallon Drive and Palos Verdes Drive West;
- 85.7 feet, Palos Verdes Drive West between the North City Limit and Hawthorne Boulevard;
- 98.9 feet, Palos Verdes Drive West between Hawthorne Boulevard and Palos Verdes Drive South;

- 104 feet, Palos Verdes Drive South between Palos Verdes Drive West and Crestmont Lane/Terranea Way;
- 91 feet Palos Verdes Drive South between Crestmont Lane/Terranea Way and Narcissa Drive;
- 77 feet, Palos Verdes Drive South between Narcissa Drive and Palos Verdes Drive East;
- 73 feet,Palos Verdes Drive South between Palos Verdes Drive East and the East City Limit;
- 51 feet, Palos Verdes Drive East between the North City Limit and Miraleste Drive;
- 244 feet Crenshaw Boulevard between the North City limit and Indian Peak Road:
- 123 feet, Crenshaw Boulevard between Indian Peak Road and Crest Road;
- 173 feet, Crest Road between Ganado Drive and Northern City Limits;
- 123 feet, Crest Road between Palos Verdes Drive East and Ganado Drive;
- 53 feet, Miraleste Drive between Palos Verdes Drive East and Via Colinita;
- 153 feet, Silver Spur Road between Hawthorne Boulevard and Dry Bank Road;
- 256 feet, Western Avenue between the North City Limit and Dilasonde Drive;
- 269 feet, Western Avenue between Dilasonde Drive and Trudie Drive;
- 283 feet, Western Avenue between Trudie Drive and South City Limit;



SOURCE: NAIP, 2014 (Aerial).

City of Rancho Palos Verdes General Plan Updates

Figure 4

Future Traffic Noise Contour Map

ESA

Path: U:\GIS\GIS\Projects\16xxxx\D160252_Rancho_Palos_Verdes_GP_Updates\03_MXDs_Projects\2017 - Noise\Fig X - Traffic Calcs (FUTURE) - 17x11 - 03-28-17.mxd, sgeissler, 3/28/2017

Interior Noise

The vehicle traffic generated on area roadways from the Draft General Plan Update, would generate exterior noise at residential uses, which would potentially impact the 45 dBA CNEL interior noise level standard. A typical, unmodified dwelling can provide 25 dB of noise level reduction for interior receptors (Raleigh-Durham International Airport Authority 1994), which is applied to the projected exterior CNEL value to estimate the projected interior CNEL. Therefore, homes exposed to exterior traffic noise levels lower than 70 dBA CNEL (45 + 25 = 70 dBA) would not have their interior noise level exceeding the 45 dBA CNEL standard with windows closed.

Residential homes proposed within the following distance from the roadway centerline without any natural barrier or sound walls providing shielding effect would be potentially exposed to traffic noise levels exceeding 70 dBA CNEL, which would be a potentially significant impact, requiring mitigation measures to ensure that window and exterior door Sound Transmission Class (STC) ratings are sufficient to limit interior noise levels to no greater than 45 dBA CNEL:

- 70 feet, Hawthorn Boulevard between Silver Spur Road and Grayslake Road/Highridge Road:
- 67 feet, Crenshaw Boulevard between the North City limit and Indian Peak Road:
- 65 feet, Western Avenue between the North City Limit and Dilasonde Drive:
- 70 feet, Western Avenue between Dilasonde Drive and Trudie Drive:
- 74 feet, Western Avenue between Trudie Drive and South City Limit:

Stationary Noise Impacts

Future residents of the proposed project would generate and would be exposed to on-site noise sources typical of residential neighborhood related activities including; air conditioning units, lawn care equipment, radio/stereos systems, domestic animals, etc. These noise sources contribute to the ambient noise levels experienced in all similarly-developed areas and typically do not exceed the noise standards for the types of land uses proposed on the project site. In addition, these noise sources are consistent with the planned developments adjacent to the project site. Therefore, residential-related on-site stationary noise impacts would be less than significant.

In addition, stationary noise sources associated with commercial uses with potential loading and unloading activity noise shall be mitigated to comply with the City's Municipal Code. As required in the City's Municipal Code, unless otherwise specified in an approved conditional use permit or other discretionary approval, all deliveries of commercial goods and supplies; trash pick-up, including the use of parking lot trash sweepers; and the operation of machinery or mechanical equipment that emits noise levels in excess of 65 dBA, as measured from the closest property line to the mechanical equipment, shall only be allowed on commercial properties that abut a residential district between the hours of 7:00 a.m. and 6:00 p.m. Monday through Friday and 9:00 a.m. and 5:00 p.m. on Saturday. Therefore, commercial-related stationary noise impacts would be less than significant. No mitigation measures are required.

Aircraft and Train Noise Impacts

The City has no railroad lines either in or abutting the City, and there are currently no regularly scheduled flight paths or aircraft over the Los Angeles International, Long Beach, and Torrance Airports. Therefore, other than occasional aircraft overflight that may result in temporary annoyance, no significant aircraft or train noise impacts would occur. No mitigation measures are required.

Mitigation Measures

Construction Noise

No mitigation measures are required, so long as project proponents implement the BMPs listed above.

Construction Vibration

The following mitigation measures shall be required for development projects to reduce vibration levels generated by construction equipment in proximity to inhabited structures, to avoid significant impacts of human annoyance.

For development projects considered under the Draft General Plan(2015), a project-level vibration analysis would be required if the construction plans for the project would include the use of any of the following:

1. Typical heavy construction equipment within 25 feet of existing inhabited structures. Typical heavy equipment is defined as equipment with an engine size of 600 horsepower or greater and includes: large dozers, large excavators, and large loaders.
2. Vibratory compaction rollers within 80 feet of inhabited structures.
3. Pile drivers are proposed within 150 feet of inhabited structures.

If none of the construction methods mentioned in the enumerated list above are proposed within the described boundaries, no further vibration analysis would be required, since the distances to sensitive receptors would create enough of a buffer to ensure impacts are less that significant.

The purpose of each project-level vibration analysis would be to determine if the specific project-level construction would generate vibration levels exceeding the human perception threshold of 0.1 in/sec PPV at the receptor. Project specific details that would be required in each analysis would include, but not be limited to, actual construction equipment type, sizes, and horsepower to be used, specific locations of each activity, and actual distances from the activity to inhabited buildings. Vibration levels of actual equipment to be used shall be estimated from FTA vibration guidance documents (FTA 2006), attenuated with distance to the inhabited structures, and compared to the Caltrans vibration threshold for human perception. If applicable, the intervening ground between equipment and structures would be considered for its soil properties for additional vibration attenuation.

If the project-specific analysis determines that a project-specific significant impact could occur mitigation shall be required to reduce the impact to less than significant. Alternative construction methods and equipment that generate lower vibration levels shall be considered. Estimated construction vibration levels would be required to not to exceed the vibration threshold of human perception at inhabited buildings (0.1 in/sec PPV at the receptor). Field vibration measurement surveys of actual construction vibration would be considered, as determined to be required by the vibration specialist, as part of construction vibration compliance with the threshold.

Implementation of this mitigation measure would avoid construction ground-borne vibration impacts associated with implementation of the General Plan Update.

Traffic Noise

Outdoor Land Uses

Projects within the following distances from the roadway centerline should consider, to the extent practicable, building a solid wall around outdoor active-use areas (backyard, patio, or balcony, etc.) with a minimum wall height of 5 feet to reduce the exterior noise level to 65 dBA CNEL for residential or other noise-sensitive land uses:

- Hawthorn Boulevard between the North City Limit and Blackhorse Road: 198 feet
- Hawthorn Boulevard between Blackhorse Road and Silver Spur Road: 189 feet
- Hawthorn Boulevard between Silver Spur Road and Grayslake Road/Highridge Road: 269 feet
- Hawthorn Boulevard between Grayslake Road/Highridge Road and Granvia Atlamira/Ridgegate Drive: 179 feet
- Hawthorn Boulevard between Granvia Atlamira/Ridgegate Drive and Eddinghill Drive/Seamount Drive: 134 feet
- Hawthorn Boulevard between Eddinghill Drive/Seamount Drive and Crest Road: 108 feet
- Hawthorn Boulevard between Crest Road and Vallon Drive: 114 feet
- Hawthorn Boulevard Vallon Drive and Palos Verdes Drive West: 108 feet
- Palos Verdes Drive West between the North City Limit and Hawthorne Boulevard: 85.7 feet
- Palos Verdes Drive West between Hawthorne Boulevard and Palos Verdes Drive South: 98.9 feet
- Palos Verdes Drive South between Palos Verdes Drive West and Crestmont Lane/Terranea Way: 104 feet
- Palos Verdes Drive South between Crestmont Lane/Terranea Way and Narcissa Drive: 91 feet
- Palos Verdes Drive South between Narcissa Drive and Palos Verdes Drive East: 77 feet
- Palos Verdes Drive South between Palos Verdes Drive East and the East City Limit: 73 feet
- Palos Verdes Drive East between the North City Limit and Miraleste Drive: 51 feet

- Crenshaw Boulevard between the North City limit and Indian Peak Road: 244 feet
- Crenshaw Boulevard between Indian Peak Road and Crest Road: 123 feet
- Crest Road between Ganado Drive and Northern City Limits: 173 feet
- Crest Road between Palos Verdes Drive East and Ganado Drive: 123 feet
- Miraleste Drive between Palos Verdes Drive East and Via Colinita: 53 feet
- Silver Spur Road between Hawthorne Boulevard and Dry Bank Road: 153 feet
- Western Avenue between the North City Limit and Dilasonde Drive: 256 feet
- Western Avenue between Dilasonde Drive and Trudie Drive: 269 feet
- Western Avenue between Trudie Drive and South City Limit: 283 feet

However, if the design of such a wall would be found ineffectual, due to site-specific conditions such as elevation differences or long set back distances between the roadway and the usable portion of the property, or undesirable, such as obstructing views, project proponents, in consultation with the City, may choose a different method to mitigate noise impacts.

Interior Noise

Residential structures along the following roadway segments proposed within the following distances from the roadway centerline on the vacant parcels and without shielding from natural barrier or sound walls will require mechanical ventilation to ensure that windows can remain closed for a prolonged period of time.

- Hawthorn Boulevard between Silver Spur Road and Grayslake Road/Highridge Road: 70 feet
- Crenshaw Boulevard between the North City limit and Indian Peak Road: 67 feet
- Western Avenue between the North City Limit and Dilasonde Drive: 65 feet
- Western Avenue between Dilasonde Drive and Trudie Drive: 70 feet
- Western Avenue between Trudie Drive and South City Limit: 74 feet

Stationary Sources Noise

No mitigation measures are required.

Aircraft and Train Noise

No mitigation measures are required.

Level of Significance After Mitigation

With implementation of the identified mitigation measures, potential short-term and long-term operational noise impacts would be reduced to below the levels of significance.

Cumulative Impacts

CEQA Guidelines require a discussion of cumulative impacts of a project "when the project's incremental effect is cumulatively considerable" (2011 CEQA Guidelines, Section 15130). As defined by Section 15065 (a)(3) "cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (2011 CEQA Guidelines, Section 15065 (a)(3)). These cumulative impacts are defined as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines Section 15355).

The geographic context for the analysis of cumulative impacts for noise depends on the impact being analyzed. For example, the project's contribution to localized impacts, such as those associated with project construction and project operation/traffic noise, could affect the local neighborhood and project's traffic study area. This cumulative impacts section provides a cumulative impact analysis of the project, but separately for project construction and project operation given the variation of timing of construction and operational activities.

Construction

The construction of the project includes the near-term and future construction of the project-level development under the General Plan Update. The potential future development could occur at any location with the General Plan boundary at any time with no scheduled near-term start date and expected end date. Since the timing or sequencing of individual projects cannot be ascertained with any certainty any quantitative analysis to ascertain the daily construction noise levels of multiple, concurrent construction would be speculative.

The geographic scope for the consideration of cumulative project construction noise impacts would be primarily the areas immediately surrounding the future potential project sites occurring within the boundary, and to a lesser degree, along designated haul routes where heavy construction truck traffic would travel during future project construction periods. Generally, noise impacts are limited to the area directly surrounding the noise source, as noise attenuates with distance at a higher rate in proximity to the source, and only has the potential to combine with other noise sources occurring simultaneously in the immediate vicinity.

The proposed project's noise impacts, when viewed together with the environmental impacts from past, present, and probably future projects, could be cumulatively considerable if ambient noise increases above the increase threshold. The project construction noise was determined to not expose persons to, or generate, noise levels in excess of standards established in the local General Plan or Noise Ordinance, or applicable standards of other agencies. Therefore, noise impacts would be less than significant. However, due primarily to the dense development of the project area, project construction noise would be in proximity to receptors, likely resulting in a potential substantial temporary increase in ambient noise. Therefore, these impacts would be considered significant. However, implementation of proposed mitigation measures would reduce the construction noise impacts to less than a substantial increase in ambient noise levels at residences adjacent to future development, and impacts would be ***less than significant*** with

regard to a temporary substantial increase in ambient noise levels. Therefore, project construction noise would not be of the magnitude to potentially combine with other cumulative projects potentially located in immediate proximity to the project site, where the noise could combine together to cumulatively substantially temporarily increase the ambient noise environment in the project area. Therefore, project construction would not be a cumulatively considerable noise impact.

As previously discussed for vibration, construction activities could result in temporary significant ground-borne vibration impacts that exceed the threshold of human perception at sensitive receptors located within 25 feet. Implementation of mitigation measures would avoid construction ground-borne vibration impacts. Due to the rapid attenuation characteristics of ground-borne vibration, and distance separating construction associated with the project and any other cumulative projects, there is not a likely potential for cumulative vibration impacts. Therefore, cumulative vibration impacts would be less than significant.

Operation

The operation of the project includes operational noise sources include stationary sources (e.g., HVAC systems of buildings) and/or mobile sources (e.g. vehicle trips). The stationary operational noise sources associated with the project would generate operational noise from stationary equipment on each potential future development site. Because noise attenuates with distance from its source, noise impacts from stationary sources would be limited to each of their respective sites and their vicinities. For this reason, the noise associated with stationary noise sources resulting from development would not contribute to a cumulative stationary noise impact.

Vehicular traffic associated with the project would generate mobile operational noise. This analysis first considers whether noise associated with future traffic is an overall cumulative impact. As well, it is considered to what degree the project would contribute to that cumulative noise impact and if that contribution is cumulative.

The overall potential cumulative impact from long-term mobile operational noise pertains to changes in existing roadway noise levels that could result from future traffic volumes associated with anticipated regional growth, including potential future project development. The incremental change for each street segment would be compared to the significance threshold of a 5 dBA CNEL increase. As previously discussed in the Traffic Noise Impacts section, the City's Draft General Plan Update would result in an increase in intensity of development within the City, which would generate additional vehicle traffic on area roadways from the proposed 756 new developments by the buildout year of 2040 in the Draft General Plan Update. As previously shown in Table 10, the estimated future noise levels with the project on area roadway segments based on future traffic volumes in the year 2040 (Translutions, 2017), were compared to the existing traffic noise levels on these segments. The future traffic noise levels with the project are expected to increase from 0.2 and 0.7 dBA CNEL by the year 2040. This range of traffic noise level change is not considered significant, and thus less significant growth-related traffic noise impacts would occur on existing uses throughout the City. Therefore, future traffic noise levels on area roadways with the project would not be cumulatively significant.

As previously discussed for project operation vibration, Ground-borne vibration generated by the potential future project development would be similar to the existing vibration generated by existing operational sources (i.e., similar to traffic vibration on adjacent roadways) in the vicinity. The potential vibration impacts from all operation activities at the closest structure locations would be less than the significance threshold of human perception. As such, vibration impacts associated with operation of the potential future projects would be below the significance threshold, and operation impacts would be less than significant. Due to the rapid attenuation characteristics of ground-borne vibration, vibration levels similar to ambient levels, and distance separating development associated with the project and any other cumulative projects, there is no potential for cumulative vibration impacts. Therefore, cumulative vibration impacts would be less than significant.

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Appendix A
Traffic Noise Calculations

ESA

Project:City of Rancho Palos Verdes General Plan Updates

Roadway/Segment	Speed MPH	Traffic Volumes AM	PM	ADT	Leq ROW	Leq 25 Feet	Leq 50 Feet	CNEL ROW	CNEL 25 Feet	CNEL 50 Feet	Distance, Feet 60 CNEL	65 CNEL	70 CNEL
Existing													
Hawthorne Boulevard, between the North City Limit and Blackhor	40			27034	73.4	70.2	68.4	74.6	71.4	69.6	630	184	43
Hawthorne Boulevard, between Blackhorse Road and Silver Spur	40			25628	73.2	70.0	68.1	74.4	71.2	69.3	600	174	40
Hawthorne Boulevard, between Silver Spur Road and Grayslake	40			35252	74.6	71.3	69.5	75.8	72.6	70.7	837	249	63
Hawthorne Boulevard, between Grayslake Road - Highridge Roa	40			24804	73.0	69.8	68.0	74.3	71.0	69.2	586	170	38
Hawthorne Boulevard, between Granvia Atlamira - Ridgegate Dri	40			18974	71.9	68.6	66.8	73.1	69.9	68.0	439	123	24
Future													
Hawthorne Boulevard, between the North City Limit and Blackhor	40			28851	73.7	70.5	68.6	74.9	71.7	69.9	677	198	47
Hawthorne Boulevard, between Blackhorse Road and Silver Spur	40			27350	73.5	70.2	68.4	74.7	71.5	69.6	645	189	44
Hawthorne Boulevard, between Silver Spur Road and Grayslake	40			37621	74.9	71.6	69.8	76.1	72.8	71.0	899	269	70
Hawthorne Boulevard, between Grayslake Road - Highridge Roa	40			26471	73.3	70.1	68.3	74.5	71.3	69.5	615	179	41
Hawthorne Boulevard, between Granvia Atlamira - Ridgegate Dri	40			20249	72.2	68.9	67.1	73.4	70.1	68.3	472	134	27

Summary	CNEL 25 ft. from ROW Project Increment	Cumulative Increment	At ROW Project Increment	Cumulative Increment
Hawthorne Boulevard, between the North City Limit and Blackhor	0.3	71.7	0.3	74.9
Hawthorne Boulevard, between Blackhorse Road and Silver Spur	0.3	71.5	0.3	74.7
Hawthorne Boulevard, between Silver Spur Road and Grayslake	0.2	72.8	0.3	76.1
Hawthorne Boulevard, between Grayslake Road - Highridge Roa	0.3	71.3	0.2	74.5
Hawthorne Boulevard, between Granvia Atlamira - Ridgegate Dri	0.2	70.1	0.3	73.4

% of ADT				
Vehicle Type	Day	Eve	Night	Sub total
Auto	77.6%	9.7%	9.7%	97.0%
Medium Truck	1.6%	0.2%	0.2%	2.0%
Heavy Truck	0.8%	0.1%	0.1%	1.0%
	80.0%	10.0%	10.0%	100.0%

ESA

Project:City of Rancho Palos Verdes General Plan Updates

Roadway/Segment	Speed MPH	Traffic Volumes AM	PM	ADT	Leq ROW	Leq 25 Feet	Leq 50 Feet	CNEL ROW	CNEL 25 Feet	CNEL 50 Feet	Distance, Feet 60 CNEL	65 CNEL	70 CNEL
Existing													
Hawthorne Boulevard, Between Eddinghill Drive - Seamount Driv	40			15821	71.1	67.9	66.0	72.3	69.1	67.2	362	99	16
Hawthorne Boulevard, Between Crest Road and Vallon Drive	40			16591	71.3	68.1	66.2	72.5	69.3	67.4	380	105	18
Hawthorne Boulevard, Between Vallon Drive and Palos Verdes D	40			15766	71.1	67.8	66.0	72.3	69.1	67.2	362	99	16
Palos Verdes Drive West, Between the North City Limit and Hawt	40			13071	70.3	67.0	65.2	71.5	68.2	66.4	297	78	9
Palos Verdes Drive West, Between Hawthorne Boulevard and Pa	40			14688	70.8	67.5	65.7	72.0	68.8	66.9	336	91	13
Future													
Hawthorne Boulevard, Between Eddinghill Drive - Seamount Driv	40			16884	71.4	68.1	66.3	72.6	69.4	67.5	389	108	19
Hawthorne Boulevard, Between Crest Road and Vallon Drive	40			17706	71.6	68.3	66.5	72.8	69.6	67.7	408	114	21
Hawthorne Boulevard, Between Vallon Drive and Palos Verdes D	40			16825	71.4	68.1	66.3	72.6	69.3	67.5	389	108	19
Palos Verdes Drive West, Between the North City Limit and Hawt	40			13949	70.5	67.3	65.5	71.8	68.5	66.7	320	86	12
Palos Verdes Drive West, Between Hawthorne Boulevard and Pa	40			15675	71.1	67.8	66.0	72.3	69.0	67.2	362	99	16

Summary	CNEL 25 ft. from ROW Project Increment	Cumulative Increment	At ROW Project Increment	Cumulative Increment
Hawthorne Boulevard, Between Eddinghill Drive - Seamount Driv	0.3	69.4	0.3	72.6
Hawthorne Boulevard, Between Crest Road and Vallon Drive	0.3	69.6	0.3	72.8
Hawthorne Boulevard, Between Vallon Drive and Palos Verdes D	0.2	69.3	0.3	72.6
Palos Verdes Drive West, Between the North City Limit and Hawt	0.3	68.5	0.3	71.8
Palos Verdes Drive West, Between Hawthorne Boulevard and Pa	0.2	69.0	0.3	72.3

% of ADT				
Vehicle Type	Day	Eve	Night	Sub total
Auto	77.6%	9.7%	9.7%	97.0%
Medium Truck	1.6%	0.2%	0.2%	2.0%
Heavy Truck	0.8%	0.1%	0.1%	1.0%
	80.0%	10.0%	10.0%	100.0%

ESA

Project:City of Rancho Palos Verdes General Plan Updates

Roadway/Segment	Speed MPH	Traffic Volumes AM	PM	ADT	Leq ROW	Leq 25 Feet	Leq 50 Feet	CNEL ROW	CNEL 25 Feet	CNEL 50 Feet	Distance, Feet 60 CNEL	65 CNEL	70 CNEL
Existing													
Palos Verdes Drive South, Between Palos Verdes Drive West and	40			14560	72.6	68.3	66.2	73.9	69.5	67.4	533	98	21
Palos Verdes Drive South, Between Crestmont Lane - Terranea V	40			12809	72.1	67.7	65.6	73.3	69.0	66.8	461	84	17
Palos Verdes Drive South,Between Narcissa Drive and Palos Ver	35			14612	73.1	67.6	65.2	74.4	68.8	66.4	427	73	17
Palos Verdes Drive South,Between Palos Verdes Drive East and	35			13797	72.9	67.3	64.9	74.1	68.5	66.2	397	68	15
Palos Verdes Drive East, Between the North City Limit and Mirale	35			10078	71.5	65.9	63.6	72.7	67.2	64.8	283	47	8
Future													
Palos Verdes Drive South, Between Palos Verdes Drive West and	40			15538	72.9	68.6	66.5	74.1	69.8	67.7	559	104	23
Palos Verdes Drive South, Between Crestmont Lane - Terranea V	40			13670	72.4	68.0	65.9	73.6	69.2	67.1	496	91	19
Palos Verdes Drive South,Between Narcissa Drive and Palos Ver	35			15594	73.4	67.8	65.5	74.6	69.1	66.7	448	77	18
Palos Verdes Drive South,Between Palos Verdes Drive East and	35			14724	73.2	67.6	65.2	74.4	68.8	66.4	427	73	17
Palos Verdes Drive East, Between the North City Limit and Mirale	35			10755	71.8	66.2	63.9	73.0	67.4	65.1	305	51	10

CNEL

Summary Roadway/Segment	25 ft. from ROW Project Increment	25 ft. from ROW Cumulative Increment	At ROW Project Increment	At ROW Cumulative Increment
Palos Verdes Drive South, Between Palos Verdes Drive West and	0.3	69.8	0.2	74.1
Palos Verdes Drive South, Between Crestmont Lane - Terranea V	0.2	69.2	0.3	73.6
Palos Verdes Drive South,Between Narcissa Drive and Palos Ver	0.3	69.1	0.2	74.6
Palos Verdes Drive South,Between Palos Verdes Drive East and	0.3	68.8	0.3	74.4
Palos Verdes Drive East, Between the North City Limit and Mirale	0.2	67.4	0.3	73.0

	% of ADT			
Vehicle Type	Day	Eve	Night	Sub total
Auto	77.6%	9.7%	9.7%	97.0%
Medium Truck	1.6%	0.2%	0.2%	2.0%
Heavy Truck	0.8%	0.1%	0.1%	1.0%
	80.0%	10.0%	10.0%	100.0%

ESA

Project:City of Rancho Palos Verdes General Plan Updates

Roadway/Segment	Speed MPH	Traffic Volumes AM	PM	ADT	Leq ROW	Leq 25 Feet	Leq 50 Feet	CNEL ROW	CNEL 25 Feet	CNEL 50 Feet	Distance, Feet 60 CNEL	65 CNEL	70 CNEL
Existing													
Palos Verdes Drive East,Between Miraleste Drive and Crest Road	35			7754	70.4	64.8	62.4	71.6	66.0	63.7	216	34	4
Palos Verdes Drive East,Between Crest Road and Ganado Drive	35			3627	65.3	60.9	58.8	66.5	62.1	60.0	78	6	-8
Palos Verdes Drive East,Between Ganado Drive and Palos Verde	35			2854	66.1	60.5	58.1	67.3	61.7	59.3	70	7	-4
Crenshaw Boulevard,Between the North City Limit and Indian Pea	40			31439	76.0	71.6	69.5	77.2	72.9	70.7	1165	227	62
Crenshaw Boulevard,Between Indian Peak Road and Crest Road	40			16432	71.3	68.0	66.2	72.5	69.2	67.4	380	105	18
Future													
Palos Verdes Drive East,Between Miraleste Drive and Crest Road	35			8275	70.7	65.1	62.7	71.9	66.3	63.9	233	37	5
Palos Verdes Drive East,Between Crest Road and Ganado Drive	35			3871	65.5	61.2	59.1	66.8	62.4	60.3	86	8	-8
Palos Verdes Drive East,Between Ganado Drive and Palos Verde	35			3046	66.3	60.7	58.4	67.6	62.0	59.6	77	8	-4
Crenshaw Boulevard,Between the North City Limit and Indian Pea	40			33552	76.3	71.9	69.8	77.5	73.1	71.0	1250	244	67
Crenshaw Boulevard,Between Indian Peak Road and Crest Road	40			19186	71.9	68.7	66.9	73.1	69.9	68.1	439	123	24

Summary	CNEL 25 ft. from ROW Project Increment	Cumulative Increment	At ROW Project Increment	Cumulative Increment
Palos Verdes Drive East,Between Miraleste Drive and Crest Road	0.3	66.3	0.3	71.9
Palos Verdes Drive East,Between Crest Road and Ganado Drive	0.3	62.4	0.3	66.8
Palos Verdes Drive East,Between Ganado Drive and Palos Verde	0.3	62.0	0.3	67.6
Crenshaw Boulevard,Between the North City Limit and Indian Pea	0.2	73.1	0.3	77.5
Crenshaw Boulevard,Between Indian Peak Road and Crest Road	0.7	69.9	0.6	73.1

% of ADT				
Vehicle Type	Day	Eve	Night	Sub total
Auto	77.6%	9.7%	9.7%	97.0%
Medium Truck	1.6%	0.2%	0.2%	2.0%
Heavy Truck	0.8%	0.1%	0.1%	1.0%
	80.0%	10.0%	10.0%	100.0%

ESA

Project:City of Rancho Palos Verdes General Plan Updates

Roadway/Segment	Speed MPH	Traffic Volumes AM	PM	ADT	Leq ROW	Leq 25 Feet	Leq 50 Feet	CNEL ROW	CNEL 25 Feet	CNEL 50 Feet	Distance, Feet 60 CNEL	65 CNEL	70 CNEL
Existing													
Crenshaw Boulevard, South of Crest Road	35			7754	68.1	64.0	62.0	69.3	65.3	63.2	121	27	-2
Crest Road, Between Hawthorne Boulevard and Highridge Road	40			3627	64.7	61.5	59.6	65.9	62.7	60.8	65	5	-14
Crest Road,Between Highridge Road and Crenshaw Boulevard	40			2854	63.7	60.4	58.6	64.9	61.6	59.8	47	-1	-11
Crest Road,Ganado Drive and Northern City Limits	35			31439	74.2	70.1	68.1	75.4	71.3	69.3	542	160	40
Crest Road,Palos Verdes Drive East and Ganado Drive	40			16432	71.3	68.0	66.2	72.5	69.2	67.4	380	105	18
Future													
Crenshaw Boulevard, South of Crest Road	35			8275	68.4	64.3	62.3	69.6	65.5	63.5	131	30	-1
Crest Road, Between Hawthorne Boulevard and Highridge Road	40			3871	65.0	61.7	59.9	66.2	63.0	61.1	72	7	-13
Crest Road,Between Highridge Road and Crenshaw Boulevard	40			3046	65.4	61.3	59.3	66.6	62.6	60.5	81	10	-9
Crest Road,Ganado Drive and Northern City Limits	35			33552	74.5	70.4	68.3	75.7	71.6	69.6	582	173	44
Crest Road,Palos Verdes Drive East and Ganado Drive	40			19186	71.9	68.7	66.9	73.1	69.9	68.1	439	123	24

CNEL

Summary	25 ft. from ROW		At ROW	
Roadway/Segment	Project Increment	Cumulative Increment	Project Increment	Cumulative Increment
Crenshaw Boulevard, South of Crest Road	0.2	65.5	0.3	69.6
Crest Road, Between Hawthorne Boulevard and Highridge Road	0.3	63.0	0.3	66.2
Crest Road,Between Highridge Road and Crenshaw Boulevard	1.0	62.6	1.7	66.6
Crest Road,Ganado Drive and Northern City Limits	0.3	71.6	0.3	75.7
Crest Road,Palos Verdes Drive East and Ganado Drive	0.7	69.9	0.6	73.1

	% of ADT			
Vehicle Type	Day	Eve	Night	Sub total
Auto	77.6%	9.7%	9.7%	97.0%
Medium Truck	1.6%	0.2%	0.2%	2.0%
Heavy Truck	0.8%	0.1%	0.1%	1.0%
	80.0%	10.0%	10.0%	100.0%

ESA

Project:City of Rancho Palos Verdes General Plan Updates

Roadway/Segment	Speed MPH	Traffic Volumes AM	PM	ADT	Leq ROW	Leq 25 Feet	Leq 50 Feet	CNEL ROW	CNEL 25 Feet	CNEL 50 Feet	Distance, Feet 60 CNEL	65 CNEL	70 CNEL
Existing													
Crestridge Road, Between Highridge Road and Crenshaw Boulev	35			6969	65.7	62.7	60.9	66.9	63.9	62.2	63	14	-13
Highridge Road,Between Hawthorne Boulevard and the City Limit	35			8806	68.7	64.6	62.5	69.9	65.8	63.7	141	34	0
Indian Peak Road, Between Crenshaw Boulevard and the City Lir	35			6367	67.3	63.2	61.1	68.5	64.4	62.3	98	20	-5
Miraleste Drive, Between Palos Verdes Drive East and Via Colinit	35			12997	68.4	65.4	63.7	69.6	66.6	64.9	131	48	-2
Miraleste Drive, Between Via Colinita and City's Limit at 9th Stree	35			6310	65.2	62.3	60.5	66.5	63.5	61.7	56	11	-14
Future													
Crestridge Road, Between Highridge Road and Crenshaw Boulev	35			7437	66.0	63.0	61.2	67.2	64.2	62.4	68	17	-12
Highridge Road,Between Hawthorne Boulevard and the City Limit	35			9398	69.0	64.9	62.8	70.2	66.1	64.0	152	37	1
Indian Peak Road, Between Crenshaw Boulevard and the City Lir	35			6795	67.5	63.5	61.4	68.8	64.7	62.6	106	23	-4
Miraleste Drive, Between Palos Verdes Drive East and Via Colinit	35			13870	68.7	65.7	63.9	69.9	66.9	65.1	141	53	-1
Miraleste Drive, Between Via Colinita and City's Limit at 9th Stree	35			6734	65.5	62.5	60.8	66.7	63.8	62.0	59	12	-14

CNEL

Summary Roadway/Segment	25 ft. from ROW Project Increment	25 ft. from ROW Cumulative Increment	At ROW Project Increment	At ROW Cumulative Increment
Crestridge Road, Between Highridge Road and Crenshaw Boulev	0.3	64.2	0.3	67.2
Highridge Road,Between Hawthorne Boulevard and the City Limit	0.3	66.1	0.3	70.2
Indian Peak Road, Between Crenshaw Boulevard and the City Lir	0.3	64.7	0.3	68.8
Miraleste Drive, Between Palos Verdes Drive East and Via Colinit	0.3	66.9	0.3	69.9
Miraleste Drive, Between Via Colinita and City's Limit at 9th Stree	0.3	63.8	0.2	66.7

% of ADT Vehicle Type	Day	Eve	Night	Sub total
Auto	77.6%	9.7%	9.7%	97.0%
Medium Truck	1.6%	0.2%	0.2%	2.0%
Heavy Truck	0.8%	0.1%	0.1%	1.0%
	80.0%	10.0%	10.0%	100.0%

ESA

Project:City of Rancho Palos Verdes General Plan Updates

Roadway/Segment	Speed MPH	Traffic Volumes AM	PM	ADT	Leq ROW	Leq 25 Feet	Leq 50 Feet	CNEL ROW	CNEL 25 Feet	CNEL 50 Feet	Distance, Feet 60 CNEL	65 CNEL	70 CNEL
Existing													
Montemalaga Road, Between Silver Spur Road and Rolling Hills	35			7756	66.1	63.2	61.4	67.3	64.4	62.6	70	18	-12
Silver Spur Road, Between the North City Limit and just north of H	35			12434	67.5	64.9	63.2	68.7	66.1	64.4	126	40	-8
Silver Spur Road, Between Hawthorne Boulevard and Dry Bank R	40			16898	69.7	67.3	65.7	70.9	68.5	66.9	256	96	6
Western Avenue, Between the North City Limit and Dilasonde Dri	40			34007	74.4	71.2	69.4	75.6	72.4	70.6	799	237	60
Western Avenue, Between Dilasonde Drive and Trudie Drive	40			35575	74.6	71.4	69.5	75.8	72.6	70.8	837	249	63
Future													
Montemalaga Road, Between Silver Spur Road and Rolling Hills	35			8277	66.4	63.4	61.7	67.6	64.7	62.9	77	21	-11
Silver Spur Road, Between the North City Limit and just north of H	35			13270	67.8	65.2	63.5	69.0	66.4	64.7	136	45	-6
Silver Spur Road, Between Hawthorne Boulevard and Dry Bank R	40			18680	71.3	68.3	66.6	72.5	69.5	67.8	380	153	20
Western Avenue, Between the North City Limit and Dilasonde Dri	40			36292	74.7	71.5	69.6	75.9	72.7	70.8	858	256	65
Western Avenue, Between Dilasonde Drive and Trudie Drive	40			37966	74.9	71.7	69.8	76.1	72.9	71.0	899	269	70

Summary	CNEL 25 ft. from ROW Project Increment	Cumulative Increment	At ROW Project Increment	Cumulative Increment
Montemalaga Road, Between Silver Spur Road and Rolling Hills	0.3	64.7	0.3	67.6
Silver Spur Road, Between the North City Limit and just north of H	0.3	66.4	0.3	69.0
Silver Spur Road, Between Hawthorne Boulevard and Dry Bank R	1.0	69.5	1.6	72.5
Western Avenue, Between the North City Limit and Dilasonde Dri	0.3	72.7	0.3	75.9
Western Avenue, Between Dilasonde Drive and Trudie Drive	0.3	72.9	0.3	76.1

Vehicle Type	% of ADT Day	Eve	Night	Sub total
Auto	77.6%	9.7%	9.7%	97.0%
Medium Truck	1.6%	0.2%	0.2%	2.0%
Heavy Truck	0.8%	0.1%	0.1%	1.0%
	80.0%	10.0%	10.0%	100.0%

ESA

Project:City of Rancho Palos Verdes General Plan Updates

Roadway/Segment	Speed MPH	Traffic Volumes AM	PM	ADT	Leq ROW	Leq 25 Feet	Leq 50 Feet	CNEL ROW	CNEL 25 Feet	CNEL 50 Feet	Distance, Feet 60 CNEL	65 CNEL	70 CNEL
0	0			0	-	-	-	-	-	-	-	-	-
Existing													
Roadway/Segment	**Speed MPH**	**Traffic Volumes AM**	**PM**	**ADT**	**Leq ROW**	**Leq 25 Feet**	**Leq 50 Feet**	**CNEL ROW**	**CNEL 25 Feet**	**CNEL 50 Feet**	**Distance, Feet 60 CNEL**	**65 CNEL**	**70 CNEL**
Western Avenue, Between Trudie Drive and South City Limit	40			37152	74.8	71.6	69.7	76.0	72.8	70.9	878	262	67
0	0			0	-	-	-	-	-	-	-	-	-
0	0			0	-	-	-	-	-	-	-	-	-
0	0			0	-	-	-	-	-	-	-	-	-
0	0			0	-	-	-	-	-	-	-	-	-
Future													
Roadway/Segment	**Speed MPH**	**Traffic Volumes AM**	**PM**	**ADT**	**Leq ROW**	**Leq 25 Feet**	**Leq 50 Feet**	**CNEL ROW**	**CNEL 25 Feet**	**CNEL 50 Feet**	**Distance, Feet 60 CNEL**	**65 CNEL**	**70 CNEL**
Western Avenue, Between Trudie Drive and South City Limit	40			39649	75.1	71.8	70.0	76.3	73.1	71.2	942	283	74
0	0			0	-	-	-	-	-	-	-	-	-
0	0			0	-	-	-	-	-	-	-	-	-
0	0			0	-	-	-	-	-	-	-	-	-
0	0			0	-	-	-	-	-	-	-	-	-

Summary	CNEL 25 ft. from ROW Project Increment	Cumulative Increment	At ROW Project Increment	Cumulative Increment
Roadway/Segment				
Western Avenue, Between Trudie Drive and South City Limit	0.3	73.1	0.3	76.3
0	-	-	-	-
0	-	-	-	-
0	-	-	-	-
0	-	-	-	-

% of ADT				
Vehicle Type	**Day**	**Eve**	**Night**	**Sub total**
Auto	77.6%	9.7%	9.7%	97.0%
Medium Truck	1.6%	0.2%	0.2%	2.0%
Heavy Truck	0.8%	0.1%	0.1%	1.0%
	80.0%	10.0%	10.0%	100.0%