HELIX
Environmental Planning

University Innovation District Project

Acoustical Analysis Report

June 2016

Prepared for:
Planning Department
City of Chula Vista
276 4th Avenue
Chula Vista, CA 91910

Prepared by:
HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942

UNIVERSITY INNOVATION DISTRICT PROJECT

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LIST OF ACRONYMS

ADT	average daily trip
AMSL	above mean sea level
ANSI	American National Standards Institute
BRT	Bus Rapid Transit
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
City	City of Chula Vista
CNEL	Community Noise Equivalent Level
dB	Decibel
dBA	A-weighted decibels
EIR	Environmental Impact Report
EUC	Eastern Urban Center/Millenia
FTA	Federal Transit Administration
GDP	General Development Plan
Hz	Hertz
HVAC	heating, ventilation and air conditioning
in/sec	inches per second
kHz	kilohertz
L_{DN}	Day-Night Sound Level
L_{EQ}	one-hour average sound level
MHPA	Multi-habitat Planning Area
MSCP	Multiple Species Conservation Program
mPa	micro-Pascals
mph	miles per hour
NSLUs	noise-sensitive land uses
OTC	Olympic Training Center
OTIC	Outdoor/Indoor Transmission Class
PPV	peak particle velocity
RCNM	Roadway Construction Noise Model

LIST OF ACRONYMS (cont.)

SPA	Sectional Planning Area
SPL	sound pressure level
STC	Sound Transmission Class
S_{WL}	sound power level
TAP	Trane Acoustics Program
TIA	Traffic Impact Analysis
TNM	Traffic Noise Model
UID	University Innovation District
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service

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EXECUTIVE SUMMARY

This report presents an assessment of potential construction and operational noise impacts associated with the proposed University Innovation District (UID) Project (project) located in the City of Chula Vista (City) in San Diego County.

The project involves six transects and three sectors over approximately 35 blocks. Implementation of the project would include a mix of academic, residential (including student housing and market-rate housing), retail, office, hotel, recreation, and open space/conservation uses through the year 2045. Educational, commercial, and residential uses are not specifically prescribed and may be developed within any of the transects/sectors.

Exterior and interior noise levels for future on-site noise-sensitive land uses (NSLUs) may exceed City noise compatibility guidelines within Transects T-3A, T-3B, T-6A, T-6B, T-6D, T-6E, and SD: Flex Overlay, and impacts would be potentially significant. As mitigation, site-specific acoustic analyses will be conducted for multi-family residences, non-residential NSLUs, and office uses to ensure that exterior and interior noise levels do not exceed the noise compatibility guidelines.

Project heating, ventilation, and air conditioning (HVAC) units may generate noise in excess of the City's noise control ordinance at nearby NSLUs. As mitigation, a design plan shall be submitted that demonstrates the HVAC units are within acceptable noise control ordinance standards.

Active uses at recreational facilities (e.g., parks and sport courts) may generate noise in excess of City noise control ordinance standards at nearby NSLUs. As mitigation, site-specific acoustic analyses will be conducted for recreational facilities to ensure that noise levels generated from the facilities would not exceed the City noise control ordinance.

Vibration impacts from major construction activities or the use of blasting or pile driving would cause potentially significant impacts to campus vibration-sensitive instruments and operations. As mitigation, notification of upcoming construction activities to occupied buildings with vibration-sensitive instruments and operations would reduce impacts to less than significant.

Traffic noise generated by the project would not cause direct significant impacts to off-site NSLUs. The Buildout (Year 2030) traffic from the proposed project would increase noise levels on adjacent roads. However, the project's traffic noise addition would not be a direct significant impact or a cumulatively considerable and impacts would be less than significant.

Construction of the project, including grading, would not cause significant noise impacts to human receptor NSLUs. However, construction noise may exceed the 60 dBA L_{EQ} threshold for sensitive habitat in the MSCP Preserve Area. Mitigation for these impacts is described in the project's Biological Technical Report (HELIX 2016).

The project is not located within the 60 CNEL noise contour for Brown Field Municipal Airport; impacts from airport noise would be less than significant.

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1.0 INTRODUCTION

1.1 PROJECT LOCATION

The proposed University Innovation District (UID) Project (project) is located in the City of Chula Vista (City) in San Diego County. The proposed project consists of approximately 383 acres of land in the southeastern area of the City. Chula Vista is located in San Diego County approximately seven miles south of the City of San Diego and approximately seven miles north of the U.S./Mexico international border. The project area consists of two geographically distinct and non-contiguous properties: the 353-acre Main Campus Property and the 30-acre Lake Property with off-site areas related to drainage and sewer. Figure 1, *Regional Location*, and Figure 2, *Project Vicinity*, illustrates the project's location and surrounding uses.

The Main Campus Property ranges in elevation from approximately 620 feet above mean sea level (AMSL) on the northwestern portion of the site near Hunte Parkway to approximately 340 feet AMSL at the southwestern end of the project near the Otay River Valley. The Lake Property ranges from north to south from about 500 to 560 feet AMSL. The Otay Valley Regional Park and the Otay River Valley are south of the site; SR-125 is about 0.5-mile west of the site; and the Eastern Urban Center/Millenia (henceforth referred to as EUC; currently under development) is located north of the site. Eastlake Parkway and Hunte Parkway, which currently terminate at the northwestern boundary of the project site, provide access to the northern part of the site.

1.2 PROJECT DESCRIPTION

The project and associated off-site improvements are consistent with the Otay Ranch General Development Plan (GDP). The project comprises a mixed-use community of academic/university, commercial, retail, residential, and recreational development within a series of transects and sectors. The transects consist of areas identified for urban development while the sectors include areas identified to include common areas, pedestrian walkways, and habitat conservation areas. The components described below apply to both the University and Innovation portions of the project. The university-related uses are generally designated in the eastern half of the Main Campus Property while the western half would include mixed-use development (residential, commercial, and office) that would relate and transition to the adjacent mixed-use Villages 9, 10 and EUC areas. However, mixed-use development could potentially occur anywhere within the project area.

1.2.1 Development Concept

The intent of the UID Sectional Planning Area (SPA) Plan is to implement the City's General Plan objectives for the University and Regional Technology Park area to stimulate academic and business investment and to bring intellectual capital and research activities to the City.

Figure 3, *Site Plan*, illustrates the site utilization plan for the project site. As shown, the UID involves six transects and three sectors over approximately 35 blocks to provide organization for development that focuses urban and campus development within the Main Campus Property and transitions into more limited development followed by open space and habitat conservation at the edges. The Lake Property features mostly habitat conservation areas with some low-intensity

satellite academic uses that would have limited physical impact and building footprints. Implementation of the project would include a mix of academic, residential (including student housing and market-rate housing), retail, office, hotel, recreation, and open space/conservation uses through the year 2045. Educational, commercial, and residential uses are not specifically prescribed and may be developed within any of the transects/sectors.

Development Standards in Chapter 3 of the SPA Plan, *Development Code*, regulate the placement of the buildings within the various transects and development areas identified. Specifically, development standards are included related to the maximum floor-area-ratio, maximum amount of development in gross square footage, minimum and maximum building heights, setbacks, and various placemaking guidelines that specify regulations for buildings and lots to regulate key characteristics of the built form (pedestrian and vehicle access, open space, parking, etc.). Below is a brief description of each of the proposed transects and development areas.

1.2.1.1 *Transect T-6: District Gateway*

Transect T-6 would consist of mixed-use development and would serve as a gateway to the UID as visitors approach the project site via Eastlake Parkway, south of Hunte Parkway. Buildings within this transect would be required to be at least three stories or 42 feet in height and no taller than 92 feet, with the exception of the "signature tower," which would be between 200 to 250 feet in height with up to 500,000 square feet of developed space. Active ground floor uses would occur on Hunte Parkway along a 20-foot wide pedestrian walkway, referred to as the "District Walk." Streetscape improvements and signage would also be included to create formal entrances. As shown on Figure 3, the T-6: Gateway District would encompass five entire blocks, in addition to the proposed "signature tower," located south of the majority of the T-6 transect.

1.2.1.2 *Transect T-5: Urban Core*

Transect T-5: Urban Core would comprise the center for innovation for the project. The design of this area would emphasize dramatic shapes and forms constructed of materials that highlight emerging technology. A mix of laboratory spaces, civic services, and recreational plaza areas would promote pedestrian activities. Similar to the development standards for Transect T-6, this transect would include buildings between 42 – 92 feet in height. Most of this transect is located towards the center of the project site; however, there are portions between Eastlake Parkway and Orion Avenue, between transects T-4 and T-6.

1.2.1.3 *Transect T-4: Town Center*

The Town Center transect is comprised of 11 blocks towards the southwestern portion of the project site and is intended to serve as a transition and interface with the main street feel of Village 9, located in between Orion Avenue and Eastlake Parkway. While most of this transect would be located adjacent to Village 9, a few blocks are designated east of Eastlake Parkway and would be located adjacent to common space and habitat conservation areas. Similar to transects T-6 and T-5, buildings would be between 42 – 92 feet in height and would have no setbacks between the building and the street. A Bus Rapid Transit (BRT) station is identified at the intersection of Campus Boulevard and Orion Avenue that would serve the project site and nearby

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Regional Location

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N

0 8 Miles

Figure 1

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Project Vicinity

UNIVERSITY INNOVATION DISTRICT

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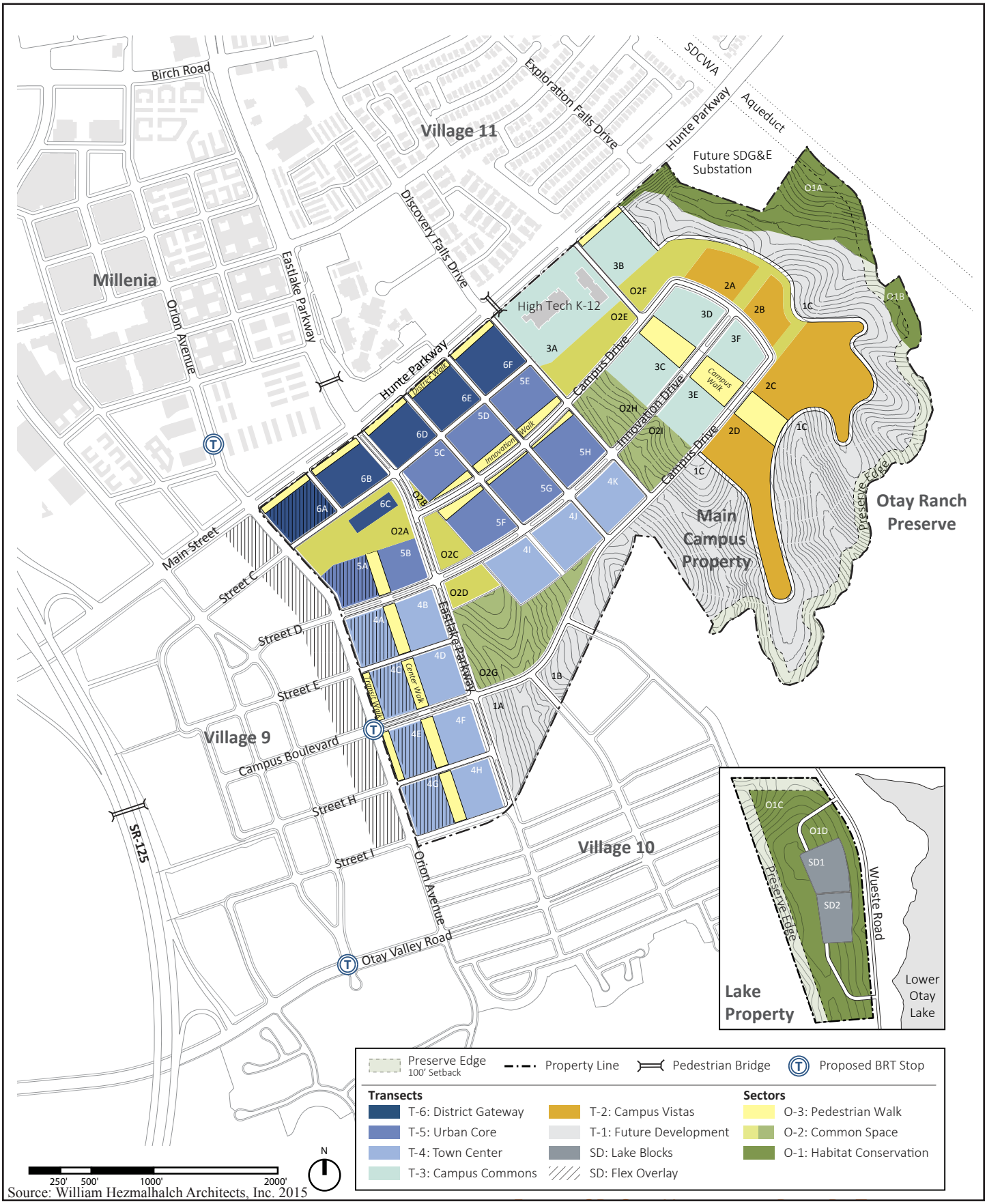
N

0 2,000 Feet

Figure 2



Source: William Hezmalhalch Architects, Inc. 2015

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Site Plan

UNIVERSITY INNOVATION DISTRICT

Figure 3

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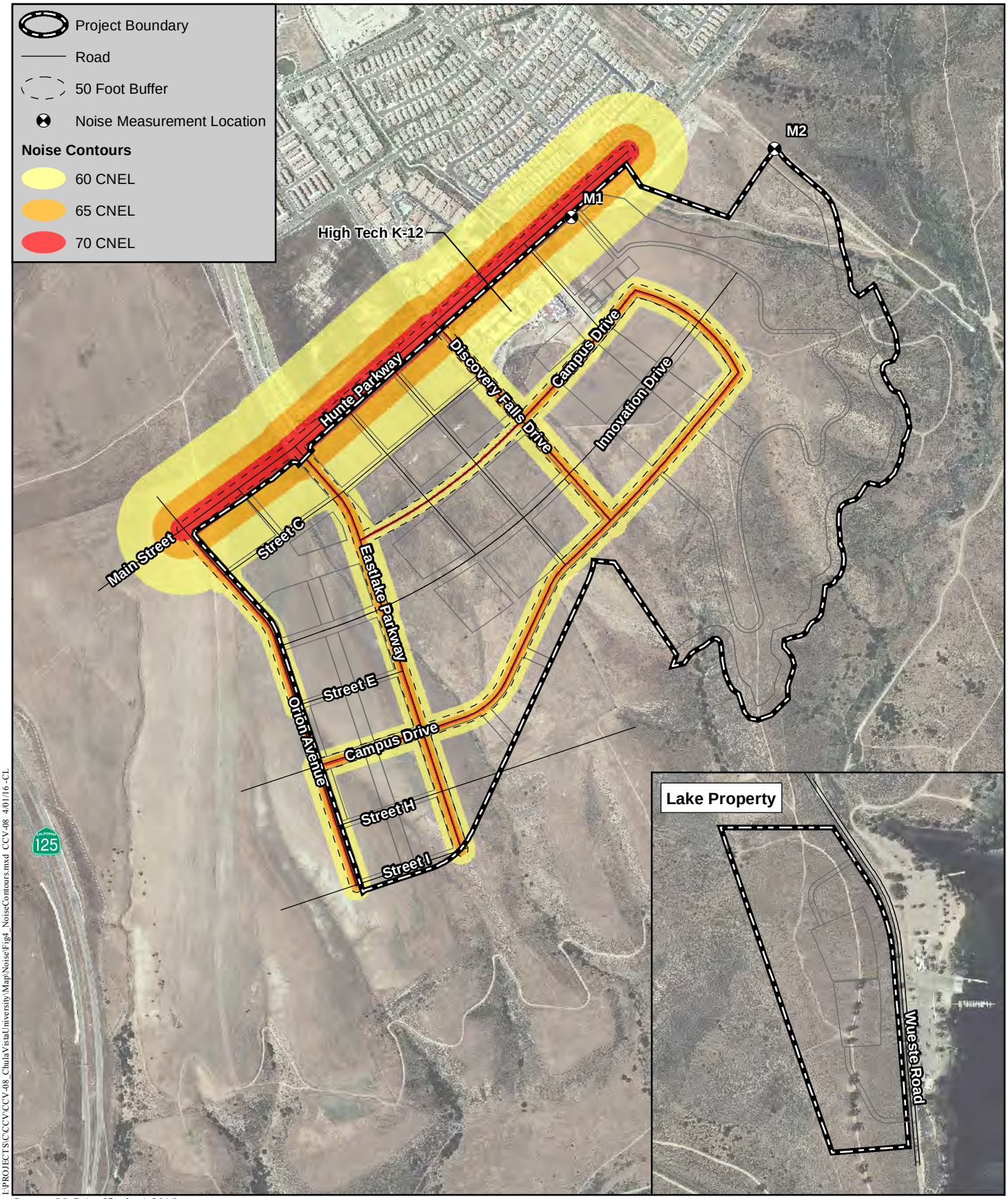

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Source: LLG (traffic data) 2015

Buildout (Year 2030) + Project Traffic Noise Contours

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N 0 800 Feet

Figure 4

off-site residential and commercial areas. Two pedestrian amenities are included in Transect T-4, including a pedestrian and open space corridor referred to as the "Center Walk" that spans over four blocks, in addition to a two-block "Transit Walk" centered on the proposed BRT stop.

1.2.1.4 *Transect T-3: Campus Commons*

The Campus Commons transect is located at the eastern part of the Main Campus Parcel, and includes six primary blocks focused around the Campus Walk, which is another pedestrian and recreational area through the project site. High Tech Elementary, Middle and High School is on one of these blocks. One of the five remaining blocks would be located along Hunte Parkway, near the existing High Tech High School. Overall, development in this transect would be lower in density compared to the central transects to serve as a transition to the southern open space areas. The site begins to decrease in elevation gradually towards the south. Buildings heights would not exceed 50 feet and building form and location are proposed to take advantage of southern-facing views.

1.2.1.5 *Transect T-2: Campus Vista*

The Campus Vista transect would be located between the T-3: Campus Commons and the T-1: Future Development transects, in the eastern part of the Main Campus Property. The T-2 Campus Vista transect comprises four areas, including two areas south of Campus Drive and Transect T-3 that would include a pavilion feature, and two areas east of Transect T-3. A pedestrian-oriented "Campus Walk" would be located through this transect, and would span both Campus Drive and Innovation Drive. The T-2: Campus Vista transect is designed to relate to naturalized open spaces and southern-facing views, which would be achieved by lower densities (maximum 0.5 FAR) and limiting buildings heights to 50 feet.

1.2.1.6 *Transect T-1: Future Development*

The T-1: Future Development transect is intended to allow limited development at the lowest intensities within the Main Campus Property and to serve as the final transition between the built and natural environment. The maximum amount of development in terms of FAR and building height would be similar to the T-2: Campus Vista transect; however, additional development restrictions would restrict the buildout of this area based on the amount of development in transects T-6 through T-2. Also, additional permit review would be required, including Design Review and City Council approval. This transect generally comprises the southern edge of the project boundary adjacent to the Otay Ranch Preserve. A Preserve Edge is included for slopes within 100 feet of the Otay Ranch Preserve to provide a buffer zone between developed and undeveloped areas to protect the Preserve from human activity and non-native species and would include regional trails.

1.2.1.7 *Transect SD: Lake Blocks*

The SD: Lake Blocks transect includes the 30-acre Lake Property, located about 0.5-mile east of the Main Campus Property. Access to the site would be from Wueste Road and development within this area would be limited to satellite academic uses with low or infrequent use. Most of this area would be preserved as habitat conservation space and would include a preserve edge to

serve as a buffer between the SD: Lake Property transect and the Otay Ranch Preserve. Maximum FAR would be 0.2 and building height would be limited to 50 feet.

1.2.1.8 *O-3: Pedestrian Walks Sector*

A series of pedestrian walks are included in the proposed project design to provide a system of public spaces interconnected to squares, plazas, common spaces, natural areas, and recreation amenities. Each of the proposed pedestrian walks would include wide views to open landscape areas or views along key district corridors. There are a total of five proposed pedestrian walks, including the District Walk, Transit Walk, Center Walk, Innovation Walk, and Campus Walk. The District Walk, located between T-6: District Gateway and Hunte Parkway, would incorporate the City's bike and pedestrian linkages from adjacent areas onto the project site and would connect with the educational nature of the project site through the existing High Tech High School. The District Walk would be located along Hunte Parkway, between Discovery Falls Drive at High Tech K-12and Orion Avenue at the northwestern project boundary. Transit Walk would be located near the southwestern corner of the project site in the T-4: Town Center transect, and would provide enhanced pedestrian access to the proposed BRT Station at Campus Boulevard and Orion Avenue. Center Walk, located just east of the Transit Walk, would extend through the T-4: Town Center transect between Eastlake Parkway and Orion Avenue and would terminate within an open space area near the proposed "signature tower" associated with the T-6: District Gateway transect. Innovation Walk is located within the T-5: Urban Core transect and alongside the northern alignment of Campus Drive between Eastlake Parkway and Discovery Falls Drive. Lastly, the Campus Walk would be located in the eastern portion of the Main Campus Property and would be located within the T-3: Campus Commons and T-2: Campus Vistas transects. The northern terminus of the Campus Walk would occur near High Tech High to the north and the T-1: Future Development transect to the south.

1.2.1.9 *O-2: Common Space Sector*

The O-2 Sector combines a variety of pedestrian, gathering, and recreation areas and includes architectural structures that accent areas with shade and gathering space. Each of the proposed four pavilion features would be individually designed and scaled to fit each unique location and the maximum allowed size of each feature would not exceed 5,000 square feet. Development in this sector may also include academic sports facilities to support academic anchor uses. It is intended that the limited built development in this sector would serve the public, such as concessions, demonstration kitchens, restrooms, or other civic-associated uses.

1.2.1.10 *O-1: Habitat Conservation Sector*

The O-1: Habitat Conservation sector is intended to protect existing natural systems and habitat and access and development in this area would be restricted. The O-1 sector areas occur at the Lake Property and the northwestern corner of the Main Campus Property. Development would be prohibited in these areas and restrictions regarding noise and lighting in adjacent and nearby areas would be implemented to reduce and avoid impacts on wildlife. The O-1 sector would be incorporated and dedicated as part of the Otay Valley Regional Park and land use and design would be regulated by the Multiple Species Conservation Program (MSCP) Subarea Plan, the

Resource Management Plan, and the Greenbelt Master Plan. Off-site storm water and wastewater improvements would be permitted within the O-1 sector.

1.2.1.11 *Transect SD: Flex Overlay*

The SD: Flex Overlay transect is intended to support and include the UID and Village 9 and would serve as a transition area between the university focused UID and the mixed-use focused Village 9. Development would be permitted that is consistent with either the SPA Plan for the UID or for Village 9. The proposed SPA Plan recommends that development occur within the proposed Flex Overlay prior to developing within the T-1 Transect.

1.2.1.12 *Off-Site Improvements*

Proposed off-site utility improvements include improvements south of the site for sewer and storm drain infrastructure and trail access. Off-site sewer improvements would be necessary for the southeastern portion of the Main Campus Property and the Lake Property. For the Main Campus Property, off-site sewer and drainage would be conveyed within pipelines that would follow an existing trail easement. For the Lake Property, off-site improvements would be necessary for the proposed sewer system and would be located within existing access roads. Also, the proposed project would implement an existing 8-foot wide dirt road within the Preserve as a link between the trails within the UID and the Greenbelt Trail, which would implement the MSCP Subarea Plan.

2.0 ENVIRONMENTAL SETTING

2.1 NOISE AND SOUND LEVEL DESCRIPTORS AND TERMINOLOGY

All noise level or sound level values presented herein are expressed in terms of decibels (dB), with A-weighting (dBA) to approximate the hearing sensitivity of humans. Time-averaged noise levels are expressed by the symbol L_{EQ}, with a specified duration. The Community Noise Equivalent Level (CNEL) is a 24-hour average, where noise levels during the evening hours of 7:00 p.m. to 10:00 p.m. have an added 5 dB weighting, and sound levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. have an added 10 dB weighting. This is similar to the Day-Night sound level (L_{DN}), which is a 24-hour average with an added 10 dB weighting on the same nighttime hours but no added weighting on the evening hours. Sound levels expressed in CNEL are always based on dBA. These metrics are used to express noise levels for both measurement and municipal regulations, as well as for land use guidelines and enforcement of noise ordinances.

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ, such as a human ear. Noise is defined as loud, unexpected, or annoying sound.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and

obstructions or atmospheric factors affecting the propagation path to the receiver contribute to the sound level and characteristics of the noise perceived by the receiver. The field of acoustics deals primarily with the propagation and control of sound.

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low-frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

The amplitude of pressure waves generated by a sound source determines the loudness of that source. A logarithmic scale is used to describe sound pressure level (SPL) in terms of dB units. The threshold of hearing for the human ear is about 0 dB, which corresponds to 20 micro-Pascals (mPa).

Because decibels are logarithmic units, SPL cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3-dB increase. In other words, 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.

2.2 NOISE AND VIBRATION SENSITIVE LAND USES

Noise-sensitive land uses (NSLUs) are land uses that may be subject to stress and/or interference from excessive noise, such as residential dwellings, transient lodging, hospitals, educational facilities, libraries, and sensitive habitat. Industrial and commercial land uses are generally not considered sensitive to noise. NSLUs adjacent or nearby to the Main Campus Property include schools (High Tech K-12), single- and multi-family residences to the north across Hunte Parkway, and sensitive habitat to the east and southeast. NSLUs adjacent to the north, south, and west of the Lake Property include sensitive habitat (Lower Otay Lake is adjacent to the east). Future development within Village 9, Village 10, and EUC may also include NSLUs such as residences and parks adjacent to the project.

Land uses in which ground-borne vibration could potentially interfere with operations or equipment, such as research, manufacturing, hospitals, and university research operations (Federal Transit Administration [FTA] 2006) are considered "vibration-sensitive." The degree of sensitivity depends on the specific equipment that would be affected by the ground-borne vibration. In addition, excessive levels of ground-borne vibration of either a regular or an intermittent nature can result in annoyance to residential uses. Existing vibration-sensitive land uses near the Main Campus Property include single and multi-family residences and High Tech K-12. No vibration-sensitive land uses are currently located adjacent to the Lake Property. Future vibration-sensitive land uses on both properties may include university research operations and residences.

2.3 REGULATORY FRAMEWORK

2.3.1 City of Chula Vista Noise Control Ordinance

Noise standards for the City are codified in the City Municipal Code's noise control ordinance. Applicable standards for the proposed project are listed below:

Section 19.68.030, Exterior Noise Limits, states that no person shall operate, or cause to be operated, any source of sound at any location within the city or allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person which causes the noise level to exceed the environmental and/or nuisance interpretation of the applicable limits given in Table 1, *City of Chula Vista Exterior Noise Limits*. The noise standards in Table 1 do not apply to construction activities.

Table 1
CITY OF CHULA VISTA EXTERIOR NOISE LIMITS

Receiving Land Use Category	Noise Level (dBA)	
	10 p.m. to 7 a.m. (Weekdays)	7 a.m. to 10 p.m. (Weekdays)
	10 p.m. to 8 a.m. (Weekends)	8 a.m. to 10 p.m. (Weekends)
All residential (except multiple dwelling)	45	55
Multiple dwelling residential	50	60
Commercial	60	65
Light industry – I-R and I-L zone	70	70
Heavy industry – I zone	80	80

Source: City noise control ordinance Section 19.68.030

Section 19.68.040, Interior Noise Limits, states that no person shall operate, or cause to be operated, any source of sound within a residential dwelling unit or allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person which causes the noise level when measured inside a neighboring receiving dwelling unit to exceed the environmental and/or nuisance interpretation of the applicable limits given in Table 2, *City of Chula Vista Interior Noise Limits*.

Table 2
CITY OF CHULA VISTA INTERIOR NOISE LIMITS

Type of Land Use	Time Interval	Noise Level (dBA) not to be Exceeded		
		Any time	1 min in 1 hr	5 min in 1 hr
Multifamily	10 pm – 7 am	45	40	35
Residential	7 am – 10 pm	55	50	45

Source: City of Chula Vista Municipal Code Section 19.68.040

Section 19.68.050, Prohibited Acts, of the Chula Vista Municipal Code regulates vibration from construction and operational sources. It prohibits operating or permitting the operation of any device that creates a vibration that is above the vibration perception threshold of any individual at or beyond the property boundary of the source if on private property or at 150 feet from the source if on a public space or public right-of-way.

Section 19.68.060, Special provision (exemptions), of the Chula Vista Municipal Code provides an exemption from exterior noise standards for construction and rehabilitation activities.

Section 17.24.040 of Chula Vista's code limits construction activities to the hours of 7:00 a.m. to 10:00 p.m. Monday through Friday, and 8:00 a.m. to 10:00 p.m. on weekends, except when the work is necessary for emergency repairs required for health and safety.

2.3.2 City of Chula Vista General Plan

The exterior land use noise compatibility guidelines from the City's General Plan Noise Element are shown in Table 3, *City of Chula Vista Exterior Noise Compatibility Guidelines*. These guidelines reflect the levels of noise exposure that are generally considered to be compatible with various types of land uses in the City.

Table 3
CITY OF CHULA VISTA EXTERIOR NOISE COMPATIBILITY GUIDELINES

Land Use	Annual CNEL					
	50	55	60	65	70	75
Residential						
Schools, Libraries, Daycare Facilities, Convalescent Homes, Outdoor Use Areas, and Other Similar Uses Considered Noise Sensitive						
Neighborhood Parks, Playgrounds						
Community Parks, Athletic Fields						
Offices and Professional						
Places of Worship (excluding outdoor use areas)						
Golf Courses						
Retail and Wholesale Commercial, Restaurants, Movie Theaters						
Industrial, Manufacturing						

Note: Shading represents the maximum noise level considered compatible for each land use category

2.3.3 City of Chula Vista Multiple Species Conservation Program Subarea Plan

The City's MSCP Subarea Plan regulates impacts to sensitive biological resources, including noise impacts. In accordance with Section 7.5.2 of the Chula Vista Subarea Plan, Adjacency Management Issues, uses in or adjacent to the Preserve should be designed to minimize noise impacts. Berms or walls should be constructed adjacent to commercial areas and any other use that may introduce noises that could impact or interfere with wildlife utilization of the Preserve. Excessively noisy areas or activities adjacent to breeding areas, including temporary grading

activities, must incorporate noise reduction measures or be curtailed during the breeding season of sensitive bird species, consistent with Table 3-5 of the MSCP Subregional Plan, included as Appendix A to the MSCP Subarea Plan. No clearing, grubbing, and/or grading is permitted within the MSCP Preserve during the breeding season of the sensitive species present.

Some studies, such as that completed by the Bioacoustics Research Team (1997), have concluded that 60 dBA is a single, simple criterion to use as a starting point for passerine impacts until more specific research is done. Associated guidelines produced by the U.S. Fish and Wildlife Service (USFWS) require that project noise be limited to a level not to exceed 60 dBA L_{EQ} or, if the existing ambient noise level is above 60 dBA, increase the ambient noise level by 3 dBA at the edge of occupied habitat during the avian species breeding season.

2.3.4 2013 California Green (CALGreen) Building Standards Code

The following noise control standards from the 2013 CALGreen (California Code of Regulations Title 24, Part 11, subsection 5.507.4, Acoustical Control) Building Standards Code for non-residential buildings are applicable to this project.

5.507.4.1 Exterior noise transmission, prescriptive method. Wall and roof-ceiling assemblies exposed to the noise source making up the building or addition envelope or altered envelope shall meet a composite Sound Transmission Class (STC) rating of at least 50 or a composite Outdoor/Indoor Transmission Class (OITC) rating of no less than 40, with exterior windows of a minimum STC of 40 or OITC of 30 in the following locations:

1. Within the 65 CNEL noise contour of an airport.

   Exceptions:

   1. L_{DN} or CNEL for military airports shall be determined by the facility Air Installation Compatible Land Use Zone plan.

   2. L_{DN} or CNEL for other airports and heliports for which a land use plan has not been developed shall be determined by the local general plan noise element.

2. Within the 65 CNEL or L_{DN} noise contour of a freeway or expressway, railroad, industrial source or fixed-guideway source as determined by the Noise Element of the General Plan.

5.507.4.1.1 Noise exposure where noise contours are not readily available. Buildings exposed to a noise level of 65 dB L_{EQ} (1 hour) during any hour of operation shall have building, addition or alteration exterior wall and roof-ceiling assemblies exposed to the noise source meeting a composite STC rating of at least 45 (or OITC 35), with exterior windows of a minimum STC of 40 (or OITC 30).

5.507.4.2 Performance method. For buildings located as defined in Section 5.507.4.1 or 5.507.4.1.1, wall and roof-ceiling assemblies exposed to the noise source making up the building or addition envelope or altered envelope shall be constructed to provide an interior noise

environment attributable to exterior sources that does not exceed an hourly equivalent noise level (L_{EQ} 1 hour) of 50 dBA in occupied areas during any hour of operation.

5.507.4.3 Interior sound transmission. Wall and floor-ceiling assemblies separating tenant spaces and tenant spaces and public places shall have an STC of at least 40.

2.4 EXISTING CONDITIONS

2.4.1 Surrounding Land Uses

Surrounding land uses to the Main Campus Property include Village 11 to the north, open space preserve to the east and southeast, future Village 10 to the south, and future Village 9 to the west. High Tech K-12, a public charter school, occupies 10-acres of the project site at the southeast corner of Discovery Falls and Hunte Parkway. Surrounding land uses to the Lake Property include the Olympic Training Center (OTC) to the north, Lower Otay Reservoir to the east and open space preserve to the south and west. Immediately to the south is undeveloped land and the City of San Diego's Otay Water Filtration Plant is located southeast of the Lake Property.

2.4.2 Existing Noise Conditions

2.4.2.1 *General Site Survey*

A traffic noise measurement and an ambient noise measurement were conducted during a site visit on Tuesday, March 1, 2016 (see Appendix A, *On-site Noise Measurement Sheets*, for survey notes). The traffic noise measurement was performed on the southern end of Hunte Parkway near Exploration Falls Drive. This location was chosen as it is an area where vehicles could achieve full speed for a representative noise value, this would be difficult in other areas adjacent to the future project due to the existing layout of the street grid (where Hunte Parkway terminates at Eastlake Parkway). The ambient noise measurement was taken just east of Exploration Falls Drive and south of Hunte Parkway, approximately 600 feet down a utility road. This location was chosen to obtain a noise measurement on the future project site absent most traffic noise. During the traffic noise measurements, start and end times were recorded and vehicle counts were made for cars, medium trucks (double-tires/two axles), and heavy trucks (three or more axles) for the corresponding road segments. The measurement time (15 minutes) was sufficiently long for a representative traffic volume to occur and the noise level (L_{EQ}) to stabilize. The vehicle counts were then converted to one-hour equivalent volumes by applying an appropriate factor.

The measured noise levels and related weather conditions are shown in Table 4, *Noise Measurement Results*. Traffic counts for the timed measurements and the one-hour equivalent volumes are shown in Table 5, *Measured Traffic Volumes and Vehicular Distribution.*

Table 4 NOISE MEASUREMENT RESULTS					
Site	**Location**	**Conditions**	**Time**	**dBA L_{EQ}**	**Notes**
1	On Hunte Parkway, just west of Exploration Falls Drive	69°F, 6 miles per hour (mph) wind, 61 percent humidity	10:23-10:38 a.m.	55.9	Consistent bird noise; sunny
2	Approximately 600 feet south from Hunte Parkway on utility road	70°F, 4 mph wind, 61 percent humidity	10:48-11:03 a.m.	43.5	Cloudy

Note: See Figure 4 for measurement site locations.

Table 5 MEASURED TRAFFIC VOLUMES AND VEHICULAR DISTRIBUTION				
Roadway	**Traffic**	**Autos**	**MT[1]**	**HT[2]**
Hunte Parkway	15-minute count	13	2	0
	One-hour Equivalent	52	8	0
	Percent	**86%**	**14%**	**0%**

[1] MT=Medium Trucks (double tires/two axles)
[2] HT=Heavy Trucks (three or more axles)

3.0 ANALYSIS METHODOLOGY AND ASSUMPTIONS

3.1 METHODOLOGY AND EQUIPMENT

The following equipment was used to measure existing noise levels at the Project site:

- Larson Davis System LxT Integrating Sound Level Meters
- Larson Davis Model CA150 Calibrator
- Windscreen and tripod for the sound level meter
- Digital camera

The sound level meter was field-calibrated immediately prior to the noise measurements to ensure accuracy. All measurements were made with a meter that conforms to the American National Standards Institute (ANSI) specifications for sound level meters (ANSI SI.4-1983 R2001). All instruments were maintained with National Bureau of Standards traceable calibration per the manufacturers' standards.

Modeling of the exterior noise environment from traffic for this report was accomplished using the following computer noise models: Traffic Noise Model (TNM) version 2.5 for on-site noise levels and the FHWA Noise Prediction Model for off-site noise levels. TNM was released in February 2004 by the U.S. Department of Transportation (USDOT), and calculates the daytime

average hourly L_{EQ} from 3-dimensional model inputs and traffic data (California Department of Transportation [Caltrans] 2004). Input variables for TNM and the FHWA Noise Prediction Model calculations include lane configuration, projected traffic volumes, estimated vehicle mix, and posted vehicle speeds. Noise levels at distances further from the source than the specific receptor would be lower due to attenuation provided by increased distance from the noise source.

The one-hour L_{EQ} noise level is calculated utilizing peak-hour traffic; peak-hour traffic volumes can be estimated based on the assumption that 10 percent of the average daily traffic would occur during a peak hour. The model-calculated one-hour L_{EQ} noise output is the equivalent to the CNEL (Caltrans 2009).

Project construction noise was analyzed using the Roadway Construction Noise Model (RCNM; USDOT 2008), which utilizes estimates of sound levels from standard construction equipment.

3.2 ASSUMPTIONS

3.2.1 Construction

Construction would require heavy equipment during mass grading, utility installations, building construction, and paving. Construction equipment used on the proposed project sites would include but not be limited to: backhoes, compactors, concrete saws, dozers, dump trucks, generators, loaders, pavers, and dump trucks.

The most likely source of vibration during construction of the proposed project would be a vibratory roller, which may be used to achieve soil compaction as part of the foundation construction. Caltrans has published standards for vibration impact assessments. The impact assessment procedures and criteria included in the Transportation and Construction Vibration Guidance Manual (September 2013) are routinely used for projects proposed by local jurisdictions. Therefore, the Caltrans measure of the structural damage threshold from ground-borne vibration of 0.25 in/sec PPV and the strongly perceptible human response threshold from ground-borne vibration of 0.1 inches per second (in/sec) peak particle velocity (PPV) from a continuous/frequent intermittent source is used in this report to determine vibration impacts.

3.2.2 Operation

The known or anticipated operational noise sources include residential heating, ventilation, and air conditioning (HVAC) units, vehicular traffic. Operational noise is further discussed under Section 4.2.2.

3.2.2.1 *Heating, Ventilation, and Air Conditioning Units*

The project buildings would likely use commercial-sized HVAC units. For the purposes of this analysis, the specifications for Carrier 48PG 14-ton HVAC units, which have a sound power level (S_{WL}) of 83.3 dBA, are used to analyze the noise impact from the proposed project buildings. The manufacturer's noise data for the HVAC units is provided below in Table 6, *Condenser Noise Data*; more detailed data can be found in Appendix B, *Carrier 48PG Condenser Data*. Modeling for these HVAC units was performed in Trane Acoustics Program (TAP).

Table 6 CONDENSER NOISE DATA									
Product	**Nominal Tons**	**Noise Levels in Decibels[1] (dB) Measured at Octave Frequencies**							**Overall Noise Level in dBA[1]**
		125 Hz	**250 Hz**	**500 Hz**	**1 KHz**	**2 KHz**	**4 KHz**	**8 KHz**	
Carrier 48PG	14	85.9	85.3	81.8	78.2	72.2	67.9	59.9	83.3

Source: Appendix B
[1] Sound Power Levels (S_{WL})
KHz = kilohertz

3.2.2.2 *Vehicular Traffic*

The Traffic Impact Analysis (TIA) for the project (Linscott, Law & Greenspan Engineers [LLG] 2015) provides the Existing and Buildout (Year 2030) future traffic volumes without and with the proposed project for surrounding street segments. Anticipated future traffic noise levels are based on these forecasted traffic volumes. Table 7, *Existing and Buildout (Year 2030) Traffic Volumes,* shows the daily traffic volumes under each scenario for the street segments in the vicinity of the project site. It should be noted that some of the street names presented in the table below differ from the street names in the TIA; this is due to street names in the UID SPA Plan that were updated after completion of the TIA. The following street names were changed from the TIA to the UID SPA Plan:

- Village 9 Street "B" is referred to as Orion Avenue;
- Village 9 Street "C" is referred to as Street C;
- Village 9 Street "E" is referred to as Street E;
- Discovery Falls Drive from Hunte Parkway to Street "K" is referred to as Campus Drive;
- Discovery Falls Drive from Street "K" to Eastlake Parkway is referred to as a segment of Campus Drive from Discovery Falls Drive to Eastlake Parkway.
- The Eastlake Parkway segments refer to Discovery Falls Drive as Orion Avenue.

Table 7
EXISTING AND BUILDOUT (YEAR 2030) TRAFFIC VOLUMES

Roadway	Segment	On-site or off-site roadway?	Speed limit (mph)[1]	Average Daily Trips (ADT)			
				Existing	Existing + Project	Buildout (Year 2030)	Buildout (Year 2030) + Project
Hunte Parkway	Otay Lakes Road to Olympic Parkway	Off-site	50	7,000	11,650	13,820	19,500
	Olympic Parkway to Exploration Falls Drive	Off-site	50	3,200	13,530	20,140	28,400
	Exploration Falls Drive to Discovery Falls Drive	Off-site (borders project)	50	3,200	8,880	20,270	21,300
	Discovery Falls Drive to Eastlake Parkway	Off-site (borders project)	50	3,700	10,930	20,570	27,800
Main Street	Eastlake Parkway to Orion Avenue	Off-site (borders project)	50	DNE	DNE	18,000	24,200
Eastlake Parkway	Otay Lakes Road to Olympic Parkway	Off-site	50	12,100	14,170	30,670	31,700
	Olympic Parkway to Birch Road	Off-site	50	11,800	16,960	27,170	28,200
	Birch Road to Hunte Parkway	Off-site	50	1,900	34,950	16,240	24,500
	Hunte Parkway to Street C	On-site	35	DNE	DNE	400	6,600
	Street C to Campus Drive	On-site	35	DNE	DNE	2,900	9,100
	Campus Drive to Otay Valley Road	On-site	35	DNE	DNE	5,450	7,000
Orion Avenue	Hunte Parkway to Street C	On-site	35	DNE	DNE	3,520	9,200
	Street C to Street E	On-site	35	DNE	DNE	320	6,000
	Street E to Campus Drive	On-site	35	DNE	DNE	DNE	1,500
	Campus Drive to Otay Valley Road	On-site	35	DNE	DNE	2,350	7,000
Discovery Falls Drive	Hunte Parkway to Campus Drive	On-site	25	DNE	DNE	5,590	15,400
Campus Drive	Discovery Falls Drive to Eastlake Parkway	On-site	25	DNE	DNE	DNE	5,600
	Eastlake Parkway to Orion Avenue	On-site	25	DNE	DNE	1,670	12,000
Olympic Parkway	E. Palomar Street to SR 125	Off-site	50	35,600	41,800	43,390	47,000
	SR 125 to Eastlake Parkway	Off-site	50	35,608	43868	44,140	49,300
	Eastlake Parkway to Hunte Parkway	Off-site	50	14,700	20380	27,320	33,000
Birch Road	La Media Road to SR-125	Off-site	50	10,700	37,040	30,750	32,300
	SR-125 to Eastlake Parkway	Off-site	50	10,700	39,620	29,330	31,400
Proctor Valley Road	Mt Miguel Road to Hunte Parkway	Off-site	45	18,000	20,070	39,350	40,900

1 On-site roadway speed for future internal roads is the posted speed limit proposed for the roadway provided in UID SPA Plan; the speed limit for the Main Street extension to Hunte Parkway is assumed to be the posted Hunte Parkway speed limit of 50 mph.

2 ADT volumes are based on the traffic numbers provided in the project TIA (LLG 2015).

NOTE: DNE = Does not exist.

Posted speed limits for existing streets were used. For internal roadways, speed limits were assumed from information in the UID SPA Plan. For the future extension of Main Street from SR 125 to Hunte Parkway, the speed limit of 50 mph on the end of Hunte Parkway to connect to Main Street was used. The percentage breakdown of vehicles for the off-site roadways and the main on-site thoroughfare roadways (Orion Avenue and Eastlake Parkway) was assumed to be 94 percent autos, 4 percent medium trucks, and 2 percent heavy trucks. The percentages for Discovery Falls Drive and Campus Drive, smaller internal on-site roadways, were assumed to be 97 percent autos, 2 percent medium trucks, and 1 percent heavy trucks. These percentages were used for vehicle composition for modeling the existing and future noise conditions in the vicinity of the project.

4.0 IMPACTS

4.1 SIGNIFICANCE CRITERIA

The following thresholds are based on Appendix G of the California Environmental Quality Guidelines (CEQA) Guidelines, the City General Plan Noise Element, and the City noise control ordinance, as applicable to the project.

A significant noise impact would occur if the project would:

1. Expose new development to noise levels at exterior use areas in excess of the noise compatibility standards established in the City General Plan Noise Element or generate noise levels that exceed the limits in the City noise ordinance. For residential, school, library, and neighborhood park uses, the exterior noise compatibility standard is 65 CNEL and the interior noise compatibility standard is 45 CNEL. For community parks and offices and professional land uses, the exterior noise compatibility standard is 70 CNEL.

2. Subject vibration-sensitive land uses to the structural damage threshold from ground-borne vibration of 0.25 in/sec PPV and the strongly perceptible human response threshold from ground-borne vibration of 0.1 in/sec PPV from a continuous/frequent intermittent source, as specified by Caltrans. According to Caltrans, major construction activity within 200 feet and pile driving within 600 feet may be potentially disruptive to sensitive operations (Caltrans 2002).

3. Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project. A substantial permanent increase would occur if implementation of the proposed project results in an ambient noise level that exceeds the exterior noise limits established in the City General Plan Noise Element, including 65 CNEL for residential, school, and neighborhood park uses; 70 CNEL for community parks, office and professional uses, and athletic fields; and 75 CNEL for commercial uses. For transportation-related noise, a significant impact would occur if the proposed project results in a 3 CNEL or greater increase in traffic noise on a roadway segment and the resultant noise level would exceed the City General Plan Noise Element exterior noise limits.

4. Result in temporary construction noise:

    - Outside the noise control ordinance-exempted hours of 7:00 a.m. to 10:00 p.m. Monday through Friday, and 8:00 a.m. to 10:00 p.m. on weekends; or

    - That exceeds 60 dBA L_{EQ} or an exceedance of the average ambient noise level by 3 dBA L_{EQ}, whichever is greater, at the edge of sensitive biological habitat within the MHPA during the breeding season.

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

4.2 ISSUE 1: NOISE LEVELS IN EXCESS OF STANDARDS

Implementation of the project would have the potential to expose new development to noise levels at exterior use areas in excess of the noise compatibility standards established in the City General Plan Noise Element or generate noise levels that exceed the limits in the City noise ordinance by constructing new roadways, developing land uses near existing roadways, developing new operational sources of noise, and by increasing human activity throughout the project site.

4.2.1 Transportation Noise

4.2.1.1 *Exterior Noise Levels*

The greatest noise exposure to proposed project land uses would be from on-site vehicular traffic noise. Noise levels for on-site roadway segments were calculated with Buildout (Year 2030) using TNM (further described in Section 3.1). Noise levels were modeled at a distance of 50 feet from the roadway centerline; this is a conservative estimate for the closest distance the project land uses would be from the roadway centerline. Noise levels were modeled for one ground level and one upper story receptor at each location. A floor height of 26 feet was used to provide an estimated height for of upper story receivers, and a distance of 5 feet was added to the floor height to represent receiver ear height. On-site roadway traffic volumes at buildout of the project are shown in Table 7.

The modeled noise level for each roadway segment is shown in Table 8, *Buildout (Year 2030) + Project On-site Traffic Noise Levels*. In addition, ground-level noise contours for 70 CNEL, 65 CNEL, and 60 CNEL were calculated for each roadway. These contours are shown in Figure 4, *Buildout (Year 2030) + Project Traffic Noise Contours,* and assume flat topography but do not take into account any shielding provided by the proposed buildings and represent unmitigated conditions. Detailed traffic noise modeling data is provided in Appendix C, *Traffic Noise Modeling*.

Table 8
BUILDOUT (YEAR 2030) + PROJECT ON-SITE TRAFFIC NOISE LEVELS

Roadway	Segment	Ground Level Traffic Noise Level (CNEL)[1]	Upper Story Traffic Noise Level (CNEL)[2]	Exterior Noise Significant Impact?[3]
Hunte Parkway	Exploration Falls Drive to Discovery Falls Drive	**73**	**72**	**Yes**
	Discovery Falls Drive to Eastlake Parkway	**74**	**73**	**Yes**
Main Street	Eastlake Parkway to Orion Avenue	**74**	**73**	**Yes**
Eastlake Parkway	Hunte Parkway to Street C	64	63	No
	Street C to Campus Drive	65	64	No
	Campus Drive to Otay Valley Road	64	63	No
Orion Avenue	Hunte Parkway to Street C	65	64	No
	Street C to Street E	63	63	No
	Street E to Campus Drive	57	57	No
	Campus Drive to Otay Valley Road	64	63	No
Discovery Falls Drive	Hunte Parkway to Campus Drive	65	64	No
Campus Drive	Campus Drive to Eastlake Parkway	60	60	No
	Eastlake Parkway to Orion Avenue	64	63	No

1 Noise levels were taken 50 feet from the roadway centerline, which is a conservative estimate of the distance to proposed project NSLUs.
2 Upper story receives are assumed at a floor height of 26 feet
3 65 CNEL is the most conservative noise level that is acceptable for the possible land uses (multi-family residential, schools, and neighborhood parks). Some land uses have an acceptable noise level higher than 65 CNEL (e.g., 70 CNEL for offices; 75 CNEL for retail and commercial).
Note: Noise levels are based on the traffic numbers provided in the project TIA (LLG 2015). Bold text indicates a significant exterior impact.

Project land uses located 50 feet from the roadway centerline of Hunte Parkway and Main Street would potentially be exposed to exterior noise levels of between 72 to 74 CNEL from traffic noise. For these roadway segments, noise levels would exceed 65 CNEL at the following distances: 210 feet on Hunte Parkway from Exploration Falls Drive to Discovery Falls Drive; 255 feet on Hunte Parkway from Discovery Falls Drive to Eastlake Parkway; and 230 feet on Main Street from Eastlake Parkway to Orion Avenue. Noise levels would exceed 70 CNEL at the following distances: 86 feet on Hunte Parkway from Exploration Falls Drive to Discovery Falls Drive; 106 feet on Hunte Parkway from Discovery Falls Drive to Eastlake Parkway; and 95 feet on Main Street from Eastlake Parkway to Orion Avenue.

These distances would include uses within the proposed T-3: Campus Commons, T-6: Gateway District, and SD: Flex Overlay transects. If residential, school, library, and neighborhood park uses are placed in these areas, noise levels would potentially exceed the exterior noise compatibility standard of 65 CNEL; if community parks and offices and professional land uses are placed in these areas, they would exceed the exterior noise compatibility standard of 70 CNEL. Therefore, impacts to exterior noise levels from the project would be potentially significant. Commercial uses would be within the acceptable compatibility standard of 75 CNEL.

In addition, all other internal roadways were modeled at 65 CNEL or less, and proposed land uses for the project on these roadways would not be subjected to excessive exterior noise levels.

4.2.1.2 *Interior Residential Noise Levels*

Traditional architectural materials are normally able to reduce exterior to interior noise by up to 15 dBA. Because building façade noise levels may exceed 60 CNEL at 11 of 13 studied project roadway segments, traditional architectural materials would not be expected to attenuate interior noise to 45 CNEL and interior noise impacts on these roadways would be potentially significant. These include uses within the proposed transects T-1: Future Development, T-3: Campus Commons, T-4: Town Center, T-5: Urban Core, T-6: Gateway District, and SD: Flex Overlay transects.

4.2.2 Operational Noise

Operational noise generated by the proposed project may affect both off-site and on-site NSLUs. Proposed NSLUs associated within the project site include schools, libraries, parks, and residential land uses. Potential noise-generating land uses within the project area include mixed-use commercial and resident-serving commercial and public or quasi-public uses including day care, school-related buildings, or parks.

Potential stationary and intermittent operational noise sources from the project include: HVAC units, loading docks, parking lots, nuisance noise, bells and loudspeaker announcements, recreational facilities, electronic amplification, maintenance activities, and infrastructure improvements.

4.2.2.1 *HVAC Units*

Mechanical HVAC units located on the ground or on rooftops of new commercial or multi-family apartment buildings would have the potential to generate noise levels that run continuously during the day and night. For modeling, the units were conservatively assumed not to include noise attenuation provided by a parapet wall. Specific planning information is not available for the HVAC units at this time; modeling assumed the use of Carrier 16-ton packaged HVAC units (50PG03-16) with a manufacturer's Sound Power Rating of 91.4 dBA SWL as these units are representative of typical HVAC units on the project's proposed building sizes. A cluster of eight HVAC units operating at a distance of 50 feet would generate a noise level of 61 dBA.

Depending on where they are located, HVAC units could exceed the City's hourly noise limit for adjacent parks and schools of 55 dBA L_{EQ} during daytime hours (45 dBA L_{EQ} at night for the parks) and the noise limit for adjacent multi-family residences of 60 dBA L_{EQ} during daytime hours (50 dBA L_{EQ} at night). For a single point source such as a piece of mechanical equipment, the sound level normally decreases by about 6 dBA for each doubling of distance from the source. Therefore, it is assumed that HVAC equipment would generate noise levels that exceed 45 dBA within 320 feet of the equipment, 50 dBA within approximately 180 feet of the equipment, 55 dBA within 100 feet of the equipment, and 60 dBA within 57 feet of the equipment. Consequently, residences or other NSLUs such as parks or schools located in close

proximity to a building that requires an HVAC system could result in a potentially significant impact.

4.2.2.2 *Loading Docks*

Commercial land uses also have the potential to generate noise from truck deliveries, such as engines idling and beeping from backing warning signals at commercial loading docks. Truck deliveries to the project would involve deliveries of supplies to commercial uses. State law currently prohibits heavy-duty diesel delivery trucks from idling more than five minutes; therefore, noise from idling would be limited to five minutes during truck deliveries (CCR Title 13, Section 2485). Truck trips would be periodic throughout the UID area and would not be concentrated in one location. Given the intermittent and short duration of noise from truck deliveries in a given location, truck deliveries would not be a source of excessive ambient noise. In addition, any commercial land uses will have to comply with the City noise limits specified in Section 2.3.1. Therefore, impacts related to truck deliveries would be less than significant**.**

4.2.2.3 *Parking Lots*

Noise sources from parking lots include car alarms, door slams, radios, and tire squeals. These sources typically range from about 30 to 66 dBA at a distance of 100 feet (Gordon Bricken & Associates 1996), and are generally short-term and intermittent. Parking lots also have the potential to generate noise levels that exceed 65 dBA depending on the location of the source; however, noise sources from the parking lot would be different from each other in kind, duration, and location, so that the overall effects would be separate and in most cases would not affect noise-sensitive receptors at the same time. In addition, any land uses containing parking lots will have to comply with the City noise limits specified in Section 2.3.1. Therefore, noise generated from parking lots would be less than significant.

4.2.2.4 *Nuisance Noise*

Noise generated from residential uses is generally described as "nuisance noise." Nuisance noise is defined as intermittent or temporary neighborhood noise from sources such as amplified music, barking dogs, and landscape maintenance equipment that may be disturbing to other residents. Nuisance noise impacts are more likely to occur in the more densely developed areas of the project site where residences would be closer together and neighbors would be more likely to hear a neighbor's dog or music. The City noise control ordinance prohibits nuisance noise from exceeding the City's noise standards at any time. Compliance with the noise control ordinance would limit exposure to excessive nuisance noise. The Chula Vista Police Department enforces the City's noise control ordinance. In addition, nuisance noises would be different from each other in kind, duration, and location, so that the overall effects would be separate and in most cases would not affect the receptors at the same time. Therefore, nuisance noise in residential neighborhoods would not result in significant impact.

4.2.2.5 *Bells and Loudspeaker Announcements*

Campus-related facilities would likely be placed in T-3: Campus Commons and T-2: Campus Vistas transects. Campus-related facilities may generate noise from amplified noise such as bells and loudspeaker announcements. Bells or other announcement devices are classified as

stationary non-emergency signaling devices by the City. The noise control ordinance prohibits schools from sounding these devices for more than 120 seconds continually in an hourly period, or intermittent sounding over a five-minute period in any hour. The future campus would comply with Chula Vista's noise standards and would not result in significant impacts related to bells and loudspeaker announcements.

4.2.2.6 *Recreational Facilities*

The proposed trails and pathways throughout the project site and the off-site trail connections would be used for walking and bicycling and would generally not support activities that would generate noise other than normal conservation levels. Therefore, the proposed trails would not be a source of operational noise. Recreational facilities that would have the potential to generate excessive noise levels include parks, common space areas, school playgrounds, and playing fields. Project-related facilities may be located in the O-2: Common Space and O-3: Pedestrian Walk sectors or the T-1 Future Development transect. Adjacent recreational facilities are present at High Tech K-12, which has a playground area and a grassy play area. No large, stadium seating recreational facilities are expected for the proposed project and are not present at High-Tech K-12.

Visitors and recreational activity participants are expected to generate a range of noise levels. Activities would generate incidental recreational noise such as cheering for sports activities or children at play. Passive recreational activities such as open turf areas and group picnic area activities will typically generate lower noise levels as compared to active sports play. Noise from recreational facilities would be a periodic source of noise because it is generally limited to specific activity times that would not be expected to be consistent throughout an entire day.

For the purposes of this analysis, a previous study prepared for a middle school playground (HELIX 2015) was used to represent typical noise levels generated at the project's proposed active play areas. The report found that during active use, 45 individuals using the playground would generate a noise level of 55.5 dBA at a distance of 100 feet. This level of activity would be expected to be similar to potential outdoor recreational facilities at the project site. Based upon this noise level, project recreational facilities would be expected to generate a noise level of 45 dBA within 330 feet, 50 dBA within 190 feet, 55 dBA within 105 feet, and 60 dBA within 60 feet.

Noise generated from proposed recreational facilities in the O-2: Common Space and O-3: Pedestrian Walk sectors or the T-1 Future Development transect and High Tech K-12's playground and grassy play area would be subject to the City's daytime noise standards of 55 dBA for residential (including schools but excluding multi-family), 60 dBA for multi-family residential and 65 dBA for commercial land uses (lower noise limits would apply if a recreational facility remains open during evening or nighttime hours). Therefore, depending on the type of activity and number of users and the siting of proposed land uses, recreational facilities would have the potential to exceed City noise ordinance limits. Consequently, residences or other NSLUs such as parks or schools located in close proximity to a proposed project recreational facility (located in the O-2: Common Space and O-3: Pedestrian Walk sectors or the T-1 Future Development transect) could result in a potentially significant impact.

In addition, project residences or other project NSLUs could be exposed to a potentially significant impact from High Tech K-12's playground and grassy play area.

Recreational facilities may be located adjacent to the MSCP Preserve as part of the T-1 Future Development transect, which borders the Preserve. The amenities, facilities, and uses of the recreational facilities that occur within the Preserve Edge, a 100-foot buffer zone adjacent to the Preserve, would be restricted to the types that are least likely to impact adjacent biological resources. These uses are described in the Preserve Edge Plan and include trails and open green space. Playgrounds and sports courts are a potential use in recreational facilities, but would only be allowed outside of the Preserve Edge. As discussed above, these types of recreational facilities would be expected to generate noise levels of 60 dBA L_{EQ} up to 60 feet from the source; therefore, given the 100-foot buffer zone, these noise levels would not be expected to be significant in the MSCP Preserve. The Preserve Edge Plan was prepared in coordination with qualified biologists, including the determination of an adequate buffer zone and restricting uses to prevent indirect impacts to the Preserve, including noise impacts. The Biological Technical Report (HELIX 2016) determined that implementation of the Preserve Edge Plan would reduce indirect operational noise impacts from project development to a less than significant level by restricting allowable activities adjacent to the Preserve. Active uses such as low-activity play elements and exercise stations may be permitted within the buffer zone; however, such uses would be required to demonstrate consistency with MSCP Preserve Adjacency Guidelines. Provided that the proposed uses would not exceed 60 dBA L_{EQ} at the Preserve, it would be allowed. Therefore, impacts would be less than significant.

4.2.2.7 *Electronic Amplification*

Electronic amplification equipment would not be permanently installed at any of the proposed recreational facilities, but temporary systems may be used in conjunction with active sport events. Activities or events at the public parks that would include amplified noise or other temporary noise generating equipment would be required to obtain a permit from the City of Chula Vista Director of Library and Recreation. If a permit is not obtained, Section 2.66.185 of the City Municipal Code prohibits any park or recreation center user to operate a radio, television, stereo or any similar electronic or mechanical device capable of producing or emitting sound at a volume where the sound is audible at a distance greater than 100 feet from the point of emission. Activities that require permitted amplified noise would be limited to normal park operation hours. In addition, amplified noise would not be a consistent source of noise. Activities would occur on various dates and times, and at varied locations. Permitted uses would still be subject to the City's hourly exterior noise level limits established in the City Municipal Code, which is enforced by the Chula Vista Police Department. Therefore, nuisance noise and permitted amplified noise from events at the project recreational facilities would not result in significant impact.

4.2.2.8 *Maintenance Activities*

Scheduled maintenance by maintenance crews could occur on a daily basis at the project parks. Maintenance activities would include the use of gasoline-powered mowers, trimmers, blowers, and edgers resulting in intermittent short-term temporary noise increases. Maintenance activities are permitted uses and would be subject to the one-hour L_{EQ} noise limits. Maintenance activities

would generally occur during the day would be subject to the daytime noise control ordinance 60 dBA at multi-family land uses and 65 dBA at commercial land uses. Although unlikely, if maintenance would be required during evening, night, or early morning hours, the City's nighttime noise control ordinance standards would apply. Landscape maintenance equipment, such as leaf blowers and gasoline-powered lawn mowers, can result in intermittent noise levels that range from approximately 80 to 120 dBA at 3 feet (City of Anderson 2008).

Landscape maintenance would have the potential to exceed the daytime hourly average limit of 60 dBA up to approximately 0.6 mile from the recreational facility, and to exceed the hourly 65 dBA noise level limit up to approximately 0.33 mile away if all equipment operates continuously for at least an hour. As discussed above under recreational activity impacts, residences may be located adjacent to parks. However, maintenance equipment would not be operating at any one location for more than a few minutes, and all equipment would not be operating simultaneously. A resident would usually only be exposed to the maintenance equipment, and therefore noise levels above 60 dBA, for a few minutes. Given this, the hourly average noise level at a specific noise receptor would likely be less than the maximum noise level. Landscape maintenance would be subject to the exterior noise level limits established in the City's noise control ordinance. Due to the limited amount of time equipment would be operating in one location, operation of landscape equipment would generally not exceed the hourly noise level limit at a particular receptor. Therefore, landscape maintenance would result in a less than significant impact.

Occasional maintenance activities would be required along the edge of development within the T-1: Future Development and SD: Lake Blocks transects, such as vegetation and sediment removal; however, these activities would not require heavy construction equipment that would generate excessive noise. As described in the Preserve Edge Plan, a manual weeding program would be prepared for the preserve edge. Additionally, the Biological Technical Report determined that implementation of the Preserve Edge Plan would reduce indirect operational impacts from project development to a less than significant level, including noise. Similar to on-site infrastructure, occasional maintenance of the off-site utilities may require heavy equipment; however, such activities would be infrequent and temporary. The City's MSCP Plan states that infrastructure repairs and maintenance are allowable as needed in the MSCP Preserve (City 2003). Maintenance would be subject to the MSCP requirement that, to the extent practicable, access for non-emergency routine maintenance will be limited during bird breeding seasons in areas where breeding and/or nesting activity may occur. Therefore, impacts would be less than significant.

4.2.2.9 *Infrastructure Improvements*

The infrastructure improvements associated with the project includes pipelines and electrical lines, which are passive systems and would not generate operational noise. Inspection of these facilities would not require intensive activities that would result in excessive noise levels. Occasional maintenance (2-4 times per year) may be required that necessitates the use of large equipment; however, such activities would be infrequent, temporary, and limited to the area close to the maintenance site. Maintenance equipment would be subject to the limits on operation hours in the City's noise control ordinance for construction and building work in residential zones. Therefore, impacts that occur from operation of these facilities would be less than significant.

4.2.3 Cumulative Impacts

The implementation of cumulative development projects would have the potential to increase ambient noise from new operational noise sources (such as HVAC equipment, parking lots, and truck deliveries) and by increasing traffic and human activity throughout the surrounding area. Development is proposed adjacent to the project site to the west, south, and north.

Buildout of the project, along with future regional growth and other projects to be developed within the project vicinity, would result in increases in traffic that would cumulatively increase traffic noise to on-site uses. The potential noise impacts that would result from cumulative projects and regional growth are included in the Buildout (Year 2030) scenario. As shown in the noise contours in Figure 4, noise levels at the proposed locations of residences, parks, schools, and offices would potentially exceed the Chula Vista noise compatibility standards along Main Street and Hunte Parkway. Therefore, a cumulative on-site noise impact would occur. These NSLUs and roadways would only be developed with implementation of the project; therefore, implementation of the proposed project would result in a cumulatively considerable contribution to a significant on-site cumulative impact. However, implementation of mitigation measures M-Noi-1 through M-Noi-5 (described below) would require future development to implement measures that would reduce noise levels to be compatible with the Chula Vista noise compatibility guidelines. Therefore, cumulative impacts from the project would be reduced to a contribution that is less than cumulatively considerable.

The University/RTP Planning Area within Village 9 includes the western area of the project site (approximately the area between Orion Avenue and Center Walk). This area is part of the SD: Flex Overlay transect, which also includes the eastern area of Village 9 (approximately the easternmost blocks of the EUC, Town Center, and Mixed Use Planning Areas). Uses at this boundary are likely to include mixed-use and medium density residential uses. Therefore, noise from HVAC units within the SD: Flex Overlay transect may generate significant noise at land uses in Village 9. Likewise, HVAC units at Village 9 may generate significant noise at the flex overlay areas of UID; according to the Village 9 Final Environmental Impact Report (EIR), HVAC units at Village 9 may exceed 50 dBA within 275 feet of the equipment (City 2013). The Village 9 Final EIR included mitigation measure 5.5-7 that would require noise levels to not cumulatively exceed the noise level limits for a receiving land use. Further, for the UID project, mitigation measure M-Noi-4 (described below) would be required that would implement the same requirements. Therefore, cumulative impacts would be less than significant.

The EUC would be located directly north of the westernmost portions of the project and is an extension of the Urban Center Zone proposed for Village 9. Village 10 is located to the south of the project. The EUC is proposed for and currently being developed as high-density mixed use development; Village 10 would likely include similar development. Similar to the UID, mixed use development in the EUC and Village 10 would include HVAC systems and commercial uses that would have the potential to result in significant impacts to NSLUs at similar distances (45 dBA within 320 feet for the equipment, 50 dBA within approximately 180 feet of the equipment, 55 dBA within 100 feet of the equipment, and 60 dBA within 57 feet of the equipment). Therefore, future development of NSLUs along the northern and southern edges of the project would have the potential to be exposed to excessive noise levels from development of the EUC, Village 9, and Village 10. Likewise, development along the northern and southern edges of the

project may result in potentially significant impacts to NSLUs along the southern edge of the EUC, the eastern edge of Village 9, and the northern edge of Village 10. Therefore, a potentially significant cumulative impact would occur along these edges. Mitigation measures M-Noi-1 through M-Noi-5 would reduce impacts related to exposure of NSLUs in the UID to noise from the EUC, Village 9, and Village 10 to a less than cumulatively considerable level.

4.2.4 Mitigation Measures

The following mitigation measures would minimize exposure of on-site land uses to noise levels in excess of the City's noise compatibility standards, including the projected traffic noise levels shown in Figure 4:

M-Noi-1 S**ite-Specific Acoustic Analysis – Multi-Family Residences**. Concurrent with Design Review and prior to the approval of building permits for multi-family areas within Transects T-3A, T-3B, T-6A, T-6B, T-6D, T-6E, and SD: Flex Overlay, where first and/or upper floor exterior noise levels exceed 60 CNEL and/or where required outdoor area (patios or balconies) noise levels exceed 65 CNEL, the City shall require 1) an acoustical analysis demonstrating to the satisfaction of the Development Services Director (or their designee) that the proposed building plans ensure that interior noise levels due to exterior noise sources will be at or below California's Title 24 Interior Noise Standards (i.e., 45 CNEL) in any habitable room, and 2) all outdoor useable areas are not exposed to noise levels in excess of the City's noise compatibility guidelines for outdoor use areas (i.e., 65 CNEL). The analysis must also identify Sound Transmission Loss rates of each window. Design-level architectural plans will be available during design review and will permit the accurate calculation of transmission loss for habitable rooms. For these areas, it may be necessary for the windows to be able to remain closed to ensure that interior noise levels meet the interior standard of 45 dBA CNEL, in which case, adequate ventilation systems shall be installed. The City shall require noise attenuation features that would 1) reduce sound levels to 45 CNEL in any habitable room, and 2) that would reduce sound levels to 65 CNEL at outdoor usable areas.

M-Noi-2 **Site-Specific Acoustic Analysis – Non-Residential NSLUs**. Concurrent with Design Review and prior to the approval of building permits for any non-residential NSLUs (schools, libraries, neighborhood parks) within Transects T-3A, T-3B, T-6A, T-6B, T-6D, T-6E, and SD: Flex Overlay, where exterior noise levels exceed 65 CNEL, the City shall require a site design plan and subsequent acoustical analysis demonstrating to the satisfaction of the Development Services Director (or their designee) that all outdoor useable areas are not exposed to noise levels in excess of 65 CNEL. Measures to reduce noise levels may include, but would not be limited to, setback of structures from the roadway, installing acoustic barriers, or orienting outdoor activity areas away from roadways so that surrounding structures provide noise attenuation. Wall and roof-ceiling assemblies making up the building envelope shall comply with the requirements of the 2013 CALGreen Building Code and meet a composite Sound Transmission Class (STC) rating of at least 50 or a composite Outdoor/Indoor Transmission

Class (OITC) rating of no less than 40, with exterior windows of a minimum STC of 40 or OITC of 30 in compliance with the California Green Building Standards Code. The City shall require noise attenuation features to reduce sound levels to 65 CNEL at outdoor usable areas.

M-Noi-3 **Site-Specific Acoustic Analysis – Office Uses**. Concurrent with Design Review and prior to the approval of building permits for any office use within Transects T-3A, T-3B, T-6A, T-6B, T-6D, T-6E, and SD: Flex Overlay the City shall require a site design plan and subsequent acoustical analysis demonstrating to the satisfaction of the Development Services Director (or their designee) that exterior noise levels at the property line are at or below the City's noise compatibility guidelines for office uses (i.e., 70 CNEL). Measures to reduce noise levels may include, but would not be limited to, setback of structures from the roadway, installing acoustic barriers, or, in mixed-use buildings, orienting offices away from roadways so that surrounding structures provide noise attenuation. The City shall require noise attenuation features to reduce sound levels to 70 CNEL at the property line.

The following mitigation measure would minimize noise generated from on-site HVAC equipment:

M-Noi-4 **HVAC Mechanical Equipment Shielding.** Concurrent with Design Review and prior to the approval of building permits for non-residential development, the City shall require a design plan for the project demonstrating to the satisfaction of the Development Services Director (or their designee) that the noise level from operation of mechanical equipment will not cumulatively exceed the following noise level limits for a designated receiving land use category as specified in Section 19.68.030 of the City noise control ordinance:

- From 10 p.m. to 7 a.m. on weekdays and from 10 p.m. to 8 a.m. on weekends:
  - 45 dBA for residential
  - 50 dBA for multiple dwelling residential
  - 60 dBA for commercial
  - 70 dBA for light industry (I-R and I-L zone)
  - 80 dBA for heavy industry (I zone)
- From 7 a.m. to 10 p.m. on weekdays and from 8 a.m. to 10 p.m. on weekends:
  - 55 dBA for residential
  - 60 dBA for multiple dwelling residential
  - 65 dBA for commercial
  - 70 dBA for light industry (I-R and I-L zone)
  - 80 dBA for heavy industry (I zone)

Noise control measures may include, but are not limited to, the selection of quiet equipment, equipment setbacks, silencers, and/or acoustical louvers. The City

shall require noise attenuation features that would reduce sound levels to allowable Chula Vista noise control ordinance.

The following mitigation measure would minimize exposure of NSLUs to noise from recreational facilities in excess of the City's noise level limits:

M-Noi-5 **Site Specific Analysis – Recreational Facilities**. Concurrent with the preparation of site-specific plan(s) and prior to the approval of a precise grading plan, the City shall require the preparation of an acoustical analysis to ensure that noise levels generated from any active uses at the recreational facilities, such as sports fields, shall not exceed the receiving land use category's exterior noise limits as identified in the City noise control ordinance. Measures to reduce noise levels may include, but would not be limited to, siting of structures or buildings either at the recreational facilities or at the receiving land use site in order to provide setbacks between active areas of the facilities and adjacent noise sensitive uses or construction of a wall to provide noise attenuation. Final noise attenuation design would be determined by a site-specific acoustic analysis conducted by a qualified acoustical engineer, to the satisfaction of the Development Services Director (or their designee).

4.2.5 Significance of Impacts After Mitigation

With implementation of the above measures (Noi-1 through Noi-5), operational noise sources would comply with the City's noise control ordinance, the General Plan noise compatibility guidelines, and the CALGreen Building Standards Code and operational noise impacts would be reduced to a less than significant level.

4.3 ISSUE 2: EXCESSIVE GROUND-BORNE VIBRATION

4.3.1 Impact Analysis

4.3.1.1 *Construction Vibration*

Off-site Impacts

The greatest potential source of vibration during construction activities would be a vibratory roller, which would be considered a continuous/frequent intermittent source of vibration. A vibratory roller would be expected to be used within 100 feet of the nearest existing vibration-sensitive land use, High Tech K-12. A vibratory roller would create approximately 0.210 in/sec PPV at a distance of 25 feet (Caltrans 2013). This would equal 0.046 in/sec PPV at a distance of 100 feet.[1] This would be lower than the Caltrans measure of the structural damage threshold from ground-borne vibration of 0.25 in/sec PPV and the strongly perceptible human response threshold from ground-borne vibration of 0.1 in/sec PPV from a continuous/frequent intermittent

[1]Equipment PPV = Reference PPV * $(25/D)^n$ (in/sec), where Reference PPV is PPV at 25 feet, D is distance from equipment to the receiver in feet, and n = 1.1 (the value related to the attenuation rate through the ground); formula from Caltrans 2013.

source. Therefore, although a vibratory roller may be perceptible to nearby off-site vibration-sensitive land uses, temporary impacts associated with the roller (and other potential construction equipment) would be less than significant.

On-site Impacts

Campus vibration-sensitive instruments and operations may require special consideration during construction. Vibration criteria for sensitive equipment are not defined and are often case-specific. In general, the criteria must be determined based on manufacturer specifications and recommendations by the equipment user. Although the proposed project includes areas within the main campus property that allow laboratory uses with vibration-sensitive equipment, major construction activity, including grading and paving of roadways, is likely to be complete within the campus property area prior to these facilities becoming fully operational. However, the potential for construction vibration to disturb vibration-sensitive instruments and operations may still occur, and impacts are assessed as potentially significant.

Construction may occur in areas other than the campus property subsequent to the campus facilities being occupied. Similar to off-site impacts, the greatest source of vibration during construction would be a vibratory roller, which is conservatively assumed to be within 50 feet of a university facility housing laboratory equipment. This would equal 0.098 in/sec PPV at a distance of 50 feet. This would be lower than the Caltrans measure of the structural damage threshold from ground-borne vibration of 0.25 in/sec PPV and the strongly perceptible human response threshold from ground-borne vibration of 0.1 in/sec PPV from a continuous/frequent intermittent source. Therefore, impacts to project uses other than campus vibration-sensitive instruments and operations would be less than significant.

4.3.1.2 *Operational Vibration*

The proposed project facilities would not include operational equipment that would generate substantial vibration. Therefore, operational vibration impacts would be less than significant.

4.3.2 Mitigation Measures

M-Noi-6 **Construction Vibration Reduction Measures.** The City shall notify the building director, or other applicable person in charge, in writing within two weeks of any major construction activity within 200 feet and blasting or pile-driving within 600 feet of a building that contains vibration-sensitive instruments and operations. The extent and duration of the construction activity will be included in the notification. .

4.3.3 Significance of Impacts After Mitigation

With implementation of the Noi-6, impacts to campus vibration-sensitive instruments and operations would be reduced to a less than significant level.

4.4 ISSUE 3: PERMANENT INCREASE IN AMBIENT NOISE LEVELS

This section addresses the potential for implementation of the proposed project to permanently increase ambient noise levels as a result of increased traffic noise. The potential for other noise sources associated with project operation to generate noise levels that exceed City standards is addressed in Section 4.2.

4.4.1 Exterior

The following analysis is based on the project-specific TIA prepared for the UID by LLG (LLG 2015). The potential for the project to permanently increase traffic noise is addressed under the following scenarios: Existing + Project and Buildout (Year 2030) + Project. Traffic noise levels for each roadway are included in Appendix C.

4.4.1.1 *Existing + Project*

Noise levels for the Existing and Existing + Project scenarios are displayed in Table 9, *Existing + Project Traffic Noise Levels*. Seven of the 13 segments have existing noise levels above 65 CNEL at the nearest NSLU; with project traffic, 12 of the 13 segments would have noise levels above 65 CNEL at the nearest NSLU. Of these 12 segments, 4 of them would have a 3 CNEL or greater increase in noise from the project, and therefore these 4 segments would have a significant impact under the Existing + Project scenario.

The large increases in noise levels along these segments are mostly due to the lack of thoroughfares under existing conditions. In this scenario, a large amount of project traffic travels east on Hunte Parkway or west on Birch Road, whereas in the buildout scenario additional thoroughfare roadways would be constructed to distribute traffic over a wider area (e.g., Main Street and Otay Valley Road).

Table 9
EXISTING + PROJECT TRAFFIC NOISE LEVELS

Roadway	Segment	Nearest NSLU (feet)	Noise Level from Roadway Centerline at nearest NSLU or 100 feet, whichever is less (CNEL)		Exceed 65 CNEL?	Increase in Noise Level	Significant Impact?
			Existing	Existing + Project			
Olympic Parkway	E. Palomar Street to SR 125	150	70.0	70.7	Yes	0.7	No
	SR 125 to Eastlake Parkway	N/A	70.0	70.9	Yes	0.9	No
	Eastlake Parkway to Hunte Parkway	120	66.1	67.5	Yes	1.4	No
Birch Road	La Media Road to SR-125	120	**64.7**	**70.1**	**Yes**	**5.4**	**Yes**
	SR-125 to Eastlake Parkway	70	67.7	70.4	Yes	2.8	No
Hunte Parkway	Otay Lakes Road to Olympic Parkway	70	64.2	66.4	Yes	2.2	No
	Olympic Parkway to Exploration Falls Drive	120	**59.5**	**65.8**	**Yes**	**6.3**	**Yes**
	Exploration Falls Drive to Discovery Falls Drive	120	59.3	63.8	No	4.5	Yes
	Discovery Falls Drive to Eastlake Parkway	150	**60.0**	**64.7**	**Yes**	**4.7**	**Yes**
Eastlake Parkway	Otay Lakes Road to Olympic Parkway	60	69.7	70.4	Yes	0.7	No
	Olympic Parkway to Birch Road	120	65.2	66.7	Yes	1.6	No
	Birch Road to Hunte Parkway	110	**57.2**	**69.9**	**Yes**	**12.7**	**Yes**
Proctor Valley Road	Mt Miguel Road to Hunte Parkway	100	66.0	66.5	Yes	0.5	No

Source: LLG 2015 (traffic data)
Note: Bold text indicates a significant exterior impact.

4.4.1.2 *Buildout (Year 2030)*

The Buildout (Year 2030) scenario compares traffic volumes with and without the proposed project, and without implementation of the mitigation measures identified in the TIA (see Table 10, *Buildout (Year 2030) + Project Off-site Traffic Noise Levels*). This scenario assumes full buildout of the proposed project and circulation network, as well as cumulative development through Year 2030. Under this scenario, all roadway segments would exceed 65 CNEL; however, none of them would have a 3 CNEL or greater increase in noise from the project and no significant impacts to off-site NSLUs would occur.

Table 10
BUILDOUT (YEAR 2030) + PROJECT OFF-SITE TRAFFIC NOISE LEVELS

Roadway	Segment	Nearest NSLU (feet)	Noise Level from Roadway Centerline at nearest NSLU or 100 feet, whichever is less (CNEL)		Exceed 65 CNEL?	Increase in Noise Level	Significant Impact?
			Buildout (Year 2030)	Buildout (Year 2030) + Project			
Olympic Parkway	E. Palomar Street to SR 125	150	70.8	71.2	Yes	0.4	No
	SR 125 to Eastlake Parkway	N/A	70.9	71.4	Yes	0.5	No
	Eastlake Parkway to Hunte Parkway	120	68.8	69.6	Yes	0.8	No
Birch Road	La Media Road to SR-125	120	69.3	69.5	Yes	0.2	No
	SR-125 to Eastlake Parkway	70	69.1	69.4	Yes	0.3	No
Hunte Parkway	Otay Lakes Road to Olympic Parkway	70	67.2	68.7	Yes	1.5	No
	Olympic Parkway to Exploration Falls Drive	120	74.2	75.7	Yes	1.5	No
	Exploration Falls Drive to Discovery Falls Drive	120	67.4	67.6	Yes	0.2	No
	Discovery Falls Drive to Eastlake Parkway	150	73.2	74.6	Yes	1.4	No
Eastlake Parkway	Otay Lakes Road to Olympic Parkway	60	73.8	73.9	Yes	0.1	No
	Olympic Parkway to Birch Road	120	68.8	68.9	Yes	0.2	No
	Birch Road to Hunte Parkway	110	66.5	68.3	Yes	1.8	No
Proctor Valley Road	Mt Miguel Road to Hunte Parkway	100	76.8	77.9	Yes	1.1	No

Source: LLG 2015 (traffic data)
Note: Bold text indicates a significant exterior impact.

4.4.1.3 *Interior*

For both single and multi-family residential land uses, the threshold would be 45 CNEL for interior spaces. As typical architectural materials are expected to attenuate noise levels by 15 CNEL, if noise levels are above 60 CNEL at the building façades a significant interior impact would occur. A significant impact would occur for the Existing + Project and Buildout (Year 2030) + Project scenarios if the noise levels exceed 60 CNEL at the nearest NSLUs and if the project's contribution would be 3 CNEL or greater.

All roadways under the Existing + Project and Buildout (Year 2030) + Project scenarios would exceed 60 CNEL. Under the Existing + Project scenario, the project would contribute a 3 CNEL or greater increase to five roadways. Therefore, the project's off-site transportation noise under the Existing + Project scenario would cause significant direct impacts to the interior noise. Under the Buildout (Year 2030) + Project scenario, the project would not contribute a 3 CNEL or greater increase to any roadway and no impacts under this scenario would occur.

4.4.1.4 *Cumulative*

Exterior

The potential for a cumulative noise impact can occur when traffic from multiple projects combines to increase noise levels above thresholds. A significant cumulative exterior impact would occur if the buildout and project results in the exposure of a NSLU to a combined exterior noise level of 65 CNEL or greater and if the increase is 3 CNEL or greater from the Existing scenario. As shown in Table 11, *Cumulative Off-site Traffic Noise Levels*, 10 of 13 segments are identified as having a significant cumulative exterior impact according to this standard.

A cumulatively considerable contribution to this impact would occur if the cumulative noise increase attributable to the project is greater than 3 CNEL. The project would not contribute more than 3 dBA to the cumulative increase in traffic noise along these 10 segments. Therefore, cumulative traffic-related exterior noise impacts from the proposed project are not cumulatively considerable and the project would not cause a significant cumulative impact.

Table 11
CUMULATIVE OFF-SITE TRAFFIC NOISE LEVELS

Roadway	Segment	Nearest NSLU (feet)	Noise Level from Roadway Centerline at nearest NSLU or 100 feet, whichever is less (CNEL)		Exceed 65 CNEL?	Increase in Noise Level	Significant Cumulative Impact?	Increase Attributable to Proposed Project (CNEL)	Cumulatively Considerable Contribution?[1]
			Existing	Buildout (Year 2030) + Project					
Olympic Parkway	E. Palomar Street to SR 125	150	70.0	71.2	Yes	1.2	No	0.3	No
	SR 125 to Eastlake Parkway	N/A	70.0	71.4	Yes	1.4	No	0.5	No
	Eastlake Parkway to Hunte Parkway	120	66.1	69.6	Yes	3.5	Yes	0.8	No
Birch Road	La Media Road to SR-125	120	64.7	69.5	Yes	4.8	Yes	0.2	No
	SR-125 to Eastlake Parkway	70	67.3	69.1	Yes	1.7	No	0.3	No
Hunte Parkway	Otay Lakes Road to Olympic Parkway	70	64.2	68.7	Yes	4.4	Yes	1.5	No
	Olympic Parkway to Exploration Falls Drive	120	59.5	75.7	Yes	16.2	Yes	1.5	No
	Exploration Falls Drive to Discovery Falls Drive	120	59.3	67.6	Yes	8.2	Yes	0.2	No
	Discovery Falls Drive to Eastlake Parkway	150	60.0	74.6	Yes	14.6	Yes	1.3	No
Eastlake Parkway	Otay Lakes Road to Olympic Parkway	60	69.7	73.9	Yes	4.2	Yes	0.1	No
	Olympic Parkway to Birch Road	120	65.2	68.9	Yes	3.8	Yes	0.2	No
	Birch Road to Hunte Parkway	110	57.2	68.3	Yes	11.1	Yes	1.8	No
Proctor Valley Road	Mt Miguel Road to Hunte Parkway	100	66.0	69.6	Yes	3.6	Yes	0.2	No

1 The project's contribution to the cumulative noise impact is based on the increase in traffic noise attributable to the proposed project under the Buildout (Year 2030) scenario. If the project's contribution is less than 3 dBA, the project's contribution is not cumulatively considerable.

Source: LLG 2015 (traffic data)

Interior

A significant cumulative interior impact would occur if the buildout and project's noise increase yields interior noise levels in excess of 45 CNEL while also causing an increase of at least 3 CNEL over existing conditions. As typical architectural materials are expected to attenuate noise levels by 15 CNEL, interior noise levels would be 45 CNEL or greater if the noise levels at the building façades exceed 60 CNEL. As shown in Table 11, all 13 segments would have a significant cumulative interior impact according to this standard.

A cumulatively considerable contribution to this impact would occur if the project contributes more than 3 CNEL to the cumulative noise increase. The project would not contribute more than 3 dBA to the cumulative increase in traffic noise along these segments. As no segments are identified as having a significant cumulative exterior impact according to this standard, cumulative traffic-related interior noise impacts would be less than significant.

4.4.2 Mitigation Measures

Four roadway segments would result in a significant exterior noise impacts under the Existing + Project scenario: Birch Road from La Media Road to SR 125; Hunte Parkway from Olympic Parkway to Exploration Falls Drive; Hunte Parkway from Discovery Falls Drive to Eastlake Parkway; and Eastlake Parkway from Birch Road to Hunte Parkway. Five roadway segments would result in a significant interior noise impact under the Existing + Project scenario: the four listed above, as well as Hunte Parkway from Exploration Falls Drive to Discovery Falls Drive.

Traffic-related noise could be reduced either by constructing noise barriers, lowering traffic speeds, or by reducing traffic. However, implementation of the project is planned to be constructed over a period of up approximately 25 years, and over time would include the construction of new roadways that would provide new connections from the project area to the regional transportation system (as can be seen in the Buildout [Year 2030] scenario). These new connections would reduce long-term traffic on the roadways surrounding the project site by routing some cumulative traffic through the west and southwest instead of the surrounding roadways to the north and east. In addition, these connections would direct traffic generated by the proposed project away from the existing off-site roadways and reduce associated traffic noise.

In the Buildout (Year 2030) scenario, the project would not result in a significant exterior or interior traffic noise increase on any roadway; in the cumulative scenario, the project would not result in a cumulatively considerable traffic noise increase.

4.4.3 Significance of Impacts After Mitigation

Impacts would be less than significant without mitigation.

4.5 ISSUE 4: TEMPORARY INCREASE IN AMBIENT NOISE LEVELS

4.5.1 Construction Noise

The primary source of temporary noise associated with implementation of the project would be construction activities. Construction for each project would involve several stages including grading, foundation construction, and finish construction. Noise generated by construction equipment can vary in intensity and duration during each phase of construction. The potential noise levels associated with typical construction equipment that may be used during construction of the proposed project are identified in Table 12, *Typical Construction Equipment Noise Levels*. As shown in Table 12, construction noise levels at 50 feet from individual equipment would range from approximately 73 to 83 dBA L_{EQ}, depending on the type of construction equipment.

Table 12
TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVELS

Equipment	Usage Per Day Percentage	Maximum Noise Level dBA L_{EQ} 50 feet from source
Backhoe	40	74
Compactor	20	76
Concrete Saw	20	83
Dozer	40	78
Dump Trucks	40	73
Excavator	40	77
Generator	50	78
Loader	40	75
Paver	40	80

Source: RCNM 2016

Reasonable worst-case construction scenarios would be from the simultaneous operation of an excavator, loader, and dump truck during grading, which is the construction activity that typically generates the highest noise levels. These pieces of equipment would be used during grading to remove or modify soil, with the loaders and dump trucks removing the debris. Noise impacts to specific receptor groups (humans and wildlife) are described below.

4.5.1.1 *Human Receivers*

Off-site human receptors located near future construction activities include the single- and multi-family residences across Hunte Parkway and High Tech K-12. The single- and multi-family residences would be located approximately 250 feet and High-Tech K-12 would be located approximately 100 feet from construction activities. Construction noise levels from the use of an excavator, loader, and dump truck could temporarily reach 65.9 dBA L_{EQ} at 250 feet and 73.9 dBA L_{EQ} at 100 feet. Model printouts can be seen in Appendix D, *Roadway Construction Noise Model (RCNM) Calculations*.

Future on-site NSLUs may occupy buildings such as academic buildings or residences while other parts of the project are still undergoing construction. A conservative estimate is that construction activities with an excavator, loader, and dump truck may occur within 50 feet of future on-site NSLUs. Construction noise levels from the use of an excavator, loader, and dump truck could temporarily reach 79.9 dBA L_{EQ} at 50 feet.

As discussed under Section 2.3, the Chula Vista Municipal Code does not specify construction noise limits but does limit construction activities to the hours of 7:00 a.m. to 10:00 p.m. Monday through Friday, and 8:00 a.m. to 10:00 p.m. on weekends. The project would only perform construction activities within these hours; therefore, noise impacts from construction activities to these receptors would be less than significant.

4.5.1.2 *Sensitive Habitat*

Sensitive habitat is located within the project site, specifically in the eastern and southeastern portions of the Main Campus Property and the majority of the Lake Property. The MSCP Preserve area, containing sensitive habitat, is located adjacent to the east and south of the Main Campus Property and adjacent to the west and north of the Lake Property. These habitat areas may support avian nesting for sensitive bird species that may be affected by construction noise. These habitat areas may be within approximately 30 feet of the closest project construction activities. Construction noise levels from an excavator, loader, and dump truck at this distance could temporarily reach 84.3 dBA L_{EQ}. The 60 dBA L_{EQ} contour line for the use of these pieces of equipment would be approximately 500 feet. Therefore, if construction activities using an excavator, loader, and a dump truck occur within 500 feet of sensitive habitat, a potentially significant noise impact would occur to sensitive habitat.

4.5.2 Mitigation Measures

Mitigation measures for construction noise impacts to sensitive habitat are described in the project's Biological Technical Report (HELIX 2016).

4.5.3 Significance of Impacts After Mitigation

With the implementation of the mitigation measures described in the Project's Biological Technical Report, potential construction noise impacts to nearby sensitive habitat would be reduced to less than significant levels.

4.6 ISSUE 5: AIRPORT NOISE LEVELS

4.6.1 Public and Private Airports

The project site is located approximately 3.6 miles north of Brown Field Municipal Airport, a public airport, and 3.4 miles west of John Nichol's Field, a private airport. The project site is not located within the 60 CNEL noise contour for the Brown Field Municipal Airport (Airport Land Use Commission 2010). With the distance from John Nichol's Field and the small size of the airport, the project site would not be expected to be exposed to excessive noise from the airport. Therefore, impacts associated with the airports are less than significant.

4.6.2 Mitigation Measures

Because impacts related to Issue 5 would be less than significant, no mitigation is required.

4.6.3 Significance of Impacts After Mitigation

Impacts would be less than significant without mitigation.

5.0 LIST OF PREPARERS

Bill Vosti	Acoustic Analyst
Charles Terry	Senior Acoustic Specialist
Joanne M. Dramko, AICP	Senior Scientist, Quality Assurance Reviewer

6.0 REFERENCES

Airport Land Use Commission

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Bioacoustics Research Team

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2008 Roadway Construction Noise Model.

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Appendix A

ON-SITE NOISE MEASUREMENT SHEETS

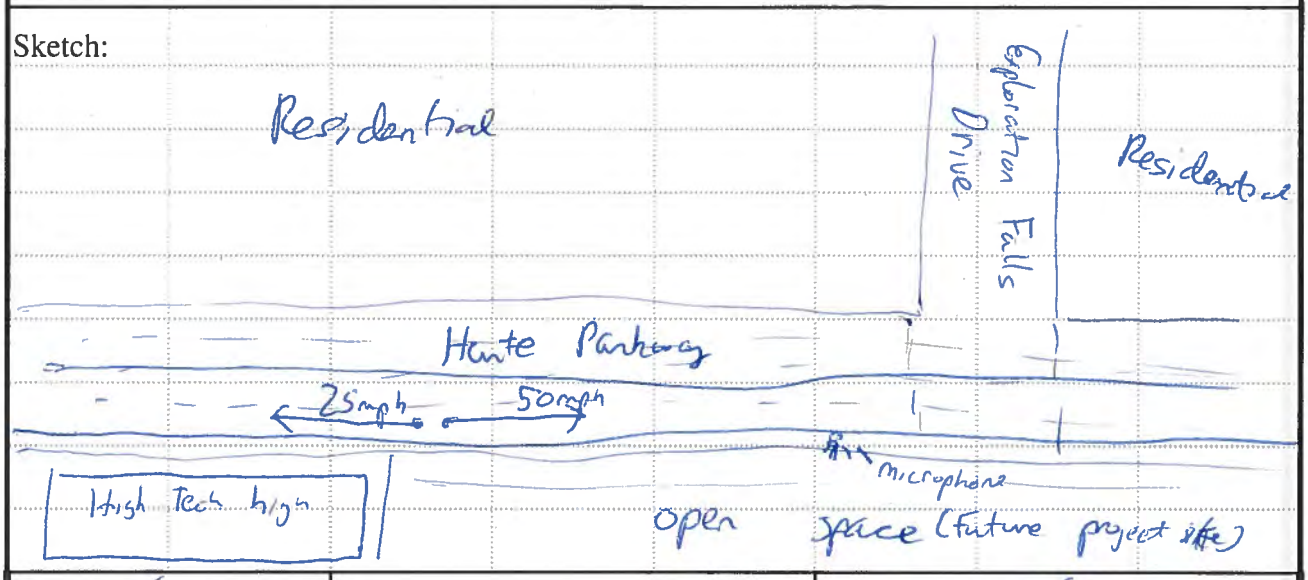
Lvl. data. 1/2

Site Survey

Job # CCV-08	Project Name: LID		
Date: 3/1/16	Site #: —	Engineer: Bill Vosti	
Address: Hunte Parkway, near Exploration Falls Drive			
Meter: LxT	Serial #: 0001741	Calibrator: CAL150	Serial #: 3688

Notes: Consistent bird noise, sunny.

Sketch:



Temp: 69°	Wind Spd: 6 mph	Humidity: 61 %
Start of Measurement: 10:23	End of Measurement: 10:38	55.9 dBA L_{EQ}

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)
𝍸 𝍸 𝍸 III	II	

Noise Measurement for Information Only

No Through Roadways

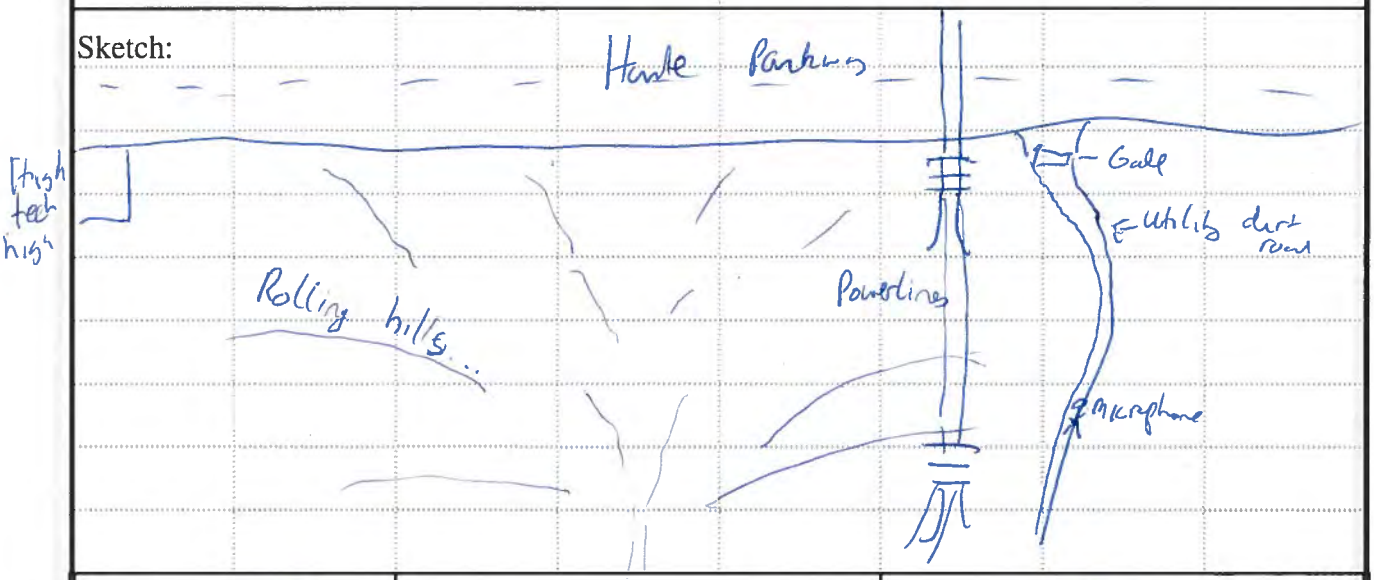
No Calibration Analysis Will Be Provided

Site Survey

Job # CCU-08	Project Name: UCD		
Date: 3/1/16	Site #: Ambient	Engineer: Bill Vosti	
Address: Off Hunte Parkway			
Meter: LxT	Serial #: 0001741	Calibrator: CALISO	Serial #: 3688

Notes: Some aircraft noise, Children playing at High tech
Very faint

Sketch:



Temp: 70°F	Wind Spd: 4 mph	Humidity: 61 %
Start of Measurement: 10:48	End of Measurement: 11:03	43.5 dBA L_{EQ}

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)
Ambient		

Noise Measurement for Information Only

No Through Roadways

No Calibration Analysis Will Be Provided

Appendix B

CARRIER 48PG CONDENSER DATA

OPERATION AIR QUANTITY LIMITS

48PG03-14 Vertical and Horizontal Units

UNIT 48PG	COOLING (cfm)		HEATING (cfm)*	
	Min	Max	Min	Max
03	600	1000	600	1680
04 (Low Heat)	900	1500	600	1680
04 (Med Heat)	900	1500	940	2810
04 (High Heat)	900	1500	1130	2820
05 (Low Heat)	1200	2000	600	1680
05 (Med Heat)	1200	2000	940	2810
05 (High Heat)	1200	2000	1130	2820
06 (Low Heat)	1500	2500	940	2810
06 (Med Heat)	1500	2500	1130	2820
06 (High Heat)	1500	2500	1510	2520
07 (Low Heat)	1800	3000	940	2810
07 (Med Heat)	1800	3000	1130	2820
07 (High Heat)	1800	3000	1510	2520
08 (Low Heat)	2250	3750	2060	5160
08 (Med Heat)	2250	3750	2110	6870
08 (High Heat)	2250	3750	2450	4900
09 (Low Heat)	2550	4250	2060	5160
09 (Med Heat)	2550	4250	2110	6870
09 (High Heat)	2550	4250	2450	4900
12 (Low Heat)	3000	5000	2110	6870
12 (Med Heat)	3000	5000	2450	4900
12 (High Heat)	3000	5000	3150	6300
14 (Low Heat)	3750	6250	2110	6870
14 (Med Heat)	3750	6250	2450	4900
14 (High Heat)	3750	6250	3150	6300

*Consult tables on pages 8 and 9 if using a stainless steel heat exchanger.

Outdoor Sound Power (Total Unit)

UNIT 48PG	A−WEIGHTED* (dB)	OCTAVE BAND LEVELS dB							
		63	125	250	500	1000	2000	4000	8000
03	75.0	82.6	79.9	75.7	73.3	70.0	64.3	58.4	50.5
04	73.2	79.8	77.2	74.1	70.1	68.0	63.6	58.4	51.9
05	71.9	79.7	79.6	72.6	69.6	66.0	61.4	56.4	48.5
06	78.5	82.2	82.6	79.5	75.7	73.9	68.6	64.0	56.3
07	78.5	87.5	83.0	78.5	76.3	73.8	68.4	63.8	56.5
08	80.0	91.7	83.6	81.0	77.9	75.0	69.9	66.0	59.3
09	79.9	89.1	82.7	80.0	77.7	75.0	70.2	66.3	57.8
12	80.0	90.4	83.1	80.9	77.8	75.2	70.0	66.1	57.6
14	83.3	86.4	85.9	85.3	81.8	78.2	72.2	67.9	59.9

LEGEND

dB − Decibel

***** Sound Rating AHRI or tone Adjusted, A−Weighted Sound Power Level in dB. For sizes 03−12, the sound rating is in accordance with AHRI Standard 270−1995. For sizes 14, the sound rating is in accordance with AHRI 370−2010.

Appendix C

TRAFFIC NOISE MODELING

Table C-1
YEAR 2030 BUILDOUT ON-SITE NOISE LEVELS

Roadway/Segment		Distance to Nearest NSLU	Buildout (Year 2035) + Project			
			CNEL @ 50 feet	70 CNEL (ft.)	65 CNEL (ft.)	60 CNEL (ft.)
Hunte Parkway	Exploration Falls Drive to Discovery Falls Drive	50	72.9	86	210	450
	Discovery Falls Drive to Eastlake Parkway	50	74.1	106	255	525
Main Street	Eastlake Parkway to Orion Avenue	50	73.5	95	230	500
Eastlake Parkway	Hunte Parkway to Street C	50	63.7	IRW	38	104
	Street C to Campus Drive	50	65.1	IRW	51	135
	Campus Drive to Otay Valley Road	50	64	IRW	42	108
Orion Avenue	Hunte Parkway to Street C	50	65.2	IRW	52	135
	Street C to Street E	50	63.3	IRW	35	95
	Street E to Campus Drive	50	57.3	IRW	IRW	28
	Campus Drive to Otay Valley Road	50	64	IRW	41	108
Discovery Falls Drive	Hunte Parkway to Campus Drive	50	64.8	IRW	47	130
Campus Drive	Discovery Falls Drive to Eastlake Parkway	50	60.3	IRW	IRW	53
	Eastlake Parkway to Orion Avenue	50	63.7	IRW	37	105

Note: All receivers assumed at ground level.
Noise levels are based on the traffic numbers provided in the Project TIA (LLG 2015).
IRW = In Right of Way; noise contours of less than 20 feet are assumed to be IRW.

FHWA Highway Noise Prediction Model

Project Number: Project Name:

CCV-08 UID

›r onsite; this spreadsheet covers offsite

Source of Traffic Volumes: LLG, June 2015

Community Noise Descriptor: L_{dn}: _____ CNEL: X

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77%	13%	10%
Medium-Duty Trucks	87%	5%	8%
Heavy-Duty Trucks	89%	3%	8%

"-" = contour is located within the roadway right-of-way.
Distance is from the centerline of the roadway segment to the receptor location.

Roadway Segment	Condition and year	Number of Lanes	Median Width	ADT Volume	Speed Limit (mph)	Alpha Factor	Vehicle Mix: Medium Trucks	Vehicle Mix: Heavy Trucks	Nearest NSLU (approx ft)	Greater Than 65 dBA?	Distance from Centerline of Roadway: CNEL at Nearest Residence or 100 Feet (whichever is less)	Distance to Contour: 70 CNEL	65 CNEL	60 CNEL	55 CNEL
Olympic Parkway															
E Palomar Street to SR 125	Existing	6	15	35,600	50	0.5	4.0%	2.0%	150.0	Yes	**70.0**	99	214	461	993
E Palomar Street to SR 125	Existing + Project	6	15	41,800	50	0.5	4.0%	2.0%	150.0	Yes	**70.7**	111	238	513	1,106
E Palomar Street to SR 125	Year 2030	6	15	43,390	50	0.5	4.0%	2.0%	150.0	Yes	**70.8**	113	244	526	1,133
E Palomar Street to SR 125	Year 2030 + Project	6	15	47,000	50	0.5	4.0%	2.0%	150.0	Yes	**71.2**	120	258	555	1,195
Olympic Parkway															
SR 125 to Eastlake Parkway	Existing	6	15	35,608	50	0.5	4.0%	2.0%	NA	Yes	**70.0**	99	214	461	993
SR 125 to Eastlake Parkway	Existing + Project	6	15	43,868	50	0.5	4.0%	2.0%	NA	Yes	**70.9**	114	246	530	1,142
SR 125 to Eastlake Parkway	Year 2030	6	15	44,140	50	0.5	4.0%	2.0%	NA	Yes	**70.9**	115	247	532	1,146
SR 125 to Eastlake Parkway	Year 2030 + Project	6	15	49,300	50	0.5	4.0%	2.0%	NA	Yes	**71.4**	123	266	573	1,234
Olympic Parkway															
Eastlake Parkway to Hunte Parkway	Existing	6	15	14,700	50	0.5	4.0%	2.0%	120.0	Yes	**66.1**	-	119	256	551
Eastlake Parkway to Hunte Parkway	Existing + Project	6	15	20,380	50	0.5	4.0%	2.0%	120.0	Yes	**67.5**	68	148	318	685
Eastlake Parkway to Hunte Parkway	Year 2030	6	15	27,320	50	0.5	4.0%	2.0%	120.0	Yes	**68.8**	83	179	386	833
Eastlake Parkway to Hunte Parkway	Year 2030 + Project	6	15	33,000	50	0.5	4.0%	2.0%	120.0	Yes	**69.6**	94	203	438	944
Birch Road															
La Media Road to SR 125	Existing	6	15.0	10,700	50	0.5	4.0%	2.0%	120.0	No	**64.7**	-	96	207	446
La Media Road to SR 125	Existing + Project	6	15.0	37,040	50	0.5	4.0%	2.0%	120.0	Yes	**70.1**	102	220	473	1,020
La Media Road to SR 125	Year 2030	6	15.0	30,750	50	0.5	4.0%	2.0%	120.0	Yes	**69.3**	90	194	418	901
La Media Road to SR 125	Year 2030 + Project	6	15.0	32,300	50	0.5	4.0%	2.0%	120.0	Yes	**69.5**	93	201	432	931
Birch Road															
SR 125 to Eastlake Parkway	Existing	6	15.0	10,700	50	0.5	4.0%	2.0%	70.0	Yes	**67.7**	-	105	227	489
SR 125 to Eastlake Parkway	Existing + Project	6	15.0	39,620	50	0.5	4.0%	2.0%	70.0	Yes	**70.4**	107	230	495	1,067
SR 125 to Eastlake Parkway	Year 2030	6	15.0	29,330	50	0.5	4.0%	2.0%	70.0	Yes	**69.1**	87	188	405	873
SR 125 to Eastlake Parkway	Year 2030 + Project	6	15.0	31,400	50	0.5	4.0%	2.0%	70.0	Yes	**69.4**	91	197	424	914
Hunte Parkway															
Otay Lakes Road to Olympic Parkway	Existing	4	15.0	7,000	45	0.5	4.0%	2.0%	70.0	No	**64.2**	-	62	134	288
Otay Lakes Road to Olympic Parkway	Existing + Project	4	15.0	11,650	45	0.5	4.0%	2.0%	70.0	Yes	**66.4**	-	87	188	404
Otay Lakes Road to Olympic Parkway	Year 2030	4	15.0	13,820	45	0.5	4.0%	2.0%	70.0	Yes	**67.2**	-	98	210	453
Otay Lakes Road to Olympic Parkway	Year 2030 + Project	4	15.0	19,500	45	0.5	4.0%	2.0%	70.0	Yes	**68.7**	57	123	264	570
Hunte Parkway															
Olympic Parkway to Exploration Falls Dr	Existing	6	15.0	3,200	50	0.5	4.0%	2.0%	120	No	**59.5**	-	-	93	199
Olympic Parkway to Exploration Falls Dr	Existing + Project	6	15.0	13,530	50	0.5	4.0%	2.0%	120	Yes	**65.8**	-	112	242	521
Olympic Parkway to Exploration Falls Dr	Year 2030	6	15.0	20,140	50	0.5	4.0%	2.0%	120	Yes	**74.2**	95	205	442	953
Olympic Parkway to Exploration Falls Dr	Year 2030 + Project	6	15.0	28,400	50	0.5	4.0%	2.0%	120	Yes	**75.7**	120	258	556	1,198
Hunte Parkway															
Exploration Falls Road to Discovery Fall	Existing	5	15	3,200	50	0.5	4.0%	2.0%	120	No	**59.3**	-	-	90	195

Calculations

Roadway Segment	Condition and year	Number of Lanes	Median Width	ADT Volume	Speed Limit (mph)	Alpha Factor	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	Nearest NSLU (approx ft)	Greater Than 65 dBA?	Distance from Centerline of Roadway CNEL at Nearest Residence or 100 Feet (whichever is less)	Distance to Contour 70 CNEL	65 CNEL	60 CNEL	55 CNEL
Exploration Falls Road to Discovery Fall	Existing + Project	5	15	8,880	50	0.5	4.0%	2.0%	120	No	**63.8**	-	83	178	384
Exploration Falls Road to Discovery Fall	Year 2030	5	15	20,270	50	0.5	4.0%	2.0%	120	Yes	**67.4**	67	144	309	666
Exploration Falls Road to Discovery Fall	Year 2030 + Project	5	15	21,300	50	0.5	4.0%	2.0%	120	Yes	**67.6**	69	148	320	689
Hunte Parkway															
Discovery Falls Road to Eastlake Parkw	Existing	5	15	3,700	50	0.5	4.0%	2.0%	150	No	**60.0**	-	-	100	214
Discovery Falls Road to Eastlake Parkw	Existing + Project	5	15	10,930	50	0.5	4.0%	2.0%	150	No	**64.7**	-	95	205	442
Discovery Falls Road to Eastlake Parkw	Year 2030	5	15	20,570	50	0.5	4.0%	2.0%	150	Yes	**73.2**	82	177	382	823
Discovery Falls Road to Eastlake Parkw	Year 2030 + Project	5	15	27,800	50	0.5	4.0%	2.0%	150	Yes	**74.6**	101	217	467	1,006
Eastlake Parkway															
Otay Lakes Road to Olympic Parkway	Existing	6	15	12,100	50	0.5	4.0%	2.0%	60.0	Yes	**69.7**	-	124	267	575
Otay Lakes Road to Olympic Parkway	Existing + Project	6	15	14,170	50	0.5	4.0%	2.0%	60.0	Yes	**70.4**	64	138	296	638
Otay Lakes Road to Olympic Parkway	Year 2030	6	15	30,670	50	0.5	4.0%	2.0%	60.0	Yes	**73.8**	107	230	496	1,068
Otay Lakes Road to Olympic Parkway	Year 2030 + Project	6	15	31,700	50	0.5	4.0%	2.0%	60.0	Yes	**73.9**	109	235	507	1,092
Eastlake Parkway															
Olympic Parkway to Birch Road	Existing	6	15	11,800	50	0.5	4.0%	2.0%	120.0	Yes	**65.2**	-	102	221	476
Olympic Parkway to Birch Road	Existing + Project	6	15	16,960	50	0.5	4.0%	2.0%	120.0	Yes	**66.7**	-	131	281	606
Olympic Parkway to Birch Road	Year 2030	6	15	27,170	50	0.5	4.0%	2.0%	120.0	Yes	**68.8**	83	179	385	830
Olympic Parkway to Birch Road	Year 2030 + Project	6	15	28,200	50	0.5	4.0%	2.0%	120.0	Yes	**68.9**	85	183	395	850
Eastlake Parkway															
Birch Road to Hunte Parkway	Existing	6	15	1,900	50	0.5	4.0%	2.0%	110.0	No	**57.2**	-	-	65	141
Birch Road to Hunte Parkway	Existing + Project	6	15	34,950	50	0.5	4.0%	2.0%	110.0	Yes	**69.9**	98	211	455	981
Birch Road to Hunte Parkway	Year 2030	6	15	16,240	50	0.5	4.0%	2.0%	110.0	Yes	**66.5**	-	127	273	589
Birch Road to Hunte Parkway	Year 2030 + Project	6	15	24,500	50	0.5	4.0%	2.0%	110.0	Yes	**68.3**	77	167	359	774
Main Street															
Magdalenda Avenue to SR 125	Existing	6	15	DNE	50	0.5	4.0%	2.0%	50.0	#VALUE!	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Magdalenda Avenue to SR 125	Existing + Project	6	15	DNE	50	0.5	4.0%	2.0%	50.0	#VALUE!	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Magdalenda Avenue to SR 125	Year 2030	6	15	36,440	50	0.5	4.0%	2.0%	50.0	Yes	**76.8**	141	305	657	1,415
Magdalenda Avenue to SR 125	Year 2030 + Project	6	15	47,000	50	0.5	4.0%	2.0%	50.0	Yes	**77.9**	168	361	778	1,676
Protctor Valley Road															
Mt Miguel Road to Hunte Parkway	Existing	6	15	18,000	45	0.5	4.0%	2.0%	100.0	Yes	**66.0**	-	117	252	543
Mt Miguel Road to Hunte Parkway	Existing + Project	6	15	20,070	45	0.5	4.0%	2.0%	100.0	Yes	**66.5**	-	126	271	584
Mt Miguel Road to Hunte Parkway	Year 2030	6	15	39,350	45	0.5	4.0%	2.0%	100.0	Yes	**69.4**	91	197	424	914
Mt Miguel Road to Hunte Parkway	Year 2030 + Project	6	15	40,900	45	0.5	4.0%	2.0%	100.0	Yes	**69.6**	94	202	435	938

Appendix D

ROADWAY CONSTRUCTION NOISE MODEL (RCNM) CALCULATIONS

Report date: 2/29/2016
Case Description: CCV-08 General Construction

		Baselines (dBA)		---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night
Equipment List	Residential	75	75	75

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dump Truck	No	40		76.5	250	0
Excavator	No	40		80.7	250	0
Front End Loader	No	40		79.1	250	0

Results

Calculated (dBA)

Equipment		*Lmax	Leq
Dump Truck		62.5	58.5
Excavator		66.7	62.8
Front End Loader		65.1	61.2
	Total	66.7	65.9

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/29/2016
Case Description CCV-08 General Construction

				---- Receptor #1 ----			
		Baselines (dBA)					
Description	Land Use	Daytime	Evening	Night			
Equipment List	Residential	75	75	75			

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dump Truck	No	40		76.5	100	0
Excavator	No	40		80.7	100	0
Front End Loader	No	40		79.1	100	0

Results

	Calculated (dBA)	
Equipment	*Lmax	Leq
Dump Truck	70.4	66.5
Excavator	74.7	70.7
Front End Loader	73.1	69.1
Total	74.7	73.9

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date 2/29/2016
Case Descr CCV-08 General Construction

		Baselines (dBA)		---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night
Equipment	Residential	75	75	75

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dump Truck	No	40		76.5	50	0
Excavator	No	40		80.7	50	0
Front End Loader	No	40		79.1	50	0

Results

Calculated (dBA)

Equipment	*Lmax	Leq
Dump Truck	76.5	72.5
Excavator	80.7	76.7
Front End Loader	79.1	75.1
Total	80.7	79.9

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date ########
Case Descr CCV-08 General Construction

		Baselines (dBA)			---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night	
Equipment	Residential	75	75	75	

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dump Truck	No	40		76.5	500	0
Excavator	No	40		80.7	500	0
Front End Loader	No	40		79.1	500	0

Results

Calculated (dBA)

Equipment	*Lmax	Leq
Dump Truck	56.5	52.5
Excavator	60.7	56.7
Front End Loader	59.1	55.1
Total	60.7	59.9

*Calculated Lmax is the Loudest value.

Report date: 2/29/2016
Case Description: CCV-08 General Construction

		Baselines (dBA)		---- Receptor #1 ----
Description	Land Use	Daytime	Evening	Night
Equipment List	Residential	75	75	75

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dump Truck	No	40		76.5	30	0
Excavator	No	40		80.7	30	0
Front End Loader	No	40		79.1	30	0

Results

Calculated (dBA)

Equipment	*Lmax	Leq
Dump Truck	80.9	76.9
Excavator	85.1	81.2
Front End Loader	83.5	79.6
Total	85.1	84.3

*Calculated Lmax is the Loudest value.