4.7.3 Construction Traffic and Equipment Noise and Vibration

4.7.3.1 Introduction

This section addresses noise and vibration impacts associated with construction-related traffic and operation of construction equipment during development of the proposed Project.

Section 4.7.1.1.1 provides an overview of the basics of sound and the metrics used to measure and characterize noise, and describes typical noise levels associated with various construction activities.

4.7.3.1.1 General Characteristics of Construction-Related Noise

The general characteristics of noise are described in Section 4.7.1.1.1; additional information regarding characteristics associated with roadway traffic noise is provided in Section 4.7.2.1.1. The following describes how noise characteristics relate to construction traffic noise and construction equipment noise.

4.7.3.1.1.1 General Characteristics of Construction Traffic Noise

As noted above, general characteristics of roadway traffic-related noise are described in Section 4.7.2. As described in that section, if a road has free-flowing uninterrupted traffic conditions, sound levels increase at a rate of 3 dBA per doubling of traffic volume. However, if a road has saturated or constrained traffic conditions, sound levels will get progressively quieter from an increase in traffic volumes based on decreasing speeds, reduced engine operation levels, reduced drive-train and tire rotations, and reduced wind shear.

4.7.3.1.1.2 General Characteristics of Construction Equipment Noise

Construction activities typically generate noise from the operation of equipment required for demolition, excavation and grading, and construction of various facilities. Typical noise levels associated with common construction equipment types generally range from 70 dBA for a power generator, as measured at a distance of 50 feet, to 95 dBA for a pile driver, as measured as a distance of 50 feet.[1] More detailed information regarding noise levels associated with other specific types of construction equipment is provided in Table 2 of **Appendix F.3**.

Construction noise typically dissipates at a rate of approximately 6.0 dB for each doubling of distance (between the noise source and the receptor). As an example, construction equipment with mufflers (independent of background ambient noise levels) during excavation and grading may generate a noise level of approximately 86 dBA L_{eq} at 50 feet from the noise source. Based on a sound dissipation rate of 6 dB per doubling of distance, a sound level of 86 dBA at 50 feet from the noise source would be approximately 80 dBA at a distance of 100 feet, 74 dBA at a distance of 200 feet, and so on. That sound drop-off rate does not take into account any intervening shielding (including landscaping or trees) or barriers, such as structures or hills between the noise source and noise receptor. A barrier that breaks the line-of-sight between a source and a receiver will typically result in at least 5 dB of noise reduction. A higher barrier may provide as much as 20 dB of noise reduction.

[1] Fifty feet is the standard reference distance used in U.S. Department of Transportation, Federal Highway Administration guidance, including guidance for the evaluation of construction equipment noise (U.S. Department of Transportation, Federal Highway Administration. *FHWA Roadway Construction Noise Model, Version 1.0 User's Guide*, Table 1. Available: https://www.gsweventcenter.com/Draft_SEIR_References/2006_01_Roadway_Construction_Noise_Model_User_Guide_FHWA.pdf.

4.7.3.1.2 General Characteristics of Vibration

Vibration is the periodic movement of mass over time. The Federal Transit Administration's (FTA) *Transit Noise and Vibration Impact Assessment Manual*[2] identifies vibration as an oscillatory[3] motion that can be described in terms of displacement, velocity, or acceleration. Displacement is the distance that a point on the floor moves from its static position, velocity represents the instantaneous speed of the floor movement, and acceleration is the rate of change of the speed. The response to vibration is most accurately described using velocity or acceleration.

Ground-borne vibration is the perceptible movement of building floors, rattling windows and doors, shaking of items on shelves or walls, and rumbling sounds. Construction-related sources of notable levels of vibration are relatively limited. One such source is the operation of heavy construction equipment, which can create vibrations that travel from the source as energy waves that move through the soil mass and rock strata to the foundations of nearby buildings. The vibration then propagates from the foundation to the building structure. Vibration from operation of construction equipment can, at certain levels, result in damage to buildings, including structural damage (e.g., cracking of floor slabs, foundations, columns, beams, or wells) or cosmetic architectural damage (e.g., cracked plaster, stucco, or tile). However, energy waves rapidly dissipate with distance from the vibration source, due to spreading of the energy and frictional losses. Thus, ground-borne vibrations from most construction activities very rarely reach the levels that can damage buildings.[4] Soil and subsurface conditions also influence levels of ground-borne vibration; for example, vibration levels are typically higher in stiffer clay soils as compared to loose sandy soil, and in areas where bedrock depth is 30 feet or less.

Construction that can result in significant levels of ground vibration generally falls into two categories that are best characterized by the cause of the vibration and its duration. Vibration that is steady-state and more or less continuous can be caused by vibratory compaction of soil, movement of large equipment, and other sources. In contrast, vibration that is more transient in nature and intermittent due to impulsive forces can be caused by pile driving and rock blasting. Neither pile driving nor rock blasting would be utilized during construction of the proposed Project. Therefore, the potential for the proposed Project to result in vibration impacts would be associated with equipment that can cause steady-state, continuous vibration.

Vibration levels related to stresses experienced by buildings are estimated using peak particle velocity (ppv), which is the maximum instantaneous positive or negative peak of the vibration signal, usually measured in inches per second (in/sec).

4.7.3.2 Methodology

4.7.3.2.1 Construction Traffic Noise

This section describes the methodology used to evaluate the potential impacts from construction traffic noise. Project impacts were determined by identifying major roadways near the airport that may be used for construction-related worker commute route or truck haul routes, assessing their traffic volumes, identifying noise-sensitive receptors along these routes, and evaluating the potential for construction-related traffic to have a noticeable effect on noise at these receptors. Proposed construction

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2 U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual,* September 2018. Available: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf.

3 To move or swing back and forth at a regular speed.

4 U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual,* September 2018. Available: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf.

haul routes are identified in Figure 2-29. The major roadways near the airport that may be used for construction-related worker trips were determined by qualitatively assessing the viability of routes based on prior projects at the airport and convenient access to the Project area from major transportation corridors. Relative to distributing traffic on the construction traffic study area roadway network, it was assumed that construction employee trips would originate from geographic locations in proportion to the distribution of regional population, and specific street routing assumptions would be generally consistent with those of other previous LAX construction projects.[5]

4.7.3.2.2 Construction Equipment Noise

Noise impacts from Project construction equipment were evaluated by considering the different types of construction activities, calculating construction-related noise levels at nearby noise-sensitive receptor locations, and comparing these construction-related noise levels to existing ambient noise levels (i.e., noise levels without Project-related construction noise). Noise-sensitive receptors near the airport were determined by identifying land uses in the vicinity of the airport that may house or accommodate members of the population who are particularly sensitive to noise impacts. Such land uses typically include residences, schools, libraries, hospitals, day-care facilities, convalescent/retirement homes, and parks,[6] and for the proposed Project, include residences, hotels, and a school in the vicinity of Project construction sites. **Figure 4.7.3-1** shows representative types of noise-sensitive receptors located in the vicinity of construction areas for the proposed Project.

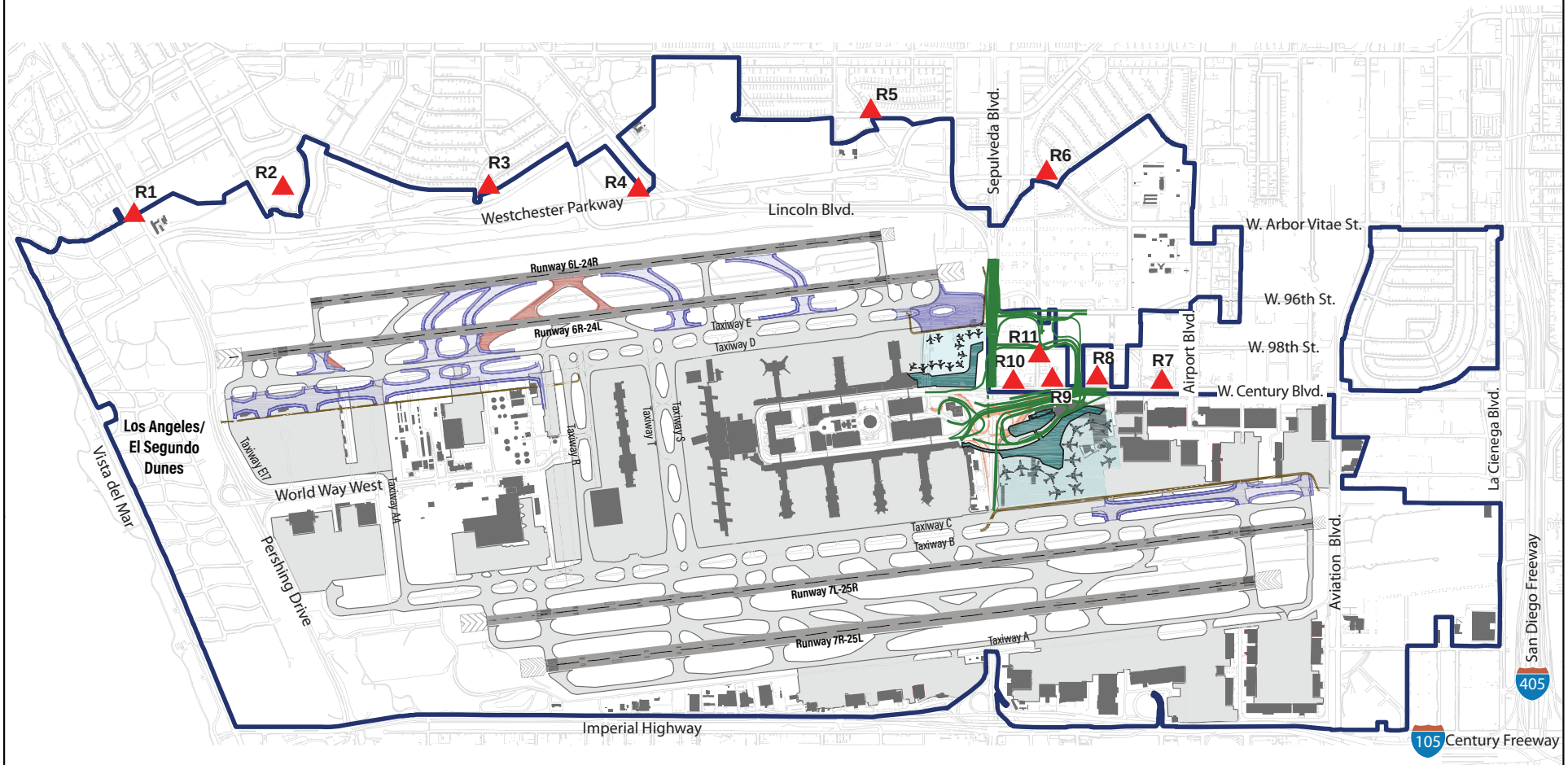
More specifically, the following steps were undertaken to calculate construction-period noise levels:

- Existing (ambient) CNEL dBA noise levels at surrounding noise-sensitive receptor locations were estimated based on aircraft noise levels that were modeled in the Federal Aviation Administration's (FAA) Aviation Environmental Design Tool (AEDT) for existing conditions (since aircraft noise is the dominant noise source for areas around LAX, the aircraft noise modeling provides an effective way to estimate existing noise levels in proximity to the nearby noise-sensitive receptors).
- Typical noise levels for each type of construction equipment were obtained from the Federal Highway Administration's (FHWA) Roadway Construction Noise Model (RCNM). Construction equipment expected to be used for the proposed Project was identified for each project component (i.e., airfield improvements, terminal improvements, and landside improvements). Usage factors for equipment types were included in the calculations, based on factors identified by FHWA as being typical for construction of roadway infrastructure projects and are consistent with the roadway construction efforts for the proposed Project. Details regarding the typical noise levels and the types of equipment to be used are provided in Table 2 of **Appendix F.3**.
- Distances between construction sites and construction staging area locations (i.e., Project-related noise sources) and surrounding noise-sensitive receptors were measured using Project plans and aerial imagery from building facades or outdoor use areas to nearest edge of construction activity in the preliminary construction plans.

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5 City of Los Angeles, Los Angeles World Airports, *Final Environmental Impact Report for Los Angeles International Airport (LAX) Landside Access Modernization Program*, (SCH 2015021014), Section 4.12.3 – Construction Surface Traffic, Figure 4.12.3-3 - Proposed Project Construction Vehicle Routes & Trip Distribution, February 2017. Available: https://www.lawa.org/en/connectinglax/automated-people-mover/documents.

6 City of Los Angeles. *L.A. CEQA Thresholds Guide*, *Your Resource for Preparing CEQA Analyses in Los Angeles*, 2006. Available: https://planning.lacity.org/odocument/cc8fb2f5-dc6c-47f1-bfc3-864b84621abb/CEQAThresholdsGuide.pdf.



Legend

- Construction Noise Analysis Receptors
- LAX Property Boundary
- Airfield Improvements
- Terminal and Related Improvements
- Taxiway to be Removed or Decommissioned
- Roadway Improvements
- Roadway to be Demolished

Note: See Table 4.7.3-1 for description of land use setting at each receptor location.

0 1,500 3,000 Feet

Scale

Source: HMMH, June 2020; CDM Smith, June 2020
Prepared by: CDM Smith, October 2020

LAX Airfield and Terminal Modernization Project

Noise-Sensitive Receptors in the Vicinity of Construction Sites

Figure 4.7.3-1

- Construction noise levels were calculated for noise-sensitive receptor locations based on the conventional standard point source noise-distance attenuation factor of 6.0 dBA for each doubling of distance. Construction noise levels were quantified at predetermined distances from the construction sites and staging areas using CNEL, as further described below. These calculations are considered conservative, as they do not account for noise reductions from intervening structures, walls, or other barriers.
- Calculated noise levels associated with Project construction at noise-sensitive receptor locations were then assessed an evening noise penalty of +5 dBA and a nighttime noise penalty of +10 dBA, consistent with noise weighting for determining the 24-hour CNEL dBA as further described below, and then logarithmically added to the existing ambient CNEL dBA AEDT noise levels to determine total sound level CNEL.
- Calculated total noise levels at noise-sensitive receptor locations were then compared to estimated existing ambient noise levels and the identified construction noise significance thresholds.

To determine background ambient sound levels from aircraft noise, the FAA's AEDT modeling program was utilized. Due to the proximity of these sites to LAX, this approach was determined to be appropriate. AEDT models aircraft performance in space and time to estimate noise levels. Utilizing flight data acquired through LAX's Airport Noise Monitoring and Management (ANOM) system for the fourth quarter of 2018 through the third quarter of 2019, background ambient sound levels from aircraft noise were determined at various noise-sensitive receptor locations in the vicinity of LAX (see **Table 4.7.3-1**). Noise levels at the locations identified in Table 4.7.3-1 are considered representative of other locations in proximity thereto.

It is anticipated that the majority of construction activities would occur during daytime hours (i.e., typically between 7:00 a.m. and 3:30 p.m.). It is likely that there could be some limited periods when construction activities are scheduled to occur both during the daytime and nighttime hours, as second and third shifts would be used for work activities that cannot normally be accomplished during the daytime shift. Examples of such activities include, but are not limited to, large-scale pours of concrete when it would be necessary to maintain a continuous stream of concrete deliveries and placement through multiple shifts, or when it is safer and more efficient to complete airfield improvement work late at night when aircraft activity levels are very low.

Table 4.7.3-1
Existing Conditions at Construction Noise-Sensitive Receptors

ID	Receiver Location	Background Conditions CNEL (dB)[1]	Land Use Setting
Construction Activity Receptors			
R1	Residential development in Playa del Rey	67.8	Residential north of airport
R2	Saint Bernard High School	67.7	High school in a residential area north of airport
R3	Residential development along southern edge of Westchester	68.4	Residential north of airport
R4	Park West Apartments on Lincoln Boulevard	66.3	Residential north of airport
R5	Residential uses along West 88th Street near Liberator Ave	67.9	Residential north of airport
R6	Residential uses near Westchester Parkway and Kittyhawk Ave	72.0	Residential north-east of airport
R7	Residence Inn by Marriott Los Angeles LAX/Century Boulevard	70.2	Commercial east of airport
R8	Sheraton Gateway Los Angeles Hotel	69.3	Commercial east of airport

Table 4.7.3-1
Existing Conditions at Construction Noise-Sensitive Receptors

ID	Receiver Location	Background Conditions CNEL (dB)[1]	Land Use Setting
R9	H Hotel Los Angeles/Homewood Suites by Hilton Los Angeles International Airport	70.4	Commercial east of airport
R10	Hyatt Regency Los Angeles International Airport	73.4	Commercial east of airport
R11	Courtyard Los Angeles LAX/Century Boulevard	71.7	Commercial east of airport
Construction Staging Area Receptors			
S1	This receptor is the same as Receptor R3		
S2	This receptor is the same as Receptor R4		
S3	Residential uses along West 88th Street near Sepulveda Westway	68.2	Residential north of airport
S4	Residential uses along Lilienthal Avenue near Airport Blvd	71.1	Residential north-east of airport
S5	Residential uses north of Arbor Vitae St between Airport Blvd and Bellanca Ave	74.0	Residential north-east of airport
S6	Renaissance Los Angeles Airport Hotel	68	Commercial east of airport
S7	This receptor is the same as Receptor R9		
S8	Residential uses within Del Aire near Aviation Blvd	65.9	Residential south of airport

Source: **Appendix F.3** of this EIR.

Note:
[1] Background condition obtained through AEDT.

To evaluate the potential noise impacts of such occurrences, the CNEL metric was chosen to quantify the 24-hour noise levels, which includes a noise weighting "penalty" for noise occurring during evening and nighttime hours. To calculate the A-weighted CNEL level by receiver location for construction equipment noise at the Project construction sites and construction staging areas, hourly activity and usage factors (i.e., the percentage of time that equipment would be active during each hour of a 24-hour day) were used to calculate an hourly equivalent noise level (L_{eq} dBA) for each phase of construction. To calculate the CNEL dBA, each corresponding construction phase L_{eq} dBA was logarithmically averaged for a 24-hour period with a penalty-weighting of 5dBA for evening hours (7:00 p.m. to 9:59 p.m.) and of 10dBA for nighttime hours (10:00 p.m. to 6:59 a.m.) applied. The construction CNEL dBA was logarithmically added to the background CNEL dBA to calculate the total CNEL dBA for a given receiver location. The total noise level was then compared to the significance threshold and exceedances identified. Additional details regarding equipment activity/usage factors and hourly average sound levels, including the noise penalty where applicable, representative of the construction equipment mix associated with the three major types of Project improvements – specifically, airfield improvements, terminal improvements, and landside access (i.e., roadway) improvements – are provided in **Appendix F.3**. The appendix also identifies the factors associated with activities at construction staging areas, including staging areas with materials processing, such as a concrete batch plant or a materials (rock) crusher, and staging areas without any materials processing. Based on these assumptions, the daily CNEL for each type of construction activity and for the construction staging areas were estimated to be as follows:

- Airfield Construction Activity: 96.6 dBA at a distance of 50 feet
- Concourse/Terminal Construction Activity: 97.0 dBA at a distance of 50 feet
- Roadway System Construction Activity: 97.0 dBA at a distance of 50 feet

- Construction Staging Area Activity (With Materials Processing): 91.0 dBA at a distance of 50 feet
- Construction Staging Area Activity (No Materials Processing): 78.0 dBA at a distance of 50 feet

It should be noted that the daily CNEL values estimated for the construction activities and the staging area are very conservative because they assume that all construction equipment associated with each type construction activity or at the staging area would be in use at the same time, and that all construction equipment would be used in every hour of the day. These assumptions are conservative, and overstate actual construction noise, because construction activities are temporally dynamic, the amount of equipment in use at any one time fluctuates throughout the day, and most proposed construction equipment is used intermittently, rather than continuously.

4.7.3.2.3 Construction Equipment Vibration

The construction-related vibration impacts of the proposed Project were evaluated using guidance developed by the FTA. FTA's guidance manual includes procedures for assessing noise and vibration impacts associated with construction of proposed mass transit projects that are applicable to other types of construction, including the proposed Project. The guidelines identify construction vibration damage criteria by building structural category as shown in **Table 4.7.3-2** below. These criteria are measured in ppv, which, as previous identified, is related to the stresses that are experienced by buildings.

Table 4.7.3-2
FTA Construction Vibration Damage Criteria

Building/Structural Category	PPV (in/sec)
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

Source: U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual,* September 2018. Available: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf.

Key:
ppv – peak particle velocity; in/sec – inches per second

Impacts due to construction activities were evaluated by identifying the proposed Project's vibration sources (i.e., construction equipment), measuring the distance between vibration sources and the surrounding structures that may be suspectable to vibration impacts, and comparing these to the FTA construction vibration damage criteria. The analysis focused on the potential for vibration impacts to nearby historic buildings, as these are more likely to be susceptible to vibration damage. The vibration source levels for various types of equipment were based on data in the FTA guidance manual.

Operation of the proposed Project would not generate ground-borne vibration, therefore, operational vibration is not addressed further in this EIR.

4.7.3.3 Existing Conditions

4.7.3.3.1 Regulatory Setting

A discussion of the City of Los Angeles General Plan Noise Element is provided in Section 4.7.1.3.1.3.

4.7.3.3.1.1 City of Los Angeles Noise Regulation

The City of Los Angeles Municipal Code (LAMC) (Chapter IV, Article I, Section 41.40, and Chapter XI, Articles 1 through 6) establishes regulations regarding allowable increases in noise levels in terms of established noise criteria. Supplementing these LAMC regulations, the City has also established CNEL guidelines that are used for land use planning purposes. Section 41.40 of the LAMC regulates construction that utilizes power equipment that generates loud noises. This regulation includes various restrictions on noise-generating activities and defines procedures for administering the regulations, including definitions of applicability and provisions for variances or exemptions.[7]

Chapter XI of the Los Angeles Municipal Code (City of Los Angeles Noise Ordinance) establishes acceptable ambient sound levels to regulate intrusive noises (e.g., stationary mechanical equipment and vehicles other than those traveling on public streets, including, but not limited to, those used for construction activity within specific land use zones). However, the provisions of Chapter XI do not apply to construction noise.

4.7.3.3.2 Environmental Setting

4.7.3.3.2.1 Noise

In general, the noise setting at and around LAX is influenced primarily by aircraft operations (takeoffs and landings). The existing aircraft noise levels in the vicinity of LAX that are delineated in the LAX 1st Quarter 2019 Noise Monitoring Report are representative of existing (baseline) ambient noise levels at the time the LAX Airfield and Terminal Modernization Project Notice of Preparation was published.[8] In addition to aircraft activities, the noise setting around LAX is influenced by vehicular traffic on major highways including I-405 and I-105, and several major arterial roads including, but not limited to, Imperial Highway, Sepulveda Boulevard, Century Boulevard, and Lincoln Boulevard.

Noise-sensitive receptors in the vicinity of Project construction sites (Airfield Improvements, Roadway Improvements, Concourse 0 site, and Terminal 9 site) and staging areas (see Figure 2-29) include residential uses, a school, and hotels in the vicinity of LAX (see Figure 4.7.3-1). As described above, existing noise levels at the identified noise-sensitive receptor locations were estimated on AEDT modeling and are provided in Table 4.7.3-1.

4.7.3.3.2.2 Vibration

As noted in Section 4.7.3.2.3, the analysis focused on the potential for impacts to nearby historic buildings, as these are more likely to be susceptible to vibration damage. There are four historical resources located on the Project site that are within 200 feet of construction activities. The four properties are listed in **Table 4.7.3-3** below and described further in Section 4.2, *Cultural Resources (Historical Resources)*, and **Appendix D** of this EIR. Of the four properties, all but one (the former Aircraft School Building), were constructed in the 1960s with reinforced concrete and steel. The former Aircraft School Building is timber and masonry, constructed in the 1940s. Therefore, of the four historical buildings, the former Aircraft School Building is considered the most susceptible to vibration damage during construction. Further, at 45 feet from the nearest construction activities, the former Aircraft School Building is the closest historical resource in distance to proposed Project construction activities.

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[7] Chapter IV, Section 41.40(j) empowers the Executive Director of the Board of Police Commissioners to make a determination that Section 41.40(c) of the regulations do not apply to major public works projects undertaken by the City of Los Angeles and its proprietary departments.

[8] City of Los Angeles, Los Angeles World Airports, *California State Airport Noise Standards Quarterly Report, First Quarter 2019, Los Angeles International Airport*, May 1, 2019. Available: https://www.lawa.org/-/media/lawa-web/noise-complaint-quarterly/2019/1q19/1q19-20190501-quarterly-report.ashx, accessed December 19, 2019.

Table 4.7.3-3
Buildings in Proximity to Construction Activity

Map #	Property	Address	Building/ Structural Category	Date	Closest Distance to the Construction Activities
1	1961 Airport Traffic Control Tower[1]	1 World Way	Steel, reinforced concrete	1961	130 feet
2	Union Savings and Loan Building[2]	9800 S. Sepulveda Boulevard	Steel, reinforced concrete	1964	75 feet
3	Former Aircraft School Building[3]	9700 S. Sepulveda Boulevard	Timber and masonry	1941-1945	45 feet
4	McCulloch Building[4]	6151 W. Century Boulevard	Steel, reinforced concrete	1963	55 feet

Source: **Appendix D** of this EIR.

Notes:

1 Eligible for listing as a City of Los Angeles Historic-Cultural Monument only; not eligible for listing in the National Register of Historic Places or California Register of Historical Resources.

2 Eligible for listing in the California Register of Historical Resources and as a City of Los Angeles Historic-Cultural Monument; not eligible for listing in the National Register of Historic Places.

3 Eligible for listing in the National Register of Historic Places, the California Register of Historical Resources, and as a City of Los Angeles Historic-Cultural Monument.

4 Eligible for listing in the California Register of Historical Resources and as a City of Los Angeles Historic-Cultural Monument. During the environmental review of the LAX Landside Access Modernization Program, FAA determined that the McCulloch Building was ineligible for the National Register. SHPO did not formally concur with this determination. Rather, because the LAX Landside Access Modernization Program would not affect the property, SHPO and FAA agreed to consider it as eligible for purposes of that project.

4.7.3.4 Thresholds of Significance

4.7.3.4.1 Construction Traffic Noise

The proposed Project would result in a significant impact related to construction traffic noise if:

Threshold 4.7.3-1 Ambient noise levels measured at the property line of noise-sensitive uses would increase by 3 dBA or more in CNEL.

This threshold is based on the L.A. CEQA Thresholds Guide's significance thresholds for mobile vehicular sources.[9]

4.7.3.4.2 Construction Equipment Noise

The proposed Project would result in a significant impact related to construction equipment noise if construction activities would:

Threshold 4.7.3-2 Exceed existing ambient exterior noise levels by 5 dBA or more at a noise-sensitive use in association with the following:

- Construction activities lasting more than 10 days in a 3-month period; or

9 City of Los Angeles, *L.A. CEQA Thresholds Guide, Your Resource for Preparing CEQA Analyses in Los Angeles*, 2006. Available: https://planning.lacity.org/odocument/cc8fb2f5-dc6c-47f1-bfc3-864b84621abb/CEQAThresholdsGuide.pdf.

- Construction activities occurring 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 at any time on Sunday.

This threshold is based on the L.A. CEQA Thresholds Guide's significance thresholds for construction noise.[10] It is anticipated that construction of most, if not all, of the improvements associated with the proposed Project would involve construction activities lasting more than ten days in a three month period, and it is likely that Project-related construction may periodically occur within evening/nighttime hours and on weekends; hence, this threshold was utilized for the construction equipment noise impact analysis.

4.7.3.4.3 Construction Equipment Vibration

The proposed Project would result in a significant impact related to vibration if it would result in:

Threshold 4.7.3-3 Generation of excessive ground-borne vibration, defined by vibration that would exceed the following damage criteria:

- Reinforced-concrete, steel, or timber (no plaster) would exceed 0.5 peak particle velocity (PPV) (inches per second);
- Engineered concrete and masonry (no plaster) would exceed 0.3 PPV;
- Non-engineered timber and masonry buildings would exceed 0.2 PPV; or
- Buildings extremely susceptible to vibration damage would exceed 0.12 PPV.

This threshold is based on the FTA's Transit Noise and Vibration Impact Assessment Manual. [11]

4.7.3.5 Project Impacts

This section evaluates the potential for the proposed Project to result in significant noise or vibration impacts due to Project construction. As no Project-related construction would occur during operations, this discussion focuses solely on construction-related impacts.

4.7.3.5.1 Impact 4.7.3-1

Summary Conclusion for Impact 4.7.3-1: Construction traffic would not cause existing ambient noise levels measured at the property line of noise-sensitive uses to increase by 3 dBA or more in CNEL. This would be a *less than significant impact* for construction.

4.7.3.5.1.1 Construction Impacts

The proposed Project would generate construction-related traffic along major roadways and access routes to and from the Project area during the construction period. Construction of the proposed Project would require moving heavy construction equipment throughout the Project area for each specialized construction activity (for example, demolition or grading). Construction-related traffic would consist of construction vehicles, construction equipment, and construction workers' personal vehicles. Proposed haul routes are identified in Figure 2-29 in Chapter 2, *Description of the Proposed Project*. As shown in that figure, the construction haul routes would be located along major roadways and away from residential areas. By using designated haul routes, construction-related vehicles would be restricted to highways and major arterials wherever feasible to minimize use of local roadways.

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[10] City of Los Angeles, *L.A. CEQA Thresholds Guide, Your Resource for Preparing CEQA Analyses in Los Angeles*, 2006. Available: https://planning.lacity.org/odocument/cc8fb2f5-dc6c-47f1-bfc3-864b84621abb/CEQAThresholdsGuide.pdf.

[11] U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual,* September 2018. Available: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf.

Construction staging areas would be located throughout the Project area, as shown on Figure 2-29, and would include areas for construction worker parking, construction trailers, construction vehicles, and construction equipment storage. Multiple construction staging areas would be used to accommodate different phases and components of the proposed Project.

As described under Section 4.7.3.4.1, Threshold 4.7.3-1 defines a significant construction-related traffic noise impact as an increase in ambient noise levels of 3 dBA or more at the property line of noise-sensitive uses using the CNEL metric.[12] As described in Section 4.7.3.1.1.1, if a sound's physical intensity is doubled, the sound level increases by 3 dBA, regardless of the initial sound level. In order for the proposed Project's construction-related traffic to cause an increase in ambient noise levels of 3 dBA CNEL or more, the daily traffic volumes on the major roadways near noise-sensitive uses would need to double. The major roadways on which construction-related traffic would be routed carry substantial existing vehicular traffic. Traffic volumes along the proposed haul routes are identified in **Table 4.7.3-4**.

Table 4.7.3-4
Existing Traffic Volumes on Proposed Haul Routes

Street	Daily Traffic Volume
Century Boulevard	54,220
98th Street[1]	8,609
96th Street	15,880
Sepulveda Boulevard	49,620
Airport Boulevard	68,060
Westchester Parkway	18,160
Pershing Drive	28,400
Imperial Highway	60,800

Source: **Appendix G** of this EIR; National Data & Surveying Services, *Volume 98th St & Avion Dr*, March 15, 2017, prepared for City of Los Angeles, Department of Transportation. Available: https://navigatela.lacity.org/dot/traffic_data/automatic_counts/98th.Avion.170316-NDSAUTO.pdf.

Note:
[1] Data from NavigateLA.

For peak construction activity anticipated for development of the proposed Project, it is estimated that the peak daily truck trips would be approximately 330 trips and peak daily worker commute trips would be approximately 2,400 trips. In applying a "passenger car equivalent" adjustment factor of 2.5 to all truck trips (i.e., each truck trip is considered to be comparable to 2.5 passenger car trips), the peak daily vehicle trip generation of trucks and workers combined would be 3,225 daily trips. Notwithstanding that total trip generation would be distributed to, and dispersed between, several different streets, total trip generation is well below the existing traffic volumes of any of the streets listed in Table 4.7.3-4. As such, the proposed Project would not result in construction-related traffic that would double the existing daily traffic volumes on any road; hence, the increase in noise levels from construction traffic associated with the proposed Project would be less than 3 dBA CNEL and construction traffic noise impacts would be less than significant.

4.7.3.5.1.2 Mitigation Measures

Because the proposed Project would result in a ***less than significant impact*** relative to construction traffic noise, no mitigation is required.

[12] CNEL is a metric used to express cumulative noise exposure as a single-number description of the sound energy to which a person or community is exposed over a period of 24 hours.

4.7.3.5.1.3 Significance of Impact After Mitigation

As indicated above, no mitigation is required to address construction traffic noise. The proposed Project would result in a ***less than significant impact***.

4.7.3.5.2 Impact 4.7.3-2

Summary Conclusion for Impact 4.7.3-2: Use of construction equipment in association with construction activities would exceed existing ambient exterior noise levels by 5 dBA or more at noise-sensitive uses. This would be a *significant impact* for construction.

4.7.3.5.2.1 Construction Impacts

Construction noise would be generated from Project construction activities for airfield improvements, terminal improvements, and landside (roadway) improvements, as well as from activities at potential staging areas (see Figure 2-29).

Grading and scraping construction activities would be the source of most construction noise associated with the proposed Project. Although not the loudest construction source, grading and scraping would occur across multiple construction activities over a longer period of time than would louder impact devices, such as jackhammers, which would be used for much shorter durations. Construction equipment would generate noise levels as high as 70 dBA L_{eq} to 95 dBA L_{eq} within 50 feet of its operation. As shown in **Table 4.7.3-5** below, there are several noise-sensitive uses at varying distances from the proposed Project improvement sites.

Although construction of the different components of the Project may cause audible noise at several noise-sensitive receptor locations (as identified in Table 4.7.3-5), the noise analysis estimates the potential noise impacts for these receptors based on the closest component of construction. Construction activities located at greater distance from the receptor would result in lower noise levels. This approach is used in order to focus on the construction activity with the greatest potential to result in a significant noise impact at each noise-sensitive receptor location (refer to the Construction Activity column). In addition, the noise analysis assumes that all construction equipment would be utilized at the same time, which is unlikely. Moreover, the analysis also conservatively assumes a potential worst-case scenario whereby construction activity might occur on a continuous basis over the course of an entire (24-hour) day. In fact, actual construction activities would occur on a more limited, partial-day construction schedule, would occur more intermittently, and would not coincide with other construction activities; hence, the actual construction-related noise levels would be lower than those identified in Table 4.7.3-5. It should also be noted that the construction-related noise levels presented in Table 4.7.3-5 do not account for noise reduction/attenuation from any intervening structures. The potential noise impacts from each construction activity on the nearest noise-sensitive receptors are discussed in the following sections, based on information presented in Table 4.7.3-5.

Table 4.7.3-5
Construction Noise Levels at Noise-Sensitive Receptor Sites

ID	Receptor	Background Conditions[1] CNEL (dBA)	Distance from Construction Activity (feet)	Construction Activity	Construction Equipment CNEL (dBA)	Total[2] CNEL (dBA)	Significance Threshold[3]	Above Threshold?
R1	Residential development in Playa del Rey	67.8	3,200	Airfield improvements	60.5	68.5	72.8	No
R2	Saint Bernard High School	67.7	2,500	Airfield improvements	62.6	68.9	72.7	No
R3	Residential development along southern edge of Westchester	68.4	1,500	Airfield improvements	67.1	70.8	73.4	No
R4	Park West Apartments on Lincoln Boulevard	66.3	1,200	Airfield improvements	69.0	70.9	71.3	No
R5	Residential uses along West 88th Street near Liberator Ave	67.9	2,500	Airfield improvements	62.6	69.0	72.9	No
R6	Residential uses near Westchester Parkway and Kittyhawk Ave	72.0	1,750	Airfield improvements	65.7	72.9	77.0	No
		72.0	2,850	Terminal (C0) construction	61.9	72.4	77.0	No
		72.0	1,500	Roadway construction	67.5	73.3	77.0	No
		72.0	NA	Combined airfield improvements, terminal (C0), and roadway construction	70.4	74.3	77.0	No
R7	Residence Inn by Marriott Los Angeles LAX/Century Boulevard	70.2	2,900	Terminal (C0) construction	61.7	70.9	75.2	No
		70.2	900	Terminal (T9) construction	71.9	74.1	75.2	No
		70.2	900	Roadway construction	71.9	74.1	75.2	No
		70.2	NA	Combined terminal (C0 and T9) and roadway construction	75.1	76.3	75.2	Yes[4]
R8	Sheraton Gateway Los Angeles Hotel	69.3	1,600	Terminal (C0) construction	66.9	71.3	74.3	No
		69.3	300	Terminal (T9) construction	81.4	81.7	74.3	Yes[4]
		69.3	100	Roadway construction	91.0	91.0	74.3	Yes[4]
		69.3	NA	Combined terminal (C0 and T9) and roadway construction	91.5	91.5	74.3	Yes[4]
R9	H Hotel Los Angeles/Homewood Suites by Hilton Los Angeles International Airport	70.4	1,200	Terminal (C0) construction	69.4	72.9	75.4	No
		70.4	250	Terminal (T9) construction	83.3	83.3	75.4	Yes[4]
		70.4	55	Roadway construction	96.2	96.2	75.4	Yes[4]

Table 4.7.3-5
Construction Noise Levels at Noise-Sensitive Receptor Sites

ID	Receptor	Background Conditions[1] CNEL (dBA)	Distance from Construction Activity (feet)	Construction Activity	Construction Equipment CNEL (dBA)	Total[2] CNEL (dBA)	Significance Threshold[3]	Above Threshold?
		70.4	NA	Combined terminal (C0 and T9) and roadway construction	96.4	96.4	75.4	Yes[4]
R10	Hyatt Regency Los Angeles International Airport	73.4	350	Terminal (C0) construction	80.1	80.9	78.4	Yes[4]
		73.4	550	Terminal (T9) construction	76.2	78.0	78.4	No
		73.4	150	Roadway construction	87.5	87.7	78.4	Yes[4]
		73.4	NA	Combined terminal (C0 and T9) and roadway construction	88.5	88.6	78.4	Yes[4]
R11	Courtyard Los Angeles LAX/Century Boulevard	71.7	1,000	Terminal (C0) construction	71.0	74.4	76.0	No
		71.7	600	Terminal (T9) construction	75.4	76.9	76.0	Yes[4]
		71.7	150	Roadway construction	87.5	87.6	76.0	Yes[4]
		71.7	NA	Combined terminal (C0 and T9) and roadway construction	87.9	88.0	76.0	Yes[4]

Source: **Appendix F.3** of this EIR.

Notes:
1 Background condition obtained through AEDT using 24-hour CNEL dBA.
2 Background plus Project construction noise.
3 Significance Threshold = Background CNEL + 5 dBA
4 Construction equipment noise levels conservatively assume all equipment would be utilized at the same time and at all hours of the 24-hour day, both of which are unlikely.

Key:
C0 = Concourse 0; T9 = Terminal 9

For receptor locations R6 through R11, the estimated noise levels presented in Table 4.7.3-5 conservatively account for the potential for major elements of the Project that are proposed nearby to be under construction simultaneously. For those receptor locations, Table 4.7.3-5 indicates the estimated construction noise levels associated with the improvements individually and combined. The remaining receptor locations, specifically, R1 through R5, are not located near more than one of the major elements of the proposed Project. The estimated construction noise levels at those locations would be influenced primarily by airfield construction.

Construction of Airfield Improvements

The nearest noise-sensitive receptors to the proposed airfield improvement construction sites are residences located north of Westchester Parkway (R3) and at the Park West Apartments (R4), at distances of approximately 1,500 feet and 1,200 feet from the closest point of construction, respectively. As shown in Table 4.7.3-5, noise exposure at these locations due to construction of the airfield improvements would be approximately 67.1 and 69.0 dBA CNEL, respectively, during the noisiest construction times. Total noise levels (i.e., background plus Project construction noise) would not exceed existing ambient exterior noise levels by 5 dBA or more at any of the receptor locations, even when considering nighttime construction activities, and impacts would be ***less than significant***.

Construction of Terminal Improvements

Construction of the proposed terminal improvements would not be located near noise-sensitive residential receptors. As shown on Table 4.7.3-5, residences located near Westchester Parkway and Kittyhawk Avenue (R6) are approximately 2,850 feet from the closest terminal construction activity (Concourse 0 construction). Construction equipment-related noise exposure at these residences would be approximately 61.9 dBA CNEL at its loudest (see Table 4.7.3-5), which is well below existing ambient noise conditions (72.0 dBA CNEL) and would not result in a total noise level that exceeds the significance threshold. Therefore, at residences located near Westchester Parkway and Kittyhawk Avenue, impacts related to construction-equipment noise from terminal construction activities would be ***less than significant***.

Hotels along and near Century Boulevard would be subject to disturbance by construction of the new Concourse 0 and Terminal 9 due to their proximity to the proposed sites. Construction noise exposure would range from 71.9 dBA CNEL at the Residence Inn by Marriott (R7) to 83.3 dBA CNEL at the H Hotel/Homewood Suites (R9) under worst-case conditions (which assumes all construction equipment is in use over a 24-hour day, and all terminal-related construction activities are occurring at the same time). Total terminal-related noise levels (i.e., background plus Project construction noise) at the Sheraton Gateway Hotel, H Hotel/Homewood Suites, Hyatt Regency, and Courtyard Los Angeles LAX/Century Boulevard would be greater than existing ambient exterior noise levels by 5 dBA or more (see Table 4.7.3-5). Therefore, construction equipment noise from construction of the proposed terminal improvements could result in a temporary but ***significant impact*** to noise-sensitive uses in the nearby area including, but not limited to, the Sheraton Gateway, H Hotel/Homewood Suites, Hyatt Regency, and Courtyard Los Angeles LAX/Century Boulevard, under conservative, worst-case conditions.

It should be noted that the estimated noise levels do not account for any intervening topography, buildings, or other obstructions that would reduce noise. It should also be noted that hotels located in proximity to LAX including, but not limited to, the specific hotels identified above, are subject to the *Sound Insulation Requirements for Noise Sensitive Structures Near Los Angeles International Airport* established

by the City of Los Angeles Department of Building and Safety.[13] The purpose of those requirements is to protect persons within designated noise-sensitive buildings from excessive exterior noise, with the goal to ensure that, after proper sound insulation measures are taken, the interior CNEL does not exceed 45 dBA. Given the existing setting of these hotels, being in proximity to aircraft operations at LAX and the associated high noise levels, the outdoor to indoor noise reduction levels at the hotels is greater than in most typical buildings due to extra sound insulation/attenuation features integrated into the buildings' design and construction. Although exterior noise levels would exceed the significance thresholds, it is not expected that these exceedances would result in sleep disturbance, given the heightened standards for interior noise insulation.

As noted previously, this analysis conservatively assumes construction activity at all sites would occur simultaneously, that all equipment would be used throughout the entire 24-hour day, and that all construction equipment at each site would be in use simultaneously. This is not expected to occur, as different pieces of construction equipment would be in use during different phases of construction, nighttime construction activities, if any, would be limited, and construction of the various Project components would not all overlap. Therefore, this analysis represents a potential worst-case scenario for construction equipment noise. As a result, actual noise exposure at these receptor locations would likely be lower than identified in Table 4.7.3-5.

Construction of Landside Access Improvements

Construction of the proposed landside access (i.e., roadway) improvements would be located approximately 1,500 feet from residences located northeast of the intersection of Sepulveda Boulevard and Westchester Parkway (R6). Construction equipment-related noise exposure at these residences would be approximately 67.5 dBA CNEL at its loudest (see Table 4.7.3-5), which is well below the ambient noise conditions (72.0 dBA CNEL) and would not result in a total noise level that exceeds the significance threshold. Therefore, at residences located northeast of the Sepulveda Boulevard and Westchester Parkway intersection, which represents residential receptors nearest to proposed roadway improvements, impacts related to construction-equipment noise from roadway construction activities would be ***less than significant***.

Hotels along Century Boulevard would be subject to construction equipment-related noise from construction of the proposed roadway improvement construction activities. Construction noise exposure would range from 71.9 dBA CNEL at the Residence Inn by Marriott (R7) to 96.2 dBA CNEL at the H Hotel/Homewood Suites (R9). As shown in Table 4.7.3-5, total noise levels (i.e., background plus roadway construction noise) would be greater than existing ambient exterior noise levels by 5 dBA or more at four of the five hotels analyzed (i.e., Sheraton Gateway, H Hotel/Homewood Suites, Hyatt Regency, and Courtyard Los Angeles LAX/Century Boulevard). Therefore, construction equipment noise from construction of the proposed roadway improvements could result in a temporary but ***significant impact*** to noise-sensitive uses in the nearby area including, but not limited to, at the Sheraton Gateway, H Hotel/Homewood Suites, Hyatt Regency, and Courtyard Los Angeles LAX/Century Boulevard, under conservative, worst-case conditions. Although exterior noise levels would exceed the significance thresholds, for reasons described above, it is not expected that these exceedances would result in sleep disturbance, given the heightened standards for interior noise insulation.

[13] City of Los Angeles, Department of Building and Safety, *Information Bulletin/Public – Building Code, Reference No.: LAMC 91.1207, Document No.: P/BC 2014-074, Sound Insulation Requirements for Noise Sensitive Structures Near Los Angeles International Airport*, Effective January 1, 2014. Available: https://www.ladbs.org/docs/default-source/publications/information-bulletins/building-code/sound-insulation-requirements-for-noise-sensitive-structures-near-los-angeles-international-airportib-p-bc2014-074.pdf?sfvrsn=13.

As noted previously, that actual noise exposure at these receptor locations would likely be lower than the levels analyzed herein because it is unlikely that all equipment would be in use at any one time or that construction activity would occur throughout the entire 24-hour day.

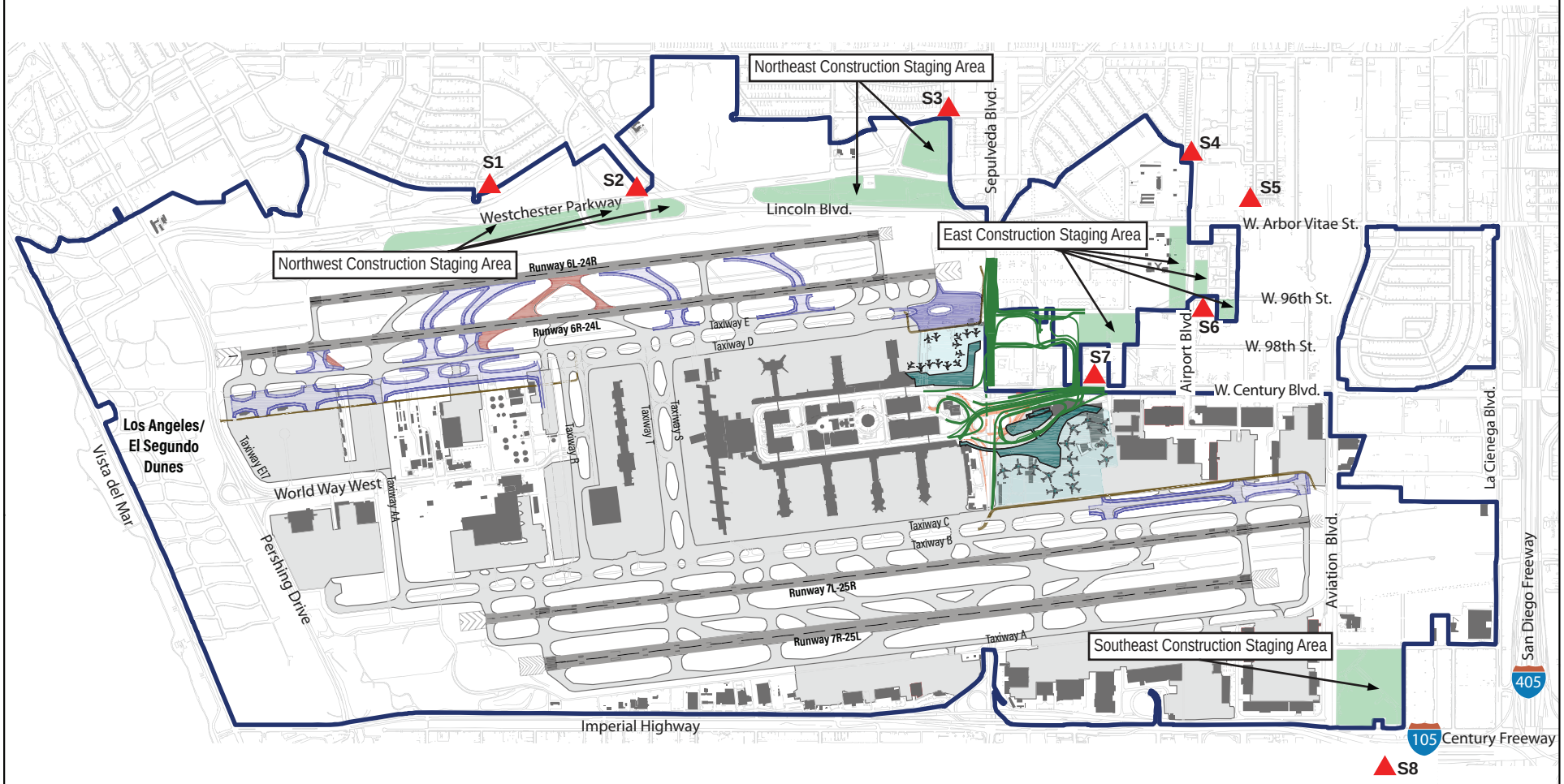
Combined Construction of Project Improvements

The five hotels at receptor locations R7 through R11 are situated in proximity to both the proposed terminal improvements and the landside access improvements and could be subject to construction noise impacts from both types of improvements should the subject construction activities occur simultaneously. Combined construction noise from the proposed airfield improvements, the landside access improvements, and proposed Concourse 0 was also evaluated for receptor location R6. Table 4.7.3-5 presents the estimated noise levels at each receptor location for the combined construction activities. As shown, the combined airfield, landside access, and terminal improvements construction noise exposure would be 70.4 dBA CNEL at Receptor R6, which would be less than existing exterior ambient noise levels (72 dBA). Total noise at this receptor would not exceed existing ambient exterior noise levels by 5 dBA. The combined terminal improvements and landside access improvements construction noise exposure would range from 75.1 dBA CNEL at the Residence Inn by Marriott (R7) to 96.4 dBA CNEL at the H Hotel/Homewood Suites (R9) under worst-case conditions (which assumes all construction equipment is in use over a 24-hour day, and all terminal-related and roadway-related construction activities are occurring at the same time). As shown in Table 4.7.3-5, total noise levels (i.e., background plus terminal and roadway construction noise) would range from 76.3 dBA to 96.4 dBA, and would be greater than existing ambient exterior noise levels by 5 dBA or more at all five hotels analyzed. Therefore, construction equipment noise from potential combined construction of the proposed terminal improvements and the roadway improvements could result in a temporary but ***significant impact*** to noise-sensitive uses in the nearby area including, but not limited to, the Residence Inn by Marriott, Sheraton Gateway, H Hotel/Homewood Suites, Hyatt Regency, and Courtyard Los Angeles LAX/Century Boulevard, under conservative, worst-case conditions. Although exterior noise levels would exceed the significance thresholds, for reasons described above, it is not expected that these exceedances would result in sleep disturbance, given the heightened standards for interior noise insulation.

As noted previously, that actual noise exposure at these receptor locations would likely be lower than the levels analyzed herein because it is unlikely that all equipment would be in use at any one time or that construction activity would occur throughout the entire 24-hour day.

Construction Staging Areas

Various construction staging areas would be utilized to mobilize and manage construction equipment and/or supplies. These construction staging areas are shown in **Figure 4.7.3-2**. It should be noted that these staging areas are currently being, or have been, used as staging areas for other construction projects at LAX. Noise-sensitive receptor locations in the vicinities of the construction staging areas are also shown in Figure 4.7.3-2. **Table 4.7.3-6** identifies the anticipated noise levels at these noise-sensitive uses. The potential noise impacts from use of these construction staging areas are discussed in the following sections.



Legend

- Construction Noise Analysis Receptors
- LAX Property Boundary
- Airfield Improvements
- Terminal and Related Improvements
- Taxiway to be Removed or Decommissioned
- Roadway Improvements
- Roadway to be Demolished
- Potential Construction Staging Area

Note: See Table 4.7.3-1 for description of land use setting at each receptor location.

0 1,500 3,000 Feet
Scale

Source: HMMH, June 2020; CDM Smith, June 2020
Prepared by: CDM Smith, October 2020

LAX Airfield and Terminal Modernization Project

Construction Staging Areas and
Nearby Noise-Sensitive Receptors

Figure
4.7.3-2

Table 4.7.3-6
Staging Area Noise Levels at Noise-Sensitive Receptor Sites

ID	Receptor	Background Conditions[1] CNEL (dBA)	Distance from Staging Area (feet)	Staging Area Construction Equipment Noise CNEL (dBA)	Total[2] CNEL (dBA)	Significance Threshold[3]	Above Threshold?
S1	Residential development along southern edge of Westchester	68.6	700	55.1	68.8	73.6	No
S2	Park West Apartments on Lincoln Boulevard	67.8	200	66.0	70.0	72.8	No
S3	Residential uses along West 88th Street near Sepulveda Westway	68.2	125	70.0	72.2	73.2	No
S4	Residential uses along Lilienthal Avenue near Airport Blvd	71.1	1,350	49.4	71.1	76.1	No
S5	Residential uses north of Arbor Vitae St between Airport Blvd and Bellanca Ave	74.0	850	53.4	74.0	79.0	No
S6	Renaissance Los Angeles Airport Hotel	68.0	150	68.5	71.2	73.1	No
S7	Sheraton Gateway Los Angeles Hotel	69.3	150	68.5	71.9	74.4	No
S8	Residential uses within Del Aire near Aviation Blvd	66.1	750	67.5[4]	69.9	71.1	No

Source: **Appendix F.3** of this EIR.

Notes:

1 Background condition obtained through AEDT using 24-hour CNEL dBA.

2 Background plus Project construction staging area noise.

3 Significant Threshold = Background CNEL + 5 dBA.

4 This noise level is conservative (high) because it assumes concrete batch plant and crusher operations would occur at the south edge of the staging area closest to the nearest residential area; however, the actual placement of those facilities within the staging area would be farther away in the central portion of the staging area where electric power infrastructure for the facilities is located. As such, actual construction noise levels at the nearest residential area would be lower than shown in the table.

Northwest Construction Staging Area

The northwest construction staging area would be located south of Westchester Parkway between Pershing Drive and Lincoln Boulevard (see Figure 4.7.3-2). This area is expected to be used primarily for construction worker parking, construction trailers/portable offices, as well as storage for tools/supplies/materials. Specifically, this construction staging area would generate noise from workers arriving at and departing from the parking area, noise from trucks traveling to and from this area, and noise from on-site activities, such as loading and unloading trucks. No materials processing (e.g., a rock crusher or concrete batch plant) would occur at the construction staging area.

Construction staging activity would occur primarily in the daytime hours and largely involve street-legal vehicles that are quieter than off-road construction equipment. Therefore, the noise from such vehicles at this staging/parking area would be much less than that from the off-road construction equipment

considered for construction of the airfield, terminal, and roadway improvements. Based on the nature, location, and anticipated use of this construction staging area, staging area activity noise levels at nearby residential areas located approximately 200 feet to the north (S2) were calculated to be 66.0 dBA CNEL, and would not result in a total noise level that exceeds the significance threshold. Therefore, impacts to residences related to noise from the northwest construction staging area would be ***less than significant*** (see Table 4.7.3-6).

Northeast Construction Staging Area

The northeast construction staging area would be located northeast of the LAX, with one portion located at the intersection of La Tijera and Sepulveda Westway, and the other portion located to the immediate south between McConnell Avenue and Sepulveda Westway (see Figure 4.7.3-2). Part of staging area has been used by LAWA for staging of construction and soundproofing activities; a block wall approximately 15 to 20 feet tall borders the northern and western edges of the staging area (i.e., between the interior of the staging area and residential areas to the north and northwest). This construction staging area would be used primarily for construction worker parking, construction trailers/portable offices, and/or outdoor storage laydown areas. No materials processing (e.g., a rock crusher or concrete batch plant) would occur at the northeast construction staging area.

Based on the nature, location, and anticipated use of the northeast construction staging area, staging area activity noise levels at nearby residential areas located approximately 125 feet to the north (S3) were calculated to be 70.0 dBA CNEL, and would not result in a total noise level that exceeds the significance threshold. Therefore, impacts to residences related to noise from the northeast construction staging area would be ***less than significant*** (see Table 4.7.3-6).

East Construction Staging Areas

The east construction staging areas would be located to the east of the airport and are expected to be used primarily for construction worker parking, and for construction trailers/portable offices, storage of tools/supplies/materials, and outdoor storage and laydown areas. One area would be located south of Arbor Vitae Street on both sides of Airport Boulevard between Belford Boulevard and Jenny Avenue, and the other would be located south of 96th Street and north of 98th Street near Avion Drive (see Figure 4.7.3-2). No materials processing (e.g., a rock crusher or concrete batch plant) would occur at the east construction staging areas.

Based on the nature, location, and anticipated use of these construction staging areas, staging area activity noise impacts to the closest nearby residential areas located approximately 850 feet to the north (S5) were calculated to be 53.4 dBA CNEL, and would not result in a total noise level that exceeds the significance threshold. In addition, there are several hotel receptors (S6 and S7) located approximately 150 feet from one of the east construction staging areas. The staging area activity noise impacts at these hotels were calculated to be 68.5 dBA CNEL, and would not result in total noise levels that exceeds the significance threshold. Therefore, impacts to residences and hotels related to noise from the east construction staging areas would be ***less than significant*** (see Table 4.7.3-6).

Southeast Construction Staging Area

The southeast construction staging area would be located southeast of the southern runway complex at the corner of Imperial Highway and Aviation Boulevard (see Figure 4.7.3-2). This staging area is expected to be used primarily for construction worker parking and construction trailers/portable offices; enclosed storage bins for contractors to keep tools, supplies, and materials; and outdoor storage and laydown areas. There is a potential for materials processing (e.g., a rock crusher or concrete batch plant) to occur within this staging area.

The nearest noise-sensitive residential use (S8), located in Del Aire, is approximately 750 feet south of the area. The staging area activity noise impacts at this receptor, assuming that materials processing would occur at this site, were calculated to be 67.5 dBA CNEL,[14] and would not result in total noise levels (i.e., 69.9 dBA) that exceeds the significance threshold. Therefore, impacts to residences related to noise from the southeast construction staging area would be ***less than significant*** (see Table 4.7.3-6).

It should be noted that an existing eight-foot concrete block wall is located along the north side of 116th Street that fronts the residential area within Del Aire. With the concrete block wall and the many other structures that exist between the southeast construction staging area and the residential area within Del Aire, including the Metro Green Line Aviation/LAX Station and several on- and off-ramps that extend to and from the elevated I-105 freeway, noise emanating from construction staging activities at this construction staging area would be attenuated. These intervening structures would provide further noise reduction.

4.7.3.5.2.2 Mitigation Measures

As noted above, the proposed Project may generate construction noise that results in significant impacts at noise-sensitive receptors consisting of hotels located along Century Boulevard. These impacts would occur during construction of Concourse 0, Terminal 9, and landside access improvements. Mitigation measures proposed to reduce significant impacts related to construction equipment noise are provided below.

- **MM-CN (ATMP)-1. Construction Noise Control Plans.**

  LAWA shall require construction contractors working on the landside access (i.e., roadway) improvements, the Concourse 0 improvements, and the Terminal 9 improvements, including the Terminal 9 APM station, to develop noise control plans to address construction equipment noise at noise-sensitive receptors where construction noise impacts may be significant. The noise control plans shall be approved by LAWA prior to implementation. The noise control plans shall calculate the total maximum noise level (in CNEL) associated with construction of the Project component, as well as cumulative noise impacts that account for Project-related activities that would occur concurrently with construction of other Project components and construction of other nearby LAX projects. If the calculated construction-related noise levels indicate an increase of 5 dBA over the baseline exterior noise level at any noise-sensitive receptor, the noise control plan shall specify provisions and/or measures to be implemented during construction that will attenuate construction noise levels to be less than 5 dBA over the baseline exterior noise level. Potential noise attenuation measures could include, but are not limited to, noise curtains, noise blankets, temporary sound walls, or their equivalent during construction. The noise control plans shall include a provision that states that, if noise levels exceed the 5 dBA increase, LAWA will require the contractor to implement additional noise attenuation measures until the noise increase is less than 5 dBA.

Due to the dynamic nature of construction activities, especially for a large diverse project such as the proposed Project, it is not feasible to specify in the planning stage exactly what noise attenuation measures would be implemented for each aspect of Project development. Such decisions are feasible when there are more details known about the specific construction equipment to be used; the operational location and setting (i.e., any intervening noise barriers between the equipment area and nearby noise-sensitive uses); the schedule of each individual component of the proposed Project, including which

[14] This noise level is conservative (high) because it assumes concrete batch plant and crusher operations would occur at the south edge of the staging area closest to the nearest residential area; however, the actual placement of those facilities within the staging area would be farther away in the central portion of the staging area where electric power infrastructure for the facilities is located. As such, actual construction noise levels at the nearest residential area would be lower than the estimated value of 69.9.

construction activities would occur concurrently; the schedule for, and duration of, equipment operation; and the nature and location of other nearby construction activity that may overlap with the Project-related construction. Given that such considerations may change over the course of developing the proposed Project improvements, the specification of appropriate construction noise attenuation measures is best determined at the time of construction. With implementation of Mitigation Measure MM-CN (ATMP)-1, the need for construction noise attenuation measures would be determined, and the specific noise measures would be identified in noise control plans specific to each Project component. The proposed mitigation measure provides a performance standard that construction noise levels shall not exceed 5 dBA over the baseline exterior noise level at the time of construction and provides a number of feasible options for attaining this standard. With adherence to this performance standard, this measure would mitigate construction noise impacts.

In addition to MM-CN (ATMP)-1, the following mitigation measures are proposed to further reduce significant impacts related to construction equipment noise.

- **MM-CN (ATMP)-2. Construction Scheduling.**

  The timing and/or sequence of the noisiest on-site construction activities shall avoid noise-sensitive times of the day, as feasible (9:00 p.m. to 7:00 a.m. Monday - Friday; 6:00 p.m. to 8:00 a.m. Saturday; anytime on Sunday or holidays).

- **MM-CN (ATMP)-3. Construction Equipment.**

  Stationary source equipment whose use is flexible with regard to relocation (such as generators and compressors) shall be located at the greatest distance practical from noise-sensitive land uses. “Quiet-design” air compressors and other quieter construction equipment shall be used when feasible and when such technology/equipment is commercially available.

In addition to the measures above, the following mitigation measure would apply to the implementation of all construction-related mitigation measures associated with the proposed Project, including mitigation measures related to construction equipment noise.

- **MM-C (ATMP)-1. Construction Mitigation Oversight.**

  LAWA shall require Airfield and Terminal Modernization Project prime contractors to designate an individual responsible for ensuring implementation of all construction-related mitigation measures and LAWA policies/requirements.

4.7.3.5.2.3 Significance of Impact After Mitigation

With implementation of Mitigation Measures MM-CN (ATMP)-1, MM-CN (ATMP)-2, MM-CN (ATMP)-3, and MM-C (ATMP)-1, significant impacts associated with construction equipment noise impacts would be reduced to a level that is ***less than significant***.

4.7.3.5.3 Impact 4.7.3-3

Summary Conclusion for Impact 4.7.3-3: Implementation of the proposed Project would not generate excessive ground-borne vibration that would exceed damage criteria. This would be a *less than significant impact* for construction.

4.7.3.5.3.1 Construction Impacts

Construction of the proposed Project has the potential to generate vibration. Construction of the proposed Project would not involve pile driving or blasting, which are generally the most severe sources of vibration. However, heavy construction equipment associated with the proposed Project, such as large bulldozers, vibratory rollers (e.g., compactors), and caisson drilling for construction of the elevated roadway, would be used during construction.

Construction vibration is a localized event and is typically only perceptible to a receptor that is close to the vibration source. The vibration-sensitive receptors located in the vicinity of proposed construction activity are the former Aircraft School Building, located along Sepulveda Boulevard approximately 45 feet east of a proposed elevated roadway; the McCulloch Building (currently the H Hotel/Homewood Suites), located on the north side of Century Boulevard approximately 55 feet north of a proposed elevated roadway; the Union Savings and Loan Building, located on Sepulveda Boulevard approximately 75 feet south of a proposed elevated roadway; and the 1961 Airport Traffic Control Tower, located within the Central Terminal Area approximately 130 from proposed roadway improvements.

The evaluation of potential impacts to nearby structures is based on typical vibration levels during construction activities presented in **Table 4.7.3-7**. Vibration levels at 25 feet are based on measured data compiled by the FTA. The table also includes calculated approximate vibration levels at other distances.

Table 4.7.3-7
Vibration Source Levels for Construction Equipment

Equipment	PPV at 40 feet (in/sec)	PPV at 30 feet (in/sec)	PPV at 25 feet (in/sec)	PPV at 20 feet (in/sec)	PPV at 10 feet (in/sec)
Vibratory Roller	0.104	0.160	0.210	0.293	0.830
Large Bulldozer/Hoe Ram	0.044	0.068	0.089	0.124	0.352
Caisson Drilling	0.044	0.068	0.089	0.124	0.352
Loaded Trucks	0.038	0.058	0.076	0.106	0.300
Jackhammer	0.017	0.027	0.035	0.049	0.138
Small Bulldozer	0.001	0.002	0.003	0.004	0.012

Sources: U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018. Available: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf; CDM Smith, 2020.

Key:
PPV = peak particle velocity; in/sec = inches per second

Of the four buildings within the Project area that may be susceptible to vibration damage, the former Aircraft School Building is of timber and masonry construction (with a vibration threshold of 0.2 ppv in/sec), while the others are constructed with reinforced concrete and steel (vibration threshold of 0.5 ppv in/sec). As noted above, in addition to being the building most sensitive to vibration, the former Aircraft School Building is also located closest to the proposed construction activities, at 45 feet. Notwithstanding, as shown in Table 4.7.3-7, vibration levels generated during construction would not the exceed 0.2 ppv in/sec threshold value beyond 40 feet from the source. (At a distance of 40 feet from the source, vibration levels would not even exceed the 0.12 ppv in/sec threshold associated with fragile buildings.) Therefore, the proposed Project would not result in significant vibration impacts during construction.

4.7.3.5.3.2 Mitigation Measures

Because the proposed Project would result in a ***less than significant impact*** relative to construction equipment vibration, no mitigation is required.

4.7.3.5.3.3 Significance of Impact After Mitigation

As indicated above, no mitigation is required to address construction equipment vibration. The proposed Project would result in a ***less than significant impact***.

4.7.3.6 Cumulative Impacts

4.7.3.6.1 Construction Traffic Noise

The geographical area of the cumulative impacts analysis includes the proposed haul routes that are located in proximity to noise-sensitive receptors. Table 3-1 in Chapter 3, *Overview of Project Setting*, identifies development projects at or adjacent to LAX. These projects are shown in Figure 3-1. Of the projects identified on Table 3-1, those whose construction traffic would be most likely to use the same roads as the proposed Project due to their location include the LAX Northside Development, Terminals 2 and 3 Modernization Project, and the LAX Landside Access Modernization Program. Although the cumulative development projects would employ construction traffic management techniques, such as designating construction routes along arterials and away from local streets, the combination of these cumulative projects and the proposed Project would result in increased construction-related traffic on roadways within the Project area. These cumulative trips would add to construction traffic-related noise at nearby noise-sensitive receptors. However, the cumulative increase in construction-related traffic would not result in a doubling of existing daily traffic volumes on any area roads. As noted earlier in Section 4.7.3.5.1.1, construction traffic routes would be located along major roadways such as those listed in Table 4.7.3-4. Major roadways with the most notable potential for having cumulative construction traffic from other development projects at or adjacent to LAX that would combine with construction traffic from the proposed Project include Westchester Parkway relative to LAX Northside Development, Sepulveda Boulevard and Century Boulevard relative to Terminals 2 and 3 Modernization Project and the LAX Landside Access Modernization Program, and 96th Street relative to the LAX Landside Access Modernization Program. As indicated in Table 4.7.3-4, existing daily traffic volumes on those roads range from 15,880 vehicles on 96th Street to 54,220 vehicles on Century Boulevard. As described in Section 4.7.3.5.1.1, the combined peak daily vehicle trip generation of Project-related construction workers and trucks (multiplied time 2.5 for "passenger car equivalent" traffic volumes) is 3,225 daily trips. Even with a very conservative assumption that those trips would not be distributed onto different roadways, it is not anticipated that additional construction traffic from the aforementioned cumulative projects would result in a doubling of traffic on the subject construction traffic routes. Therefore, the increase in noise levels from cumulative construction-related traffic would not exceed 3 dBA CNEL and cumulative construction traffic noise impacts would be ***less than significant***.

4.7.3.6.2 Construction Equipment Noise

Cumulative noise impacts could occur at noise-sensitive receptor locations if construction of other development projects were to occur concurrently with Project construction. Because noise levels decrease with distance, only those development projects that are located in close proximity to the proposed Project were included in the analysis of cumulative construction equipment noise. Specifically, only those projects located in close proximity to the proposed landside access improvements would have the potential to contribute to cumulative construction equipment noise impacts. (The proposed airfield and terminal improvements are not located in close enough proximity to other development projects to result in cumulative construction equipment noise impacts.) Therefore, the geographical area of the cumulative impacts analysis for construction noise includes the proposed Project landside access (i.e., roadway) construction sites and adjacent areas.

As noted in the discussion of cumulative construction traffic noise above, development projects at or adjacent to LAX are summarized in Table 3-1 and shown in Figure 3-1. Based on project location and construction timing, the LAX Landside Access Modernization Program is the only development project with the potential to contribute to cumulative construction noise impacts. The remaining development projects in Table 3-1 are located too far from noise-sensitive receptor locations and/or from construction

activities associated with the proposed Project for additive elevated noise levels to occur at the receptor locations.

The LAX Landside Access Modernization Program components that are located in proximity to the proposed Project's landside access improvements include portions of the Automated People Mover (APM), development of Jetway Boulevard (which will be constructed between Vicksburg Avenue and Avion Drive, and from Century Boulevard north past 96th Street), and improvements to Century Boulevard. Construction of nearby portions of the APM and development of Jetway Boulevard would not overlap with construction of the proposed Project's landside access improvements. However, the LAX Landside Access Modernization Program improvements to Century Boulevard between Vicksburg Avenue and Avion Drive may occur during the same timeframe as the proposed Project's roadway improvements (specifically, the proposed new roadways that would be located parallel to, and immediately west of, Jetway Boulevard and the proposed improvements to Century Boulevard west of Jetway Boulevard).

The nearest noise-sensitive receptors common to the proposed Project's roadway improvements and the LAX Landside Access Modernization Program's improvements to Century Boulevard are the hotels located on the north side of Century Boulevard between Sepulveda Boulevard and Avion Drive, namely the H Hotel/Homewood Suites and the Sheraton Gateway.

In order to determine cumulative construction equipment noise impacts, construction equipment noise associated with the proposed Project improvements whose construction may overlap with the LAX Landside Access Modernization Program were calculated.[15] In addition, construction noise levels for the LAX Landside Access Modernization Program were also calculated based on distances provided in the LAX Landside Access Modernization Program EIR.[16] The results are provided in **Table 4.7.3-8**. As shown in Table 4.7.3-8, cumulative construction equipment noise levels from the proposed Project and the LAX Landside Access Modernization Program would be greater than 5 dBA higher than existing ambient noise levels at the Sheraton Gateway hotel and the H Hotel/Homewood Suites. Therefore, the proposed Project, in conjunction with other development projects, could have a ***significant cumulative impact*** with respect to construction equipment noise. Because the proposed Project, by itself, would have significant impacts at these locations, the Project's contribution to the significant cumulative impact would be ***cumulatively considerable***.

Mitigation Measure MM-CN (ATMP)-1, Construction Noise Control Plan, includes a provision whereby calculation of construction-related noise, as the basis for assessing the need for construction noise attenuation, shall take into account Project-related activities that would occur concurrently with construction of nearby LAX Landside Access Modernization Program facilities. This would address construction noise impacts. When implemented jointly, Mitigation Measures MM-CN (ATMP)-1, MM-CN (ATMP)-2, and MM-CN (ATMP)-3 would reduce cumulative impacts associated with construction equipment noise to a level that is ***less than significant***.

[15] The construction equipment noise levels associated with the proposed Project improvements whose construction may overlap with the LAX Landside Access Modernization Program are not the same as the noise levels shown in Table 4.7.3-5. The noise levels in Table 4.7.3-5 reflect noise from the proposed Project improvement located in closest proximity to the noise-sensitive receptor. The proposed Project improvements whose construction may overlap with the LAX Landside Access Modernization Program are located farther away from the noise-sensitive receptors.

[16] City of Los Angeles, Los Angeles World Airports, *Final Environmental Impact Report for Los Angeles International Airport (LAX) Landside Access Modernization Program*, (SCH 2015021014), Section 4.9 – Noise, February 2017. Available: https://www.lawa.org/en/connectinglax/automated-people-mover/documents.

Table 4.7.3-8
Cumulative Construction Equipment Noise Impacts

Receptor	Proposed Project CNEL (dBA)	LAX Landside Access Modernization Program CNEL (dBA)	Total Cumulative CNEL (dBA)	Significance Threshold	Above Threshold?
Sheraton Gateway Los Angeles Hotel	85	78	85.8	74.3	Yes[1]
H Hotel Los Angeles/Homewood Suites by Hilton Los Angeles International Airport	96.2	81.9	96.4	75.4	Yes[1]
Hyatt Regency Los Angeles International Airport	87.5	70.4	87.6	78.4	Yes[1]

Source: CDM Smith, 2020.

Note:

[1] Construction equipment noise levels assume all equipment would be utilized at the same time and at all hours of the 24-hour day, both of which are unlikely.

4.7.3.6.3 Construction Vibration

The geographic scope of construction vibrational impacts is very limited, given the rate of vibrational attenuation. The vibration-sensitive receptor that is located in proximity to both the proposed Project and the LAX Landside Access Modernization Program is the McCullough Building (currently the H Hotel/Homewood Suites). This receptor is constructed of steel and reinforced concrete; the threshold of significance for construction equipment vibration at buildings of this construction type is 0.5 ppv.

The McCullough Building is located approximately 55 feet from the nearest construction activity associated with the proposed Project and is located approximately 80 feet from the nearest construction activity associated with the LAX Landside Access Modernization Program. As shown in Table 4.7.3-7, even for the most intensive vibration activity (expected to be vibratory rollers or similar equipment), the highest vibration levels would be 0.104 in/sec at 40 feet or one-fifth of the level of significance. Given the distances to the proposed Project and LAX Landside Access Modernization Program construction activities (i.e., 55 feet and 80 feet, respectively), cumulative construction vibration impacts would not exceed the significance threshold of 0.5 in/sec at this receptor. As a result, cumulative construction vibration impacts would be ***less than significant***.

4.7.3.7 Summary of Impact Determinations

Table 4.7.3-9 summarizes the impact determinations of the proposed Project related to construction traffic and equipment noise and vibration, as described above in Sections 4.7.3.5 and 4.7.3.6. Impact determinations are based on the significance criteria presented in Section 4.7.3.4, and the information and data sources cited throughout Section 4.7.3.

Table 4.7.3-9
Summary of Impacts and Mitigation Measures Associated with the Proposed Project Related to Construction Noise

Environmental Impacts	Impact Determination	Mitigation Measures	Level of Significance After Mitigation
Impact 4.7.3-1: Construction traffic would not cause existing ambient noise levels measured at the property line of noise-sensitive uses to increase by 3 dBA or more in CNEL. This would result in a ***less than significant impact*** for construction.	Construction: Less than Significant Operations: Not Applicable	Construction: No mitigation is required Operations: Not Applicable	Construction: Less than Significant Operations: Not Applicable
Impact 4.7.3-2: Use of construction equipment in association with construction activities would exceed existing ambient exterior noise levels by 5 dBA or more at noise-sensitive uses. This would be a ***significant impact*** for construction**.**	Construction: Significant Operations: Not Applicable	Construction: MM-CN (ATMP)-1. Construction Noise Control Plan. MM-CN (ATMP)-2. Construction Scheduling. MM-CN (ATMP)-3. Construction Equipment. MM-C (ATMP)-1. Construction Mitigation Oversight. Operations: Not Applicable	Construction: Less than Significant Operations: Not Applicable
Impact 4.7.3-3: Implementation of the proposed Project would not generate excessive ground-borne vibration that would exceed damage criteria. This would be a ***less than significant impact*** for construction**.**	Construction: Less than Significant Operations: Not Applicable	Construction: No mitigation is required Operations: Not Applicable	Construction: Less than Significant Operations: Not Applicable
Cumulative Impact: With respect to construction equipment noise, implementation of the proposed Project, in conjunction with other development projects, would result in a ***significant cumulative impact*** for construction. The proposed Project's contribution to this significant cumulative impact would be ***cumulatively considerable***. Cumulative construction traffic noise and construction vibration impacts would be ***less than significant***.	Construction: Cumulatively Significant Operations: Not Applicable	Construction: MM-CN (ATMP)-1. Construction Noise Control Plan. MM-CN (ATMP)-2. Construction Scheduling. MM-CN (ATMP)-3. Construction Equipment. Operations: Not Applicable	Construction: Less than Significant Operations: Not Applicable

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