

## 4.12 NOISE

This section provides an overview of noise and vibration levels and evaluates the construction and operational impacts associated with the proposed project. Supporting data and calculations are included in Appendix F. Topics addressed include short-term construction and long-term operational noise and vibration. The following background 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. **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) and Equivalent Noise Level ( $L_{eq}$ ).

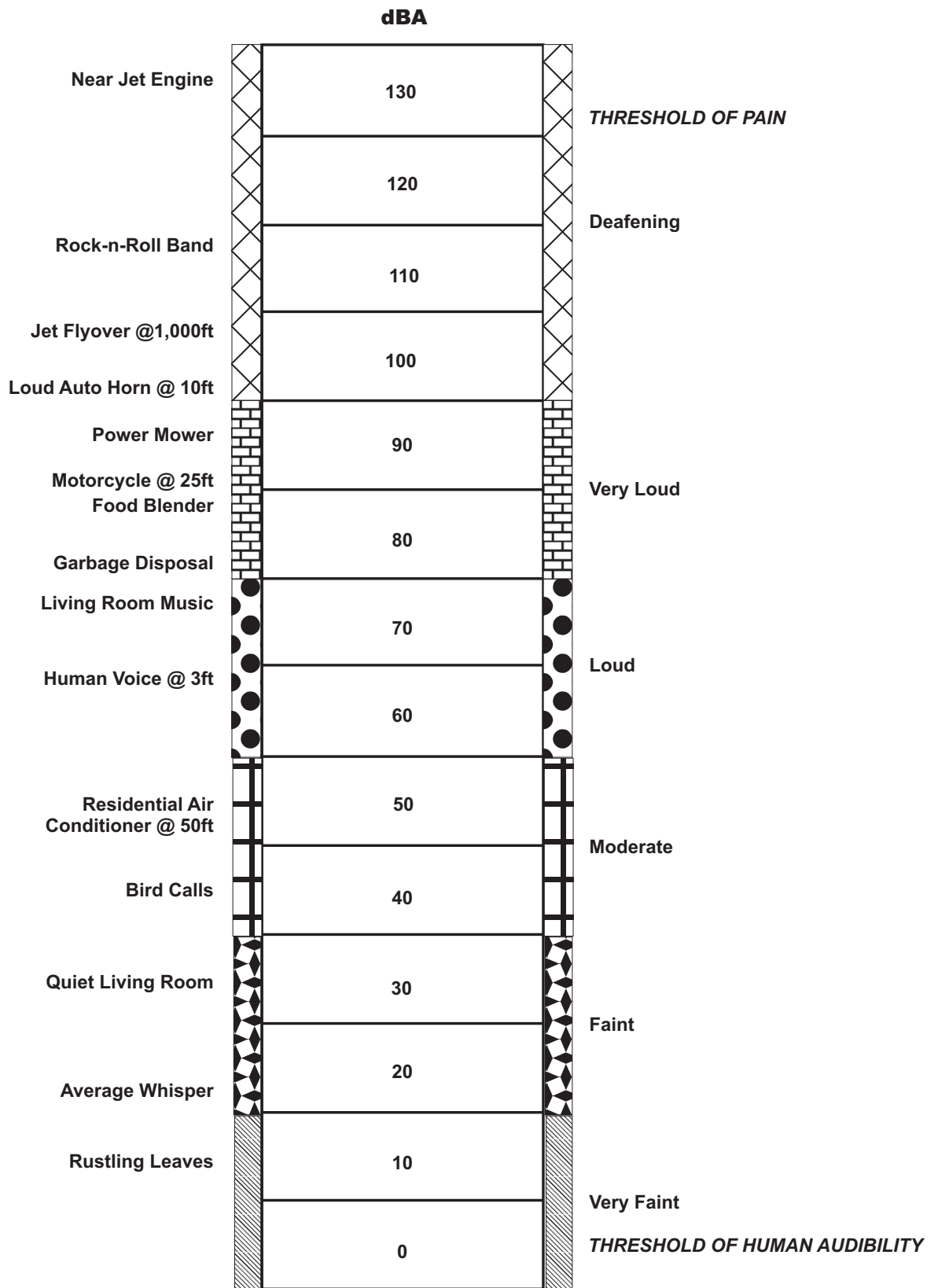
*Community Noise Equivalent Level.* CNEL is an average sound level during a 24-hour period. CNEL is a noise measurement scale, which accounts for noise source, distance, single event duration, single event occurrence, frequency, and time of day. Human reaction to sound between 7:00 p.m. and 10:00 p.m. 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.

*Equivalent Noise Level.*  $L_{eq}$  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.

**Effects of Noise.** Noise is generally defined as unwanted sound. The degree to which noise can impact the human environment range 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.

**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 would be noticeable and would likely evoke a community reaction. A 10-dBA increase is subjectively heard as a doubling in loudness and would cause a community response.

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. 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.



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

Generally, noise is most audible when traveling by direct line-of-sight.<sup>1</sup> 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. Sound barriers can reduce sound levels by up to 20 dBA. 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. 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 defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings and is usually measured in inches per second. 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. The decibel notation acts to compress the range of numbers required to describe vibration.

**Effects of Vibration.** High levels of vibration may cause physical personal injury or damage to buildings. However, vibration levels rarely affect human health. Instead, most people consider vibration to be an annoyance that can affect concentration or disturb sleep. In addition, high levels of vibration can damage fragile buildings or interfere with equipment that is highly sensitive to vibration (e.g., electron microscopes). To counter the effects of vibration, the Federal Transit Administration (FTA) has published guidance relative to vibration impacts.

**Perceptible Vibration Changes.** In contrast to noise, ground vibration is not a phenomenon that most people experience every day. The background vibration velocity level in residential areas is usually 50 RMS or lower, well below the threshold of perception for humans which is around 65 RMS.<sup>2</sup> Most perceptible indoor vibration is caused by sources within buildings, such as operation of mechanical equipment, movement of people, or slamming of doors. Typical outdoor sources of perceptible ground vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If the roadway is smooth, the vibration from traffic is rarely perceptible.

## **REGULATORY FRAMEWORK**

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### **Noise**

**City of Los Angeles Municipal Code (LAMC).** The City of Los Angeles has numerous ordinances and enforcement practices that apply to intrusive noise and that guide new construction. These are summarized in the following sections. The City's comprehensive noise ordinance (LAMC Section 111 et seq.) establishes sound measurement and criteria, minimum ambient noise levels for different land use zoning classifications, sound emission levels for specific uses (radios, television sets, vehicle repairs and amplified equipment, etc.), hours of operation for certain uses (construction activity, rubbish collection, etc.), standards for determining noise deemed a disturbance of the peace, and legal remedies for violations. Its ambient noise

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<sup>1</sup>Line-of-sight is an unobstructed visual path between the noise source and the noise receptor.

<sup>2</sup>*Ibid.*

standards are consistent with current State and federal noise standards. They are correlated with land use zoning classifications in order to guide the measurement of intrusive noise that results in intermittent (periodic) or extended impacts on a geographically specific site. The intent is to maintain identified ambient noise levels and to limit, mitigate, or eliminate intrusive noise that exceeds the ambient noise levels within the zones specified. The standards guide building construction and equipment installation, equipment maintenance and nuisance noise enforcement.

*Zoning and Land Use.* The City's planning and zoning code (LAMC Section 11 et seq.) contains a variety of provisions that directly or indirectly mitigate noise impacts on, or impacts that are associated with, different types of land uses. Permit processing is guided by the General Plan, especially the community plans which together are the City's Land Use Element. The plans designate appropriate land use (zoning) classifications. The noise ordinance guides 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 set back 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 buildings, 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, board of zoning appeals and City Council to assess potential use impacts and impose conditions to mitigate noise impacts. 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. Potential impacts include door slamming and people talking as they walk to their cars.

The authority to revoke, discontinue a use or to impose nuisance abatement conditions on established uses has become a major tool for reducing nuisance noise. Use permits may be revoked by the commission, zoning administrator, or, on appeal, by the board of zoning appeals or 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 have been increasingly utilized in recent years 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.


**City of Los Angeles CEQA Thresholds Guide.** The City of Los Angeles has published CEQA significance thresholds to be used in noise analyses.<sup>3</sup> The Thresholds Guide includes a community noise exposure table that addressed land use consistency (**Table 4.12-1**). Specific significance thresholds are further discussed below and include thresholds for construction and operational noise levels.


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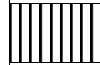
<sup>3</sup>City of Los Angeles, *CEQA Thresholds Guide*, 2006.


**TABLE 4.12-1: LAND USE COMPATIBILITY FOR COMMUNITY NOISE ENVIRONMENTS**

Land Use Category	Community Noise Exposure (dBA, CNEL)					
	55	60	65	70	75	80
Residential - Low Density Single-Family, Duplex, Mobile Homes	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
Residential - Multi-Family	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
Transient Lodging - Motels Hotels	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
Schools, Libraries, Churches, Hospitals, Nursing Homes	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
Auditoriums, Concert Halls, Amphitheaters	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
Sports Arena, Outdoor Spectator Sports	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
Playgrounds, Neighborhood Parks	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
Golf Courses, Riding Stables, Water Recreation, Cemeteries	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
Office Buildings, Business Commercial and Professional	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
Industrial, Manufacturing, Utilities, Agriculture	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray
	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray

 **Normally Acceptable** - Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.

 **Conditionally Acceptable** - New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply system or air conditionally will normally suffice.

 **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.

 **Clearly Unacceptable** - New construction or development should generally not be undertaken.

**SOURCE:** California Office of Noise Control, Department of Health Services.

**City of Los Angeles General Plan Noise Element.** The Noise Element of the General Plan 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 project.

<b>TABLE 4.12-2: RELEVANT GENERAL PLAN NOISE GOALS, OBJECTIVES, AND POLICIES</b>	
<b>Goal/Objective/Policy</b>	<b>Goal/Objective/Policy Description</b>
P6	When processing building permits, continue to require appropriate 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 (Los Angeles Municipal Code Section 111 et seq., and any other insulation related code or standards or 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 Los Angeles Municipal Code 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 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.
<b>SOURCE:</b> City of Los Angeles General Plan, <i>Noise Element</i> , 1999.	

### Vibration

There are no adopted City or State standards for vibration. **Table 4.12-3** shows FTA guidelines for vibration damage criteria. These criteria are based on the type of building construction.

<b>TABLE 4.12-3: VIBRATION DAMAGE CRITERIA</b>	
<b>Building Category</b>	<b>PPV (Inches Per Second)</b>
I. Reinforced-concrete, steel, or timber (no plaster)	0.5
II. Engineered concrete and masonry (no plaster)	0.3
III. Non-engineered timber and masonry buildings	0.2
IV. Buildings extremely susceptible to vibration damage	0.12
<b>SOURCE:</b> FTA, <i>Transit Noise and Vibration Impact Assessment</i> , May 2006.	

## EXISTING SETTING

### Noise

The existing noise environment was characterized through a series of sound measurements taken using a SoundPro DL Sound Level Meter between 11:00 a.m. and 2:00 p.m. on September 21, 2010. Noise monitoring locations are shown in **Figure 4.12-2**. As shown in **Table 4.12-4**, existing ambient sound levels range between 51.2 and 75.5 dBA  $L_{eq}$ . The major noise source within the West Adams CPA is automobiles.

<b>TABLE 4.12-4: EXISTING NOISE LEVELS</b>	
<b>Noise Monitoring Location</b>	<b>Sound Level (dBA, <math>L_{eq}</math>)</b>
Crenshaw Boulevard between 66 <sup>th</sup> and 67 <sup>th</sup> Streets	72.2
Slauson Avenue at 2 <sup>nd</sup> Street	65.6
Martin Luther King at Leimert Boulevards	71.7
Don Diablo at Don Arellanes Drives	51.2
Crenshaw Boulevard between Coliseum Street and Rodeo Road	69.9
La Brea Avenue and Roseland Street	75.5
Washington Boulevard between Harcourt Avenue and Palm Grove Avenue	70.3
Cadillac Avenue and Bedford Street	68.2
<b>SOURCE:</b> TAHA, 2012.	

### Vibration

Heavy-duty trucks can generate ground vibrations that vary depending on vehicle type and weight, and pavement conditions. Vibration levels from adjacent roadways are not typically perceptible within the West Adams CPA. There are no substantial stationary sources of vibration within the CPA.

### 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. Residences, schools, hospitals, guest lodging, libraries, and some passive recreation areas would each be considered noise- and vibration-sensitive and may warrant unique measures for protection from intruding noise. The predominate land use in the West Adams CPA is residential. Single-family neighborhoods are generally located in the southern and eastern portion of the West Adams CPA. Multi-family residential uses are located throughout the West Adams CPA with a concentration in the north. The 8,221-acre West Adams CPA contains numerous schools and medical facilities. Residents of the West Adams CPA benefit from direct access to the Baldwin Hills and particularly, the Kenneth Hahn State Recreation Area, which comprises approximately 80 acres of Regional Open Space within the CPA. An additional 120 acres of open space are dispersed throughout the West Adams CPA as Neighborhood and Community Parks.





LEGEND:  West Adams CPA # Noise Monitoring Locations

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|--|--|
| <ul style="list-style-type: none"> <li><b>1.</b> Crenshaw Blvd between 66<sup>th</sup> and 67<sup>th</sup> Streets</li> <li><b>2.</b> Slauson Avenue at 2<sup>nd</sup> Street</li> <li><b>3.</b> Martin Luther King Jr. Blvd at Leimert Blvd</li> <li><b>4.</b> Don Diablo Drive at Don Arellanas Drive</li> </ul> | <ul style="list-style-type: none"> <li><b>5.</b> Slauson Avenue at 2<sup>nd</sup> Street</li> <li><b>6.</b> Martin Luther King Jr. Blvd at Leimert Blvd</li> <li><b>7.</b> Washington Blvd between Harcourt and Palm Grove Avenues</li> <li><b>8.</b> Cadillac Avenue at Bedford Street</li> </ul> |
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SOURCE: ESRI and TAHA, 2012.

APPROX.  
SCALE



**FIGURE 4.12-2**

**NOISE MONITORING LOCATIONS**

## THRESHOLDS OF SIGNIFICANCE

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In accordance with Appendix G of the State CEQA Guidelines, the proposed project would have a significant impact related to noise if it would:

- Expose persons 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 ground vibration or ground noise levels;
- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; and/or
- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

The following specific significance thresholds are relevant to the proposed project.

**Construction.** The proposed project would have a significant impact related to construction activity if:

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

**Operations.** The proposed project would have a significant impact related to operational activity if:

- Ambient noise level measured at the property line of the affected uses increase by 3 decibels CNEL to or within the “normally unacceptable” or “clearly unacceptable” categories, as shown in **Table 4.12-1** or any 5-dBA or more increase in noise level.

**Vibration.** There are no adopted State or City of Los Angeles vibration standards. Based on federal guidelines, the proposed project would have a significant impact related to vibration if:

- Vibration levels would exceed the damage criteria listed in **Table 4.12-3**.

## IMPACTS

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The proposed project is the adoption of the West Adams New Community Plan and its implementing ordinances. These ordinances, which include standards and guidelines for projects within the West Adams CPA, include a Community Plan Implementation Overlay District (CPIO) containing several subdistricts throughout the plan area, as well as amendments to the existing Crenshaw Corridor Specific Plan. The proposed project further involves General Plan Amendments and zone changes to create consistency with the City’s General Plan Framework Element, as well as create consistency between both planned and existing uses of parcels and their relationship to surrounding areas. Through implementation of the CPIO, the proposed project further restricts detrimental uses, incentivizes development in targeted areas, and provides development standards to ensure that new construction is consistent with neighborhood character, as well as corrects minor errors within the existing West Adams Community Plan. While there are noise impacts to consider within the West Adams CPA, they are subject to the local regulations mentioned above; therefore, the proposed West Adams New Community Plan and its implementing ordinances do not contain any specific guidelines that would affect noise.

## CONSTRUCTION

### Noise

Construction activity occurring within the West Adams CPA 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.)

<b>TABLE 4.12-5: MAXIMUM NOISE LEVELS OF COMMON CONSTRUCTION MACHINES</b>	
<b>Noise Source</b>	<b>Noise Level at 50 feet (dBA) /a/</b>
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. <b>SOURCE:</b> City of Los Angeles, <i>CEQA Thresholds Guide</i> , 2006.	

Construction activity typically involves the operation of multiple pieces of equipment at the same time. **Table 4.12-6** shows construction noise levels by 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.

<b>TABLE 4.12-6: OUTDOOR CONSTRUCTION NOISE LEVELS</b>		
<b>Construction Phase</b>	<b>Noise Level At 50 Feet (dBA, <math>L_{eq}</math>)</b>	<b>Noise Level At 50 Feet With Mufflers (dBA, <math>L_{eq}</math>)</b>
Ground Clearing	84	82
Grading/Excavation	89	86
Foundations	78	77
Structural	85	83
Finishing	89	86
<b>SOURCE:</b> City of Los Angeles, <i>CEQA Thresholds Guide</i> , 2006.		

Land uses sensitive to increased noise levels (e.g., residences) are located throughout the West Adams CPA and could be 50 feet or closer to construction activity. At this distance, construction noise during grading/excavation and finishing activity would be approximately 89 dBA  $L_{eq}$ . Noise monitoring indicated that existing ambient sound levels range between 51.2 and 75.5 dBA  $L_{eq}$ . For residential areas where noise monitoring was not completed, the LAMC indicates that the presumed ambient noise level is 50 dBA. According to this noise data, construction activity would increase ambient noise levels between 13.5 and 39 dBA  $L_{eq}$ .

Non-emergency construction activity would be prohibited between 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 unless consideration is given to a noise variance. However, under both monitored and presumed noise levels, construction noise would increase ambient noise levels by more than 10 dBA and would exceed the significance thresholds for construction activities lasting more than one day and construction activities lasting more than ten days in a three month period. Therefore, without mitigation, the proposed project would result in a significant impact related to construction noise.

### Ground 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 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 vibration levels from various pieces of construction equipment at 25, 50, and 100 feet. The majority of construction equipment would not exceed any of the standards listed in **Table 4.12-3**, above. Vibration generated by pile drivers, clam shovels, and vibratory rollers would exceed the building damage standards depending on the distance from the source to the receptor. Therefore, without mitigation, the proposed project would result in a significant impact related to construction vibration.

<b>TABLE 4.12-7: VIBRATION VELOCITIES FOR CONSTRUCTION EQUIPMENT</b>				
<b>Equipment</b>		<b>Peak Particle Velocity (Inches/Second) /a/</b>		
		<b>25 Feet</b>	<b>50 Feet</b>	<b>100 Feet</b>
Pile Driving (Impact)	Upper Range	1.518	0.537	0.190
	Typical	0.644	0.228	0.081
Pile Driving (Sonic)	Upper Range	0.734	0.260	0.092
	Typical	0.170	0.060	0.021
Clam Shovel Drop		0.202	0.071	0.025
Hydromill (Slurry Wall)	In Soil	0.008	0.003	0.001
	In Rock	0.017	0.006	0.002
Vibratory Roller		0.210	0.074	0.026
Hoe Ram		0.089	0.031	0.011
Large Bulldozer		0.089	0.031	0.011
Caisson Drilling		0.089	0.031	0.011
Loaded Trucks		0.076	0.027	0.010
Jackhammer		0.035	0.012	0.004
Small Bulldozer		0.003	0.001	0.000

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

## **OPERATIONS**

### **Noise**

**Stationary Noise.** The proposed West Adams New Community Plan objectives promote the internal relationship of mutually supportive uses, such as employment, housing, recreation, and community-serving facilities. The primary stationary source of noise related to areas of mixed-use development is mechanical equipment. It is assumed that the majority of stationary noise associated with the proposed project would be generated by heating, ventilation, and air conditioning (HVAC) systems. The precise location of HVAC systems is unknown at this time as specific projects have not been planned. Possible HVAC system locations include building basements, street level, and rooftops. Mechanical equipment such as HVAC systems typically generate noise levels of approximately 60 dBA  $L_{eq}$  at 50 feet.

HVAC systems will be shielded from view to comply with the LAMC, and are not anticipated to significantly increase ambient noise levels.

Another objective is to revitalize underutilized industrial areas through the strategic location of potential future new development along major east/west corridors and at specific activity centers and nodes. While the development would occur in designated commercial and industrial areas, it may border residential areas leading to noise incompatibility between land uses. The planning policies of the proposed project would encourage new industrial development designs to be compatible with adjacent land uses. This would be achieved by encouraging buffers between residential and industrial land uses and promoting a transition between industrial uses from intensive uses to less intensive uses in those areas in close proximity to residential neighborhoods. However, without specific details on projects, the potential exists for residential land uses to be exposed to incompatible noise levels associated with industrial facilities.

**Mobile Noise.** An analysis was completed to determine if the proposed West Adams New Community Plan would significantly increase mobile noise levels in the West Adams CPA. **Table 4.12-8** shows predicted AM and PM 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 greatest project-related noise increase from Existing (2008) to Future With Project (2030) conditions would be 2.6 dBA  $L_{eq}$  during the PM peak hour and would occur along Stocker Street between La Brea and Santa Rosalia Drive. Mobile noise generated by the proposed project would not cause the ambient noise level measured at the property line of the affected uses to increase by 3 dBA CNEL to or within the “normally unacceptable” or “clearly unacceptable” category (**Table 4.12-1** above) or any 5 dBA or more increase in noise level. Therefore, the proposed project would result in a less-than-significant mobile noise impact.

The proposed project would encourage transit-oriented development (TOD) along the Expo LRT Line. Light rail movements typically generate a noise level of approximately 82 dBA  $L_{eq}$  at 50 feet. Based on guidance provided by the FTA, LRT can generate impacts at land uses within 350 feet and with an unobstructed view of the rail line. Land uses within 175 feet and with an obstructed view of the rail line may also be impacted. TOD districts would potentially be located within 350 feet of the Expo LRT Line. Therefore, without mitigation, the proposed project would result in a significant impact related to transit noise exposure.

### **Ground Vibration**

It is not anticipated that the West Adams CPA will be developed with substantial sources of vibration (e.g., blasting operations). Operational ground-borne vibration in the project vicinity would be generated by vehicular travel on the local roadways. Similar to existing conditions, traffic vibration levels would not be perceptible by sensitive receptors. Therefore, the proposed project would result in less-than-significant impacts related to operational vibration.

<b>TABLE 4.12-8: OPERATIONAL MOBILE SOURCE NOISE LEVELS</b>					
<b>Roadway Segment</b>	<b>Estimated dBA, L<sub>eq</sub></b>				
	<b>Existing (Year 2008)</b>	<b>Future Without Project (Year 2030)</b>	<b>Project Impact</b>	<b>Future Plus Project (Year 2030)</b>	<b>Project Impact</b>
<b>AM PEAK HOUR</b>					
Clyde Avenue between Coliseum Street and Rodeo Road	64.4	64.5	0.1	64.8	0.4
Hauser Boulevard between Washington and Venice Boulevards	65.9	66.0	0.1	66.3	0.4
Buckingham Road between Jefferson and Adams Boulevards	66.4	66.7	0.3	67.1	0.7
West Boulevard between Adams and Washington Boulevards	65.0	65.6	0.6	65.9	0.9
West Boulevard between Washington and Venice Boulevards	65.6	66.2	0.6	66.2	0.6
West Boulevard between Venice and Pico Boulevards	65.6	65.8	0.2	66.2	0.6
West Boulevard between Florence Avenue and Hyde Park Boulevard	68.3	68.6	0.3	68.8	0.5
West Boulevard between Hyde Park Boulevard and Slauson Avenue	65.1	66.3	1.2	66.4	1.3
6 <sup>th</sup> Avenue between Adams and Washington Boulevards	65.6	66.2	0.6	66.7	1.1
6 <sup>th</sup> Avenue between Washington and Venice Boulevards	66.5	66.9	0.4	67.3	0.8
Dublin Avenue between Martin Luther King Jr. Boulevard and Rodeo Road	65.0	66.1	1.1	66.5	1.5
18 <sup>th</sup> Street between La Cienega Boulevard and Fairfax Avenue	65.9	66.6	0.7	66.7	0.8
Cadillac Avenue between Corning Street and La Cienega Boulevard	67.4	67.6	0.2	67.7	0.3
Cattaraugus Avenue between Canfield Avenue and Robertson Boulevard	66.9	66.3	(0.6)	66.4	(0.5)
Coliseum Street between Clyde Avenue Duray Place	64.6	64.8	0.2	65.0	0.4
Coliseum Street between Santa Rosalia Drive and Martin Luther King Jr. Boulevard	65.5	65.4	(0.1)	66.3	0.8
Coliseum Street between Martin Luther King Jr. Boulevard and Chesapeake Avenue	66.4	67.3	0.9	67.5	1.1
Coliseum Street between Westside and 7 <sup>th</sup> Avenues	65.4	66.4	1.0	66.9	1.5
Stocker Street between La Brea and Santa Rosalia Drive	65.5	67.0	1.5	67.3	1.8
Stocker Street between Degnan Boulevard and Leimert	65.2	65.9	0.7	65.9	0.7
<b>PM PEAK HOUR</b>					
Clyde Avenue between Coliseum Street and Rodeo Road	65.2	65.7	0.5	66.0	0.8
Hauser Boulevard between Washington and Venice Boulevards	66.4	66.2	(0.2)	66.7	0.3
Buckingham Road between Jefferson and Adams Boulevards	66.4	67.0	0.6	67.6	1.2
West Boulevard between Adams and Washington Boulevards	65.5	65.9	0.4	66.9	1.4

<b>TABLE 4.12-8: OPERATIONAL MOBILE SOURCE NOISE LEVELS</b>					
<b>Roadway Segment</b>	<b>Estimated dBA, L<sub>eq</sub></b>				
	<b>Existing (Year 2008)</b>	<b>Future Without Project (Year 2030)</b>	<b>Project Impact</b>	<b>Future Plus Project (Year 2030)</b>	<b>Project Impact</b>
West Boulevard between Washington and Venice Boulevards	65.4	65.7	0.3	66.3	0.9
West Boulevard between Venice and Pico Boulevards	65.6	66.0	0.4	66.4	0.8
West Boulevard between Florence Avenue and Hyde Park Boulevard	69.0	69.7	0.7	69.8	0.8
West Boulevard between Hyde Park Boulevard and Slauson Avenue	66.8	67.4	0.6	67.7	0.9
6 <sup>th</sup> Avenue between Adams and Washington Boulevards	65.8	66.5	0.7	66.7	0.9
6 <sup>th</sup> Avenue between Washington and Venice Boulevards	66.3	67.0	0.7	67.1	0.8
Dublin Avenue between Martin Luther King Jr. Boulevard and Rodeo Road	65.8	66.5	0.7	66.7	0.9
18 <sup>th</sup> Street between La Cienega Boulevard and Fairfax Avenue	66.3	66.6	0.3	67.1	0.8
Cadillac Avenue between Corning Street and La Cienega Boulevard	67.8	67.9	0.1	68.1	0.3
Cattaraugus Avenue between Canfield Avenue and Robertson Boulevard	67.0	66.4	(0.6)	67.1	0.1
Coliseum Street between Clyde Avenue Duray Place	65.3	65.8	0.5	66.2	0.9
Coliseum Street between Santa Rosalia Drive and Martin Luther King Jr. Boulevard	65.0	65.7	0.7	66.5	1.5
Coliseum Street between Martin Luther King Jr. Boulevard and Chesapeake Avenue	66.5	67.6	1.1	67.9	1.4
Coliseum Street between Westside and 7 <sup>th</sup> Avenues	65.7	66.6	0.9	66.8	1.1
Stocker Street between La Brea and Santa Rosalia Drive	65.9	68.5	2.6	68.5	2.6
Stocker Street between Degnan and Leimert Boulevards	64.8	66.0	1.2	66.1	1.3

**SOURCE:** TAHA, 2012.

## MITIGATION MEASURES

### CONSTRUCTION

#### Noise

**N1** As a condition of approval for any Discretionary or “Active Change Area Project”, as defined in Section 3.4 of the Project Description, the City shall require all contractors to include the following best management practices in contract specifications:

- 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.

### **Ground Vibration**

**N2** As a condition of approval for any Discretionary or “*Active Change Area Project*”, as defined in Section 3.4 of the Project Description, the City shall require project proponents to consider potential vibration impacts to historic buildings. The project proponents shall coordinate with the City to identify historic buildings located within 20 feet of general construction activity or 76 feet of pile driving activity. Projects with construction activity within these distances from historic buildings shall develop a Vibration Control Plan to mitigate potential impacts. The Vibration Control Plan shall be completed by a qualified structural engineer and include a pre-construction survey letter establishing baseline conditions at potentially affected buildings. The survey 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-on 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).

## ***OPERATIONS***

### **Noise**

**N3** As a condition of approval for any Discretionary or “*Active Change Area Project*”, as defined in Section 3.4 of the Project Description, the City shall require proposed industrial projects located within 1,000 feet of a residential land use to complete a noise study using the significance thresholds established in the City of Los Angeles CEQA Thresholds Guide. Identified impacts shall be mitigated per the City’s Noise Ordinance.

**N4** As a condition of approval for any Discretionary or “*Active Change Area Project*”, as defined in Section 3.4 of the Project Description, the City shall require that proposed land uses within 175 feet with an obstructed view or 350 feet with an unobstructed view of the Exposition Light Rail Transit Line to complete a noise study using the significance thresholds established in the City of Los Angeles CEQA Thresholds Guide. Identified impacts shall be mitigated per the City’s Noise Ordinance.

### **Ground Vibration**

No impacts related to operational ground vibration would occur. No mitigation measures are required.



## SIGNIFICANCE OF IMPACTS AFTER MITIGATION

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### ***CONSTRUCTION***

#### **Noise**

Impacts related to construction noise were determined to be significant without mitigation. Mitigation Measure **N1** would control construction noise levels at sensitive land uses. In the absence of detailed noise analyses associated with specific projects, it is anticipated that construction noise levels at various sensitive land uses would still exceed the City's thresholds of significance. Construction noise impacts would need to be evaluated further under subsequent CEQA documentation for individual projects proposed in the West Adams CPA. Therefore, the proposed project would result in a significant and unavoidable impact related to construction noise.

#### **Ground Vibration**

Impacts related to construction ground vibration were determined to be significant without mitigation. Mitigation Measures **N1** and **N2** would reduce vibration associated with pile driving and protect historic buildings that are easily damaged by vibration. In the absence of detailed vibration analyses associated with specific projects, it is anticipated that construction vibration levels at various sensitive land uses would still exceed the thresholds of significance. Construction vibration impacts would need to be evaluated further under subsequent CEQA documentation for individual projects proposed in the West Adams CPA. Therefore, the proposed project would result in a significant and unavoidable impact related to construction vibration.

### ***OPERATIONS***

#### **Noise**

Implementation of Mitigation Measures **N3** and **N4** would reduce the impacts to less than significant.

#### **Ground Vibration**

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