4.5 Noise

4.5.1 Introduction

This section analyzes potential noise and ground-borne vibration impacts that would result from the development of the proposed Project. The analysis describes the existing noise environment within the Project area, estimates future noise and ground-borne vibration levels at surrounding land uses resulting from construction and operation of the proposed Project, and evaluates the potential for significant impacts. Noise calculation and data sheets for the proposed Project are included in Appendix C of this Environmental Impact Report (EIR). The analysis of potential operational noise impacts in this section is based in part on the following technical reports: *Noise Analysis Results for the Proposed WAMA at LAX* prepared by Harris Miller Miller & Hanson Inc. (HMMH) and the *West Aircraft Maintenance Area – Taxi Noise* memorandum prepared by Ricondo & Associates. These reports are included in Appendix C of this EIR.

Prior to the preparation of this EIR, an Initial Study (IS) was prepared (Appendix A of this EIR) using the California Environmental Quality Act (CEQA) Environmental Checklist Form to assess potential environmental impacts associated with noise. The IS found that for one of six noise-related thresholds the proposed Project would result in "no impact" and that no further analysis of that topic in an EIR was required. The determination of "no impact" was made for the following threshold because it is focused on projects within the vicinity of a private airstrip, whereas the proposed Project is located within a public airport, which is addressed by a separate threshold. Refinements have been made to the proposed Project to reflect additional information and coordination with the public and the Federal Aviation Administration (FAA). The refinements do not represent a material change to the proposed Project that was described in the IS/Notice of Preparation (NOP) and do not change any of the conclusions in the IS. The threshold not addressed further is as follows:

- For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

4.5.1.1 Noise Descriptors

Noise levels are measured using a variety of scientific metrics. As a result of extensive research into the characteristics of aircraft noise and human response to that noise, standard noise descriptors have been developed for aircraft noise exposure analyses. The descriptors used in this noise analysis are described below.

A-Weighted Sound Pressure Level (dBA): The decibel (dB) is a unit used to describe sound pressure level. When expressed in dBA, the sound has been filtered to reduce the effect of very low and very high frequency sounds, much as the human ear filters sound frequencies. Without this filtering, calculated and measured sound levels would include events that the human ear cannot hear (e.g., dog whistles and low frequency sounds, such as the groaning sounds emanating from large buildings with changes in temperature and wind). With A-weighting, calculations and sound monitoring equipment approximate the sensitivity of the human ear to sounds of different frequencies.

Some common sounds on the dBA scale are listed in **Table 4.5-1**. As shown in Table 4.5-1, the relative perceived loudness of a sound doubles for each increase of 10 dBA, although a 10-dBA change in the sound level corresponds to a factor of 10 change in relative sound energy.

Table 4.5-1

Common Sounds On The A-Weighted Decibel Scale

Sound	Sound level (dBA)	Relative loudness (approximate)	Relative sound energy
Rock music, with amplifier	120	64	1,000,000
Thunder, snowmobile (operator)	110	32	100,000
Boiler shop, power mower	100	16	10,000
Orchestral crescendo at 25 feet, noisy kitchen	90	8	1,000
Busy street	80	4	100
Interior of department store	70	2	10
Ordinary conversation, 3 feet away	60	1	1
Quiet automobiles at low speed	50	1/2	.1
Average office	40	1/4	.01
City residence	30	1/8	.001
Quiet country residence	20	1/16	.0001
Rustle of leaves	10	1/32	.00001
Threshold of hearing	0	1/64	.000001

Source: U.S. Department of Housing and Urban Development, Aircraft Noise Impact--Planning Guidelines for Local Agencies, 1972

In general, humans find a change in sound level of 3 dB is just noticeable, a change of 5 dB is clearly noticeable, and a change of 10 dB is perceived as doubling or halving sound level. Because of the logarithmic scale of the decibel unit, sound levels cannot be added or subtracted arithmetically. If a sound's physical intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. For example, 60 dB plus 60 dB equals 63 dB, 80 dB plus 80 dB equals 83 dB. However, where ambient noise levels are high in comparison to a new noise source, there will be a small change in noise levels. For example, when 70 dB ambient noise levels are combined with a 60 dB noise source the resulting noise level equals 70.4 dB.

Maximum Noise Level (L_{max}): L_{max} is the maximum or peak sound level during a noise event. The metric only accounts for the instantaneous peak intensity of the sound, and not for the duration of the event. As an aircraft passes by an observer, the sound level increases to a maximum level and then decreases. Some sound level meters measure and record the maximum or L_{max} level.

Sound Exposure Level (SEL): SEL, expressed in dBA, is a time integrated measure, expressed in decibels, of the sound energy of a single noise event at a reference duration of one second. The sound level is integrated over the period that the level exceeds a threshold. Therefore, SEL accounts for both the maximum sound level and the duration of the sound. The standardization of discrete noise events into a one-second duration allows calculation of the cumulative noise exposure of a series of noise events that occur over a period of time. Because of this compression of sound energy, the SEL of an aircraft noise event is typically 7 to 12 dBA greater than the L_{max} of the event. SELs for aircraft noise events depend on the location of the aircraft relative to the noise receptor, the type of operation (landing, takeoff, or overflight), and the type of aircraft.

Equivalent Continuous Noise Level (L_{eq}): L_{eq} is the sound level, expressed in dBA, of a steady sound which has the same A-weighted sound energy as the time-varying sound over the averaging period. Unlike SEL, L_{eq} is the average sound level for a specified time period (e.g., 24 hours, 8 hours, 1 hour, etc.). L_{eq} is calculated by integrating the sound energy from all noise events over a given time period and applying a factor for the number of events. L_{eq} can be expressed for any time interval, for example the L_{eq} representing an averaged level over an 8 hour period would be expressed as $L_{eq(8)}$.

Day-Night Average Sound Level (DNL): DNL, formerly referred to as L_{dn}, is expressed in dBA and represents the noise level over a 24-hour period. Because environmental noise fluctuates over time, DNL was devised to relate noise exposure over time to human response. DNL is a 24-hour average of the hourly L_{eq}, but with penalties to account for the increased sensitivity to noise events that occur during the more sensitive nighttime periods. Specifically, DNL penalizes noise 10 dB during the nighttime time period (10:00 p.m. to 7:00 a.m.). The U.S. Environmental Protection Agency (USEPA) introduced the metric in 1976 as a single number measurement of community noise exposure. The FAA adopted DNL as the noise metric for measuring cumulative aircraft noise under Federal Aviation Regulations (FAR) Part 150, Airport Noise Compatibility Planning. The Department of Housing and Urban Development, the Veterans Administration, the Department of Defense, the United States Coast Guard, and the Federal Transit Administration have also adopted DNL for measuring cumulative noise exposure.

DNL is used to describe existing and predicted noise exposure in communities in airport environs based on the average daily operations over the year and the average annual operational conditions at an airport. Therefore, at a specific location near an airport, the noise exposure on a particular day is likely to be higher or lower than the annual average noise exposure, depending on the specific operations at an airport on that day. DNL is widely accepted as the best available method to describe aircraft noise exposure and is the noise descriptor required for aircraft noise exposure analyses and land use compatibility planning under FAR Part 150 and for environmental assessments for airport improvement projects (FAA Order 10501.E).

Community Noise Equivalent Level (CNEL): CNEL, expressed in dBA, is the standard metric used in California to represent cumulative noise exposure. The metric provides a single-number description of the sound energy to which a person or community is exposed over a period of 24 hours similar to DNL. CNEL includes penalties applied to noise events occurring after 7:00 p.m. and before 7:00 a.m., when noise is considered more intrusive. The penalized time period is further subdivided into evening (7:00 p.m. through 9:59 p.m.) and nighttime (10:00 p.m. to 6:59 a.m.). When a noise event occurs in the evening, a penalty of 4.77 dBA is added to the nominal sound level (equivalent to a three-fold increase in aircraft operations). A 10 dBA penalty is added to nighttime noise events (equivalent to a ten-fold increase in aircraft operations).

The evening weighting is the only difference between CNEL and DNL. For purposes of aircraft noise analysis in the State of California, the FAA recognizes the use of CNEL.[1]

[1] See FAA Order 5050.4B, Page 8, Section 9, Paragraph "n" for FAA's acceptance of the CNEL metric as a suitable substitute for the Day-Night Average Sound Level (DNL).

4.5.2 Methodology

4.5.2.1 Construction Noise and Vibration

4.5.2.1.1 Construction Noise

On-site construction and construction trucks staging and hauling route noise impacts are evaluated by determining the noise levels generated by different types of construction activity, calculating the construction-related noise level at nearby sensitive receptor locations, and comparing these construction-related noise levels to existing ambient noise levels (i.e., noise levels without construction noise). More specifically, the following steps were undertaken to calculate construction-period noise levels:

1. Ambient noise levels at surrounding sensitive receptor locations were estimated from field measurement data made in proximity to the nearby noise-sensitive receptors;
2. Typical noise levels for each type of construction equipment as shown in noise calculation sheets included in Appendix C were obtained from the Federal Highway Administration's (FHWA) Roadway Construction Noise Model;
3. Distances between construction site locations (noise source) and surrounding sensitive receptors were measured using Project plans, GIS, and Google Earth;
4. Construction noise levels were calculated for sensitive receptor locations based on the conventional standard point source noise-distance attenuation factor of 6.0 dBA for each doubling of distance; and,
5. Calculated noise levels associated with Project construction at sensitive receptor locations were then compared to estimated existing noise levels and the construction noise significance thresholds identified below.

4.5.2.2 Operational Noise

The proposed Project involves the consolidation, relocation, and modernization of some of the existing aircraft maintenance facilities at LAX, and will not increase passenger or gate capacity, nor flights and/or aircraft operations at LAX. Therefore, the operational noise analysis associated with the proposed Project addresses potential impacts from: aircraft engine run-up activity at the Project site; aircraft taxi operations to and from the Project site; and other maintenance activities compared to existing conditions.

4.5.2.2.1 Aircraft Engine Run-up Activity Noise

The analysis of potential noise impacts associated with aircraft engine run-up activity included estimation of the sound levels and sound directivity associated with aircraft engine ground run-ups specific to particular types of aircraft. Such estimates were developed for the existing ground run-up activities that presently occur at LAX and for future conditions with completion of the proposed Project. Twenty-nine locations in the communities to the north of the airport (i.e., Westchester and Playa del Rey) and to the south of the airport (El Segundo) were selected as representative noise-sensitive receptors where ground run-up noise levels were calculated and impacts assessed in terms of CNEL. The following describes the approach to that analysis including the computer models used and assumptions made in the evaluation.

Potential noise impacts associated with Project-related aircraft engine run-up activity were addressed primarily through the application of the computer noise model SoundPLAN®, a commercially available software suite specializing in computer simulations of noise propagation from sources such as traffic noise, indoor and outdoor occupational noise, general industrial noise and aircraft noise. SoundPLAN® provides an estimate of sound levels at a distance from a specific noise source, or sources, taking into account the following:

1. Specific characteristics of each noise source including its frequency spectrum and directivity characteristics, which in this case included conducting noise measurements of representative aircraft engine run-up activities as further described below.
2. Terrain features including relative elevations of noise sources, receivers, and intervening objects.
3. Ground effects due to areas of pavement and unpaved ground.
4. Shielding and reflections due to intervening buildings or other structures and diffracted paths around and over structures.
5. Atmospheric effects on sound propagation.

Additional information related to noise source data, topography and ground cover, intervening buildings, and atmospheric conditions is provided below, with more detailed explanations provided in Appendix C of this EIR.

Noise Source Data

The FAA's Integrated Noise Model (INM), and actual aircraft source level measurements, were used to develop the aircraft generated noise data needed as inputs to the SoundPLAN®. The INM provides data on aircraft organized into noise spectral classes for arrival and departure profiles. Aircraft within a specific spectral class have the same shape to their spectrum. The INM was used to develop test run-up scenarios for the specific aircraft conducting run-ups at LAX and then generalized the noise spectrum and directivity for each aircraft based on data validation through aircraft source level measurements and the resulting A-weighted sound pressure levels. Based on the types of aircraft conducting run-up activities at LAX, a total of 11 aircraft run-up source type inputs, considered to be reasonably representative of the variety of aircraft run-up types at LAX, were developed for use in SoundPLAN® to compute sound levels in community locations attributed to the various aircraft run-ups.

Local Topography and Ground Cover

Topographical data were extracted from digital CAD drawing files to develop the base map data used in the run-up analysis. Aerial views of the LAX property were used to define and designate the ground cover in specific geographic sections as either acoustically "hard" (water, concrete, etc.) or "soft" (soil, vegetation, etc.), in order to better estimate the correct sound attenuation over the ground from the noise source to the respective receiver.

Building Footprints

Footprints of buildings on the airport that may reflect or shield noise energy from the various run-up locations were included in the data base. Additionally for the future scenario, electronic data files were used to remove those buildings that are anticipated to be removed in the future (the former TWA Hangar, the American Airlines Low Bay Hangar, and the US Airways Hangar) and to add new buildings in the proposed Project site (i.e., the two proposed aircraft hangars).

Local Average Meteorological Conditions

The SoundPLAN® model includes several methods of accounting for atmospheric effects on sound propagation. For this evaluation, the model's implementation of the General Prediction Method [2] was used. The equations used assume propagation under conditions of a "moderate downwind or slight temperature inversion." This provides a realistic, but conservative estimate of community sound levels caused by ground-based airport sources.

Calculation of Community Noise Equivalent Level

As further described below in Section 4.5.4.3 CNEL is the noise metric used to assess the significance of noise impacts associated with ground run-ups. SoundPLAN® uses the annual number of run-ups and run-up durations known or anticipated to occur during certain periods of a 24-hour day to derive annual average daily run-up durations for day, evening, and night periods for all aircraft run-ups at the locations identified. The model then uses all of these annual average daily run-up durations for day, evening, and night periods for all sites and all aircraft to derive the CNEL values at specific locations.

4.5.2.2.2 Aircraft Taxi Operation Noise

As indicated above, implementation of the proposed Project would not increase the number of aircraft operations at LAX, but would result in a change to the normal taxi route that certain aircraft currently take (i.e., as the proposed Project provides for the consolidation and relocation of existing aircraft maintenance and remain overnight (RON)/remain all day (RAD) activities to a new location in the southwest portion of the airport, certain aircraft may travel a different taxi route than what they do today under baseline conditions). Taxi paths delineating the routes of aircraft traveling to and from the Project site were defined based on conservative assumptions (i.e., long taxiing distances) regarding where those taxiing trips would begin or end. Three sets of taxi paths were identified for the noise analysis as follows:

- Terminal 2, representing the approximate mid-point of northern concourses at the Central Terminal Area (CTA), utilizing Taxiway AA and Taxilane C traveling to and from the Project site for RON/RAD parking;
- Terminal 2, again representing the approximate mid-point of northern concourses at the CTA, utilizing Taxiway R and Taxiway/Taxilane C traveling to and from the Project site for RON/RAD parking; and
- Delta Airlines/United Airlines maintenance facilities utilizing Taxiway/Taxilane C traveling to and from the Project site for maintenance activities – this route would also encompass

[2] "Environmental Noise from Industrial Plants General Prediction Method," Danish Acoustical Laboratory, The Danish Academy of Technical Science, Lyngby, Denmark, 1982.

the travel path of passenger aircraft at Terminal 6, as the approximate mid-point of southern concourses at the CTA, traveling to and from the proposed Project site for RON/RAD parking.

It should be noted that all of the taxiways included in the three paths above are existing taxiways, which would not be modified by the proposed Project, with the exception of the westerly extensions of Taxiways B and C (as Taxilane C) into the Project site (see Figure 2-4 in Chapter 2, *Project Description*).

A taxi profile was created in the INM to represent a taxi operation; the noise-source altitude was assumed to be the average engine-installation height; a constant taxi speed of 15 knots was assumed; and the engine thrust setting was assumed to be 10 percent of the maximum thrust value in the noise power distance curves associated with specific aircraft. Based on the above, sound exposure level (SEL) noise footprints were prepared for a typical Airplane Design Group (ADG) III (Boeing 737-300) and an ADG IV (Boeing 767-300) aircraft. SEL is a time integrated measure that accounts for both the maximum sound level and the duration of the sound. Using the SEL values associated with these taxiing operations, CNEL values were calculated based on the number and time of day operations were estimated to occur.

4.5.2.2.3 Operational Maintenance Noise

The proposed Project would include areas for routine aircraft maintenance. Operation of the Project may include the use of hand tools and pneumatic tools that generate noise. Pneumatic tools are tools that are driven by a gas – usually compressed air. Some examples of pneumatic tools include air impact wrenches, pneumatic drills, and pneumatic nail guns. The FHWA provides estimated noise levels for pneumatic tools. The potential for noise levels from the use of pneumatic tools will be assessed based on the potential to contribute to noise impacts at off-site sensitive receptors.

4.5.2.3 Ground-Borne Vibration

Vibration consists of waves transmitted through solid material. The frequency of a vibrating object describes how rapidly it is oscillating, measured in Hertz (Hz). Most environmental vibrations consist of a composite, or "spectrum," of many frequencies, and are generally classified as broadband or random vibrations. The normal frequency range of most ground-borne vibration that can be felt generally starts from a low frequency of less than 1 Hz to a high of about 200 Hz. Vibration is often measured in terms of the peak particle velocity (PPV) in inches per second (in/sec), because it is related to the stresses that are experienced by buildings. Vibration is also measured in vibration decibels (VdB). The human threshold of perception is around 65 VdB; the dividing line between barely perceptible and distinctly perceptible is around 75 VdB; and vibration levels are acceptable at 85 VdB if there are an infrequent number of events per day.[3]

Ground-borne vibration is vibration that is passed into the ground from sources on- or below-ground, and such vibration is transmitted over distances, depending on the source and the ground conditions, and subsequently passes into receptor structures where it can affect both the occupants of the building and the building structure itself. Example sources of ground-borne

[3] Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006.

vibration include certain types of construction activity, such as pile driving, and certain forms of transportation such as railroads and roadways on which there are substantial volumes of heavy vehicles (i.e., trucks and buses) and/or that have poorly maintained surface conditions (i.e., potholes and bumps).

The analysis of ground-borne vibration impacts related to the proposed Project focused on the potential for construction activities to result in significant impacts. Such vibration impacts were evaluated by identifying potential construction-related vibration sources, measuring the distance between vibration sources and surrounding structure locations, and making an impact determination based on the applicable thresholds of significance, discussed later in this section.

Operations-related ground-borne vibration impacts are not expected to occur. The proposed Project does not include any railroad operations, and the movement of heavy vehicles, such as trucks, ground support equipment, and aircraft would occur at slow speeds, on new and/or smooth surfaces, at distances substantially removed from noise-sensitive receptors (i.e., nearest residence is over 1,500 feet away from edge of Project site).

Public comments were received during the Draft EIR Scoping Period regarding potential vibration impacts associated with aircraft engine ground-run ups. Such vibration is generally not ground-borne, but rather is created by low-frequency noise energy associated with aircraft engine operations. Regardless, it is not anticipated that Project-related ground run-ups would result in notable vibration impacts to sensitive receptors near the airport. The issue of aircraft-generated vibration impacts was addressed in the LAX Master Plan Final EIR. Specifically, as described in Topical Response TR-N-8 of the LAX Master Plan Final EIR (LAX Master Plan Final EIR-Part II page 2-118),[4] low frequency noise and its energy impacts were studied thoroughly in several studies and included older aircraft, such as the Concord, exhibiting much higher noise levels and low-frequency energy levels than those associated with modern aircraft. In a 2002 report, the FICAN released the report "*FICAN on the Findings of the Minneapolis-St. Paul International Airport (MSP) Low-Frequency Noise (LFN) Expert Panel*," concurring with the opinion that low-frequency noise from civil aircraft will not pose a public health risk, risk of structural damage, or an increase in indoor speech interference. It is important to note that this LAX Master Plan Final EIR discussion and conclusion pertained to the numerous (i.e., several hundred) aircraft takeoffs and landings that occur on a daily basis at LAX, whereas the number of aircraft ground run-ups anticipated to occur in conjunction with the proposed Project is estimated to be around five per month, and would occur at a distance much farther away from nearby communities than the aircraft operations that occur daily on the outboard runways at LAX. Based on the above, notable vibration impacts from Project-related ground run-ups are not expected to occur; hence, the issue is not addressed further in this section.

4.5.3 Existing Conditions

4.5.3.1 Regulatory Context

Many government agencies have established noise standards and guidelines to protect citizens from potential hearing damage and various other adverse physiological and social effects associated with noise and ground-borne vibration. The City of Los Angeles has adopted a

4 City of Los Angeles, Los Angeles World Airports, Final Environmental Impact Report for Los Angeles International Airport (LAX) Proposed Master Plan Improvements, April 2004.

number of policies, which are based in part on federal and State regulations and are directed at controlling or mitigating environmental noise effects. There are no City adopted policies or standards that relate to ground-borne vibration, but the Federal Transit Administration (FTA) and the California Department of Transportation (Caltrans) do have such policies and/or standards. The government agency policies that are relevant to Project construction and operation noise levels are discussed below.

4.5.3.1.1 Federal

Federal Aviation Administration

The FAA Order 1050.1E states that a significant noise impact would occur if an analysis shows that the proposed action will cause noise sensitive areas to experience an increase in the DNL of 1.5 dB or more at or above DNL 65 dB noise exposure when compared to the no action alternative for the same timeframe.[5] DNL values are considered to be comparable to CNEL values.[6]

Federal Transportation Administration

The FTA *Transit Noise and Vibration Impact Assessment* states that heavy-duty equipment may produce temporary ground-borne vibration.[7] For purposes of evaluating the significance of the vibration impacts, vibration levels that exceed approximately 80 VdB at residential land uses for infrequent events and 72 VdB for frequent events, which are the vibration level that is considered by the FTA to cause an annoyance, would be considered significant.

4.5.3.1.2 State

The State of California mandates the use of CNEL as the required noise metric, which is also accepted by the FAA for airport noise studies in California.[8] Accordingly, the Aeronautics Division of Caltrans establishes 65 dBA CNEL as a noise impact boundary within which no incompatible land uses should be implemented. Federal and state airport noise regulations, as well as local plans and ordinances, ensure that a buffer of compatible land uses is maintained in the vicinity of LAX.

With respect to vibration, the Caltrans technical publication *Transportation- and Construction-Induced Vibration Guidance Manual* establishes a vibration damage potential criteria of 0.5 inch-per-second PPV for older residential structures, 1.0 inch-per-second PPV for newer residential structures, and 2.0 inch-per-second PPV for modern industrial/commercial buildings.[9] These vibration criteria for potential damage to structures are generally higher (i.e., less stringent) than

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5 Federal Aviation Administration Order 1050.1E, March 20, 2006.

6 CNEL is used by the State of California and is similar to DNL except that an additional penalty is associated with noise events occurring during evening hours (7:00 p.m. – 10:00 p.m.). Noise events occurring during this period are weighted by 4.77 dBA. FAA Order 5050.4B, accepts the use of CNEL for airport noise studies in California.

7 Federal Transit Administration, Transit Noise and Vibration Impact Assessment, (2006).

8 Federal Aviation Administration, Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Projects*, CH.1(9)(n), June 8, 2004.

9 California Department of Transportation, Transportation- and Construction-Induced Vibration Guidance Manual, June 2004

the FTA *Transit Noise and Vibration Impact Assessment* criteria for annoyance, as discussed above.

The California Division of Occupational Safety and Health (CalOSHA) provides guidelines to ensure people employed in the State of California are not exposed to noise levels greater than 85 dBA. An employer is required to administer a continuing effective hearing conservation program whenever employee noise exposures equal or exceed an 8-hour time-weighted average sound level of 85 dBA (referred to as the "action level"), or equivalently, a dose of 50 percent.

4.5.3.1.3 Local

The City of Los Angeles Municipal Code (LAMC) (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. Those regulations and guidelines are described in more detail below.

City of Los Angeles Noise Regulation

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, as further described below) within specific land use zones. In accordance with the City's Noise Ordinance, a noise level increase of 5 dBA over the existing average ambient noise level at an adjacent property line is considered a noise violation. For the purposes of determining whether or not a violation of the City of Los Angeles Noise Ordinance is occurring, the sound level measurements of an offending noise that has a duration of five minutes or less during a one-hour period is reduced by 5 dBA to account for people's increased tolerance for short-duration noise events. In cases in which the actual measured ambient noise level is not known, the presumed ambient noise level, as indicated in **Table 4.5-2** is used.

Table 4.5-2

City of Los Angeles Presumed Ambient Noise Levels

Zone	Daytime Hours (7 a.m. to 10 p.m.) dBA (Leq)	Nighttime Hours (10 p.m. to 7 a.m.) dBA (Leq)
Residential	50	40
Commercial	60	55
Manufacturing (M1, MR1, MR2)	60	55
Heavy Manufacturing (M2, M3)	65	65

Source: Los Angeles Municipal Code, Chapter XI, Article I, Section 111.03.

The City of Los Angeles Noise Ordinance also limits noise from construction equipment within 500 feet of a residential zone to 75 dBA, measured at a distance of 50 feet from the source, unless compliance with the limitation is technically infeasible.[10] The City of Los Angeles Noise Ordinance prohibits construction noise between the hours of 9:00 p.m. and 7:00 a.m. Monday through Friday and on Saturday before 8:00 a.m. and after 6:00 p.m., and does not allow construction noise on Sunday or on a national holiday.[11]

City of Los Angeles General Plan Noise Element

The City of Los Angeles has developed a Noise Element of the General Plan to guide in the development of noise regulations.[12] The Noise Element of the City of Los Angeles General Plan addresses noise mitigation regulations, strategies, and programs and delineates federal, state, and City jurisdiction relative to rail, automotive, aircraft, and nuisance noise.

The City of Los Angeles has adopted local guidelines based, in part, on the community noise compatibility guidelines established by the State Department of Health Services (CDHS) for use in assessing the compatibility of various land use types with a range of noise levels. CNEL guidelines for specific land uses are classified into four categories: (1) "normally acceptable," (2) "conditionally acceptable," (3) "normally unacceptable," and (4) "clearly unacceptable." As shown in **Table 4.5-3**, a CNEL value of 65 dBA is the upper limit of what is considered a "normally acceptable" noise environment for multi-family residential uses, although a CNEL as high as 70 dBA is considered "conditionally acceptable." The upper limit of what is considered "normally unacceptable" for residential uses is set at 75 dBA CNEL.

Table 4.5-3

City of Los Angeles Land Use Compatibility for Community Noise

Land Use	Community Noise Exposure CNEL, dBA			
	Normally Acceptable	**Conditionally Acceptable**	**Normally Unacceptable**	**Clearly Unacceptable**
Single-Family, Duplex, Mobile Homes	50 to 60	55 to 70	70 to 75	Above 70[a]
Multi-Family Homes	50 to 65	60 to 70	70 to 75	Above 70[a]
Schools, Libraries, Churches, Hospitals, Nursing Homes	50 to 70	60 to 70	70 to 80	Above 80
Transient Lodging—Motels, Hotels	50 to 65	60 to 70	70 to 80	Above 80
Auditoriums, Concert Halls, Amphitheaters	—	50 to 70	—	Above 65
Sports Arena, Outdoor Spectator Sports	—	50 to 75	—	Above 70

[10] In accordance with the Noise Regulation (LAMC, Section 112.05), "technically infeasible" means that said noise limitations cannot be complied with despite the use of mufflers, shields, sound barriers, and/or other noise reduction devices or techniques during the operation of the equipment.

[11] Los Angeles Municipal Code, Section 41.40.

[12] City of Los Angeles, Noise Element of the Los Angeles City General Plan, February 3, 1999.

Table 4.5-3

City of Los Angeles Land Use Compatibility for Community Noise

Land Use	Community Noise Exposure CNEL, dBA			
	Normally Acceptable	**Conditionally Acceptable**	**Normally Unacceptable**	**Clearly Unacceptable**
Playgrounds, Neighborhood Parks	50 to 70	—	67 to 75	Above 72
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50 to 75	—	70 to 80	Above 80
Office Buildings, Business and Professional Commercial	50 to 70	67 to 77	Above 75	—
Industrial, Manufacturing, Utilities, Agriculture	50 to 75	70 to 80	Above 75	—

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 systems or air conditioning 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.

[a] This 70 dB figure is quoted directly from the City of Los Angeles L.A. CEQA Thresholds Guide. However, other sources quote this number as 75 dB (i.e., State of California General Plan Guidelines, Preliminary Draft, Governor's Office of Planning and Research, October 2002, p. 258, and Noise Element of the City of Los Angeles General Plan, Department of City Planning Los Angeles, California, February 1999, p. I-1). This may be a typographical error in the L.A. CEQA Thresholds Guide. Note that this potential error does not affect the determination of significant impacts for this report.

Source: California Department of Health Services, Guidelines for the Preparation and Content of the Noise Element of the General Plan, 1999.

4.5.3.2 Environmental Setting

The existing noise environment at and around the Project site consists of noise from airport-related activities including aircraft departing, landing, and taxiing on runways and connecting taxiways; and noise from vehicular traffic movements on local roadways.

Some land uses are considered more sensitive to intrusive noise than others due to the amount of noise exposure and the types of activities typically involved at the receptor location. The *L.A. CEQA Thresholds Guide* states that residences, schools, motels and hotels, libraries, religious institutions, hospitals, nursing homes, and parks are generally more sensitive to noise than commercial and industrial land uses.

Potential noise sensitive locations that may be affected by this proposed Project were identified based on reviews of land use inventories, aerial imagery, and land use maps. Since the proposed Project site is located near the west end of the airport, the identification of representative noise-sensitive receptors focused on areas in El Segundo west of Sepulveda Boulevard and areas in Playa del Rey and Westchester west of Lincoln Blvd. As shown in **Table 4.5-4**, 29 representative noise-sensitive receptors included 13 schools, 1 health care facility, 1 library, and 14 places of worship.

In addition to these receptor locations, two additional sites in the City of El Segundo were chosen for inclusion in the analysis, due to proximity to the Project site. One location, named P-ESG1, is on the roof of a condominium complex located nearest the proposed Project run-up location and at a higher elevation than the proposed Project site (i.e., more direct unobstructed noise path between noise source and noise receptor than might occur at-grade with intervening topography or structures along the noise path); and the second, P-ESG2, is in the greenbelt area north of Imperial Way located at a position along the maximum directivity of the noise emanating from an aircraft run-up within the proposed Project.

Table 4.5-4

Representative Noise-Sensitive Receptor Locations

ID #	Address/Location
School	
1	El Segundo High School 640 Main St.
2	Center St. Elementary School 700 Center St.
3	Richmond Street Elementary 615 Richmond St.
4	Imperial School 540 E. Imperial Ave.
5	St. Anthony’s Catholic School 233 Lomita St.
6	El Segundo Middle School 332 Center St.
7	El Segundo Pre-School 301 West Grand Ave.
8	Hilltop Christian School 777 E. Grand Ave.
9	Loyola Village Elementary School Villanova St. and Rayford Dr.
10	Paseo Del Rey Natural Science Magnet 7751 Paseo Del Rey St.
11	Westchester High School 7400 W. Manchester Ave.
12	St. Bernard High School 9100 Falmouth Ave.
13	St. Anastasia School 8631 S. Stanmoor Dr.
Health Care Facility	
14	Playa Del Rey Care and Rehabilitation Center 7716 W. Manchester Ave.
Library	
15	El Segundo Public Library 111 W. Mariposa Ave.
Place of Worship	
16	Pacific Baptist Church 859 Main St.
17	United Methodist Church 54 Main St.
18	First Baptist Church 591 E. Palm Ave.
19	St. John's Lutheran Church 1611 E. Sycamore Ave.
20	Church of Christ of Latter Day Saints 1215 E. Mariposa Ave.
21	St. Anthony’s Catholic Church 720 E. Grand Ave.
22	St. Andrew Catholic Church 538 Concord St.
23	St. Michaels Episcopal Church 361 Richmond St.
24	El Segundo Christian Church Franklin Ave. and Concord St.
25	Kingdom Hall of Jehovah's Witnesses 608 E. Grand Ave.
26	St. Anastasia Catholic Church 7390 W. Manchester Ave.
27	Messiah Congregational Church W. Manchester Ave. and Rayford Dr.
28	Hope Chapel Del Rey Foursquare 7299 W. Manchester Ave.
29	Del Rey Hills Evangelical Free Church 8505 Saran Dr.

Table 4.5-4

Representative Noise-Sensitive Receptor Locations

ID #	Address/Location
El Segundo Residential Area near LAX Boundary	
P-ESG1	Roof of building at 770 West Imperial Ave.
P-ESG2	Greenbelt across from 216 East Imperial Ave.

Source: LAWA, Google Earth, 2013

Existing Run-up Activity Noise Levels

Existing noise levels associated with aircraft engine run-up activity were determined based on the nature and location of run-up activities presently occurring at LAX. **Figure 4.5-1** shows the run-up locations for the existing conditions, and also delineates, by number and symbol, the location and nature of sensitive noise receptors identified above in Table 4.5-4. **Table 4.5-5** shows the data assumptions of run-up activity for existing conditions at the five locations where such activity presently occurs (Qantas Airlines currently conducts run-ups at the United/Continental Airlines ramp[13] and US Airways conducts run-ups at the American Airlines ramp).

Based on the data identified in Table 4.5-5, and other related assumptions that are detailed in Appendix C of this EIR, the noise levels associated with existing run-up activity at LAX were calculated at each sensitive receptor location using the SoundPLAN® model. In conjunction with use of the SoundPLAN® model, noise measurements of actual aircraft engine run-ups at LAX were completed to provide a basis for comparing modeled noise levels with measured noise levels, as detailed in Appendix C of this EIR. Although the SoundPLAN® model has been validated many times and uses sound propagation parameters consistent with international standards, comparison of the computed results to measured values provides additional confirmation in the model's results for this evaluation. SoundPLAN® was used to compute sound levels at each of the measurement locations used during the close-in source-level measurements described above. On average, the computed A-weighted sound levels for a subject aircraft, such as the Boeing 757-223 aircraft run-ups, agreed to within less than one-half decibel (0.5 dB) of the measured levels. This comparison validated the modeled source-level data in the model. In addition, the measured Lmax noise levels obtained at P-ESG1 for the respective run-up periods were compared to those computed by SoundPLAN at P-ESG1 and the levels from SoundPLAN were about 2-3 dB higher than measured. It was concluded that the SoundPLAN model results were conservatively high, but reasonable and appropriate for use in the noise analysis.

[13] The United/Continental Airlines ramp refers to the aircraft maintenance area located in the western portion of the airport. The subject area was operated by Continental Airlines which has merged with United Airlines. For brevity, the subject area is identified in the figures presented herein as the "United" area.

Source: Harris Miller Miller & Hanson Inc., 2013
Prepared by: PCR Services Corporation, 2013

West Aircraft Maintenance Area Project
Draft EIR

Existing Run-Up Locations

Figure
4.5-1

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Table 4.5-5

Existing Conditions – Run-up Activity

Airline Aircraft	Location			Parameters			Annual Number		
	Latitude (deg)	Longitude (deg)	True Heading (deg)	Number of Engines	Power Setting (lbs per engine or %) (other engine) [a]	Duration for a single run-up (sec)	Day 7am to 7 pm	Evening 7 pm to 10 pm	Night 10 pm to 7 am
Qantas A380	33° 56'16.88"N	118° 25'16.42"W	263	1	80% (50%)	600	24		
Qantas B747-400	33° 56'16.88"N	118° 25'16.42"W	263	1	80% (50%)	600	12		
American B767-300ER	33° 56'20.03"N	118° 24'48.96W	263	1	100% (80%)	300	72	28.8	187.2
American B757-200	33° 56'20.03"N	118° 24'48.96W	263	1	100% (80%)	300	54	21.6	140.4
American B737-800	33° 56'20.03"N	118° 24'48.96W	263	1	100% (80%)	300	36	14.4	93.6
American B777-200ER	33° 56'20.03"N	118° 24'48.96W	263	1	100% (80%)	300	9	3.6	23.4
American MD-80	33° 56'20.03"N	118° 24'48.96W	263	1	100% (80%)	300	9	3.6	23.4
FedEx MD-11	33° 56'44.16"N	118° 25'22.89"W	263	3	100%	300		48	
US Airways A321/320/31 9	33° 56'20.03"N	118° 24'48.96"W	263	1	100% (idle)	300	6	2.4	15.6
United B737-900ER	33° 56'16.88"N	118° 25'16.42"W	263	1	100% (idle)	300	129. 6	32.4	162
United B737-900ER	33° 56'16.55"N	118° 25'23.35"W	083	1	100% (idle)	300	129. 6	32.4	162
United B757-200/300	33° 56'16.88"N	118° 25'16.42"W	263	1	100% (idle)	300	129. 6	32.4	162
United B757-200/300	33° 56'16.55"N	118° 25'23.35"W	083	1	100% (idle)	300	129. 6	32.4	162
United B777-200ER	33° 56'16.88"N	118° 25'16.42"W	263	1	100% (idle)	300	26.4	6.6	33
United B777-200ER	33° 56'16.55"N	118° 25'23.35"W	083	1	100% (idle)	300	26.4	6.6	33
United B787	33° 56'16.88"N	118° 25'16.42"W	263	1	100% (idle)	300	2.4	0.6	3
United B787	33° 56'16.55"N	118° 25'23.35"W	083	1	100% (idle)	300	2.4	0.6	3
Delta B757-200/300	33° 56'36.31"N	118° 23'39.87"W	263	1	80% (50%)	600	30	12	78
Delta B767-300	33° 56'36.31"N	118° 23'39.87"W	263	1	80% (50%)	600	27	10.8	70.2

a. Power setting shown in parentheses is for the engine on the wing opposite the engine being tested, as is necessary to maintain the overall stability of the aircraft during engine run-up activity.

Source: LAWA and Airlines, 2013

Community Noise Equivalent Levels

Noise levels associated with existing engine run-up activities at the airport were modeled to determine CNEL values for the noise sensitive locations, and the results are shown in **Table 4.5-6**. These values established the baseline upon which comparisons were made relative to the determination of significant impacts from run-up activity.

Table 4.5-6

Existing Conditions Aircraft Run-up CNEL by Location

ID #	Address/Location	Existing Conditions CNEL (dB)
1	El Segundo High School 640 Main St.	61.7
2	Center St. Elementary School 700 Center St.	62.8
3	Richmond Street Elementary 615 Richmond St.	60.5
4	Imperial School 540 E. Imperial Ave.	69.1
5	St. Anthony’s Catholic School 233 Lomita St.	51.3
6	El Segundo Middle School 332 Center St.	58.6
7	El Segundo Pre-School 301 West Grand Ave.	56.0
8	Hilltop Christian School 777 E. Grand Ave.	57.0
9	Loyola Village Elementary School Villanova St. and Rayford Dr.	58.0
10	Paseo Del Rey Natural Science Magnet 7751 Paseo Del Rey St.	53.3
11	Westchester High School 7400 W. Manchester Ave.	47.3
12	St. Bernard High School 9100 Falmouth Ave.	56.8
13	St. Anastasia School 8631 S. Stanmoor Dr.	45.1
14	Playa Del Rey Care and Rehabilitation Center 7716 W. Manchester Ave.	45.5
15	El Segundo Public Library 111 W. Mariposa Ave.	60.5
16	Pacific Baptist Church 859 Main St.	66.3
17	United Methodist Church 54 Main St.	60.4
18	First Baptist Church 591 E. Palm Ave.	63.3
19	St. John's Lutheran Church 1611 E. Sycamore Ave.	64.6
20	Church of Christ of Latter Day Saints 1215 E. Mariposa Ave.	61.6
21	St. Anthony’s Catholic Church 720 E. Grand Ave.	56.7
22	St. Andrew Catholic Church 538 Concord St.	59.9
23	St. Michaels Episcopal Church 361 Richmond St.	57.5
24	El Segundo Christian Church Franklin Ave. and Concord St.	55.2
25	Kingdom Hall of Jehovah's Witnesses 608 E. Grand Ave.	56.2
26	St. Anastasia Catholic Church 7390 W. Manchester Ave.	53.3
27	Messiah Congregational Church W. Manchester Ave. and Rayford Dr.	52.9
28	Hope Chapel Del Rey Foursquare 7299 W. Manchester Ave.	53.3
29	Del Rey Hills Evangelical Free Church 8505 Saran Dr.	51.0
P-ESG1	Roof of building at 770 West Imperial Ave.	69.9
P-ESG2	Greenbelt across from 216 East Imperial Ave.	69.1

Source: HMMH, SoundPLAN, June 26, 2013

Single Event Noise Levels

In addition to the CNEL values presented above, single-event noise levels from the six run-up locations (five existing run-up sites and the Project site) were calculated for general informational purposes only. To determine how the noise levels from a single event propagate into the communities, the maximum sound level (L_{max}) emanating from each run-up site was evaluated. For the existing run-up locations, aircraft types were determined from those aircraft using the specific run-up pads. **Table 4.5-7** lists the various aircraft engine run-ups from the existing sites and the resulting Lmax at each noise sensitive receiver.

4.5.4 Thresholds of Significance

4.5.4.1 Construction Equipment Noise

The following thresholds of significance are set forth in the City's *L.A. CEQA Thresholds Guide*, which states that a project would normally have a significant impact on noise levels from construction if:

- Construction activities lasting more than one day would exceed existing ambient exterior noise levels by 10 dBA or more at a noise-sensitive use;
- Construction activities lasting more than 10 days in a three-month period would exceed existing ambient exterior noise levels by 5 dBA or more at a noise-sensitive use; 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 at any time on Sunday.

These thresholds were utilized because they address physical impacts on the environment and are included in the *L.A. CEQA Thresholds Guide*.

4.5.4.2 Construction Vibration

Construction vibration impacts are assessed in accordance with the FTA *Transit Noise and Vibration Impact Assessment*. According to the document, heavy-duty equipment may produce temporary ground-borne vibration. For purposes of evaluating the significance of vibration impacts associated with Project use of heavy-duty equipment during construction, a significant impact would occur if:

- Vibration levels exceed approximately 80 VdB at residential land uses for infrequent events and 72 VdB for frequent events.

4.5.4.3 Operational Noise

A project would have a potential impact on noise levels from project operation if:

- Noise-sensitive areas are newly exposed to 65 CNEL or greater.
- Noise-sensitive areas at or above 65 dB CNEL noise exposure experience an increase in noise of 1.5 dB CNEL or more when compared to the existing noise levels.

Table 4.5-7

Noise Levels for Existing Conditions Run-ups by Aircraft and Location
dBA, L_{max}

ID # (Figure 4.5-1)	Delta		FedEx	American					USAir
	767	757	MD-11	767	757	737	777	MD-80	A320
1	61.4	58.1	55.2	69.6	66.2	70.4	72.7	74.5	65.9
2	60.6	57.2	71.1	72.6	69.2	73.4	75.9	77.6	68.9
3	60.3	57.0	55.7	68.4	65.0	69.0	71.4	73.2	64.7
4	64.8	61.7	77.4	79.5	76.6	79.9	82.1	84.1	75.8
5	41.0	38.0	48.6	59.3	55.8	59.9	63.1	64.2	55.6
6	54.2	50.9	59.2	67.7	64.2	68.7	71.1	72.8	64.0
7	57.1	53.8	52.8	63.8	60.4	64.7	67.1	68.9	60.1
8	61.3	57.9	53.0	64.6	61.2	65.5	68.1	69.8	60.9
9	51.2	47.7	82.5	68.8	65.0	69.7	72.0	73.9	65.1
10	47.5	44.3	74.3	39.2	36.2	39.6	42.5	43.9	35.5
11	50.6	46.9	67.5	53.4	49.9	53.9	57.1	58.1	49.7
12	50.9	47.3	79.4	44.5	41.3	44.6	47.9	48.9	40.8
13	43.2	40.2	71.0	54.1	50.5	54.7	57.7	58.9	50.4
14	37.9	35.0	64.3	39.4	36.7	39.8	42.9	44.1	35.7
15	60.4	57.1	53.7	68.4	65.0	69.1	71.5	73.3	64.7
16	61.7	58.4	58.1	73.8	70.5	74.2	76.5	78.4	70.1
17	60.8	57.4	53.8	68.3	64.9	69.1	71.5	73.3	64.6
18	64.2	60.9	56.8	71.8	68.6	72.8	75.1	76.9	68.2
19	58.0	54.5	62.5	75.8	72.7	76.6	79.4	80.7	72.1
20	57.5	54.1	70.3	71.3	67.9	72.2	74.7	76.3	67.6
21	56.6	53.2	50.2	65.5	62.2	66.7	68.9	70.9	61.8
22	59.5	56.1	54.3	67.9	64.5	68.6	71.0	72.8	64.2
23	58.8	55.5	52.5	65.5	62.1	66.3	68.8	70.5	61.8
24	57.8	54.5	51.8	63.7	60.2	64.5	67.1	68.7	60.0
25	59.9	56.5	50.9	63.5	60.1	64.5	67.0	68.8	59.8
26	49.1	45.7	78.5	63.1	59.6	63.9	66.6	68.1	59.5
27	50.8	47.3	77.3	63.5	59.9	64.4	66.9	68.7	59.8
28	49.2	45.5	77.6	64.1	60.5	65.0	67.5	69.4	60.4
29	51.3	48.0	73.9	43.4	40.0	43.5	46.9	47.9	39.7
P-ESG1	59.0	55.8	56.1	71.3	68.2	71.6	74.0	75.7	67.6
P-ESG2	64.9	61.9	59.8	76.5	73.4	77.0	79.2	81.1	72.8

Source: HMMH, SoundPLAN, 2013

Table 4.5-7 (Continued)

Noise Levels for Existing Conditions Run-ups by Aircraft and Location
dBA, L_{max}

	United (facing east)				United (facing west)				Qantas	
ID #	**737**	**757**	**777**	**787**	**737**	**757**	**777**	**787**	**A380**	**747**
1	69.3	65.3	71.7	68.7	73.6	69.3	75.9	72.6	69.9	79.6
2	65.9	62.2	68.4	65.5	73.9	69.9	76.9	73.1	70.9	79.7
3	69.5	65.4	72.0	68.8	71.7	67.5	74.0	70.8	68.1	77.8
4	71.4	68.4	73.7	71.3	79.9	75.8	82.2	78.9	76.2	85.8
5	58.8	54.5	61.8	58.2	63.1	59.0	66.3	62.6	60.4	69.0
6	63.6	59.4	66.1	62.9	70.1	66.2	72.9	69.4	66.9	75.9
7	66.2	61.8	68.6	65.2	66.4	62.0	68.8	65.4	62.8	72.3
8	61.9	57.7	64.6	61.2	69.3	65.1	72.0	68.5	66.0	75.1
9	49.3	45.4	52.4	48.8	48.0	44.3	50.9	47.4	44.9	54.2
10	67.6	63.2	70.0	66.6	41.9	38.0	44.5	41.3	38.5	48.1
11	60.1	55.7	63.0	59.2	36.4	32.4	39.6	35.7	33.7	42.4
12	70.6	66.2	73.2	69.8	46.5	42.4	49.2	45.9	43.2	52.5
13	46.4	43.3	50.2	46.0	38.5	34.3	41.2	37.6	35.4	44.6
14	59.9	55.7	62.9	59.0	34.8	31.0	38.0	34.2	32.1	40.8
15	69.2	65.1	71.6	68.5	71.9	67.6	74.2	70.9	68.2	77.9
16	73.8	70.2	76.1	73.4	78.5	74.5	80.8	77.8	74.8	84.8
17	68.5	64.3	70.9	67.8	72.0	67.7	74.4	71.0	68.4	78.0
18	68.9	65.0	71.3	68.3	75.1	71.0	77.6	74.3	71.6	81.0
19	64.2	60.5	66.8	63.7	73.8	70.5	77.4	73.3	71.4	79.8
20	65.1	61.3	67.6	64.6	72.8	68.9	75.8	72.0	69.8	78.6
21	63.3	58.8	65.6	62.3	68.2	63.7	70.5	67.1	64.5	73.9
22	69.4	65.2	71.9	68.6	70.8	66.5	73.1	69.9	67.1	76.8
23	67.0	62.8	69.6	66.2	68.2	63.9	70.6	67.2	64.6	74.1
24	63.8	59.5	66.3	62.9	66.0	61.7	68.5	65.1	62.6	71.9
25	61.7	57.5	64.4	61.0	68.6	64.3	71.2	67.7	65.2	74.4
26	53.8	50.2	57.4	53.4	47.0	42.5	49.7	46.1	43.8	52.9
27	45.8	42.3	49.0	45.3	43.9	39.8	46.4	43.1	40.5	50.1
28	43.4	40.1	46.5	42.9	45.0	40.4	47.1	43.8	41.2	51.1
29	64.5	60.2	67.1	63.5	44.4	40.2	46.8	43.5	42.0	51.4
P-ESG1	83.7	79.8	86.1	83.1	77.2	74.0	79.6	77.2	73.6	84.1
P-ESG2	75.1	72.2	77.5	75.2	81.6	77.9	83.9	80.9	77.9	87.9

Source: HMMH, SoundPLAN, 2013

4.5.5 Applicable LAX Master Plan Commitments and Mitigation Measures

LAX Master Plan commitments and mitigation measures are described in the LAX Master Plan's Mitigation Monitoring and Reporting Program (MMRP). Of the commitments and mitigation measures that were designed to address noise impacts, the following four mitigation measures and three LAX Master Plan Commitments are applicable to the proposed Project and are considered in the noise analysis. Although the following noise control measures are applicable to the proposed Project and would be implemented during the course of Project implementation, the noise impacts analysis presented in Section 4.5.6 did not take credit for noise reductions associated with these measures. As such, the noise impacts analysis is considered to be conservative.

MM-N-7. Construction Noise Control Plan.

- A Construction Noise Control Plan will be prepared to provide feasible measures to reduce significant noise impacts throughout the construction period for all projects near noise sensitive uses. For example, noise control devices shall be used and maintained, such as equipment mufflers, enclosures, and barriers. Natural and artificial barriers such as ground elevation changes and existing buildings may be used to shield construction noise.

MM-N-8. Construction Staging.

- Construction operations shall be staged as far from noise-sensitive uses as feasible.

MM-N-9. Equipment Replacement.

- Noisy equipment shall be replaced with quieter equipment (for example, rubber tired equipment rather than track equipment) when technically and economically feasible.

MM-N-10. Construction Scheduling.

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

N-1. Maintenance of Applicable Elements of Existing Aircraft Noise Abatement Program.

- All components of the current airport noise abatement program that pertain to aircraft noise will be maintained.

Surface Transportation (ST)-16, Designated Haul Routes.

- Every effort will be made to ensure that haul routes are located away from sensitive noise receptors.

Surface Transportation (ST)-22, Designated Truck Routes.

- For dirt and aggregate and all other materials and equipment, truck deliveries will be on designated routes only (freeways and non-residential streets). Every effort will be made for routes to avoid residential frontages. The designated routes on City of Los Angeles streets are subject to approval by LADOT's Bureau of Traffic Management and may include, but will not necessarily be limited to: Pershing Drive (Westchester Parkway to

Imperial Highway); Florence Avenue (Aviation Boulevard to I-405); Manchester Boulevard (Aviation Boulevard to I-405); Aviation Boulevard (Manchester Avenue to Imperial Highway); Westchester Parkway/Arbor Vitae Street (Pershing Drive to I-405); La Cienega Boulevard (north of Imperial Highway); Airport Boulevard (Arbor Vitae Street to Century Boulevard); Sepulveda Boulevard (Westchester Parkway to Imperial Highway); I-405; and I-105.

4.5.6 Impact Analysis

4.5.6.1 Construction Activities

4.5.6.1.1 On-site Construction Noise

Noise from construction activities would be generated by vehicles and equipment involved during various stages of construction operations: demolition, excavation, foundation, vertical construction, and paving. The noise levels created by construction equipment would vary depending on factors such as the type of equipment, the specific model, the operation being performed and the condition of the equipment. Construction noise associated with the proposed Project was analyzed using a mix of typical construction equipment, estimated durations and construction phasing.

Table 4.5-8 provides the estimated construction noise levels at nearby noise sensitive receptors where current ambient noise levels were recorded and also provides a comparison with the noise impact criterion.

These noise levels account for the proposed Project contractor(s) construction equipment, fixed or mobile, with properly operating and maintained noise mufflers, consistent with manufacturers' standards in accordance with MM-N-7 of the LAX Master Plan MMRP. The estimated noise levels represent a conservative scenario because construction activities are analyzed as if all of them were occurring along the perimeter of the construction area, whereas construction would typically occur throughout the site, further from noise-sensitive receptors. Detailed noise calculations for construction activities are provided in Appendix C of this EIR. As shown in Table 4.5-3, the highest noise level predicted to occur at the nearest noise-sensitive receptor location in the City of El Segundo during construction would be 59 dBA during the paving phase. Noise levels during all other phases and for all other receptor locations evaluated would be less than 59 dBA. The nearest noise sensitive receptors located north of the Project site in Westchester in the City of Los Angles are more than 4,000 feet away from the Project site. For all of the noise sensitive receptor locations shown in Table 4.5-4, construction-related noise would not exceed existing ambient noise levels by 5 dBA since measured ambient noise levels at the two closest receptor locations are 69.1 dBA CNEL (P-ESG1) and 69.9 dBA CNEL (P-ESG2). Therefore, impacts from on-site construction would be less than significant.

4.5.6.1.2 Off-Site Construction Noise

Delivery and haul trucks would enter the Project site via Pershing Drive and leave the site via the same driveway. Vehicles are expected to use Imperial Highway to access the regional freeway system (I-405 and I-105), as needed. It is estimated that during the peak month of construction there would be a maximum of 228 haul truck round trips per day. The proposed Project's truck trips would generate noise levels of approximately 59 dBA CNEL at 25 feet

Table 4.5-8

Estimate of Construction Noise Levels (Leq) at Off-Site Sensitive Receiver Locations in the City of El Segundo

Receptor[a]	Construction Phases	Nearest Distance between Receptor and Construction Site, (feet)	Estimated Construction Noise Levels at the Noise Sensitive Receptor by Construction Phase,[a] Hourly Leq (dBA)	Significance Impacts Threshold, (dBA)[b]	Exceeds Significance threshold?
Nearest Residential Uses in the City of El Segundo	Demolition	1,550	55	74.1 – 74.9	No
	Excavation	1,550	54		No
	Grading	1,550	58		No
	UG Utilities Installation	2,250	52		No
	Foundation	2,250	52		No
	Paving	1,550	59		No

[a] Estimated construction noise levels represent a conservative condition when noise generators are at the property boundary, located closest to the receptors.
[b] Significance threshold is the ambient noise levels plus 5 dBA.

Source: PCR Services Corporation, 2013.

distance from the right of way of Imperial Highway. However, residential uses along Imperial Highway are located approximately 150 feet from the south edge of Imperial Highway. Therefore, truck related noise levels associated with the Project would be 54 dBA CNEL at the nearest sensitive receptor location, P-ESG1 and P-ESG2 as shown in Table 4.5-6. Based on the LAX Noise Contour Map,[14] the nearest residential uses to the Project site in the City of El Segundo are located within the 70 dBA, CNEL noise contour. Therefore, traffic noise levels generated by truck trips would increase traffic noise levels along Imperial Highway by 0.1 dBA. Therefore, construction haul trucks would not exceed the existing ambient noise by 5 dBA in close proximity of the construction site. As such, construction haul truck related noise would result in a less than significant noise impact.

4.5.6.1.3 Construction Vibration

Construction activities can generate varying degrees of ground vibration, depending on the construction procedures and the construction equipment. The primary and most intensive vibration source associated with the development of the proposed Project would be associated with the use of dozers during construction. The nearest sensitive receptors to the Project site are approximately 1,550 feet to the south (in the City of El Segundo). According to the FTA, large dozers may generate vibration levels of approximately 87 VdB at a distance of 25 feet. At 1,550 feet, the vibration levels would attenuate to less than 35 VdB. A vibration level of less than 35 VdB is below the FTA vibration threshold of significance (i.e., 72 VdB to 80 VdB) and, therefore, construction vibration impacts would be less than significant.

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14 Ibid

4.5.6.2 Operation

4.5.6.2.1 Aircraft Engine Run-up Activity Noise

With implementation of the proposed Project, it is anticipated that the distribution of run-up activity at LAX would change from those of existing conditions. **Figure 4.5-2** shows the run-up locations for future conditions with Project implementation, and also delineate by number and symbol the location and nature of sensitive noise receptors that, for analysis purposes, are assumed to remain the same as in existing conditions. **Table 4.5-9** shows the data assumptions for the future run-up activity with the relocation of certain aircraft run-ups to the Project site, constituting approximately 60 run-ups annually (5 monthly) that would occur at the Project site. The majority of the run-ups remain at their current locations (i.e., approximately 2,436 annually or 203 monthly).

Based on the anticipated redistribution of ground run-up activity anticipated to occur with implementation of the proposed Project, the resultant CNEL value at each noise-sensitive receptor location was calculated. **Table 4.5-10** shows the CNEL results and the differences or change in CNEL from existing conditions. As shown, all of the CNEL changes are between -0.1 and 0.2 dB and less than significant; essentially little to no change in the CNEL values for all locations.

Single Event Noise Levels

In addition to the CNEL analysis presented above, which provides the basis for evaluating whether implementation of the proposed Project would result in a significant impact associated with run-up activity, single-event noise levels from the six run-up locations (five existing run-up sites and the Project site) were calculated. To determine how the noise levels from a single event propagate into the communities, the maximum sound level (L_{max}) emanating from each run-up site was evaluated. For the existing run-up locations, aircraft types were determined from those aircraft using the specific run-up pads. The proposed Project run-ups were represented by those that would relocate to the proposed Project site.

Table 4.5-11 lists the estimated Lmax values at each noise sensitive receiver with implementation of the proposed Project. The tables show that the single-event noise levels for those run-ups to be relocated to the proposed Project may increase or decrease at the various locations based on the changes in distance or changes in shielding at the proposed Project compared to the existing run-up location. The increases or decreases may or may not be perceptible based on the other noise source levels at the community sites. The sound levels listed in the subject tables are for a single aircraft conducting a run-up at LAX. The values do not include noise from other aircraft events such as departures and arrivals, nor do they account for noise generated by traffic and other community noise sources; hence, they should not be considered representative of what a receptor would experience over the course of a typical day – they are provided for general informational purposes only.

In summarizing the results of the noise analysis completed for Project-related changes in run-up activity at LAX, specifically as related to concluding whether a significant noise impacts would occur, the range of change in CNEL for the proposed Project run-up operational scenario compared to the existing conditions is estimated to be -0.1 to 0.2 dB. Therefore, noise level increases would be less than 1.5 dB CNEL at or above 65 dB CNEL noise exposure areas when compared to existing conditions, so impacts associated with Project-related changes in run-ups would be less than significant.

4.5.6.2.2 Taxi Operation Noise

As described earlier, implementation of the proposed Project would not increase the number of aircraft operations at LAX, but would result in a change to the normal taxi route that certain aircraft currently take to and from aircraft maintenance areas and RON/RAD areas. The evaluation of potential noise impacts associated with that change focuses on the taxi routes aircraft would take going to and from the proposed Project site that would be different from the route they currently take. Given that the vast majority of existing aircraft taxiing operations at LAX would be unaffected by the proposed Project, the evaluation of Project-related impacts focuses specifically on the number, type, and route of aircraft taxiing to and from the Project site, as opposed to modeling the entirety of taxiing operations at LAX with and without the Project (which is unlikely to show any notable difference). Assumptions associated with aircraft movement to and from the proposed Project site are discussed in the Project Description and summarized below:

Morning (AM – 7:00 a.m. to 7:00 p.m.) – 13 total aircraft movements

- Seven aircraft arrive at the Project site from early arrival flights and remain all day awaiting their return to gates for same day PM departure flights; servicing/light maintenance checks may occur while aircraft are parked. These aircraft are assumed to include the four wide-body aircraft that currently use the aircraft parking area at the former TWA Hangar area, and three wide-body aircraft that might typically park at the RON/RAD positions adjacent to Taxiway R.
- Four aircraft that arrived at the Project site the prior PM leave to go to gates for AM departure flights. These include three narrow-body aircraft that might otherwise park overnight at one of the northern concourses in the CTA and one narrow-body aircraft that might otherwise park overnight at one of the southern concourses in the CTA.
- On average, one aircraft arrives each AM for maintenance that will last more than one day (i.e., would go to a maintenance hangar/bay and stay there for several days - assumes that between the total hangar positions and adjacent bays, one position/bay would, on average, be available each day).
- On average, one aircraft leaves each AM after having completed maintenance. This includes the departure of aircraft that have been at the Project site for several days of maintenance, or the departure of aircraft that arrived at the site the previous PM.

Afternoon/Evening (PM – 7:00 p.m. to 7:00 a.m.) – 13 total aircraft movements

- Seven aircraft that arrived at the Project site in the AM return to gates for same day PM departure flights.
- Four aircraft arrive at the Project site and stay overnight (until next AM, awaiting AM departure flights); servicing/light maintenance checks may occur while the aircraft are parked.

Source: Harris Miller Miller & Hanson Inc., 2013
Prepared by: PCR Services Corporation, 2013

West Aircraft Maintenance Area Project Draft EIR	Proposed Future Run-Up Locations	Figure 4.5-2

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Table 4.5-9

Proposed Future Conditions Run-up Activity at the proposed Project (Changes from Existing Conditions Indicated in Bold)

Airline Aircraft	Location			Parameters			Annual Number		
	Latitude (deg)	Longitude (deg)	True Heading (deg)	Number of Engines	Power Setting (lbs per engine or %)[a]	Duration for a single run-up (sec)	Day 7am to 7 pm	Evening 7 pm to 10 pm	Night 10 pm to 7 am
Qantas A380	**33° 56'16.67"N**	**118° 25'44.97"W**	**263 WAMA**	1	80% (50%)	600	24		
Qantas B747-400	**33° 56'16.67"N**	**118° 25'44.97"W**	**263 WAMA**	1	80% (50%)	600	12		
American B767-300ER	33° 56'20.03"N	118° 24'48.96W	263	1	100% (80%)	300	72	28.8	187.2
American B757-200	33° 56'20.03"N	118° 24'48.96W	263	1	100% (80%)	300	54	21.6	140.4
American B737-800	33° 56'20.03"N	118° 24'48.96W	263	1	100% (80%)	300	36	14.4	93.6
American B777-200ER	33° 56'20.03"N	118° 24'48.96W	263	1	100% (80%)	300	9	3.6	23.4
American MD-80	33° 56'20.03"N	118° 24'48.96W	263	1	100% (80%)	300	9	3.6	23.4
FedEx MD-11	33° 56'44.16"N	118° 25'22.89"W	263	3	100%	300		48	
US Airways A321/320/319	**33° 56'16.67"N**	**118° 25'44.97"W**	**263 WAMA**	1	100% (idle)	300	6	2.4	15.6
United B737-900ER	33° 56'16.88"N	118° 25'16.42"W	263	1	100% (idle)	300	129.6	32.4	162
United B737-900ER	33° 56'16.55"N	118° 25'23.35"W	083	1	100% (idle)	300	129.6	32.4	162
United B757-200/300	33° 56'16.88"N	118° 25'16.42"W	263	1	100% (idle)	300	129.6	32.4	162
United B757-200/300	33° 56'16.55"N	118° 25'23.35"W	083	1	100% (idle)	300	129.6	32.4	162
United B777-200ER	33° 56'16.88"N	118° 25'16.42"W	263	1	100% (idle)	300	26.4	6.6	33
United B777-200ER	33° 56'16.55"N	118° 25'23.35"W	083	1	100% (idle)	300	26.4	6.6	33
United B787	33° 56'16.88"N	118° 25'16.42"W	263	1	100% (idle)	300	2.4	0.6	3
United B787	33° 56'16.55"N	118° 25'23.35"W	083	1	100% (idle)	300	2.4	0.6	3
Delta B757-200/300	33° 56'36.31"N	118° 23'39.87"W	263	1	80% (50%)	600	30	12	78
Delta B767-300	33° 56'36.31"N	118° 23'39.87"W	263	1	80% (50%)	600	27	10.8	70.2

[a] Power setting shown in parentheses is for the engine on the wing opposite the engine being tested, as is necessary to maintain the overall stability of the aircraft during engine run-up activity.

Note: Qantas and US Air run-ups at WAMA.

Source: LAWA and Airlines, 2013

Table 4.5-10

Comparison of Aircraft Run-up CNELs for Existing Conditions and Proposed Future Conditions with the Proposed Project by Location

ID #	Address/Location	Existing Conditions CNEL (dB)	Future with Proposed Project CNEL (dB)	Difference: Proposed Project – Existing Conditions Change in CNEL (dB)
1	El Segundo High School 640 Main St.	61.7	61.7	0
2	Center St. Elementary School 700 Center St.	62.8	62.8	0
3	Richmond Street Elementary 615 Richmond St.	60.5	60.5	0
4	Imperial School 540 E. Imperial Ave.	69.1	69.0	-0.1
5	St. Anthony's Catholic School 233 Lomita St.	51.3	51.5	0.2
6	El Segundo Middle School 332 Center St.	58.6	58.5	-0.1
7	El Segundo Pre-School 301 West Grand Ave.	56.0	56.1	0.1
8	Hilltop Christian School 777 E. Grand Ave.	57.0	57.0	0
9	Loyola Village Elementary School Villanova St. and Rayford Dr.	58.0	58.0	0
10	Paseo Del Rey Natural Science Magnet 7751 Paseo Del Rey St.	53.3	53.3	0
11	Westchester High School 7400 W. Manchester Ave.	47.3	47.3	0
12	St. Bernard High School 9100 Falmouth Ave.	56.8	56.8	0
13	St. Anastasia School 8631 S. Stanmoor Dr.	45.1	45.1	0
14	Playa Del Rey Care and Rehabilitation Center 7716 W. Manchester Ave.	45.5	45.5	0
15	El Segundo Public Library 111 W. Mariposa Ave.	60.5	60.5	0
16	Pacific Baptist Church 859 Main St.	66.3	66.3	0
17	United Methodist Church 54 Main St.	60.4	60.4	0
18	First Baptist Church 591 E. Palm Ave.	63.3	63.2	-0.1
19	St. John's Lutheran Church 1611 E. Sycamore Ave.	64.6	64.6	0
20	Church of Christ of Latter Day Saints 1215 E. Mariposa Ave.	61.6	61.6	0
21	St. Anthony's Catholic Church 720 E. Grand Ave.	56.7	56.7	0
22	St. Andrew Catholic Church 538 Concord	59.9	60.0	0.1

Table 4.5-10

Comparison of Aircraft Run-up CNELs for Existing Conditions and Proposed Future Conditions with the Proposed Project by Location

ID #	Address/Location	Existing Conditions	Future with Proposed Project	Difference: Proposed Project – Existing Conditions
		CNEL (dB)	CNEL (dB)	Change in CNEL (dB)
	St.			
23	St. Michaels Episcopal Church 361 Richmond St.	57.5	57.6	0.1
24	El Segundo Christian Church Franklin Ave. and Concord St.	55.2	55.2	0
25	Kingdom Hall of Jehovah's Witnesses 608 E. Grand Ave.	56.2	56.2	0
26	St. Anastasia Catholic Church 7390 W. Manchester Ave.	53.3	53.3	0
27	Messiah Congregational Church W. Manchester Ave. and Rayford Dr.	52.9	52.9	0
28	Hope Chapel Del Rey Foursquare 7299 W. Manchester Ave.	53.3	53.3	0
29	Del Rey Hills Evangelical Free Church 8505 Saran Dr.	51.0	51.0	0
P-ESG1	Roof of building at 770 West Imperial Ave.	69.9	70.0	0.1
P-ESG2	Greenbelt across from 216 East Imperial Ave.	69.1	69.0	-0.1

Source: HMMH, SoundPLAN, 2013

- On average, one aircraft leaves each PM after having completed maintenance that occurred at the Project site over an extended period (i.e., more than one day).
- On average, one aircraft arrives each PM for maintenance that will last more than one day.

Based on the above, it is estimated that a maximum of 26 aircraft would travel to or from the Project site on a daily basis.

Airlines utilizing RON/RAD spaces at LAX today typically have their aircraft towed from an aircraft passenger gate located in the CTA or the West Remote Gates to a RON/RAD space, and then have them towed back to an aircraft passenger gate when the aircraft is ready for passenger boarding. According to LAWA Operations staff, nearly all large aircraft utilizing RON/RAD spaces at LAX (ADG V and VI aircraft) are towed to and from RON/RAD spaces; however, some smaller aircraft (ADG III and IV aircraft) are taxied to RON/RAD spaces. Thus, aircraft traveling to and from the Project site would mostly be towed with high-speed tugs, but some aircraft may be under power (taxi).

Table 4.5-11

Noise Levels for Proposed Future Conditions Run-ups at the proposed Project by Aircraft
dBA, L_{max}

ID #	Proposed Project		
	A320	A380	747
1	69.3	70.7	79.8
2	66.9	68.9	77.3
3	68.6	69.8	79.2
4	71.6	73.1	82.0
5	61.9	63.7	72.4
6	63.0	64.8	73.5
7	63.5	64.6	73.9
8	62.4	64.2	72.7
9	47.9	49.4	58.3
10	46.4	47.7	56.7
11	31.8	34.1	42.3
12	50.0	51.4	60.1
13	36.6	38.5	47.2
14	42.8	44.3	53.1
15	68.6	69.9	79.2
16	73.1	74.5	83.6
17	68.3	69.6	78.8
18	66.4	68.2	76.8
19	66.6	69.0	76.9
20	66.1	68.1	76.4
21	63.2	64.7	73.6
22	68.0	69.2	78.5
23	64.9	66.2	75.4
24	60.6	62.0	71.2
25	64.3	66.0	74.6
26	44.5	46.0	55.1
27	39.5	40.9	50.1
28	42.0	43.4	53.0
29	39.1	40.6	49.5
P-ESG1	75.6	76.3	86.3
P-ESG2	72.2	73.7	82.8

Source: HMMH, SoundPLAN, 2013

Once leaving the Project site, aircraft would be towed back or taxi to a passenger gate or cargo ramp area to resume normal operation. It is assumed that approximately 80 percent of the aircraft (or 20 per day) that would utilize the proposed Project would be towed to and from the Project site, while approximately 20 percent (or 6 per day) would taxi to and from the site on a daily basis. The noise levels associated with an aircraft taxiing under its own power is typically much greater than noise levels associated with an aircraft being towed; hence, the focus of this noise analysis is on impacts associated with aircraft taxiing movements.

With the taxiing operations identified above, CNEL values were calculated based on the number and time of day operations were estimated to occur and added to the existing ambient CNELs in residential areas to the north and south of the airport, to determine whether the Project-related aircraft taxiing noise would result in a 1.5 dB CNEL or greater increase at a noise sensitive use. Information regarding existing CNEL values was obtained from LAWA's California State Airport Noise Standards Quarterly Report, Fourth Quarter 2012 (Available: http://lawa.org/uploadedFiles/LAX/pdf/4Q12 Quarterly Report map.pdf, accessed September 16, 2013).[15]

The total average daytime noise level associated with Project operations, defined as occurring between 7:00 a.m. and 7:00 p.m., and the total average nighttime noise level associated with proposed Project operations, defined as occurring between 7:00 pm and 7:00 am, were calculated. Those noise levels were compared to the existing daytime ambient noise level and existing nighttime ambient noise levels that occur in residential areas to the north and south of the airport, being the community of Westchester and the City of El Segundo, respectively. Information regarding existing daytime and nighttime ambient noise levels in those areas was obtained from LAWA Noise Monitoring Station records.

Existing ambient noise levels in the southern portion of Westchester, nearest to LAX, range between approximately 63 to 64 dBA during the daytime and 59 to 60 dBA during the nighttime. As also indicated on that page, existing ambient noise levels in El Segundo adjacent to the airport are estimated to be approximately 65 dBA or greater during the daytime and 60 dBA or greater during the nighttime.

Existing ambient noise levels in terms of airport-related CNEL within the southern portion of Westchester range between approximately 65 dBA and 70 dBA. Existing ambient noise levels in terms of airport-related CNEL along the northern edge of El Segundo range between approximately 68 dBA to 75 dBA, with the higher noise levels occurring as one moves from east to west.

Average Hourly Ambient Daytime and Nighttime Noise Levels

The average hourly noise levels associated with Project-related taxiing operations in the daytime and taxiing operations at nighttime were estimated assuming one 737-300 aircraft taxiing between the Project site and the north CTA concourses in the daytime and one 737-300 aircraft taxiing on that route at night, and two 737-300 aircraft taxiing between the Project site and the south concourses or the Delta Airlines/United Airlines aircraft maintenance area in the

[15] Of the six total daily aircraft taxiing operations associated with the proposed Project, half are assumed to occur during daytime hours (i.e., between 7am and 7pm) and half are assumed to occur during nighttime hours (i.e., between 7pm and 7am). Relative to calculating CNEL values associated with such operations, it is unknown whether or how many nighttime operations would occur between 7 pm and 10 pm, which would be assigned a noise penalty of approximately 4.77 dB, or between 10 pm and 7 am, which would be assigned a noise penalty of 10 dB. To provide a conservative (worst-case) analysis, it is assumed that all nighttime taxiing operations would occur between 10 pm and 7 am, therefore incurring the 10 dB noise penalty. To the extent that some or all nighttime taxiing operations actually occur between 7 pm and 10pm, the resultant noise impact, in terms of CNEL, would be less than indicated in this analysis.

daytime and two 737-300 aircraft taxiing on that route at night.[16] The resultant Project-related taxiing noise levels at the southern edge of Westchester directly north of the nearest taxi route were estimated to be approximately 39.0 dBA in the daytime and 38.4 dBA at night. As indicated above in Existing Conditions, existing ambient noise levels in the southern portion of Westchester are approximately 63-64 dBA in the day and 59-60 dBA at night. The Project-related aircraft taxiing noise would be substantially less than existing ambient noise levels, and when added to existing ambient noise levels, would increase the existing ambient noise levels by approximately 0.01 dB in the daytime and 0.03 dB at night.[17]

At the northern edge of El Segundo directly south of the nearest taxi route, the Project-related taxiing noise levels are estimated to be approximately 42.8 dBA in the daytime and 42.2 dBA at night. Existing ambient noise levels in the northern portion of El Segundo near LAX are approximately 65 dBA or greater in the day and 60 dBA or greater at night. The Project-related aircraft taxiing noise would be substantially less than existing ambient noise levels, and when added to existing ambient noise levels, would increase the existing ambient noise levels by approximately 0.03 dB in the daytime and 0.07 dB at night.

CNEL

Based on the number of taxiing operations and the day/night split described above in the discussion of ambient noise levels, the CNEL value associated with Project-related taxiing was estimated. The resultant CNEL values would be 44.6 dBA at the noise sensitive uses north of the nearest taxi route (Westchester), and 48.3 dBA at the south of the nearest taxi route in the City of El Segundo. When added to the existing CNELs in Westchester and El Segundo, these Project-related CNEL values would increase the existing CNEL in Westchester by approximately 0.04 dB and increase the existing CNEL in El Segundo by approximately 0.07 dB. In both cases, the increase would be substantially less than the threshold of significance of a 1.5 dB increase; hence, the increased Project-related taxiing noise impact would be less than significant.

4.5.6.2.3 Operational Maintenance Noise

As discussed in Chapter 2, Project Description, the proposed Project would include areas for tool storage and welding. Typically, hangars include a maintenance shop and provide areas for routine aircraft maintenance. Operation of the Project may include the use of hand tools and pneumatic tools that generate noise. Pneumatic tools are tools that are driven by a gas – usually compressed air. Some examples of pneumatic tools include air impact wrenches, pneumatic drills, and pneumatic nail guns. Pneumatic hand tools typically generate noise levels ranging from 95 to 115 dBA measured at the source. The FHWA estimates a value of 85 dBA for pneumatic tools at 50 feet from the source,[18] which corresponds to the upper end of the 95 to

16 While the taxiing noise analysis considered both the Boeing 737-300 aircraft and the Boeing 767-300 aircraft, the ambient noise level and CNEL estimates presented herein are based on only the Boeing 737-300, in order to provide a conservative (worst-case) analysis. As indicated in the SEL noise contour figures presented above, the taxiing noise levels associated with the 737-300 aircraft are comparatively greater than those of the 767-300 aircraft.

17 Sound levels are expressed in decibels and are based on a logarithmic scale. Sound levels cannot be added directly (i.e., 60 dB + 60 dB does not equal 120 dB; instead it equates to 63 dB). The addition of noise decibels can be computed by the following equation: (10 Log10 (10^(P1/10) + 10^(P2/10))).

18 Federal Highway Administration, Roadway Noise Construction Model (RCNM), Software Version 1.1

115 dBA range measured at the source. The use of pneumatic tools, like all construction equipment, is highly variable. It is not possible to predict precisely how often a tool or piece of equipment will be used. Over shorter time frames, such as 15 minutes, a pneumatic tool could be in use frequently; however, a 100 percent usage rate is not possible because a pneumatic tool would cease to operate and generate no noise as a worker positions a new nail, screw, or bolt.

As discussed previously, point source noise levels decrease by 6 dBA for every doubling of the distance. An 85 dBA noise level measured at 50 feet would attenuate to approximately 48 dBA when measured at the sensitive receptor nearest to the proposed maintenance hangars (i.e., approximately 3,400 feet).[19] In addition, intervening structures or barriers would block the transmission of operational maintenance noise to off-site noise sensitive receptors by up to 10 dBA or more. Maintenance occurring inside the proposed hangar would also potentially reduce the noise levels by up to 10 dBA or more, depending on the location of the maintenance activity inside the hangar and the relative location of the hangar doors.

Given the basic nature of maintenance activities, it is not possible to delineate what hours of the day noise-intensive activities would occur. However, even with a very conservative assumption that the aforementioned worst-case unattenuated noise level of 85 dBA occurred throughout a 24-hour day, the resultant CNEL value, including noise penalties during evening and nighttime hours, would be 54.7 dBA at the nearest sensitive receptor. Rounded upward, the noise associated with operational maintenance activity would generate noise levels at 55 dBA CNEL or less at the nearest sensitive receptors, which is approximately 13 to 20 dBA less than the existing CNEL (i.e., approximately 68 dBA to 75 dBA in the western portion of El Segundo). Given the logarithmic scale of the decibel unit, the sum of two noise levels with a 10 dBA or more relative difference would result in no perceptible increase in the total noise level (i.e., the sum of two noise levels one being 68 dBA and the other being 55 dBA is 68.2 dBA). Therefore, noise from operational maintenance activity would not result in noise-sensitive receptors being newly exposed to 65 dBA CNEL or result in an increase of 1.5 dBA CNEL or more in areas currently exposed to 65 dBA CNEL; hence, Project-related maintenance noise impacts would be less than significant.

4.5.7 Cumulative Impacts

The geographic context for the analysis of cumulative noise impacts depends on the impact being analyzed. Noise is by definition a localized phenomenon, and substantially reduces in magnitude as the distance from the source increases. As such, only projects and growth due to occur in the immediate Project area, including LAX Master Plan projects as well as other capital improvement projects undertaken by LAWA and other local agencies, would be likely to contribute to cumulative noise impacts. The following cumulative impacts analysis is based on the "list approach" taking into account the projects identified in Section 3.6.1 (in Chapter 3, *Overview of Project Setting*).

(12/08/2008).

[19] Although light maintenance and aircraft servicing, such as Maintenance Level A Checks and cabin cleaning, may occur while aircraft are parked on the Project site apron areas, such activities typically do not involve the use of pneumatic tools or other noise-intensive equipment. The use of such equipment is anticipated to occur primarily, if not entirely, within the confines of the proposed maintenance hangars.

4.5.7.1 Construction Noise

Noise from construction of the proposed Project and related projects would be localized, thereby potentially affecting areas immediately within 500 feet from the construction site. Due to distance attenuation (more than 1,500 feet away) to the nearest residential uses in the City of El Segundo and intervening structures, construction noise from one site would not result in a noticeable increase in noise at sensitive receptors near the other site, which would preclude a cumulative noise impact. The nearest related project in proximity to the proposed Project that is anticipated to be under construction at the same time as the Project is the Runway Safety Area (RSA) Improvements-South Airfield. As indicated in the construction noise analysis for that project, the highest construction noise level at the nearest noise-sensitive receptor in El Segundo is projected to be 63 dBA.[20] When added to the highest estimated noise level for construction of the proposed Project, which is 59 dBA (see Table 4.5-8), the combined noise level would be approximately 64 dBA, which is well below the applicable threshold of significance (i.e., 74.1-74.9 dBA, which represents a 5 dB increase over existing ambient noise levels). The next closest related projects, the Midfield Satellite Concourse: Phase 1 – North Concourse Project and the LAX Bradley West Project Remaining Work, are much farther away (i.e., over 3,000 feet and 5,000 feet from the Project site, respectively), which based on that distance would not generate construction noise levels such that when combined with those of the proposed Project and the RSA Improvements-South Airfield project, would result in significant cumulative noise impacts to the nearest noise-sensitive receptor. As such, cumulative impacts associated with construction noise would be less than significant.

With respect to off-site construction traffic, according to the traffic study report, the proposed Project would not result in a cumulative considerable contribution that would be considered a significant impact.[21] In order for there to be a 5 dBA increase in the CNEL along Imperial Highway, which is near sensitive receptors and would be affected by cumulative traffic, the average daily traffic volumes along Imperial Highway would need to more than triple. Based on the analysis provided in Section 4.7, *Construction Surface Transportation*, including for peak cumulative traffic in March 2018, there is no evidence to suggest that Imperial Highway would experience anywhere near that level of traffic increase. Moreover, as indicated in Section 4.5.6.1.2 above, the Project-related increase in ambient noise levels along Imperial Highway, which is in general proximity to noise-sensitive receptors, is estimated to be 0.1 dBA CNEL. Notwithstanding that no significant cumulative impact in traffic noise is expected to occur, the Project's contribution to a cumulative traffic noise impact would not be considerable. As such, cumulative traffic noise impacts would be less than significant and no mitigation measures are necessary.

4.5.7.2 Construction Vibration

Similar to construction noise, vibration from construction of the proposed Project and related projects would be localized to within a few hundred feet from the construction site. Vibration levels from a large dozer would attenuate to below the FTA perception level of 65 VdB at approximately 150 feet, which is well below the threshold of significance of 72 VdB to 80 VdB.

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[20] City of Los Angeles, Los Angeles World Airports, Draft Environmental Impact Report for Los Angeles International Airport (LAX) Runway 7L/25R Runway Safety Area (RSA) and Associated Improvements Project, September 2013.

[21] Ricondo & Associates, Inc., June 2013.

Given that the nearest related project, the RSA Improvements-South Airfield project, is approximately 1,500 feet from the proposed Project site (other related projects are much farther away, as described above) and both projects are each more than 1,300 feet from the nearest sensitive receptor, it is not anticipated that there would be combined construction vibration impacts; hence, cumulative impacts associated with construction vibrations would be less than significant.

4.5.7.3 Operational Noise

As indicated in the impacts analysis above, operations-related increases in existing CNEL levels, estimated at nearby noise-sensitive receptors, resulting from implementation of the proposed Project would include a maximum of 0.2 dBA increase associated with run-up activity, a 0.07 dBA increase associated with aircraft taxiing, and maximum of 0.2 dBA increase from aircraft maintenance activities. These increases, individually and collectively, would be substantially less than the threshold of significance (i.e., 1.5 dBA CNEL increase). Of the related projects identified in Section 3.6, the one with the most potential to result in operations-related changes to existing CNEL levels at the nearest sensitive noise-receptors also affected by the proposed Project would be the RSA-Improvements South Airfield project. Other related projects that may result in changes in operational noise are located much farther away from the nearest noise-sensitive receptors affected by the proposed Project and are not expected to have a notable contribution to cumulative operational noise impacts. As indicated in Figure 4.6-7 of the RSA-Improvements South Airfield project Draft EIR for that project, it is anticipated that CNEL levels in the northwest portion of El Segundo for 2015 With Project Conditions would increase by approximately 0.3 dBA compare to 2011 Baseline Conditions.[22] This increase in combination with the increases described above for the proposed Project would not result in a 1.5 dBA increase in the existing ambient noise level (i.e., CNEL) for the affected area; hence, cumulative impacts associated with operational noise would be less than significant.

4.5.8 Mitigation Measures

As no significant noise or vibration impacts would occur as a result of construction or operation of the proposed Project, no mitigation measures specific to the proposed Project are required. The LAX Master Plan commitments and mitigation measures discussed in Section 4.5.5 above are included as project design features under the proposed Project.

4.5.9 Level of Significance After Mitigation

Not applicable. Impacts are less than significant, as indicated above; therefore, no additional mitigation measures are required.

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[22] City of Los Angeles, Los Angeles World Airports, Draft Environmental Impact Report for Los Angeles International Airport (LAX) Runway 7L/25R Runway Safety Area (RSA) and Associated Improvements Project, September 2013.

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