

4.12 NOISE

This section provides an overview of noise and vibration levels in the CPAs and evaluates the construction and operational impacts associated with the Proposed Plans. Supporting data and calculations are included in Appendix H of this Draft EIR. Topics addressed include short-term construction and long-term operational noise and vibration. The following information provides noise and vibration characteristics and effects.

NOISE CHARACTERISTICS AND EFFECTS

Characteristics of Sound. Sound is technically described in terms of the loudness (amplitude) and frequency (pitch) of the sound. The standard unit of measurement for sound is the decibel (dB). The human ear is not equally sensitive to sound at all frequencies. The “A-weighted scale,” abbreviated dBA, reflects the normal hearing sensitivity range of the human ear. On this scale, the range of human hearing extends from approximately 3 to 140 dBA.¹ **Figure 4.12-1** provides examples of A-weighted noise levels from common sounds.

Noise Definitions. This noise analysis discusses sound levels in terms of Community Noise Equivalent Level (CNEL), Day-Night Noise Level (L_{dn}), and Equivalent Noise Level (L_{eq}).

Community Noise Equivalent Level (CNEL). CNEL is an average sound level during a 24-hour period. CNEL is a noise measurement scale, which accounts for noise source, distance, single event duration, single event occurrence, frequency, and time of day. Human reaction to sound between 7:00 p.m. and 10:00 p.m. is as if the sound were actually 5 dBA higher than if it occurred from 7:00 a.m. to 7:00 p.m. From 10:00 p.m. to 7:00 a.m., humans perceive sound as if it were 10 dBA higher due to the lower background level. Hence, the CNEL is obtained by adding an additional 5 dBA to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and 10 dBA to sound levels in the night from 10:00 p.m. to 7:00 a.m. Because CNEL accounts for human sensitivity to sound, the CNEL 24-hour figure is always a higher number than the actual 24-hour average.²

Day-Night Noise Level (L_{dn}). L_{dn} is similar to CNEL except that a 10 dBA penalty is added from 10:00 p.m. to 7:00 a.m. There is no 5 dBA penalty that exists for the CNEL calculation.³

Equivalent Noise Level (L_{eq}). L_{eq} is the average noise level on an energy basis for any specific time period. The L_{eq} for one hour is the energy average noise level during the hour. The average noise level is based on the energy content (acoustic energy) of the sound. L_{eq} can be thought of as the level of a continuous noise which has the same energy content as the fluctuating noise level. The equivalent noise level is expressed in units of dBA.⁴

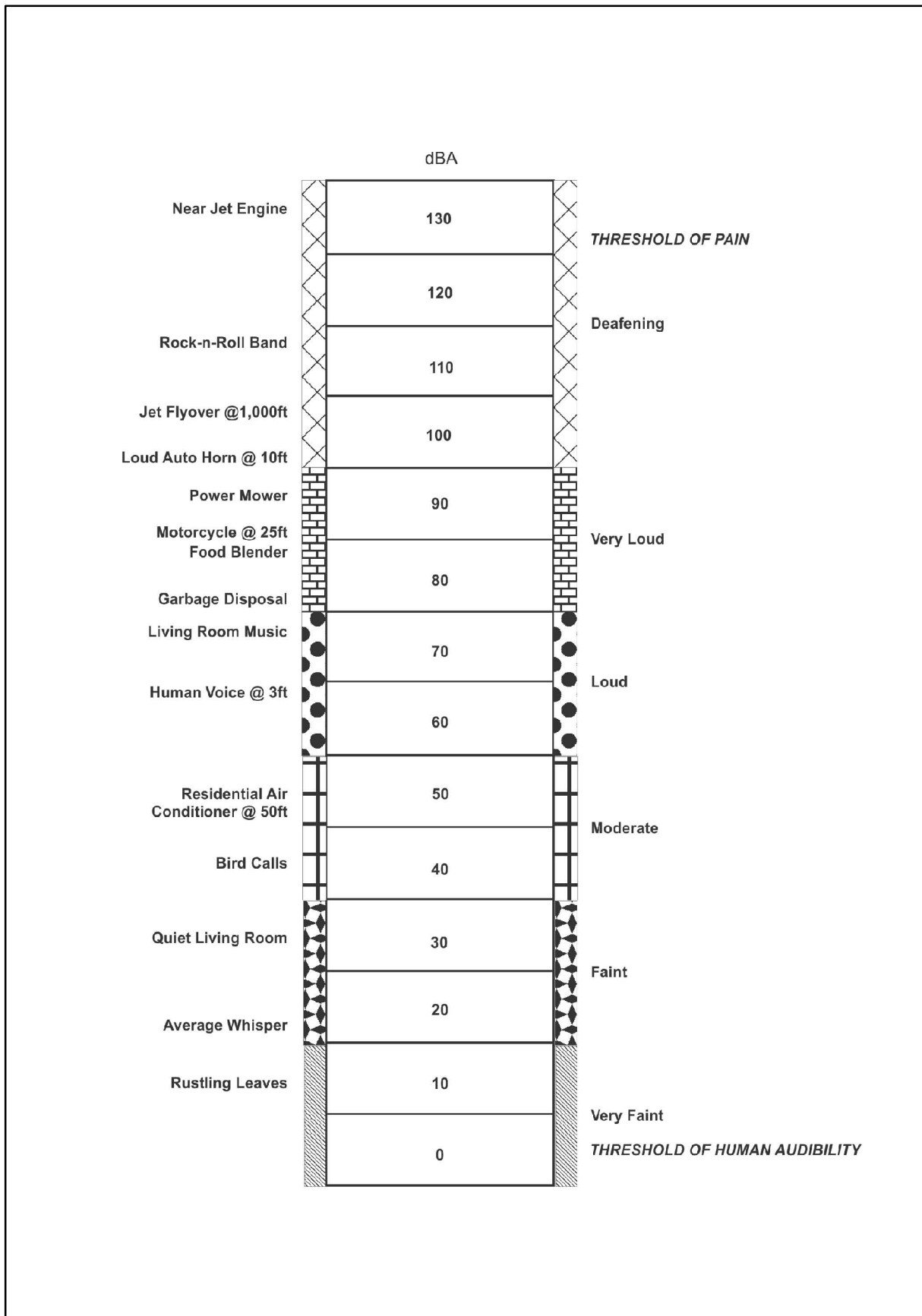
Effects of Noise. Noise is generally defined as unwanted sound. The degree to which noise can impact the human environment ranges from levels that interfere with speech and sleep (annoyance and nuisance) to levels that cause adverse health effects (hearing loss and psychological effects). Human response to noise is subjective and can vary greatly from person to person. Factors that influence individual response include the intensity, frequency, and pattern of noise, the amount of background noise present before the intruding noise, and the nature of work or human activity that is exposed to the noise source.

¹City of Los Angeles, *CEQA Thresholds Guide*, 2006.

²California Department of Transportation, *Technical Noise Supplement*, 2009.

³*Ibid.*

⁴*Ibid.*



SOURCE: Cowan, James P., Handbook of Environmental Acoustics.

Audible Noise Changes. Studies have shown that the smallest perceptible change in sound level for a person with normal hearing sensitivity is approximately 3 dBA. A change of at least 5 dBA is noticeable. A 10-dBA increase is subjectively heard as a doubling in loudness.⁵

Noise levels decrease as the distance from the noise source to the receiver increases. Noise generated by a stationary noise source, or “point source,” will decrease by approximately 6 dBA over hard surfaces (e.g., reflective surfaces such as parking lots or smooth bodies of water) and 7.5 dBA over soft surfaces (e.g., absorptive surfaces such as soft dirt, grass, or scattered bushes and trees) for each doubling of the distance.⁶ For example, if a noise source produces a noise level of 89 dBA at a reference distance of 50 feet, then the noise level would be 83 dBA at a distance of 100 feet from the noise source, 77 dBA at a distance of 200 feet, and so on. Noise generated by a mobile source will decrease by approximately 3 dBA over hard surfaces and 4.8 dBA over soft surfaces for each doubling of the distance.

Noise is most audible when traveling by direct line-of-sight. Line-of-sight is an unobstructed visual path between the noise source and the noise receptor. Barriers, such as walls, berms, or buildings that break the line-of-sight between the source and the receiver greatly reduce noise levels from the source since sound can only reach the receiver by bending over the top of the barrier. However, if a barrier is not high or long enough to break the line-of-sight from the source to the receiver, its effectiveness is greatly reduced.

VIBRATION CHARACTERISTICS AND EFFECTS

Characteristics of Vibration. Vibration is an oscillatory motion through a solid medium in which the motion’s amplitude can be described in terms of displacement, velocity, or acceleration.⁷ Vibration can be a serious concern, causing buildings to shake and rumbling sounds to be heard. In contrast to noise, vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of vibration are trains, buses on rough roads, and construction activities, such as blasting, pile driving, and heavy earth-moving equipment.

Vibration Definitions. There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is most frequently used to describe vibration impacts to buildings and is usually measured in inches per second.⁸ The PPV is defined as the maximum instantaneous peak of the vibration signal. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (Vdb) is commonly used to measure RMS.

Effects of Vibration. High levels of vibration may cause physical personal injury or damage to buildings. Groundborne vibration levels rarely affect human health. Instead, most people consider groundborne vibration to be an annoyance that can affect concentration or disturb sleep. High levels of groundborne vibration can damage fragile buildings or interfere with equipment that is highly sensitive to groundborne vibration (e.g., electron microscopes). Although responses to vibration differ, 65 Vdb is the approximate threshold of perception for many people.⁹ The approximate dividing line between barely and distinctly perceptible is 75 Vdb, and 85 Vdb is typically only acceptable if there are an infrequent number of events per day.

⁵California Department of Transportation, *Technical Noise Supplement*, 2009.

⁶*Ibid.*

⁷FTA, *Transit Noise and Vibration Impact Assessment*, 2006.

⁸*Ibid.*

⁹*Ibid.*

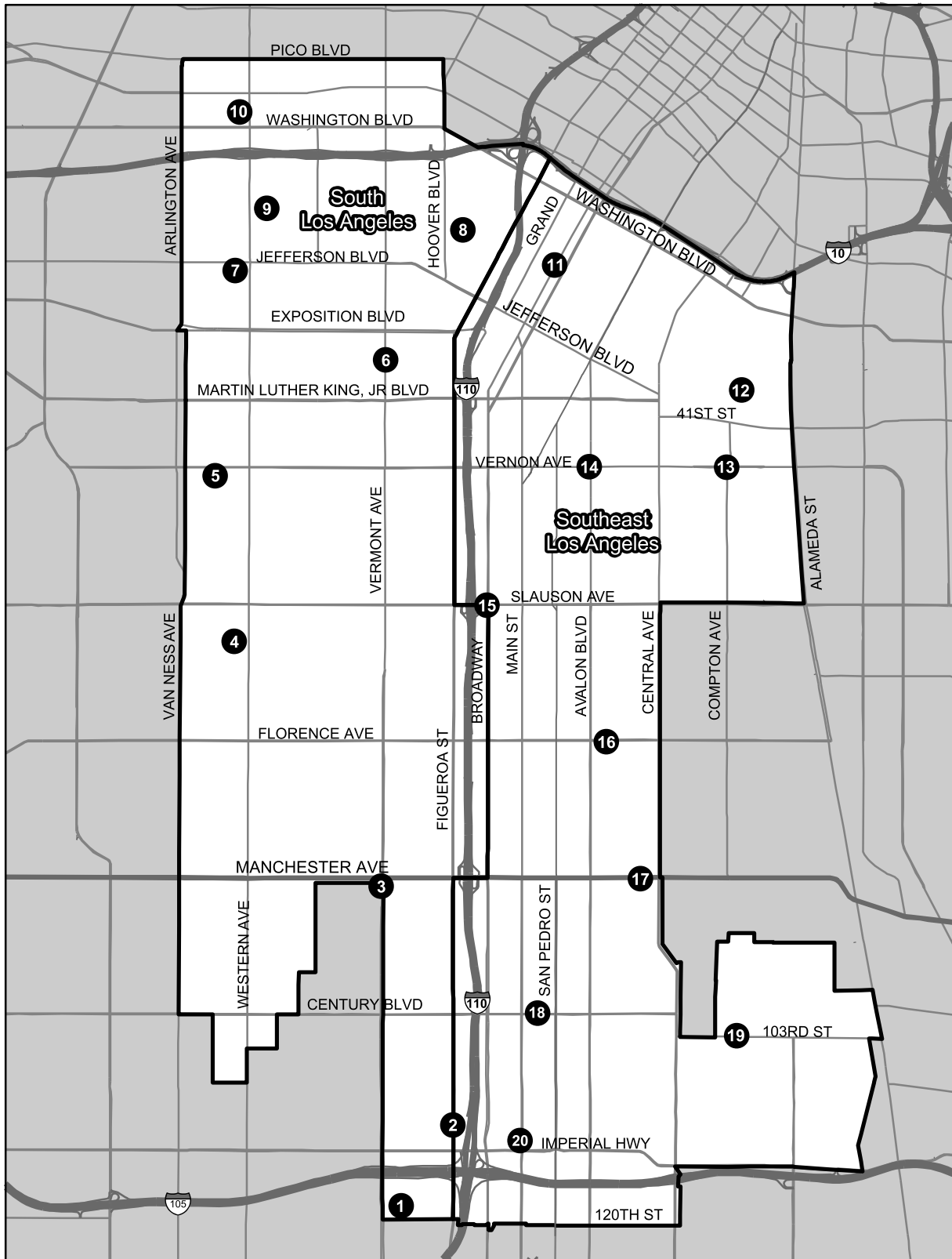
EXISTING SETTING

NOISE

A series of sound measurements were taken on May 10 and 11, 2016 to characterize existing conditions in the CPAs. Sound measurements were taken using a SoundPro DL Sound Level calibrated before and after the measurements. Noise monitoring locations are shown in **Figure 4.12-2**. The locations were selected to represent a wide variety of noise conditions in the CPAs (e.g., busy roadways and residential neighborhoods). **Table 4.12-1** shows that the existing ambient noise levels range between 54.5 and 75.1 dBA L_{eq} . Sources of noise included automobiles, industrial facilities, and common urban activities. In addition, the South Los Angeles CPA intersects with the Airport Influence Area for the Los Angeles International Airport (LAX).¹⁰

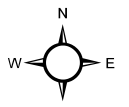
TABLE 4.12-1: EXISTING NOISE LEVELS IN THE CPAS			
Figure 4.12-2 ID No.	Noise Monitoring Location	Land Use Description	Sound Level (dBA, L_{eq})
SOUTH LOS ANGELES CPA			
1	120 th St. and Vermont Ave.	Commercial, Multi-family Residential	70.0
2	Figueroa St. and Imperial Hwy.	Commercial and I-110 Freeway	75.1
3	Vermont Ave and Manchester Ave.	Commercial	73.7
4	Western Ave. and Slauson Ave.	Industrial, School Bus Parking	59.8
5	Vernon Ave. and Western Ave.	Commercial	72.1
6	Vermont Ave. and Exposition Park Dr.	Multi-family, Office, and Stadium/Parking	71.2
7	Jefferson Blvd. and Western Ave.	Single-family Residential	62.1
8	Adams Blvd. and Severance St.	Mixed Residential	57.3
9	Adams Blvd. and Western Ave.	Mixed Residential	54.5
10	Venice Blvd. and Western Ave.	Commercial	72.2
SOUTHEAST LOS ANGELES CPA			
11	Adams Blvd. and Broadway	Commercial	72.8
12	32 nd St. and Nevin Ave.	Mixed Residential and Elementary School	65.3
13	Compton Ave. and Vernon Ave.	Commercial/Mixed Residential	71.5
14	Avalon Blvd. and Vernon Ave.	Commercial	72.9
15	Broadway and Slauson Ave.	Commercial	73.6
16	Florence Ave. and Stanford Ave.	Industrial and Commercial	73.0
17	Manchester Ave. and Wadsworth Ave.	Commercial	73.7
18	Century Blvd. and Wall St.	Single-family Residential, Some Multi-family Residential	72.2
19	103 rd St. and Compton Ave.	Commercial, High School, Middle School, Elementary School, Health Center, Library	68.4
20	Main St. and 113 th St.	Middle School, Commercial	68.4
SOURCE: TAHA, 2016.			

¹⁰Los Angeles County Airport Land Use Commission, *LAX Airport Influence Area*: http://planning.lacounty.gov/assets/upl/project/aluc_airport-lax.pdf, accessed May 23, 2016.



LEGEND:

- Community Plan Area
- # Noise Monitoring Locations



0 4,000 8,000 Feet

SOURCE: TAHA, 2016.



VIBRATION

Common sources of vibration include heavy vehicles on rough roads, construction activities (e.g., earth-moving equipment and pile driving), and rail activity. In addition, commercial or industrial activities may generate vibration (e.g., business that recycle construction debris and use heavy equipment). Vibration has not been monitored in the CPAs for the Draft EIR. The Federal Transit Administration (FTA) has stated that, at 50 feet, the typical background vibration is 52 VdB, the vibration from buses and trucks is 63 VdB, and the vibration from bulldozers is 93 Vdb.¹¹

SENSITIVE RECEPTORS

Noise- and vibration-sensitive land uses are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Sensitive uses include residences, transient lodgings, schools, libraries, churches, hospitals, playgrounds, and parks.¹² It is not practical or particularly useful to identify each one of the above uses within the approximately 9,881 acre (approximately 15.4 square miles) South Los Angeles CPA and approximately 9,887 acre (approximately 15.5 square miles) Southeast Los Angeles CPA. Residential land uses cover the majority of the CPAs accounting for approximately 74 percent of the South Los Angeles CPA and approximately 58 percent of the Southeast Los Angeles CPA. As described in Section 4.14 Public Services, there are approximately 106 public schools, eight libraries, and approximately 73 parks within the CPAs. Also, refer to Section 4.5 Cultural Resources for a discussion of historic properties that may be sensitive to increases in noise and vibration levels.

REGULATORY FRAMEWORK

NOISE

FEDERAL

Federal Aviation Administration (FAA). The FAA sets noise limits for commercial aircraft (14 Code of Federal Regulations (CFR) Part 36) and establishes procedures for airport noise studies and land use compatibility evaluations (14 CFR Part 150) in the Federal Aviation Regulations. Part 150 prescribes the procedures, standards, and methodology governing the development, submission, and review of airport noise exposure maps and airport noise compatibility programs, including the process for evaluating and approving or disapproving those programs. It prescribes single systems for (a) measuring noise at airports and surrounding areas that generally provides a highly reliable relationship between projected noise exposure and surveyed reaction of people to noise; and (b) determining exposure of individuals to noise that results from the operations of an airport. CFR Part 150 also identifies those land uses which are normally compatible with various levels of exposure to noise by individuals. It provides technical assistance to airport operators, in conjunction with other local, state, and federal authorities, to prepare and execute appropriate noise compatibility planning and implementation programs.

U.S. Department of Housing and Urban Development (HUD). HUD regulations may be found in 24 CFR Part 51, Subpart B and include exterior noise standards for new housing construction assisted or supported by the department. HUD states that an acceptable noise level is 65 dBA L_{dn} or less, a normally unacceptable noise level exceeds 65 dBA L_{dn} but does not exceed 75 dBA L_{dn} (appropriate sound attenuation measures must be provided to achieve an acceptable status), and an unacceptable noise level exceeds 75 dBA L_{dn} . HUD regulations do not contain standards for interior noise levels. The noise environment inside a building is considered acceptable if the noise environment external to the building is acceptable and the building is constructed in a manner common to the area.

¹¹FTA, *Transit Noise and Vibration Impact Assessment*, May 2006.

¹²City of Los Angeles, *CEQA Thresholds Guide*, 2006.

STATE

Department of Health Services. The Department of Health Services, Environmental Health Division, has published the Guidelines for Noise and Land Use Compatibility (the State Guidelines) which recommend guidelines for local governments to use when setting standards for human exposure to noise and preparing noise elements for general plans. The State Guidelines indicate that residential land uses and other noise sensitive receptors generally should be located in areas where outdoor ambient noise levels do not exceed 65 to 70 dBA (CNEL or L_{dn}).

Application of this compatibility matrix to development projects is not mandated by the Department of Health Services; however, each jurisdiction is required to consider the State Guidelines when developing its General Plan Noise Element and when determining acceptable noise levels within its community. According to the State Guidelines, an exterior noise level of 60 dBA CNEL is considered to be a “normally acceptable” noise level for single-family, duplex, and mobile homes involving normal, conventional construction, without any special noise insulation requirements. Exterior noise levels up to 65 dBA CNEL are typically considered “normally acceptable” for multi-family units and transient lodging without any special noise insulation requirements. Between these values and 70 dBA CNEL, exterior noise levels are typically considered “conditionally acceptable,” and residential construction should only occur after a detailed analysis of the noise reduction requirements is made and needed noise attenuation features are included in the project design. Exterior noise attenuation features include, but are not limited to, setbacks to place structures outside the conditionally acceptable noise contour and orientation.

Department of Housing and Community Development. The Department of Housing and Community Development has required that new residential units should not be exposed to outdoor ambient noise levels in excess of 65 dBA (CNEL or L_{dn}), and, if necessary, sufficient noise insulation must be provided to reduce interior ambient levels to 45 dBA. Within a 65 dBA exterior noise environment, interior noise levels are typically reduced to acceptable levels (to at least 45 dBA CNEL) through conventional construction, but with closed windows and fresh air supply systems or air conditioning.

LOCAL

The Noise Element of the City of Los Angeles General Plan (General Plan) establishes CNEL guidelines for land use compatibility and includes a number of goals, objectives, and policies for land use planning purposes. The City also has regulations to control unnecessary, excessive, and annoying noise, as cited by the Los Angeles Municipal Code (LAMC) Chapter XI Noise Regulation. These regulations are described further below.





City of Los Angeles General Plan Noise Element. The City of Los Angeles General Plan Noise Element identifies potential significant noise sources, addresses vibration issues, identifies historic and current noise management approaches and guides the development of noise regulations. It addresses noise mitigation regulations, strategies and programs and delineates federal, state and City jurisdiction relative to rail, automotive, aircraft and nuisance noise. **Table 4.12-2** shows Noise Element policies relevant to the Proposed Plans. The City's noise compatibility guidelines are illustrated in **Table 4.12-3**, which indicates that residential land uses and other noise sensitive receptors generally should be located in areas where outdoor ambient noise levels do not exceed 65 to 70 dBA (CNEL or L_{dn}).

TABLE 4.12-2: RELEVANT GENERAL PLAN NOISE GOALS, OBJECTIVES, AND POLICIES	
Goal/Objective/Policy	Goal/Objective/Policy Description
P5	Continue to enforce, as applicable, city, state, and federal regulations intended to abate or eliminate disturbances of the peace and other intrusive noise.
P6	When processing building permits, continue to require appropriate project design and/or insulation measures, in accordance with the California Noise Insulation Standards (Building Code Title 24, Section 3501 et seq.), or any amendments thereto or subsequent related regulations, so as to assure that interior noise levels will not exceed the minimum ambient noise levels, as set forth in the City's noise ordinance (LAMC Section 111 et seq., and any other insulation related requirements) for a particular zone or noise sensitive use, as defined by the California Noise Insulation Standards.
P11	For a proposed development project that is deemed to have a potentially significant noise impact on noise sensitive uses, require mitigation measures, as appropriate, in accordance with California Environmental Quality Act and City procedures.
P12	When issuing discretionary permits for a proposed noise-sensitive use or subdivision of four or more detached single-family units and which use is determined to be potentially significantly impacted by existing or proposed noise sources, require mitigation measures, as appropriate, in accordance with procedures set forth in the California Environmental Quality Act so as to achieve an interior noise level CNEL of 45 dB, or less, in any habitable room as required by LAMC Section 91.
P13	Continue to plan, design and construct or oversee construction of public projects, and projects on City owned properties, so as to minimize potential noise impacts on noise sensitive uses and to maintain or reduce existing ambient noise levels.
P15	Continue to take into consideration, during updating/revision of the City's general plan community plans, noise impacts from freeways, highways, outdoor theaters and other significant noise sources and to incorporate appropriate policies and programs into the plans that will enhance land use compatibility.
P16	Use, as appropriate, the "Guidelines for Noise Compatible Land Use", or other measures that are acceptable to the City, to guide land use and zoning reclassification, subdivision, conditional use and use variance determinations and environmental assessment considerations, especially relative to sensitive uses within a CNEL of 65 dB airport noise exposure areas and within a line-of-sight of freeways, major highways, railroads or truck haul routes.

SOURCE: City of Los Angeles, *Noise Element of the Los Angeles City General Plan*, February 3, 1999.

Los Angeles Municipal Code (LAMC). The City of Los Angeles has established noise ordinances concerning the generation and control of noise that could adversely affect its citizens and noise sensitive land uses. Regarding construction, Section 41.40 (Noise Due to Construction, Excavation Work – When Prohibited) in Chapter IV (Public Welfare) of the LAMC indicates that no construction or repair work shall be performed between the hours of 9:00 p.m. and 7:00 a.m., since such activities would generate loud noises and disturb persons occupying sleeping quarters in any adjacent dwelling, hotel, apartment or other place of residence. No person, other than an individual home owner engaged in the repair or construction of his/her single-family dwelling, shall perform any construction or repair work of any kind or perform such work within 500 feet of land so occupied before 8:00 a.m. or after 6:00 p.m. on any Saturday or on a federal holiday, or at any time on Sunday. Under certain conditions, the City may grant a waiver to allow limited construction activities to occur outside of the limits described above.

Chapter XI (Noise Regulation) of the LAMC includes the ordinances for sources of noise other than construction activities. Chapter XI is intended to prohibit unnecessary, excessive and annoying noises from all sources within the City. There are numerous specific ordinances, many of which do not relate to the impact analysis presented below. This discussion summarizes the general regulations and focuses on the ordinances most relevant to the Proposed Plans.

TABLE 4.12-3: COMMUNITY NOISE EXPOSURE						
Land Use	Community Noise Exposure (dBA, CNEL)					
	55	60	65	70	75	80
Single-Family, Duplex, Mobile Homes	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Multi-Family Homes	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Transient Lodging - Motels, Hotels	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Schools, Libraries, Churches, Hospitals, Nursing Homes	Normally Acceptable	Normally Acceptable	Normally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Auditoriums, Concert Halls, Amphitheaters	Normally Acceptable	Normally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Sports Arena, Outdoor Spectator Sports	Normally Acceptable	Normally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Playgrounds, Neighborhood Parks	Normally Acceptable	Normally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Golf Courses, Riding Stables, Water Recreation, Cemeteries	Normally Acceptable	Normally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Office Buildings, Business Commercial and Professional	Normally Acceptable	Normally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable	Clearly Unacceptable
Industrial, Manufacturing, Utilities, Agriculture	Normally Acceptable	Normally Acceptable	Normally Unacceptable	Clearly Unacceptable	Clearly Unacceptable	Clearly Unacceptable
<p> Normally Acceptable - Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.</p> <p> Conditionally Acceptable - New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply system or air conditionally will normally suffice.</p> <p> Normally Unacceptable - New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.</p> <p> Clearly Unacceptable - New construction or development should generally not be undertaken.</p>						
SOURCE: City of Los Angeles, <i>CEQA Thresholds Guide</i> , 2006.						

A noise level increase from certain regulated noise sources of 5 dBA over the existing or presumed ambient noise level at an adjacent property line is considered a violation of the Noise Regulations. The 5-dBA increase above ambient is applicable to City-regulated noise sources e.g., mechanical equipment), and it is applicable any time of the day. The LAMC states that the baseline ambient noise shall be the actual measured ambient noise level of the City's presumed ambient noise level, whichever is greater. The actual ambient noise level is the measures noise levels averaged over a period of at least 15 minutes. The LAMC indicates that in cases where the actual measured ambient conditions are not known, the City's presumed noise levels should be used. The presumed ambient noise levels are in Section 111.03 (Minimum Ambient Noise Level) of the LAMC (**Table 4.12-4**).

TABLE 4.12-4: PRESUMED EXISTING AMBIENT NOISE LEVEL			
	Zones	dBA	
		Daytime (7:00 a.m. to 10:00 p.m.)	Nighttime (10:00 p.m. to 7:00 a.m.)
Residential	A1, A2, RA, RE, RS, RD, RW1, RW2, R1, R2, R3, R4, and R5	50	40
Commercial	P, PB, CR, C1, C1.5, C2, C4, C5, and CM	60	55
Industrial	M1, MR1, and MR2	60	55
	M2 and M3	65	65

SOURCE: LAMC, Section 111.03.

To account for people's increased tolerance for short-duration noise events, the LAMC provides a 5 dBA allowance for noise sources occurring more than 5 minutes but less than 15 minutes in any 1-hour period (for a total of 10 dBA above the ambient), and an additional 5 dBA allowance (total of 15 dBA above the ambient) for noise sources occurring 5 minutes or less in any 1-hour periods. These additional allowances for short-duration noise sources are applicable to noise sources occurring between the hours of 7:00 a.m. and 10:00 p.m. (daytime hours). Furthermore, the LAMC provides a reduction of 5 dBA for steady high-pitched noise or repeated impulsive noise.

LAMC Section 112.02 requires that any heating, ventilation, and air conditioning (HVAC) system within any zone of the City not cause an increase in ambient noise levels on any other occupied property or if a condominium, apartment house, duplex, or attached business, within any adjoining unit to exceed the ambient noise level by more than 5 dBA.

Section 112.05 (Maximum Noise Level of Powered Equipment or Powered Hand Tools) of the LAMC also specifies the maximum noise level of powered equipment or powered hand tools. Any powered equipment or hand tool that produces a maximum noise level exceeding 75 dBA at a distance of 50 feet is prohibited. However, this noise limitation does not apply where compliance is technically infeasible. Technically infeasible means the above noise limitation cannot be met despite the use of mufflers, shields, sound barriers and/or any other noise reduction device or techniques during the operation of equipment.

Other Regulations (Zoning and Nuisance Abatement). The City's planning and zoning code (LAMC Chapter 1) contains a variety of provisions that directly or indirectly reduce noise impacts on or impacts that are associated with, different types of land uses. The plans designate appropriate land use (zoning) classifications. These regulations guide land use considerations by setting maximum ambient noise levels for specific zones.

The most basic noise management measure is traditional zoning that separates agricultural, residential, commercial and industrial uses. Another is the front yard setback that not only adds attractiveness to a neighborhood but serves to distance homes from adjacent street noise. Side and rear yards also serve as noise buffers. Through zone change and subdivision processes, site or use specific conditions can be

imposed to assure compatibility of land use and to protect users of a site from impacts from adjacent uses. The commercial (C zones) and manufacturing (M zones) provisions of the code contain use specific requirements intended to reduce noise, odor and other impacts on adjacent uses. These include prohibiting of certain commercial and industrial uses within so many feet of residential or less restrictive uses or zones, requiring increased setbacks from residential uses, limiting hours of operation, containing uses wholly within an enclosed building, requiring sound walls, prohibiting openings that face residential uses and prohibiting audibility of noise outside a facility.

Conditional use and zone variance permits (LAMC Sections 12.24, 12.27, 12.28 and 12.29) allow the planning commission, zoning administrators and, on appeal, City Council to assess potential inconsistencies and impose conditions to control noise. Conditional use or use variance permits are required in certain zones for various land uses including, but not limited to, schools, churches, alcohol sales, parks, mixed-use development, and automobile repair facilities. In most cases the uses are allowed by right in less restrictive zones. Some are prohibited entirely in residential zones. The permitting procedures include site investigations, notice to neighbors and hearings to assist decision makers in determining if the use should be permitted and, if permitted, allow imposition of appropriate conditions of approval. Typical conditions include specific site design, setbacks, use limitations on all or parts of the site, walls and hours of operation so as to minimize noise and other impacts.

Supplemental use districts or “overlay zones” (LAMC Section 13) for such uses as oil drilling typically contain construction, installation and operational provisions that are intended to minimize or eliminate noise impacts on adjacent uses. For example, oil drilling district noise mitigation provisions include drilling operation term limits, drilling equipment noise guidelines and a requirement that oil production activities be inaudible outside the enclosed operations structure. In some cases, the commission and City Council are authorized to impose additional conditions to further mitigate potential impacts associated with a particular supplemental use.

Other code provisions allow a zoning administrator to conditionally permit, without public hearing, particular uses allowed in a zone, provided that the uses meet certain criteria, such as provision of additional parking or walls. The additional parking requirements for such uses as health clubs, restaurants, trade schools and auditoriums in part are to minimize noise impacts, especially in the evening and at night on residential neighborhoods.

The City has the authority to revoke, discontinue a use or to impose nuisance abatement conditions on established uses. Use permits may be revoked by the commission, zoning administrator, or, on appeal, by the City Council for nuisance (including disturbance of the peace) or noncompliance with conditions of a conditional permit. In addition, a zoning administrator may discontinue or, on appeal, the board or council may impose operational conditions on existing commercial or industrial uses that are deemed a nuisance, including for excessive noise or disturbance of the peace (LAMC Section 12.21-A.15). These two procedures can be utilized to encourage owners to operate activities on their properties in a manner that is compatible with adjacent uses, particularly residential uses.

Building Sound Insulation Regulations. With the development of inexpensive insulation materials, air conditioning and improved noise reduction techniques it became economically feasible to design buildings that provide effective insulation from outside noise as well as from weather conditions. It has been estimated that standard insulation, efficiently sealing windows and other energy conservation measures reduce exterior-to-interior noise by approximately 15 decibels. Such a reduction generally is adequate to reduce interior noise from outside sources, including street noise, to an acceptable level. Building setbacks and orientation also reduce noise impacts.

Sound transmission control requirements were added to the national Uniform Building Code (UBC) in 1992. The UBC standards were incorporated into the City of Los Angeles Building Code (LAMC Section 91) in 1994. They are consistent with state noise insulation standards (California Building Code Title 24, Section 3501 et seq.), requiring that intrusive noise not exceed 45 dB in any habitable room. As with state

standards, the provisions do not apply to detached single-family residential uses. The City's airport noise abatement programs apply the standard to detached single-family dwellings.

The City of Los Angeles Building Code guides building construction. The insulation provisions are intended to mitigate interior noise from outside sources, as well as sound between structural units. The provisions vary according to the intended use of the building, e.g., residential, commercial, industrial. The regulations are intended to achieve a maximum interior sound level equal to or less than the ambient noise level standard for a particular zone, as set forth in the City's Noise Ordinance.

VIBRATION

There are no adopted City standards for groundborne vibration. The Federal Transit Administration (FTA) regulates vibration levels from proposed projects. According to the FTA, vibration impacts associated with human annoyance would be significant if vibration caused by new development occurring because of implementation of the Proposed Plans exceeds 85 VdB, which is the vibration level that is considered to be acceptable only if there are an infrequent number of events per day. In terms of groundborne vibration impacts on structures, the FTA vibration damage threshold is approximately 90 VdB for buildings extremely susceptible to building damage (e.g., historic structures) and 98 VdB for engineered concrete and masonry buildings without plaster (e.g., typical urban development).¹³

There are no adopted state policies or standards for groundborne vibration. The traditional view has been that common vibrations related to roadway traffic and construction activities pose no threat to buildings or structures. The California Department of Transportation recommends that extreme care be taken when sustained pile driving occurs within 7.5 meters (25 feet) of any building and 15 to 30 meters (50 to 100 feet) of a historic building or a building in poor condition.

THRESHOLDS OF SIGNIFICANCE

In accordance with Appendix G of the State CEQA Guidelines, the Proposed Plans would have a significant impact related to noise if they would:

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

Based on the City of Los Angeles CEQA Thresholds Guide, which was developed to address the Appendix G thresholds listed above, implementation of the Proposed Plans would have a significant impact on noise levels from construction and/or operations if:

- Construction activities lasting more than one day would exceed existing ambient noise levels by 10 dBA or more at a noise-sensitive use;

¹³FTA, *Transit Noise and Vibration Impact Assessment*, May 2006.

- Construction activities lasting more than ten days in a three-month period would exceed existing ambient noise levels by 5 dBA or more at a noise-sensitive use; and/or
- Construction activities would exceed the ambient noise level by 5 dBA at a noise-sensitive use between the hours of 9:00 p.m. and 7:00 a.m. Monday through Friday, before 8:00 a.m. or after 6:00 p.m. on Saturday, or anytime on Sunday.
- Permanent ambient noise level measured at the property line of affected uses increases by 3 dBA CNEL to or within the “normally unacceptable” or “clearly unacceptable” categories, as shown in **Table 4.12-3**, or any 5 dBA or more increase in noise level.

There are no adopted City standards for vibration. Based on regulatory guidance, vibration impacts associated with human annoyance would be significant if vibration caused by new development occurring because of implementation of the Proposed Plans exceeds 85 VdB, which is the vibration level that is considered to be acceptable only if there are an infrequent number of events per day.¹⁴ In terms of groundborne vibration impacts on structures, the FTA vibration damage threshold is approximately 100 VdB for fragile buildings and approximately 95 VdB for extremely fragile historic buildings.¹⁵

METHODOLOGY

The noise and vibration analysis considers construction and operational sources. Construction noise levels were based on example equipment levels provided in the Thresholds Guide. Construction noise levels were also provided for various phases of construction activity based on the same source. Construction vibration levels were based on example equipment levels provided in FTA's Transit Noise and Vibration Impact Assessment guidance document.¹⁶ Mobile source noise levels were estimated using the Federal Highway Administration (FHWA) RD-77-108 methodology. This methodology accounts for traffic volumes, roadway width, and vehicle mix. The analysis also discussed operational mechanical equipment noise (e.g., heating, ventilation, and air conditioning [HVAC]), land use compatibility, and operational vibration.

Regarding the mobile source noise analysis, there are two CEQA cases that address analysis scenarios of long-range planning documents: 1) *Sunnyvale West Neighborhood Assoc. v. City of Sunnyvale City Council (6th Dist. 2010) 190 Cal.App.4th 1351* (Sunnyvale West); and 2) *Neighbors for Smart Rail v. Exposition Metro Line Construction Authority (2013) 57 Cal.4th 439* (Expo II). The first case indicated that project impacts should be compared directly to existing conditions. The second case clarified that comparison to an existing condition may not be appropriate if there is, “substantial evidence that an analysis based on existing conditions would tend to be misleading or without informational value to EIR users.” For a planning project that would be implemented over time, comparing the Reasonably Expected Development to existing conditions would be misleading and of little or no informational value because the CPAs cannot be built out immediately. Impacts would not occur in the context of existing conditions but rather in the future context once the Proposed Plans have had time to be realized. For a planning project, significance of impacts is appropriately assessed based on a comparison between Future (2035) with Project conditions (at the earliest time the level of Reasonably Expected Development could reasonably be expected) and Future (2035) No Project conditions. The changes in the Proposed Plans are anticipated to only be fully realized over time, with improvements anticipated to be implemented over the next 20 years or later. Since the Proposed Plans would be completed in the future, an analysis of the Proposed Plans compared to baseline year conditions is inappropriate and of limited informational value (because of the 20-year life of the Proposed Plans). Nonetheless, a comparison to baseline year conditions is also provided in the Impact Section. Therefore, an analysis of the Proposed Project's future (2035) land use changes and associated mobile noise impacts are compared to future mobile noise impacts in 2035 without the proposed project.

¹⁴FTA, *Transit Noise and Vibration Impact Assessment*, May 2006.

¹⁵*Ibid.*

¹⁶*Ibid.*

This discussion of noise addresses impacts for both of the CPAs. No distinction is made between Change Areas and Non-Change Areas within the CPAs where zoning controls would not change because noise levels are a direct function of both mobile sources (traffic in the CPAs) and construction activity throughout the CPAs.

IMPACTS

Impact 4.12-1 Would implementation of the Proposed Plans expose people to or generate noise in levels in excess of standards established in the local general plan or noise ordinance? Mitigation Measure N1 reduces construction impacts, but not to a less than significant level. Mitigation Measure N2 reduces potential operational noise impacts. This impact is significant and unavoidable for construction-related impacts and less than significant for operational-related impacts.

The Thresholds Guide includes impact assessment methodology and thresholds for assessing if a project would expose people to or generate noise in levels in excess of standards established in the LAMC and/or Noise Element of the General Plan.

Construction Noise

Construction activity occurring within the CPAs would result in temporary increases in ambient noise levels on an intermittent basis. Noise levels would fluctuate depending on the construction phase, equipment type and duration of use, distance between the noise source and receptor, and presence or absence of noise attenuation barriers. Construction activities typically require the use of numerous pieces of noise-generating equipment. Typical noise levels at 50 feet from various types of equipment that may be used during construction are listed in **Table 4.12-5**. The loudest noise levels are typically generated by impact equipment (e.g., pile drivers) and heavy-duty equipment (e.g., scrapers and graders).

Construction activities occurring within the CPAs are subject to Regulatory Compliance Measures associated with the City ordinances. These include:

- Compliance with the Noise Ordinance No. 161,574, and any subsequent ordinances, which prohibit the emission or creation of noise beyond certain levels at adjacent uses unless technically infeasible.
- Compliance with Section 41.40 of the LAMC, which restricts construction activities to the hours of 7:00 a.m. to 6:00 p.m. Monday through Friday, and 8:00 a.m. to 6:00 p.m. on Saturday, and prohibits activities on Sundays and federal holidays.
- Compliance with the City's Building Regulations Ordinance No. 178,048, which requires a construction site notice to be provided that includes the following information: job site address, permit number, name and phone number of the contractor and owner or owner's agent, hours of construction allowed by code or any discretionary approval for the site, and City's telephone numbers where violations can be reported. The notice shall be posted and maintained at the construction site prior to the start of construction and displayed in a location that is readily visible to the public and approved by the City's Department of Building and Safety.

Notwithstanding the exemptions provided in Section 41.40, LAMC Section 112.05 establishes performance standards for powered equipment or tools. The maximum allowable noise level for most construction equipment within 500 feet of any residential zone is 75 dBA measured at 50 feet from the noise source. This restriction holds unless compliance is not technically feasible even with the use of noise "mufflers, shields, sound barriers, and/or other noise reduction devices or techniques."

TABLE 4.12-5: MAXIMUM NOISE LEVELS OF COMMON CONSTRUCTION MACHINES	
Noise Source	Noise Level at 50 feet (dBA) /a/
Front Loader	73-86
Trucks	82-95
Cranes (moveable)	75-88
Cranes (derrick)	86-89
Vibrator	68-82
Saws	72-82
Pneumatic Impact Equipment	83-88
Jackhammers	81-98
Pumps	68-72
Generators	71-83
Compressors	75-87
Concrete Mixers	75-88
Concrete Pumps	81-85
Back Hoe	73-95
Pile Driving (peaks)	95-107
Tractor	77-98
Scraper/Grader	80-93
Paver	85-88

/a/ Machinery equipped with noise control devices or other noise-reducing design features does not generate less noise than shown in the table.
SOURCE: City of Los Angeles, *CEQA Thresholds Guide*, 2006.

Noise would be experienced by sensitive uses due to construction activities associated with development pursuant to the Proposed Plans. Sensitive uses are located throughout the CPAs, and as specific development plans have not yet been determined at individual sites, for the purpose of this analysis it is assumed that sensitive receptors could be as close as 50 feet from where construction would take place. As shown in **Table 4.12-5**, above, sensitive receptors could experience noise levels ranging from 71 to 107 dBA L_{eq} . Typical construction noise levels could exceed the 75 dBA L_{eq} at 50 feet standard in the LAMC. Therefore, prior to implementation of mitigation, the Proposed Plans would result in a *significant impact* related to construction noise exceeding established standards.

Operational Noise

The analysis below assesses the impacts of the proposed zones on the surrounding community (e.g., future industrial adjacent to existing residential). It does not assess the impact of the existing community to a new zone (e.g., existing manufacturing adjacent to future residential).

The assessment considers the general compatibility between land uses allowed in changed zones and the type of existing adjacent (i.e., abutting and across the street) land uses. The Proposed Plans are designed to reduce conflicts and promote compatible development. There are areas where noise conflicts would exist, either on the boundary between zones or in area with mixed land uses. For example, single-family residential zones could be converted to mixed-use zones as well as neighborhood-serving commercial land uses such as grocery stores. A new grocery store located next to a single-family or multi-family residence could increase noise levels due a variety of noise sources, including truck deliveries and parking activity, and thus would be potentially incompatible. The proposed zoning would potentially have a greater noise impact on adjacent sensitive uses compared to existing zoning.

As another example, some multi-family residential zones would be converted to the mixed-use commercial/residential zones. The mixed-use zones would mostly be developed with residential uses, but could also be developed entirely as commercial use. Thus, commercial uses could be operational adjacent to residences, schools, or other existing sensitive uses. As discussed above, due to noise sources such as truck delivery, commercial uses would potentially impact adjacent sensitive uses.

There are some areas where noise levels would be reduced by zone changes. For example, some manufacturing zoning would be converted to new industrial zones or hybrid industrial zones that would not allow traditional industrial uses, rather uses tailored toward 21st century industries, such as creative office, research and development, media, and technology. It is not anticipated that new industrial land uses would generate more noise than existing manufacturing facilities, which typically include substantial operations of mechanical equipment. New industrial and hybrid industrial land uses would include the operations of some mechanical equipment (e.g. HVAC equipment); however, the noise generated by this equipment would be similar or less than the noise generated by heavier equipment that is typically associated with manufacturing facilities allowed in the existing manufacturing zones. Therefore, the proposed zoning would have a lesser impact on adjacent sensitive uses compared to the existing zoning.

Under the Proposed Plans, the majority of new large development that could potentially cause noise impacts would be located within the CPIO District Subareas because the Subareas cover nearly all Commercial and Industrial land in the CPAs. Most development in non-CPIO areas would not be expected to have noise impacts because development would be residential in nature and smaller than development along the commercial corridors and in industrial areas, and most projects would qualify for an infill exemption. Similarly, large-scale development is not anticipated in the Residential Subareas (M, N, and O) of the CPIOs, where new development would be limited to low- to medium-scale residential uses.

The City's existing development standards and the proposed CPIO development standards would reduce the potential for land use inconsistencies. A primary goal of the Proposed Plans is to reduce residential-industrial land use conflicts. This would be accomplished by: 1) establishing CPIOs with development standards for industrial land that is located in close proximity to residential uses in order to restrict new noxious incompatible uses, requiring all operations to occur within an enclosed building, and require buffering and screening elements that protect adjacent uses; and 2) amending General Plan Land Use designations and zones on current industrially-designated land to create consistency with as-built conditions in areas that are predominantly commercial and/or residential and to prohibit new incompatible industrial uses in these areas. Foreseeable projects would be consistent with the LAMC and the CPIO development standards, which are anticipated to reduce potential noise impacts to a less than significant level. However, it is not possible to identify all projects and potential inconsistencies that would be developed after implementation of the Proposed Plans. Therefore, prior to implementation of mitigation and due to the introduction of new land uses, the Proposed Plans would result in a *significant impact* related to exposing persons to or generating noise levels in excess of established standards.

UBC standards were incorporated into LAMC Section 91 in 1994 requiring that intrusive noise not exceed 45 dBA in any habitable room. Although impacts of the environment on the project are not assessed in this section, current development standards (e.g., double-paned windows associated with Title 24) would ensure that interior noise levels are less than 45 dB. Refer to Section 4.10 Land Use and Planning for a discussion of land use compatibility with existing noise conditions, including guidelines referenced in the Noise Element of the General Plan.

The City of Los Angeles General Plan Noise Element identifies potential significant noise sources, addresses vibration issues, identifies noise management approaches and guides the development of noise regulations. **Table 4.12-6** includes City policies in the Noise Element of the General Plan that are relevant to the Proposed Plans. The Proposed Plans would be consistent with the guidelines in the General Plan.

TABLE 4.12-6: CONSISTENCY WITH GENERAL PLAN NOISE GOALS, OBJECTIVES, AND POLICIES

Goal/Objective/Policy	Goal/Objective/Policy Description	Project Consistency
P5	Continue to enforce, as applicable, city, state, and federal regulations intended to abate or eliminate disturbances of the peace and other intrusive noise.	Consistent: The Proposed Plans do not change or affect any existing regulations and are consistent with the standards established in the LAMC.
P6	When processing building permits, continue to require appropriate project design and/or insulation measures, in accordance with the California Noise Insulation Standards (Building Code Title 24, Section 3501 et seq.), or any amendments thereto or subsequent related regulations, so as to assure that interior noise levels will not exceed the minimum ambient noise levels, as set forth in the City's noise ordinance (LAMC Section 111 et seq., and any other insulation related requirements) for a particular zone or noise sensitive use, as defined by the California Noise Insulation Standards.	Consistent: Refer to Section 4.10, Land Use and Planning for a discussion of project consistency with ambient noise levels. Implementation of the Proposed Plans would not inhibit mandatory compliance with the LAMC or Building Code.
P11	For a proposed development project that is deemed to have a potentially significant noise impact on noise sensitive uses, require mitigation measures, as appropriate, in accordance with California Environmental Quality Act and City procedures.	Consistent: The Proposed Plans will include Mitigation Measure N1 to reduce impacts identified in this EIR.
P12	When issuing discretionary permits for a proposed noise-sensitive use or subdivision of four or more detached single-family units and which use is determined to be potentially significantly impacted by existing or proposed noise sources, require mitigation measures, as appropriate, in accordance with procedures set forth in the California Environmental Quality Act so as to achieve an interior noise level CNEL of 45 dB, or less, in any habitable room as required by LAMC Section 91.	Consistent: Refer to Section 4.10, Land Use and Planning for a discussion of project consistency with ambient noise levels. Current development standards (e.g., double-paned windows associated with Title 24) ensure that interior noise levels are less than 45 dB.
P13	Continue to plan, design and construct or oversee construction of public projects, and projects on City owned properties, so as to minimize potential noise impacts on noise sensitive uses and to maintain or reduce existing ambient noise levels.	Consistent: The Proposed Plans include mitigation measures to reduce impacts identified in this EIR.
P15	Continue to take into consideration, during updating/revision of the City's general plan community plans, noise impacts from freeways, highways, outdoor theaters and other significant noise sources and to incorporate appropriate policies and programs into the plans that will enhance land use compatibility.	Consistent: A primary goal of the Proposed Plans is to promote land use compatibility. Refer to Section 4.10 Land Use and Planning for a discussion of project consistency with ambient noise levels.
P16	Use, as appropriate, the "Guidelines for Noise Compatible Land Use", or other measures that are acceptable to the City, to guide land use and zoning reclassification, subdivision, conditional use and use variance determinations and environmental assessment considerations, especially relative to sensitive uses within a CNEL of 65 dB airport noise exposure areas and within a line-of-sight of freeways, major highways, railroads or truck haul routes.	Consistent: A primary goal of the Proposed Plans is to promote land use compatibility. Refer to Section 4.10, Land Use and Planning for a discussion of project consistency with ambient noise levels.

SOURCE: City of Los Angeles, *Noise Element of the Los Angeles City General Plan*, February 3, 1999; TAHA, 2016.

Mitigation Measures

- N1** Any approval of a project located within a CPIO Subarea (except for Residential Subareas M, N, and O) shall ensure that all contractors include the following best management practices in contract specifications, where applicable:
- Construction haul truck and materials delivery traffic shall avoid residential areas whenever feasible. If no alternatives are available, truck traffic shall be routed on streets with the fewest residences.
 - The construction contractor shall locate construction staging areas away from sensitive uses.
 - When construction activities are located in close proximity to noise-sensitive land uses, noise barriers (e.g., temporary walls or piles of excavated material) shall be constructed between activities and noise sensitive uses.
 - Impact pile drivers shall be avoided where possible in noise-sensitive areas. Drilled piles or the use of a sonic vibratory pile driver are quieter alternatives that shall be utilized where geological conditions permit their use. Noise shrouds shall be used when necessary to reduce noise of pile drilling/driving.
 - Construction equipment shall be equipped with mufflers that comply with manufacturers' requirements.
 - The construction contractor shall use on-site electrical sources to power equipment rather than diesel generators where feasible.
- N2** The following conditions shall apply to future development within the CPIO Subareas (except Residential Subareas M, N, and O):
- Industrial activity yards that include the operation of heavy equipment shall be shielded by sound barriers that block line-of-sight to sensitive receptors.
 - Mechanical equipment (e.g., heating, ventilation and air conditioning (HVAC) Systems) shall be enclosed with sound buffering materials.
 - Truck loading/unloading activity shall be prohibited between the hours of 10:00 p.m. and 7:00 a.m. when located within 200 feet of a residential land use.
 - Parking structures located within 200 feet of any residential use shall be constructed with a solid wall abutting the residences and utilize textured surfaces on garage floors and ramps to minimize tire squeal.

Level of Significance of Impact after Mitigation

Implementation of Mitigation Measure **N1** would reduce construction noise levels at existing and future noise-sensitive receptors during construction activities associated with implementation of the Proposed Plans (where those activities are located within non-Residential CPIO Subareas). Although most construction activities located in the Residential Subareas of the CPIOs or outside of the CPIOs are not anticipated to have noise impacts, it is possible that a small number of projects in these areas may have impacts. However, requiring Mitigation Measure **N1** for all projects in the CPAs would be infeasible because the City as a policy matter has determined the use of staff resources to apply these mitigation measures to all residential projects in the CPIO subareas (including M, N, and O) and outside the CPIO subareas is not justified. It would require City staff to evaluate each and every project, including otherwise ministerial projects, to determine if that project, because of its unique characteristics, should be subject to this mitigation measure. Alternatively, it would require the rezoning every property in both CPAs (thousands of additional lots). From an implementation and administrative point of view requiring these procedures or actions would be extremely difficult and require an inordinate amount of staff time and resources to capture the small number of projects that could have noise impacts. In addition, as identified in **Table 4.12-5**, above, noise levels from various mechanized construction equipment would exceed 75 dBA at distances of 50 feet from the equipment which could exceed the limitations established in LAMC Section 112.05. Depending on the location of construction activities, typical construction noise levels could still exceed 75 dBA despite implementation of mitigation. Implementation of environmental review on a discretionary project level

(Mitigation Measure N1) would help to reduce this impact, but not necessarily to less than significant, because certain construction activities may still be required in proximity to nearby sensitive receptors, and construction-related noise levels could exceed the 75 dBA threshold. Construction activity would be short-term and temporary at each location, although construction is anticipated to be ongoing somewhere in the area throughout the time frame of the Proposed Plans. Regardless, impacts related to the generation of construction noise in excess of the LAMC standards under the Proposed Plans would be **significant and unavoidable**.

Implementation of Mitigation Measure N2 will be incorporated into the environmental standards for projects in the non-residential CPIO subareas. Implementation of these common industry standard mitigation measures is expected to reduce potential operational noise impacts from industrial and commercial operations to **less than significant**.

Impact 4.12-2 Would implementation of the Proposed Plans expose people to or generate excessive vibration or groundborne noise levels? This impact is significant and unavoidable for construction-related vibration and less than significant for operational-related vibration.

Construction Vibration

Construction activity can result in varying degrees of ground vibration depending on the equipment and methods employed. Operation of construction equipment causes vibrations that spread through the ground and diminish in strength with distance. Buildings founded on the soil in the vicinity of the construction site respond to these vibrations with varying results ranging from no perceptible effects at the lowest levels, low rumbling sounds and perceptible vibrations at moderate levels, and slight damage at the highest levels.

Table 4.12-7 shows construction equipment vibration levels based on various reference distances. Construction vibration is a localized event and is typically only perceptible to a receptor that is in close proximity to the vibration source. The type of low- or mid-rise buildings anticipated to be built under the Proposed Plans would typically be constructed with loaders and bulldozers. However, it is possible that pile driving would be necessary depending on site-specific geologic conditions. Construction equipment would typically generate vibration levels up to 87 Vdb at 25 feet, although pile driving could generate a vibration level of 112 Vdb at 25 feet. It is possible that heavy equipment could operate within 25 feet of, or adjacent to nearby buildings.

TABLE 4.12-7: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT				
Equipment	Approximate Vdb			
	25 Feet	50 Feet	75 Feet	100 Feet
Pile Driver (Impact)	112	106	102	100
Caisson Drilling	87	81	77	75
Large Bulldozer	87	81	77	75
Loaded Trucks	86	80	76	74
Jackhammer	79	73	69	67
Small Bulldozer	58	52	48	46

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

The vibration levels associated with this equipment could exceed the 90 VdB significance thresholds for buildings extremely susceptible to building damage (e.g., historic structures). Refer to Section 4.5, Cultural Resources for a discussion of historic structures located in the CPAs. In addition, vibration levels could exceed 98 VdB significance threshold for engineered concrete and masonry buildings without plaster (e.g., typical urban development), causing building damage or substantial human annoyance. Therefore, prior to implementation of mitigation, the Proposed Plans would result in a **significant impact** related to construction vibration.

Operational Vibration

It is not anticipated that the CPAs will be developed with substantial sources of vibration (e.g., blasting operations). Operational groundborne vibration in the project vicinity would be generated by vehicular travel on the local roadways. According to the FTA, Transit Noise and Vibration Impact Assessment guidance document, vibration from traffic is rarely perceptible.¹⁷ Similar to existing conditions, traffic vibration levels even with the expected additional trips from the Proposed Plans would not be perceptible by sensitive receptors. Therefore, impacts related to operational vibration under the Proposed Plans would be *less than significant*.

Mitigation Measures

N3 Any approval of a project located within a CPIO Subarea (except for Residential Subareas M, N, and O) that is adjacent to buildings listed or determined eligible for listing in the National Register of Historic Places or the California Register of Historical Resources, designated as a Historic-Cultural Monument by the City of Los Angeles, within a Historic Preservation Overlay Zone (“historic buildings”), or determined to be historically significant in SurveyLA or other historic resource survey meeting all of the requirements of Public Resources Code, section 5024.1(g), shall ensure all of the following requirements are or will be met:

- Historic buildings adjacent to the project’s construction zones are identified.
- A Vibration Control Plan is prepared and approved by the City.
- The Vibration Control Plan shall be completed by a qualified structural engineer.
- The Vibration Control Plan shall include a pre-construction survey letter establishing baseline conditions at potentially affected buildings. The survey letter shall provide a shoring design to protect the identified land uses from potential damage. The structural engineer may recommend alternative procedures that produce lower vibration levels such as sonic pile driving or caisson drilling instead of impact pile driving.

At the conclusion of vibration causing activities, the qualified structural engineer shall issue a follow-up letter describing damage, if any, to impacted buildings. The letter shall include recommendations for any repair, as may be necessary, in conformance with the Secretary of the Interior Standards. Repairs shall be undertaken and completed in conformance with all applicable codes including the California Historical Building Code (Part 8 of Title 24).

N4 Any approval of a project located within a CPIO Subarea (except for Residential Subareas M, N, and O) shall ensure that all contractors include the following best management practices in contract specifications, where applicable:

- Impact pile drivers shall be avoided where possible in vibration-sensitive areas. Drilled piles or the use of a sonic vibratory pile driver are alternatives that shall be utilized where geological conditions permit their use.
- The construction activities shall involve rubber-tired equipment rather than metal-tracked equipment.
- The construction contractor shall manage construction phasing (scheduling demolition, earthmoving, and ground-impacting operations so as not to occur in the same time period), use low-impact construction technologies, and shall avoid the use of vibrating equipment where possible to avoid construction vibration impacts.

Level of Significance of Impact after Mitigation

Impacts related to operational vibration were determined to be less than significant without mitigation. Impacts related to construction vibration were determined to be significant without mitigation. Although

¹⁷FTA, *Transit Noise and Vibration Impact Assessment*, May 2006.

most construction activities located in the Residential Subareas of the CPIOs or outside of the CPIOs are not anticipated to have vibration impacts, it is possible that a small number of projects in these areas may have impacts. However, requiring Mitigation Measures N3 and N4 for all projects in the CPAs would be infeasible because the City as a policy matter has determined the use of staff resources to apply these mitigation measures to all residential projects in the CPIO subareas (including M, N, and O) and outside the CPIO subareas is not justified. It would require City staff to evaluate each and every project, including otherwise ministerial projects, to determine if that project, because of its unique characteristics, should be subject to these mitigation measures. Alternatively, it would require the rezoning every property in both CPAs (thousands of additional lots). From an implementation and administrative point of view requiring these procedures or actions would be extremely difficult and require an inordinate amount of staff time and resources to capture the small number of projects that could have vibration impacts. It is difficult to quantify the vibration reduction associated with Mitigation Measure N3 without project specifics, including the distance from the equipment to the historic land use. However, implementing caisson drilling instead of impact pile driving would reduce vibration levels from 112 Vdb at 25 feet to approximately 87 Vdb at 25 feet. The unmitigated analysis also concluded that vibration levels could exceed 98 VdB significance threshold for engineered concrete and masonry buildings without plaster (e.g., typical urban development), causing building damage or substantial human annoyance. Vibration is an unavoidable byproduct of construction activity. In an urban environment, vibration from construction equipment is related to the weight and movements of equipment. In the absence of specific projects with detailed construction requirements, there is no feasible mitigation to control equipment weight and movements from construction activity associated with each infill project.

It is anticipated that Mitigation Measure N3 would substantially reduce/control construction vibration for historically designated or national, state or local eligible structures. In addition, Mitigation Measure N4 would limit vibration levels at uses other than historic properties. However, in the absence of construction details associated with specific projects and without knowing the proximity of construction activities to specific receptors, it is anticipated that construction vibration levels at adjacent buildings could exceed the thresholds of significance. Therefore, the Proposed Plans would result in a *significant and unavoidable* impact related to construction vibration.

Impact 4.12-3 Would implementation of the Proposed Plans result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project? This impact is less than significant with mitigation.

Operational/Stationary Noise

The following impact analysis relates to the CEQA Thresholds Guide. Impact 4.12-1 assessed consistency with the LAMC and Noise Element of the General Plan.

Regarding operational noise, the Proposed Plans intend to promote the internal relationship of mutually supportive uses, such as employment, housing, recreation, and community-serving facilities. For these land uses, stationary mechanical equipment and mobile vehicles are typical sources of permanent operational noise.¹⁸ A substantial permanent increase in noise levels would result if the ambient noise level measured at the property line of affected uses increases by 3 dBA CNEL to or within the “normally unacceptable” or “clearly unacceptable” categories, as shown in **Table 4.12-3**, or any 5 dBA or more increase in noise level.¹⁹

For mechanical equipment, residential and most commercial uses are limited to HVAC equipment. Industrial and manufacturing land uses can contain significant sources of stationary mechanical equipment noise. A primary goal of the Proposed Plans is to reduce residential-industrial land use conflicts. This would be accomplished by 1) establishing CPIOs with development standards for industrial land that is located in close proximity to residential uses in order to restrict new noxious incompatible uses and require buffering

¹⁸City of Los Angeles, *CEQA Thresholds Guide*, 2006.

¹⁹*Ibid.*

and screening elements that protect adjacent uses; and 2) amending General Plan Land Use designations and zones on current industrially-designated land to create consistency with as-built conditions in areas that are predominantly commercial and/or residential and to prohibit new incompatible industrial uses in these areas.

While new development would occur in designated commercial and industrial areas, it may border residential areas leading to noise incompatibility between land uses. The proposed CPIOs include Industrial Subareas that protect residential and other sensitive uses located adjacent to industrially-zoned land from impacts associated with incompatibility of uses. Foreseeable projects would be consistent with the LAMC and the CPIO development standards, which are anticipated to reduce potential noise impacts to a less than significant level. However, it is not possible to identify all projects and potential inconsistencies that would be developed after implementation of the Proposed Plans. It is possible that operational activities would increase noise levels at adjacent receptors by 3 dBA CNEL to or within the “normally unacceptable” or “clearly unacceptable” categories, as shown in **Table 4.12-3**, or increase noise by levels at least 5 dBA. Therefore, prior to implementation of mitigation and due to the introduction of new land uses, the Proposed Plans would result in a **significant impact** related to exposing persons to or generating noise levels in excess of established standards.

Mobile Noise

For mobile sources, an analysis was completed to determine if implementation of the Proposed Plans would significantly increase mobile noise levels in the CPAs. **Table 4.12-8** shows predicted peak hour mobile source noise levels at a representative sample of intersections with high traffic volumes and/or located near noise-sensitive land uses. The locations were selected to represent a wide variety of noise conditions in the CPAs (e.g., busy roadways and residential neighborhoods). Mobile source noise levels would not increase by more than 3 dBA at the analyzed roadway segments. At some of the analyzed intersections, mobile noise levels will decrease under the Proposed Plans as traffic is redistributed and strategies and policies to reduce travel demand are implemented, such as placing density at transit centers. Mobile noise generated by the Proposed Plans would not cause the ambient noise level measured to increase by 3 dBA CNEL to or within the “normally unacceptable” or “clearly unacceptable” category (**Table 4.12-3** above) or any 5 dBA or more increase in noise level. Therefore, impacts related to mobile noise under the Proposed Plans would be **less than significant**.

Mitigation Measures

Refer to Mitigation Measure N2.

Level of Significance of Impact after Mitigation

Implementation of Mitigation Measure N2 includes mitigation measures beyond the CPIO development standards. While difficult to quantify noise reduction associated with Mitigation Measure N2, implementing these conditions would reduce noise levels. Foreseeable projects would be consistent with the LAMC, the CPIO development standards, and include additional mitigation measures to control noise exposure. After implementation of mitigation, future noise levels would be consistent with **Table 4.12-3**, and would not increase noise levels at adjacent receptors by 3 dBA CNEL to or within the “normally unacceptable” or “clearly unacceptable” categories, or increase any ambient noise level by 5 dBA or more. Implementation of mitigation measures would reduce potential operational noise impacts to **less than significant**.

TABLE 4.12-8: OPERATIONAL MOBILE SOURCE NOISE LEVELS

Roadway Segment	Estimated dBA, CNEL			
	Existing (Year 2008)	Future Without Project (Year 2035)	Proposed Project (Year 2035)	Project Impact
SOUTH LOS ANGELES				
Intersection of Vermont Ave. and 120 th St.	62.4	63.2	61.3	-1.9
Intersection of Imperial Hwy. and Figueroa St.	63.5	63.7	62.5	-1.2
Intersection of Vermont Ave. and Manchester Blvd.	65.2	65.0	65.5	0.5
60 th Pl. between Western Ave. and Saint Andrews Pl.	52.4	52.9	52.4	-0.5
Intersection of Western Ave. and Vernon Ave.	64.0	64.1	63.8	-0.3
Vermont Ave. between Exposition Park Dr. and 38 th St.	59.8	59.7	59.8	0.1
36 th Pl. between Western Ave. and Saint Andrews Pl.	55.1	55.2	54.9	-0.3
Scarff St. between Adams Blvd. and 28 th St.	53.6	53.9	53.9	0.0
Dalton Ave. between Adams Blvd. and 27 th St.	54.7	54.7	54.5	-0.2
Western Ave. between Venice Blvd. and 18 th St.	60.4	60.4	60.3	-0.1
SOUTHEAST LOS ANGELES				
Intersection of Adams Blvd. and Broadway	61.2	61.2	61.2	0.0
Intersection of Naomi Ave. and Adams Blvd.	59.9	59.9	59.9	0.0
Intersection of Vernon Ave. and Compton Ave.	62.0	62.1	62.0	-0.1
Intersection of Avalon Blvd. and Vernon Ave.	64.1	64.1	64.1	0.0
Intersection of Broadway and Slauson Ave.	64.2	64.0	64.2	0.2
Florence Ave. between Avalon Blvd. and Stanford Ave.	63.5	63.7	63.6	-0.1
Manchester Ave. between Mckinley Ave. and Wadsworth Ave.	60.2	60.3	60.3	0.0
Century Blvd. between Wall St. and Main St.	62.3	62.3	62.3	0.0
Intersection of 103 rd St. and Compton Ave.	61.1	61.3	61.3	0.0
Main St. between 113 th St. and Imperial Hwy.	59.6	59.7	59.7	0.0
SOURCE: TAHA, 2016.				

Impact 4.12-4 Would implementation of the Proposed Plans result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project? This impact is significant and unavoidable.

As discussed above in Impact 4.12-1, land uses sensitive to increased noise levels (e.g., residences) are located throughout the CPAs. Construction activity typically involves the operation of multiple pieces of equipment at the same time. **Table 4.12-9** shows noise levels by construction phase at 50 feet. The grading/excavation and finishing phases typically generate the loudest noise levels at 89 dBA L_{eq} without equipment mufflers, and 86 dBA L_{eq} with equipment mufflers.

TABLE 4.12-9: OUTDOOR CONSTRUCTION NOISE LEVELS

Construction Phase	Noise Level At 50 Feet (dBA, L_{eq})	Noise Level At 50 Feet With Mufflers (dBA, L_{eq})
Ground Clearing	84	82
Grading/Excavation	89	86
Foundations	78	77
Structural	85	83
Finishing	89	86
SOURCE: City of Los Angeles, CEQA Thresholds Guide, 2006.		

The existing daytime noise level in residential areas is presumed to be 50 dBA (**Table 4.12-4**). As discussed in Impact 4.12-1, it is anticipated that construction activity within the CPAs would be located within 50 feet of residences and other sensitive receptors. Based on **Table 4.12-9**, the daytime ambient noise levels would increase between 28 and 39 dBA depending on the construction phase. Construction noise would increase ambient noise levels by more than 10 dBA for activities lasting more than one day, and by more than 5 dBA for construction activities lasting more than ten days in a three month period. This would result in a substantial temporary or periodic increase in ambient noise levels above levels existing without the Proposed Plans. Therefore, prior to implementation of mitigation, the Proposed Plans would result in a *significant impact* related to construction noise.

Mitigation Measures

Refer to Mitigation Measure **N1**, above, for mitigation related to temporary and periodic noise from construction activity.

Level of Significance of Impact after Mitigation

Impacts related to temporary and periodic noise from construction activity were determined to be significant without mitigation. While difficult to quantify, the noise reduction associated with each part of Mitigation Measure **N1** would noticeably reduce noise levels. For example, requiring equipment mufflers would reduce engine noise by at least 3 dBA. However, in the absence of detailed noise analyses associated with specific projects, it is anticipated that construction noise levels at various sensitive land uses would exceed the City's thresholds of significance. Therefore, the Proposed Plans would result in a *significant and unavoidable* impact related to temporary and periodic noise after mitigation.

Impact 4.12-5 For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would implementation of the Proposed Plans expose people residing or working in the project area to excessive noise levels? Refer to Section 4.10, Land Use and Planning for a discussion of land use compatibility and an assessment of potential impacts.

The Southeast Los Angeles CPA is not located within an airport land use plan²⁰ or within two miles of an airport, thus no impact would occur. Some areas within the South Los Angeles CPA are located within the Airport Influence Area for LAX.²¹ Refer to Section 4.10, Land Use and Planning for a discussion of land use compatibility and an assessment of potential impacts. Any impacts that would occur to future residents or users in the South Los Angeles CPA from existing conditions from the noise related to Airport Influence Area would not be an impact under CEQA. Additionally, it is not reasonably foreseeable that the Proposed Plans would exacerbate those existing conditions, as any increase in flight activity based on the increase in population in the CPAs would be at best negligible.

Mitigation Measures

Refer to Section 4.10, Land Use and Planning.

Level of Significance of Impacts after Mitigation

Refer to Section 4.10, Land Use and Planning.

²⁰Los Angeles County Airport Land Use Commission, *Airport Influence Areas*, May 13, 2003.

²¹*Ibid.*

Impact 4.12-6 For a project within the vicinity of a private airstrip, would implementation of the Proposed Plans expose people residing or working in the project area to excessive noise levels? No impact would occur.

The CPAs are not located within the vicinity of a private airstrip. New development would not expose people residing or working in the project area to excessive noise related to airstrip operations. Therefore, the Proposed Plans would have *no impact* related to airstrip noise, and no further analysis of this issue is required.

Mitigation Measures

No impacts related to excessive noise levels within the vicinity of a private airstrip would occur under the Proposed Plans. No mitigation measures are required.

Level of Significance of Impacts after Mitigation

No impacts related to excessive noise levels within the vicinity of a private airstrip would occur.

CUMULATIVE IMPACTS

For construction impacts, only the immediate area around the specific development site is included in the cumulative context. For operational/roadway related impacts, the context is the reasonably expected development of the Proposed Plans, including existing and future development of cumulative projects within the CPAs, as well as related projects in adjacent communities that would be potentially impacted. Noise is by definition a localized phenomenon, and is significantly reduced in magnitude as distance from the source increases. Consequently, only projects and growth anticipated to occur in the CPAs would be likely to contribute to cumulative noise impacts.

Similar to any urban area where new structures are proposed as part of urban development/redevelopment, increases in noise at sensitive uses would occur as a result of construction of various developments, including those associated with the Proposed Plans. Other construction that may occur in the vicinity of the CPAs would contribute to noise levels similar to those generated in the CPAs due to implementation of the Proposed Plans. Where this development adjoins potential construction, the combined construction noise levels would have a cumulative effect with respect to increases in ambient noise levels and exceedance of City standards. Noise is not strictly additive, and a doubling of noise sources would not cause a doubling of noise levels; however, cumulative construction noise levels would be in excess of the city standards at nearby sensitive receptors.

Per the LAMC, construction activities would be prohibited between the hours of 9:00 p.m. and 7:00 a.m. Monday through Friday, before 8:00 a.m. or after 6:00 p.m. on Saturdays, and on Sundays and public holidays unless consideration is given to a noise variance. However, as discussed above, noise levels from various pieces of construction equipment could exceed the City standards. Combined with cumulative development, implementation of the Proposed Plans would increase ambient noise levels by more than 10 dBA for activities lasting more than one day, and by more than 5 dBA for construction activities lasting more than ten days in a three-month period. The Proposed Plans' contribution to the impact would be cumulatively considerable. Therefore, the cumulative impact of the Proposed Plans construction-related exposure of persons to noise levels above the City of Los Angeles established standard would be considered *significant and unavoidable*. Similarly, cumulative construction noise would result in a significant impact related to periodic and temporary noise levels and would be cumulatively considerable.

The traffic analysis presented in the Draft EIR took into account the combined effect of project-generated traffic, existing traffic volumes and through future traffic from areas both within and adjacent to the CPAs. **Table 4.12-10** presents the cumulative increase in future traffic noise levels. None of the analyzed roadway segments would experience an increase in noise levels that exceed 3 dBA CNEL. The significance threshold for operational noise states that an impact would occur if the ambient noise level measured at the property line of affected uses increases by 3 dBA CNEL to or within the “normally unacceptable” or “clearly unacceptable” categories, as shown in **Table 4.12-3**, or any 5 dBA or more increase in noise level. Cumulative mobile source noise levels would not exceed the significance thresholds. Therefore, cumulative impacts would be less than significant and would not be cumulatively considerable.

TABLE 4.12-10: CUMULATIVE OPERATIONAL MOBILE SOURCE NOISE LEVELS			
Roadway Segment	Estimated dBA, CNEL		
	Existing (Year 2008)	Proposed Project (Year 2035)	Project Impact
SOUTH LOS ANGELES			
Intersection of Vermont Ave. and 120 th St.	62.4	61.3	-1.1
Intersection of Imperial Hwy. and Figueroa St.	63.5	62.5	-1.0
Intersection of Vermont Ave. and Manchester Blvd.	65.2	65.5	0.3
60 th Pl. between Western Ave. and Saint Andrews Pl.	52.4	52.4	0.0
Intersection of Western Ave and Vernon Ave.	64.0	63.8	-0.2
Vermont Ave. between Exposition Park Dr. and 38 th St.	59.8	59.8	0.0
36 th Pl. between Western Ave and Saint Andrews Pl.	55.1	54.9	-0.2
Scarff St. between Adams Blvd. and 28 th St.	53.6	53.9	0.3
Dalton Ave. between Adams Blvd. and 27 th St.	54.7	54.5	-0.2
Western Ave. between Venice Blvd. and 18 th St.	60.4	60.3	-0.1
SOUTHEAST LOS ANGELES			
Intersection of Adams Blvd. and Broadway	61.2	61.2	0.0
Intersection of Naomi Ave. and Adams Blvd.	59.9	59.9	0.0
Intersection of Vernon Ave. and Compton Ave	62.0	62.0	0.0
Intersection of Avalon Blvd. and Vernon Ave.	64.1	64.1	0.0
Intersection of Broadway and Slauson Ave	64.2	64.2	0.0
Florence Ave. between Avalon Blvd. and Stanford Ave.	63.5	63.6	0.1
Manchester Ave. between Mckinley Ave. and Wadsworth Ave.	60.2	60.3	0.1
Century Blvd. between Wall St. and Main St.	62.3	62.3	0.0
Intersection of 103 rd St and Compton Ave.	61.1	61.3	0.2
Main St. between 113 th St. and Imperial Hwy.	59.6	59.7	0.1
SOURCE: TAHA, 2016.			

An additional source of operational noise includes new stationary sources such as HVAC systems. These types of mechanical equipment are typical to urban infill developments common throughout the City. While new development would occur in designated commercial and industrial areas, it may border residential areas leading to noise incompatibility between land uses. The proposed CPIOs include Industrial Subareas that protect residential and other sensitive uses located adjacent to industrially-zoned land from impacts associated with incompatibility of uses. Foreseeable projects would be consistent with the LAMC and the CPIO development standards, which are anticipated to reduce potential noise impacts to a less than significant level. Future noise levels would be consistent with **Table 4.12-3**, and would not increase noise levels at adjacent receptors by 3 dBA CNEL to or within the “normally unacceptable” or “clearly unacceptable” categories, or increase any ambient noise level by 5 dBA or more. The Proposed Plans’ contribution to the change in existing noise levels would not be considered cumulatively considerable.

Therefore, the cumulative impact related to existing noise levels would be less than significant and would not be cumulatively considerable.

Regarding vibration, the construction of projects pursuant to the Proposed Plans would produce temporary vibration impacts. However, the construction vibration impact would be **significant and unavoidable**. Cumulative development in the CPAs is not considered likely to result in the exposure of on-site or off-site receptors to excessive groundborne noise and vibration due to the localized nature of vibration impacts, due to the fact that all construction would not occur at the same time and at the same location. Therefore, only receptors located in close proximity to each construction site would be potentially affected by each activity.

Construction activities associated with implementation of the Proposed Plans may overlap for some time with construction activities for other projects, which are adjacent to, or within the CPAs. However, for the combined vibration impact from the simultaneous construction projects to reach cumulatively significant levels, intense construction from these projects would have to occur simultaneously within 50 feet of any receptor. As individual development projects under the Proposed Plans may be constructed concurrently with each other or other related projects, it is possible that intense construction from two or more projects would simultaneously occur at distances of 50 feet or less from existing nearby receptors. Therefore, vibration from future development could potentially combine to result in a **significant and unavoidable impact** and would be cumulatively considerable.

Groundborne vibration could conceivably be generated by the operation of future development projects and related projects in the vicinity of the CPAs. It is not anticipated that new development would include substantial sources of operational groundborne vibration. It is reasonable to assume that other projects in the vicinity of the CPAs would have similar characteristics. Consequently, impacts related to operational groundborne noise and vibration impacts at any on-site or off-site receptor would not be considered cumulatively considerable.

REFERENCES

California Department of Transportation, *Technical Noise Supplement*, 2009.

City of Los Angeles, *CEQA Thresholds Guide*, 2006.

City of Los Angeles, *Noise Element of the General Plan*, 1999.

Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, May 2006.

Los Angeles County Airport Land Use Commission, *Airport Influence Areas*, May 13, 2003.

Los Angeles Municipal Code.

PDH Continuing Professional Competency, *Overview of Noise Control and HVAC Acoustics in Buildings*, 2012.