Appendix G

Noise Technical Report

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Noise Technical Report

Midway-Pacific Highway and Old Town Community Plan Updates

City of San Diego

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Executive Summary

This technical report evaluates potential noise impacts attributed to the proposed Community Plan Updates (CPUs) for the Midway-Pacific Highway and Old Town communities of San Diego, California. Each CPU would update the current community plans for these communities, which were adopted in 1991 and 1987, respectively. The updates provide proposals for future land uses and public improvements that align with policies established by the 2008 City of San Diego General Plan (General Plan) and provide a comprehensive long-range policy framework for the development of both community areas through 2035.

The existing Midway-Pacific Highway and Old Town CPU areas are comprised of a broad variety of land uses including residential uses of varying densities, mixed-use areas, recreation and open space, village centers, registered historic properties, commercial uses, and industrial uses. Both CPUs for these communities intend to reduce the amount of industrial and large commercial spaces and increase the amount of medium and high-density residential uses and smaller commercial spaces. The increase in medium and high-density residential land uses would increase the diversity of land uses within many areas of the existing CPU areas and would be consistent with the General Plan.

An increase in medium and high-density residential land uses within these CPU areas would result in the introduction of noise-sensitive receptors in areas that may not have previously been considered noise sensitive. The policies proposed by the CPUs intend to reflect or enhance applicable noise guidelines in the existing General Plan and City of San Diego CEQA Guidelines with a community-specific approach.

Existing noise sources characterizing the CPU areas include vehicular traffic noise from highways and local roadways, aircraft approach and departure traffic from San Diego International Airport (SDIA), freight and passenger rail operation, light rail transit (LRT) operation, HVAC unit operation, sounds associated with commercial and industrial operations, birdsong, and intermittent sound sources typical of urban communities including but not limited to human speech, vehicle idling, car horns, landscaping, and music from loudspeaker systems in vehicles and homes.

Ambient Noise Level Increase

A significant impact would occur if noise sensitive land uses (NSLU) would be exposed to a significant increase of ambient noise levels as a result of the implementation of the CPU and associated discretionary actions. A significant increase at subject NSLUs is identified as any of the following:

- For NSLUs exposed to existing noise levels in excess of the land use compatibility guideline thresholds, a significant impact would occur if the NSLUs are exposed to an ambient noise level increase of 3 A-weighted decibels (dBA).
- For NSLUs currently exposed to existing ambient noise levels that do not exceed the land use compatibility guideline thresholds, a significant impact would occur if the NSLUs are exposed to an ambient noise level increase of 5 dBA.
- For NSLUs at or slightly less than the applicable land use compatibility guideline threshold, a significant increase would occur if the NSLUs are exposed to an ambient noise level increase of 5 dBA, or if the NSLUs are exposed to an ambient noise level increase of 3 dBA more than the applicable land use compatibility guideline thresholds (e.g. if the compatibility guideline is 70 dBA CNEL, and existing and future noise levels are at 68 and 72 dBA CNEL respectively, the increase would be considered less than significant because the increase would be below 73 dBA CNEL [3 dBA increase over the compatibility guideline threshold]).

Midway-Pacific Highway CPU

The existing ambient noise levels in the Midway-Pacific Highway CPU are largely dominated by traffic noise from Interstate 5 (I-5), Interstate 8 (I-8), and the major arterial roadways which extend throughout the CPU area. Noise generated by existing vehicular traffic is currently exposing several NSLUs to outdoor ambient sound levels that exceed those established by the land use compatibility guidelines. The proposed Midway-Pacific Highway CPU would not result in an improvement to the existing state of ambient noise in the community, and these areas would continue to be exposed to noise levels in excess of standards. Significant increases in ambient noise levels would occur along one roadway segment within the CPU area. Currently, land uses abutting this roadway segment include retail sales, commercial services, offices, industrial, and wholesale/distribution/storage use. The nearest residential land uses are located greater than 1000 feet away from the segment. Proposed CPU land uses along this roadway segment include residentially permitted business parks, residentially permitted community commercial, and park space. The implementation of the Midway-Pacific Highway CPU and discretionary actions would expose existing several NSLUs along this roadway segment to significant increases in ambient noise levels.

Old Town CPU

The existing ambient noise levels in the Old Town CPU are also largely dominated by the sounds of traffic from I-5, I-8, and the major arterial roadways which closely follow the general alignment of both freeways. Noise generated by existing vehicular traffic is currently exposing several NSLUs to levels which exceed those established by the land use compatibility guidelines. Similar to the Midway-Pacific Highway CPU, the proposed Old Town CPU would not result in an improvement to the existing state of ambient noise in the community, and these areas would continue to be exposed to noise levels in excess of standards. However, no significant ambient level increases were identified at any NSLUs as a result of the implementation of the Old Town CPU and associated discretionary actions.

Transportation Noise and Land Use Compatibility

A significant impact would occur if implementation of the proposed CPUs would result in an exposure of people to current or future transportation noise levels that exceed guidelines established in the Noise Element of the General Plan.

As discussed in the previous paragraphs, ambient noise levels within both CPUs are currently exposing several NSLUs to levels which exceed those established by the Noise Element of the General Plan. The NSLUs proposed in both the Midway-Pacific Highway CPU and Old Town CPU are located within many of these currently-incompatible areas. In these cases, an existing mitigation framework is in place in the CPU and General Plan regulations in the City of San Diego Municipal Code (SDMC), as well as Title 24 of the California Code of Regulations, which, in aggregate, would reduce traffic noise exposure by setting standards for the siting of NSLUs. These regulations require a site-specific noise analysis to be undertaken for any project that would potentially locate NSLUs within an area exposed to incompatible interior or exterior transportation noise levels. With this framework in place, noise impacts to discretionary projects would be less than significant. However, in cases of ministerial projects, there are no existing regulations in place to prevent the siting of NSLUs within areas that could potentially expose people to incompatible noise levels. Therefore, exterior noise impacts for ministerial projects located within incompatible land use areas would be significant and unmitigated. Interior noise impacts, however, would be less than significant, as all ministerial project applicants would still be required to demonstrate compliance with interior noise standards (45 dBA CNEL) through the process of submitting and receiving approval of a Title 24 Compliance Report.

Vehicle Traffic

Traffic noise exposure levels are incompatible for all land use types along the I-5 and I-8 in both CPU areas. As stated above, policies such as the General Plan policy NE-A.4, would reduce traffic noise exposure to proposed NSLUs sited in potentially incompatible areas by requiring acoustical studies consistent with the Acoustical Study Guidelines. Site-specific exterior noise analyses would need to demonstrate that the subject project would not locate noise-sensitive receptors (NSRs) in areas where existing or future noise levels would exceed the noise compatibility guidelines of the General Plan as part of future discretionary proposals. Additionally, a similar site-specific interior noise analyses would need to demonstrate compliance with the interior noise compatibility guidelines of the General plan in areas where exterior noise levels are predicted to exceed the exterior noise compatibility guidelines of the General Plan. With this regulatory framework, noise impacts to new discretionary development would be less than significant.

However, in cases of ministerial projects, there are no existing regulations in place to prevent the siting of NSLUs within areas that could potentially expose people to incompatible noise levels. Therefore, exterior noise impacts for ministerial projects located within incompatible land use areas would be significant and unmitigated. Interior noise impacts, however, would be less than significant, as all ministerial project applicants would still be required to demonstrate compliance with interior noise standards (45 dBA CNEL) through the process of submitting and receiving approval of a Title 24 Compliance Report.

Rail Noise

Railway noise is generated from the rail traffic on the Los Angeles-San Diego-San Luis Obispo (LOSSAN) rail corridor, consisting of freight trains (BNSF), regional and commuter passenger rail (Amtrak and North County Transit District [NCTD] Coaster), and LRT (San Diego Metropolitan Transit System [SDMTS] Trolley). The LOSSAN corridor closely follows the alignment of I-5 within both CPU areas. Railway noise generated from the rail traffic on corridor would exceed 60 dBA within 230 feet of the Midway-Pacific Highway CPU boundary, and 235 feet of the Old Town CPU boundary. Both CPUs propose new NSLUs within these distances, vehicular traffic noise from Pacific Highway and I-5 produce CNEL noise levels from 70 to greater than 75 dBA at these predicted distances, which far-exceed the CNEL contribution of railroad operations. The regulatory framework and measures applied for project-specific developments relating to the mitigation of traffic noise would, in turn, also reduce noise exposure from rail operations to compatible levels. Therefore, noise level impacts resulting from rail operations would be less than significant.

ALUCP Consistency

A significant impact would occur if implementation of the proposed CPUs would result in land uses that are not compatible with forecasted aircraft noise levels as defined by the adopted Airport Land Use Compatibility Plan (ALUCP).

Midway-Pacific Highway CPU

The Midway-Pacific Highway CPU area immediately abuts a large portion of the SDIA boundary and experiences projected SDIA operations levels ranging from 60 to greater than 75 dBA CNEL. Per the City Significance Determination Thresholds, if a future project implemented under the proposed Midway-Pacific Highway CPU and associated discretionary actions is proposed within the 60 dBA CNEL contour, the potential exterior noise impacts from aircraft noise would not constitute a significant environmental impact. The Midway-Pacific Highway CPU proposed multiple NSLUs within CNEL contours greater than 60 dBA CNEL, however, the ALUCP conditionally allows future residential uses in areas above the 65 dBA CNEL in locations where community plans have allowed residential. These future residential developments would include noise attenuation consistent with the Noise Element of the General Plan and the ALUCP for SDIA. Interior noise impacts would be regulated by the requirement for residential development within the 60 dBA CNEL contour to reduce interior noise levels attributed to airport noise to 45 dBA CNEL. The City currently submits both discretionary and ministerial projects that increase residential units and non-residential floor area for new land use development to the ALUC to obtain a consistency determination from the ALUCP.

Interior noise levels for new construction are also addressed through implementation of General Plan policies NE-I.1 and NE-I.2, which include Title 24 of the CCR, which requires submission of a Title 24 Compliance Report to demonstrate interior noise levels of 45 dBA CNEL when NSLUs are proposed in an area experiencing predicted to be exposed to CNEL levels within the 65 dBA CNEL contour, or, if CNEL contours are unavailable, areas exposed to 1-hour L_{eq} levels of 65 dBA or greater. With this framework, airport noise impacts to new development would be less than significant.

Old Town CPU

The nearest segment of runway operated by SDIA is located approximately 0.8 miles south of the Old Town CPU area southern boundary. As depicted in Figure 6.1-2, no portions of the Old Town CPU are located within any of the noise level CNEL contours presented in the ALUCP. Though aircraft departures are audible throughout the Old Town CPU area, CNEL levels attributed to SDIA will not exceed 60 dBA CNEL. Neither exterior nor interior noise compatibility impacts would occur at any of the proposed project land uses; thus, the implementation of the proposed Old Town CPU and associated discretionary actions would result in a less than significant exposure to noise from aircraft.

Municipal Code Compliance

A significant impact would occur if implementation of the proposed CPU results in the exposure of people to noise levels that exceed property line limits established in the Noise Abatement and Control Ordinance of the SDMC.

While noise-sensitive residential land uses would be exposed to noise associated with the operation of commercial uses, policies are in place to control noise and reduce noise impacts among various land uses. Noise policies, as contained in the General Plan Noise Element, the proposed CPUs, and regulations in the Noise Ordinance are in place to control and reduce noise at various land uses to levels below impact thresholds for specific land use types. These include the requirement for noise studies for new developments, limits on hours of operation for various noise-generating activities, and standards for the compatibility of land use types with respect to outdoor ambient noise levels. In addition, enforcement of the federal, state, and local noise regulations would control impacts. At the project level, commercial and industrial land uses would be required to comply with the City's daytime and nighttime property line noise level limits per the applicable General Plan policy and SDMC. Given implementation of these policies and enforcement of the Noise Abatement and Control Ordinance of the SDMC, impacts would be less than significant.

Construction Noise

A significant impact would occur if implementation of the proposed CPUs resulted in the exposure of people to significant temporary construction noise.

Construction activities related to implementation of the proposed CPUs would potentially generate short-term noise levels in excess of 75 dBA one-hour L_{eq} at adjacent properties within 177 feet. Although no specific construction or development is proposed under either of the proposed CPUs and associated discretionary actions at this time, construction noise impacts could occur due to the highly-developed nature of land uses within both CPU areas. Since there is a high likelihood that construction activities would take place adjacent to NSLUs, there is potential for construction noise levels to exceed the SDMC construction noise limit of 75 dBA L_{eq} 12-hour average and thus, impacts would be significant without mitigation. Typically, noise can be reduced to comply with SDMC standards with the implementation and enforcement of standard construction noise control measures during construction planning and execution. Implementation of the mitigation measures outlined in this analysis would reduce and/or limit the 12-hour average construction noise levels emanating from the site to SDMC-compliant levels and thus, noise exposure as a result of construction efforts associated with the implementation of the CPUs would be less than significant.

Vibration (Construction)

Conventional construction activities (i.e., excluding pile driving) may be perceptible by human receptors, however, these activities would not be capable of exceeding structural damage thresholds or "strongly perceptible" thresholds outlined in Section 3.1.3. By use of administrative controls, such as scheduling vibration-intensive construction activities to hours with the least potential to affect nearby sensitive receptors, perceptible vibration can be kept to a minimum and, as such, would result in a less than significant impact with respect to mere perception

Pile driving has the potential to generate the highest groundborne vibration levels and is the primary concern for vibratory impacts on structures and human receptors. The construction of future land uses as a result of the implementation of each of the proposed CPUs and associated discretionary actions would have the potential to result in a significant impact related to vibration associated with construction when occurring within the distances provided in Table 6.1-5. At a project level, for projects where construction would include vibration-generating activities such as pile driving within the distances in Table 6.1-5, measures outlined in this analysis will reduce construction-related vibration impacts; however, at the program level it cannot be known whether the measures would be adequate to minimize vibration levels to less than significant, thus, construction-related vibration impacts would be significant and unavoidable.

Vibration (Operation)

The proposed land uses in both of the CPUs include retail facilities, restaurants, and office spaces that would not require heavy mechanical equipment or heavy truck deliveries, both of which could generate atypical levels of vibration. Additional proposed land uses, such as residential developments and civic uses do not typically generate any notable vibration. Thus, operational vibration impacts associated with implementation of the proposed CPUs and associated discretionary actions would be less than significant.

1. Introduction and Objectives

The project analyzed in this noise report includes the Midway-Pacific Highway and Old Town CPU for communities located in west-central San Diego, California. These CPUs serve to update existing adopted community plans and will establish goals and supporting policies for the future growth and development in each community while ensuring consistency with the City of San Diego General Plan (General Plan). These plans serve as long-range guides to development with a focus on the distribution and arrangement of land, roadway and transit networks, and preservation and enhancement of natural open space, historic resources, and cultural resources through 2035.

1.1 Community Plan Areas, Goals, and Policies

1.1.1 Midway-Pacific Highway Community Area

The Midway-Pacific Highway CPU area encompasses roughly 1,324 acres of land, bounded on the south by Laurel Street, on the east by Interstate 5 (I-5), on the north by Interstate 8 (I-8), and variably on the west by The San Diego International Airport (SDIA), the Marine Corps Recruitment Depot (MCRD), and several local roadways.

The primary goals, recommendations, and objectives of the CPU include establishment of multi-use villages and districts, pedestrian, bicycle, and transit mobility improvements, identification of community parks and recreational facilities, transit-oriented residential and commercial development, maintenance of industrial and commercial employees, water quality and conveyance improvements, and alternative uses for government-owned land.

1.1.2 Old Town Community Area

The Old Town CPU area encompasses roughly 230 acres of land, approximately bounded on the south by Witherby Street, on the west by I-5, on the north by I-8, and variably on the east by several local roadways. This community is the site of the initial settlement of the City of San Diego and is the birthplace of the state of California, and thus, contains many historically significant resources throughout.

The primary goals, recommendations, and objectives of the CPU include the establishment of a community of national and international historic importance, establishment of the community as a visitor destination and residential community, support for the creation of small and local business serving specific community purposes, pedestrian, bicycle, and transit mobility improvements, and the establishment of a community connected to its heritage and open space areas.

2. Fundamentals of Noise and Vibration

2.1 Noise

Noise is generally defined as unwanted or objectionable sound. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance and, in the extreme, hearing impairment. The unit of measurement used to describe a noise level is the decibel (dB); decibels are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used for earthquake magnitudes. Thus, a doubling of the energy of a noise source, such as doubling of traffic volume, would increase the noise level by 3 dB; a halving of the energy would result in a 3-dB decrease.

Human Perception of Noise

The human ear is not equally sensitive to all frequencies within the sound spectrum. Therefore, a method called “A weighting” is used to filter noise frequencies that are not audible to the human ear. The A scale approximates the frequency response of the average young ear when listening to most ordinary everyday sounds. When people make relative judgments of the loudness or annoyance of a sound, their judgments correlate well with the A-scale levels of those sounds. Therefore, the “A-weighted” noise scale is used for measurements and standards involving the human perception of noise. In this report, all noise levels are A-weighted and “dBA” is understood to identify the A-weighted dB. Table 2.1-1 Typical Noise Levels provides typical noise levels associated with common activities.

Human perception of noise has no simple correlation with acoustical energy. The perception of noise is not linear in terms of dBA or in terms of acoustical energy. Two noise sources do not sound twice as loud as one source. It is widely accepted that the average healthy ear can barely perceive changes of 3 dBA (increase or decrease); that a change of 5 dBA is readily perceptible; and that an increase (or decrease) of 10 dBA sounds twice (or half) as loud (Caltrans 2009).

Averaging Noise Levels

In addition to noise levels at any given moment, the duration and averaging of noise over time is also important for the assessment of potential noise disturbance. Noise levels varying over time are averaged over a period of time, usually hour(s), expressed as dBA L_{eq}. For example, L_{eq} (3h) would be a 3-hour average noise level. When no period is specified, a 1-hour average is assumed (L_{eq} (1h) or L_{eq}).

Table 2.1-1
Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
-	110	Rock Band
Jet Fly-over at 300 m (1,000 ft)	100	-
Gas Lawn Mower at 1 m (3 ft)	90	-
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	80	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	70	Vacuum Cleaner at 3 m (10 ft)
Commercial Area Heavy Traffic at 90 m (300 ft)	60	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	50	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	30	Library
Quiet Rural Nighttime	20	Bedroom at Night, Concert Hall (Background)
-	10	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

Source: Caltrans 2009
Notes: m=meters ft=feet
km/hr=kilometers per hour
mph=miles per hour

The time of day of noise is also an important factor to consider when assessing potential community noise impacts, as noise levels that may be acceptable during the daytime hours may create disturbance during evening or nighttime hours, when people are typically at home and sleeping. The Community Noise Equivalent Level (CNEL) is a descriptor used to characterize average noise levels over a 24-hour period, calculated from hourly L_{eq} values, with 5 dBA added to the hourly L_{eq} levels occurring between 7:00 p.m. and 10:00 p.m. and 10 dBA added to the hourly L_{eq} levels occurring between 10:00 p.m. and 7:00 a.m., to reflect the greater disturbance potential from evening and nighttime noise, respectively. The day/night average sound level (L_{dn}) is the same as the CNEL, except the evening period is included in the daytime period.

Noise Attenuation

From the source to the receiver, noise changes both in level and frequency spectrum. The most obvious change is the decrease in noise as the distance from the source increases. The manner in which noise reduces with distance depends on the following important factors: ground absorption, atmospheric effects and refraction, shielding by natural and man-made features, noise barriers, diffraction, and reflection. For a point noise source, such as stationary construction equipment, the attenuation rate or drop-off in noise level would be at least -6 dBA for each doubling of unobstructed distance between source and the receiver, and could improve to a rate of 7.5 dBA depending on the acoustic characteristics of the ground surface over which the sound travels between the source and a receiver. For a linear noise source, such as vehicles traveling on a roadway, the attenuation rate or drop-off in noise level would be approximately -3 dBA for each doubling of unobstructed distance between source and the receiver and could improve up to a rate of -4.5 dBA depending on the acoustic characteristics of the ground surface.

A large object in the path between a noise source and a receiver can significantly attenuate noise levels at that receiver. The amount of attenuation provided by this "shielding" depends on the size of the object and the frequencies of the noise levels. Natural terrain features, such as hills and dense woods, as well as man-made features, such as buildings and walls, can significantly alter noise levels. Walls or berms are often specifically used to reduce noise at one or more receptors with respect to identified substantial sound sources of concern.

Noise Sensitive Receptors

Some land uses are considered more sensitive to noise than others due to the types of persons or activities involved, such as sleeping, reading, talking, or convalescing. Noise-sensitive receptors are generally considered humans engaged in activities, or occupying land uses, that may be subject to the stress of significant interference from noise. Typically, land uses associated with noise-sensitive human receptors include residential dwellings, hotels/motels, hospitals, nursing homes, educational facilities, and libraries.

In addition to human receptors, protected animal species and their habitats, e.g., bird species protected under the Migratory Bird Treaty Act, may be considered noise sensitive receptors during their breeding season. Temporary, indirect impacts are likely to arise from construction-generated noise resulting in destruction and/or avoidance of habitat by wildlife. These impacts are addressed in the Project's Biological Technical Report (BTR), which has been prepared by AECOM, Inc. under separate cover (AECOM 2017).

2.2 Vibration

In addition to noise, construction activities generate vibration, which can be interpreted as energy transmitted in waves through the soil mass. These energy waves generally dissipate with distance from the vibration source, with propagation distances determined by frequency, frictional losses, and soil types and strata. When groundborne vibrations reach receiving structures, the energy can be transmitted to the foundation of the buildings which in turn may result in vibration of the building structure to varying degrees.

Typical outdoor sources of perceptible groundborne vibration are construction equipment and traffic on rough (i.e., unpaved or uneven) roads. Construction activity can also result in varying degrees of groundborne vibration, depending on the type of equipment, methods employed, distance between source and receptor, duration, number of perceived vibration events, and local geology.

One major concern with regard to construction vibration is potential building damage, which is assessed in terms of peak particle velocity (PPV), typically in units of inches per second (in/sec). In addition to structural damage, the groundborne vibration may also induce human annoyance. Human annoyance thresholds are typically much lower than damage thresholds, both of which are discussed in Section 3.1.3.

3. Noise Analysis Overview

3.1 Regulatory Overview and Impact Criteria

3.1.1 California Code of Regulations

Title 24, Part 2, Chapter 12, Section 1207 covers sound transmission regulations that are applicable to all new construction in the state of California. Section 1207.4 stipulates that interior noise levels generated by exterior noise sources shall not exceed 45 dB CNEL or L_{dn} within a habitable room (whichever noise metric is utilized in the noise element of the local general plan). The City of San Diego General Plan relies upon the CNEL metric for compliance assessment and thus, interior noise levels within habitable spaces as a result from exterior noise sources cannot exceed 45 dBA CNEL. Section 1207.5 directs the reader to the California Green Building Standards Code, Chapter 5, Division 5.5 for additional sound transmission requirements.

3.1.2 California Green (CalGreen) Environmental Comfort

Title 24, Part 11, Section 5.507 specifies environmental comfort with regard to noise exposure for non-residential buildings. The subsections therein provide means of acoustical controls through which building assembly and component requirements are used to assess exterior noise issues. Section 5.507.4 stipulates two compliance approaches. The prescriptive method is utilized when occupied structures are planned with a 65 CNEL contour of an airport, railroad, highway traffic, or industrial noise source. In this case, the wall and roof-ceiling assemblies are required to achieve a composite sound transmission class (STC) rating of at least 50, or a composite outdoor-indoor transmission class (OITC) rating of not less than 40. Additionally, exterior windows are required to be rated with a minimum STC of 40, or OITC of 30. The performance method does not require specific STC and OITC ratings; however, it requires that the interior noise environment attributable to outdoor noise sources not exceed an hourly L_{eq} of 50 dBA. This could be done by means of building envelope construction and/or exterior features such as noise walls or berms. The performance method requires an acoustical analysis documenting compliance with the interior sound level limits, prepared and approved by the architect or engineer of record.

3.1.3 California Department of Transportation (Caltrans) - Vibration

The Caltrans Transportation and Construction Vibration Guidance Manual (Caltrans 2013) (Caltrans Manual) provides guidance for the analysis of vibratory impacts generated by transportation and construction projects by providing thresholds for structural damage and human perception/annoyance. The CPUs are not subject to Caltrans requirements; however, the Caltrans Manual provides vibration thresholds for reference. Table 3.1-1 below shows a curated list of damage and annoyance thresholds from Caltrans Manual, as applicable to various receiver and vibratory source types.

Table 3.1-1
Maximum Vibration Levels for Construction Equipment for Potential Damage and Annoyance (PPV in/sec)

Structure Type	Potential Damage Thresholds		"Strongly Perceptible" Annoyance Criteria	
	Transient Sources	Continuous/Frequent Intermittent Sources	Transient Sources	Continuous/Frequent Intermittent Sources
Historic and some old buildings	0.5	0.25	0.9	0.1
Older residential structures	0.5	0.3		
New residential structures	1.0	0.5		
Modern industrial and commercial buildings	2.0	0.5		

Note: Transient sources generate a single vibratory event, such as blasting. Continuous/frequent sources include pile driving equipment and other construction activities generating multiple vibration-intensive events across a given period.

in/sec = inches per second; PPV = peak particle velocity
Source: Transportation and Construction Vibration Guidance Manual, Caltrans 2013

As shown above in Table 3.1-1, vibratory activities have potential to result in structural damage when vibration levels exceed 0.25 to 2 in/sec PPV as applicable to the source type and receiver characterization, and potential for human annoyance when vibration levels exceed 0.1 to 0.9 in/sec PPV as applicable to the source type.

3.1.4 City of San Diego Municipal Code

The City regulates noise through the City's Municipal Code (SDMC), Chapter 5, Article 9.5, Noise Abatement and Control. The following sections of the Ordinance provide sound level limits between adjacent properties, noise insulation standards, and construction noise limits.

Section 59.5.0401 Sound Level Limits regulates noise sources by establishing one-hour sound level thresholds at City of San Diego property lines. These limits, which vary by land use type and time of day, are shown in Table 3.1-2 below.

Table 3.1-2 San Diego Municipal Code Noise Level Thresholds		
Land Use	**Time of Day**	**One-Hour Average Sound Level (dB)**
1. Single Family Residential	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m.	50 45 40
2. Multi-Family Residential (Up to a maximum density of 1/2,000)	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m.	55 50 45
3. All other Residential	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m.	60 55 50
4. Commercial	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m.	65 60 60
5. Industrial or Agricultural	Any time	75

Source: City 2010

Section 59.50404 Construction Noise of the noise ordinance regulates noise produced by construction activities. Construction activities are prohibited between the hours of 7 p.m. and 7 a.m. and on Sundays and certain legal holidays, unless a permit has been granted beforehand by the Noise Abatement and Control Administrator or conjunction with emergency work. Section 59.5.0404 also limits construction noise to an average sound level of 75 dBA during the 12-hour period from 7 a.m. to 7 p.m. at or beyond the property lines of any property zoned residential.

3.1.5 City of San Diego CEQA

The City of San Diego's CEQA Significance Determination Thresholds CEQA (City of San Diego 2011) outline the criteria and thresholds used to determine whether projects may have a significant effect on the environment under Section 21082.2 of CEQA (City of San Diego 2011). Under this document, a significant impact would occur if the proposed CPUs would:

1. Result in or create a significant increase in the existing ambient noise levels;
2. Result in an exposure of people to current or future transportation noise levels which exceed guidelines established in the Noise Element of the General Plan;
3. Result in land uses which are not compatible with aircraft noise levels as defined by an adopted Airport Land Use Compatibility Plan (ALUCP);
4. Result in the exposure of people to noise levels which exceed property line limits established in the Noise Abatement and Control Ordinance of the Municipal Code; or
5. Result in the exposure of people to significant temporary construction noise.

3.1.6 City of San Diego General Plan

The Noise Element of the City's General Plan (City 2015) provides goals and policies to guide compatible land uses and incorporate of noise attenuation measures for new uses. The goal of the Noise Element is controlling noise to acceptable levels at its source. However, when this is not feasible, the City applies additional measures to limit the effect of noise on future land uses, which include spatial separation, site planning, and building design techniques that address noise exposure and the insulation of buildings to reduce interior noise levels. The City uses the Land Use – Noise Compatibility Guidelines shown below in Table 3.1-3 for evaluating land use noise compatibility for proposed developments.

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Table 3.1-3
Land Use Noise Compatibility Guidelines

Land Use Category	Exterior Noise Exposure (dBA CNEL) 60 65 70 75				
Parks and Recreational					
Parks, Active and Passive Recreation					
Outdoor Spectator Sports, Golf Courses; Water Recreational Facilities; Indoor Recreation Facilities					
Agricultural					
Crop Raising & Farming; Community Gardens, Aquaculture, Dairies; Horticulture Nurseries & Greenhouses; Animal Raising, Maintain & Keeping; Commercial Stables					
Residential					
Single Dwelling Units; Mobile Homes		45			
Multiple Dwelling Units **For uses affected by aircraft noise, refer to Policies NE-D.2. & NE-D.3.*		45	45*		
Institutional					
Hospitals; Nursing Facilities; Intermediate Care Facilities; Kindergarten through Grade 12Educational Facilities; Libraries; Museums; Child Care Facilities		45			
Other Educational Facilities including Vocational/Trade Schools and Colleges and Universities		45	45		
Cemeteries					
Retail Sales					
Building Supplies/Equipment; Food, Beverages & Groceries; Pets & Pet Supplies; Sundries Pharmaceutical, & Convenience Sales; Wearing Apparel & Accessories			50	50	
Commercial Services					
Building Services; Business Support; Eating & Drinking; Financial Institutions; Maintenance & Repair; Personal Services; Assembly & Entertainment (includes public and religious assembly); Radio & Television Studios; Golf Course Support			50	50	
Visitor Accommodations		45	45	45	
Offices					
Business & Professional; Government; Medical, Dental & Health Practitioner; Regional & Corporate Headquarters			50	50	
Vehicle and Vehicular Equipment Sales and Services Use					
Commercial or Personal Vehicle Repair & Maintenance; Commercial or Personal Vehicle Sales & Rentals; Vehicle Equipment & Supplies Sales & Rentals; Vehicle Parking					
Wholesale, Distribution, Storage Use Category					
Equipment & Materials Storage Yards; Moving & Storage Facilities; Warehouse; Wholesale Distribution					
Industrial					
Heavy Manufacturing; Light Manufacturing; Marine Industry; Trucking & Transportation Terminals; Mining & Extractive Industries					
Research & Development				50	

	Compatible	**Indoor Uses**	Standard construction methods should attenuate exterior noise to an acceptable indoor noise level. Refer to Section I.
		Outdoor Uses	Activities associated with the land use may be carried out.
45, 50	**Conditionally Compatible**	**Indoor Uses**	Building structure must attenuate exterior noise to the indoor noise level indicated by the number (45 or 50) for occupied areas. Refer to Section I.
		Outdoor Uses	Feasible noise mitigation techniques should be analyzed and incorporated t make the outdoor activities acceptable. Refer to Section I.
	Incompatible	**Indoor Uses**	New construction should not be undertaken.
		Outdoor Uses	Severe noise interference makes outdoor activities unacceptable.

Source: City 2015

As Table 3.1-3 indicates, the City's exterior unconditional "compatible" noise level standard for residential uses (single and multiple dwelling units) is 60 dBA CNEL or less. Compatible land use indicates that standard construction methods will attenuate exterior noise to an acceptable indoor noise level and people can carry out outdoor activities with minimal noise interference. Residential land uses (multiple dwelling units) with exterior noise levels of up to 70 dBA CNEL are "conditionally compatible" provided that the building structure attenuates interior noise levels to 45 dBA CNEL. For "conditionally compatible" land uses, the noise environment should be studied, consistent with Acoustical Study Guidelines presented in the General Plan to demonstrate that noise mitigation measures can be included in the project design to meet the applicable noise compatibility guidelines.

For residential land uses (multiple dwelling units), the "incompatible" noise level standard is greater than 70 dBA CNEL, and new construction should generally not be undertaken. Outdoor activities would be exposed to severe and unacceptable noise interference, and structures would require extensive mitigation techniques to make the indoor environment acceptable. The City assumes that standard construction design techniques would provide a 15 dB reduction of exterior noise levels to an interior receiver. Standard construction could be assumed to result in interior noise levels of 45 dBA CNEL or less when exterior sources are 60 dBA CNEL or less. When exterior noise levels are greater than 60 dBA CNEL and the interior threshold is 45 dBA CNEL, consideration of specific construction techniques is required.

Motor Vehicle Traffic Noise

Traffic noise level is dependent upon traffic volume, speed, flow, vehicle mix, pavement type and condition, and the use of barriers, as well as distance to the receptor. At higher speeds, typically on freeways, highways and primary arterials, the noise from tire/pavement interaction can be greater than from vehicle exhaust and engine noise. Noise-sensitive land uses adjacent to freeways and highways should be buffered from excessive noise levels by intervening, less sensitive, industrial-commercial uses or shielded by sound walls or landscaped berms. The City can, however, influence daily traffic volumes and reduce peak-hour traffic by promoting alternative transportation modes and integration of mixed-use infill development. The peak hour traffic may or may not be the worst-case noise levels since higher traffic volumes can lead to higher congestion and lower operating speeds. The worst-case noise levels may occur in hours with lower volumes and higher speeds. Although not generally considered "compatible", the City conditionally allows multiple unit and mixed-use residential uses up to 75 dBA CNEL in areas affected primarily by vehicular traffic noise with existing residential uses. Any future residential use above the 70 dBA CNEL must include noise attenuation measures to ensure an interior noise level of 45 dBA CNEL and be located in an area where a community plan allows multiple unit and mixed-use residential uses.

Commercial and Mixed-Use Activity Noise

Noise generated by ground floor commercial operations, maintenance, truck deliveries, and vehicular and pedestrian traffic can affect adjacent and aboveground floor residential areas. Noise attenuation methods in mixed-use buildings are essential to minimize excessive noise associated with nonresidential uses. The City's noise ordinance limits noise levels to 65 dBA during the day and 60 dBA during the night generated on-site by commercial uses to minimize the effect of noise on adjacent sensitive land uses.

Typical Noise Attenuation Methods

Noise impacts can typically be abated by five basic methods: 1) reducing the sound level of the noise generator, 2) interrupting the noise path between the source and receiver(s), 3) increasing the distance between the source and receiver(s), 4) insulating the receiver(s) (building material and construction methods), and 5) temporary removal or relocation of the effected receiver(s). All of the methods help to reduce interior noise levels, but only the first three help to reduce outside noise levels, with the exception of aircraft noise.

3.1.6.1 San Diego County Regional Airport Authority

The San Diego County Regional Airport Authority, serving as the ALUC, is required by state law to prepare an ALUCP for SDIA. The ALUCP contains policies and criteria that address land use compatibilities concerning noise generated by airport operations, and the adopted ALUCP for SDIA contains policies that limit residential uses in areas experiencing noise levels above 60 dBA CNEL by placing conditions on land uses within the 60 dB CNEL contour. Land uses such as residential, temporary lodging facilities, religious and educational institutions, day cares, and medical facilities in such areas would be conditionally compatible in these areas if attenuation measures reduce interior noise levels to 45 dBA CNEL.

4. Existing Conditions

4.1 Existing Land Use and Zoning

4.1.1 Existing Land Uses – Midway-Pacific Highway CPU Area

The Midway-Pacific community is a highly developed area with a limited amount of vacant parcels. Residential land uses only account for approximately 6% of existing land uses within the CPU area, with the majority of land uses designated for military, commercial retail, transportation, and industrial activities. Residential land uses are primarily multi-family developments located along the western boundary of the CPU area, with two high-density multi-family housing developments adjacent to I-5 on Hancock between Witherby Street and Washington Street.

4.1.2 Existing Land Uses – Old Town CPU Area

The Old Town community is also a highly developed area with a limited amount of vacant parcels. Unlike the Midway-Pacific Highway area, existing land uses in the Old Town community are predominantly associated with Transportation as well as Parks and Open Space. Residential land uses account for approximately 8% of existing land uses within the CPU area, most of which are located throughout the southeastern portion, consisting of both single family and multi-family residences interspersed with office spaces.

4.2 Existing Noise Levels

Ambient noise levels were measured within both CPU areas to characterize the existing sound environments and assist in determining constraints and opportunities for the proposed CPU.

4.2.1 Baseline Ambient Noise Survey

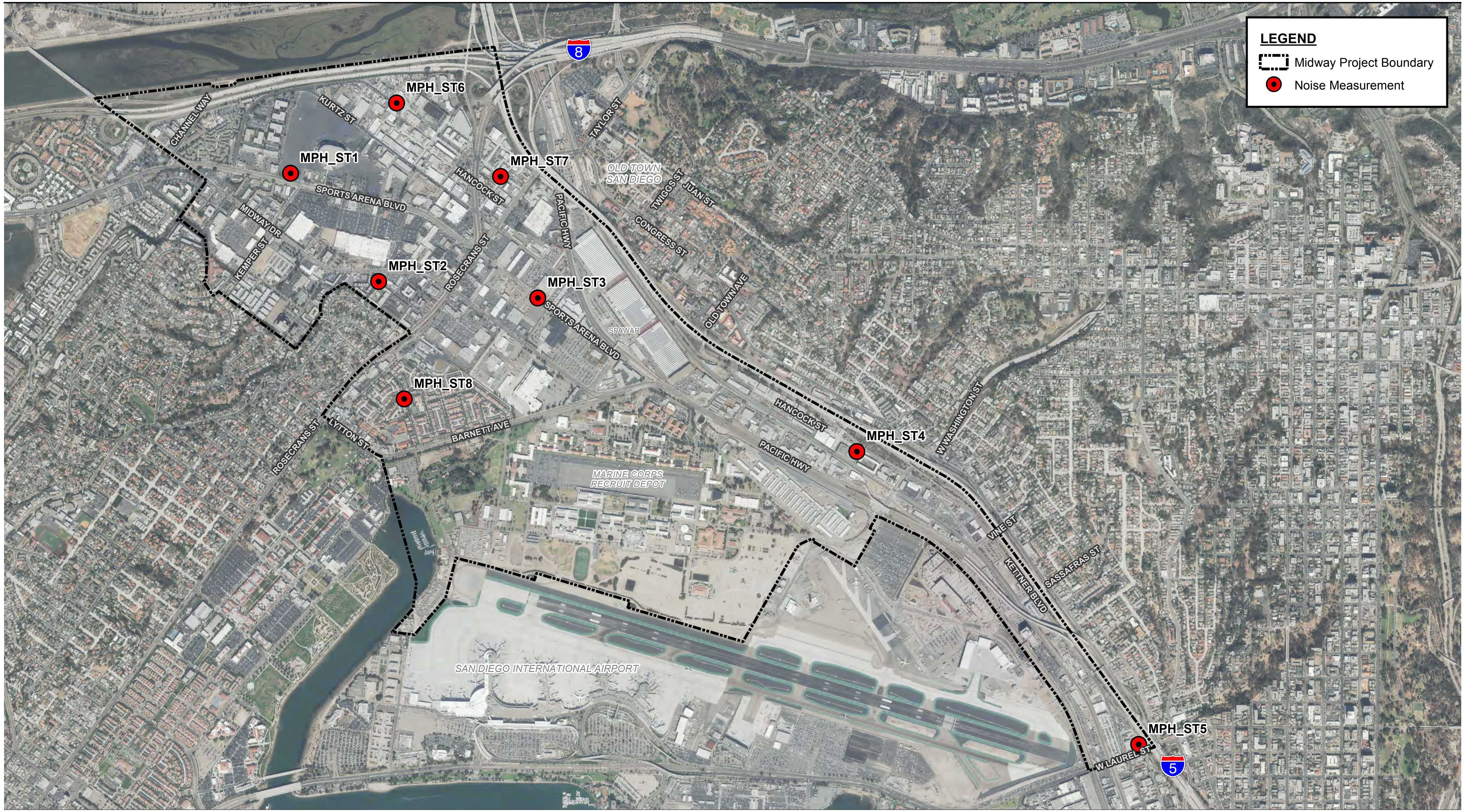
After a preliminary review of online aerial imagery, draft CPUs, and input from City staff, multiple field noise survey location candidates were identified in the CPU vicinities for short-term (ST) Sound Pressure Level (SPL) measurements. A total of 14 ST measurements were conducted over two measurement surveys conducted on April 10 and May 23, 2017. As depicted in Figures 4.2-1 and 4.2-2, 8 measurement locations took place within the Midway-Pacific Highway CPU area, and 6 were located within the Old Town CPU area. All ST measurements were conducted in the attendance of the sound level meter (SLM) operator, who made simultaneous documentation of observations (e.g., perceived sound sources and environmental conditions).

4.2.1.1 Instrumentation

The ST measurements were conducted using a Larson-Davis (LD) Model LxT (serial numbers [SN] 4485 and 4486) SLMs, rated by the American National Standards Institute (ANSI) as Type 1 per IEC 61672-1:2013, ANSI S1.4, and ANSI S1.43. The SLM microphones were fitted with standard 3.5-inch diameter spherical-shaped open-cell foam windscreen and positioned roughly 5 feet above grade. The microphone was also placed at least 10 feet from any vertical acoustically reflecting surfaces. The SLMs were set using slow time-response and the A-weighting scale. SLM calibration was field-checked before and after each measurement period with an L/D Model CAL200 (SN 5768 and 4637) acoustic calibrator. Where not already described, sound level measurements performed for this field survey were conducted in accordance with applicable portions of International Organization for Standardization (ISO) (1996a, 1996b, 1996c) standards. A Kestrel Model 3500 (SN 2058303) handheld anemometer was used to determine average wind speed, temperature, barometric pressure, and relative humidity before each round of community measurements.

4.2.1.2 Measurement Results

Measurement ID nomenclature was structured by CPU area, with “OT” representing measurements located within the Old Town CPU area, and “MPH” representing measurement located within the Midway-Pacific Highway CPU area. Summarized measurement data appears in 4.2-1, detailed 1-minute interval data is available in Appendix A.



Source: SANDAG 2014; City of San Diego 2017; SanGIS 2017; AECOM 2017.

1,500 750 0 1,500 Feet

Scale: 1:18,000; 1 inch = 1,500 feet

Figure 4.2-1
Midway-Pacific Highway Community Plan Update
Noise Measurement Locations

Path: P:_6044\60440144_MidOld_CPU\900-CAD-GIS\920 GIS\922_Maps\Noise\Midway_NoiseMeasurements.mxd, 6/22/2017, daniel.arellano

Source: SANDAG 2014; City of San Diego 2017; SanGIS 2017; AECOM 2017.

750 375 0 750 Feet

Scale: 1:9,000; 1 inch = 750 feet

Figure 4.2-2
Old Town Community Plan
Noise Measurement Locations

Path: P:_6044\60440144_MidOld_CPU\900-CAD-GIS\920 GIS\922_Maps\Noise\OldTown_NoiseMeasurements.mxd, 6/22/2017, daniel.arellano

Measurement OT-ST1 was conducted on the pitcher's mound of the baseball diamond on the corner of Taylor Street and Whiteman Street, approximately 81 feet from the Taylor Street edge of pavement (EOP). The primary noise source at this location was vehicular traffic on I-8 and Taylor Street. Additional noise sources included fixed-wing aircraft flyovers from small propeller planes, distant train horn soundings, a distant sprinkler system operating within the Presidio Hill Golf Course, and intermittent westbound jet aircraft departures from SDIA.

Measurement OT-ST2 was conducted on the sidewalk in adjacent to a single family residence located at 2606 Juan Street. The primary noise source at this location was vehicular traffic on Juan Street. Additional noise sources included fixed-wing aircraft flyovers from small propeller planes, distant trolley horn soundings, intermittent westbound jet aircraft departures from SDIA, and speech from Old Town San Diego State Historic Park visitors in Parking Lot C.

Measurement OT-ST3 was conducted on the sidewalk in front of the multi-family residence located at 2495 Harney Street within a cul-de-sac, approximately 80 feet from the I-5 EOP. The primary source of noise at this location was vehicular traffic from I-5. This location has a direct line-of-sight to freeway traffic to the northwest through a chain-link fence. Additional sources included intermittent westbound jet aircraft departures from SDIA and residents entering their vehicles and driving out of the cul-de-sac.

Measurement OT-ST4 was conducted in a parking space southeast of the hillside multi-family residential structure located at 3999 Old Town Avenue. The primary source of noise at this location was intermittent birdcalls and continuous distant traffic noise from I-5. Additional noise sources included intermittent westbound jet aircraft departures from SDIA and train horn sounding.

Measurement OT-ST5 was conducted in a commercial parking lot between Ampudia Street, Moore Street, Old Town Avenue, and Jefferson Street, - approximately 225 feet from the I-5 EOP. The primary noise source at this location was vehicular traffic from I-5. Additional noise sources included distant speech, rustling leaves, vehicle movements within the parking lot, and intermittent westbound jet aircraft departures from SDIA.

Measurement OT-ST6 was conducted in a commercial parking lot located between I-5 and Pacific Highway, approximately 70 feet from the Pacific Highway EOP and 100 feet from the I-5 northbound to I-8 eastbound ramp. The primary noise source at this location was vehicular traffic from I-5 and Pacific Highway. Additional noise sources included HVAC unit operation, distant speech, birdcalls, vehicle movements within the parking lot, and intermittent westbound jet aircraft departures from SDIA.

Measurement MPH-ST1 was conducted within a parking lot associated with the Valley View Casino Center (formerly San Diego Sports Arena) entertainment and sports venue/Kobey's Swap Meet, located approximately 90-feet of from edge of pavement (EOP) of Sports Arena Boulevard, and located within the CPU-proposed Sports Arena Community Village area. The primary noise sources at this location were traffic on Sports Arena Boulevard, distant traffic on I-8, and intermittent westbound jet aircraft departures from SDIA.

Measurement MPH-ST2 was conducted at the northern corner of the Loma Village Apartments located at 3175 Cauby Street, approximately 135 feet south of Midway Drive EOP. Due to ongoing construction in the area of the CPU-proposed Kemper Neighborhood Village during both measurement surveys, this measurement was located in the abutting Cauby District and is expected to be representative of noise levels also experienced within the proposed Kemper Neighborhood Village area at similar distances from Midway Drive. The primary noise sources at this location were traffic on Midway Drive and intermittent westbound jet aircraft departures from SDIA. Additional noise sources included distant rail operations, distant landscape mowing across Midway Drive, and rustling palm fronds along Cauby Street.

Measurement MPH-ST3 was conducted on the southern side of Sports Arena Boulevard, east of Rosecrans Street on a sidewalk within an industrial area, located within the area of the CPU-proposed Dutch Flats Urban Village. The primary noise sources at this location were distant traffic on Pacific Highway and I-5, local traffic on Sports Arena Boulevard, intermittent westbound jet aircraft departures from SDIA, and intermittent semi-truck engine idling across the roadway at an existing retail shipping facility. Periods of active truck idling during the measurement were removed from the reported data, resulting in the shorter measurement duration shown in Table 4.2-1. Additional noise sources included helicopter and personal fixed-wing aircraft flyovers, and speech from pedestrian pass-bys.

Table 4.2-1
Existing Community Noise Measurement Results

Meas. ID	Date	Time	Duration (Minutes)	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}
OT-ST1	4/10/17	08:45	15	62.5	56.6	75.6	63.7	60.6	58.7
OT-ST2	4/10/17	09:07	15	61.6	54.3	73.2	64.1	59.6	57.1
OT-ST3	4/10/17	09:28	15	70.5	66.8	75.7	71.8	70.3	68.9
OT-ST4	4/10/17	09:55	15	56.0	52.7	66.7	57.3	54.9	54.2
OT-ST5	5/23/17	11:48	15	63.9	60.6	73.8	65.3	63.3	62.2
OT-ST6	5/23/17	11:08	15	68.2	63.3	83.3	69.1	66.7	65.5
MP-ST1	4/10/17	10:51	15	64.2	52.6	81.1	66.5	61.1	56.8
MP-ST2	4/10/17	11:24	15	60.6	48.6	73.6	62.9	55.4	51.9
MP-ST3	4/10/17	12:20	12	62.4	47.9	75.0	64.9	57.3	52.7
MP-ST4	4/10/17	12:45	15	68.4	58.8	92.2	68.2	64.1	61.9
MP-ST5	4/10/17	13:15	15	73.1	62.4	95.3	73.4	67.6	65.0
MP-ST6	5/23/17	09:55	15	63.9	54.2	77.0	66.5	60.8	57.8
MP-ST7	5/23/17	10:25	15	65.6	55.7	79.0	67.5	61.8	59.2
MP-ST8	5/23/17	12:26	15	58.4	48.2	76.7	57.8	53.5	51.1

Measurement MPH-ST4 was conducted near Hancock Street and Noell Street in the cul-de-sac entrance to the Mission Apartments complex, located within the CPU-proposed Hancock Transit Corridor. The primary noise source at this location was traffic on Pacific Highway and I-5. Additional noise sources included passenger train pass-bys, trolley pass-bys, helicopter overflights, and intermittent westbound jet aircraft departures from SDIA.

Measurement MPH-ST5 was conducted near 2520 India Street in front of a small row of single-family residences north of West Laurel Street in the CPU-proposed Kettner District. The primary noise sources at this location were traffic on West Laurel Street, India Street, and I-5, as well as frequent jet aircraft overflights on approach to SDIA. Additional noise sources were not perceptible due to the elevated existing ambient noise level.

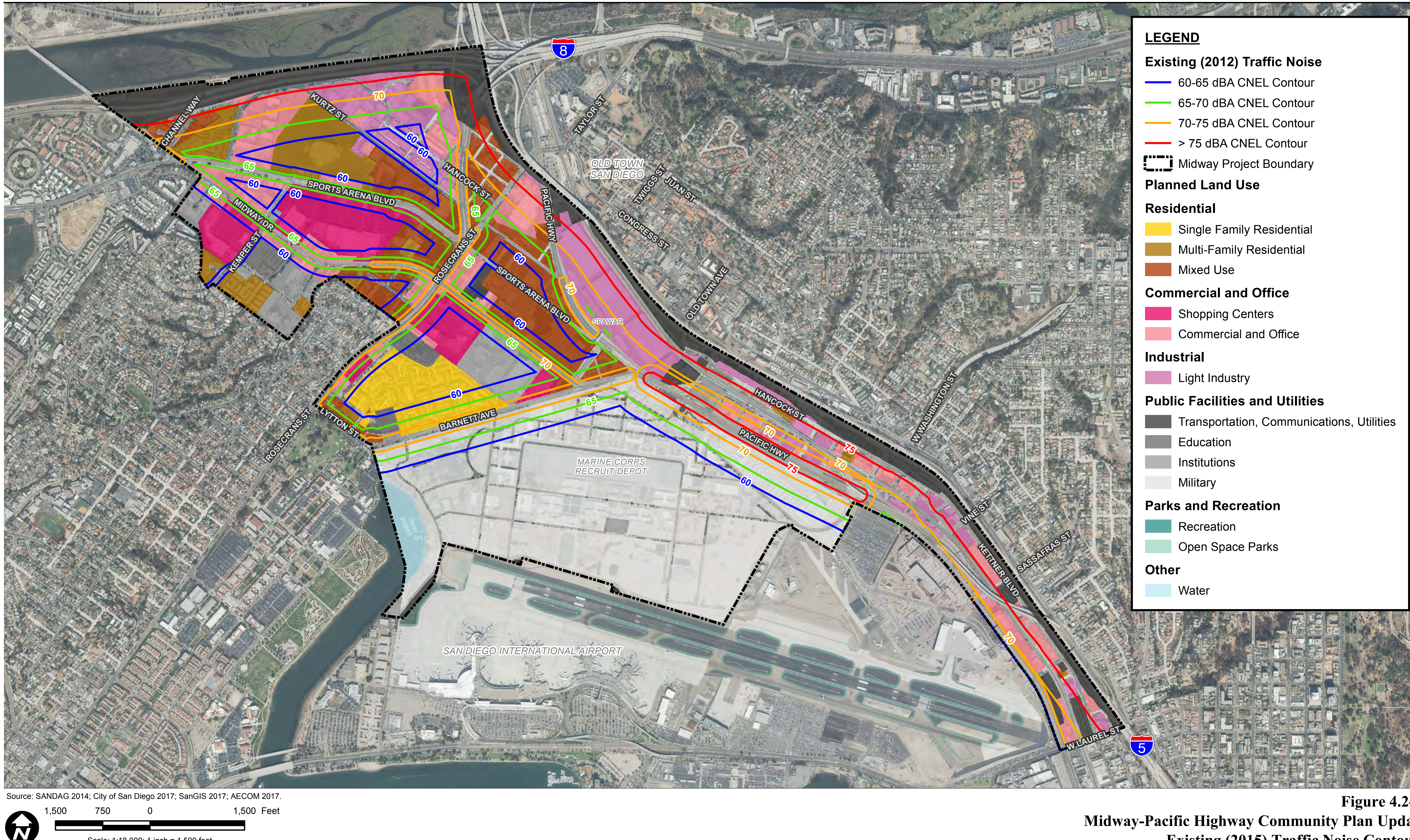
Measurement MPH-ST6 was conducted on a sidewalk area in front of 3538 Hancock Street in the CPU-proposed Camino Del Rio District. The primary noise sources at this location were traffic from I-8, and intermittent westbound jet aircraft departures from SDIA. Additional noise sources included birds vocalizing, HVAC unit operation, and traffic on Hancock Street and local roadways.

Measurement MPH-ST7 was conducted on the western corner of the intersection of Moore Street and Gaines Street in a warehouse/commercial area between Camino Del Rio West and Rosecrans within the CPU-proposed Kurtz District. The primary noise sources at this location were mechanical sounds from the automotive repair shop immediately to the southwest and traffic from Camino Del Rio West and I-5. Additional noise sources included rustling leaves and intermittent westbound jet aircraft departures from SDIA.

Measurement MPH-ST8 was conducted on the southwestern corner of the intersection of St. Charles Street and Durham Ridge Place, located within the Gateway Village military housing neighborhood in the CPU-proposed Lytton District. The primary noise sources were distant traffic noise and rustling leaves and palm fronds. Additional noise sources included a distant crying infant and distant intermittent hammering. No jet aircraft departures from SDIA were observed during the measurement period.

4.2.2 Existing Traffic Noise

Vehicles traveling on I-5 and I-8 dominate the existing ambient environment throughout the majority of both CPU areas, further supplemented by arterial and secondary roadways. Figures 4.2-3 and 4.2-4 display the aggregate



Source: SANDAG 2014; City of San Diego 2017; SanGIS 2017; AECOM 2017.

Figure 4.2-3
Midway-Pacific Highway Community Plan Update
Existing (2015) Traffic Noise Contours

Path: P:_6044\60440144_MidOld_CPU\900-CAD-GIS\920 GIS\922_Maps\Noise\Midway_Contours_Existing.mxd, 6/22/2017, daniel.arellano

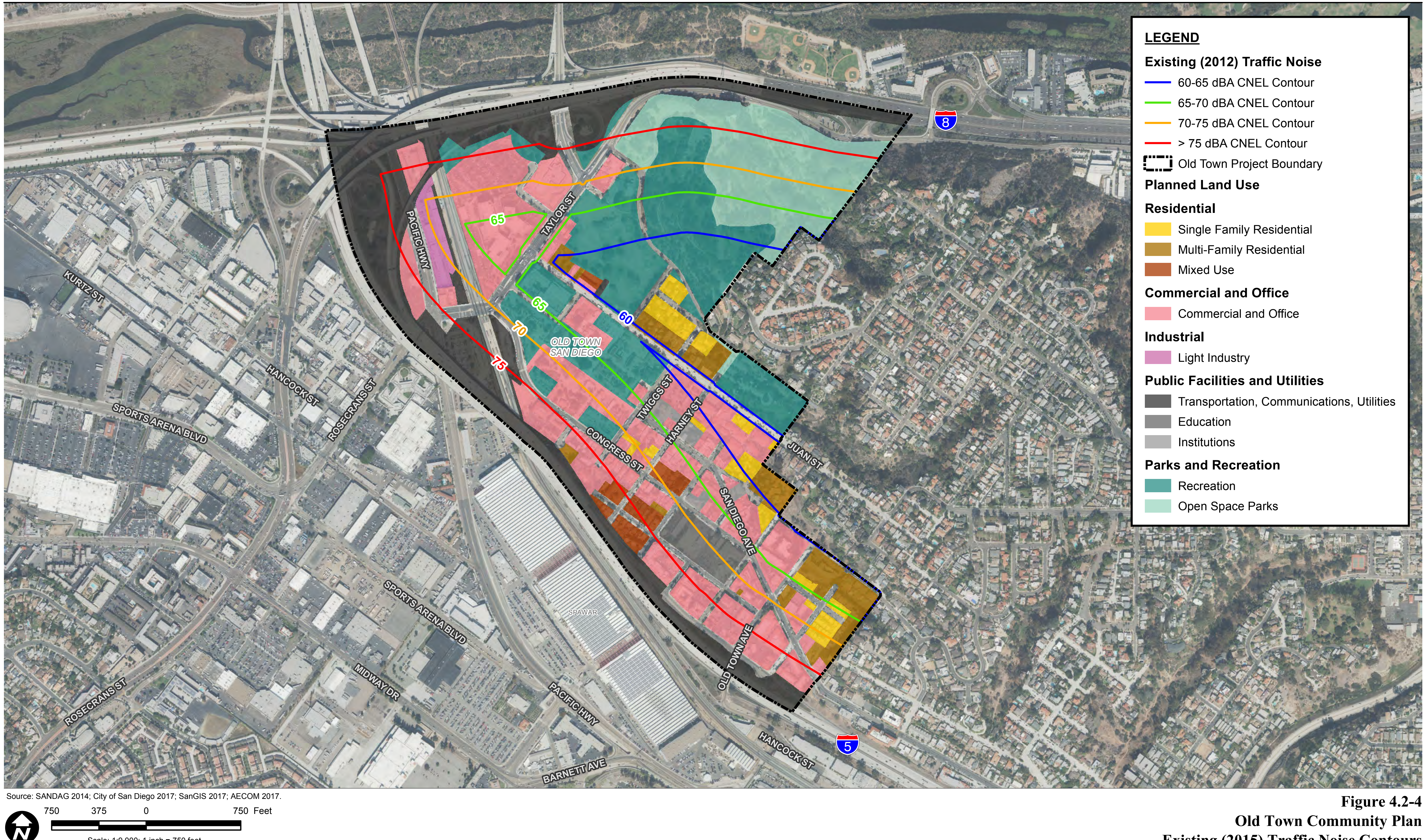


Figure 4.2-4
Old Town Community Plan
Existing (2015) Traffic Noise Contours

Path: P:_6044\60440144_MidOld_CPU\900-CAD-GIS\920 GIS\922_Maps\Noise\OldTown_Contours_Existing.mxd, 6/22/2017, daniel.arellano predicted existing dBA CNEL generated by each roadway identified in the TIS for both CPU areas. As shown in the figure, existing traffic noise levels within the CPU areas are responsible for relatively high CNEL levels when proximal to the interstates and primary roadways. The predicted contour locations displayed in this figure do not consider attenuation that may be provided by topography, existing structures, or expanses of dense vegetation, and are not considered accurate for site-specific assessments. However, these contours can serve as a general guide to determine when (and where) a detailed acoustic analysis should be conducted for a specific project.

4.2.3 Existing Rail Traffic Noise

Railway noise is generated from the rail traffic on the Los Angeles-San Diego-San Luis Obispo (LOSSAN) rail corridor, consisting of freight trains (BNSF), regional and commuter passenger rail (Amtrak and NCTD Coaster), and light rail transit (LRT) (MTS Trolley). Noise associated with these operations includes locomotive engines, wheel-to-rail and switch noise, horn sounding, station approach and disembark bell sounding, emergency signaling devices, and stationary bells associated with the at-grade crossings at Taylor Street, Noell Street, West Washington Street, Sassafras Street, and Palm Street, and the partial at-grade crossing at West Laurel Street where trolley traffic utilizes an above-grade viaduct. The rail corridor generally parallels I-5 through both CPU areas and includes the intermodal Old Town Transit Center in the Old Town CPU area, a passenger rail stop serviced by all passenger and LRT trains. Light rail and passenger rail train movements occur through the Old Town CPU area multiple times per hour between 4 a.m. and 1 a.m. every day. The BNSF also operates freight trains along the corridor daily, typically utilizing the rail during evening and nighttime hours. Rail traffic noise levels greater than or equal to 60 dBA L_{dn} (metric used by the Federal Railroad Administration [FRA]), extend into the Midway-Pacific Highway CPU area from the railroad alignment at a distance of approximately 187 feet, and into the Old Town CPU approximately 230 feet.

4.2.4 Existing Aircraft Noise

4.2.4.1 Midway-Pacific Highway CPU Area

The SDIA is located generally south of the Midway-Pacific Highway CPU area. Flight paths for aircraft approach and departure run largely parallel to the Midway–Pacific Highway CPU area along the Marine Corps Recruitment Depot property line with exception of the southern boundary of the CPU boundary, which is located directly beneath the flight path typically used for aircraft arrival.

The San Diego County Regional Airport Authority has an Airport Noise Mitigation Office and has implemented a number of programs to reduce the aircraft noise impact on the community. Actions include the enforcement of a curfew on departing aircraft and the Quieter Home Program (QHP). The QHP provides sound insulation retrofits for residences located within the 65 dBA CNEL contour with the goal of reducing interior noise levels by at least 5 dBA. Existing residences located within the 65 dBA CNEL contour for SDIA in the Midway-Pacific Highway CPU area are eligible for this program. (Note that eligibility to participate in the program is based on the noise exposure maps prepared under 14 CFR Part 150, which are different than the ALUCP contour maps.) According to the latest program maps on the QHP website, shown in Figure 4.2-5, none of the eligible residences in the Midway-Pacific Highway CPU area have participated in the program. It cannot be determined at the program level whether these eligible existing structures contain adequate attenuation to reduce interior noise to the 45 dBA CNEL standard.

4.2.4.2 Old Town CPU Area

SDIA is located south of the Old Town CPU area. Flight paths for aircraft approach are occluded by terrain; however, aircrafts departing westbound from SDIA can be seen and heard throughout the CPU area.

4.2.5 Existing Stationary Noise

Stationary noise sources in both CPUs are generally characterized by the specific land uses. Existing residential areas experience noise sources from stationary noise sources typical of an urban environment, including HVAC operation from nearby residential and non-residential land uses, landscaping, dogs barking, children playing, and operating entertainment systems with loudspeakers. As noted in the measurement summaries for the Midway-Pacific Highway CPU area, some NSLUs experience noise from mechanic shops and other commercial facility operation.

5. Noise Analysis Methodology

5.1 Surface Transportation

5.1.1 Roadway Traffic

Existing and future traffic noise levels were predicted using the FHWA Traffic Noise Model (TNM) Version 2.5, the most recent version approved by the FHWA at the time of this analysis. This screening-level noise analysis considered the following TNM input parameters: traffic mix, vehicle speed, traffic volume, and roadway-specific paved width. While the model has the capability to account for roadway gradients, and shielding effects from terrain and buildings/barriers, this analysis assumed flat topography throughout the both CPUs and omitted existing structures that may offer additional shielding to NSRs.

Existing (2015) and future (2035) traffic volumes and traffic mixes for both CPU areas were provided in the Midway-Pacific Highway & Old Town Mobility Element Updates Transportation Impact Study (TIS) conducted by Chen Ryan (Chen Ryan 2017). Truck mixes for roadways followed assumptions and data provided in the TIS, which reported a 2% truck mix on local roadways, a 2.8% truck mix on I-8, and a 4.1% truck mix on I-5.

The Caltrans Technical Noise Supplement (Caltrans 2013) was used as guidance for developing CNEL values. This document provides an approach for utilizing basic traffic data, typically in the form of Average Daily Traffic (ADT) and peak-hour volumes, to develop predicted CNEL values. This analysis separated each roadway's ADT volume into daytime, evening, and nighttime periods representative of 80%, 5%, and 15% of the total ADT respectively, and applied CNEL adjustment factors to predicted noise levels. Using an array receivers at varying distances from the edge-of-pavement of each modeled roadway in TNM, CNEL values and pertinent distances were calculated and tabulated to be used in report tables and also for use in figure generation to display isopleths or contour buffers of applicable CNEL values. Appendix B displays detailed traffic information used for modeling all roadway segments, including speed limits, roadway paved widths, existing and future ADTs, and truck traffic mix percentages.

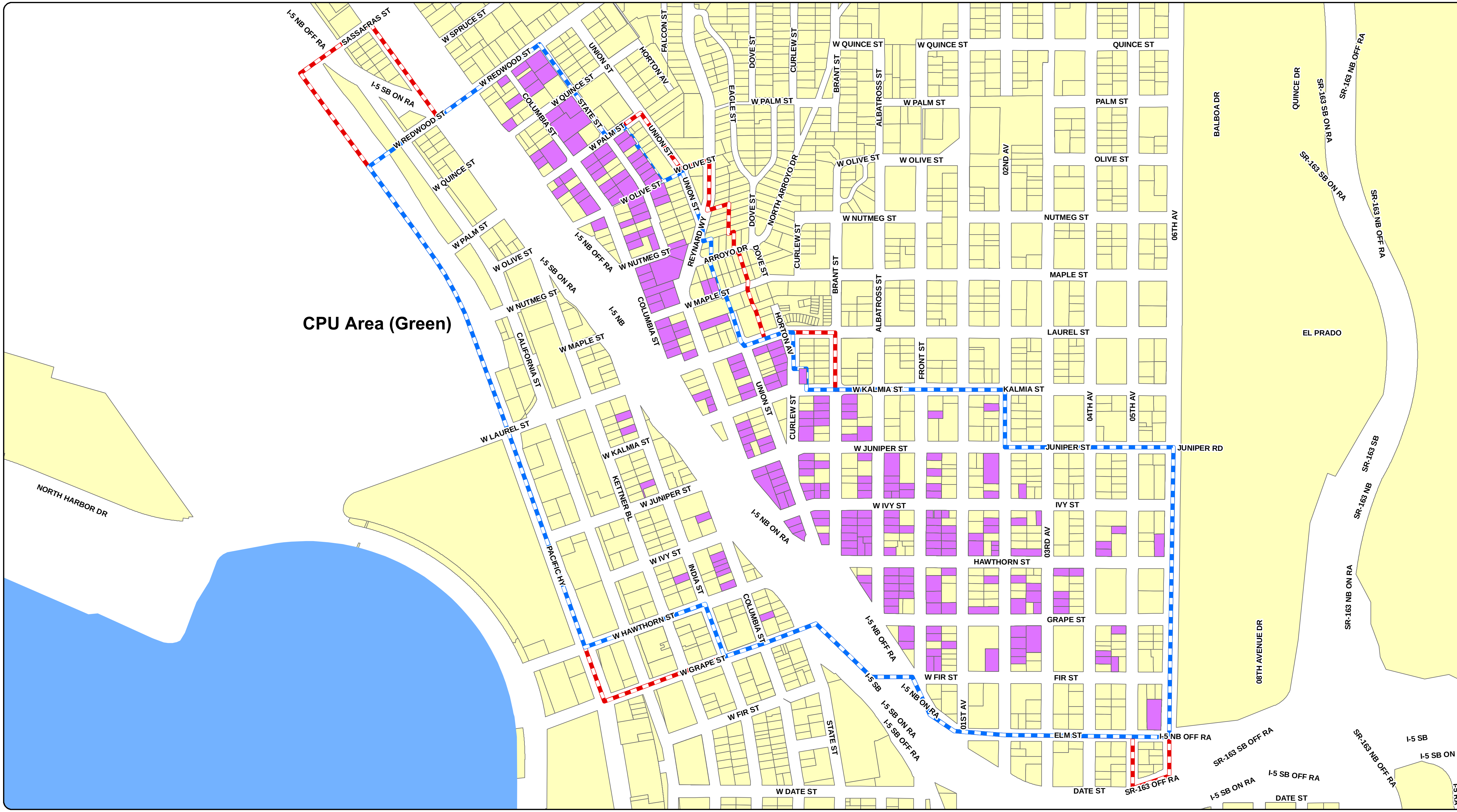
5.1.2 Rail Noise

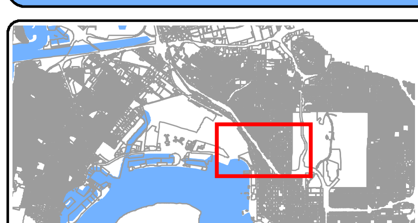
Noise generated by railroad operations was modeled following recommendations in the FTA-recommended Noise Impact Assessment Spreadsheet (Harris Miller Miller & Hanson, Inc. 2007). Input parameters used in this analyses included train type, frequency of pass-bys during daytime (7 a.m. – 10 p.m.) and nighttime (10 p.m. and 7 a.m.) hours, speed of travel, and total number of rail cars. The Noise Impact Assessment Spreadsheet has a calculation output of a day-night noise levels (L_{dn}), although this is calculated differently from CNEL values, L_{dn} values are typically always within 1 dBA of CNEL values, thus, this analysis considers the L_{dn} output of the Impact Assessment Spreadsheet to be analogous to the CNEL values required for land use planning and noise assessment.

Both passenger and freight rail speeds through the Midway-Pacific Highway CPU area were modeled to be traveling at speeds of 25 to 30 miles per hour (mph). Speeds for passenger rail servicers were reduced to 15 mph for the Old Town CPU area rail noise assessment to reflect the slowing and stopping of trains at the Old Town Transit Center, a passenger rail stop serviced by all passenger and LRT trains.

Input parameters for passenger rail speeds as well as daytime/nighttime pass-by frequencies obtained from published SDMTS Trolley, NCTD Coaster, and Amtrak timetables and schedules are shown below in Table 5.1-1.

BNSF freight train schedules are not standardized nor publicly available; However, to support a previous AECOM project noise analysis, BNSF freight data was obtained from an NCTD control point (CP) along the rail corridor from select dates in 2016. This data provides detailed information on the train type, time of pass-by, quantity of loaded and empty cars, as well as other ancillary details not pertinent to noise analyses. Since freight trains do not typically stop at the Old Town Transit Center, freight rail operation speeds were identical for both CPU areas. For purposes of this analysis, this previous raw data was averaged and considered to be a representative estimate of typical weekday operations with the final model input parameters shown in Table 5.1-2 below.





N
W E
S

1 inch = 600 feet

Completed Parcels
Ocean/Bay
Current 67dB Program Boundary
Future 66dB Program Boundary

QUIETER HOME PROGRAM

Figure 4.2-5

San Diego County Regional Airport Authority
Quieter Home Program - East (Area 1)

Map Number: 17

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Table 5.1-1
Passenger Rail Operations Assumptions

		Quantity per Time Frame		Speed (mph)	
Train Service	**Cars Per Train**	**Daytime**	**Nighttime**	**Midway-Pacific Highway CPU Area**	**Old Town CPU Area**
SDMTS Trolley – Green Line	3	96	11	25	15
NCTD Coaster	5	20	2	30	15
Amtrak	8	19	5	30	15
SDMTS Trolley – Blue Line (Service Beginning 2021)	3	208	37	25	15

Sources: SDMTS 2017, NCTD 2017, Amtrak 2017, SANDAG 2014

Table 5.1-2
Passenger Rail Operations assumptions

		Quantity per Time Frame		
Train Service	**Locomotives / Cars**	**Daytime**	**Nighttime**	**Speed (mph)**
BNSF Freight	2 / 59	1	3	30

Additional detail regarding input parameters for the Impact Assessment Spreadsheet are included in Appendix B.

5.2 Aircraft & Airport Noise

The Airport Environs Overlay Zone (AEOZ), defined in Chapter 13, Article 2, Division 3 of the SDMC, provides supplemental regulations for the property surrounding SDIA to ensure that land uses are compatible with the operation of airports by implementing ALUCP. Aircraft noise is evaluated based on the noise contours developed by the San Diego County Regional Airport Authority and provided in the ALUCP for SDIA (San Diego County Regional Airport Authority 2014). The projected aircraft noise contours provided in the ALUCP are based on year 2030 forecasted noise exposure. Aircraft noise contours for 2035 are expected to be identical to those shown in the ALUCP, provided that no major changes occur with respect to aircraft types using SDIA, terminal capacities, or FAA flight paths and patterns

5.3 Municipal Code Compliance

A stationary noise source generally considered “point source”, as the sound it generates emanates from a single location. Sources of stationary noise are specific to given land use types within the CPU areas. The implementation of both CPUs and associated discretionary actions would introduce several new residential land uses that would ultimately be abutting or located within close proximity other residential, commercial, recreational, or institutional land uses which may feature stationary noise sources. Stationary noise sources associated with these land uses would include rooftop or ground-level HVAC units, mechanical equipment, truck delivery and loading operations, and recreational activities. Noise generated from point sources propagates outward in a in all directions, known as spherical divergence. This characteristic results in a reliable attenuation factor of approximately 6 dB for each doubling of distance.

5.4 Construction Noise

Neither of the CPUs propose any specific construction, but construction is expected to occur when proposed future development is initiated. Future development construction would create a temporary increase in ambient noise levels at nearby NSLUs during construction activities, such as site demolition and grading, equipment and material staging, and construction.

5.4.1 FTA General Assessment and Detailed Analysis

Construction noise was modeled using a combination of the FTA "General Assessment" and "Detailed Assessment" to determine potential noise impact distances. The approach used in this study utilized 50-foot reference maximum noise levels (L_{max}) and utilization factors (UF) (presented as a percentage of equipment use in a given hour), from the FHWA's Roadway Construction Noise Model User's Guide (RCNM 2006). Following the guidelines of the General Assessment, the construction noise analysis considers the two loudest pieces of potential construction equipment operating simultaneously. This study assumed that, absent of pile driving activities, that the two loudest pieces of equipment would be a concrete saw and hoe ram; which are both typically used during breaking and major alterations of existing pavement. Per the RCNM database, both of these pieces of construction equipment have a 50 foot reference level of 90 dBA L_{max} and an assumed usage factor of 20%, equating to an hourly L_{eq} of 86 dBA at 50 feet.

5.4.2 Construction and Post-Construction Operations Vibration

Commercial operations have potential to generate groundborne vibration through machinery operation or heavy truck transportation. Although this vibration may be momentary or relatively low in intensity, vibrations determined to be excessive for human exposure in these scenarios are typically regulated and addressed at an occupational health and safety level.

Construction activities can generate groundborne vibration of varying degrees based on the construction activity and equipment being used. Groundborne vibration associated with construction activities would occur temporarily during groundbreaking activities such as pile driving or caisson drilling, demolition, and sub-surface excavation, with pile-driving activities having the highest potential to generate significant groundborne vibration. The Caltrans Transportation and Construction Vibration Guidance Manual (Caltrans 2013) provides an equation for pile-driving vibration level prediction at a receiver location, which is expressed as:

$$PPV\ (in/sec) = PPV_{ref}(\frac{25}{D})^{n}$$

Where:

PPV_{ref} = Reference level of a pile driver

D = Distance of the receiver from the pile driving activity

n = Value related to the vibration attenuation rate through the subject soil type

Vibration levels generated by pile-driving activities for this analysis were predicted using the reference level reported in the FTA Transit Noise and Impact Assessment Manual (FTA 2006) of 1.518 in/sec PPV at 25 feet, and an "n" value reported in the Caltrans Manual of 1.1, representative of hard soil types. This expression provides the means for the assessment of compliance with structural damage thresholds and human receptor annoyance levels at any given receptor distance.

6. Future Noise Environment and Impacts

6.1 Midway-Pacific Highway Community Plan Update

6.1.1 Increase in Ambient Noise

Existing stationary noise sources identified within the CPU area were typical of a developed mixed-use neighborhood, including HVAC units in operation and noise associated with commercial uses such as automotive mechanic shops. Although the Midway-Pacific Highway CPU area proposes the development of land uses which may ultimately generate noise during operations, operational noise levels would be required to comply with the SDMC and General Plan guidelines.

Noise from vehicular traffic is the prominent source of noise in the CPU area and has greater potential to affect existing noise-sensitive receivers if annual average daily traffic volumes increase substantially. The freeways generating the greatest noise levels affecting the Midway-Pacific Highway CPU area are I-5 and I-8. The streets generating the greatest noise levels within the CPU area are Camino Del Rio West, Midway Drive, Sports Arena Boulevard, Rosecrans Street, Pacific Highway, and Laurel Street. Vehicular traffic volumes on roadways in the CPU area would generally increase due to the future development proposed by the Midway-Pacific Highway CPU and associated discretionary actions. Table 6.1-1 summarizes the existing and future traffic noise levels along various roadway segments in the Midway-Pacific Highway CPU area. Roadway noise is reported in this table as the dBA CNEL at 50 feet from the roadway EOP.

Table 6.1-1
Increases in Ambient Noise for the Midway-Pacific Highway CPU Area

Roadway	Roadway Segment		Predicted Ambient Noise Level (dBA, CNEL @ 50 Feet from EOP)		
	From	To	Existing (2015)	Future (2035)	Change in dB
Barnett Avenue	Midway Drive	Pacific Highway	70.8	70.3	-0.5
Camino Del Rio West	Rosecrans Street	I-5/I-8 Ramps	68.1	69.4	1.3
Channel Way	**Sports Arena Boulevard**	**Hancock Street**	51.7	58.1	**6.4**
Charles Lindbergh Parkway	Midway Drive	Sports Arena Boulevard	Fut. Road	56.4	N/A
	Sports Arena Boulevard	Kurtz Street	Fut. Road	57.7	N/A
Dutch Flats Parkway	Barnett Avenue	Midway Drive	Fut. Road	60.3	N/A
	Midway Drive	Sports Arena Boulevard	Fut. Road	58.5	N/A
Frontier Drive	Sports Arena Boulevard	Kurtz Street	Fut. Road	59.8	N/A
Greenwood Street	Sports Arena Boulevard	Kurtz Street	Fut. Road	58.0	N/A
Hancock Street	Sports Arena Boulevard	Kurtz Street	56.8	49.9	-6.9
	Kurtz Street	Camino Del Rio West	58.0	62.9	4.9
	Camino Del Rio West	Rosecrans Street	55.8	59.9	4.1
	Old Town Avenue	Witherby Street	61.1	61.9	0.8
	Witherby Street	Washington Street	54.8	58.7	3.9
Kemper Street	Kenyon Street	Midway Drive	58.5	58.8	0.3
	Midway Drive	Sports Arena Boulevard	58.1	59.1	1.0
	Sports Arena Boulevard	Hancock Street	Fut. Road	58.7	N/A
Kettner Boulevard	Washington Street	Vine Street	68.3	70.0	1.7
	Vine Street	Sassafras Street	67.9	69.6	1.7
	Sassafras Street	Laurel Street	67.2	69.4	2.2
Kurtz Street	Hancock Street	Rosecrans Street	58.4	62.2	3.8
	Rosecrans Street	Pacific Highway	59.2	59.4	0.2

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Table 6.1-1
Increases in Ambient Noise for the Midway-Pacific Highway CPU Area

Roadway	Roadway Segment		Predicted Ambient Noise Level (dBA, CNEL @ 50 Feet from EOP)		
	From	To	Existing (2015)	Future (2035)	Change in dB
Laurel Street	Pacific Highway	Kettner Boulevard	63.4	63.9	0.5
Lytton Street / Barnett Avenue	Rosecrans Street	Midway Drive	66.8	67.2	0.4
Midway Drive	W. Point Loma Boulevard/Sports Arena Boulevard	Kemper Street	65.3	66.0	0.7
	Kemper Street	East Drive	65.3	65.3	0.0
	East Drive	Rosecrans Street	66.7	66.6	-0.1
	Rosecrans Street	Barnett Avenue	66.0	66.8	0.8
Pacific Highway	Sea World Drive	Taylor Street	63.6	65.1	1.5
	Taylor Street	Kurtz Street	65.9	67.5	1.6
	Kurtz Street	Sports Arena Boulevard	67.9	68.4	0.5
	Sports Arena Boulevard	Barnett Avenue	65.3	67.0	1.7
	Barnett Avenue	Washington Street	74.2	73.8	-0.4
	Washington Street	Sassafras Street	63.6	65.9	2.3
	Sassafras Street	Laurel Street	67.2	69.3	2.1
Rosecrans Street	Lytton Street	Midway Drive	67.7	68.4	0.7
	Midway Drive	Sports Arena Boulevard	68.8	68.6	-0.2
	Sports Arena Boulevard	Pacific Highway/Taylor Street	63.6	65.2	1.6
Sports Arena Boulevard	I-8 EB Ramps	W. Point Loma Boulevard/Sports Arena Boulevard	66.7	67.7	1.0
	W. Point Loma Boulevard/Midway Drive	Kemper Street	63.9	64.5	0.6
	Kemper Street	East Drive	64.4	65.7	1.3
	East Drive	Rosecrans Street	66.0	64.2	-1.8
	Rosecrans Street	**Pacific Highway**	56.7	62.8	**6.1**
Sassafras Street	Pacific Highway	Kettner Boulevard	58.7	62.5	3.8
Washington Street	Frontage Rd	Pacific Highway	59.1	60.7	1.6
	Pacific Highway	Hancock Street	59.9	62.4	2.5
Vine Street	**California Street**	**Kettner Boulevard**	41.3	52.5	**11.2**
Freeways					
Interstate 5	I-8	Old Town Avenue	80.9	82.4	1.5
	Old Town Avenue	Washington Avenue	81.6	82.3	0.7
	Washington Avenue	Pacific Highway	80.3	81.1	0.8
	Pacific Highway	Laurel Street	80.3	81.9	1.6

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Table 6.1-1
Increases in Ambient Noise for the Midway-Pacific Highway CPU Area

Roadway	Roadway Segment		Predicted Ambient Noise Level (dBA, CNEL @ 50 Feet from EOP)		
	From	To	Existing (2015)	Future (2035)	Change in dB
Interstate 8	Sports Arena Boulevard	I-5	78.6	79.4	0.8

CNEL = Community Noise Equivalent Level; dBA = A-weighted decibel; EOP = edge of pavement
Bold = 2035 noise level would exceed the established exterior compatibility level for the surrounding land use and noise levels would increase by 3 dB or more, or future noise levels would be below 65 dBA CNEL but ambient noise levels would increase by more than 5 dBA over existing noise levels.

The following street segments in the Midway-Pacific Highway CPU currently generate noise levels lower than 65 dBA CNEL and would remain generating future noise levels lower than 65 dBA CNEL. However, future noise levels would increase by more than 5 dBA over existing ambient noise levels along the following roadway segments:

- Channel Way from Sports Arena Boulevard to Hancock Street
- Sports Arena Boulevard from Rosecrans Street to Pacific Highway
- Vine Street from California Street to Kettner Boulevard

Although these streets on their own may produce traffic noise levels 5 dBA greater than predicted in the existing condition, the ambient noise levels in two of the above roadway segments will be wholly dominated by traffic noise from the nearby freeways. As displayed in Figure 4.2-1, receivers along Channel Way are currently exposed to existing CNEL levels of approximately 66 dBA to greater than 75 dBA due to vehicular traffic on I-8. Although Table 6.1-1 reports a CNEL increase of 6.1 dBA at receivers 50 feet from the Channel Way EOP and a future CNEL value of 58.1 dBA, this future CNEL value is approximately 8–19 dBA less than predicted existing and future noise levels generated by I-8 as shown in the aforementioned figure. Thus, the increase in traffic noise levels contributed by increased traffic on Channel Way would be less than 1 dBA and imperceptible to the human ear. Similarly, the reported segment of Vine Street also experiences a similar scenario, with a reported 11.2 dBA CNEL increase and a predicted future CNEL of 52.5 dBA, yet this area falls within I-5 CNEL contours of 74 to greater than 75 dBA. Thus, the increase in traffic noise levels contributed by increased traffic on Vine Street would also be less than 1 dBA and similarly imperceptible to the human ear.

The increase in ambient noise levels adjacent to the segment of Sports Arena Boulevard would result in the exposure of existing sensitive receptors to a significant increase in ambient noise levels, and impacts would be significant. Possible noise-reduction measures would include retrofitting older structures with acoustically rated window and doors featuring higher STC ratings, which is a measure exterior noise reduction performance.

An existing regulatory framework and review process exists for new development in areas exposed to high levels of ambient noise. Policies in the proposed Midway-Pacific Highway CPU and General Plan related to decibel levels, procedures in the SDMC, and regulations (Title 24) would reduce traffic noise exposure, because they set standards for the siting of sensitive land uses. Site-specific noise analyses demonstrating that the proposed project would not subject sensitive receptors to existing or future noise levels exceeding the noise compatibility guidelines of the City's General Plan would be required as part of the review process for discretionary projects, to the extent practicable. With the implementation of these regulations and procedures, noise impacts applicable to new discretionary projects would be less than significant. However, in the case of ministerial projects, there is no procedure to ensure that exterior noise is adequately attenuated. Therefore, exterior noise impacts attributed to ministerial projects located in areas that exceed the applicable land use and noise compatibility level would be significant and unavoidable. Interior noise impacts for all projects, including ministerial projects, would be less than significant because applicants must demonstrate compliance with the relevant interior noise standards through submission and approval of a Title 24 Compliance Report.

6.1.2 Exposure to Existing and Future Transportation Noise

6.1.2.1 Vehicle Noise

The vehicular traffic from adjacent freeways is the dominant noise source affecting land use compatibility within the Midway-Pacific Highway CPU area. The distances to the 60 dBA, 65 dBA, 70 dBA, and 75 dBA CNEL noise contours attributed to traffic volumes associated with the CPU are shown in Table 6.1-2. Distances to the roadway noise contours are based on an assumed hard, flat site, with no intervening barriers or obstructions. Future year noise contours for the proposed Midway-Pacific Highway CPU area are shown graphically in Figure 6.1-1.

Table 6.1-2
Future Vehicle Traffic Noise CNEL Contour Distances for the Midway-Pacific Highway CPU Area

Roadway	Modeled Roadway Segment		Distance to Predicted dBA CNEL (Approximate Feet from Roadway EOP)			
	From	To	75	70	65	60
Barnett Avenue	Midway Drive	Pacific Highway	<1	55	193	382
Camino Del Rio West	Rosecrans Street	I-5/I-8 Ramps	<1	40	168	392
Channel Way	Sports Arena Boulevard	Hancock Street	<1	<1	<1	21
Charles Lindbergh Parkway	Midway Drive	Sports Arena Boulevard	<1	<1	<1	9
Charles Lindbergh Parkway	Sports Arena Boulevard	Kurtz Street	<1	<1	<1	20
Dutch Flats Parkway	Barnett Avenue	Midway Drive	<1	<1	<1	55
Dutch Flats Parkway	Midway Drive	Sports Arena Boulevard	<1	<1	<1	21
Frontier Drive	Sports Arena Boulevard	Kurtz Street	<1	<1	<1	47
Greenwood Street	Sports Arena Boulevard	Kurtz Street	<1	<1	<1	21
Hancock Street	Sports Arena Boulevard	Kurtz Street	<1	<1	<1	1
Hancock Street	Kurtz Street	Camino Del Rio West	<1	<1	21	102
Hancock Street	Camino Del Rio West	Rosecrans Street	<1	<1	6	49
Hancock Street	Old Town Avenue	Witherby Street	<1	<1	17	83
Hancock Street	Witherby Street	Washington Street	<1	<1	<1	21
Kemper Street	Kenyon Street	Midway Drive	<1	<1	<1	21
Kemper Street	Midway Drive	Sports Arena Boulevard	<1	<1	<1	40
Kemper Street	Sports Arena Boulevard	Hancock Street	<1	<1	<1	21
Kettner Boulevard	Washington Street	Vine Street	6	50	146	234
Kettner Boulevard	Vine Street	Sassafras Street	<1	45	150	255
Kettner Boulevard	Sassafras Street	Laurel Street	<1	43	147	250
Kurtz Street	Hancock Street	Rosecrans Street	<1	<1	20	90
Kurtz Street	Rosecrans Street	Pacific Highway	<1	<1	<1	42
Laurel Street	Pacific Highway	Kettner Boulevard	<1	<1	40	134
Lytton Street / Barnett Avenue	Rosecrans Street	Midway Drive	<1	14	96	262
Midway Drive	W. Point Loma Boulevard/Sports Arena Boulevard	Kemper Street	<1	7	68	202
Midway Drive	Kemper Street	East Drive	<1	2	55	180
Midway Drive	East Drive	Rosecrans Street	<1	12	80	215
Midway Drive	Rosecrans Street	Barnett Avenue	<1	13	85	222
Pacific Highway	Sea World Drive	Taylor Street	<1	<1	52	180
Pacific Highway	Taylor Street	Kurtz Street	<1	16	106	281
Pacific Highway	Kurtz Street	Sports Arena Boulevard	<1	21	132	317
Pacific Highway	Sports Arena Boulevard	Barnett Avenue	<1	10	93	265
Pacific Highway	Barnett Avenue	Washington Street	21	147	369	561
Pacific Highway	Washington Street	Sassafras Street	<1	11	64	161
Pacific Highway	Sassafras Street	Laurel Street	<1	40	161	375
Rosecrans Street	Lytton Street	Midway Drive	<1	20	135	354
Rosecrans Street	Midway Drive	Sports Arena Boulevard	<1	21	141	365

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Table 6.1-2
Future Vehicle Traffic Noise CNEL Contour Distances for the Midway-Pacific Highway CPU Area

Roadway	Modeled Roadway Segment		Distance to Predicted dBA CNEL (Approximate Feet from Roadway EOP)			
	From	To	75	70	65	60
Rosecrans Street	Sports Arena Boulevard	Pacific Highway/Taylor Street	<1	1	53	186
Sports Arena Boulevard	I-8 EB Ramps	W. Point Loma Boulevard/Sports Arena Boulevard	<1	18	108	277
Sports Arena Boulevard	W. Point Loma Boulevard/Midway Drive	Kemper Street	<1	<1	42	168
Sports Arena Boulevard	Kemper Street	East Drive	<1	<1	62	208
Sports Arena Boulevard	East Drive	Rosecrans Street	<1	<1	40	153
Sports Arena Boulevard	Rosecrans Street	Pacific Highway	<1	<1	20	105
Sassafras Street	Pacific Highway	Kettner Boulevard	<1	<1	20	98
Washington Street	Frontage Rd	Pacific Highway	<1	<1	5	62
Washington Street	Pacific Highway	Hancock Street	<1	<1	18	98
Vine Street	California Street	Kettner Boulevard	<1	<1	<1	<1
Freeways						
Interstate 5	I-8	Old Town Avenue	333	629	891	1242
Interstate 5	Old Town Avenue	Washington Avenue	322	600	853	1192
Interstate 5	Washington Avenue	Pacific Highway	255	545	785	1100
Interstate 5	Pacific Highway	Laurel Street	306	603	865	1208
Interstate 8	Sports Arena Boulevard	I-5	181	450	695	971

At any specific NSR location, the measured existing noise levels would depend upon not only the current source noise level, but also the nature of the path of sound from the source to the NSR. In many cases, structures, ground topography, and other obstacles occlude the direct line of sight from NSR to the traffic noise sources, which could significantly reduce noise exposure at discrete receptor locations.

As shown in Figure 6.1-1, future traffic noise levels with the proposed Midway-Pacific Highway CPU at existing and proposed residential use areas would, in cases of residences close to the freeways and major roadways, exceed the General Plan Noise Element conditionally compatible thresholds for residential land uses (65 dBA CNEL for single-family and conditionally up to 75 dBA CNEL for multi-family and mixed-use developments that meet the requirements of Section B of the Noise Element). Noise levels greater than 75 dBA CNEL are considered incompatible for all land use types. Land uses located adjacent to I-5 and I-8 in the Midway-Pacific Highway CPU area have the potential to be exposed to noise levels greater than 75 dBA CNEL. Broader mitigation, such as noise walls adjacent to freeways and roadways, can reduce exterior noise to levels compliant with General Plan Noise Element guidelines.

In the Midway-Pacific Highway CPU area, future noise levels for all land uses would be incompatible (i.e., greater than 75 dBA CNEL) at areas located within approximately 255 to 333 feet from I-5 EOP and 181 feet from I-8 EOP. Noise levels for sensitive land uses would be incompatible (i.e., greater than 70 dBA CNEL) at areas located within approximately 545 to 629 feet from I-5 and 450 feet from I-8. These areas are currently developed; however, the proposed Midway-Pacific Highway CPU and associated discretionary actions would result in changes to the land use in these areas, including the introduction of new sensitive land uses. The development of new noise-sensitive land uses as a result of the proposed in the Midway–Pacific Highway CPU may subject receptors to noise levels that exceed General Plan guidelines. Proposed development projects within these areas, such as those located in the immediate vicinity of the freeways within the Channel District, Sports Arena Community Village, Camino Del Rio District, Kurtz District, Hancock Transit Corridor, and the Kettner District, all have potential to experience CNEL levels greater than 75 dBA. Per Section B of the General Plan Noise Element, any future residential use in areas above 70 dBA CNEL must include noise attenuation measures to ensure interior levels of 45 dBA CNEL and be located in an area where a community plan allows multi-family and mixed-use residential uses.

Policies in the proposed Midway-Pacific Highway CPU, General Plan, and Title 24 would reduce traffic noise exposure because they set standards for the siting of NSLUs. General Plan policy NE-A.4 requires an acoustical study consistent with Acoustical Study Guidelines for proposed developments in areas where the existing or future noise level exceeds or would exceed the “compatible” noise level thresholds. Site-specific exterior noise analyses that demonstrate that the project would not place sensitive receptors in locations where the exterior existing or future noise levels would exceed the noise compatibility guidelines of the General Plan would be required as part of future discretionary proposals. Site-specific interior noise analyses demonstrating compliance with the interior noise compatibility guidelines of the General Plan would also be required for land uses located in areas where exterior noise levels exceed the noise and land use compatibility thresholds as defined in the General Plan. This requirement is implemented through submission of a Title 24 Compliance Report to demonstrate that the building envelope acoustic performance results in interior noise levels of 45 dBA CNEL or less. With this framework, exterior traffic noise impacts associated with new development requiring discretionary approvals and interior traffic noise impacts for both ministerial and discretionary projects would be less than significant.

However, in the case of exterior noise impacts associated with ministerial projects, there are no policies or standards ensuring that exterior noise is adequately attenuated to compatible levels. Therefore, exterior noise impacts for ministerial projects located in areas where the applicable land use and noise compatibility level is exceeded would be significant and unavoidable.

6.1.2.2 Rail Noise

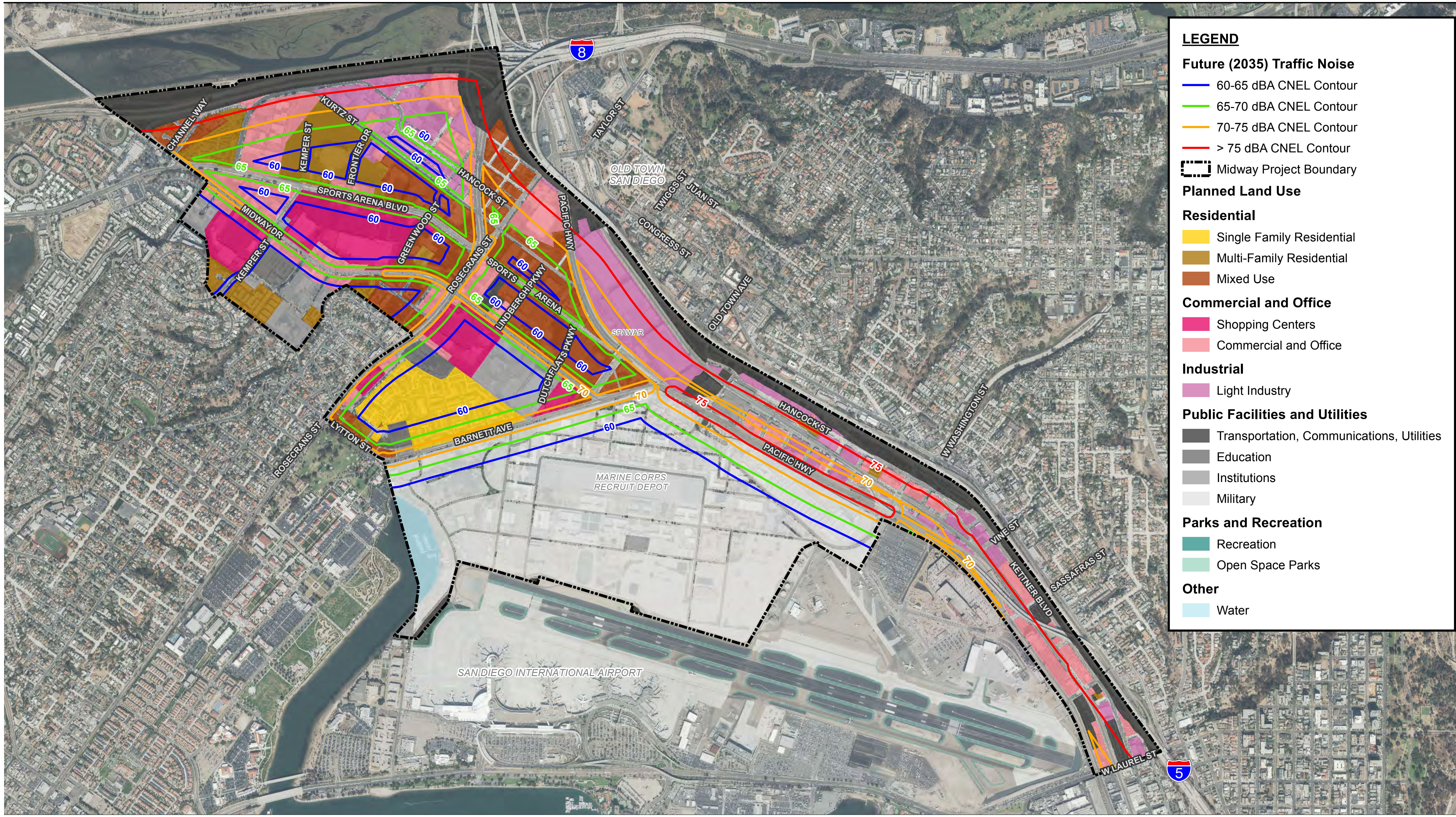
Railway noise is generated from the rail traffic on LOSSAN rail corridor, consisting of freight trains (BNSF), regional and commuter rail (Amtrak and NCTD Coaster), and LRT (MTS Trolley). LRT and passenger rail train movements occur through the Midway-Pacific Highway CPU area multiple times per hour between 4 a.m. and 1 a.m. every day. BNSF also operates freight trains along the corridor daily, but typically in the evening and nighttime hours. Modeling results are shown in Table 6.1-3. Noise contour distances were calculated assuming flat-site conditions and no intervening buildings that would provide noise attenuation, which would represent a conservative, worst-case analysis.

Detailed FTA model runs showing modeled input parameters are included in Appendix C.

Table 6.1-3
Existing Predicted Railway Noise Levels

Source	Distance of Predicted 60 dBA (L_{dn}) Noise Levels from Rail Center Alignment
MTS Trolley	38 feet
Amtrak Passenger Rail	82 feet
Coaster Passenger Rail	57 feet
Freight Rail	105 feet
Aggregate of Rail Sources	182 feet

The San Diego Association of Governments is currently constructing the infrastructure to facilitate the planned 2021 start-date of the Mid-Coast Corridor Transit Project. This project will result in additional MTS Trolley service along the existing LRT corridor within the Midway–Pacific Highway CPU area. This additional service will introduce an additional 128 LRT events per day (SANDAG 2014). As shown in Table 6.1-4, the aggregate operation of existing rail uses and the anticipated Mid-Coast Corridor Transit Project Blue Line trolley will generate 60 dBA L_{dn} approximately 15 feet farther into the study area. No future change in service is expected to occur for other rail uses along the corridor.



Source: SANDAG 2014; City of San Diego 2017; SanGIS 2017; AECOM 2017.

1,500 750 0 1,500 Feet

Scale: 1:18,000; 1 inch = 1,500 feet

Figure 6.1-1
Midway-Pacific Highway Community Plan Update
Future (2035) Traffic Noise Contours

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Table 6.1-4 Future Predicted Railway Noise Levels	
Source	**Distance of Predicted 60 dBA (L_{dn}) Noise Levels from Rail Center Alignment**
MTS Trolley	64 feet
Amtrak Passenger Rail	82 feet
Coaster Passenger Rail	57 feet
Freight Rail	105 feet
Aggregate of Rail Sources	197 feet

The nearest sensitive land uses are located on both sides of the railroad alignment, with some residential receivers abutting the railroad right-of-way at distances as close as 12 feet from the nearest track. Although these receivers are in proximity to railroad operations, Figures 4.2-3 and 6.1-1 show that both existing and future vehicular traffic noise from Pacific Highway and I-5 produce CNEL noise levels from 70 to 75 dBA, which far-exceed the CNEL contribution from railroad operations. Therefore, noise level impacts resulting from trolley and train operations would be less than significant.

6.1.3 ALUCP Consistency

Aircraft noise is evaluated based on the noise contours developed by the San Diego County Regional Airport Authority and provided in the ALUCP for SDIA (2014). The aircraft noise contours are based on year 2030 forecast noise exposure. As depicted in Figure 6.1-2, the Midway-Pacific Highway CPU area immediately abuts a large portion of the SDIA boundary and experiences levels ranging from 60 to greater than 75 dBA CNEL. Existing residential uses are primarily located within the northwestern portion of the Midway-Pacific Highway CPU area, with sparse single-family and multi-family residences in the southeastern vicinity, the majority of these residences have the potential to be exposed to aircraft levels exceeding 60 dB CNEL. Proposed residential and mixed-use development is also planned within these contour zones. The ALUCP conditionally allows future residential uses in areas above the 65 dBA CNEL in locations where community plans have allowed residential. These future residential developments would include noise attenuation consistent with the Noise Element of the General Plan and the ALUCP for SDIA.

Per the City Significance Determination Thresholds, if a future project implemented under the proposed Midway-Pacific Highway CPU and associated discretionary actions is proposed within the 60 dBA CNEL contour (as shown in Figure 6.1-2), the potential exterior noise impacts from aircraft noise would not constitute a significant environmental impact. However, interior noise impacts would be regulated by the requirement for residential development within the 60 dBA CNEL and greater to reduce interior noise levels attributed to airport noise to 45 dBA CNEL. The City currently submits both discretionary and ministerial projects that increase residential units and non-residential floor area for new land use development to the ALUC to obtain a consistency determination from the ALUCP. Interior noise levels for new construction are also addressed through implementation of General Plan policies NE-I.1 and NE-I.2, which include Title 24 of the CCR, which requires submission of a Title 24 Compliance Report to demonstrate interior noise levels of 45 dBA CNEL when NSLUs are proposed in an area experiencing predicted to be exposed to CNEL levels within the 65 dBA CNEL contour, or, if CNEL contours are unavailable, areas exposed to 1-hour L_{eq} levels of 65 dBA or greater. With this framework, airport noise impacts to new development would be less than significant.

6.1.4 Municipal Code Compliance

Proposed mixed-use areas would contain residential, commercial, and industrially permitted developments. Where residential uses are located in proximity to commercial or industrial sites, NSRs are likely to be exposed to additional noise aside from traffic noise contributions found throughout the CPU area. These NSRs could be exposed to noise due to operations traffic, truck idling, loading and unloading operations, mechanical equipment such as HVAC units and air handlers, trash-hauling activities, and customer/employee use of commercial facilities.

While noise-sensitive residential land uses would be exposed to noise associated with the operation of commercial uses, policies are in place to control noise and reduce noise impacts between various land uses. Noise policies, as contained in the General Plan Noise Element, the proposed Midway-Pacific Highway CPU, and regulations in the

Noise Ordinance are in place to control and reduce noise levels between various land uses to levels below impact thresholds for specific land use types. These include the requirement for noise studies for new developments, limits on hours of operation for various noise-generating activities, and standards for the compatibility of land use types. In addition, enforcement of the federal, state, and local noise regulations would control impacts. Given implementation of these policies and enforcement of the Noise Abatement and Control Ordinance of the SDMC, impacts would be less than significant.

6.1.5 Construction Noise and Vibration

Although no specific construction or development is proposed under the proposed Midway-Pacific Highway CPU and associated discretionary actions at this time, construction noise impacts could occur as future development occurs. Due to the highly-developed nature of land uses within Midway-Pacific Highway CPU area, there is a high likelihood that construction activities would take place adjacent to NSLUs.

Hourly average noise levels would vary depending on the duration of equipment operation, type of equipment, relative location of the construction equipment to the noise-sensitive receptor, and presence of intervening barriers. As detailed in Section 5.4.1, construction equipment predictions followed the FTA assessment techniques focusing on predicting noise emissions from the two loudest potential pieces of construction equipment from a given construction phase, which would result in a maximum hourly L_{eq} of 83.7 dBA at 50 feet from the source. This level would attenuate to an hourly L_{eq} of 75 dBA at approximately 177 feet from the source. The City Noise Ordinance assesses construction noise using a 12-hour L_{eq} metric, thus, if the construction equipment used in the prediction above were operating for the 12-hour maximum allowable construction time period (7 a.m. to 7 p.m.), NSLUs at distances of less than 177 feet would experience a significant impact.

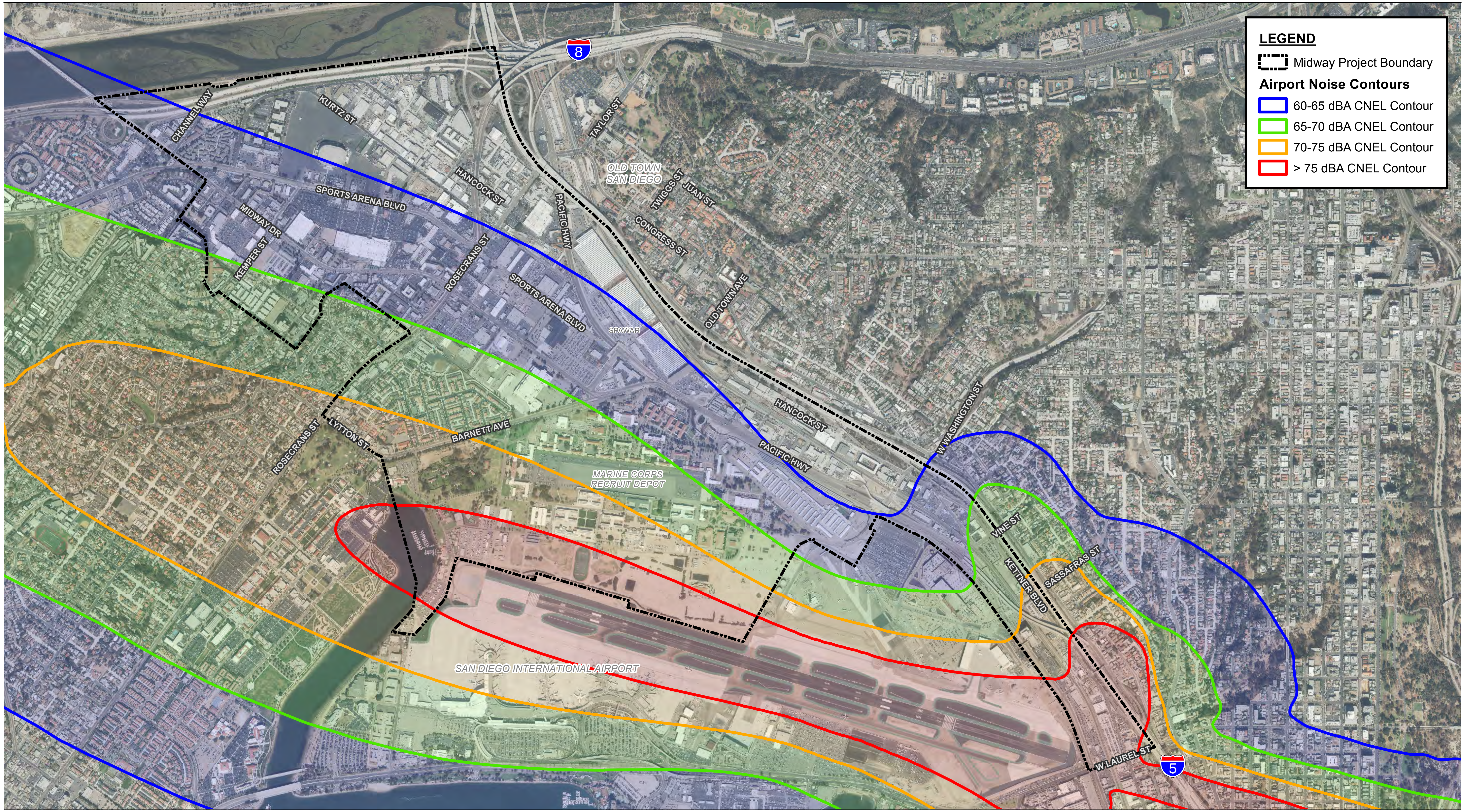
It should be noted that 12-hours of continuous construction activities are not typical, and that any reduction in daily construction duration of the analyzed equipment operation (e.g. an 8-hour work period) may drastically reduce the 12-hour L_{eq} average, and thus, reduce the distance at which NSLUs would experience noise impacts.

The City regulates noise associated with construction equipment and activities through the Noise Abatement and Control article within the SDMC. The City also imposes conditions of approval for building and grading permits related to noise. However, there is also a procedure in place that allows for a permit to deviate from the noise ordinance. Due to the highly developed nature of the Midway-Pacific Highway CPU area with sensitive receivers potentially located in proximity to construction sites, there is a potential for construction of future projects to expose existing residences to significant noise levels.

Construction activities can generate groundborne vibration of varying degrees based on the construction activity and equipment being used. Groundborne vibration and noise associated with construction activities would only occur temporarily during groundbreaking activities such as demolition, pile driving or caisson drilling, and excavation for underground levels, and vibratory pile driving could be used to stabilize the walls of excavated areas. However, non-pile driving or foundation work construction phases that have the highest potential of producing vibration would be intermittent and only occur for short periods of time. The Caltrans Transportation and Construction Vibration Guidance Manual (Caltrans 2013) identifies potential vibration damage thresholds for various structure types and human receptors as measured by PPV, in inches per second. Although non-pile driving activities may be slightly perceptible, these activities would not be capable of exceeding structural damage thresholds or “strongly perceptible” thresholds outlined in Section 3.1.3. By use of administrative controls, such as scheduling vibration-intensive construction activities to hours with the least potential to affect nearby sensitive receptors, perceptible vibration can be kept to a minimum and, as such, would result in a less than significant impact with respect to mere perception.

Pile driving has the potential to generate the highest groundborne vibration levels and is the primary concern for vibratory impacts on structures and human receptors. As discussed in Section 3.1.3, pile driving or other intermittent or continuous vibratory construction potential damage thresholds range from 0.25 PPV in/sec for historic and certain older buildings, to 0.5 PPV in/sec for modern industrial/commercial buildings, with human receptors experience “strongly perceptible” vibration at 0.1 PPV in/sec. Table 6.1-5 shows maximum distances within which potential structure-specific damage or receiver annoyance may occur.

Detailed vibration distance calculations are included in Appendix C.



Source: SANDAG 2014; City of San Diego 2017; SanGIS 2017; AECOM 2017.

1,500 750 0 1,500 Feet

Scale: 1:18,000; 1 inch = 1,500 feet

Figure 6.1-2
Midway-Pacific Highway Community Plan Update
ALUCP Forecasted Airport Noise Exposure Contours

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Table 6.1-5 Vibration Source Levels for Construction Equipment and Applicable Criteria		
Structure Type	Maximum Distance (feet) for Potential Structural Damage	Maximum Distance (feet) for "Strongly Perceptible" Human Response
Historic and some old buildings	129	300
Older residential structures	109	300
New residential structures	69	300
Modern industrial and commercial buildings	69	300

Although the mere perception of vibration is not considered a discrete impact threshold, the 300 foot perception distance above highlights potential for responses of annoyance by persons located within this distance to pile driving activities. Pile driving within the structure-specific distances listed above has the potential to result in structural damage. The construction of future land uses as a result of the implementation of the proposed Midway-Pacific Highway CPU and associated discretionary actions would have the potential to result in a significant impact related to vibration associated with construction.

6.1.6 Vibration from Operations

Commercial and industrial operations often utilize equipment or conduct processes which may generate vibration to land uses in close proximity to the source. Vibrations generated by such operations are generally regulated from an occupational health and safety perspective, the effect of which would reduce the exposure of employees to excessive vibration and as a result, also reduce the exposure of abutting land uses. Vibrations from operations typically of low amplitude and attenuate sharply as they traverse through the surrounding soil. The proposed land uses within the Midway-Pacific Highway CPU and associated discretionary actions includes retail facilities, restaurants, and office spaces that would not require heavy mechanical equipment or heavy truck deliveries, both of which could generate atypical levels of vibration. Additional proposed land uses, such as residential developments and civic uses do not typically generate any notable vibration. Thus, operational vibration impacts associated with proposed Midway-Pacific Highway CPU and associated discretionary actions implementation would be less than significant.

6.2 Old Town Community Plan Update

6.2.1 Increase in Ambient Noise

Existing stationary noise sources identified within the Old Town CPU area were typical of a developed mixed-use neighborhood, including HVAC units in operation and noise associated with commercial uses such as golf course sprinkler systems. Although the Old Town CPU area proposes the development of land uses that may ultimately generate noise during operations, operational noise levels would be required to comply with the SDMC and General Plan guidelines.

Noise from vehicular traffic is the prominent source of noise in the CPU area and has greater potential to affect existing noise-sensitive receivers if annual average daily traffic volumes increase substantially. The freeways generating the greatest noise levels affecting the Old Town CPU area are I-5 and I-8. The streets generating the greatest noise levels within the CPU area are Taylor Street, Old Town Avenue, and San Diego Avenue. Vehicular traffic volumes on roadways in the CPU area would generally increase due to the future development proposed by the Old Town CPU and associated discretionary actions. Table 6.2-1 summarizes the existing and future traffic noise levels along various roadway segments in the Old Town CPU area. Roadway noise is reported in this table as the dBA CNEL at 50 feet from the roadway EOP.

Table 6.2-1
Increases in Ambient Noise for the Old Town CPU Area

Roadway	Roadway Segment		Predicted Ambient Noise Level (dBA, CNEL @ 50 Feet from EOP)		
	From	To	Existing (2015)	Future (2035)	Change in dB
Congress Street	Taylor Street	Twiggs Street	56	58	2
	Twiggs Street	Harney Street	56	58	2
	Harney Street	San Diego Avenue/ Ampudia Street	56	58	2
San Diego Avenue	Twiggs Street	Harney Street	54	56	2
	Harney Street / Conde Street	Ampudia Street / Arista	56	56	0
	Ampudia Street	Old Town Avenue	60	60	1
	Old Town Avenue	Hortensia Street	57	58	1
Juan Street	Taylor Street	Twiggs Street	59	60	1
	Twiggs Street	Harney Street	58	60	2
	Harney Street	San Juan Rd	56	57	2
Taylor Street	Pacific Hwy/ Rosecrans Street	Congress Street	65	66	2
	Congress Street	Juan Street	63	65	2
	Juan Street	Morena Boulevard	64	66	2
	Morena Boulevard	I-8 EB Ramps	65	66	1
Twiggs Street	Congress Street	San Diego Avenue	53	54	1
	San Diego Avenue	Juan Street	54	56	2
Harney Street	Congress Street	San Diego Avenue	53	53	0
	San Diego Avenue	Juan Street	54	55	1
Pacific Highway	Sea World Drive	Taylor Street	64	65	1
	Taylor Street	Kurtz Street	66	68	2
Old Town Avenue	Hancock Street	Moore Street	61	61	0
	Moore Street	San Diego Avenue	58	58	0
Freeways					
Interstate 8	I-5	Morena Boulevard	80	81	1
	Morena Boulevard	Hotel Circle	81	82	1
Interstate 5	I-8	Old Town Avenue	81	82	2
	Old Town Avenue	Washington Avenue	82	82	1

CNEL = Community Noise Equivalent Level; dBA = A-weighted decibel; EOP = edge of pavement

As shown in Table 6.2-1, no roadway segments that are generating existing noise levels greater than 65 dBA CNEL are predicted to generate an increase in noise levels greater than 3 dBA in the future condition. Additionally, no roadway segments currently generate noise levels lower than 65 dBA CNEL that are predicted to increase in by more than 5 dBA over existing ambient noise levels, thus, ambient noise level increases at existing NSLUs would be less than significant.

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An existing regulatory framework and review process exists for new development in areas exposed to high levels of ambient noise. Policies in the proposed Old Town CPU and General Plan related to decibel levels, procedures in the SDMC, and regulations (Title 24) would reduce traffic noise exposure, because they set standards for the siting of sensitive land uses. Site-specific noise analyses demonstrating that the proposed project would not subject sensitive receptors to existing or future noise levels exceeding the noise compatibility guidelines of the City's General Plan would be required as part of the review process for discretionary projects, to the extent practicable. With the implementation of these regulations and procedures, noise impacts applicable to new discretionary projects would be less than significant. However, in the case of ministerial projects, there is no procedure to ensure that exterior noise is adequately attenuated. Therefore, exterior noise impacts attributed to ministerial projects located in areas that exceed the applicable land use and noise compatibility level would be significant and unavoidable. Interior noise impacts for all projects, including ministerial projects, would be less than significant because applicants must demonstrate compliance with the relevant interior noise standards through submission and approval of a Title 24 Compliance Report.

6.2.2 Exposure to Existing and Future Transportation Noise

6.2.2.1 Vehicle Noise

The vehicular traffic from adjacent freeways is the dominant noise source affecting land use compatibility within the Old Town CPU area. The distances to the 60 dBA, 65 dBA, 70 dBA, and 75 dBA CNEL noise contours attributed to traffic volumes associated with the CPU are shown in Table 6.2-2. Distances to the roadway noise contours are based on an assumed hard, flat site, with no intervening barriers or obstructions. Future year noise contours for the proposed Old Town CPU area are shown graphically in Figure 6.2-1.

Table 6.2-2
Future Vehicle Traffic Noise CNEL Contour Distances for the Old Town CPU Area

Roadway	Modeled Roadway Segment		Distance to Predicted dBA CNEL (Approximate Feet from Roadway EOP)			
	From	To	75	70	65	60
Congress Street	Taylor Street	Twiggs Street	<1	<1	<1	21
Congress Street	Twiggs Street	Harney Street	<1	<1	<1	20
Congress Street	Harney Street	San Diego Avenue/ Ampudia Streets	<1	<1	<1	20
San Diego Avenue	Twiggs Street	Harney Street	<1	<1	<1	10
San Diego Avenue	Harney Street/Conde Street	Ampudia Street / Arista	<1	<1	<1	13
San Diego Avenue	Ampudia Street	Old Town Avenue	<1	<1	8	56
San Diego Avenue	Old Town Avenue	Hortensia Street	<1	<1	<1	21
Juan Street	Taylor Street	Twiggs Street	<1	<1	5	47
Juan Street	Twiggs Street	Harney Street	<1	<1	4	44
Juan Street	Harney Street	San Juan Road	<1	<1	<1	20
Taylor Street	Pacific Highway/ Rosecrans Street	Congress Street	<1	4	79	237
Taylor Street	Congress Street	Juan Street	<1	1	52	182
Taylor Street	Juan Street	Morena Blvd	<1	2	67	212
Taylor Street	Morena Blvd	I-8 EB Ramps	<1	13	56	109
Twiggs Street	Congress Street	San Diego Avenue	<1	<1	<1	3
Twiggs Street	San Diego Avenue	Juan Street	<1	<1	<1	14
Harney Street	Congress Street	San Diego Avenue	<1	<1	<1	<1
Harney Street	San Diego Avenue	Juan Street	<1	<1	<1	7
Pacific Highway	Sea World Drive	Taylor Street	<1	<1	52	180
Pacific Highway	Taylor Street	Kurtz Street	<1	16	106	281
Old Town Avenue	Hancock Street	Moore Street	<1	<1	13	60
Old Town Avenue	Moore Street	San Diego Avenue	<1	<1	<1	21
Freeways						
Interstate 8	I-5	Morena Blvd	256	545	785	1094
Interstate 8	Morena Blvd	Hotel Circle	297	579	824	1154
Interstate 5	I-8	Old Town Avenue	333	629	891	1242
Interstate 5	Old Town Avenue	Washington Avenue	322	600	853	1192

At any specific NSR location, the measured existing noise levels would depend upon not only the current source noise level, but also the nature of the path of sound from the source to the NSR. In many cases, structures, ground topography, and other obstacles occlude the direct line of sight from NSRs to the traffic noise sources, which could significantly reduce noise exposure at discrete receptor locations.

As shown in Figure 6.2-1, future traffic noise levels with the proposed Old Town CPU at existing and proposed residential use areas would, in cases of residences close to the freeways and major roadways, exceed the General Plan Noise Element conditionally compatible thresholds for residential land uses (65 dBA CNEL for single-family and conditionally up to 75 dBA CNEL for multi-family and mixed-use developments that meet the requirements of Section B of the Noise Element). Noise levels greater than 75 dBA CNEL are considered incompatible for all land use types. Land uses located adjacent to I-5 and I-8 in the Old Town CPU area have the potential to be exposed to noise levels greater than 75 dBA CNEL. Broader mitigation, such as noise walls adjacent to freeways and roadways, can reduce exterior noise to levels compliant with General Plan Noise Element guidelines.

In the Old Town CPU area, future noise levels for all land uses would be incompatible (i.e., greater than 75 dBA CNEL) at areas located within 322 to 333 feet from I-5 EOP and 256 to 297 feet from I-8 EOP. Noise levels for sensitive land uses would be incompatible (i.e., greater than 70 dBA CNEL) at areas located within approximately 600 to 629 feet from I-5 and 545 to 579 feet from I-8. These areas are currently developed; however, the proposed Old Town CPU and associated discretionary actions would result in changes to the land use in these areas, including the introduction of new sensitive land uses. The development of new noise-sensitive land uses as a result of the proposed in the Old Town CPU may subject receptors to noise levels that exceed General Plan guidelines. Proposed development projects within these areas, such as those located in the immediate vicinity of the freeways within the Hortensia, Taylor, and Residential Sub-Districts, all have potential to experience CNEL levels greater than 75 dBA. Per Section B of the General Plan Noise Element, any future residential use in areas above 70 dBA CNEL must include noise attenuation measures to ensure interior levels of 45 dBA CNEL and be located in an area where a community plan allows multi-family and mixed-use residential uses.

Policies in the proposed Old Town CPU, General Plan, and Title 24 would reduce traffic noise exposure because they set standards for the siting of NSLUs. General Plan policy NE-A.4 requires an acoustical study consistent with Acoustical Study Guidelines for proposed developments in areas where the existing or future noise level exceeds or would exceed the “compatible” noise level thresholds. Site-specific exterior noise analyses that demonstrate that the project would not place sensitive receptors in locations where the exterior existing or future noise levels would exceed the noise compatibility guidelines of the General Plan would be required as part of future discretionary proposals. Site-specific interior noise analyses demonstrating compliance with the interior noise compatibility guidelines of the General Plan would also be required for land uses located in areas where exterior noise levels exceed the noise and land use compatibility thresholds as defined in the General Plan. This requirement is implemented through submission of a Title 24 Compliance Report to demonstrate that the building envelope acoustic performance results in interior noise levels of 45 dBA CNEL or less. With this framework, exterior traffic noise impacts associated with new development requiring discretionary approvals and interior traffic noise impacts for both ministerial and discretionary projects would be less than significant.

However, in the case of exterior noise impacts associated with ministerial projects, there are no policies or standards ensuring that exterior noise is adequately attenuated to compatible levels. Therefore, exterior noise impacts for ministerial projects located in areas where the applicable land use and noise compatibility level is exceeded would be significant and unavoidable.

6.2.2.2 Rail Noise

Railway noise is generated from the rail traffic on LOSSAN rail corridor, consisting of freight trains (BNSF), regional and commuter rail (Amtrak and NCTD Coaster), and LRT (MTS Trolley). LRT and passenger rail train movements occur through the Midway-Pacific Highway CPU area multiple times per hour between 4 a.m. and 1 a.m. every day. BNSF also operates freight trains along the corridor daily, but typically in the evening and nighttime hours. As discussed in the Section 5.1.2, passenger rail vehicles were modeled at a slower operating speed within the Old Town CPU area to represent the slowing and stopping of passenger trains at the Old Town Transit Center. The result of slowing train speeds for diesel locomotives (Amtrak and Coaster) results in higher noise levels propagating into the

Figure 6.2-1
Old Town Community Plan
Future (2035) Traffic Noise Contours

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surrounding community since the primary noise source associated with these operations, the diesel locomotive, is gradually passing sensitive receivers. The primary noise source associated with trolley operations, absent of diesel locomotive power, emanates from the wheel-to-rail interaction. Noise generated by this interaction typically increases with speed, thus, the noise levels generated when slowing the modeled Trolley operations resulted in a reduction of noise levels. Freight rail operations do not stop at the Old Town Transit Center and thus, were modeled at typical operating speeds. Rail noise modeling results are shown in Table 6.2-3. Noise contour distances were calculated assuming flat-site conditions and no intervening buildings that would provide noise attenuation, which would represent a conservative, worst-case analysis.

Detailed FTA model runs showing modeled input parameters are included in Appendix C.

Table 6.2-3
Predicted Railway Noise Levels through 2021

Source	Distance of Predicted 60 dBA (L_{dn}) Noise Levels from Rail Center Alignment
MTS Trolley	19 feet
Amtrak Passenger Rail	130 feet
Coaster Passenger Rail	90 feet
Freight Rail	105 feet
Aggregate of Rail Sources	230 feet

The San Diego Association of Governments is currently constructing the infrastructure to facilitate the planned 2021 start-date of the Mid-Coast Corridor Transit Project. This project will result in additional MTS Trolley service along the existing LRT corridor within the Midway–Pacific Highway CPU area. This additional service will introduce an additional 128 LRT events per day (SANDAG 2014). As shown in Table 6.2-4, the aggregate operation of existing rail uses and the anticipated Mid-Coast Corridor Transit Project Blue Line trolley will generate 60 dBA L_{dn} approximately 5 feet farther into the study area. No future change in service is expected to occur for other rail uses along the corridor.

Table 6.2-4
Future Predicted Railway Noise Levels

Source	Distance of Predicted 60 dBA (L_{dn}) Noise Levels from Rail Center Alignment
MTS Trolley	32 feet
Amtrak Passenger Rail	130 feet
Coaster Passenger Rail	90 feet
Freight Rail	105 feet
Aggregate of Rail Sources	235 feet

The nearest noise-sensitive land uses are located on the eastern side of the railroad alignment, with some motel and office-space receivers abutting the railroad right-of-way at distances as close as 60 feet from the nearest track. The nearest residential receiver is located 205 feet from the railroad right-of-way on Harney Street; however, the track at this location is on the opposing side of the elevated I-5 that, at an elevation of 20 feet, completely occludes the line-of-sight of the receivers toward the railroad. Once the railroad alignment enters the Old Town CPU beneath I-5, the nearest residential receiver is located approximately 230 feet away toward the southeast. Although these receivers are in proximity to railroad operations, Figures 4.2-4 and 6.2-1 show that vehicular traffic noise from Pacific Highway and I-5 produce CNEL noise levels from 70 to 75 dBA, which far-exceed the CNEL contribution from railroad operations. Therefore, noise level impacts resulting from trolley and train operations would be less than significant.

6.2.3 ALUCP Consistency

The nearest segment of runway operated by SDIA is located approximately 0.8 mile south of the Old Town CPU area southern boundary. Aircraft noise is evaluated based on the noise contours developed by the San Diego County Regional Airport Authority and provided in the ALUCP for SDIA (2014). As depicted earlier in Figure 6.1-2, no portions of the Old Town CPU are located within any of the noise level CNEL contours presented in the ALUCP. Though aircraft departures are audible throughout the Old Town CPU area, CNEL levels attributed to SDIA will not exceed 60 dBA CNEL. Neither exterior nor interior noise compatibility impacts would occur at any of the proposed project land uses; thus, the implementation of the proposed Old Town CPU and associated discretionary actions would result in a less than significant exposure to noise from aircraft.

6.2.4 Municipal Code Compliance

Impacts from stationary noise sources as they relate to the City of San Diego Noise Ordinance as a result of the implementation of the Old Town CPU are identical to impact conclusions made in Section 6.1.4 of the Midway-Pacific Highway CPU analysis.

6.2.5 Construction Noise and Vibration

Impacts from construction noise and vibration as a result of the implementation of the Old Town CPU are identical to impact conclusions made in Section 6.1.5 of the Midway-Pacific Highway CPU analysis.

6.2.6 Vibration from Operations

Impacts from vibration associated with land use operations as a result of the implementation of the Old Town CPU are identical to impact conclusions made in Section 6.1.6 of the Midway-Pacific Highway CPU analysis.

7. Summary of Predicted Impacts and Mitigation

The following is a summary of impacts for each significance threshold addressed in Section 7. For significant impacts, program-level mitigation is identified where feasible, and the subsequent mitigation framework identifies measures to be applied to future development projects within the Midway-Pacific Highway and Old Town CPU areas to reduce noise impacts when and where they occur.

7.1 Increase in Ambient Noise Levels

7.1.1 Midway-Pacific Highway CPU

The increase in ambient noise levels adjacent to the segment of Sports Arena Boulevard would result in the exposure of existing sensitive receptors to a significant increase in ambient noise levels, and impacts would be significant and unavoidable. Possible noise-reduction measures would include retrofitting older structures with acoustically rated window and doors featuring higher STC ratings. For all other roadway segments in the CPU areas not identified in Sections 6.1.1, the increase in ambient noise would be less than significant.

Exposure of future NSLUs to an increase in ambient noise levels is controlled by an existing regulatory framework comprised of policies in the proposed Midway-Pacific Highway CPU and General Plan, procedures in the SDMC, and regulations (Title 24), which require interior noise levels to be attenuated to 45 dBA CNEL or less in all residential, temporary lodging facilities, religious and educational institutions, day cares, and medical facilities. Additionally, site-specific noise analyses demonstrating that the proposed project would not subject sensitive receptors to existing or future noise levels exceeding the noise compatibility guidelines of the City's General Plan would be required as part of the review process for discretionary projects, to the extent practicable. With the implementation of these regulations and procedures, noise impacts applicable to new discretionary projects would be less than significant.

However, in the case of future ministerial projects, there is no procedure to ensure that exterior noise is adequately attenuated. Therefore, exterior noise impacts attributed to ministerial projects located in areas that exceed the applicable land use and noise compatibility level would be significant and unavoidable.

Interior noise impacts for all projects, including ministerial projects, would be less than significant because applicants must demonstrate compliance with the relevant interior noise standards through submission and approval of a Title 24 Compliance Report.

7.1.2 Old Town CPU

No significant increase of ambient noise levels over existing noise levels are would occur as a result of the implementation of the Old Town CPU and associated discretionary actions. Thus, exposure of existing and future NSLUs of an increase in ambient noise levels over existing noise levels would be less than significant.

7.2 Exposure to Existing and Future Transportation Noise

7.2.1 Vehicle Traffic Noise Exposure in Both CPUs

The vehicular traffic from adjacent freeways is the dominant noise source affecting land use compatibility within the Midway-Pacific Highway and Old Town CPU areas. Future traffic noise levels generated by freeway traffic would, in cases of residences close to the freeways and major roadways, exceed the General Plan Noise Element conditionally compatible thresholds for residential land uses (65 dBA CNEL for single-family and conditionally up to 75 dBA CNEL for multi-family and mixed-use developments that meet the requirements of Section B of the Noise Element). Land uses located adjacent to I-5 and I-8 in the CPU areas have the potential to be exposed to noise levels greater than 75 dBA CNEL. Broader mitigation, such as noise walls adjacent to freeways and roadways, can reduce exterior noise to levels compliant with General Plan Noise Element guidelines. The development of new NSLUs as a result of each CPU implementation may subject receptors to noise levels that exceed General Plan guidelines, with some planned sub-districts located within areas experience existing traffic noise levels greater than 75 dBA CNEL. Per Section B of the General Plan Noise Element, any future residential use in areas above 70 dBA CNEL must include noise attenuation measures to ensure interior levels of 45 dBA CNEL and be located in an area where a community plan allows multi-family and mixed-use residential uses.

Additionally, policies in the proposed Midway-Pacific Highway and Old Town CPUs, General Plan, and Title 24 would reduce traffic noise exposure because they set standards for the siting of NSLUs. General Plan policy NE-A.4 requires an acoustical study consistent with Acoustical Study Guidelines for proposed developments in areas where the existing or future noise level exceeds or would exceed the “compatible” noise level thresholds. Site-specific exterior noise analyses that demonstrate that the project would not place sensitive receptors in locations where the exterior existing or future noise levels would exceed the noise compatibility guidelines of the General Plan would be required as part of future discretionary proposals. Site-specific interior noise analyses demonstrating compliance with the interior noise compatibility guidelines of the General Plan would also be required for land uses located in areas where exterior noise levels exceed the noise and land use compatibility thresholds as defined in the General Plan. This requirement is implemented through submission of a Title 24 Compliance Report to demonstrate that the building envelope acoustic performance results in interior noise levels of 45 dBA CNEL or less. With this framework, exterior traffic noise impacts associated with new development requiring discretionary approvals and interior traffic noise impacts for both ministerial and discretionary projects would be less than significant.

However, in the case of exterior noise impacts associated with ministerial projects, there are no policies or standards ensuring that exterior noise is adequately attenuated to compatible levels. Therefore, exterior noise impacts for ministerial projects located in areas where the applicable land use and noise compatibility level is exceeded would be significant and unavoidable.

7.2.2 Rail Noise Exposure in Both CPUs

Railway noise generated from the rail traffic on LOSSAN rail corridor would exceed 60 dBA within 230 feet of the Midway-Pacific Highway CPU boundary, and 235 feet of the Old Town CPU boundary. Both CPUs propose new NSLUs within these distances, however, Figures 4.2-3 and 4.2-4 show that vehicular traffic noise from Pacific Highway and I-5 already produce CNEL noise levels from 70 to greater than 75 dBA at these proposed locations, which far-exceed the CNEL contribution of railroad operations. The regulatory framework and mitigation measures applied for project-specific developments for traffic noise would in turn, also reduce noise exposure from rail operations to compatible levels. Therefore, noise level impacts resulting from rail operations would be less than significant.

7.3 ALUCP Consistency

7.3.1 Midway-Pacific Highway CPU

As depicted in Figure 6.1-2, the Midway-Pacific Highway CPU area immediately abuts a large portion of the SDIA boundary and experiences levels ranging from 60 to greater than 75 dBA CNEL. Per the City Significance Determination Thresholds, if a future project implemented under the proposed Midway-Pacific Highway CPU and associated discretionary actions is proposed within the 60 dBA CNEL and greater contours (as shown in the ALUCP for SDIA), the potential exterior noise impacts from aircraft noise would not constitute a significant environmental impact. The ALUCP conditionally allows future residential uses in areas above the 65 dBA CNEL in locations where community plans have allowed residential. These future residential developments would include noise attenuation consistent with the Noise Element of the General Plan and the ALUCP for SDIA. Interior noise impacts would be regulated by the requirement for residential development within the 60 dBA CNEL and greater contours to reduce interior noise levels attributed to airport noise to 45 dBA CNEL. The City currently submits both discretionary and ministerial projects that increase residential units and non-residential floor area for new land use development to the ALUC to obtain a consistency determination from the ALUCP.

Interior noise levels for new construction are also addressed through implementation of General Plan policies NE-I.1 and NE-I.2, which include Title 24 of the CCR, which requires submission of a Title 24 Compliance Report to demonstrate interior noise levels of 45 dBA CNEL when NSLUs are proposed in an area experiencing predicted to be exposed to CNEL levels within the 65 dBA CNEL contour, or, if CNEL contours are unavailable, areas exposed to 1-hour L_{eq} levels of 65 dBA or greater. With this framework, airport noise impacts to new development would be less than significant.

7.3.2 Old Town CPU

The nearest segment of runway operated by SDIA is located approximately 0.8 mile south of the Old Town CPU area southern boundary. As depicted in Figure 6.1-2, no portions of the Old Town CPU are located within any of the noise level CNEL contours presented in the ALUCP. Though aircraft departures are audible throughout the Old Town CPU area, CNEL levels attributed to SDIA will not exceed 60 dBA CNEL. Neither exterior nor interior noise compatibility impacts would occur at any of the proposed project land uses; thus, the implementation of the proposed Old Town CPU and associated discretionary actions would result in a less than significant exposure to noise from aircraft.

7.4 Municipal Code Compliance in Both CPUs

While noise-sensitive residential land uses would be exposed to noise associated with the operation of commercial uses, policies are in place to control noise and reduce noise impacts between various land uses. Noise policies, as contained in the General Plan Noise Element, the proposed CPUs, and regulations in the Noise Ordinance are in place to control and reduce noise levels between various land uses to levels below impact thresholds for specific land use types. These include the requirement for noise studies for new developments, limits on hours of operation for various noise-generating activities, and standards for the compatibility of land use types. In addition, enforcement of the federal, state, and local noise regulations would control impacts. At the project level, commercial and industrial land uses would be required to comply with the City's daytime and nighttime property line noise level limits per the applicable General Plan policy and SDMC. Given implementation of these policies and enforcement of the Noise Abatement and Control Ordinance of the SDMC, impacts would be less than significant.

7.5 Construction Noise and Vibration in Both CPUs

Although no specific construction or development is proposed under either of the proposed CPUs and associated discretionary actions at this time, construction noise impacts could occur as future development occurs. Due to the highly-developed nature of land uses within both CPU areas, there is a high likelihood that construction activities would take place adjacent to NSLUs. The City regulates noise associated with construction equipment and activities through its Noise Abatement and Control article within the SDMC. The City also imposes conditions of approval for building and grading permits related to noise. At the project level, future project developments will be required to incorporate feasible mitigation measures when construction is located within 177 feet of a NSLU to prevent construction noise exposure impacts. Noise can be reduced to comply with City standards when standard construction noise control measures are enforced administratively and on the project site. These standard construction noise measures include the following:

- Construction activities shall be limited to the hours between 7:00 a.m. and 7:00 p.m.. Construction is not allowed on legal holidays as specified in Section 21.04 of the SDMC, with exception of Columbus Day and Washington's Birthday, or on Sundays (consistent with Section 59.5.0404 of the SDMC).
- Equip all internal combustion engine-driven equipment with appropriately-sized intake and/or exhaust mufflers that are properly operating and maintained consistent with manufacturer's standards.
- Stationary noise-generating equipment (e.g., compressors or generators) shall be located as far as possible from adjacent residential receivers and oriented so that emitted noise is directed away from sensitive receptors whenever feasible. Non-noise generating mobile equipment, such as trailers, should be placed in the direct sound path between the major noise-producing construction equipment and the NSLU whenever practicable.
- If levels are expected to potentially exceed SDMC thresholds, temporary noise barriers with a minimum height of 8 feet shall be located around pertinent active construction equipment or entire work areas to shield nearby sensitive receivers.
- Utilize "quiet" air compressors, generators, and other stationary noise sources where technology exists.
- The contractor shall prepare a detailed construction plan identifying the schedule for major noise-generating construction activities. The construction plan shall identify a procedure for coordination with adjacent residential land uses so that construction activities can be scheduled to minimize noise disturbance.
- Designate a "disturbance coordinator" who would be responsible for receiving and responding to any complaints about construction noise or vibration. The disturbance coordinator will determine the cause of the noise complaint and, if identified as a sound generated by construction area activities, will require that reasonable measures be implemented to correct the problem.
- The contractor should prepare a detailed construction plan identifying the schedule for major noise-generating construction activities, and procedures for coordination with adjacent NSLUs so that construction activities can be scheduled to minimize noise disturbance.

Implementation of the standard controls outlined in the above list would reduce construction noise levels emanating from the construction sites to compliant levels and minimize potential disruption and annoyance. With the implementation of these controls, the noise exposure as a result of construction efforts associated with the implementation of the CPUs would be less than significant.

7.6 Vibration in Both CPUs

7.6.1 Construction

Non-pile driving construction activities may be perceptible by human receptors, however, these activities would not be capable of exceeding structural damage thresholds or "strongly perceptible" thresholds outlined in Section 3.1.3. By use of administrative controls, such as scheduling vibration-intensive construction activities to hours with the least potential to affect nearby sensitive receptors, perceptible vibration can be kept to a minimum and, as such, would result in a less than significant impact with respect to mere perception

Pile driving has the potential to generate the highest groundborne vibration levels and is the primary concern for vibratory impacts on structures and human receptors. The construction of future land uses as a result of the implementation of the proposed individual CPUs and associated discretionary actions would have the potential to result in a significant impact related to vibration associated with construction when occurring within the distances provided in Table 6.1-3. At a project level, for projects where construction would include vibration-generating activities such as pile driving within the distances in Table 6.1-5, site-specific vibration studies shall be conducted to determine the area of impact and present appropriate mitigation measures to the satisfaction of the Chief Building Official that may include the following:

- Identify sites that would include vibration compaction activities such as pile driving and have the potential to generate groundborne vibration and the sensitivity of nearby structures to groundborne vibration.
- Develop a vibration monitoring and construction contingency plan to identify structures where monitoring would be conducted; set up a vibration monitoring schedule; define structure-specific vibration limits; and address the need to conduct photo, elevation, and crack surveys to document before and after construction conditions. Construction contingencies would be identified for when vibration levels approach the limits.
- Monitor vibration during initial demolition activities and during pile-driving activities. Monitoring results may indicate the need for more or less intensive measurements.
- Designate a "disturbance coordinator" who would be responsible for receiving and responding to any complaints about construction vibration. The disturbance coordinator will determine the cause of the noise complaint and will require that reasonable measures be implemented to correct the problem.
- When vibration levels approach limits, suspend construction and implement contingencies to either lower vibration levels or secure the affected structures.
- Conduct post-activity survey on structures where either monitoring has indicated high levels or complaints of damage have been made. Make appropriate repairs or compensation where damage has occurred as a result of construction activities.

Implementation of the above mitigation measure would reduce construction-related vibration impacts; however, at the program level it cannot be known whether the measures would be adequate to minimize vibration levels to less than significant, thus, construction-related vibration impacts would be significant and unavoidable.

7.6.2 Operation

The proposed land uses within both of the CPUs and associated discretionary actions include retail facilities, restaurants, and office spaces that would not require heavy mechanical equipment or heavy truck deliveries, both of which could generate atypical levels of vibration. Additional proposed land uses, such as residential developments and civic uses do not typically generate any notable vibration. Thus, operational vibration impacts associated with implementation of the proposed CPUs and associated discretionary actions would be less than significant.

8. References

Appendix A

Field Measurement Data

Measurement ID	Date	Time	Run Duration (hh:mm)	LA_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}
OT-ST1	2017-04-10	08:45:00	00:01	59.3	57.2	62.6	60.6	59.1	57.5
	2017-04-10	08:46:00	00:01	68.4	58.5	75.6	73.0	65.5	60.2
	2017-04-10	08:47:00	00:01	59.4	58.2	62.2	61.1	58.9	58.5
	2017-04-10	08:48:00	00:01	62.7	58.0	69.2	65.4	61.3	58.7
	2017-04-10	08:49:00	00:01	61.4	57.8	65.9	63.5	61.1	58.1
	2017-04-10	08:50:00	00:01	60.8	58.6	64.5	61.9	60.7	59.1
	2017-04-10	08:51:00	00:01	61.5	58.6	70.1	62.3	60.1	59.0
	2017-04-10	08:52:00	00:01	59.8	58.5	62.5	60.6	59.6	58.8
	2017-04-10	08:53:00	00:01	60.1	57.3	62.2	61.4	60.1	58.2
	2017-04-10	08:54:00	00:01	59.4	56.6	64.4	61.2	58.7	57.4
	2017-04-10	08:55:00	00:01	65.8	58.0	71.2	70.1	61.9	58.8
	2017-04-10	08:56:00	00:01	59.5	57.1	62.0	60.8	59.4	58.1
	2017-04-10	08:57:00	00:01	61.1	58.5	65.9	62.9	60.6	59.0
	2017-04-10	08:58:00	00:01	62.5	58.7	71.3	64.6	60.8	59.1
	2017-04-10	08:59:00	00:01	62.4	58.4	67.1	66.1	61.5	59.4
OT-ST2	2017-04-10	09:07:00	00:01	61.9	54.3	73.2	65.6	57.3	55.4
	2017-04-10	09:08:00	00:01	61.2	56.7	66.4	63.9	59.9	57.5
	2017-04-10	09:09:00	00:01	59.2	55.0	64.7	62.8	57.4	56.1
	2017-04-10	09:10:00	00:01	58.9	54.7	64.4	61.3	58.0	55.5
	2017-04-10	09:11:00	00:01	63.0	57.1	67.9	66.1	62.1	59.2
	2017-04-10	09:12:00	00:01	62.6	56.6	68.3	65.5	61.6	57.4
	2017-04-10	09:13:00	00:01	61.2	55.9	67.9	64.2	59.1	56.8
	2017-04-10	09:14:00	00:01	63.9	56.8	72.5	67.2	62.1	57.5
	2017-04-10	09:15:00	00:01	61.9	57.7	66.2	64.3	60.9	58.6
	2017-04-10	09:16:00	00:01	60.2	55.9	66.1	63.2	59.3	56.9
	2017-04-10	09:17:00	00:01	60.3	55.5	66.4	62.9	58.8	56.4
	2017-04-10	09:18:00	00:01	64.3	57.6	73.1	67.3	62.0	58.4
	2017-04-10	09:19:00	00:01	60.4	56.2	65.2	63.8	58.7	57.2
	2017-04-10	09:20:00	00:01	62.2	57.7	68.6	65.4	60.7	58.1
	2017-04-10	09:21:00	00:01	57.1	55.2	61.6	58.6	56.3	55.5
OT-ST3	2017-04-10	09:28:00	00:01	71.0	67.3	75.7	72.5	70.5	69.1
	2017-04-10	09:29:00	00:01	70.3	67.6	73.4	71.7	69.8	68.6
	2017-04-10	09:30:00	00:01	71.2	69.2	73.1	72.1	71.1	70.1
	2017-04-10	09:31:00	00:01	71.2	69.7	74.3	72.3	71.0	70.1
	2017-04-10	09:32:00	00:01	71.5	68.8	73.6	72.7	71.4	69.8
	2017-04-10	09:33:00	00:01	70.5	67.8	72.7	72.0	70.3	69.2
	2017-04-10	09:34:00	00:01	70.8	68.5	72.8	72.1	70.6	69.5
	2017-04-10	09:35:00	00:01	70.1	67.5	73.3	71.1	69.9	68.6
	2017-04-10	09:36:00	00:01	70.1	67.9	71.7	71.1	70.1	68.6
	2017-04-10	09:37:00	00:01	70.1	67.4	75.1	71.9	69.5	67.8
	2017-04-10	09:38:00	00:01	69.8	67.7	71.8	70.9	69.8	68.2
	2017-04-10	09:39:00	00:01	70.2	66.8	73.1	71.5	70.2	67.9
	2017-04-10	09:40:00	00:01	70.3	66.9	72.7	71.6	70.2	68.6
	2017-04-10	09:41:00	00:01	70.4	67.0	73.5	72.1	70.3	68.3
	2017-04-10	09:42:00	00:01	70.3	67.2	73.1	71.5	70.2	68.6
OT-ST4	2017-04-10	09:55:00	00:01	58.0	53.5	66.4	62.0	54.6	53.8
	2017-04-10	09:56:00	00:01	56.5	53.7	62.4	59.4	55.2	54.1
	2017-04-10	09:57:00	00:01	54.3	53.4	55.6	55.2	54.2	53.6
	2017-04-10	09:58:00	00:01	54.7	53.6	56.5	55.9	54.4	53.9
	2017-04-10	09:59:00	00:01	54.9	54.0	56.4	55.8	54.9	54.2
	2017-04-10	10:00:00	00:01	56.4	54.8	58.9	58.0	55.8	55.4
	2017-04-10	10:01:00	00:01	55.8	54.3	58.5	57.6	55.2	54.5
	2017-04-10	10:02:00	00:01	55.3	54.0	58.2	55.9	55.3	54.4

Measurement ID	Date	Time	Run Duration (hh:mm)	LA_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}
OT-ST4 (cont.)	2017-04-10	10:03:00	00:01	55.6	54.4	56.7	56.2	55.5	55.0
	2017-04-10	10:04:00	00:01	60.0	54.7	66.7	64.0	56.2	55.0
	2017-04-10	10:05:00	00:01	55.4	53.7	58.8	57.2	54.8	54.1
	2017-04-10	10:06:00	00:01	54.6	52.7	56.8	55.5	54.5	53.5
	2017-04-10	10:07:00	00:01	54.3	53.5	57.0	54.9	54.0	53.7
	2017-04-10	10:08:00	00:01	55.5	53.7	58.2	56.7	55.3	54.4
	2017-04-10	10:09:00	00:01	54.1	53.4	54.8	54.5	54.1	53.7
OT-ST5	2017-05-23	11:48:00	00:01	64.2	61.9	70.8	64.6	63.6	63.1
	2017-05-23	11:49:00	00:01	65.8	63.6	71.1	68.8	64.7	64.2
	2017-05-23	11:50:00	00:01	64.6	62.8	66.9	66.2	64.2	63.1
	2017-05-23	11:51:00	00:01	62.8	60.8	65.0	63.8	62.5	61.6
	2017-05-23	11:52:00	00:01	63.2	61.5	64.5	64.1	63.1	62.2
	2017-05-23	11:53:00	00:01	63.3	60.9	68.3	64.9	62.8	61.6
	2017-05-23	11:54:00	00:01	65.2	62.3	71.0	67.0	64.7	62.7
	2017-05-23	11:55:00	00:01	63.2	60.8	66.9	65.3	62.4	61.5
	2017-05-23	11:56:00	00:01	64.0	61.1	68.0	66.9	63.0	61.8
	2017-05-23	11:57:00	00:01	63.1	60.6	69.1	64.9	62.7	61.3
	2017-05-23	11:58:00	00:01	64.2	62.0	68.3	65.3	64.0	62.7
	2017-05-23	11:59:00	00:01	62.6	60.6	64.7	63.8	62.3	61.1
	2017-05-23	12:00:00	00:01	63.3	60.7	65.7	64.7	62.9	61.9
	2017-05-23	12:01:00	00:01	64.4	60.9	73.8	65.6	63.3	61.7
	2017-05-23	12:02:00	00:01	63.2	61.6	64.6	63.6	63.2	62.4
OT-ST6	2017-05-23	11:08:00	00:01	65.9	64.1	68.8	67.0	65.6	64.6
	2017-05-23	11:09:00	00:01	65.2	64.1	67.6	66.0	64.9	64.3
	2017-05-23	11:10:00	00:01	66.1	63.7	67.6	66.9	66.2	64.7
	2017-05-23	11:11:00	00:01	67.5	65.6	71.8	69.7	66.7	66.1
	2017-05-23	11:12:00	00:01	66.3	65.1	67.4	67.0	66.2	65.6
	2017-05-23	11:13:00	00:01	66.7	64.8	69.5	67.9	66.6	65.2
	2017-05-23	11:14:00	00:01	67.6	65.8	68.5	68.2	67.8	66.5
	2017-05-23	11:15:00	00:01	70.9	66.5	81.1	71.9	68.7	67.1
	2017-05-23	11:16:00	00:01	68.8	65.9	71.9	71.0	68.3	66.4
	2017-05-23	11:17:00	00:01	66.7	64.4	69.4	68.7	66.5	65.4
	2017-05-23	11:18:00	00:01	67.2	64.7	70.5	68.1	66.8	65.8
	2017-05-23	11:19:00	00:01	65.8	63.3	67.7	66.6	65.9	64.1
	2017-05-23	11:20:00	00:01	73.1	64.5	83.3	77.8	66.4	65.1
	2017-05-23	11:21:00	00:01	68.8	64.2	78.0	70.8	66.8	65.1
	2017-05-23	11:22:00	00:01	67.3	65.2	72.6	68.4	67.0	66.1
MPH-ST1	2017-04-10	10:51:00	00:01	66.5	56.9	72.4	71.7	64.2	57.0
	2017-04-10	10:52:00	00:01	60.8	54.6	67.0	65.2	58.7	55.4
	2017-04-10	10:53:00	00:01	65.9	57.7	71.0	69.2	64.7	59.8
	2017-04-10	10:54:00	00:01	59.9	56.1	62.6	61.4	60.1	56.8
	2017-04-10	10:55:00	00:01	66.1	55.1	74.3	72.0	61.3	57.8
	2017-04-10	10:56:00	00:01	61.3	54.9	69.2	64.6	58.7	55.4
	2017-04-10	10:57:00	00:01	62.5	57.5	69.1	65.9	60.6	58.4
	2017-04-10	10:58:00	00:01	70.0	56.3	81.1	72.7	63.6	57.8
	2017-04-10	10:59:00	00:01	63.2	53.9	71.6	65.5	61.7	54.9
	2017-04-10	11:00:00	00:01	62.2	53.5	70.1	64.6	61.6	55.1
	2017-04-10	11:01:00	00:01	59.7	55.3	63.3	62.0	59.2	55.9
	2017-04-10	11:02:00	00:01	61.4	53.2	67.4	66.3	58.4	53.8
	2017-04-10	11:03:00	00:01	59.0	52.6	65.7	62.5	58.1	53.8
	2017-04-10	11:04:00	00:01	63.8	57.8	70.0	67.8	61.3	59.3
	2017-04-10	11:05:00	00:01	64.6	59.7	68.5	66.8	64.4	60.9

Measurement ID	Date	Time	Run Duration (hh:mm)	LA_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}
MPH-ST2	2017-04-10	11:24:00	00:01	56.6	51.7	67.8	59.9	54.1	52.5
	2017-04-10	11:25:00	00:01	56.3	49.2	67.7	58.3	54.9	51.8
	2017-04-10	11:26:00	00:01	60.6	50.7	69.2	65.1	57.4	51.5
	2017-04-10	11:27:00	00:01	61.9	50.4	73.0	67.4	54.1	50.9
	2017-04-10	11:28:00	00:01	58.2	50.9	68.7	59.8	55.8	51.8
	2017-04-10	11:29:00	00:01	59.8	51.8	65.9	62.3	60.2	52.9
	2017-04-10	11:30:00	00:01	55.3	51.6	62.2	57.3	53.8	52.3
	2017-04-10	11:31:00	00:01	55.2	49.6	65.4	58.0	53.6	50.3
	2017-04-10	11:32:00	00:01	65.3	54.4	73.6	71.4	55.8	54.9
	2017-04-10	11:33:00	00:01	59.8	50.0	72.9	62.9	56.0	51.7
	2017-04-10	11:34:00	00:01	55.2	48.6	62.0	60.6	52.8	49.4
	2017-04-10	11:35:00	00:01	65.2	53.7	73.6	69.8	57.5	54.6
	2017-04-10	11:36:00	00:01	53.2	49.4	57.6	55.7	52.1	50.2
	2017-04-10	11:37:00	00:01	60.5	48.9	67.4	65.6	57.9	50.6
	2017-04-10	11:38:00	00:01	62.7	51.9	70.0	69.0	54.9	53.5
MPH-ST3	2017-04-10	12:20:00	00:01	60.8	52.1	71.2	65.5	56.4	53.8
	2017-04-10	12:21:00	00:01	57.4	48.9	69.2	61.4	51.5	49.3
	2017-04-10	12:22:00	00:01	50.4	47.9	57.5	52.3	49.3	48.3
	2017-04-10	12:23:00	00:01	63.3	48.3	74.6	68.1	54.8	48.8
	2017-04-10	12:24:00	00:01	57.7	49.2	64.2	61.4	54.1	49.9
	2017-04-10	12:25:00	00:01	61.9	50.3	68.4	65.2	60.9	51.1
	2017-04-10	12:26:00	00:01	63.3	53.6	71.1	68.3	60.2	54.3
	2017-04-10	12:27:00	00:01	64.2	51.9	72.8	70.2	54.8	52.7
	2017-04-10	12:28:00	00:01	63.7	55.7	68.4	66.4	63.6	57.4
	2017-04-10	12:29:00	00:01	66.5	55.7	75.0	70.1	63.5	56.2
	2017-04-10	12:30:00	00:01	62.0	53.7	72.2	65.5	58.0	54.9
	2017-04-10	12:31:00	00:01	61.4	52.3	71.9	63.8	60.0	55.8
MPH-ST4	2017-04-10	12:45:00	00:01	65.2	60.8	70.3	67.9	64.4	61.9
	2017-04-10	12:46:00	00:01	63.2	58.8	66.3	65.1	62.8	61.5
	2017-04-10	12:47:00	00:01	63.6	60.1	66.8	65.2	63.4	61.3
	2017-04-10	12:48:00	00:01	71.7	60.8	79.4	77.2	67.1	61.5
	2017-04-10	12:49:00	00:01	64.3	62.0	68.9	65.7	63.8	62.5
	2017-04-10	12:50:00	00:01	64.8	61.3	67.7	66.7	64.6	62.4
	2017-04-10	12:51:00	00:01	68.2	62.3	72.4	71.3	66.3	63.4
	2017-04-10	12:52:00	00:01	65.4	62.1	73.7	67.3	64.2	62.5
	2017-04-10	12:53:00	00:01	64.9	61.0	70.5	67.2	63.9	61.8
	2017-04-10	12:54:00	00:01	65.1	61.3	69.6	67.7	64.5	62.3
	2017-04-10	12:55:00	00:01	76.7	60.3	92.2	76.3	61.7	60.8
	2017-04-10	12:56:00	00:01	63.0	60.5	67.8	65.1	62.1	61.2
	2017-04-10	12:57:00	00:01	62.5	59.2	66.1	64.5	61.9	59.7
	2017-04-10	12:58:00	00:01	65.2	61.4	67.8	66.6	65.2	62.4
	2017-04-10	12:59:00	00:01	67.5	62.2	77.5	68.9	65.1	63.1
MPH-ST5	2017-04-10	13:15:00	00:01	68.1	65.2	71.0	69.8	67.8	65.9
	2017-04-10	13:16:00	00:01	68.7	63.1	76.6	72.2	66.2	64.4
	2017-04-10	13:17:00	00:01	67.5	63.8	70.7	69.7	67.5	64.3
	2017-04-10	13:18:00	00:01	70.8	63.7	79.7	75.6	67.2	64.3
	2017-04-10	13:19:00	00:01	70.8	63.8	80.4	74.4	67.7	65.7
	2017-04-10	13:20:00	00:01	68.8	65.4	74.8	70.8	67.8	66.1
	2017-04-10	13:21:00	00:01	70.1	65.7	78.4	74.1	67.3	66.3
	2017-04-10	13:22:00	00:01	68.5	64.3	72.1	70.4	68.2	66.0
	2017-04-10	13:23:00	00:01	68.6	62.5	76.7	71.5	66.6	63.5
	2017-04-10	13:24:00	00:01	75.2	62.4	84.6	81.8	68.3	63.2
	2017-04-10	13:25:00	00:01	67.2	63.9	69.5	68.3	67.4	64.6

Measurement ID	Date	Time	Run Duration (hh:mm)	LA_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}
MPH-ST5 (cont.)	2017-04-10	13:26:00	00:01	72.5	64.7	81.1	76.6	69.9	65.2
	2017-04-10	13:27:00	00:01	81.9	65.3	95.3	83.4	68.9	66.1
	2017-04-10	13:28:00	00:01	67.1	63.5	74.4	70.1	65.4	64.2
	2017-04-10	13:29:00	00:01	69.8	64.5	78.3	72.1	67.9	65.3
MPH-ST6	2017-05-23	09:55:00	00:01	62.8	56.1	69.2	66.8	60.3	56.9
	2017-05-23	09:56:00	00:01	63.8	57.7	72.6	67.2	60.7	59.0
	2017-05-23	09:57:00	00:01	65.7	58.3	77.0	68.5	60.5	58.9
	2017-05-23	09:58:00	00:01	64.5	57.9	71.8	67.9	61.8	58.3
	2017-05-23	09:59:00	00:01	67.5	60.1	75.8	72.0	63.8	60.6
	2017-05-23	10:00:00	00:01	64.3	57.4	69.7	67.4	63.5	57.9
	2017-05-23	10:01:00	00:01	58.7	56.1	62.3	61.1	57.9	56.5
	2017-05-23	10:02:00	00:01	62.6	57.5	69.8	65.9	61.0	58.4
	2017-05-23	10:03:00	00:01	63.5	57.4	71.8	66.7	61.0	58.1
	2017-05-23	10:04:00	00:01	59.8	54.2	67.3	63.2	57.8	55.3
	2017-05-23	10:05:00	00:01	61.2	54.9	67.4	64.3	59.6	55.7
	2017-05-23	10:06:00	00:01	61.8	57.8	68.6	64.8	60.0	58.5
	2017-05-23	10:07:00	00:01	60.8	56.2	68.9	63.5	58.5	56.9
	2017-05-23	10:08:00	00:01	65.1	57.6	77.0	67.0	63.0	58.6
	2017-05-23	10:09:00	00:01	66.3	56.5	74.8	70.6	62.1	57.4
MPH-ST7	2017-05-23	10:25:00	00:01	70.5	64.3	75.0	72.4	70.1	67.7
	2017-05-23	10:26:00	00:01	70.5	64.7	75.6	72.7	70.1	67.2
	2017-05-23	10:27:00	00:01	67.1	58.5	75.4	71.7	62.7	58.9
	2017-05-23	10:28:00	00:01	62.2	56.1	66.5	65.0	61.8	57.7
	2017-05-23	10:29:00	00:01	61.5	57.5	68.3	65.3	59.4	57.8
	2017-05-23	10:30:00	00:01	61.7	57.6	69.0	65.2	59.9	58.2
	2017-05-23	10:31:00	00:01	64.1	57.5	74.6	67.6	61.5	57.9
	2017-05-23	10:32:00	00:01	61.7	57.2	67.8	64.3	60.4	57.7
	2017-05-23	10:33:00	00:01	61.8	57.2	68.2	65.1	60.0	57.8
	2017-05-23	10:34:00	00:01	61.2	57.1	66.3	64.0	60.0	58.4
	2017-05-23	10:35:00	00:01	67.7	57.1	79.0	70.5	59.2	57.6
	2017-05-23	10:36:00	00:01	63.7	58.3	69.7	67.1	62.3	58.7
	2017-05-23	10:37:00	00:01	65.3	55.7	76.8	70.0	58.2	56.2
	2017-05-23	10:38:00	00:01	62.3	55.9	71.5	65.3	59.9	56.7
	2017-05-23	10:39:00	00:01	63.4	58.4	71.1	65.6	62.0	59.0
MPH-ST8	2017-05-23	12:26:00	00:01	53.0	51.6	54.1	53.8	53.1	51.8
	2017-05-23	12:27:00	00:01	54.7	51.8	59.0	56.7	54.1	52.2
	2017-05-23	12:28:00	00:01	54.5	51.3	59.5	57.3	52.8	51.8
	2017-05-23	12:29:00	00:01	53.7	51.2	58.7	56.2	53.1	51.6
	2017-05-23	12:30:00	00:01	56.8	52.2	66.0	59.4	54.2	52.8
	2017-05-23	12:31:00	00:01	53.3	50.6	58.1	55.4	52.6	51.2
	2017-05-23	12:32:00	00:01	54.0	50.7	62.4	54.4	53.6	51.6
	2017-05-23	12:33:00	00:01	53.8	48.8	62.7	56.1	51.5	49.6
	2017-05-23	12:34:00	00:01	51.0	48.2	52.3	52.0	51.6	48.9
	2017-05-23	12:35:00	00:01	66.8	51.7	74.6	73.4	57.0	52.4
	2017-05-23	12:36:00	00:01	52.2	50.0	55.2	53.4	52.0	50.3
	2017-05-23	12:37:00	00:01	55.4	50.8	62.0	59.0	53.6	51.4
	2017-05-23	12:38:00	00:01	62.0	51.6	66.8	65.6	61.0	52.2
	2017-05-23	12:39:00	00:01	52.6	48.3	57.8	56.1	51.7	49.0
	2017-05-23	12:40:00	00:01	60.0	48.5	76.7	58.7	50.0	49.0

Appendix B

Traffic Data

Rail Operations Data

Roadway	From	To	Speed Limit (mph)	Pavement Width / Right-of-Way Width	2012 ADT	2035 ADT	Truck Mix	TNM Input Existing Type	TNM Input Existing Vol.	TNM Input Existing Speed	TNM Input Future Type	TNM Input Future Vol.	TNM Input Future Speed	ADT to CNEL Adjustment (dBA)
Lytton St / Barnett Ave	Rosecrans St	Midway Dr	40	76'/86'	22,070	24,300	2.00%	Auto	920	40	Auto	1013	40	4.2
								MT	9	40	MT	10	40	4.2
								HT	9	40	HT	10	40	4.2
Midway Dr	W. Point Loma Blvd/Sports Arena Blvd	Kemper St	35	60'/76	19,960	23,300	2.00%	Auto	832	35	Auto	971	35	4.2
								MT	8	35	MT	10	35	4.2
								HT	8	35	HT	10	35	4.2
Midway Dr	Kemper St	East Dr	35	60'/76'	20,240	20,100	2.00%	Auto	843	35	Auto	838	35	4.2
								MT	8	35	MT	8	35	4.2
								HT	8	35	HT	8	35	4.2
Midway Dr	East Dr	Rosecrans St	35	60'/80'	27,600	26,800	2.00%	Auto	1150	35	Auto	1117	35	4.2
								MT	12	35	MT	11	35	4.2
								HT	12	35	HT	11	35	4.2
Midway Dr	Rosecrans St	Barnett Ave	35	56'/72'	23,000	28,100	2.00%	Auto	958	35	Auto	1171	35	4.2
								MT	10	35	MT	12	35	4.2
								HT	10	35	HT	12	35	4.2
Sports Arena Blvd	I-8 EB Ramps	W. Point Loma Blvd/Sports Arena Blvd	35	76'/88'	31,010	39,200	2.00%	Auto	1292	35	Auto	1633	35	4.2
								MT	13	35	MT	16	35	4.2
								HT	13	35	HT	16	35	4.2
Sports Arena Blvd	W. Point Loma Blvd/Midway Dr	Kemper St	35	96'/106'	17,600	19,500	2.00%	Auto	733	35	Auto	813	35	4.2
								MT	7	35	MT	8	35	4.2
								HT	7	35	HT	8	35	4.2
Sports Arena Blvd	Kemper St	East Dr	35	96'/106'	19,520	25,300	2.00%	Auto	813	35	Auto	1054	35	4.2
								MT	8	35	MT	11	35	4.2
								HT	8	35	HT	11	35	4.2
Sports Arena Blvd	East Dr	Rosecrans St	35	82'/92'	26,800	17,700	2.00%	Auto	1117	35	Auto	738	35	4.2
								MT	11	35	MT	7	35	4.2
								HT	11	35	HT	7	35	4.2
Sports Arena Blvd	Rosecrans St	Pacific Hwy	35	52'/82'	2,600	11,000	2.00%	Auto	108	35	Auto	458	35	4.2
								MT	1	35	MT	5	35	4.2
								HT	1	35	HT	5	35	4.2
Kurtz St	Hancock St	Rosecrans St	30	40'/48'	5,340	12,800	2.00%	Auto	223	30	Auto	533	30	4.2
								MT	2	30	MT	5	30	4.2
								HT	2	30	HT	5	30	4.2
Kurtz St	Rosecrans St	Pacific Hwy	30	48'/48'	6,690	6,900	2.00%	Auto	279	30	Auto	288	30	4.2
								MT	3	30	MT	3	30	4.2
								HT	3	30	HT	3	30	4.2
Hancock St	Sports Arena Blvd	Kurtz St	30	62'/78'	3,930	1,100	2.00%	Auto	164	30	Auto	46	30	4.2
								MT	2	30	MT	0	30	4.2
								HT	2	30	HT	0	30	4.2
Hancock St	Kurtz St	Camino Del Rio West	30	40'/50'	4,710	14,800	2.00%	Auto	196	30	Auto	617	30	4.2
								MT	2	30	MT	6	30	4.2
								HT	2	30	HT	6	30	4.2
Hancock St	Camino Del Rio West	Rosecrans St	30	40'/50'	2,990	7,500	2.00%	Auto	125	30	Auto	313	30	4.2
								MT	1	30	MT	3	30	4.2
								HT	1	30	HT	3	30	4.2

Roadway	From	To	Speed Limit (mph)	Pavement Width / Right-of-Way Width	2012 ADT	2035 ADT	Truck Mix	TNM Input Existing Type	TNM Input Existing Vol.	TNM Input Existing Speed	TNM Input Future Type	TNM Input Future Vol.	TNM Input Future Speed	ADT to CNEL Adjustment (dBA)
Hancock St	Old Town Ave	Witherby St	30	44'/44'	9,680	11,300	2.00%	Auto	403	30	Auto	471	30	4.2
								MT	4	30	MT	5	30	4.2
								HT	4	30	HT	5	30	4.2
Hancock St	Witherby St	Washington St	30	60'/70'	2,740	5,100	2.00%	Auto	114	30	Auto	213	30	4.2
								MT	1	30	MT	2	30	4.2
								HT	1	30	HT	2	30	4.2
Kettner Blvd	Washington St	Vine St	40	42'/58'	23,720	34,700	2.00%	Auto	988	40	Auto	1446	40	4.2
								MT	10	40	MT	14	40	4.2
								HT	10	40	HT	14	40	4.2
Kettner Blvd	Vine St	Sassafras St	40	52'/58'	23,080	34,600	2.00%	Auto	962	40	Auto	1442	40	4.2
								MT	10	40	MT	14	40	4.2
								HT	10	40	HT	14	40	4.2
Kettner Blvd	Sassafras St	Laurel St	40	52'/68'	20,150	32,800	2.00%	Auto	840	40	Auto	1367	40	4.2
								MT	8	40	MT	14	40	4.2
								HT	8	40	HT	14	40	4.2
Pacific Hwy	Sea World Dr	Taylor St	45	86'/108'	7,460	10,600	2.00%	Auto	311	45	Auto	442	45	4.2
								MT	3	45	MT	4	45	4.2
								HT	3	45	HT	4	45	4.2
Pacific Hwy	Taylor St	Kurtz St	45	88'/110'	13,300	19,300	2.00%	Auto	554	45	Auto	804	45	4.2
								MT	6	45	MT	8	45	4.2
								HT	6	45	HT	8	45	4.2
Pacific Hwy	Kurtz St	Sports Arena Blvd	45	88'/110'	21,470	24,000	2.00%	Auto	895	45	Auto	1000	45	4.2
								MT	9	45	MT	10	45	4.2
								HT	9	45	HT	10	45	4.2
Pacific Hwy	Sports Arena Blvd	Barnett Ave	45	92'/110'	11,600	17,400	2.00%	Auto	483	45	Auto	725	45	4.2
								MT	5	45	MT	7	45	4.2
								HT	5	45	HT	7	45	4.2
Pacific Hwy	Barnett Ave	Washington St	55	118'/118'	54,690	51,100	2.00%	Auto	2279	55	Auto	2129	55	4.2
								MT	23	55	MT	21	55	4.2
								HT	23	55	HT	21	55	4.2
Pacific Hwy - Halved (Separated Seg)	Washington St	Sassafras St	45	42' SB / 42' NB	11,650	18,600	2.00%	Auto	243	45	Auto	775	45	4.2
								MT	2	45	MT	8	45	4.2
								HT	2	45	HT	8	45	4.2
Pacific Hwy	Sassafras St	Laurel St	45	98'/110'	19,160	31,100	2.00%	Auto	798	45	Auto	1296	45	4.2
								MT	8	45	MT	13	45	4.2
								HT	8	45	HT	13	45	4.2
Congress St	Taylor St	Twiggs St	25	36'/48'	4,230	7,800	2.00%	Auto	176	25	Auto	325	25	4.2
								MT	2	25	MT	3	25	4.2
								HT	2	25	HT	3	25	4.2
Congress St	Twiggs St	Harney St	25	36'/48'	4,380	6,400	2.00%	Auto	183	25	Auto	267	25	4.2
								MT	2	25	MT	3	25	4.2
								HT	2	25	HT	3	25	4.2
Congress St	Harney St	San Diego Ave/ Ampudia St	25	36'/48'	4,280	6,000	2.00%	Auto	178	25	Auto	250	25	4.2
								MT	2	25	MT	3	25	4.2
								HT	2	25	HT	3	25	4.2

Roadway	From	To	Speed Limit (mph)	Pavement Width / Right-of-Way Width	2012 ADT	2035 ADT	Truck Mix	TNM Input Existing Type	TNM Input Existing Vol.	TNM Input Existing Speed	TNM Input Future Type	TNM Input Future Vol.	TNM Input Future Speed	ADT to CNEL Adjustment (dBA)
San Diego Ave	Twiggs St	Harney St	25	52'/70'	3,540	4,900	2.00%	Auto	148	25	Auto	204	25	4.2
								MT	1	25	MT	2	25	4.2
								HT	1	25	HT	2	25	4.2
San Diego Ave	Harney St	Ampudia St	25	40'/52'	4,350	4,600	2.00%	Auto	181	25	Auto	192	25	4.2
								MT	2	25	MT	2	25	4.2
								HT	2	25	HT	2	25	4.2
San Diego Ave	Ampudia St	Old Town Ave	25	42'/54'	10,160	12,100	2.00%	Auto	423	25	Auto	504	25	4.2
								MT	4	25	MT	5	25	4.2
								HT	4	25	HT	5	25	4.2
San Diego Ave	Old Town Ave	Hortensia St	25	40'/56'	5,400	6,800	2.00%	Auto	225	25	Auto	283	25	4.2
								MT	2	25	MT	3	25	4.2
								HT	2	25	HT	3	25	4.2
Juan St	Taylor St	Twiggs St	30	36'/48'	5,430	7,000	2.00%	Auto	226	30	Auto	292	30	4.2
								MT	2	30	MT	3	30	4.2
								HT	2	30	HT	3	30	4.2
Juan St	Twiggs St	Harney St	30	36'/48'	4,810	6,600	2.00%	Auto	200	30	Auto	275	30	4.2
								MT	2	30	MT	3	30	4.2
								HT	2	30	HT	3	30	4.2
Juan St	Harney St	San Juan Rd	30	36'/48'	4,230	7,800	2.00%	Auto	176	30	Auto	325	30	4.2
								MT	2	30	MT	3	30	4.2
								HT	2	30	HT	3	30	4.2
Channel Wy	W. Mission Bay Dr	Hancock St	25	40'/50'	1,280	7,100	2.00%	Auto	53	25	Auto	296	25	4.2
								MT	1	25	MT	3	25	4.2
								HT	1	25	HT	3	25	4.2
Kemper St	Kenyon St	Midway Dr	25	62'/76'	9,010	9,600	2.00%	Auto	375	25	Auto	400	25	4.2
								MT	4	25	MT	4	25	4.2
								HT	4	25	HT	4	25	4.2
Kemper St	Midway Dr	Sports Arena Blvd	25	50'/60'	8,120	9,300	2.00%	Auto	338	25	Auto	388	25	4.2
								MT	3	25	MT	4	25	4.2
								HT	3	25	HT	4	25	4.2
Kemper St (*Fut Road*)	Sports Arena Blvd	Hancock St	N/A	*50*	N/A	9,500	2.00%	N/A	N/A	N/A	Auto	396	*30*	4.2
								N/A	N/A	N/A	MT	4	*30*	4.2
								N/A	N/A	N/A	HT	4	*30*	4.2
Frontier Dr (*Fut Road*)	Sports Arena Blvd	Kurtz St	N/A	*50*	N/A	12,400	2.00%	N/A	N/A	N/A	Auto	517	*30*	4.2
								N/A	N/A	N/A	MT	5	*30*	4.2
								N/A	N/A	N/A	HT	5	*30*	4.2
Greenwood St (*Fut Road*)	Sports Arena Blvd	Kurtz St	N/A	*50*	N/A	7,000	2.00%	N/A	N/A	N/A	Auto	292	*30*	4.2
								N/A	N/A	N/A	MT	3	*30*	4.2
								N/A	N/A	N/A	HT	3	*30*	4.2
Camino Del Rio West	Rosecrans St	I-5/I-8 Ramps	35	106'/120'	50,700	66,800	2.00%	Auto	2113	35	Auto	2783	35	4.2
								MT	21	35	MT	28	35	4.2
								HT	21	35	HT	28	35	4.2
Rosecrans St	Lytton St	Midway Dr	35	106'/120'	46,400	54,100	2.00%	Auto	1933	35	Auto	2254	35	4.2
								MT	19	35	MT	23	35	4.2
								HT	19	35	HT	23	35	4.2

Roadway	From	To	Speed Limit (mph)	Pavement Width / Right-of-Way Width	2012 ADT	2035 ADT	Truck Mix	TNM Input Existing			TNM Input Future			ADT to CNEL Adjustment (dBA)
								Type	Vol.	Speed	Type	Vol.	Speed	
Rosecrans St	Midway Dr	Sports Arena Blvd	35	106'/120'	59,100	56,800	2.00%	Auto	2463	35	Auto	2367	35	4.2
								MT	25	35	MT	24	35	4.2
								HT	25	35	HT	24	35	4.2
Rosecrans St	Sports Arena Blvd	Pacific Hwy/Taylor St	35	82'/100'	15,500	22,000	2.00%	Auto	646	35	Auto	917	35	4.2
								MT	6	35	MT	9	35	4.2
								HT	6	35	HT	9	35	4.2
Charles Lindbergh Pkwy (*Fut Road*)	Midway Dr	Sports Arena Blvd	N/A	*50*	N/A	6,000	2.00%	N/A	N/A	N/A	Auto	250	*30*	4.2
								N/A	N/A	N/A	MT	3	*30*	4.2
								N/A	N/A	N/A	HT	3	*30*	4.2
Charles Lindbergh Pkwy (*Fut Road*)	Sports Arena Blvd	Kurtz Street	N/A	*50*	N/A	8,100	2.00%	N/A	N/A	N/A	Auto	338	*30*	4.2
								N/A	N/A	N/A	MT	3	*30*	4.2
								N/A	N/A	N/A	HT	3	*30*	4.2
Dutch Flats Pkwy (*Fut Road*)	Barnett Avenue	Midway Dr	N/A	*50*	N/A	13,300	2.00%	N/A	N/A	N/A	Auto	554	*30*	4.2
								N/A	N/A	N/A	MT	6	*30*	4.2
								N/A	N/A	N/A	HT	6	*30*	4.2
Dutch Flats Pkwy (*Fut Road*)	Midway Dr	Sports Arena Blvd	N/A	*50*	N/A	8,700	2.00%	N/A	N/A	N/A	Auto	363	*30*	4.2
								N/A	N/A	N/A	MT	4	*30*	4.2
								N/A	N/A	N/A	HT	4	*30*	4.2
Barnett Ave	Midway Dr	Pacific Hwy	40	92'/108'	57,954	51,500	2.00%	Auto	2415	40	Auto	2146	40	4.2
								MT	24	40	MT	21	40	4.2
								HT	24	40	HT	21	40	4.2
Washington St	Frontage Rd	Pacific Hwy	25	62'/70'	10,680	16,300	2.00%	Auto	445	25	Auto	679	25	4.2
								MT	4	25	MT	7	25	4.2
								HT	4	25	HT	7	25	4.2
Washington St	Pacific Hwy	Hancock St	25	60'/74'	12,870	22,900	2.00%	Auto	536	25	Auto	954	25	4.2
								MT	5	25	MT	10	25	4.2
								HT	5	25	HT	10	25	4.2
Vine St	California St	Kettner Blvd	25	50'/78'	250	2,000	2.00%	Auto	10	25	Auto	83	25	4.2
								MT	0	25	MT	1	25	4.2
								HT	0	25	HT	1	25	4.2
Sassafras St	Pacific Hwy	Kettner Blvd	25	52'/74'	8,700	21,200	2.00%	Auto	363	25	Auto	883	25	4.2
								MT	4	25	MT	9	25	4.2
								HT	4	25	HT	9	25	4.2
Laurel St	Pacific Hwy	Kettner Blvd	25	54'/70'	26,290	29,500	2.00%	Auto	1095	25	Auto	1229	25	4.2
								MT	11	25	MT	12	25	4.2
								HT	11	25	HT	12	25	4.2
Taylor St	Pacific Hwy/ Rosecrans St	Congress St	35	94'/118'	22,100	30,300	2.00%	Auto	921	35	Auto	1263	35	4.2
								MT	9	35	MT	13	35	4.2
								HT	9	35	HT	13	35	4.2
Taylor St	Congress St	Juan St	35	80'/98'	13,560	21,200	2.00%	Auto	565	35	Auto	883	35	4.2
								MT	6	35	MT	9	35	4.2
								HT	6	35	HT	9	35	4.2
Taylor St	Juan St	Morena Blvd	35	80'/100'	17,530	25,600	2.00%	Auto	730	35	Auto	1067	35	4.2
								MT	7	35	MT	11	35	4.2
								HT	7	35	HT	11	35	4.2

Roadway	From	To	Speed Limit (mph)	Pavement Width / Right-of-Way Width	2012 ADT	2035 ADT	Truck Mix	TNM Input Existing Type	TNM Input Existing Vol.	TNM Input Existing Speed	TNM Input Future Type	TNM Input Future Vol.	TNM Input Future Speed	ADT to CNEL Adjustment (dBA)
Taylor St	Morena Blvd	I-8 EB Ramps	35	20'/20'	13,140	15,300	2.00%	Auto	548	35	Auto	638	35	4.2
								MT	5	35	MT	6	35	4.2
								HT	5	35	HT	6	35	4.2
Twiggs St	Congress St	San Diego Ave	25	30'/42'	2,080	2,600	2.00%	Auto	87	25	Auto	108	25	4.2
								MT	1	25	MT	1	25	4.2
								HT	1	25	HT	1	25	4.2
Twiggs St	San Diego Ave	Juan St	25	30'/50'	2,670	3,600	2.00%	Auto	111	25	Auto	150	25	4.2
								MT	1	25	MT	2	25	4.2
								HT	1	25	HT	2	25	4.2
Harney St	Congress St	San Diego Ave	25	30/42'	1,520	1,800	2.00%	Auto	63	25	Auto	75	25	4.2
								MT	1	25	MT	1	25	4.2
								HT	1	25	HT	1	25	4.2
Harney St	San Diego Ave	Juan St	25	30'/46'	2,350	3,300	2.00%	Auto	98	25	Auto	138	25	4.2
								MT	1	25	MT	1	25	4.2
								HT	1	25	HT	1	25	4.2
Old Town Ave	Hancock St	Moore St	25	28'/36'	11,750	12,400	2.00%	Auto	490	25	Auto	517	25	4.2
								MT	5	25	MT	5	25	4.2
								HT	5	25	HT	5	25	4.2
Old Town Ave	Moore St	San Diego Ave	25	38'/48'	6,120	6,700	2.00%	Auto	255	25	Auto	279	25	4.2
								MT	3	25	MT	3	25	4.2
								HT	3	25	HT	3	25	4.2

Freeway	From	To	Speed Limit (mph)	Lane Quantity (Mainline / Aux)	2012 ADT	2035 ADT	Truck Mix	TNM Input Existing Type	TNM Input Existing Hourly	TNM Input Existing Speed	TNM Input Future Type	TNM Input Future Hourly	TNM Input Future Speed	ADT to CNEL Adjustment (dBA)
Interstate 8	Sports Arena Blvd	I-5	65	6 / 2	102,000	122,200	2.80%	Auto	4250	65	Auto	5092	65	4.2
								MT	60	65	MT	71	65	4.2
								HT	60	65	HT	71	65	4.2
Interstate 8	I-5	Morena Blvd	65	9 / 1	132,000	183,000	2.80%	Auto	5500	65	Auto	7625	65	4.2
								MT	77	65	MT	107	65	4.2
								HT	77	65	HT	107	65	4.2
Interstate 8	Morena Blvd	Hotel Circle	65	9 / 1	191,000	216,900	2.80%	Auto	7958	65	Auto	9038	65	4.2
								MT	111	65	MT	127	65	4.2
								HT	111	65	HT	127	65	4.2
Interstate 5	I-8	Old Town Ave	65	9 / 1	199,000	231,600	4.10%	Auto	8292	65	Auto	9650	65	4.2
								MT	170	65	MT	198	65	4.2
								HT	170	65	HT	198	65	4.2
Interstate 5	Old Town Ave	Washington Ave	65	9 / 0	192,000	227,100	4.10%	Auto	8000	65	Auto	9463	65	4.2
								MT	164	65	MT	194	65	4.2
								HT	164	65	HT	194	65	4.2
Interstate 5	Washington Ave	Pacific Highway	65	8 / 0	142,000	171,400	4.10%	Auto	5917	65	Auto	7142	65	4.2
								MT	121	65	MT	146	65	4.2
								HT	121	65	HT	146	65	4.2
Interstate 5	Pacific Highway	Laurel St	65	8 / 2	147,000	216,400	4.10%	Auto	6125	65	Auto	9017	65	4.2
								MT	126	65	MT	185	65	4.2
								HT	126	65	HT	185	65	4.2

Train Schedule Conversion for FTA Noise Model Input

Entity	Scheduled Quantity During Period				Hourly Breakdown	
	Daytime (7AM-7PM)	Evening (7PM-10PM)	Nighttime (10PM-7AM)		Daytime (7AM-10PM)	Nighttime (10PM-7AM)
Coaster	19	1	2	>	1.33	0.22
Amtrak	17	2	5	>	1.27	0.56
Trolley (Green)	96	11	37	>	7.13	4.11
Freight	0	1	3	>	0.07	0.33
Trolley (Blue 2021)	208	0	37	>	13.87	4.11
Trolley (Combined)	304	11	74	>	21.0	8.2

BNSF Freight Data - Samping of Six 24-Hour Weekdays in 2016

SubDivision	Date Selected	Direction	Train ID	Loads	Emtys[1]	Tons	Time[2]	Length
SAN DIEGO	7/22/2016	WEST	HSDGBAR1 22	1	65	2539	21:20:02	3948
SAN DIEGO	7/29/2016	WEST	HSDGBAR1 29	29	44	4552	21:14:00	5629
SAN DIEGO	8/5/2016	WEST	HSDGBAR1 05	25	55	4100	20:25:18	6600
SAN DIEGO	8/12/2016	WEST	HSDGBAR1 12	9	38	2300	20:23:46	3400
SAN DIEGO	8/13/2016	WEST	HSDGBAR1 13	5	7	1280	20:26:53	780
SAN DIEGO	8/13/2016	EAST	HBARSDG1 13	33	0	4284	22:23:29	2500
SAN DIEGO	8/13/2016	WEST	VSDGCLO1 13	63	0	4070	22:55:51	5725
SAN DIEGO	9/15/2016	EAST	HBARSDG1 15	45	0	4400	23:37:36	3700
SAN DIEGO	9/15/2016	WEST	HSDGBAR1 15	12	56	3356	22:27:45	4855
SAN DIEGO	9/15/2016	EAST	VRICSDG4 12	0	67	3576	22:55:14	6502
SAN DIEGO	9/15/2016	WEST	VSDGCLO1 15	49	0	3409	23:23:13	4688

1. Raw data sheets spell heading as "Emtys" rather than "Emptys"
2. Times have not been adjusted for passing periods at studied CPU areas, reported times occur in Del Mar, CA

Appendix C

FTA Rail Noise Calculation

Vibration Distance Calculations

Federal Transit Administration
Noise Impact Assessment Spreadsheet
Copyright 2007 HMMH Inc.
version: 7/3/2007

Project:	MPH & Old Town CPU

Noise Source Parameters	
Number of Noise Sources:	5

Noise Source Parameters		Source 1
	Source Type:	Fixed Guideway
	Specific Source:	Diesel Electric Locomotive
Daytime hrs	**Avg. Number of Locos/train**	1
	Speed (mph)	30
	Avg. Number of Events/hr	1.33
Nighttime hrs	**Avg. Number of Locos/train**	1
	Speed (mph)	30
	Avg. Number of Events/hr	0.22
Distance	**Distance from Source to Receiver (ft)**	182
	Number of Intervening Rows of Buildings	0
Adjustments		No
		No
		No

Source 1 Results

Leq(day):	51.4 dBA
Leq(night):	43.6 dBA
Ldn:	52.4 dBA

Noise Source Parameters		Source 2
	Source Type:	Fixed Guideway
	Specific Source:	Diesel Electric Locomotive
Daytime hrs	**Avg. Number of Locos/train**	1
	Speed (mph)	30
	Avg. Number of Events/hr	1.27
Nighttime hrs	**Avg. Number of Locos/train**	1
	Speed (mph)	30
	Avg. Number of Events/hr	0.56
Distance	**Distance from Source to Receiver (ft)**	182
	Number of Intervening Rows of Buildings	
Adjustments		

Source 2 Results

Leq(day):	51.2 dBA
Leq(night):	47.7 dBA
Ldn:	54.8 dBA
Incremental Ldn (Src 1-2):	56.8 dBA

Noise Source Parameters		Source 3
	Source Type:	Fixed Guideway
	Specific Source:	Rail Transit Vehicle
Daytime hrs	Avg. Number of Transit Vehicles/train	3
	Speed	25
	Avg. Number of Events/hr	7.13
Nighttime hrs	Avg. Number of Transit Vehicles/train	3
	Speed	25
	Avg. Number of Events/hr	4.11
Distance	Distance from Source to Receiver (ft)	182
	Number of Intervening Rows of Buildings	
Adjustments	Noise Barrier?	No
	Jointed Track?	No
	Embedded Track?	No
	Aerial Structure?	No

Source 3 Results

Leq(day):	45.3 dBA
Leq(night):	42.9 dBA
Ldn:	49.7 dBA
Incremental Ldn (Src 1-3):	57.6 dBA

Noise Source Parameters		Source 4
	Source Type:	Fixed Guideway
	Specific Source:	Diesel Electric Locomotive
Daytime hrs	Avg. Number of Locos/train	2
	Speed (mph)	30
	Avg. Number of Events/hr	0.07
Nighttime hrs	Avg. Number of Locos/train	2
	Speed (mph)	30
	Avg. Number of Events/hr	0.33
Distance	Distance from Source to Receiver (ft)	182
	Number of Intervening Rows of Buildings	
Adjustments		

Source 4 Results

Leq(day):	41.7 dBA
Leq(night):	48.4 dBA
Ldn:	54.3 dBA
Incremental Ldn (Src 1-4):	59.2 dBA

Noise Source Parameters		Source 5
	Source Type:	Fixed Guideway
	Specific Source:	Rail Car
Daytime hrs	Avg. Number of Rail Cars/train	59
	Speed (mph)	30
	Avg. Number of Events/hr	0.07
Nighttime hrs	Avg. Number of Rail Cars/train	59
	Speed (mph)	30
	Avg. Number of Events/hr	0.33
Distance	Distance from Source to Receiver (ft)	182
	Number of Intervening Rows of Buildings	
Adjustments	Noise Barrier?	No
	Jointed Track?	No
	Embedded Track?	No
	Aerial Structure?	No

Source 5 Results

Leq(day):	39.7 dBA
Leq(night):	46.4 dBA
Ldn:	52.3 dBA
Incremental Ldn (Src 1-5):	60.0 dBA

Federal Transit Administration
Noise Impact Assessment Spreadsheet

version: 7/3/2007

Project:	**MPH & Old Town CPU**

Noise Source Parameters	
Number of Noise Sources:	**5**

Noise Source Parameters		**Source 1**
	Source Type:	Fixed Guideway
	Specific Source:	Diesel Electric Locomotive
Daytime hrs	**Avg. Number of Locos/train**	1
	Speed (mph)	30
	Avg. Number of Events/hr	1.33
Nighttime hrs	**Avg. Number of Locos/train**	1
	Speed (mph)	30
	Avg. Number of Events/hr	0.22
Distance	**Distance from Source to Receiver (ft)**	197
	Number of Intervening Rows of Buildings	0
Adjustments		No
		No
		No

Source 1 Results

Leq(day):	50.9 dBA
Leq(night):	43.1 dBA
Ldn:	51.9 dBA

Noise Source Parameters		**Source 2**
	Source Type:	Fixed Guideway
	Specific Source:	Diesel Electric Locomotive
Daytime hrs	**Avg. Number of Locos/train**	1
	Speed (mph)	30
	Avg. Number of Events/hr	1.27
Nighttime hrs	**Avg. Number of Locos/train**	1
	Speed (mph)	30
	Avg. Number of Events/hr	0.56
Distance	**Distance from Source to Receiver (ft)**	197
	Number of Intervening Rows of Buildings	
Adjustments		

Source 2 Results

Leq(day):	50.7 dBA
Leq(night):	47.2 dBA
Ldn:	54.3 dBA
Incremental Ldn (Src 1-2):	56.3 dBA

Noise Source Parameters		Source 3
	Source Type:	Fixed Guideway
	Specific Source:	Rail Transit Vehicle
Daytime hrs	Avg. Number of Transit Vehicles/train	3
	Speed	25
	Avg. Number of Events/hr	21
Nighttime hrs	Avg. Number of Transit Vehicles/train	3
	Speed	25
	Avg. Number of Events/hr	8.2
Distance	Distance from Source to Receiver (ft)	197
	Number of Intervening Rows of Buildings	
Adjustments	Noise Barrier?	No
	Jointed Track?	No
	Embedded Track?	No
	Aerial Structure?	No

Source 3 Results

Leq(day):	49.4 dBA
Leq(night):	45.4 dBA
Ldn:	52.6 dBA
Incremental Ldn (Src 1-3):	57.8 dBA

Noise Source Parameters		Source 4
	Source Type:	Fixed Guideway
	Specific Source:	Diesel Electric Locomotive
Daytime hrs	Avg. Number of Locos/train	2
	Speed (mph)	30
	Avg. Number of Events/hr	0.07
Nighttime hrs	Avg. Number of Locos/train	2
	Speed (mph)	30
	Avg. Number of Events/hr	0.33
Distance	Distance from Source to Receiver (ft)	197
	Number of Intervening Rows of Buildings	
Adjustments		

Source 4 Results

Leq(day):	41.1 dBA
Leq(night):	47.9 dBA
Ldn:	53.8 dBA
Incremental Ldn (Src 1-4):	59.3 dBA

Noise Source Parameters		Source 5
	Source Type:	Fixed Guideway
	Specific Source:	Rail Car
Daytime hrs	**Avg. Number of Rail Cars/train**	59
	Speed (mph)	30
	Avg. Number of Events/hr	0.07
Nighttime hrs	**Avg. Number of Rail Cars/train**	59
	Speed (mph)	30
	Avg. Number of Events/hr	0.33
Distance	**Distance from Source to Receiver (ft)**	197
	Number of Intervening Rows of Buildings	
Adjustments	**Noise Barrier?**	No
	Jointed Track?	No
	Embedded Track?	No
	Aerial Structure?	No

Source 5 Results

Leq(day):	39.2 dBA
Leq(night):	45.9 dBA
Ldn:	51.8 dBA
Incremental Ldn (Src 1-5):	60.0 dBA

Federal Transit Administration
Noise Impact Assessment Spreadsheet

version: 7/3/2007

	Project:	MPH & Old Town CPU

Noise Source Parameters		
	Number of Noise Sources:	5

Noise Source Parameters		Source 1
	Source Type:	Fixed Guideway
	Specific Source:	Diesel Electric Locomotive
Daytime hrs	Avg. Number of Locos/train	1
	Speed (mph)	15
	Avg. Number of Events/hr	1.33
Nighttime hrs	Avg. Number of Locos/train	1
	Speed (mph)	15
	Avg. Number of Events/hr	0.22
Distance	Distance from Source to Receiver (ft)	230
	Number of Intervening Rows of Buildings	0
Adjustments		No
		No
		No

Source 1 Results

Leq(day):	52.9 dBA
Leq(night):	45.1 dBA
Ldn:	53.9 dBA

Noise Source Parameters		Source 2
	Source Type:	Fixed Guideway
	Specific Source:	Diesel Electric Locomotive
Daytime hrs	Avg. Number of Locos/train	1
	Speed (mph)	15
	Avg. Number of Events/hr	1.27
Nighttime hrs	Avg. Number of Locos/train	1
	Speed (mph)	15
	Avg. Number of Events/hr	0.56
Distance	Distance from Source to Receiver (ft)	230
	Number of Intervening Rows of Buildings	
Adjustments		

Source 2 Results

Leq(day):	52.7 dBA
Leq(night):	49.2 dBA
Ldn:	56.3 dBA
Incremental Ldn (Src 1-2):	58.3 dBA

Noise Source Parameters		Source 3
	Source Type:	Fixed Guideway
	Specific Source:	Rail Transit Vehicle
Daytime hrs	Avg. Number of Transit Vehicles/train	3
	Speed	15
	Avg. Number of Events/hr	7.13
Nighttime hrs	Avg. Number of Transit Vehicles/train	3
	Speed	15
	Avg. Number of Events/hr	4.11
Distance	Distance from Source to Receiver (ft)	230
	Number of Intervening Rows of Buildings	
Adjustments	Noise Barrier?	No
	Jointed Track?	No
	Embedded Track?	No
	Aerial Structure?	No

Source 3 Results

Leq(day):	39.3 dBA
Leq(night):	36.9 dBA
Ldn:	43.8 dBA
Incremental Ldn (Src 1-3):	58.4 dBA

Noise Source Parameters		Source 4
	Source Type:	Fixed Guideway
	Specific Source:	Diesel Electric Locomotive
Daytime hrs	Avg. Number of Locos/train	2
	Speed (mph)	30
	Avg. Number of Events/hr	0.07
Nighttime hrs	Avg. Number of Locos/train	2
	Speed (mph)	30
	Avg. Number of Events/hr	0.33
Distance	Distance from Source to Receiver (ft)	230
	Number of Intervening Rows of Buildings	
Adjustments		

Source 4 Results

Leq(day):	40.1 dBA
Leq(night):	46.9 dBA
Ldn:	52.8 dBA
Incremental Ldn (Src 1-4):	59.5 dBA

Noise Source Parameters		Source 5
	Source Type:	Fixed Guideway
	Specific Source:	Rail Car
Daytime hrs	Avg. Number of Rail Cars/train	59
	Speed (mph)	30
	Avg. Number of Events/hr	0.07
Nighttime hrs	Avg. Number of Rail Cars/train	59
	Speed (mph)	30
	Avg. Number of Events/hr	0.33
Distance	Distance from Source to Receiver (ft)	230
	Number of Intervening Rows of Buildings	
Adjustments	Noise Barrier?	No
	Jointed Track?	No
	Embedded Track?	No
	Aerial Structure?	No

Source 5 Results

Leq(day):	38.2 dBA
Leq(night):	44.9 dBA
Ldn:	50.8 dBA
Incremental Ldn (Src 1-5):	60.0 dBA

Federal Transit Administration
Noise Impact Assessment Spreadsheet

version: 7/3/2007

Project:	**MPH & Old Town CPU**

Noise Source Parameters	
Number of Noise Sources:	**5**

Noise Source Parameters		**Source 1**
	Source Type:	Fixed Guideway
	Specific Source:	Diesel Electric Locomotive
Daytime hrs	**Avg. Number of Locos/train**	1
	Speed (mph)	15
	Avg. Number of Events/hr	1.33
Nighttime hrs	**Avg. Number of Locos/train**	1
	Speed (mph)	15
	Avg. Number of Events/hr	0.22
Distance	**Distance from Source to Receiver (ft)**	235
	Number of Intervening Rows of Buildings	0
Adjustments		No
		No
		No

Source 1 Results

Leq(day):	52.8 dBA
Leq(night):	45.0 dBA
Ldn:	53.7 dBA

Noise Source Parameters		**Source 2**
	Source Type:	Fixed Guideway
	Specific Source:	Diesel Electric Locomotive
Daytime hrs	**Avg. Number of Locos/train**	1
	Speed (mph)	15
	Avg. Number of Events/hr	1.27
Nighttime hrs	**Avg. Number of Locos/train**	1
	Speed (mph)	15
	Avg. Number of Events/hr	0.56
Distance	**Distance from Source to Receiver (ft)**	235
	Number of Intervening Rows of Buildings	
Adjustments		

Source 2 Results

Leq(day):	52.6 dBA
Leq(night):	49.0 dBA
Ldn:	56.2 dBA
Incremental Ldn (Src 1-2):	58.1 dBA

Noise Source Parameters		Source 3
	Source Type:	Fixed Guideway
	Specific Source:	Rail Transit Vehicle
Daytime hrs	Avg. Number of Transit Vehicles/train	3
	Speed	15
	Avg. Number of Events/hr	21
Nighttime hrs	Avg. Number of Transit Vehicles/train	3
	Speed	15
	Avg. Number of Events/hr	8.2
Distance	Distance from Source to Receiver (ft)	235
	Number of Intervening Rows of Buildings	
Adjustments	Noise Barrier?	No
	Jointed Track?	No
	Embedded Track?	No
	Aerial Structure?	No

Source 3 Results

Leq(day):	43.9 dBA
Leq(night):	39.8 dBA
Ldn:	47.1 dBA
Incremental Ldn (Src 1-3):	58.5 dBA

Noise Source Parameters		Source 4
	Source Type:	Fixed Guideway
	Specific Source:	Diesel Electric Locomotive
Daytime hrs	Avg. Number of Locos/train	2
	Speed (mph)	30
	Avg. Number of Events/hr	0.07
Nighttime hrs	Avg. Number of Locos/train	2
	Speed (mph)	30
	Avg. Number of Events/hr	0.33
Distance	Distance from Source to Receiver (ft)	235
	Number of Intervening Rows of Buildings	
Adjustments		

Source 4 Results

Leq(day):	40.0 dBA
Leq(night):	46.7 dBA
Ldn:	52.6 dBA
Incremental Ldn (Src 1-4):	59.5 dBA

Noise Source Parameters		Source 5
	Source Type:	Fixed Guideway
	Specific Source:	Rail Car
Daytime hrs	Avg. Number of Rail Cars/train	59
	Speed (mph)	30
	Avg. Number of Events/hr	0.07
Nighttime hrs	Avg. Number of Rail Cars/train	59
	Speed (mph)	30
	Avg. Number of Events/hr	0.33
Distance	Distance from Source to Receiver (ft)	235
	Number of Intervening Rows of Buildings	
Adjustments	Noise Barrier?	No
	Jointed Track?	No
	Embedded Track?	No
	Aerial Structure?	No

Source 5 Results

Leq(day):	38.0 dBA
Leq(night):	44.8 dBA
Ldn:	50.7 dBA
Incremental Ldn (Src 1-5):	60.0 dBA

Pile Driver Ref PPV in/sec @ 25' (FTA 2006):	1.518
Equation Used:	Caltrans 2013, Equation 10, n = 1.1

Caltrans Structure Type	**Threshold (PPV in/sec)**	**Distance Input (feet)**	**Resulting Vibration Level (PPV in/s)**
Historic / Older	0.25	129	0.25
Old Residential	0.3	109	0.3
New Residential	0.5	69	0.5
Modern Industrial/Commercial	0.5	69	0.5

Human Perception (Caltrans 2013):	**Threshold (PPV in/sec)**	**Distance Input (feet)**	**Resulting Vibration Level (PPV in/s)**
Strongly Perceptible	0.1	297	0.1