APPENDIX I

ACOUSTICAL ASSESSMENT

Acoustical Assessment

The Koll Center Residences

Michael Baker
INTERNATIONAL

ACOUSTICAL ANALYSIS

FOR THE

KOLL CENTER RESIDENCES PROJECT

CITY OF NEWPORT BEACH, CALIFORNIA

SEPTEMBER 2017

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1.0 Introduction

1.0 INTRODUCTION

This report documents the results of an acoustical analysis completed for the Koll Center Residences Project, a 12.56-acre development project at 4400 Von Karman Avenue in Newport Beach, California. This report describes the existing noise environment in the project area and evaluates potential short- and long-term noise and groundborne vibration impacts associated with project development.

1.1 PROJECT LOCATION

The Koll Center Residences Project site in Newport Beach, California located west of Birch Street, east of and Von Karman Avenue, and north of Jamboree Road. The project site is surrounded by commercial land uses in all directions. Existing multi-family residences are located east of the project site. Major transportation facilities in the vicinity of the proposed project site include Interstate 405 located approximately 1.2 miles to the north; refer to Exhibit 1**,** *Regional Vicinity***,** and Exhibit 2**,** *Site Vicinity*.

1.2 PROJECT DESCRIPTION

The Koll Center Residences Project proposes to demolish 819 parking spots in order to make way for the construction of 260 luxury residential condominiums, 3,000 square feet (sf) of neighborhood serving retail, a 490 stand-alone stall parking garage and a 1.19-acre public park. The condominiums consist of (3) multi-floor residential towers, 13 stories of residential over 2 levels above grade parking and 2-3 levels below grade parking, with retail at ground level. Refer to Exhibit 3, *Site Plan*.

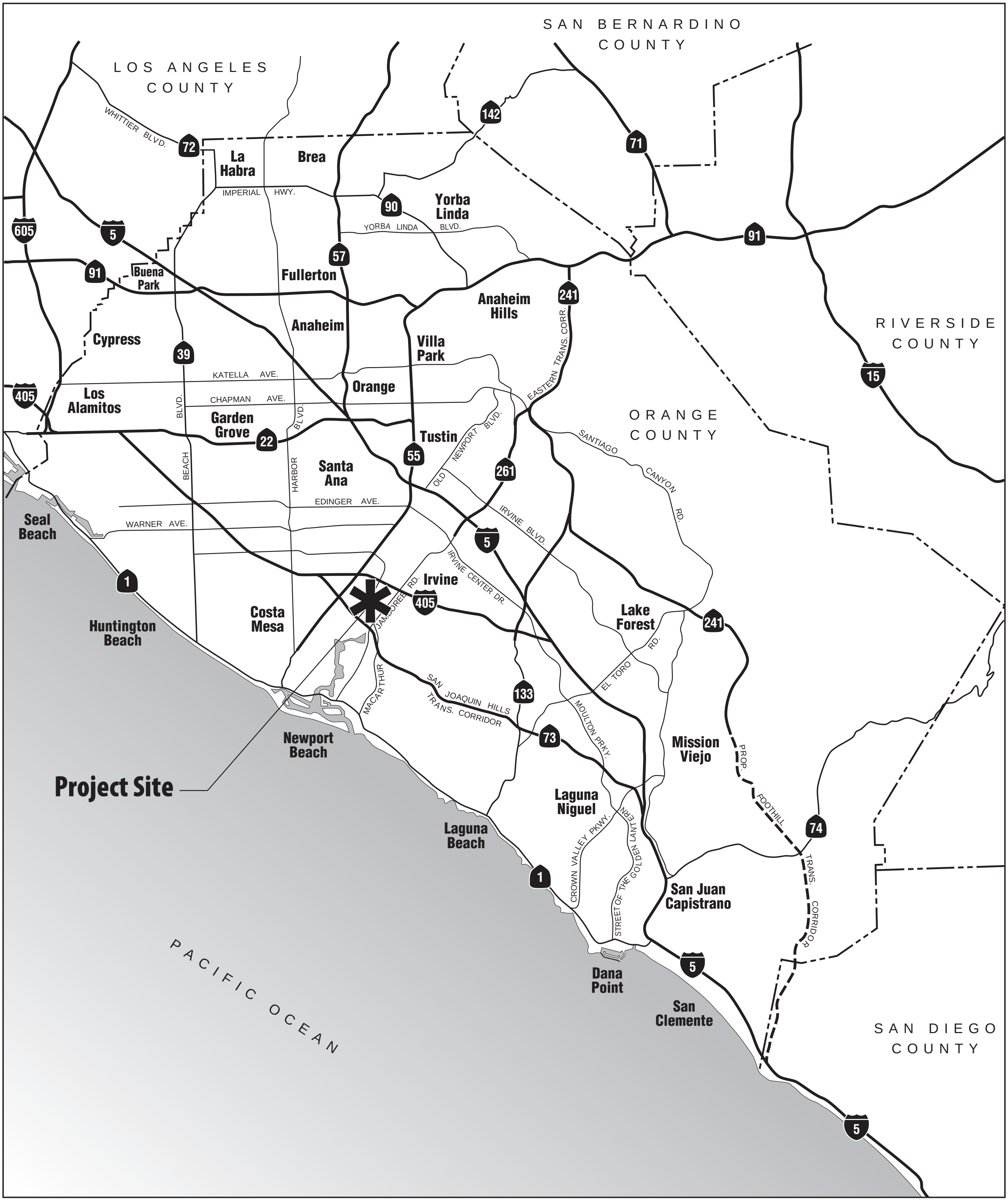
Each residential tower would include mix of one-bedroom, two-bedroom, and three-bedroom residential condominium units. The units would be configured as flats ranging in size from approximately 1,240 sf to 3,160 sf with private balconies. Each residence would have a semi-private access through a private lobby in each building or from a secured residents-only area of the parking garage. Private amenities would be located on the third-story of each building (podium) which are proposed to include a club room, pool, spa, pool deck with shower and restroom, lawn, amenity courtyard, fitness area, and bocce ball courts. Each building would have conference centers that could be used by residents for business uses.

Building 1: Tower 1

Building 1 is proposed as a 13-story podium residential building with five levels of structured parking (3 levels below ground and 2 levels above ground), and street level retail uses. Tower 1 would have 87 residential units, as well as a multi-level penthouse unit on the top level of the building.

Building 2: Tower 1 and Tower 2

Building 2 includes two, 13-story podium residential towers with common parking and amenities. Building 2 would have four levels of structured parking (2 levels below ground and 2 levels above ground) with street level retail uses. Tower 2 and Tower 3 are proposed to have 86 and 87 residential units, respectively.



Subject Site

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Regional Vicinity

Exhibit 1

Source: Google Earth Pro, April 2017

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Site Vicinity

Exhibit 2

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THE KOLL CENTER RESIDENCES • ACOUSTICAL ASSESSMENT

Site Plan

Exhibit 3

Construction Activities and Phasing

Implementation of the proposed project would be phased over a four-year period with demolition and construction activities anticipated to commence in the first quarter of 2018 and construction completed in the third quarter of 2022. A free-standing parking structure would be constructed prior to the first residential building (Building 1) to replace surface parking temporarily and permanently displaced. Completion of the parking structure would be followed by Building 1, and then Buildings 2 and 3. The project site would be graded, and foundation excavation would require 127,730 CY of cut and removal of approximately 118,504 cubic yards (CY) of soil in total.

Implementation of the project would displace approximately 819 parking spaces associated with the existing office buildings. While a portion of the spaces would be replaced as surface parking around the proposed residential buildings, other spaces would be permanently displaced for the three buildings, a one-acre public park, and free-standing parking structure.

Phase A. Phase A includes the demolition of approximately 137 surface parking spaces to allow for the construction of a free-standing 490-stall parking structure. The approximately 50-foot-high parking structure would include three levels of below-ground parking and five levels of above-ground parking and roof deck parking. Valet parking is proposed for the use of office employees and visitors during the construction of the parking structure. Phase A would begin in advance of breaking ground on the remainder of the residential buildings. Grading associated with the parking structure would be approximately 24,726 CY of cut with approximately 24,139 CY of export from the project site. Construction activities are anticipated to occur over an approximate 10-month timeframe.

Phase 1. Phase 1 includes the demolition of approximately 307 surface parking spaces to allow for the construction of the first residential building. Accessible parking spaces for the 4440 Von Karman office building and the trash enclosure would be relocated from the south side to the north side of the building, and surface parking improvements adjacent to the building would be provided.

Building 1 would be located adjacent to Birch Street and adjacent to the office building located at 4910 Birch Street within the boundaries of the project site. Building 1 includes 87 residential units with 5 levels of parking (2 levels above-grade and 3 levels of below-grade parking), and approximately 1,768 sf of retail uses on the ground level of Building 1. The parking garages within the buildings would be gated. The displaced parking would be replaced in the new free-standing parking structure and at Building 1. Construction associated with Building 1 would require approximately 56,699 CY of cut and 51,951 CY of export. Construction activities are anticipated to occur over an approximate 22-month timeframe.

Phase 2. Phase 2 includes the demolition of approximately 243 office parking spaces to allow for the construction of Building 2 and Building 3. Building 2 would be located adjacent to and south of Building 1. Building 3 would be located southwest of Building 2. Buildings 2 and 3 include 86 and 87 residential units, respectively, 4 levels of parking (2 levels of above-grade and 2 levels of below-grade parking), and approximately 1,232 sf of retail on the ground level of Building 2. The displaced parking would be replaced with the new free-standing parking structure and Phase 1 parking garage in Building 1. Buildings 2 and 3 require approximately 46,306 CY of cut and 42,414 CY of cut of export from the project site. Construction activities are anticipated to occur over an approximate 22-month timeframe.

Phase 3. Phase 3 includes the demolition of approximately 132 parking spaces to allow for the construction of the public park and the reconfiguration of on-site surface parking and access. The displaced parking is replaced in the new free-standing parking structure. Construction activities are anticipated to occur over an approximate 6- to 9-month timeframe.

2.0 Acoustical Analysis

2.0 ACOUSTICAL ANALYSIS

2.1 FUNDAMENTALS OF SOUND AND ENVIRONMENTAL NOISE

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound and is expressed as cycles per second, or hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as airborne sound that is loud, unpleasant, unexpected, or undesired and may therefore be classified as a more specific group of sounds. A typical noise environment consists of a base of steady background noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this background noise is the sound from individual local sources. These sources can vary from an occasional aircraft or train passing by to virtually continuous noise from, for example, traffic on a major highway. Perceptions of sound and noise are highly subjective from person to person.

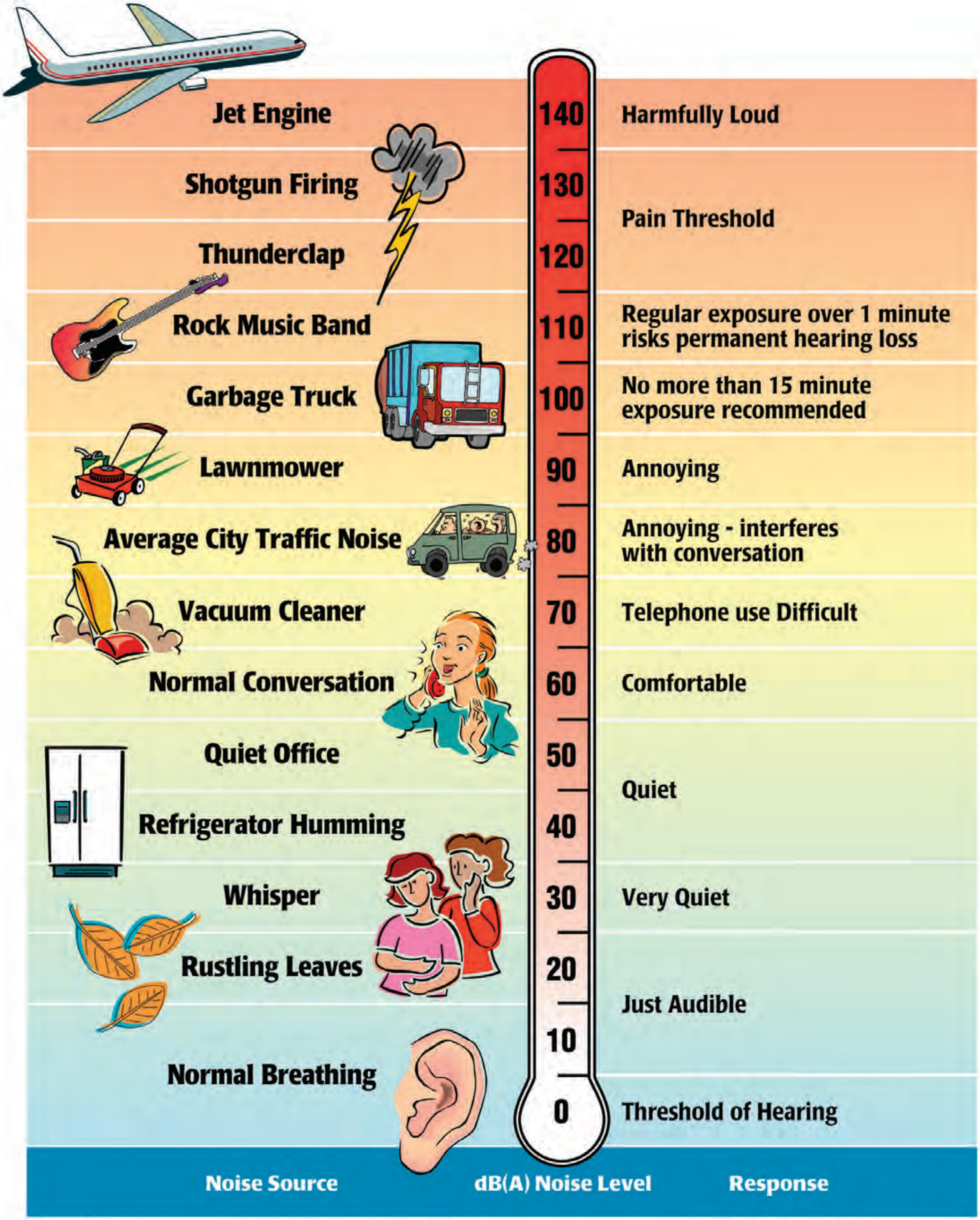
Measuring sound directly in terms of pressure would require a large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals) as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent on many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this analysis are in terms of A-weighted levels, but are expressed as dB, unless otherwise noted.

Addition of Decibels

The decibel scale is logarithmic, not linear, and therefore sound levels cannot be added or subtracted through ordinary arithmetic. Two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70 dBA sound is half as loud as an 80 dBA sound and twice as loud as a 60 dBA sound. When two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions (FTA 2006). Under the decibel scale, three sources of equal loudness together would produce an increase of 5 dB.

Typical noise levels associated with common noise sources are depicted in Exhibit 4, *Common Environmental Noise Levels*.



Source:

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

Common Environmental Noise Levels

Sound Propagation and Attenuation

Sound spreads (propagates) uniformly outward in a spherical pattern, and the sound level decreases (attenuates) at a rate of approximately 6 dB for each doubling of distance from a stationary or point source. Sound from a line source, such as a highway, propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of approximately 3 dB for each doubling of distance from a line source, such as a roadway, depending on ground surface characteristics (FHWA 2011). No excess attenuation is assumed for hard surfaces like a parking lot or a body of water. Soft surfaces, such as soft dirt or grass, can absorb sound, so an excess ground-attenuation value of 1.5 dB per doubling of distance is normally assumed. For line sources, an overall attenuation rate of 3 dB per doubling of distance is assumed (FHWA 2011).

Noise levels may also be reduced by intervening structures; generally, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm reduces noise levels by 5 to 10 dBA (FHWA 2006). The manner in which older homes in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows. The exterior-to-interior reduction of newer residential units is generally 30 dBA or more.

Noise Descriptors

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Several rating scales have been developed to analyze the adverse effect of community noise on people. Because environmental noise fluctuates over time, these scales consider that the effect of noise on people is largely dependent on the total acoustical energy content of the noise, as well as the time of day when the noise occurs. The L_{eq} is a measure of ambient noise, while the L_{dn} and CNEL are measures of community noise. Each is applicable to this analysis and defined in Table 1, *Definitions of Acoustical Terms*.

The A-weighted decibel sound level scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends on the distance between the receptor and the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

TABLE 1
DEFINITIONS OF ACOUSTICAL TERMS

Term	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micropascals (or 20 micronewtons per square meter), where 1 pascal is the pressure resulting from a force of 1 newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micropascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	A 24-hour average L_{eq} with a 10 dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.4 dBA L_{dn}.
Community Noise Equivalent Level, CNEL	A 24-hour average L_{eq} with a 5 dBA "weighting" during the hours of 7:00 p.m. to 10:00 p.m. and a 10 dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.7 dBA CNEL.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends on its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: Cyril M. Harris, *Handbook of Noise Control*, 1979.

Human Response to Noise

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of actual physiological damage, such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities, including sleep, speech, recreation, and tasks that demand concentration or coordination. Hearing loss can occur at the highest noise intensity levels.

Noise environments and consequences of human activities are usually well represented by median noise levels during the day or night or over a 24-hour period. Environmental noise levels are generally considered low when the CNEL is below 60 dBA, moderate in the 60 to 70 dBA range, and high above 70 dBA. Examples of low daytime levels are isolated, natural settings with noise levels as low as 20 dBA and quiet, suburban, residential streets with noise levels around 40 dBA. Noise levels above 45 dBA at night can disrupt sleep. Examples of moderate-level noise environments are urban residential or semi-commercial areas (typically 55 to 60 dBA) and commercial locations (typically 60 dBA). People may consider louder environments adverse, but most will accept the higher levels associated with noisier urban residential or residential-commercial areas (60 to 75 dBA) or dense urban or industrial areas (65 to 80 dBA). Regarding increases in A-weighted noise levels (dBA), the following relationships should be noted in understanding this analysis:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived by humans.
- Outside of the laboratory, a 3 dBA change is considered a just-perceivable difference.
- A change in level of at least 5 dBA is required before any noticeable change in community response would be expected. An increase of 5 dBA is typically considered substantial.
- A 10 dBA change is subjectively heard as an approximate doubling in loudness and would almost certainly cause an adverse change in community response.

Effects of Noise on People

Hearing Loss

While physical damage to the ear from an intense noise impulse is rare, a degradation of auditory acuity can occur even within a community noise environment. Hearing loss occurs mainly due to chronic exposure to excessive noise, but may be due to a single event such as an explosion. Natural hearing loss associated with aging may also be accelerated from chronic exposure to loud noise.

The Occupational Safety and Health Administration (OSHA) has a noise exposure standard that is set at the noise threshold where hearing loss may occur from long-term exposures. The maximum allowable level is 90 dBA averaged over 8 hours. If the noise is above 90 dBA, the allowable exposure time is correspondingly shorter.

Annoyance

Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The L_{dn} as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. For ground vehicles, a noise level of about 55 dBA L_{dn} is the threshold at which a substantial percentage of people begin to report annoyance.

2.2 FUNDAMENTALS OF ENVIRONMENTAL GROUNDBORNE VIBRATION

Sources of earthborne vibrations include natural phenomena (earthquakes, volcanic eruptions, sea waves, landslides, etc.) or man-made causes (explosions, machinery, traffic, trains, construction equipment, etc.). Vibration sources may be continuous (e.g., factory machinery) or transient (e.g., explosions).

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One is the peak particle velocity (PPV); another is the root mean square (RMS) velocity. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. The RMS velocity is defined as the average of the squared amplitude of the signal. The PPV and RMS vibration velocity amplitudes are used to evaluate human response to vibration.

Table 2, *Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibration Levels*, displays the reactions of people and the effects on buildings produced by continuous vibration levels. The annoyance levels shown in the table should be interpreted with care since vibration may be found to be annoying at much lower levels than those listed, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. In high noise environments, which are more prevalent where groundborne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

TABLE 2
HUMAN REACTION AND DAMAGE TO BUILDINGS FOR CONTINUOUS OR FREQUENT INTERMITTENT VIBRATION LEVELS

Peak Particle Velocity (inches/second)	Approximate Vibration Velocity Level (VdB)	Human Reaction	Effect on Buildings
0.006–0.019	64–74	Range of threshold of perception	Vibrations unlikely to cause damage of any type
0.08	87	Vibrations readily perceptible	Recommended upper level to which ruins and ancient monuments should be subjected
0.1	92	Level at which continuous vibrations may begin to annoy people, particularly those involved in vibration sensitive activities	Virtually no risk of architectural damage to normal buildings
0.2	94	Vibrations may begin to annoy people in buildings	Threshold at which there is a risk of architectural damage to normal dwellings
0.4–0.6	98–104	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Architectural damage and possibly minor structural damage

Source: Caltrans 2004

Ground vibration can be a concern in instances where buildings shake and substantial rumblings occur. However, it is unusual for vibration from typical urban sources such as buses and heavy trucks to be perceptible. Common sources for groundborne vibration are planes, trains, and construction activities such as earth-moving which requires the use of heavy-duty earth moving equipment. For the purposes of this analysis, a PPV descriptor with units of inches per second (in/sec) is used to evaluate construction-generated vibration for building damage and human complaints.

2.3 NOISE-SENSITIVE RECEPTORS

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as parks, historic sites, cemeteries, and recreation areas are considered sensitive to increases in exterior noise levels. Schools, churches, hotels, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses. The project site is primarily surrounded by commercial and office uses. Currently, the closest sensitive receptors are the multi-family residences in The Plaza complex, located approximately 1,410 feet to the east.

2.4 EXISTING NOISE CONDITIONS

Newport Beach is impacted by various noise sources. Mobile sources of noise, especially cars and trucks, are the most common and significant sources of noise in most communities. Other sources of noise are the various land uses (i.e., residential, commercial, institutional, and recreational and parks activities) throughout the city that generate stationary-source noise. The nearest airport and only airport in the project vicinity is John Wayne Airport, located approximately 0.44 miles northwest of the project site.

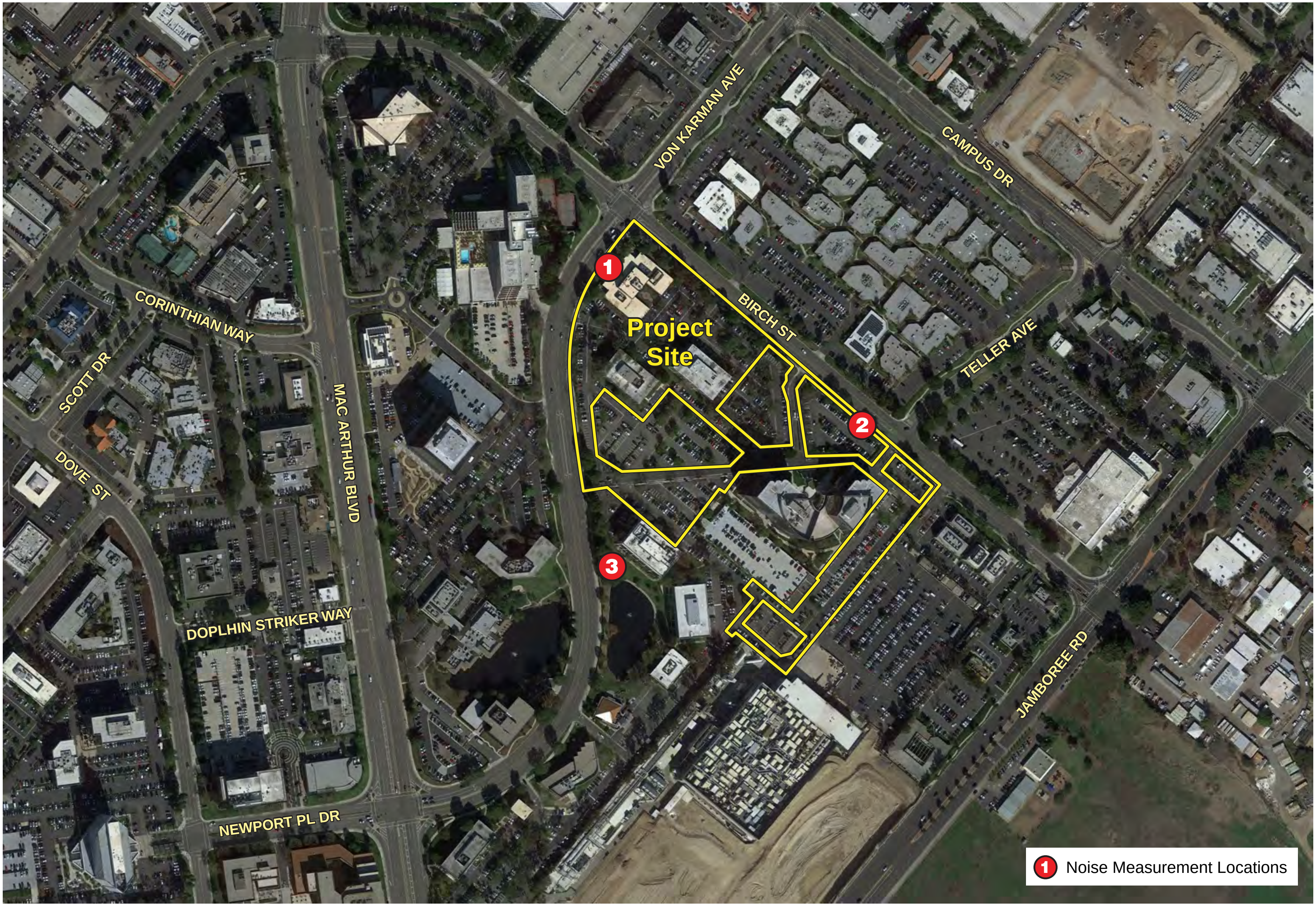
Existing Ambient Noise Measurements

The project site currently consists of surface parking at Koll Center Newport. A mix of office and retail and limited residential uses dominate the area. In order to quantify existing ambient noise levels in the project area, Michael Baker International conducted three short-term noise measurements on April 18, 2017. The noise measurement sites were representative of typical existing noise exposure within and immediately adjacent to the project site (see Exhibit 5, *Noise Measurement Locations*). The 10-minute measurements were taken between 11:00 a.m. and 12:30 p.m. Short-term (L_{eq}) measurements are considered representative of the noise levels throughout the day. The average noise levels and sources of noise measured at each location are listed in Table 3, *Existing Noise Measurements*.

TABLE 3
EXISTING NOISE MEASUREMENTS

Site No.	Location	L_{eq} (dBA)	L_{min} (dBA)	L_{max} (dBA)	Time
1	Along the eastern boundary of project site, adjacent to the Birch Street and Teller Avenue intersection.	64.3	46.1	85.3	11:25 a.m.
2	Along the northwestern boundary of project site, adjacent to the Birch Street and Von Karman Avenue intersection.	64.9	52.2	86.8	11:41 a.m.
3	Along the western boundary of project site along Von Karman Avenue.	67.7	54.1	87.2	11.56 a.m.

Source: Michael Baker International. See Appendix A for noise measurement data.



Source: Google Earth Pro, April 2017

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Noise Measurement Locations

Exhibit 5

As shown in Table 3, the ambient recorded noise levels ranged from 64.3 dBA to 67.7 dBA near the project site. The noise most commonly in the project vicinity is produced by automotive vehicles (cars, trucks, buses, motorcycles). Traffic moving along streets and freeways produces a sound level that remains relatively constant and is part of the city's minimum ambient noise level. Vehicular noise varies with the volume, speed and type of traffic. Slower traffic produces less noise than fast moving traffic. Trucks typically generate more noise than cars. Infrequent or intermittent noise also is associated with vehicles, including sirens, vehicle alarms, slamming of doors, garbage and construction vehicle activity and honking of horns. These noises add to urban noise and are regulated by a variety of agencies.

Existing Roadway Noise Levels

Existing roadway noise levels were calculated for the roadway segments in the project vicinity. This task was accomplished using the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108) and traffic volumes from the project transportation impact analysis (see Appendix B, *Traffic Noise Model Output Files*). The model calculates the average noise level at specific locations based on traffic volumes, average speeds, roadway geometry, and site environmental conditions. The average vehicle noise rates (energy rates) used in the FHWA model have been modified to reflect average vehicle noise rates identified for California by the California Department of Transportation (Caltrans). The Caltrans data shows that California automobile noise is 0.8 to 1.0 dBA higher than national levels and that medium and heavy truck noise is 0.3 to 3.0 dBA lower than national levels. The average daily noise levels along these roadway segments are presented in Table 4, *Existing Traffic Noise Levels*.

TABLE 4
EXISTING TRAFFIC NOISE LEVELS

Roadway Segment	CNEL at 100 Feet from Centerline of Roadway
MacArthur Boulevard	
North of Main Street	66.8
Main Street to NB I-405	68.2
Between I-405 NB and SB Ramps	69.7
Michelson Drive to SB I-405	68.7
Michelson Drive to Campus Drive	69.3
Jamboree Road to University Drive	70.4
Von Karman Avenue	
North of Main Street	64.1
Main Street to Michelson Drive	64.4
Michelson Drive to Dupont Drive	63.2
Dupont Drive to Campus Drive	63.2
Teller Avenue	
Michelson Drive to Dupont Drive	59.4
Dupont Drive to Campus Drive	56.6

TABLE 4 (CONTINUED)
EXISTING TRAFFIC NOISE LEVELS

Roadway Segment	CNEL at 100 Feet from Centerline of Roadway
Jamboree Road	
North of Main Street	70.7
Main Street to NB I-405	71.0
Between I-405 NB and SB I-405 Ramp	71.6
SB I-405 to Michelson Drive	71.2
Michelson Drive to Dupont Drive	69.2
Dupont Drive to Campus Drive	68.6
Campus Drive to Birch Street	68.4
Birch Street to Fairchild Road	68.6
Fairchild Road to MacArthur Boulevard	67.6
Carlson Avenue	
Michelson Drive to Campus Drive	59.9
Harvard Avenue	
North of Michelson Drive	66.1
Michelson Drive to University Drive	64.9
Main Street	
West of MacArthur Boulevard	66.0
MacArthur Boulevard to Von Karman Avenue	65.7
Von Karman Avenue to Jamboree Road	65.0
East of Jamboree Road	64.7
Michelson Drive	
MacArthur Boulevard to Von Karman Avenue	61.1
Von Karman Avenue to Jamboree Road	62.7
Jamboree Road to Carlson Avenue	63.9
Carlson Avenue to Harvard Avenue	64.0
East of Harvard Avenue	63.4
Dupont Drive	
Von Karman Avenue to Teller Avenue	55.7
Teller Avenue to Jamboree Road	54.3
Campus Drive	
West of MacArthur Boulevard	65.8
MacArthur Boulevard to Von Karman Avenue	62.0
Von Karman Avenue Ave to Teller Avenue	61.3
Teller Avenue to Jamboree Road	61.3
Jamboree Road to Carlson Avenue	63.4
Carlson Avenue to University Drive	65.7
East of University Drive	64.4
University Drive	
MacArthur Avenue Boulevard to California Avenue	67.1
California Avenue to Mesa Road	66.9
Mesa Road to Campus Drive	66.9
Campus Drive to Harvard Avenue	66.4

Note: Traffic noise levels were calculated using the FHWA roadway noise prediction model based on traffic data within the Traffic Impact Analysis prepared by Kimley-Horn (2017). Refer to Appendix B for noise modeling assumptions and results.

As depicted in Table 4, the existing traffic-generated noise level on project-vicinity roadways currently ranges from 54.3 to 71.6 dBA CNEL. As previously described, CNEL is 24-hour average noise level with a 5 dBA "weighting" during the hours of 7:00 p.m. to 10:00 p.m. and a 10 dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively.

2.5 NOISE IMPACT ASSESSMENT

Thresholds of Significance

California Environmental Quality Act

Appendix G of the CEQA Guidelines as amended contain analysis guidelines related to the assessment of noise. A project would result in a significant impact if it would:

- Cause exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- Cause exposure of persons to, or generation of, excessive groundborne vibration or groundborne noise levels.
- Cause a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- Cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.
- For a project located within an airport land-use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, result in exposure of people residing or working in the project area to excessive noise levels.
- For a project within the vicinity of a private airstrip, result in exposure of people residing or working in the project area to excessive noise levels.

Criteria for determining the significance of noise impacts were developed based on information contained in the City's noise standards and guidelines.

City of Newport Beach General Plan Noise Element

California Government Code Section 65302(g) requires that a Noise Element be included in the General Plan of each county and city in the State. The *City of Newport Beach General Plan's* Noise Element (2006) is a tool for including noise control in the planning process in order to maintain compatible land use with environmental noise levels. It is the guiding document for the City's noise policy and is designed to protect residents and businesses from excessive and persistent noise intrusions. The Noise Element follows the State guidelines in Section 46050.1 of the *California Health and Safety Code.* The General Plan Noise Element quantifies the community noise environment in terms of noise exposure contours for both near-term and long-term levels of growth and traffic activity.

The City's noise standards are correlated with land use zoning classifications in order to maintain identified ambient noise levels and to limit, mitigate, or eliminate intrusive noise that exceeds the ambient noise levels within a specified zone. The City has adopted local guidelines based, in part, on the community noise compatibility guidelines established by the California Department of Health Services for use in assessing the compatibility of various land use types with a range of noise levels. The noise/land use compatibility guidelines for land uses within the City are presented in Table 5, *Land Use Noise Compatibility Matrix*.

TABLE 5
LAND USE NOISE COMPATIBILITY MATRIX

Land Use Categories		Community Noise Equivalent Level (CNEL)						
Categories	Uses	<55	55–60	60-65	65–70	70–75	75-80	>80
Residential	Single Family, Two Family, Multiple Family	A	A	B	C	C	D	D
Residential	Mixed Use	A	A	A	C	C	C	D
Residential	Mobile Home	A	A	B	C	C	D	D
Commercial- Regional, District	Hotel, Motel, Transient Lodging	A	A	B	B	C	C	D
Commercial- Regional, Village District, Special	Commercial Retail, Bank, Restaurant, Movie Theatre	A	A	A	A	B	B	C
Commercial Industrial Institutional	Office Building, Research and Development, Professional Offices, City Office Building	A	A	A	B	B	C	D
Commercial- Recreational Institutional- Civic Center	Amphitheatre, Concert Hall Auditorium, Meeting Hall	B	B	C	C	D	D	D
Commercial- Recreation	Children's Amusement Park, Miniature Golf Course, Go-cart Track, Equestrian Center, Sports Club	A	A	A	B	B	D	D
Commercial- General, Special Industrial, Institutional	Automobile Service Station, Auto Dealership, Manufacturing, Warehousing, Wholesale, Utilities	A	A	A	A	B	B	B
Institutional	Hospital, Church, Library, Schools' Classroom	A	A	B	C	C	D	D
Open Space	Parks	A	A	A	B	C	D	D
Open Space	Golf Course, Cemeteries, Nature Centers Wildlife Reserves, Wildlife Habitat	A	A	A	A	B	C	C
Agriculture	Agriculture	A	A	A	A	A	A	A

Zone A: Clearly Compatible—Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.
Zone B: Normally Compatible**—New construction or development should be undertaken only after detailed analysis of the noise reduction requirements and are made and needed noise insulation features in the design are determined. Conventional construction, with closed windows and fresh air supply systems or air conditioning, will normally suffice.
Zone C: Normally Incompatible—New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in the design.
Zone D: Clearly Incompatible—New construction or development should generally not be undertaken.

Source: Newport Beach General Plan (2006)

Under "Clearly Compatible" conditions, the specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements. Under "Normally Compatible" conditions, new construction or development should be undertaken only after detailed analysis of the noise reduction requirements are made and needed noise insulation features in the design are determined. Under

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

The following discussion provides a summary of the City of Newport Beach Noise Element goals and policies as they apply to regulatory guidance and significance criteria.

Goal N1, Noise Compatibility**,** is focused on minimizing land use conflicts between various noise sources. Policies applicable to the proposed project include the following:

Policy N1.1, Noise Compatibility of New Development, requires that all proposed projects are compatible with the noise environment through use of the noise compatibility matrix (Table 5) and that exterior and interior noise standards are enforced. The enforcement of interior and exterior noise standards is accomplished through the Noise Ordinance in the City of Newport Beach Municipal Code.

Policy N 1.4, New Developments in Urban Areas, requires that applicants of residential portions of mixed-use projects and high density residential developments in urban areas (such as the Airport Area and Newport Center) demonstrate that the design of the structure will adequately isolate noise between adjacent uses and units (common floor/ceilings) in accordance with the California Building Code.

Policy N1.6, Mixed Use Developments, encourages new mixed-use developments to site loading areas, parking lots, driveways, trash enclosures, mechanical equipment, and other noise sources away from the residential portion of the development.

Policy N1.8, Significant Noise Impacts, requires the employment of noise mitigation measures for existing sensitive uses when a significant noise impact is identified for new development impacting existing sensitive uses,[1] as identified in Table 6, *General Plan Policy N1.8 Significant Noise Impact Criteria for New Development Impacting Existing Sensitive Uses*.

TABLE 6
GENERAL PLAN POLICY N1.8 SIGNIFICANT NOISE IMPACT CRITERIA FOR NEW DEVELOPMENT IMPACTING EXISTING SENSITIVE USES

CNEL (dBA)	dBA Increase
55–60	3
60–65	2
65–70	1
70–75	1
Over 75	Any increase is considered significant
CNEL: 24-hour community noise equivalent level; dBA: A-weighted decibel.	

Source: Newport Beach General Plan (2006)

1 According to the City of Newport Beach Noise Element, noise sensitive uses in the City include public and private educational facilities, hospitals, convalescent homes, and day cares. However, the primary noise sensitive use within the City is residential use. The noise exposure of these sensitive uses varies from low, in quiet residential areas, to high, in areas adjacent to the freeway.

Goal N2, Minimized motor vehicle traffic and boat noise impacts on sensitive noise receptors, is focused on minimizing transportation noise impacts on sensitive noise receptors.

Policy N2.1, New Development, requires that noise-sensitive uses in areas above 60 dBA CNEL meet the interior and exterior noise levels presented later in this analysis in Table 6.

Policy N2.2, Design of Sensitive Land Uses, requires the use of walls, berms, and interior noise insulation, among others, in the design of new residential or other new noise-sensitive land uses that are adjacent to major roads.

Policy N 2.3 Limiting Hours of Truck Deliveries. Limit the hours of truck deliveries to commercial uses abutting residential uses and other noise sensitive land uses to minimize excessive noise unless there is no feasible alternative. Any exemption shall require compliance with nighttime (10:00 p.m. to 7:00 a.m.) noise standards.

Goal N3, Minimization of Airport-Related Noise, is focused on minimizing noise impacts on sensitive noise receptors from operations at John Wayne Airport.

- *Policy N3.2, Residential Development,* requires that residential development in the Airport Area be located outside of the 65 dBA CNEL noise contour no larger than shown in the 1985 JWA Master Plan and require residential developers to notify prospective purchasers or tenants of aircraft overflight and noise.

Goal N4, Minimization of Non-Transportation-Related Noise, is focused on minimizing noise impacts on sensitive noise receptors.

Policy N4.1, Stationary Noise Sources, requires the enforcement of interior and exterior noise standards outlined in the City's Noise Ordinance.

Policy N4.4, Limiting Hours of Recreational Activities, limits hours when recreational activities in parks and the harbor can take place. This goal is implemented by the *City of Newport Beach Municipal Code* (Section 11.04.040), which states that no person shall enter or remain upon any park facility between the hours of 11:00 p.m. and 6:00 a.m.

Policy N4.6, Maintenance or Construction Activities, requires the enforcement of the Noise Ordinance noise limits and limits hours of maintenance or construction activity in or adjacent to residential areas, including noise that results from in-home hobby or work related activities.

Goal N5, Minimize excessive construction-related noise, addresses construction noise.

- Policy N5.1, Limiting Hours of Activity, promotes enforcing the limits on hours of construction activity; these limits are in Section 10.28.040 of the Newport Beach Municipal Code.

City of Newport Beach Municipal Code

The City has numerous ordinances and enforcement practices that apply to intrusive noise and that guide new construction. The City's comprehensive noise ordinance sets forth maximum ambient noise levels for different land use zoning classifications, hours of operation for construction activities, standards for determining when noise is deemed to be a disturbance, and legal remedies for violations.

Section 10.26.025, Exterior Noise Standards, provides maximum exterior noise levels. Table 7, *Allowable Exterior Noise Level*, displays noise standards that, unless otherwise specifically indicated, shall apply to all property with a designated noise zone. If the ambient noise level exceeds the resulting standard, the ambient shall be the standard.

TABLE 7
ALLOWABLE EXTERIOR NOISE LEVEL

Noise Zone	Type of Land Use	7 a.m. to 10 p.m.	10 p.m. to 7 a.m.
I	Single-, two-or multiple-family residential	55 dBA	50 dBA
II	Commercial	65 dBA	60 dBA
III	Residential portions of mixed-use properties	60 dBA	50 dBA
IV	Industrial or manufacturing	70 dBA	70 dBA

Source: Newport Beach Municipal Code (April 25, 2017)

Section 10.26.030, Interior Noise Standards, provides maximum interior noise levels. Table 8, *Allowable Interior Noise Level*, displays noise standards that, unless otherwise specifically indicated, shall apply to all residential property within all noise zones. If the ambient noise level exceeds the resulting standard, the ambient shall be the standard.

TABLE 8
ALLOWABLE INTERIOR NOISE LEVEL

Noise Zone	Type of Land Use	7 a.m. to 10 p.m.	10 p.m. to 7 a.m.
I	Residential	45 dBA	40 dBA
III	Residential portions of mixed-use properties	45 dBA	40 dBA

Source: Newport Beach Municipal Code (March 28, 2017)

Construction Noise

The City recognizes that the control of construction noise is difficult and therefore provides exemptions for construction noise. Section 10.26.035D, Exemptions, of the City's Noise Ordinance exempts noise sources associated with construction, repair, remodeling, demolition, or grading of any real property from the City's Noise Ordinance standards (Table 7 and Table 8). These activities are subject to the provisions of Chapter 10.28, which prohibits construction activities that generate loud noise that disturbs, or could disturb, a person of normal sensitivity who works or resides in the vicinity except during weekdays between the hours of 7:00 a.m. to 6:30 p.m., and Saturdays between the hours of 8:00 a.m. to 6:00 p.m. Construction is not allowed on Sundays or any federal holiday.

Heating, Ventilation, and Air Conditioning (HVAC) Units

Section 10.26.045 of the City's Noise Ordinance specifies that new permits for HVAC equipment in or adjacent to residential areas shall be issued only where installations can be shown by computation, based on the sound rating of the proposed equipment, not to exceed an A-weighted sound pressure level of 50 dBA, or not to exceed an A-weighted sound pressure level of 55 dBA and be installed with a timing device that will deactivate the equipment during the hours of 10:00 p.m. to 7:00 a.m.

Significance of Changes in Traffic Noise Levels

An off-site traffic noise impact typically occurs when there is a discernable increase in traffic and the resulting noise level exceeds an established noise standard. In community noise considerations, changes in noise levels greater than 3 dB are often identified as substantial, while changes less than 1 dB will not be discernible to local residents. A 5 dB change is generally recognized as a clearly discernable difference.

As traffic noise levels at sensitive uses likely approach or exceed the 65 CNEL standard, a 3.0 dB increase as a result of the project is used as the increase threshold for the project. Thus, the project would result in a significant noise impact if a permanent increase in ambient noise levels of 3.0 dB occurs upon project implementation and the resulting noise level exceeds the applicable exterior standard at a noise sensitive use.

Significance of Changes in Cumulative Traffic Noise Levels

The project's contribution to a cumulative traffic noise increase would be considered significant when the combined effect exceeds the perception level (i.e., auditory level increase) threshold. The combined effect compares the "cumulative with project" condition to the "existing" conditions. This comparison accounts for the traffic noise increase from the project generated in combination with traffic generated by projects in the cumulative projects list. The following criteria have been utilized to evaluate the combined effect of the cumulative noise increase.

- *Combined Effects*: The cumulative with project noise level ("Future With Project") would cause a significant cumulative impact if a 3.0 dB increase over existing conditions occurs and the resulting noise level exceeds the applicable exterior standard at a sensitive use.

Although there may be a significant noise increase due to the proposed project in combination with other related projects (combined effects), it must also be demonstrated that the project has an incremental effect. In other words, a significant portion of the noise increase must be due to the proposed project. The following criteria have been utilized to evaluate the incremental effect of the cumulative noise increase.

- *Incremental Effects*: The "Future With Project" causes a 1 dBA increase in noise over the "Future No Project" noise level.

A significant impact would result only if both the combined and incremental effects criteria have been exceeded and the resulting noise level exceeds the applicable exterior standard at a noise sensitive use.

Methodology

This analysis of the existing and future noise environments is based on noise prediction modeling and empirical observations. Predicted noise levels were calculated utilizing data from the Federal Highway Administration's Roadway Construction Model (2006). The traffic noise levels in the project vicinity Street were calculated using the FHWA Highway Noise Prediction Model (FHWA-RD-77-108).

Groundborne vibration levels associated with construction-related activities for the project were evaluated utilizing typical groundborne vibration levels associated with construction equipment, obtained from the Caltrans guidelines set forth above. Potential groundborne vibration impacts related to structural damage and human annoyance were evaluated, taking into account the distance from construction activities to nearby land uses and typically applied criteria for structural damage and human annoyance.

Impact Assessment

Result in a Substantial Temporary or Periodic Increase in Ambient Noise Levels in the Project Vicinity above Levels Existing without the Project and above City Standards

Short-Term Construction-Generated Noise

Based on the project's implementation assumptions, the proposed project would be phased over an approximately 4.5-year period with demolition and construction activities anticipated to commence in the first quarter of 2018 and construction completed in the third quarter of 2022. The free-standing parking structure would be constructed in Phase A over an approximate 10-month timeframe (months 0 through 10). Phase 1 includes the demolition of approximately 331 surface parking spaces to allow for the construction of Building 1. Phase 1 would not begin until after the Phase A parking structure is completed and ready for occupancy. Construction of Building 1 is anticipated to occur over an approximate 22-month timeframe (months 10 through 32). Phase 2 includes the demolition of approximately 242 office parking spaces to allow for the construction of Building 2 and Building 3. Construction of Building 2 and Building 3 is anticipated to occur over an approximate 22-month timeframe (months 32 through 54). Phase 3 includes the demolition of approximately 109 parking spaces at locations within the project site. Phase 3 is the construction of the public park and the reconfiguration of other on-site surface parking and access. No additional grading is assumed in Phase 3. Phase 3 construction activities are anticipated to occur over an approximate six- to nine-month timeframe (months 45 through 54).

Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g., land clearing, grading, excavation, and paving). Noise generated by construction equipment, including earthmovers, material handlers, and portable generators, can reach high levels. Some noise sources are mobile (e.g., vehicles) and others are moved from one location to another at a job site depending on the specific construction activity. All of these factors contribute to an intermittent and variable noise environment. Although noise ranges are generally similar for all construction phases, the ground clearing and excavation phase tends to involve the most heavy-duty equipment having a higher noise-generation potential.

Typical noise levels generated by construction equipment are shown in Table 9, *Typical Construction Equipment Noise Levels*. Operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. Other primary sources of acoustical disturbance would be due to random incidents potentially at different locations, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts).

TABLE 9
TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVELS

Equipment	Typical Noise Level (dBA) at 50 Feet from Source	
	L_{max}	L_{eq}
Air Compressor	80	76
Backhoe/Front End Loader	80	76
Compactor (Ground)	80	73
Concrete Mixer Truck	85	81
Concrete Mixer (Vibratory)	80	73
Concrete Pump Truck	82	75
Concrete Saw	90	83
Crane	85	77
Dozer/Grader/Excavator/Scraper	85	81
Drill Rig Truck	84	77
Generator	82	79
Gradall	85	81
Hydraulic Break Ram	90	80
Jackhammer	85	78
Impact Hammer/Hoe Ram (Mounted)	90	83
Pavement Scarifier/Roller	85	78
Paver	85	82
Pneumatic Tools	85	82
Pumps	77	74
Truck (Dump/Flat Bed)	84	80

Source: FTA 2006

As depicted in Table 9, noise levels associated with individual construction equipment used for typical construction projects can reach levels of up to approximately 90 dBA L_{max} (FTA 2006) at 50 feet from the source. Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. The City of Newport Beach does not have quantitative standards for construction noise levels and only allows construction noise between 7:00 a.m. and 6:30 p.m. weekdays and 8:00 a.m. and 6:00 p.m. Saturdays. No construction noise is allowed on Sundays or any federal holidays.

Construction activities would also cause increased noise along access routes to and from the site due to movement of equipment and workers. The proposed project would require the export of approximately 118,500 cubic yards of soil, which could result in approximately 7,407 soil hauling trips over the approximately 4.5-year construction period. These trips would occur incrementally over the construction phases.

Currently, the closest sensitive receptors are multi-family residences located on the northeast corner of Campus Drive at Jamboree Road, approximately 1,410 feet east of the project site. Phase I of the Uptown Newport development is currently under construction and could have occupied residences during construction of the proposed project. Phase I of the Uptown Newport is located southeast of the project site on Jamboree Road approximately 440 feet away; however, there is an intervening industrial building that separates the construction site from the Phase A construction site. Additionally, it is expected that future project residents would occupy Building 1 following the completion of Phase 1 construction. Residents in Building 1 would be exposed to Phase 2 construction noise for as long as a 22-month period of time.

Tenants in nearby office buildings would be exposed to elevated noise levels during all construction phases to varying degrees due to proximity to specific phases of construction. Specifically, tenants at 4910 Birch Street and 4440 Von Karman Avenue would be more affected by the construction of Buildings 1 and 2 over a 44-month timeframe than tenants at 4490 Von Karman Avenue, 4340 Von Karman Avenue, and 4350 Von Karman Avenue. Construction of the Phase A parking structure would affect tenants in 4340 and 4350 Von Karman Avenue to a greater degree than other buildings. Construction of the Phase A parking structure is not expected to affect tenants in 4910 Birch Street. Noise affecting 4340 Von Karman Avenue and 4350 Von Karman Avenue is the most notable and may be potentially disruptive at times, especially when equipment is operating at maximum power. Noise levels would be higher during the demolition, site preparation, and excavation activities, where the use of heavy construction equipment is more frequent, but also during other portions of the overall (building) construction process.

Phase A Construction Noise Impacts

Phase A would include the construction of a free-standing parking structure in the southernmost portion of the project site and is expected to take approximately 10 months. The nearest receptors that would be exposed to Phase A construction noise would include the 5000 Birch Street office building located approximately 230 feet to the north; a fast food restaurant (4501 Jamboree Road) located approximately 525 feet to the east; the Uptown Newport project site (multi-family residential community with neighborhood-serving retail uses) located approximately 20 feet to the south/east and the 4340 Von Karman Avenue office building located approximately 100 feet to the west of the Phase A construction site.[2] As a conservative estimate, the anticipated short-term and intermittent construction noise levels generated during site clearing/excavation activities (i.e., the construction activity with highest number of equipment used during Phase A construction) were modeled using the FHWA's *Roadway Construction Noise Model (FHWA-HEP-05-054) (*dated January 2006). Table 10, *Project Construction Average L_{eq} (dBA) Noise Levels by Receptor Distance and Construction Phase*, identifies the estimated construction noise levels at the closest receptors. Exterior noise levels would range between 65.7 dBA and 92.1 dBA at the closest receptors to the project site.

Phase 1 Construction Noise Impacts

Phase 1 includes the demolition of approximately 331 surface parking spaces and the construction of Building 1. The nearest receptors that would be exposed to Phase 1 construction noise would include 3636 Birch Street office building located approximately 315 feet to the north; the 5015 Birch Street office building located approximately 175 feet to the east; multiple office uses in the 5000 Birch Street office building located approximately 90 feet to the south; and the 4910 Birch Street office building located approximately 25 feet to the west of the Phase 1 construction site. As a conservative estimate, the anticipated short-term construction noise levels generated during concrete operation activities (i.e., the construction activity with highest number of equipment used during Phase 1 construction) were modeled using the FHWA's *Roadway*

2 Distances to all receptors were measured using Google Earth, 2017. The measured distances are approximate and are from the nearest construction area boundary to the building exterior of the closest receptor.

Note: Where the Uptown Newport project site is adjacent to the Koll Center Residences site, the property is occupied by an industrial use. The timing of demolition of this use and development with a mix of uses including residential has not been determined.

*Construction Noise Model (FHWA-HEP-05-054) (*dated January 2006). Exterior noise levels would range between 72.5 dBA and 94.5 dBA at the closest receptors to the project site.

TABLE 10
PROJECT CONSTRUCTION AVERAGE LEQ (DBA) NOISE LEVELS
BY RECEPTOR DISTANCE AND CONSTRUCTION PHASE

Construction Phase/ Activity	Receptor Locations				Estimated Exterior Construction Noise Level (dBA L_{eq})[2]	Estimated Interior Construction Noise Level (dBA L_{eq})[2, 3]
	Land Use	Address	Direction	Distance (ft)[1]		
Phase A						
Site Clearing, Excavation[4]	Office	5000 Birch St.	North	230	72.9 dBA	48.9 dBA
	Fast Food	5000 Birch St.	East	525	65.7 dBA	41.7 dBA
	Industrial/ Multi-Family (Uptown Newport)[7]	N/A	East/South	20	92.1 dBA	68.1 dBA
	Office	4340 Von Karman Ave	West	100	80.1 dBA	56.1 dBA
Phase 1						
Foundation Operation[5]	Office	3636 Birch St	North	315	72.5 dBA	48.5 dBA
	Office	5015 Birch St	East	175	77.6 dBA	53.6 dBA
	Office	5000 Birch St	South	90	83.4 dBA	59.4 dBA
	Office	4910 Birch St	West	25	94.5 dBA	70.5 dBA
Phase 2						
Foundation Operation[6]	Office	2050 Main St	North	30	95.9 dBA	71.9 dBA
	Multi-Family Residential: Building 1	N/A	East	50	91.5 dBA	67.5 dBA
	Office	5000 Birch St	South	100	85.4 dBA	61.4 dBA
	Office	4400 MacArthur Blvd	West	270	76.8 dBA	52.8 dBA

1 Distance is from the nearest receptor to the closest construction activity area of the project site.
2. Derived from the FHWA *Roadway Construction Noise Model (FHWA-HEP-05-054),* Jan 2006. Refer to Appendix B of EIR Appendix I for noise modeling assumptions and results.
3. A typical building can reduce noise levels by 24 dBA with the windows closed (United States Environmental Protection Agency, *Protective Noise Levels*, November 1978). This assumes all windows and doors are closed, thereby attenuating the exterior noise levels by 24 dBA.
4. Assumes the use of 1 excavator, 1 tractor/loader/backhoe, 1 loader, 1 air compressor, 1 concrete saw, 1 water truck, and 1 crew truck with tool trailer.
5. Assumes the use of 2 cement and mortar mixers, 2 concrete saws, 1 crane, 2 plate compactors, 2 concrete pumps, and 2 welders.
6. Assumes the use of 4 cement and mortar mixers, 4 concrete saws, 2 cranes, 4 plate compactors, 4 concrete pumps, and 2 welders.
7. Phase A would be approximately 20 feet from Phase 2 of Uptown Newport at its closest point. This location of Uptown Newport is currently an industrial use. Construction of Phase A of the proposed project is anticipated to be completed prior to 2027, when removal of the current industrial use and construction of the residential uses would occur.

Phase 2 Construction Noise Impacts

Phase 2 includes the demolition of approximately 242 office parking spaces and the construction of Building 2. The nearest receptors that would be exposed to Phase 2 construction noise would include the 4910 Birch Street office building located approximately 30 feet to the north; multi-family residences located approximately 50 feet to the east (i.e., Koll Center Building 1 residents), the 5000 Birch Street office building located approximately 100 feet to the south; and the 4400 MacArthur Boulevard office building located approximately 270 feet to the west of the Phase 2 construction site. As a conservative estimate, the anticipated short-term construction noise levels generated during concrete operation activities (i.e., the construction activity with highest number of equipment used during Phase 2 construction) were modeled using the FHWA's *Roadway*

*Construction Noise Model (FHWA-HEP-05-054) (*dated January 2006). Exterior noise levels would range between 76.8 dBA and 95.9 dBA at the closest receptors to the project site.

Construction Phases Summary: project-related construction activities would be limited to daytime hours and would comply with the construction hours specified in Section 10.28.040 (Construction Activity – Noise Regulations), of the City's Municipal Code. Phase A construction noise in an office complex adjacent to an industrial use would not result in significant impacts due to the 10-month construction period and the distance to sensitive receptors (since residences would not be built or occupied for Uptown Newport Phase 2 during the proposed project's Phase A construction). The adjacent office uses that would be mostly impacted during Phase 1 construction are not designated noise-sensitive uses, but construction activity would potentially cause annoyance and interfere with office activities in areas facing the Phase 1 construction area. Noise disturbances may occur for prolonged periods of time. In addition, construction of Phase 2 would result in high noise levels at the residential uses built during the project's Phase 1. Due to the length of construction activities and the level of noise from the combination of construction activities, project-related construction noise at the nearby office and retail receivers and future Phase 1 uses would be significant. As such, a potentially significant impact would occur and mitigation would be required.

Construction Noise Mitigation

The City of Newport Beach Municipal Code limits noise sources associated with construction, repair, remodeling, or grading of any real property to the hours of 7:00 a.m. and 6:30 p.m. on weekdays, and 8:00 a.m. and 6:00 p.m. on Saturdays or any federal holiday. The Code also exempts noise levels caused by construction equipment to meet the basic noise level limits previously identified in Table 7 and Table 8. However, because of the magnitude of the noise levels discussed above and shown in Table 10, and because of the extended length of the overall construction period, these impacts would be significant.

Compliance with Standard Condition (SC) NOI-1 would require that loud noise-generating construction would occur only during hours permitted by the City Noise Ordinance. In addition, Mitigation Measures (MM) NOI-1 through MM NOI-4 would reduce construction noise impacts or minimize the severity of the impacts through a variety of noise abatement methods. MM NOI-1 requires the construction of temporary noise barriers between the construction site and sensitive receptors whenever grading or other operations requiring multiple units of diesel engine equipment would occur within 300 feet of receptors and occur for more than 20 working days. Noise reduction by a barrier depends upon the barrier interrupting the line of sight between the noise source and the receiver. Therefore, the barriers prescribed by MM NOI-1 would provide noise reduction for exterior and first floor receptors, but would provide little or no noise reduction for second floor or higher receptors.

MM NOI-2 includes requirements for the proper maintenance and use of equipment; specifies the locations of stationary equipment and maintenance; places limits on engine idling; and restricts the use of noise-producing signals for safety warning purposes only. MM NOI-3 and MM NOI-4 require the notification of businesses within 500 feet of the project site, and the placement of signage related to construction activities, respectively. Implementation of MM NOI-1 through MM NOI-4 would reduce construction noise levels; however, this temporary noise increase is considered a significant unavoidable short-term noise impact.

Result in the Exposure of Persons to or Generation of Excessive Groundborne Vibration or Groundborne Noise Levels

Increases in groundborne vibration levels attributable to the proposed project would be primarily associated with construction-related activities. Construction on the project site would have the potential to result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used and the operations involved. Ground vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. The effect on buildings located in the vicinity of the construction site often varies depending on soil type, ground strata, and construction characteristics of the receiver building(s). The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibration at moderate levels, to slight damage at the highest levels. Groundborne vibrations from construction activities rarely reach levels that damage structures.

Construction-related ground vibration is normally associated with impact equipment such as pile drivers, jackhammers, and the operation of some heavy-duty construction equipment, such as dozers and trucks. Vibration decreases rapidly with distance.

The Federal Transit Administration (FTA) has published standard vibration velocities for construction equipment operations. In general, depending on the building category of the nearest buildings adjacent to the potential pile driving area, the potential construction vibration damage criteria vary. For example, for a building that is constructed with reinforced concrete with no plaster, the FTA guidelines show that a vibration level of up to 0.50 inch per second (inch/sec) peak particle velocity (PPV) is considered safe and would not result in any construction vibration damage. The FTA architectural damage criterion for continuous vibrations for non-engineered timber and masonry buildings (i.e., 0.20 inch/second) appears to be conservative. The types of construction vibration impact include human annoyance and building damage. Human annoyance occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time. Building damage can be cosmetic or structural. Ordinary buildings that are not particularly fragile would not experience any cosmetic damage (e.g., plaster cracks) at distances beyond 30 feet. This distance can vary substantially depending on the soil composition and underground geological layer between vibration source and receiver. In addition, not all buildings respond similarly to vibration generated by construction equipment. The City of Newport Beach does not provide numerical vibration standards for construction activities. Therefore, this impact discussion uses FTA standard of 0.20 inch/second PPV with respect to the prevention of structural damage for normal buildings and human annoyance.

The nearest structures to any of the construction activities include office buildings that are approximately 50 feet distant at the nearest. Table 11, *Typical Construction Equipment Vibration Levels*, identifies vibration levels feet for typical construction equipment.

Based on FTA data, vibration velocities from typical heavy construction equipment operations that would be used during project construction range from 0.003 to 0.089 inch/second PPV at 25 feet and 0.001 to 0.024 inch/second PPV from the source of activity. It is also acknowledged that construction activities would occur throughout the project site and would not be concentrated at the point closest to the nearest structure. Vibration from construction activities experienced at the nearest building would be expected to be below the 0.20 inch/second PPV significance threshold. As noted above, the 0.20 inch/second PPV threshold is conservative because the construction vibration damage criteria for non-engineered timber and masonry buildings. Buildings would be better represented by the 0.50 inch/second PPV significance threshold (construction vibration damage criteria for a reinforced concrete, steel or timber buildings).

Once operational, the project would not be a source of groundborne vibration. Therefore, project-related vibration impacts would be less than significant level.

TABLE 11
TYPICAL CONSTRUCTION EQUIPMENT VIBRATION LEVELS

Equipment Type	Peak Particle Velocity at 25 Feet (inches per second)	Peak Particle Velocity at 50 Feet (inches per second)[1]
Large Bulldozer	0.089	0.024
Caisson Drilling	0.089	0.024
Loaded Trucks	0.076	0.020
Rock Breaker	0.059	0.016
Jackhammer	0.035	0.001
Small Bulldozer/Tractor	0.003	0.001

Notes:
1. Calculated using the following formula:

$$PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$$

where: PPV (equip) = the peak particle velocity in inch per second of the equipment adjusted for the distance
PPV (ref) = the reference vibration level in inch per second from Table 12-2 of the FTA Transit Noise and Vibration Impact Assessment Guidelines
D = the distance from the equipment to the receiver

Source: FTA 2006; Caltrans 2004

Result in a Substantial Permanent Increase in Ambient Noise Levels in the Project Vicinity above Levels Existing without the Project and above City Standards

Operational Noise

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels.

Off-Site Project-Related Traffic Noise

Increased traffic on local roadways would result from implementation of the project and would be a contributor of noise in the study area. Traffic noise levels for roadways primarily affected by the proposed project were calculated using the FHWA's Highway Noise Prediction Model (FHWA-RD-77-108). Traffic noise modeling was conducted for conditions with and without the project, based on traffic volumes obtained from the project's traffic analysis (Kimley-Horn 2017).

Under CEQA, consideration must be given to the magnitude of the increase and the existence of noise-sensitive receptors in order to determine if the noise increase is a significant adverse environmental effect. The following City of Newport Beach General Plan Noise Element Policy N1.8 for traffic noise increases is used to determine if a noise-sensitive land use would be impacted and would therefore require mitigation (Table 6):

- For an existing ambient noise level between 55 and 60 dBA CNEL, an increase of 3 dBA or more;

- For an existing ambient noise level between 60 and 65 dBA CNEL, an increase of 2 dBA or more;
- For an existing ambient noise level between 65 and 75 dBA CNEL, an increase of 1 dBA or more; and
- For an existing ambient noise level greater than 75 dBA CNEL, any increase.

Noise level impacts are assessed by evaluating the noise levels "with" and "without" the project for the following scenarios: Existing Conditions (Without Project), Existing Conditions Plus Project, and Opening Year.

Existing Conditions With and Without Project

As identified in Table 12, *Existing Plus Project Conditions Predicted Traffic Noise Levels*, under the "Existing" scenario, noise levels would range from approximately from 54.3 to 71.6 dBA CNEL, with the highest noise levels occurring on Jamboree Road between the I-405 northbound and the southbound I-405 ramps. The "Existing With Project" scenario noise levels would range from approximately 54.3 to 71.6 dBA with the highest noise levels also occurring along the same roadway segment. The table also compares the "Existing" scenario to the "Existing With Project" scenario. The project would increase noise levels on the surrounding roadways by a maximum of 0.1 dBA. Based on the significance criteria set forth in this EIR, project noise increases would be less than significant and no mitigation would be required.

TABLE 12
EXISTING PLUS PROJECT CONDITIONS PREDICTED TRAFFIC NOISE LEVELS

Roadway Segment	Existing					Existing Plus Project					Difference in dBA @ 100 feet from Roadway
	ADT	dBA @ 100 Feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet)			ADT	dBA @ 100 Feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet)			
			70 CNEL Noise Contour	65 CNEL Noise CNEL	60 CNEL Noise Contour			70 CNEL Noise Contour	65 CNEL Noise CNEL	60 CNEL Noise Contour	
MacArthur Boulevard											
North of Main Street	26,939	66.8	-	133	286	26,999	66.8	-	133	286	0
Main Street to NB I-405	35,479	68.2	76	164	353	35,539	68.2	76	164	353	0
Between I-405 NB and SB Ramps	51,177	69.7	96	207	446	51,328	69.8	96	208	447	0.1
Michelson Drive to SB I-405	52,637	68.7	81	175	377	52,879	68.7	82	176	379	0
Michelson Drive to Campus Drive	35,873	69.3	90	194	418	36,115	69.3	90	195	420	0
Jamboree Road to University Drive	39,361	70.4	106	229	494	39,601	70.4	107	230	496	0
Von Karman Avenue											
North of Main Street	21,662	64.1	-	88	189	21,722	64.2	-	88	189	0.1
Main Street to Michelson Drive	22,999	64.4	-	92	198	23,059	64.5	-	92	198	0.1
Michelson Drive to Dupont Drive	16,965	63.2	-	75	162	17,025	63.2	-	76	163	0
Dupont Drive to Campus Drive	16,965	63.2	-	75	162	17,025	63.2	-	76	163	0
Teller Avenue											
Michelson Drive to Dupont Drive	5,566	59.4	-	42	91	5,566	59.4	-	42	91	0
Dupont Drive to Campus Drive	2,955	56.6	-	-	60	2,955	56.6	-	-	60	0

TABLE 12 (CONTINUED)
EXISTING PLUS PROJECT CONDITIONS PREDICTED TRAFFIC NOISE LEVELS

Roadway Segment	Existing					Existing Plus Project					Difference in dBA @ 100 feet from Roadway
	ADT	dBA @ 100 Feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet)			ADT	dBA @ 100 Feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet)			
			70 CNEL Noise Contour	65 CNEL Noise CNEL	60 CNEL Noise Contour			70 CNEL Noise Contour	65 CNEL Noise CNEL	60 CNEL Noise Contour	
Jamboree Road											
North of Main Street	63,067	70.7	111	238	513	63,127	70.7	111	238	513	0
Main Street to NB I-405	70,074	71.0	117	253	544	70,224	71.0	117	253	545	0
Between I-405 NB and SB I-405 Ramp	78,431	71.6	127	274	590	78,581	71.6	127	274	591	0
SB I-405 to Michelson Drive	71,095	71.2	120	258	556	71,337	71.2	120	259	557	0
Michelson Drive to Dupont Drive	45,474	69.2	89	191	413	45,716	69.3	89	192	414	0.1
Dupont Drive to Campus Drive	41,587	68.6	81	175	377	41,829	68.7	81	176	378	0.1
Campus Drive to Birch Street	39,071	68.4	78	169	364	39,283	68.4	79	170	365	0
Birch Street to Fairchild Road	41,102	68.6	81	175	377	41,344	68.7	81	175	378	0.1
Fairchild Road to MacArthur Boulevard	33,314	67.6	70	150	323	33,556	67.7	70	151	325	0.1
Carlson Avenue											
Michelson Drive to Campus Drive	6,128	59.9	-	46	98	6,128	59.9	-	46	98	0
Harvard Avenue											
North of Michelson Drive	25,439	66.1	55	118	254	25,439	66.1	55	118	254	0
Michelson Drive to University Drive	19,009	64.9	-	98	211	19,009	64.9	-	98	211	0
Main Street											
West of MacArthur Boulevard	23,739	66.0	-	116	250	23,739	66.0	-	116	250	0
MacArthur Boulevard to Von Karman Avenue	29,325	65.7	-	112	241	29,325	65.7	-	112	241	0
Von Karman Avenue to Jamboree Road	24,984	65.0	-	100	216	24,984	65.0	-	100	216	0
East of Jamboree Road	23,323	64.7	-	96	207	23,323	64.7	-	96	207	0
Michelson Drive											
MacArthur Boulevard to Von Karman Avenue	10,635	61.1	-	55	118	10,635	61.1	-	55	118	0
Von Karman Avenue to Jamboree Road	15,386	62.7	-	70	150	15,386	62.7	-	70	150	0
Jamboree Road to Carlson Avenue	20,475	63.9	-	84	182	20,475	63.9	-	84	182	0
Carlson Avenue to Harvard Avenue	20,475	64.0	-	85	184	20,475	64.0	-	85	184	0
East of Harvard Avenue	17,894	63.4	-	78	168	17,894	63.4	-	78	168	0
Dupont Drive											
Von Karman Avenue to Teller Avenue	4,176	55.7	-	-	52	4,176	55.7	-	-	52	0
Teller Avenue to Jamboree Road	3,021	54.3	-	-	-	3,021	54.3	-	-	-	0

TABLE 12 (CONTINUED)
EXISTING PLUS PROJECT CONDITIONS PREDICTED TRAFFIC NOISE LEVELS

Roadway Segment	Existing					Existing Plus Project					Difference in dBA @ 100 feet from Roadway
	ADT	dBA @ 100 Feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet)			ADT	dBA @ 100 Feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet)			
			70 CNEL Noise Contour	65 CNEL Noise CNEL	60 CNEL Noise Contour			70 CNEL Noise Contour	65 CNEL Noise CNEL	60 CNEL Noise Contour	
Campus Drive											
West of MacArthur Boulevard	29,714	65.8	-	113	243	29,714	65.8	-	113	243	0
MacArthur Boulevard to Von Karman Avenue	13,075	62.0	-	63	136	13,075	62.0	-	63	136	0
Von Karman Avenue Ave to Teller Avenue	11,189	61.3	-	57	122	11,189	61.3	-	57	122	0
Teller Avenue to Jamboree Road	11,186	61.3	-	57	122	11,216	61.3	-	57	122	0
Jamboree Road to Carlson Avenue	18,431	63.4	-	79	170	18,431	63.4	-	79	170	0
Carlson Avenue to University Drive	18,427	65.7	51	111	239	18,427	65.7	51	111	239	0
East of University Drive	22,648	64.4	-	92	197	22,648	64.4	-	92	197	0
University Drive											
MacArthur Avenue Boulevard to California Avenue	24,765	67.1	64	139	299	24,765	67.1	64	139	299	0
California Avenue to Mesa Road	30,386	66.9	62	134	288	30,386	66.9	62	134	288	0
Mesa Road to Campus Drive	30,580	66.9	62	134	290	30,580	66.9	62	134	290	0
Campus Drive to Harvard Avenue	25,303	66.4	-	123	265	25,303	66.4	-	123	265	0

Notes: ADT = average daily trips; dBA = A-weighted decibels; CNEL = community noise equivalent level

Source: Traffic noise levels were calculated using the FHWA roadway noise prediction model based on traffic data within the Traffic Impact Analysis prepared by Kimley-Horn (2017). Refer to Appendix B for noise modeling assumptions and results.

Opening Year With and Without Project

Table 13, *Opening Year Predicted Traffic Noise Levels*, compares the "Opening Year Without Project" and "Opening Year With Project" scenarios. Without the project, noise levels would range from approximately from 55.4 to 72.1 dBA CNEL, with the highest noise levels occurring on Jamboree Road between the I-405 northbound and southbound I-405 ramps. With the project, noise levels would range from approximately 55.4 to 72.1 dBA with the highest noise levels also occurring along the same roadway segment. Traffic noise levels would result in a maximum increase of 0.1 dBA. Based on the significance criteria set forth in this EIR, project noise increases would be less than significant and no mitigation would be required.

TABLE 13
OPENING YEAR PREDICTED TRAFFIC NOISE LEVELS

Roadway Segment	Opening Year					Opening Year Plus Project					Difference in dBA @ 100 feet from Roadway
	ADT	dBA @ 100 Feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet)			ADT	dBA @ 100 Feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet)			
			70 CNEL Noise Contour	65 CNEL Noise CNEL	60 CNEL Noise Contour			70 CNEL Noise Contour	65 CNEL Noise CNEL	60 CNEL Noise Contour	
MacArthur Boulevard											
North of Main Street	34,645	67.9	73	157	338	34,705	67.9	73	157	338	0
Main Street to NB I-405	53,893	70.0	100	216	466	53,953	70.0	101	217	466	0
Between I-405 NB and SB Ramps	55,245	70.1	101	218	470	55,396	70.1	101	218	471	0
Michelson Drive to SB I-405	59,303	69.2	88	190	409	59,545	69.2	88	190	410	0
Michelson Drive to Campus Drive	38,911	69.7	95	205	441	39,153	69.7	95	206	443	0
Jamboree Road to University Drive	21,640	67.8	71	154	332	21,880	67.9	72	155	334	0.1
Von Karman Avenue											
North of Main Street	26,738	65.1	47	101	217	26,798	65.1	47	101	218	0
Main Street to Michelson Drive	28,299	65.3	49	105	227	28,359	65.3	49	106	227	0
Michelson Drive to Dupont Drive	19,351	63.7	-	82	177	19,411	63.7	-	82	178	0
Dupont Drive to Campus Drive	19,247	63.7	-	82	177	19,307	63.7	-	82	177	0
Teller Avenue											
Michelson Drive to Dupont Drive	8,011	61.0	-	54	116	8,011	61.0	-	54	116	0
Dupont Drive to Campus Drive	5,514	59.4	-	42	91	5,514	59.4	-	42	91	0
Jamboree Road											
North of Main Street	71,163	71.2	120	258	556	71,223	71.2	120	258	556	0
Main Street to NB I-405	76,261	71.4	124	267	576	76,411	71.4	124	268	577	0
Between I-405 NB and SB I-405 Ramp	65,025	70.7	112	242	521	65,175	70.8	112	242	522	0.1
SB I-405 to Michelson Drive	87,498	72.1	138	296	638	87,740	72.1	138	297	639	0
Michelson Drive to Dupont Drive	61,592	70.6	109	234	505	61,834	70.6	109	235	506	0
Dupont Drive to Campus Drive	47,754	69.2	89	192	413	47,996	69.3	89	192	415	0.1
Campus Drive to Birch Street	45,570	69.1	87	187	403	45,782	69.1	87	188	405	0
Birch Street to Fairchild Road	44,841	69.0	86	185	399	45,083	69.0	86	186	400	0
Fairchild Road to MacArthur Boulevard	39,327	68.4	78	168	361	39,569	68.4	78	168	363	0
Carlson Avenue											
Michelson Drive to Campus Drive	9,156	61.6	-	60	128	9,156	61.6	-	60	128	0
Harvard Avenue											
North of Michelson Drive	25,802	66.1	55	119	256	25,802	66.1	55	119	256	0
Michelson Drive to University Drive	19,247	64.9	-	99	213	19,247	64.9	-	99	213	0

TABLE 13 (CONTINUED)
OPENING YEAR PREDICTED TRAFFIC NOISE LEVELS

Roadway Segment	Opening Year					Opening Year Plus Project					Difference in dBA @ 100 feet from Roadway
	ADT	dBA @ 100 Feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet)			ADT	dBA @ 100 Feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet)			
			70 CNEL Noise Contour	65 CNEL Noise CNEL	60 CNEL Noise Contour			70 CNEL Noise Contour	65 CNEL Noise CNEL	60 CNEL Noise Contour	
Main Street											
West of MacArthur Boulevard	27,050	66.5	59	126	272	27,050	66.5	59	126	272	0
MacArthur Boulevard to Von Karman Avenue	35,270	66.5	59	126	272	35,270	66.5	59	126	272	0
Von Karman Avenue to Jamboree Road	28,403	65.6	-	109	236	28,403	65.6	-	109	236	0
East of Jamboree Road	24,449	64.9	-	99	213	24,449	64.9	-	99	213	0
Michelson Drive											
MacArthur Boulevard to Von Karman Avenue	22,681	64.4	-	91	196	22,681	64.4	-	91	196	0
Von Karman Avenue to Jamboree Road	21,640	64.1	-	88	189	21,640	64.1	-	88	189	0
Jamboree Road to Carlson Avenue	26,530	65.0	47	100	216	26,530	65.0	47	100	216	0
Carlson Avenue to Harvard Avenue	25,594	64.9	-	99	213	25,594	64.9	-	99	213	0
East of Harvard Avenue	19,039	63.6	-	81	175	19,039	63.6	-	81	175	0
Dupont Drive											
Von Karman Avenue to Teller Avenue	5,618	57.0	-	-	63	5,618	57.0	-	-	63	0
Teller Avenue to Jamboree Road	3,849	55.4	-	-	49	3,849	55.4	-	-	49	0
Campus Drive											
West of MacArthur Boulevard	33,397	66.3	-	122	262	33,397	66.3	-	122	262	0
MacArthur Boulevard to Von Karman Avenue	16,126	62.9	-	72	156	16,126	62.9	-	72	156	0
Von Karman Avenue Ave to Teller Avenue	13,629	62.2	-	65	139	13,629	62.2	-	65	139	0
Teller Avenue to Jamboree Road	12,797	61.9	-	62	134	12,827	61.9	-	62	134	0
Jamboree Road to Carlson Avenue	20,808	64.0	-	85	184	20,808	64.0	-	85	184	0
Carlson Avenue to University Drive	19,664	66.0	54	116	250	19,664	66.0	54	116	250	0
East of University Drive	24,866	64.8	-	97	210	24,866	64.8	-	97	210	0
University Drive											
MacArthur Avenue Boulevard to California Avenue	27,154	67.5	68	147	317	27,154	67.5	68	147	317	0
California Avenue to Mesa Road	32,877	67.2	66	141	304	32,877	67.2	66	141	304	0
Mesa Road to Campus Drive	33,397	67.3	66	143	307	33,397	67.3	66	143	307	0
Campus Drive to Harvard Avenue	28,507	66.9	62	133	287	28,507	66.9	62	133	287	0

Notes: ADT = average daily trips; dBA = A-weighted decibels; CNEL = community noise equivalent level

Source: Traffic noise levels were calculated using the FHWA roadway noise prediction model based on traffic data within the Traffic Impact Analysis prepared by Kimley-Horn (2017). Refer to Appendix B for noise modeling assumptions and results.

On-Site Mobile Noise

Residences

Future residents at the project site would be exposed to mobile traffic noise along Birch Street and Von Karman Avenue, and some aircraft noise from John Wayne Airport. Table 14, *On-Site Mobile Combined Noise Levels*, identifies the combined noise levels of mobile traffic and aircraft noise at the future residences on the site.

TABLE 14
ON-SITE MOBILE COMBINED NOISE LEVELS

Project Boundary	Roadway Segment	Distance to Road	Traffic Noise (dBA CNEL)[1, 2]	Aircraft Noise (dBA CNEL)	Total Exterior Noise Level (dBA CNEL)[2]	Total Interior Noise Level (dBA CNEL)[3]
Northeast	Birch Street	200	62.0	60	64.1	40.1
West	Von Karman Avenue	40	65.1	60	66.3	42.3

Notes:
1. Calculated using the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108) and traffic volumes from the *Final Environmental Impact Report for Uptown Newport* (City of Newport Beach, February 2013).
2. Noise levels calculated from the roadway centerline to the closest residential building on the project site.
3. Typical building construction can reduce noise levels by 24 dBA with the windows closed (United States Environmental Protection Agency, *Protective Noise Levels*, November 1978).

As shown in the Table 14, buildings facing Von Karman Avenue would experience interior noise levels ranging between 40.1 dBA and 42.3 dBA, which would be below the City's 45 dBA interior daytime threshold, and 45 dBA standard in Title 24 of the California Code of Regulations. However, interior noise levels would exceed the City's 40 dBA nighttime standard, and exterior noise levels (approximately 66.3 dBA) would exceed the City's 60 dBA daytime exterior standard (for residential portions of a mixed-use development). Therefore, the project would be required to comply with MM NOI-5, which requires all residential units to be designed to ensure that interior noise levels in habitable rooms from exterior sources (including aircraft and vehicles on adjacent roadways) shall not exceed 45 dBA, in compliance with Title 24 of the California Code of Regulations. Further, the project would be required to comply with MM NOI-6, which require a detailed acoustical study demonstrating that all residential units would meet the City's 60 dBA exterior noise standard for all patios, balconies, and common outdoor living areas through any necessary noise reduction features (barriers, berms, enclosures, etc.). Compliance with MM NOI-5 and MM NOI-6 would result in a less than significant impact.

Public and Private Outdoor Amenity and Recreational Areas

A 1.17-acre public park would be constructed adjacent to Birch Street as part of the proposed project. Due to its location along Birch Street, users of the proposed park would be exposed to frequent traffic noise. Based on the FHWA Noise Prediction Model (FHWA-RD-77-108) and traffic volumes from the *Final Environmental Impact Report for Uptown Newport* (City of Newport Beach, February 2013), traffic noise levels at the public park would be approximately 68.0 dBA, which would be considered within the Zone "B" "normally compatible" range of 65-70 dBA in the City's Land Use Noise Compatibility Matrix (Table 5). As defined in the City's General Plan, new construction or development should be undertaken only after detailed analysis of the noise reduction requirements and are made and needed noise insulation features in the design are determined for areas designated "normally compatible". Therefore, an acoustical study analyzing potential noise reduction features at the public park is required as part of MM NOI-6, in accordance with the City's General Plan Noise Element and Table 5.

On-Site Stationary Noise

Potential long-term stationary noise impacts would be associated with residential and retail uses, and the public park. An analysis of the long-term stationary noise sources from the proposed project is provided below.

Mechanical Equipment. Mechanical equipment (e.g., HVAC equipment) typically generates noise levels of approximately 50 to 60 dBA at 50 feet. SC NOI-2 requires that HVAC units be designed and installed in accordance with the Newport Beach Noise Ordinance. This section of the Noise Ordinance specifies noise levels for new HVAC installations in or adjacent to residential areas. Compliance may be achieved by several methods, including selecting quiet models, constructing barriers or parapet walls, enclosing the equipment, and placing the equipment in locations that would result in compliance with the Noise Ordinance. Operation of mechanical equipment would not be anticipated to increase ambient noise levels beyond the acceptable compatible land use noise levels. Therefore, the proposed project would result in a less than significant impact related to stationary noise levels.

Truck Deliveries. Potential noise impacts with the project's retail uses would be associated primarily with truck deliveries. The primary noise associated with truck deliveries is the arrival and departure of trucks. Normal deliveries are mostly by two-axle medium trucks and typically occur during daytime hours. No loading docks are proposed. It is anticipated that truck deliveries would be infrequent and limited to small two-axle trucks. While there would be temporary noise increases during truck maneuvering and engine idling, these impacts would short term and infrequent. Additionally, General Plan Policy N 2.3 requires truck deliveries abutting noise sensitive land uses to be limited to minimize excessive noise. An exemption to this policy would require compliance with nighttime (10:00 p.m. to 7:00 a.m.) noise standards (refer to SC NOI-3). Impacts would be less than significant.

Public and Private Outdoor Amenity and Recreational Areas. As noted above, the project would include a 1.17-acre public park along Birch Street in the eastern portion of the project site. Activities at the park would include two pickleball courts, a passive garden, lawn area, park gathering plaza, and tables for chess/seating. The most prominent noise sources at the park would be from pickleball and gatherings at the plaza area. Pickleball creates noise levels of approximately 58 dBA at a distance of 30 feet.[3] Noise has a decay rate due to distance attenuation, which is calculated based on the Inverse Square Law of sound propagation. Based upon the Inverse Square Law, sound levels decrease by 6 dBA for each doubling of distance from the source.[4] The closest sensitive receptors to the pickleball courts would be residences at Building 1 (of the proposed project) located approximately 120 feet to the west. At this distance, noise levels would be approximately 46 dBA, which is well below the City's 60 dBA exterior threshold for Zone III (residential portions of mixed-use properties) between the hours of 7:00 a.m. and 6:00 p.m.. Interior noise levels would be approximately 22 dBA, which is well below the City's 40 and 45 dBA interior threshold for Zone III during nighttime and daytime hours, respectively.

As noted above, the proposed park includes a gathering plaza for residents to use. This area has the potential to be accessed by groups of people intermittently for various occasions (e.g.,

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3 Michael Baker International noise measurements conducted on August 15, 2017.
4 Cyril M. Harris, *Noise Control in Buildings*, 1994.

birthday parties, picnics, etc.). Noise generated by groups of people (i.e., crowds) is dependent on several factors including vocal effort, impulsiveness, and the random orientation of the crowd members. Crowd noise is estimated at 60 dBA at one meter (3.28 feet) away for raised normal speaking.[5] This noise level would have a +5 dBA adjustment for the impulsiveness of the noise source, and a -3 dBA adjustment for the random orientation of the crowd members.[6] Therefore, crowd noise would be approximately 62 dBA at one meter from the source (i.e., at the gathering plaza). As a result, crowd noise would be approximately 25 dBA at the closest sensitive receptors (i.e., residences in Building 1 located approximately 230 feet to the west of the proposed gathering plaza), which would not exceed the existing the City's 60 dBA exterior noise standard for Zone III (residential portions of mixed-use properties) between the hours of 7:00 a.m. and 6:00 p.m**.** Further, noise levels from the proposed park would not be louder than the existing ambient noise levels in the area (i.e., 64.3 dBA L_{eq} along Birch Street; refer to Table 3).

The proposed residential buildings would include outdoor pool areas on the podium level (level 3) that would constitute a stationary noise source. Specifically, an outdoor pool area would be provided at Building 1, and a shared outdoor pool area would be provided for Buildings 2 and 3. Similar to the noise generated at the gathering plaza for the proposed park, crowd noise at the pool areas would be approximately 62 dBA at one meter from the source. The closest sensitive receptors (residences at Buildings 1, 2, and 3) would be located approximately 170 feet, 40 feet, and 40 feet away, respectively. At these distances, noise levels would be approximately 28 dBA, 40 dBA, and 40 dBA, respectively, which are below the City's 60 dBA exterior noise standards for Zone III (residential portions of mixed-use properties) between the hours of 7:00 a.m. and 6:00 p.m.

As discussed above, the proposed park and outdoor pool areas would not generate noise levels that would exceed the City's noise standards at the closest sensitive receptors. Therefore, impacts would be less than significant.

Surface Parking and Parking Structures. The proposed project includes the construction of a free-standing parking structure, and parking structures associated with Buildings 1, 2, and 3. The free-standing parking structure would include three levels of below-ground parking and five levels of above-ground parking including rooftop parking. Building 1 is proposed as a 13-story podium building with 5 levels of structured parking (3 levels below ground and 2 levels above ground). Building 2 and Building 3 share common parking and amenities located within the podium the two buildings share. Building 2 and 3 would have four levels of common structured parking (2 levels below ground and 2 levels above ground). Surface parking would also be provided, and currently exists on the site.

Traffic associated with parking lots and garages is typically not of sufficient volume to exceed community noise standards, which are based on a time-averaged scale such as the CNEL scale. While the instantaneous maximum sound levels generated by a car door slamming, engine starting up, and car pass-bys may be an annoyance, noise levels are not a significant impact.

Maximum noise levels from noise events at surface parking areas and parking levels that are not completely shielded, such as car door slamming, engine start-up, alarm activation, car horns and tire squealing range from 55 to 70 dBA L_{max} at 50 feet from the source. The City of Newport Beach Noise Ordinance standards prescribe exterior noise level limits of 50 dBA at residential portions of mixed-use properties for nighttime hours and 60 dBA for daytime hours; interior noise limits are 45 dBA during daytime hours and 40 dBA during nighttime hours. The closest sensitive receptors to

5 M.J. Hayne, et al, *Prediction of Crowd Noise*, Acoustics, November 2006.
6 Ibid.

the proposed free-standing parking structure would be residences located approximately 25 feet to the east at Uptown Newport. At this distance, noise levels from the parking structure could reach 76 dBA L_{max}, which would exceed the City's interior and exterior noise standards (daytime and nighttime) for residential uses. To reduce noise levels at the residences to the east of the free-standing parking structure, the project would be required to submit an acoustical study to the City of Newport beach Community Development detailing noise-attenuation features that would reduce noise levels to below City standards (refer to MM NOI-7). To further reduce noise at the proposed free-standing parking structure, MM NOI-8 requires the parking lot surface of all proposed parking garages to be textured to eliminate tire squeal noise, and requires ventilation equipment to not exceed the City's noise standards for Zone III (i.e., a daytime exterior maximum of 60 dBA L_{eq} [or 80 dBA L_{max}] and a nighttime exterior maximum of 50 dBA L_{eq} [or 70 dBA L_{max}], daytime interior maximum of 45 dBA L_{eq}, and a nighttime interior maximum of 40 dBA L_{eq}). Due to the noise reduction requirements as part of MM NOI-7 and the additional noise reduction measures required in MM NOI-8, noise from the proposed free-standing parking structure would be less than significant.

Result in the Exposure of People to Excessive Airport Noise

The nearest airport and only airport in the project vicinity is John Wayne Airport, located approximately 0.44 miles northwest of the project site. However, a review of the Land Use Plan for John Wayne Airport (2008), shows the project site located outside of the 60 dBA CNEL contour. Therefore, there is no impact surrounding the proposed project concerning airport noise.

Additionally, there are no private airstrips located immediately adjacent to or near the project site. Therefore, the proposed project would not result in a safety hazard for people working or residing at the project site. Therefore, no impact would occur.

Cumulative Noise

Cumulative Construction Noise

The project's construction activities would result in a substantial temporary increase in ambient noise levels. There would be periodic, temporary, unavoidable significant noise impacts that would cease upon completion of construction activities. The project would contribute to significant unavoidable construction noise impacts should other development proximate to the project site occur concurrent with the project.

Cumulative Operational Noise

Cumulative noise impacts describe how much noise levels are projected to increase over existing conditions with the development of the proposed project and other foreseeable projects. Cumulative noise impacts would occur primarily as a result of increased traffic on local roadways due to buildout of the proposed project and other projects in the vicinity. Cumulative increases in traffic noise levels were estimated by comparing the Existing Plus Project and Opening Year scenarios to existing conditions. The traffic analysis considers cumulative traffic from future growth assumed in the traffic mode, as well as cumulative projects identified by the cities of Newport Beach and Irvine.

A project's contribution to a cumulative traffic noise increase would be considered significant when the combined effect exceeds perception level (i.e., auditory level increase) threshold. The combined effect compares the "cumulative with project" condition to "existing" conditions. This comparison accounts for the traffic noise increase generated by a project combined with the traffic noise increase generated by projects in the cumulative project list. The following criteria have been utilized to evaluate the combined effect of the cumulative noise increase.

- *Combined Effect.* The cumulative with project noise level ("Cumulative With Project") would cause a significant cumulative impact if a 3.0 dB increase over "Existing" conditions occurs and the resulting noise level exceeds the applicable exterior standard at a sensitive use. Although there may be a significant noise increase due to the proposed project in combination with other related projects (combined effects), it must also be demonstrated that the project has an incremental effect. In other words, a significant portion of the noise increase must be due to the proposed project.

The following criteria have been utilized to evaluate the incremental effect of the cumulative noise increase.

- *Incremental Effects*. The "Cumulative With Project" causes a 1.0 dBA increase in noise over the "Cumulative Without Project" noise level.

A significant impact would result only if both the combined and incremental effects criteria have been exceeded. Noise by definition is a localized phenomenon, and reduces as distance from the source increases. Consequently, only the proposed project and growth due to occur in the project site's general vicinity would contribute to cumulative noise impacts. Table 15, *Cumulative Plus Project Conditions Predicted Traffic Noise Levels*, lists the traffic noise effects along roadway segments in the project vicinity for "Existing," "Cumulative Without Project," and "Cumulative With Project," conditions, including incremental and net cumulative impacts.

First, it must be determined whether the "Future With Project" increase above existing conditions (*Combined Effects*) is exceeded. As indicated in Table 15, the proposed project has one street segment (Michelson Drive between MacArthur Boulevard to Von Karman Avenue) that exceeds combined effects criterion. Next, under the *Incremental Effects* criteria, cumulative noise impacts are defined by determining if the forecast ambient ("Future Without Project") noise level is increased by 1 dB or more. As shown in Table 15, the incremental effects criterion is not exceeded. Based on the results of Table 15, there would not be any roadway segments that would result in significant impacts, as they would not exceed either the combined or the incremental effects criteria. The proposed project would not result in long-term mobile noise impacts based on project generated traffic as well as cumulative and incremental noise levels. Therefore, the proposed project, in combination with cumulative background traffic noise levels, would result in a less than significant cumulative impact in this regard.

TABLE 15
CUMULATIVE PLUS PROJECT CONDITIONS PREDICTED TRAFFIC NOISE LEVELS

Roadway Segment	Existing	Cumulative Without Project	Cumulative With Project	Combined Effects	Incremental Effects	Cumulatively Significant Impact?
	dBA @ 100 Feet from Roadway Centerline	dBA @ 100 Feet from Roadway Centerline	dBA @ 100 Feet from Roadway Centerline	Difference In dBA Between Existing and Cumulative With Project	Difference In dBA Between Cumulative Without Project and Cumulative With Project	
MacArthur Boulevard						
North of Main Street	66.8	67.9	67.9	1.1	0	No
Main Street to NB I-405	68.2	70.0	70.0	1.8	0	No
Between I-405 NB and SB Ramps	69.7	70.1	70.1	0.4	0	No
Michelson Drive to SB I-405	68.7	69.2	69.2	0.5	0	No
Michelson Drive to Campus Drive	69.3	69.7	69.7	0.4	0	No
Jamboree Road to University Drive	70.4	67.8	67.9	-2.5	0.1	No
Von Karman Avenue						
North of Main Street	64.1	65.1	65.1	1	0	No
Main Street to Michelson Drive	64.4	65.3	65.3	0.9	0	No
Michelson Drive to Dupont Drive	63.2	63.7	63.7	0.5	0	No
Dupont Drive to Campus Drive	63.2	63.7	63.7	0.5	0	No
Teller Avenue						
Michelson Drive to Dupont Drive	59.4	61.0	61.0	1.6	0	No
Dupont Drive to Campus Drive	56.6	59.4	59.4	2.8	0	No
Jamboree Road						
North of Main Street	70.7	71.2	71.2	0.5	0	No
Main Street to NB I-405	71.0	71.4	71.4	0.4	0	No
Between I-405 NB and SB I-405 Ramp	71.6	70.7	70.8	-0.8	0.1	No
SB I-405 to Michelson Drive	71.2	72.1	72.1	0.9	0	No
Michelson Drive to Dupont Drive	69.2	70.6	70.6	1.4	0	No
Dupont Drive to Campus Drive	68.6	69.2	69.3	0.7	0.1	No
Campus Drive to Birch Street	68.4	69.1	69.1	0.7	0	No
Birch Street to Fairchild Road	68.6	69.0	69.0	0.4	0	No
Fairchild Road to MacArthur Boulevard	67.6	68.4	68.4	0.8	0	No
Carlson Avenue						
Michelson Drive to Campus Drive	59.9	61.6	61.6	1.7	0	No
Harvard Avenue						
North of Michelson Drive	66.1	66.1	66.1	0	0	No
Michelson Drive to University Drive	64.9	64.9	64.9	0	0	No
Main Street						
West of MacArthur Boulevard	66.0	66.5	66.5	0.5	0	No
MacArthur Boulevard to Von Karman Avenue	65.7	66.5	66.5	0.8	0	No
Von Karman Avenue to Jamboree Road	65.0	65.6	65.6	0.6	0	No
East of Jamboree Road	64.7	64.9	64.9	0.2	0	No

TABLE 15 (CONTINUED)
CUMULATIVE PLUS PROJECT CONDITIONS PREDICTED TRAFFIC NOISE LEVELS

Roadway Segment	Existing	Cumulative Without Project	Cumulative With Project	Combined Effects	Incremental Effects	Cumulatively Significant Impact?
	dBA @ 100 Feet from Roadway Centerline	dBA @ 100 Feet from Roadway Centerline	dBA @ 100 Feet from Roadway Centerline	Difference In dBA Between Existing and Cumulative With Project	Difference In dBA Between Cumulative Without Project and Cumulative With Project	
Michelson Drive						
MacArthur Boulevard to Von Karman Avenue	61.1	64.4	64.4	3.3	0	No
Von Karman Avenue to Jamboree Road	62.7	64.1	64.1	1.4	0	No
Jamboree Road to Carlson Avenue	63.9	65.0	65.0	1.1	0	No
Carlson Avenue to Harvard Avenue	64.0	64.9	64.9	0.9	0	No
East of Harvard Avenue	63.4	63.6	63.6	0.2	0	No
Dupont Drive						
Von Karman Avenue to Teller Avenue	55.7	57.0	57.0	1.3	0	No
Teller Avenue to Jamboree Road	54.3	55.4	55.4	1.1	0	No
Campus Drive						
West of MacArthur Boulevard	65.8	66.3	66.3	0.5	0	No
MacArthur Boulevard to Von Karman Avenue	62.0	62.9	62.9	0.9	0	No
Von Karman Avenue Ave to Teller Avenue	61.3	62.2	62.2	0.9	0	No
Teller Avenue to Jamboree Road	61.3	61.9	61.9	0.6	0	No
Jamboree Road to Carlson Avenue	63.4	64.0	64.0	0.6	0	No
Carlson Avenue to University Drive	65.7	66.0	66.0	0.3	0	No
East of University Drive	64.4	64.8	64.8	0.4	0	No
University Drive						
MacArthur Avenue Boulevard to California Avenue	67.1	67.5	67.5	0.4	0	No
California Avenue to Mesa Road	66.9	67.2	67.2	0.3	0	No
Mesa Road to Campus Drive	66.9	67.3	67.3	0.4	0	No
Campus Drive to Harvard Avenue	66.4	66.9	66.9	0.5	0	No

Source: Traffic noise levels were calculated using the FHWA roadway noise prediction model based on traffic data within the Traffic Impact Analysis prepared by Kimley-Horn (2017). Refer to Appendix B for noise modeling assumptions and results.
Notes: ADT = average daily traffic; dBA = A-weighted decibels; CNEL = community noise equivalent level

Vibration

Vibration impacts during construction of the proposed project would be localized and would occur intermittently for varying periods of time throughout the construction period. Short-term cumulative impacts related to vibration levels could occur if construction associated with the proposed project as well as surrounding current and future development were to occur simultaneously. Noise and vibration associated with construction of the proposed project, in combination with other projects proximate to the project site boundaries, could adversely impact sensitive receptors in the vicinity of the project site with a cumulative noise level greater than the noise generated solely at the project site.

Potential cumulative projects include Uptown Newport which is the only reasonably foreseeable project near the project site. Based on the proposed schedule for Uptown Newport (Phase 1 of Uptown Newport is currently being constructed, and Phase 2 construction would begin in 2022 or 2027), construction of the proposed project could coincide with construction of the Uptown

Newport Project. However, as discussed above, short-term construction vibration impacts from the proposed project would less than significant. Therefore, there would be no cumulative vibration impacts.

2.6 MITIGATION PROGRAM

Standard Conditions

SC NOI-1 To ensure compliance with Newport Beach Municipal Code Section 10.28.040, grading and construction plans shall include a note indicating that loud noise-generating project construction activities (as defined in Section 10.28.040 of the Newport Beach Municipal Code) shall take place between the hours of 7:00 a.m. and 6:30 p.m. on weekdays and from 8:00 a.m. to 6:00 p.m. on Saturdays. Loud, noise-generating construction activities are prohibited outside of these hours and on Sundays and federal holidays.

SC NOI-2 Heating, ventilation and air conditioning (HVAC) units shall be designed and installed in accordance with Section 10.26.045 of the Newport Beach Municipal Code, which specifies the maximum noise levels for new HVAC installations and associated conditions. All mechanical equipment shall be screened from view of adjacent properties and adjacent public streets for each residential structure, as authorized by a Site Development Review Permit.

SC NOI-3 As required by General Plan Policy N 2.3, the hours of truck deliveries to commercial uses abutting residential uses and other noise sensitive land uses shall be limited to minimize excessive noise unless there is no feasible alternative. Any exemption shall require compliance with nighttime (10:00 P.M. to 7:00 A.M.) noise standards.

Mitigation Measures

Construction Activities

MM NOI-1 Grading plans and specifications shall include temporary noise barriers for all grading, hauling, and other heavy equipment operations that would occur within 300 feet of sensitive receptors and occur for more than 20 working days. The noise barriers shall be a minimum height of 12 feet high. The barriers shall be solid from the ground to the top of the barrier, and have a weight of at least 2.5 pounds per square foot, which is equivalent to ¾ inch thick plywood. The barrier design shall optimize the following requirements: (1) the barrier shall be located to maximize the interruption of line of sight between the equipment and the receptor; (2) the length and of the barrier shall be selected to block the line of sight between the construction area and the receptors; (3) the barrier shall be located as close as feasible to the receptor or as close as feasible to the construction area.

MM NOI-2 Prior to the start of grading, the Construction Manager shall provide evidence acceptable to the City of Newport Beach Public Works Director and/or Community Development Director, that:

a. All construction vehicles and equipment, fixed or mobile, shall be maintained in good operating condition and be equipped with all internal combustion, engine-driven equipment fitted with intake and exhaust muffles, air intake silencers, and engine shrouds no less effective than as originally equipped by the manufacturer.

b. Where stationary equipment, such as generators, cranes, and air compressors, is located within 50 feet of a sensitive receptor including offices, the equipment shall be equipped with appropriate noise reduction measures (e.g., silencers, shrouds, or other devices) to limit equipment noise.

c. Equipment maintenance, vehicle parking, and material staging areas shall be located as far away from office buildings adjacent to the project site as feasible.

d. Electrically powered equipment instead of pneumatic or internal combustion powered equipment shall be used to the extent possible.

e. All internal combustion engine idling both on the site and at nearby queuing areas shall be limited to no more than five minutes for any given vehicle or machine. Signs shall be posted at the job site and along queueing lanes to reinforce the prohibition of unnecessary engine idling.

f. The use of noise producing signals, including horns, whistles, alarms, and bells shall be for safety warning purposes only. Use smart back-up alarms, which automatically adjust the alarm level based on the background noise level, or switch off back-up alarms and replace with human spotters.

MM NOI-3 At least 30 days prior to the start of any ground disturbing or other noise generating activities, the contractor shall notify all businesses within 500 of the project site of the planned start date, duration, nature of the construction activity, and noise abatement measures to be provided. The notification shall include a contact telephone number for questions and the submittal of any complaints of excess, unanticipated noise or vibration.

MM NOI-4 Prior to the beginning of construction activities, a sign shall be posted at the entrance to the job site, clearly visible to the public, that contains a contact name and telephone number of the construction contractor's authorized representative to respond in the event of a vibration or noise complaint. If the authorized representative receives a complaint, he/she shall investigate, take appropriate corrective action, and report the action to the City of Newport Beach's Community Development Director.

Operational Activities

MM NOI-5 All residential units shall be designed to ensure that interior noise levels in habitable rooms from exterior sources (including aircraft and vehicles on adjacent roadways) shall not exceed 45 dBA CNEL. This mitigation measure complies with the applicable sections of the California Building Code (Title 24 of the *California Code of Regulations*). Prior to granting of a building permit, the Applicant shall submit to the City of Newport Beach Community Development Department for review and approval architectural plans and an accompanying noise study that demonstrates that interior noise levels in the habitable rooms of residential units would be 45 dBA CNEL or less. Where closed windows are required to achieve the 45 dBA CNEL limit, project plans and specifications shall include ventilation as required by the California Building Code.

MM NOI-6 Prior to issuance of building permits for Phase 1 and Phase 2, a detailed acoustical study based on architectural plans shall be prepared by a qualified acoustical consultant and submitted to the Community Development Department to demonstrate that all residential units would meet the City's 60 dBA daytime (7:00 a.m. to 10:00 p.m.) exterior noise standard, and 50 dBA L_{eq} nighttime (10:00 p.m. to 7:00 a.m.) exterior noise standard for all patios, balconies, and common outdoor living areas. In addition, the acoustical study shall demonstrate that interior noise levels at all residential units at the project site would meet the City's 45 dBA L_{eq} daytime threshold, and 40 dBA L_{eq} nighttime threshold. This mitigation measure complies with the applicable sections of the California Building Code (Title 24 of the *California Code of Regulations*). The necessary noise reduction may be achieved by implementing noise control measures at the receiver locations. The final grading and building plans shall incorporate the required noise barriers (patio enclosure, wall, berm, or combination wall/berm), and the property owner/developer shall install these barriers and enclosures.

MM NOI-7 Prior to issuance of building permits for Phase A, a detailed acoustical study based on architectural plans for the free-standing parking structure shall be prepared by a qualified acoustical consultant and submitted to the Community Development Department to demonstrate that the future adjoining residences to the southeast at the Uptown Newport property would meet the City's 60 dBA L_{eq} daytime (7:00 a.m. to 10:00 p.m.) exterior noise standard, and 50 dBA L_{eq} nighttime (10:00 p.m. to 7:00 a.m.) exterior noise standard for all patios, balconies, and common outdoor living areas. In addition, the acoustical study shall demonstrate that interior noise levels at the Uptown Newport residential units would meet the City's 45 dBA L_{eq} daytime threshold, and 40 dBA L_{eq} nighttime threshold. The necessary noise reduction may be achieved by incorporating a perimeter barrier or other noise-attenuation features at the free-standing parking structure. The final building plans shall incorporate the required noise-attenuation features, and the property owner/ developer shall install these barriers and enclosures.

MM NOI-8 The parking lot surface of all parking garages shall be textured to eliminate tire squeal noise. Ventilation equipment for the parking garages shall be designed to meet the City's noise limits for Zone III, not exceed exterior daytime maximum of 60 dBA and a nighttime maximum of 50 dBA. This can be accomplished by selecting quieter equipment or by enclosing ventilation equipment.

3.0 References

3.0 REFERENCES

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APPENDICES

APPENDIX A: EXISTING AMBIENT NOISE MEASUREMENTS

Site Number: 1
Recorded By: Ryan Chiene
Job Number: 159401
Date: 4/18/17
Time: 11:25 a.m.
Location: Near eastern boundary of project site, adjacent to the Birch Street and Teller Avenue intersection.
Source of Peak Noise: Cars on Birch Street, planes flying overhead, birds chirping, people walking and talking.

Noise Data			
Leq (dB)	Lmin (dB)	Lmax (dB)	Peak (dB)
64.3	46.1	85.3	101.1

Equipment						
Category	Type	Vendor	Model	Serial No.	Cert. Date	Note
Sound	Sound Level Meter	Brüel & Kjær	2250	3011133	3/27/2017	
	Microphone	Brüel & Kjær	4189	3086765	3/27/2017	
	Preamp	Brüel & Kjær	ZC 0032	25380	3/27/2017	
	Calibrator	Brüel & Kjær	4231	2545667	3/27/2017	

Weather Data			
Est.	Duration: 10 minutes		Sky: Sunny
	Note: dBA Offset = -0.01		Sensor Height (ft): 5 ft
	Wind Ave Speed (mph / m/s)	Temperature (degrees Fahrenheit)	Barometer Pressure (inches)
	< 5.0	68.0	30.09

<u>Photo of Measurement Location</u>

2250

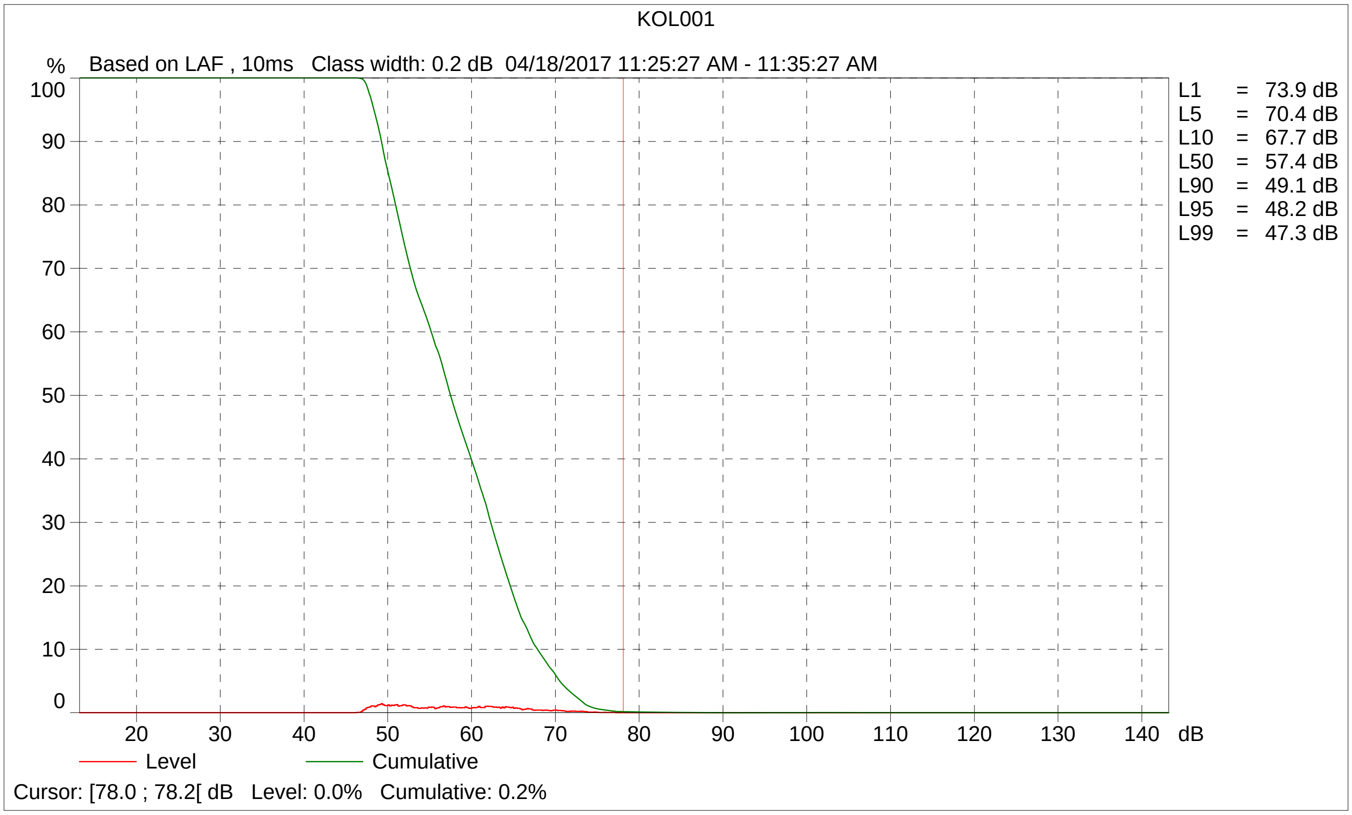
Instrument:		2250
Application:		BZ7222 Version 4.7.2
Start Time:		04/18/2017 11:25:27
End Time:		04/18/2017 11:35:27
Elapsed Time:		00:10:00
Bandwidth:		Broadband
Max Input Level:		141.93

	Time	Frequency
Broadband (excl. Peak):	FSI	AZ
Broadband Peak:		C
Instrument Serial Number:		3011133
Microphone Serial Number:		3086765
Input:		Top Socket
Windscreen Correction:		None
Sound Field Correction:		Free-field

Calibration Time:		04/17/2017 13:47:07
Calibration Type:		External reference
Sensitivity:		44.6077175438404 mV/Pa

KOL001

	Start time	End time	Elapsed time	Overload [%]	LAeq [dB]	LAFmax [dB]	LAFmin [dB]
Value				0.00	64.3	85.3	46.1
Time	11:25:27 AM	11:35:27 AM	0:10:00				
Date	04/18/2017	04/18/2017					


KOL001
%
Based on LAF , 10ms Class width: 0.2 dB 04/18/2017 11:25:27 AM - 11:35:27 AM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 73.9 dB
L5 = 70.4 dB
L10 = 67.7 dB
L50 = 57.4 dB
L90 = 49.1 dB
L95 = 48.2 dB
L99 = 47.3 dB
Level
Cumulative
Cursor: [78.0 ; 78.2[dB Level: 0.0% Cumulative: 0.2%

Site Number: 2			
Recorded By: Ryan Chiene			
Job Number: 159401			
Date: 4/18/17			
Time: 11:41 a.m.			
Location: Near northwestern boundary of project site, adjacent to the Birch Street and Von Karman Avenue intersection.			
Source of Peak Noise: Traffic on Birch Street and Von Karman Avenue, planes flying overhead, birds chirping.			
Noise Data			
Leq (dB)	Lmin (dB)	Lmax (dB)	Peak (dB)
64.9	52.2	86.8	114.4

Equipment						
Category	Type	Vendor	Model	Serial No.	Cert. Date	Note
Sound	Sound Level Meter	Brüel & Kjær	2250	3011133	3/27/2017	
	Microphone	Brüel & Kjær	4189	3086765	3/27/2017	
	Preamp	Brüel & Kjær	ZC 0032	25380	3/27/2017	
	Calibrator	Brüel & Kjær	4231	2545667	3/27/2017	

Weather Data			
Est.	Duration: 10 minutes		Sky: Sunny
	Note: dBA Offset = -0.01		Sensor Height (ft): 5 ft
	Wind Ave Speed (mph / m/s)	Temperature (degrees Fahrenheit)	Barometer Pressure (inches)
	< 5.0	70.0	30.09

<u>Photo of Measurement Location</u>

2250

Instrument:		2250
Application:		BZ7222 Version 4.7.2
Start Time:		04/18/2017 11:41:16
End Time:		04/18/2017 11:51:16
Elapsed Time:		00:10:00
Bandwidth:		Broadband
Max Input Level:		141.93

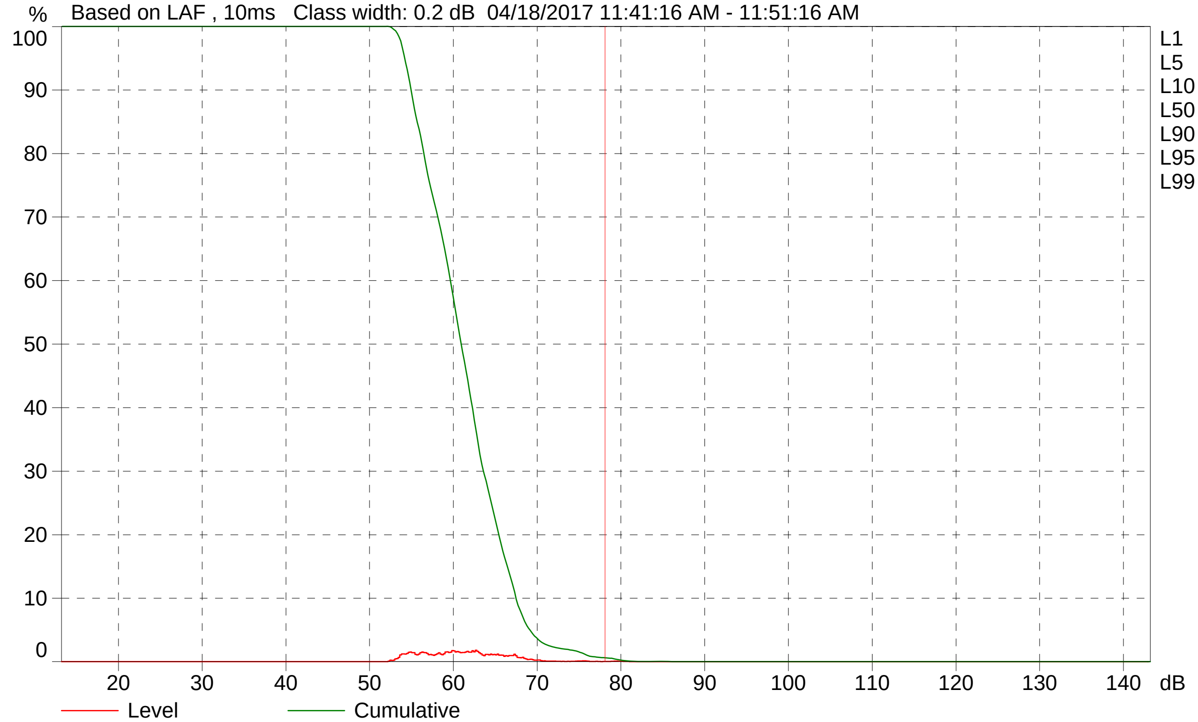
	Time	Frequency
Broadband (excl. Peak):	FSI	AZ
Broadband Peak:		C
Instrument Serial Number:		3011133
Microphone Serial Number:		3086765
Input:		Top Socket
Windscreen Correction:		None
Sound Field Correction:		Free-field

Calibration Time:		04/17/2017 13:47:07
Calibration Type:		External reference
Sensitivity:		44.6077175438404 mV/Pa

KOL002

	Start time	End time	Elapsed time	Overload [%]	LAeq [dB]	LAFmax [dB]	LAFmin [dB]
Value				0.00	64.9	86.8	52.2
Time	11:41:16 AM	11:51:16 AM	0:10:00				
Date	04/18/2017	04/18/2017					

KOL002



L1	=	75.8 dB
L5	=	69.0 dB
L10	=	67.4 dB
L50	=	60.8 dB
L90	=	54.8 dB
L95	=	54.1 dB
L99	=	53.1 dB

Cursor: [78.0 ; 78.2[dB Level: 0.0% Cumulative: 0.6%

Site Number: 3			
Recorded By: Ryan Chiene			
Job Number: 159401			
Date: 4/18/17			
Time: 11:56 a.m.			
Location: Near western boundary of project site along Von Karman Avenue.			
Source of Peak Noise: Traffic on Von Karman Avenue, planes flying overhead, people walking and talking.			
Noise Data			
Leq (dB)	Lmin (dB)	Lmax (dB)	Peak (dB)
67.7	54.1	87.2	107.0

Equipment						
Category	Type	Vendor	Model	Serial No.	Cert. Date	Note
Sound	Sound Level Meter	Brüel & Kjær	2250	3011133	3/27/2017	
	Microphone	Brüel & Kjær	4189	3086765	3/27/2017	
	Preamp	Brüel & Kjær	ZC 0032	25380	3/27/2017	
	Calibrator	Brüel & Kjær	4231	2545667	3/27/2017	

Weather Data			
Est.	Duration: 10 minutes		Sky: Sunny
	Note: dBA Offset = -0.01		Sensor Height (ft): 5 ft
	Wind Ave Speed (mph / m/s)	Temperature (degrees Fahrenheit)	Barometer Pressure (inches)
	< 5.0	70.0.	30.09

Photo of Measurement Location

2250

Instrument:		2250
Application:		BZ7222 Version 4.7.2
Start Time:		04/18/2017 11:56:06
End Time:		04/18/2017 12:06:06
Elapsed Time:		00:10:00
Bandwidth:		Broadband
Max Input Level:		141.93

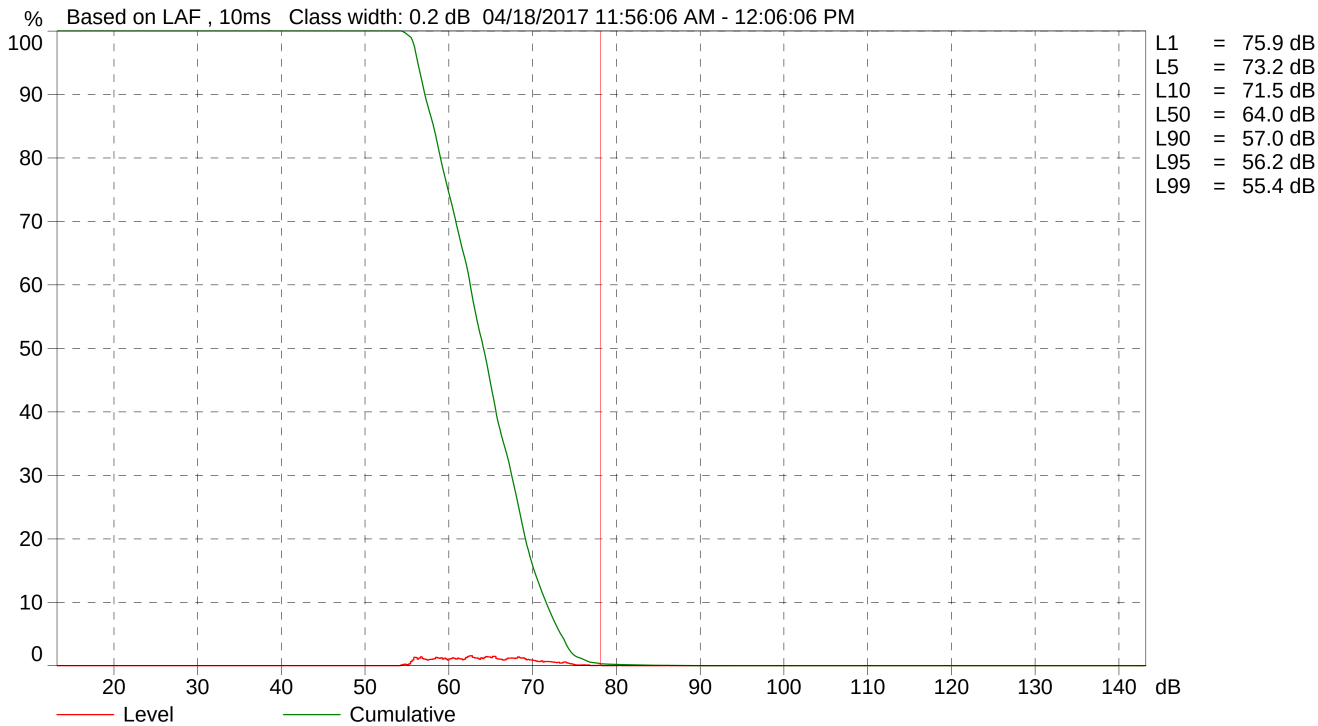
	Time	Frequency
Broadband (excl. Peak):	FSI	AZ
Broadband Peak:		C
Instrument Serial Number:		3011133
Microphone Serial Number:		3086765
Input:		Top Socket
Windscreen Correction:		None
Sound Field Correction:		Free-field

Calibration Time:		04/17/2017 13:47:07
Calibration Type:		External reference
Sensitivity:		44.6077175438404 mV/Pa

KOL003

	Start time	End time	Elapsed time	Overload [%]	LAeq [dB]	LAFmax [dB]	LAFmin [dB]
Value				0.00	67.7	87.2	54.1
Time	11:56:06 AM	12:06:06 PM	0:10:00				
Date	04/18/2017	04/18/2017					

KOL003



Cursor: [78.0 ; 78.2[dB Level: 0.0% Cumulative: 0.3%

APPENDIX B: TRAFFIC NOISE

TRAFFIC NOISE LEVELS AND NOISE CONTOURS

Project Number: 1A
Project Name: Koll Center Residences

Background Information

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Source of Traffic Volumes: Kimley Horn 2017
Community Noise Descriptor: L_{dn}: ______ CNEL: x

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

Analysis Condition Roadway, Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Alpha Factor	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	Distance from Centerline of Roadway CNEL at 100 Feet	Distance to Contour 70 CNEL	65 CNEL	60 CNEL	55 CNEL
MacArthur Boulevard												
North of Main Street	7	12	26,939	50	0.5	1.8%	0.1%	66.8	-	133	286	615
Main Street to NB I-405	8	10	35,479	50	0.5	1.8%	0.1%	68.2	76	164	353	760
Between I-405 NB and SB Ramps	8	7	51,177	50	0.5	1.8%	0.1%	69.7	96	207	446	962
Michelson Drive to SB I-405	8	7	52,637	45	0.5	1.8%	0.1%	68.7	81	175	377	813
Michelson Drive to Campus Drive	8	7	35,873	55	0.5	1.8%	0.1%	69.3	90	194	418	900
Jamboree Road to University Drive	6	10	39,361	60	0.5	1.8%	0.1%	70.4	106	229	494	1,065
Von Karman Avenue												
North of Main Street	4	0	21,662	45	0.5	1.8%	0.1%	64.1	-	88	189	407
Main Street to Michelson Drive	4	5	22,999	45	0.5	1.8%	0.1%	64.4	-	92	198	426
Michelson Drive to Dupont Drive	4	10	16,965	45	0.5	1.8%	0.1%	63.2	-	75	162	350
Dupont Drive to Campus Drive	4	10	16,965	45	0.5	1.8%	0.1%	63.2	-	75	162	350
Teller Avenue												
Michelson Drive to Dupont Drive	2	10	5,566	50	0.5	1.8%	0.1%	59.4	-	42	91	196
Dupont Drive to Campus Drive	2	10	2,955	50	0.5	1.8%	0.1%	56.6	-	-	60	129
Jamboree Road												
North of Main Street	8	7	63,067	50	0.5	1.8%	0.1%	70.7	111	238	513	1,105
Main Street to NB I-405	8	3	70,074	50	0.5	1.8%	0.1%	71.0	117	253	544	1,173

Existing Conditions

Between I-405 NB and SB I-405 Ramp	8	5	78,431	50	0.5	1.8%	0.1%	71.6	127	274	590	1,271
SB I-405 to Michelson Drive	8	7	71,095	50	0.5	1.8%	0.1%	71.2	120	258	556	1,197
Michelson Drive to Dupont Drive	8	7	45,474	50	0.5	1.8%	0.1%	69.2	89	191	413	889
Dupont Drive to Campus Drive	7	7	41,587	50	0.5	1.8%	0.1%	68.6	81	175	377	812
Campus Drive to Birch Street	7	10	39,071	50	0.5	1.8%	0.1%	68.4	78	169	364	784
Birch Street to Fairchild Road	7	10	41,102	50	0.5	1.8%	0.1%	68.6	81	175	377	811
Fairchild Road to MacArthur Boulevard	7	5	33,314	50	0.5	1.8%	0.1%	67.6	70	150	323	697
Carlson Avenue												
Michelson Drive to Campus Drive	4	0	6,128	50	0.5	1.8%	0.1%	59.9	-	46	98	211
Harvard Avenue												
North of Michelson Drive	4	0	25,439	50	0.5	1.8%	0.1%	66.1	55	118	254	546
Michelson Drive to University Drive	4	10	19,009	50	0.5	1.8%	0.1%	64.9	-	98	211	455
Main Street												
West of MacArthur Boulevard	6	0	23,739	50	0.5	1.8%	0.1%	66.0	-	116	250	538
MacArthur Boulevard to Von Karman Avenue	6	5	29,325	45	0.5	1.8%	0.1%	65.7	-	112	241	518
Von Karman Avenue to Jamboree Road	6	5	24,984	45	0.5	1.8%	0.1%	65.0	-	100	216	466
East of Jamboree Road	6	5	23,323	45	0.5	1.8%	0.1%	64.7	-	96	207	445
Michelson Drive												
MacArthur Boulevard to Von Karman Avenue	4	5	10,635	45	0.5	1.8%	0.1%	61.1	-	55	118	255
Von Karman Avenue to Jamboree Road	4	0	15,386	45	0.5	1.8%	0.1%	62.7	-	70	150	324
Jamboree Road to Carlson Avenue	4	0	20,475	45	0.5	1.8%	0.1%	63.9	-	84	182	392
Carlson Avenue to Harvard Avenue	4	10	20,475	45	0.5	1.8%	0.1%	64.0	-	85	184	396
East of Harvard Avenue	4	7	17,894	45	0.5	1.8%	0.1%	63.4	-	78	168	361
Dupont Drive												
Von Karman Avenue to Teller Avenue	4	10	4,176	40	0.5	1.8%	0.1%	55.7	-	-	52	112
Teller Avenue to Jamboree Road	4	10	3,021	40	0.5	1.8%	0.1%	54.3	-	-	-	90
Campus Drive												
West of MacArthur Boulevard	6	5	29,714	45	0.5	1.8%	0.1%	65.8	-	113	243	523
MacArthur Boulevard to Von Karman Avenue	4	5	13,075	45	0.5	1.8%	0.1%	62.0	-	63	136	292
Von Karman Avenue Ave to Teller Avenue	4	5	11,189	45	0.5	1.8%	0.1%	61.3	-	57	122	263
Teller Avenue to Jamboree Road	4	5	11,186	45	0.5	1.8%	0.1%	61.3	-	57	122	263
Jamboree Road to Carlson Avenue	4	0	18,431	45	0.5	1.8%	0.1%	63.4	-	79	170	366
Carlson Avenue to University Drive	2	0	18,427	55	0.5	1.8%	0.1%	65.7	51	111	239	515
East of University Drive	4	12	22,648	45	0.5	1.8%	0.1%	64.4	-	92	197	425
University Drive												
MacArthur Boulevard to California Avenue	4	10	24,765	55	0.5	1.8%	0.1%	67.1	64	139	299	643
California Avenue to Mesa Road	4	10	30,386	50	0.5	1.8%	0.1%	66.9	62	134	288	622
Mesa Road to Campus Drive	4	10	30,580	50	0.5	1.8%	0.1%	66.9	62	134	290	624
Campus Drive to Harvard Avenue	6	10	25,303	50	0.5	1.8%	0.1%	66.4	-	123	265	572

Existing Plus Project Conditions

TRAFFIC NOISE LEVELS AND NOISE CONTOURS

Project Number: 1B
Project Name: Koll Center Residences

Background Information

Model Description:	FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Source of Traffic Volumes:	Kimley Horn 2017
Community Noise Descriptor:	L_{dn}: ______ CNEL: x

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

Analysis Condition Roadway, Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Alpha Factor	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	CNEL at 100 Feet	Distance to Contour 70 CNEL	65 CNEL	60 CNEL	55 CNEL
MacArthur Boulevard												
North of Main Street	7	12	26,999	50	0.5	1.8%	0.1%	66.8	-	133	286	616
Main Street to NB I-405	8	10	35,539	50	0.5	1.8%	0.1%	68.2	76	164	353	761
Between I-405 NB and SB Ramps	8	7	51,328	50	0.5	1.8%	0.1%	69.8	96	208	447	964
Michelson Drive to SB I-405	8	7	52,879	45	0.5	1.8%	0.1%	68.7	82	176	379	816
Michelson Drive to Campus Drive	8	7	36,115	55	0.5	1.8%	0.1%	69.3	90	195	420	904
Jamboree Road to University Drive	6	10	39,601	60	0.5	1.8%	0.1%	70.4	107	230	496	1,069
Von Karman Avenue												
North of Main Street	4	0	21,722	45	0.5	1.8%	0.1%	64.2	-	88	189	408
Main Street to Michelson Drive	4	5	23,059	45	0.5	1.8%	0.1%	64.5	-	92	198	427
Michelson Drive to Dupont Drive	4	10	17,025	45	0.5	1.8%	0.1%	63.2	-	76	163	351
Dupont Drive to Campus Drive	4	10	17,025	45	0.5	1.8%	0.1%	63.2	-	76	163	351
Teller Avenue												
Michelson Drive to Dupont Drive	2	10	5,566	50	0.5	1.8%	0.1%	59.4	-	42	91	196
Dupont Drive to Campus Drive	2	10	2,955	50	0.5	1.8%	0.1%	56.6	-	-	60	129
Jamboree Road												
North of Main Street	8	7	63,127	50	0.5	1.8%	0.1%	70.7	111	238	513	1,106
Main Street to NB I-405	8	3	70,224	50	0.5	1.8%	0.1%	71.0	117	253	545	1,174
Between I-405 NB and SB I-405 Ramp	8	5	78,581	50	0.5	1.8%	0.1%	71.6	127	274	591	1,273
SB I-405 to Michelson Drive	8	7	71,337	50	0.5	1.8%	0.1%	71.2	120	259	557	1,200

Distance from Centerline of Roadway

Existing Plus Project Conditions

Michelson Drive to Dupont Drive	8	7	45,716	50	0.5	1.8%	0.1%	69.3	89	192	414	892
Dupont Drive to Campus Drive	7	7	41,829	50	0.5	1.8%	0.1%	68.7	81	176	378	815
Campus Drive to Birch Street	7	10	39,283	50	0.5	1.8%	0.1%	68.4	79	170	365	787
Birch Street to Fairchild Road	7	10	41,344	50	0.5	1.8%	0.1%	68.7	81	175	378	814
Fairchild Road to MacArthur Boulevard	7	5	33,556	50	0.5	1.8%	0.1%	67.7	70	151	325	700
Carlson Avenue												
Michelson Drive to Campus Drive	4	0	6,128	50	0.5	1.8%	0.1%	59.9	-	46	98	211
Harvard Avenue												
North of Michelson Drive	4	0	25,439	50	0.5	1.8%	0.1%	66.1	55	118	254	546
Michelson Drive to University Drive	4	10	19,009	50	0.5	1.8%	0.1%	64.9	-	98	211	455
Main Street												
West of MacArthur Boulevard	6	0	23,739	50	0.5	1.8%	0.1%	66.0	-	116	250	538
MacArthur Boulevard to Von Karman Avenue	6	5	29,325	45	0.5	1.8%	0.1%	65.7	-	112	241	518
Von Karman Avenue to Jamboree Road	6	5	24,984	45	0.5	1.8%	0.1%	65.0	-	100	216	466
East of Jamboree Road	6	5	23,323	45	0.5	1.8%	0.1%	64.7	-	96	207	445
Michelson Drive												
MacArthur Boulevard to Von Karman Avenue	4	5	10,635	45	0.5	1.8%	0.1%	61.1	-	55	118	255
Von Karman Avenue to Jamboree Road	4	0	15,386	45	0.5	1.8%	0.1%	62.7	-	70	150	324
Jamboree Road to Carlson Avenue	4	0	20,475	45	0.5	1.8%	0.1%	63.9	-	84	182	392
Carlson Avenue to Harvard Avenue	4	10	20,475	45	0.5	1.8%	0.1%	64.0	-	85	184	396
East of Harvard Avenue	4	7	17,894	45	0.5	1.8%	0.1%	63.4	-	78	168	361
Dupont Drive												
Von Karman Avenue to Teller Avenue	4	10	4,176	40	0.5	1.8%	0.1%	55.7	-	-	52	112
Teller Avenue to Jamboree Road	4	10	3,021	40	0.5	1.8%	0.1%	54.3	-	-	-	90
Campus Drive												
West of MacArthur Boulevard	6	5	29,714	45	0.5	1.8%	0.1%	65.8	-	113	243	523
MacArthur Boulevard to Von Karman Avenue	4	5	13,075	45	0.5	1.8%	0.1%	62.0	-	63	136	292
Von Karman Avenue Ave to Teller Avenue	4	5	11,189	45	0.5	1.8%	0.1%	61.3	-	57	122	263
Teller Avenue to Jamboree Road	4	5	11,216	45	0.5	1.8%	0.1%	61.3	-	57	122	264
Jamboree Road to Carlson Avenue	4	0	18,431	45	0.5	1.8%	0.1%	63.4	-	79	170	366
Carlson Avenue to University Drive	2	0	18,427	55	0.5	1.8%	0.1%	65.7	51	111	239	515
East of University Drive	4	12	22,648	45	0.5	1.8%	0.1%	64.4	-	92	197	425
University Drive												
MacArthur Boulevard to California Avenue	4	10	24,765	55	0.5	1.8%	0.1%	67.1	64	139	299	643
California Avenue to Mesa Road	4	10	30,386	50	0.5	1.8%	0.1%	66.9	62	134	288	622
Mesa Road to Campus Drive	4	10	30,580	50	0.5	1.8%	0.1%	66.9	62	134	290	624
Campus Drive to Harvard Avenue	6	10	25,303	50	0.5	1.8%	0.1%	66.4	-	123	265	572

TRAFFIC NOISE LEVELS AND NOISE CONTOURS

Cumulative No Project Conditions

Project Number: 2A
Project Name: Koll Center Residences

Background Information

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Source of Traffic Volumes: Kimley Horn 2017
Community Noise Descriptor: L_{dn}: ____ CNEL: x

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

Analysis Condition Roadway, Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Alpha Factor	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	CNEL at 100 Feet	Distance from Centerline of Roadway – Distance to Contour 70 CNEL	65 CNEL	60 CNEL	55 CNEL
MacArthur Boulevard												
North of Main Street	7	12	34,645	50	0.5	1.8%	0.1%	67.9	73	157	338	728
Main Street to NB I-405	8	10	53,893	50	0.5	1.8%	0.1%	70.0	100	216	466	1,004
Between I-405 NB and SB Ramps	8	7	55,245	50	0.5	1.8%	0.1%	70.1	101	218	470	1,012
Michelson Drive to SB I-405	8	7	59,303	45	0.5	1.8%	0.1%	69.2	88	190	409	880
Michelson Drive to Campus Drive	8	7	38,911	55	0.5	1.8%	0.1%	69.7	95	205	441	950
Jamboree Road to University Drive	6	10	21,640	60	0.5	1.8%	0.1%	67.8	71	154	332	714
Von Karman Avenue												
North of Main Street	4	0	26,738	45	0.5	1.8%	0.1%	65.1	47	101	217	469
Main Street to Michelson Drive	4	5	28,299	45	0.5	1.8%	0.1%	65.3	49	105	227	489
Michelson Drive to Dupont Drive	4	10	19,351	45	0.5	1.8%	0.1%	63.7	-	82	177	382
Dupont Drive to Campus Drive	4	10	19,247	45	0.5	1.8%	0.1%	63.7	-	82	177	380
Teller Avenue												
Michelson Drive to Dupont Drive	2	10	8,011	50	0.5	1.8%	0.1%	61.0	-	54	116	250
Dupont Drive to Campus Drive	2	10	5,514	50	0.5	1.8%	0.1%	59.4	-	42	91	195
Jamboree Road												
North of Main Street	8	7	71,163	50	0.5	1.8%	0.1%	71.2	120	258	556	1,198
Main Street to NB I-405	8	3	76,261	50	0.5	1.8%	0.1%	71.4	124	267	576	1,241
Between I-405 NB and SB I-405 Ramp	8	5	65,025	50	0.5	1.8%	0.1%	70.7	112	242	521	1,122
SB I-405 to Michelson Drive	8	7	87,498	50	0.5	1.8%	0.1%	72.1	138	296	638	1,375

Cumulative No Project Conditions

Michelson Drive to Dupont Drive	8	7	61,592	50	0.5	1.8%	0.1%	70.6	109	234	505	1,088
Dupont Drive to Campus Drive	7	7	47,754	50	0.5	1.8%	0.1%	69.2	89	192	413	890
Campus Drive to Birch Street	7	10	45,570	50	0.5	1.8%	0.1%	69.1	87	187	403	869
Birch Street to Fairchild Road	7	10	44,841	50	0.5	1.8%	0.1%	69.0	86	185	399	860
Fairchild Road to MacArthur Boulevard	7	5	39,327	50	0.5	1.8%	0.1%	68.4	78	168	361	778
Carlson Avenue												
Michelson Drive to Campus Drive	4	0	9,156	50	0.5	1.8%	0.1%	61.6	-	60	128	276
Harvard Avenue												
North of Michelson Drive	4	0	25,802	50	0.5	1.8%	0.1%	66.1	55	119	256	551
Michelson Drive to University Drive	4	10	19,247	50	0.5	1.8%	0.1%	64.9	-	99	213	458
Main Street												
West of MacArthur Boulevard	6	0	27,050	50	0.5	1.8%	0.1%	66.5	59	126	272	587
MacArthur Boulevard to Von Karman Avenue	6	5	35,270	45	0.5	1.8%	0.1%	66.5	59	126	272	586
Von Karman Avenue to Jamboree Road	6	5	28,403	45	0.5	1.8%	0.1%	65.6	-	109	236	507
East of Jamboree Road	6	5	24,449	45	0.5	1.8%	0.1%	64.9	-	99	213	459
Michelson Drive												
MacArthur Boulevard to Von Karman Avenue	4	5	22,681	45	0.5	1.8%	0.1%	64.4	-	91	196	422
Von Karman Avenue to Jamboree Road	4	0	21,640	45	0.5	1.8%	0.1%	64.1	-	88	189	407
Jamboree Road to Carlson Avenue	4	0	26,530	45	0.5	1.8%	0.1%	65.0	47	100	216	466
Carlson Avenue to Harvard Avenue	4	10	25,594	45	0.5	1.8%	0.1%	64.9	-	99	213	460
East of Harvard Avenue	4	7	19,039	45	0.5	1.8%	0.1%	63.6	-	81	175	376
Dupont Drive												
Von Karman Avenue to Teller Avenue	4	10	5,618	40	0.5	1.8%	0.1%	57.0	-	-	63	136
Teller Avenue to Jamboree Road	4	10	3,849	40	0.5	1.8%	0.1%	55.4	-	-	49	106
Campus Drive												
West of MacArthur Boulevard	6	5	33,397	45	0.5	1.8%	0.1%	66.3	-	122	262	565
MacArthur Boulevard to Von Karman Avenue	4	5	16,126	45	0.5	1.8%	0.1%	62.9	-	72	156	336
Von Karman Avenue Ave to Teller Avenue	4	5	13,629	45	0.5	1.8%	0.1%	62.2	-	65	139	300
Teller Avenue to Jamboree Road	4	5	12,797	45	0.5	1.8%	0.1%	61.9	-	62	134	288
Jamboree Road to Carlson Avenue	4	0	20,808	45	0.5	1.8%	0.1%	64.0	-	85	184	396
Carlson Avenue to University Drive	2	0	19,664	55	0.5	1.8%	0.1%	66.0	54	116	250	538
East of University Drive	4	12	24,866	45	0.5	1.8%	0.1%	64.8	-	97	210	452
University Drive												
MacArthur Boulevard to California Avenue	4	10	27,154	55	0.5	1.8%	0.1%	67.5	68	147	317	684
California Avenue to Mesa Road	4	10	32,877	50	0.5	1.8%	0.1%	67.2	66	141	304	655
Mesa Road to Campus Drive	4	10	33,397	50	0.5	1.8%	0.1%	67.3	66	143	307	662
Campus Drive to Harvard Avenue	6	10	28,507	50	0.5	1.8%	0.1%	66.9	62	133	287	619

TRAFFIC NOISE LEVELS AND NOISE CONTOURS

Cumulative Plus Project Conditions

Project Number: 2B
Project Name: Koll Center Residences

Background Information

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Source of Traffic Volumes: Kimley Horn 2017
Community Noise Descriptor: L_{dn}: ______ CNEL: x

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

Analysis Condition Roadway, Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Alpha Factor	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	CNEL at 100 Feet	Distance from Centerline of Roadway – Distance to Contour 70 CNEL	65 CNEL	60 CNEL	55 CNEL
MacArthur Boulevard												
North of Main Street	7	12	34,705	50	0.5	1.8%	0.1%	67.9	73	157	338	728
Main Street to NB I-405	8	10	53,953	50	0.5	1.8%	0.1%	70.0	101	217	466	1,005
Between I-405 NB and SB Ramps	8	7	55,396	50	0.5	1.8%	0.1%	70.1	101	218	471	1,014
Michelson Drive to SB I-405	8	7	59,545	45	0.5	1.8%	0.1%	69.2	88	190	410	883
Michelson Drive to Campus Drive	8	7	39,153	55	0.5	1.8%	0.1%	69.7	95	206	443	954
Jamboree Road to University Drive	6	10	21,880	60	0.5	1.8%	0.1%	67.9	72	155	334	720
Von Karman Avenue												
North of Main Street	4	0	26,798	45	0.5	1.8%	0.1%	65.1	47	101	218	469
Main Street to Michelson Drive	4	5	28,359	45	0.5	1.8%	0.1%	65.3	49	106	227	490
Michelson Drive to Dupont Drive	4	10	19,411	45	0.5	1.8%	0.1%	63.7	-	82	178	383
Dupont Drive to Campus Drive	4	10	19,307	45	0.5	1.8%	0.1%	63.7	-	82	177	381
Teller Avenue												
Michelson Drive to Dupont Drive	2	10	8,011	50	0.5	1.8%	0.1%	61.0	-	54	116	250
Dupont Drive to Campus Drive	2	10	5,514	50	0.5	1.8%	0.1%	59.4	-	42	91	195
Jamboree Road												
North of Main Street	8	7	71,223	50	0.5	1.8%	0.1%	71.2	120	258	556	1,199
Main Street to NB I-405	8	3	76,411	50	0.5	1.8%	0.1%	71.4	124	268	577	1,242
Between I-405 NB and SB I-405 Ramp	8	5	65,175	50	0.5	1.8%	0.1%	70.8	112	242	522	1,124
SB I-405 to Michelson Drive	8	7	87,740	50	0.5	1.8%	0.1%	72.1	138	297	639	1,378

Cumulative Plus Project Conditions

Michelson Drive to Dupont Drive	8	7	61,834	50	0.5	1.8%	0.1%	70.6	109	235	506	1,091
Dupont Drive to Campus Drive	7	7	47,996	50	0.5	1.8%	0.1%	69.3	89	192	415	893
Campus Drive to Birch Street	7	10	45,782	50	0.5	1.8%	0.1%	69.1	87	188	405	872
Birch Street to Fairchild Road	7	10	45,083	50	0.5	1.8%	0.1%	69.0	86	186	400	863
Fairchild Road to MacArthur Boulevard	7	5	39,569	50	0.5	1.8%	0.1%	68.4	78	168	363	782
Carlson Avenue												
Michelson Drive to Campus Drive	4	0	9,156	50	0.5	1.8%	0.1%	61.6	-	60	128	276
Harvard Avenue												
North of Michelson Drive	4	0	25,802	50	0.5	1.8%	0.1%	66.1	55	119	256	551
Michelson Drive to University Drive	4	10	19,247	50	0.5	1.8%	0.1%	64.9	-	99	213	458
Main Street												
West of MacArthur Boulevard	6	0	27,050	50	0.5	1.8%	0.1%	66.5	59	126	272	587
MacArthur Boulevard to Von Karman Avenue	6	5	35,270	45	0.5	1.8%	0.1%	66.5	59	126	272	586
Von Karman Avenue to Jamboree Road	6	5	28,403	45	0.5	1.8%	0.1%	65.6	-	109	236	507
East of Jamboree Road	6	5	24,449	45	0.5	1.8%	0.1%	64.9	-	99	213	459
Michelson Drive												
MacArthur Boulevard to Von Karman Avenue	4	5	22,681	45	0.5	1.8%	0.1%	64.4	-	91	196	422
Von Karman Avenue to Jamboree Road	4	0	21,640	45	0.5	1.8%	0.1%	64.1	-	88	189	407
Jamboree Road to Carlson Avenue	4	0	26,530	45	0.5	1.8%	0.1%	65.0	47	100	216	466
Carlson Avenue to Harvard Avenue	4	10	25,594	45	0.5	1.8%	0.1%	64.9	-	99	213	460
East of Harvard Avenue	4	7	19,039	45	0.5	1.8%	0.1%	63.6	-	81	175	376
Dupont Drive												
Von Karman Avenue to Teller Avenue	4	10	5,618	40	0.5	1.8%	0.1%	57.0	-	-	63	136
Teller Avenue to Jamboree Road	4	10	3,849	40	0.5	1.8%	0.1%	55.4	-	-	49	106
Campus Drive												
West of MacArthur Boulevard	6	5	33,397	45	0.5	1.8%	0.1%	66.3	-	122	262	565
MacArthur Boulevard to Von Karman Avenue	4	5	16,126	45	0.5	1.8%	0.1%	62.9	-	72	156	336
Von Karman Avenue Ave to Teller Avenue	4	5	13,629	45	0.5	1.8%	0.1%	62.2	-	65	139	300
Teller Avenue to Jamboree Road	4	5	12,827	45	0.5	1.8%	0.1%	61.9	-	62	134	289
Jamboree Road to Carlson Avenue	4	0	20,808	45	0.5	1.8%	0.1%	64.0	-	85	184	396
Carlson Avenue to University Drive	2	0	19,664	55	0.5	1.8%	0.1%	66.0	54	116	250	538
East of University Drive	4	12	24,866	45	0.5	1.8%	0.1%	64.8	-	97	210	452
University Drive												
MacArthur Boulevard to California Avenue	4	10	27,154	55	0.5	1.8%	0.1%	67.5	68	147	317	684
California Avenue to Mesa Road	4	10	32,877	50	0.5	1.8%	0.1%	67.2	66	141	304	655
Mesa Road to Campus Drive	4	10	33,397	50	0.5	1.8%	0.1%	67.3	66	143	307	662
Campus Drive to Harvard Avenue	6	10	28,507	50	0.5	1.8%	0.1%	66.9	62	133	287	619