4.1 Noise

4.1.1 Introduction

The noise analysis addresses noise levels from aircraft, surface roadway, and construction traffic and equipment in the communities surrounding LAX under existing (1996) baseline conditions, Year 2000 conditions, and conditions as forecast for the No Action/No Project Alternative and the four build alternatives in the Year 2015. The effect of noise is presented in terms of the total area, population, homes, and other noise-sensitive receptors such as schools and churches within various noise contours and at selected other locations in the airport environs. For NEPA purposes, the noise analysis compares the conditions for the four build alternatives in 2015 to the No Action/No Project Alternative conditions for 2015. For CEQA purposes, the noise analysis compares the conditions projected for the four build alternatives in 2015 to the 1996 environmental baseline conditions to determine significant impacts. In addition to analyzing cumulative impacts, the noise analysis provides a comprehensive evaluation of the effects of single event aircraft noise relative to nighttime awakening in homes and speech interference at schools. The analysis of single event noise effects addresses the types of concerns raised in a recent CEQA court case ruling, as described below in subsection 4.1.2, *General Approach and Methodology.* The effects of single event noise at night and impacts on speech interference at schools are presented herein for 1996 baseline conditions and Year 2000 conditions, and as forecast for all build alternatives in the year 2015. Throughout this section, all noise levels are provided for outdoor conditions, unless stated specifically to be interior noise levels.

Noise mitigation measures that reduce noise impacts by lowering noise levels through noise abatement at noise-sensitive land uses are evaluated in subsection 4.1.8, *Mitigation Measures*.

The technical data and statistical reports used to develop the aircraft and other noise exposure patterns and conclusions about the effect of noise on the surrounding area are provided in Appendix D*, Aircraft Noise Technical Report,* Appendix S-C, *Supplemental Aircraft Noise Technical Report* (which also includes road traffic noise data)*,* and Appendix K, *Supplemental Environmental Evaluation for LAX Expressway and State Route 1 Improvements*. The impact of surface traffic and aircraft noise on sensitive land uses is addressed in greater detail in Section 4.2, *Land Use*. Mitigation measures that relocate, insulate, or shield noise-sensitive land uses are also evaluated in Section 4.2, *Land Use (*subsection 4.2.8*, Mitigation Measures)*, and in Appendix K, *Supplemental Environmental Evaluation for LAX Expressway and State Route 1 Improvements*.

4.1.2 General Approach and Methodology

4.1.2.1 Aircraft Noise Methodology

Aircraft noise was assessed using noise exposure contours and grid-point analysis for all areas surrounding the airport, and location specific analysis was conducted at noise-sensitive uses, as described below.

4.1.2.1.1 Noise Exposure Contours

Aircraft noise is presented graphically as contour lines connecting points of equal noise exposure. Noise levels are higher within each contour interval moving toward the center of the noise source. These contours are overlaid on maps of the noise-sensitive land uses surrounding the airport to determine the area and land uses affected by noise.

The noise measure used in this analysis to describe annual average day noise levels is CNEL (Community Noise Equivalent Level), which is mandated by California law and accepted by the FAA for the evaluation of airport noise levels in the state.[47] CNEL, an average sound level expressed in terms of average day A-weighted decibels (dBA)[48] such as "65 dBA CNEL," or simply "65 CNEL," considers both

[47] See FAA Order 5050.4A, Page 30, paragraph "g" for FAA's acceptance of the CNEL metric as a suitable substitute for the Day Night Average Sound Level (DNL).

[48] The dBA metric incorporates a weighting methodology used to account for changes in human hearing sensitivity as a function of frequency. The A-weighting network de-emphasizes the high (6.3-KHz and above) and low (below 1-KHz) frequencies, and emphasizes the frequencies between 1-KHz and 6.3-KHz, in an effort to simulate the relative response of human hearing.

the loudness and duration of exposure. Noise exposure contours connecting points of equal noise exposure were used to locate the 65, 70, and 75 CNEL contours for annual average day conditions.

The CNEL metric applies mathematical penalties to evening and nighttime operations, artificially inflating the actual amount of noise energy present in the airport environs to account for the greater sensitivity of underlying land uses in the quieter hours between 7 p.m. and 7 a.m.[49] It applies an additional 4.77 dB weighting to noise events occurring in evening periods (7:00 p.m. to 9:59 p.m.) and an additional 10 dB weighting during nighttime periods (10:00 p.m. to 6:59 a.m.) to account for the increased annoyance of noise at those times. The measure is similar to the Day Night Average Sound Level (DNL) metric used in all other states, except that DNL does not include a penalty for evening hours. Consequently, CNEL measurements at airports with evening flights would be higher than the DNL levels. Detailed information about aircraft noise and its measurement is provided in Appendix D*, Aircraft Noise Technical Report* and Appendix S-C1, *Supplemental Aircraft Noise Technical Report*.

CNEL noise contours and other noise computations (including single event effects) were developed for the existing baseline, Year 2000 conditions, and each of the alternatives in 2015 using the Integrated Noise Model (INM), Version 6.0c,[50] the latest computer model developed by the FAA. The projected acreage, number of residences, noise-sensitive uses, and population within each noise contour band were calculated by overlaying the noise contours into a Geographic Information System (GIS) land use database of the environs. This GIS is also used by LAWA for its quarterly noise reports to Caltrans. (See Section 4.2, *Land Use,* for further information about the contents of the GIS database.)

The INM requires the compilation of extensive information about how the airport operates (for environmental baseline conditions) or is expected to be operated (for future conditions). The model requires the integration of an assortment of data relating to airfield geometry, weather conditions, number and type of aircraft operations, time of day of aircraft operations, runway use patterns, flight tracks, and other data and assumptions. Extensive detail regarding the inputs to the INM computer model for all conditions and alternatives are provided in Appendix D*, Aircraft Noise Technical Report*.

The aircraft operating conditions were determined for application to the INM through simulations using the FAA's SIMMOD model. The simulation modeling, conducted by the FAA's consultants, assumed a condition of maximum operational efficiency of four distinct operating configurations during the average weekday of the peak month of the year. To convert the simulation output to average annual day levels, required in INM, ratios between peak month and average month operations levels were applied for each aircraft operating group.

4.1.2.1.2 Grid Point Analysis

The INM computer model also has the capability to generate aircraft noise levels at regularly spaced grid-points. Such information supplements the analysis provided by contours. Noise levels were calculated for 234 points distributed on a regularly spaced grid with an interval of 3,000 feet (**Figure F4.1-1**, Regularly Spaced Grid Point Locations), and at 928 individual locations of noise-sensitive use (**Figures F4.1-2** through **F4.1-4**). Each intersection in the grid was identified and evaluated for changes in noise exposure.

Grid-point analysis was also used to determine changes of 1.5 CNEL and 3 CNEL by applying the noise-level-difference function of the INM. Grid-points included the aforementioned 1,162 locations, including the regularly spaced locations within the areas exposed to the 60 CNEL contour and known noise-sensitive land uses in the vicinity of the airport and its approach corridors. These locations are indicated in **Figure F4.1-1**, **Figure F4.1-2**, Noise Sensitive Public Facilities - Schools, **Figure F4.1-3,** Noise Sensitive Public Facilities - Churches, and **Figure F4.1-4,** Noise Sensitive Public Facilities - Miscellaneous Uses. These uses are also addressed in detail in Section 4.2, *Land Use*.

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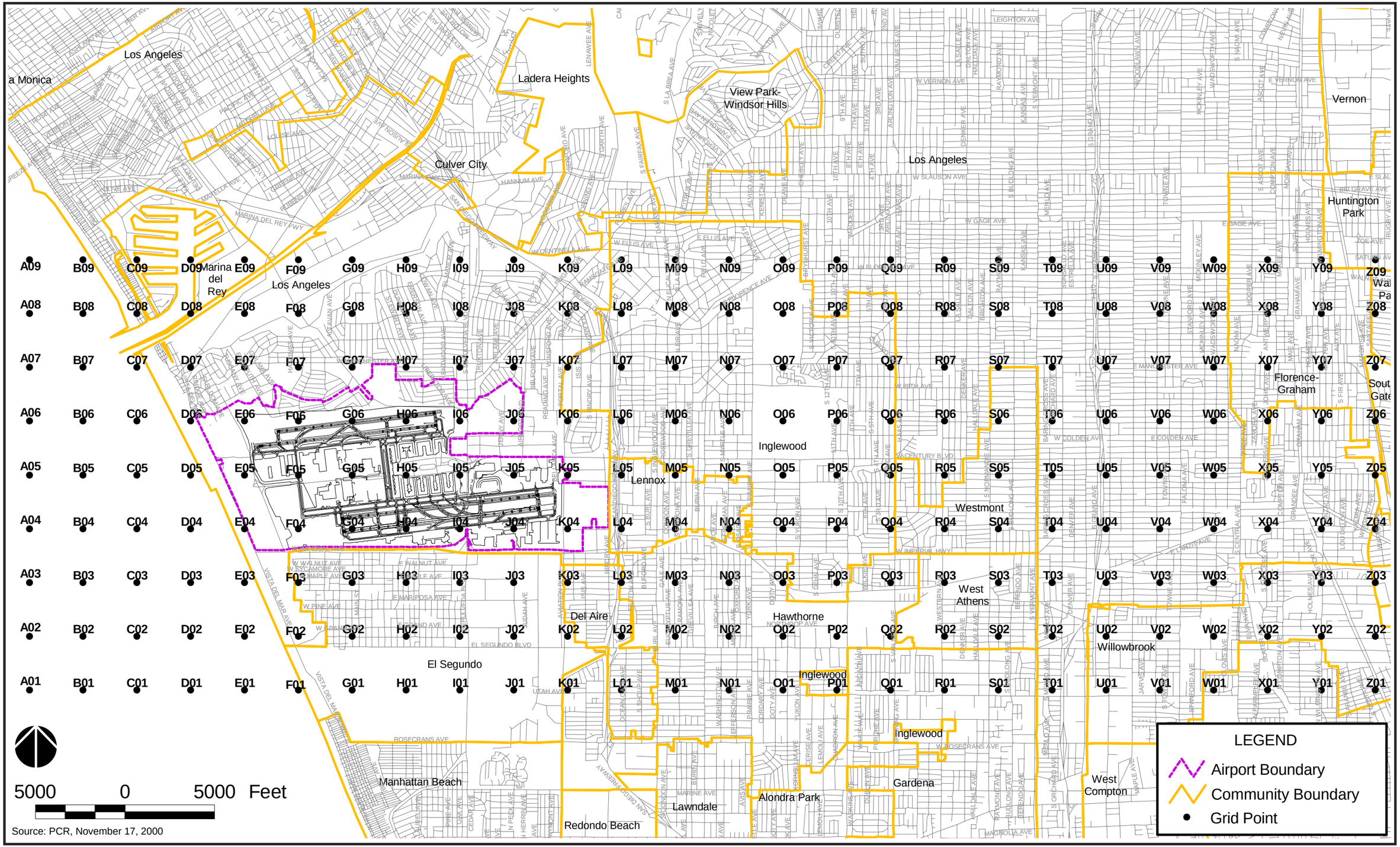
49 For additional information regarding the penalties applied to the CNEL metric to reflect the heightened annoyance of noise during evening and night hours, see the 2002 California Airport Land Use Planning Handbook, published by the California Department of Transportation, Division of Aeronautics, January 2002, 6-22, 7-18 and 7-28.

50 Version 6.1 of the Integrated Noise Model was released on March 4, 2003, subsequent to all the evaluations prepared for this EIS/EIR. INM 6.1, incorporates new algorithms that modify lateral attenuation equations for propeller aircraft and some jet aircraft. Also, military aircraft noise power distance relationships were redefined and five new civilian aircraft were added to the model. It does not appear that version 6.1 of the INM will materially change the contours for LAX produced by INM 6.0c.



Source: PCR, November 17, 2000

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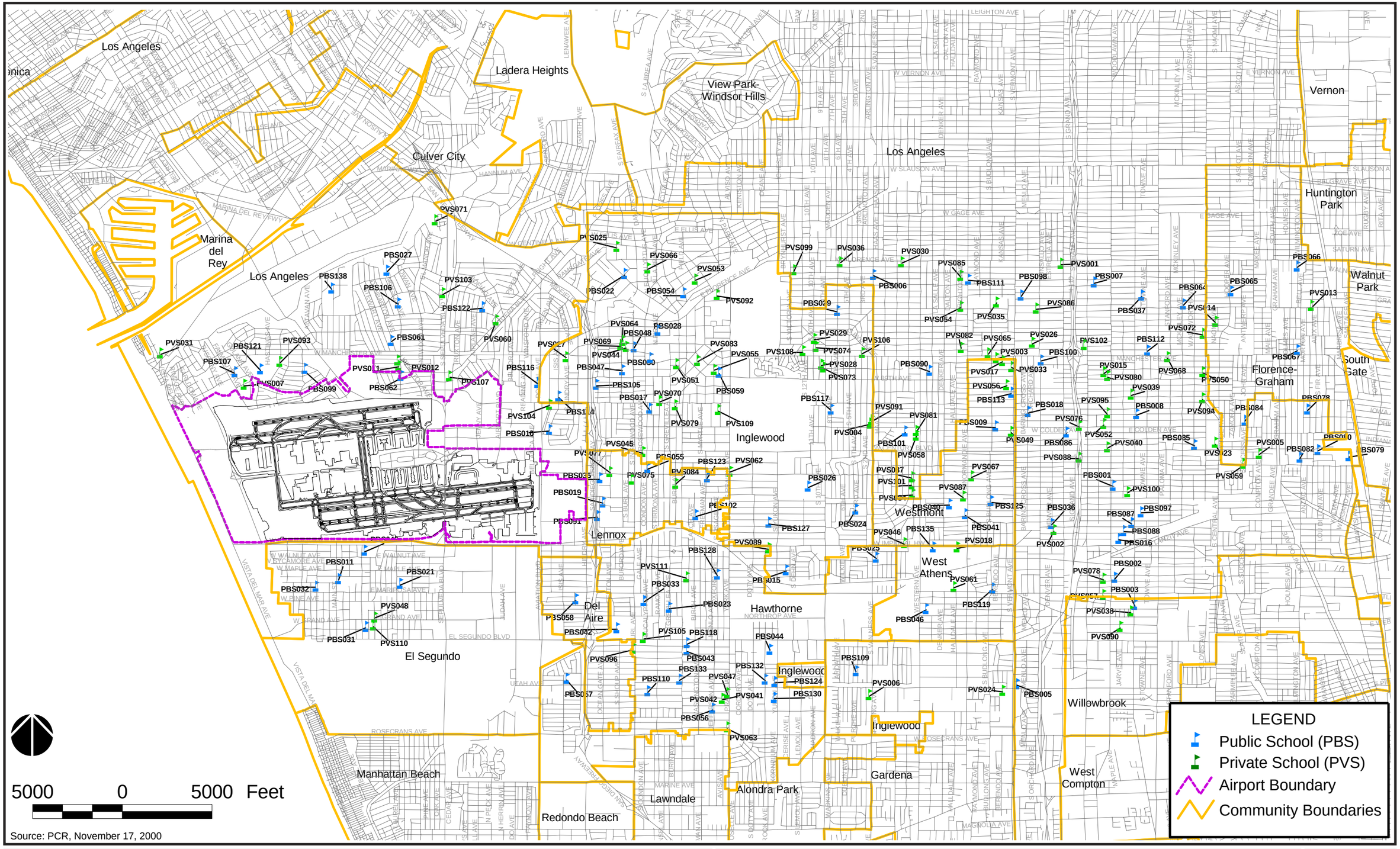
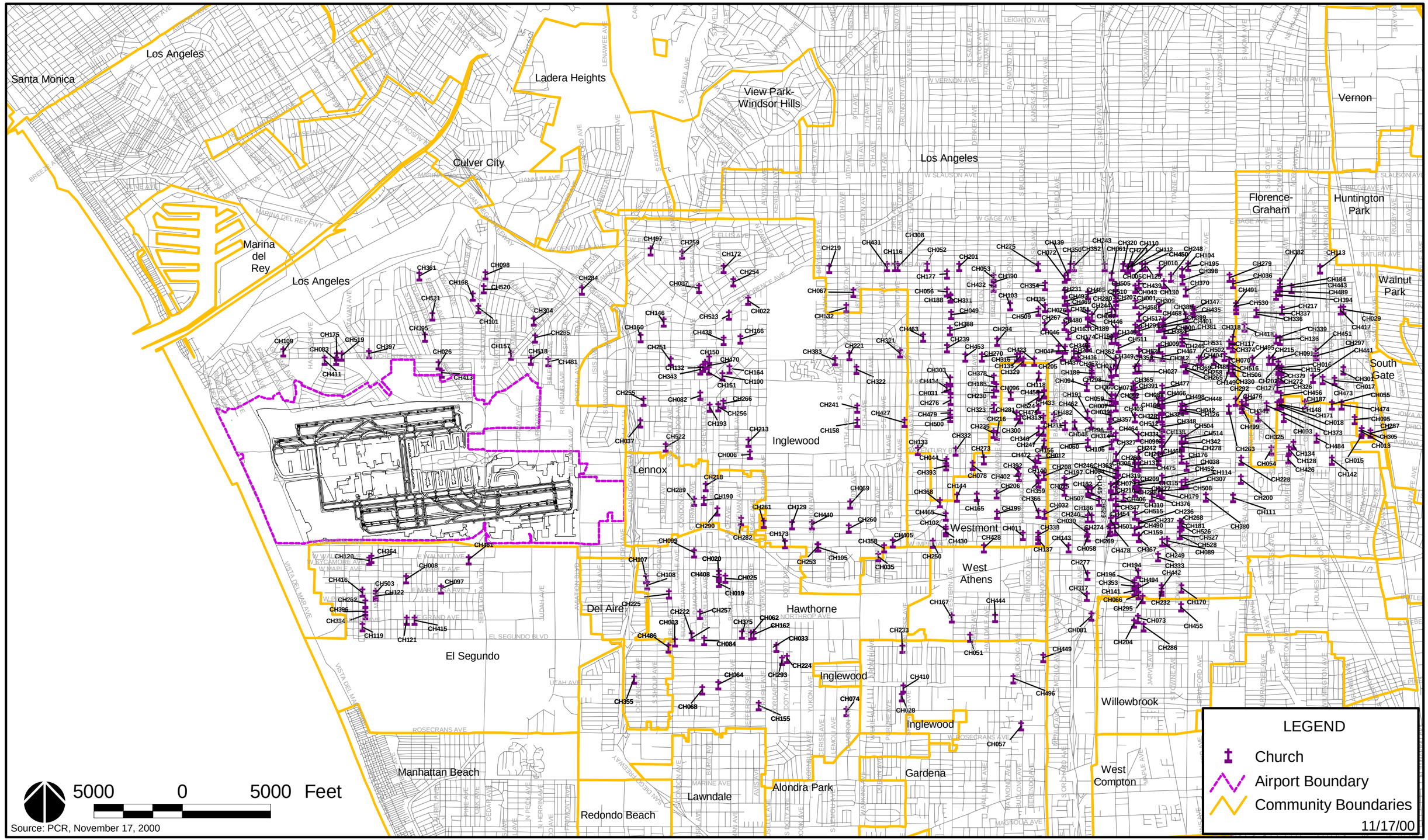
Regularly Spaced Grid Point Locations

Figure
F4.1-1

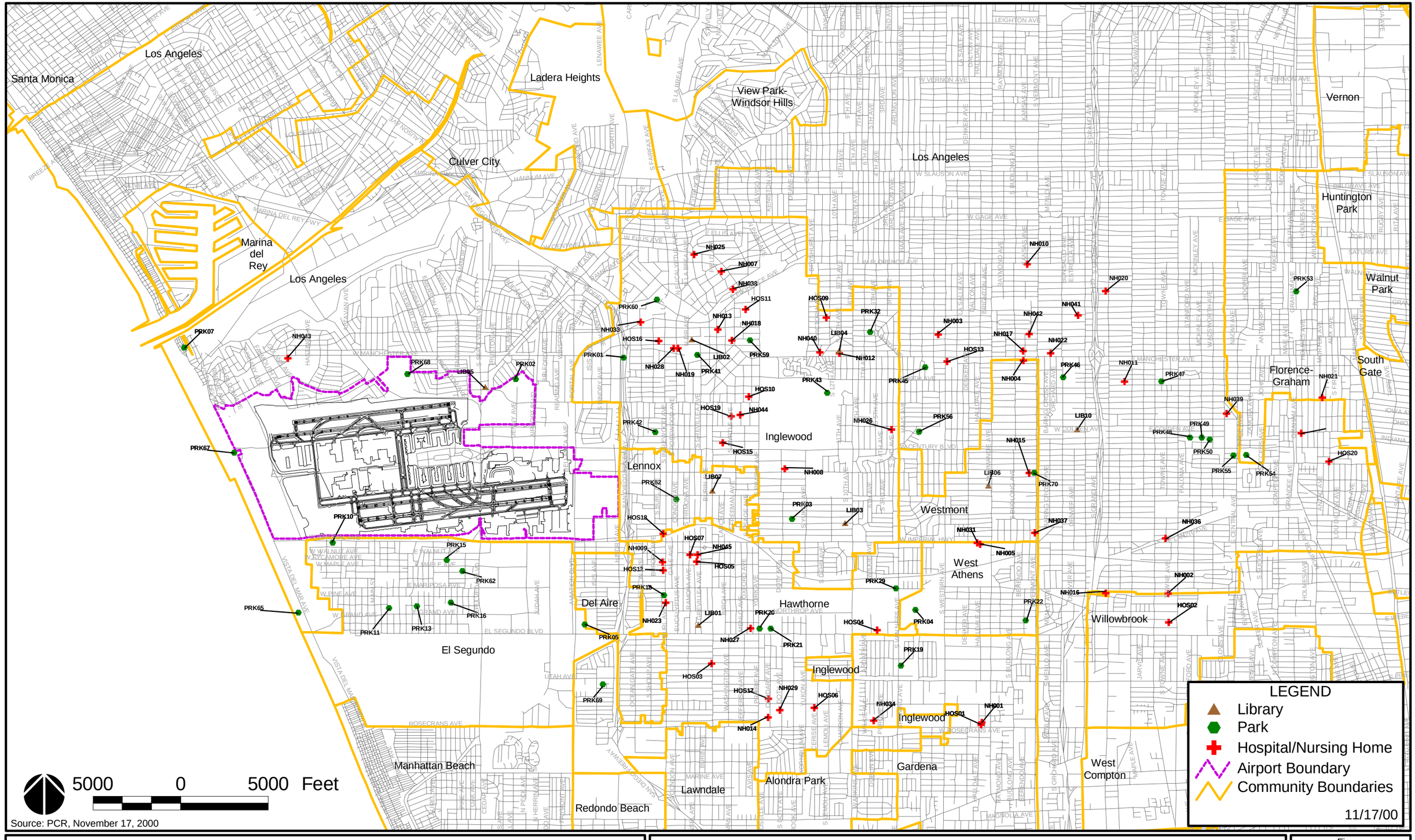


Source: PCR, November 17, 2000

LAX Master Plan Final EIS/EIR	**Noise Sensitive Public Facilities - Schools**	Figure **F4.1-2**



LAX Master Plan Final EIS/EIR	**Noise Sensitive Public Facilities - Churches**	Figure **F4.1-3**



Source: PCR, November 17, 2000

LAX Master Plan Final EIS/EIR	**Noise Sensitive Public Facilities - Miscellaneous Uses**	Figure **F4.1-4**

4.1.2.1.3 Single Event Aircraft Noise Exposure

In August 2001, the California Court of Appeal found that, for purposes of CEQA, an evaluation of the effects of single event aircraft noise levels would be required of the Oakland Board of Port Commissioners in its development of a nighttime air cargo facility at Oakland International Airport.[51] In that case, referred to as "*Berkeley Jets*" throughout this section, the Court of Appeal ruled that, to provide a more accurate and complete picture of a project's noise impacts and to provide more comprehensive mitigation, a single event noise analysis must supplement an EIR's analysis of time-averaged noise levels, including use of appropriate thresholds of significance and mitigation of significant events.

Although the LAX Master Plan Draft EIS/EIR provided single event noise levels at many locations throughout the airport environs for 1996 baseline and future alternative conditions, no attempt was made at that time to assess the significance of those levels or to mitigate their effects. Comments received during the public review period for the Draft EIS/EIR included concerns regarding the potential for increased aircraft activity (i.e., number of arriving or departing flights) occurring at night to result in increased nighttime awakenings. Concerns were also expressed regarding potential disruption of classrooms and the educational process by overflights of additional aircraft during school hours. The Supplement to the Draft EIS/EIR added, as included, in this Final EIS/EIR, a comprehensive analysis of single event noise to address such concerns, in a manner consistent with, and responsive to, the *Berkeley Jets* ruling.

Although the *Berkeley Jets* ruling directed that the significance of single event noise effects be addressed in an EIR, there was no established basis for defining or assessing the significance of single event aircraft noise, and the Court of Appeal did not set forth any standards of significance in the evaluation of such events. Furthermore, although the California Airport Land Use Planning Handbook generally discusses the relevance of single event noise to land use planning in the airport environs, it does not suggest thresholds of significance for application to these evaluations.[52] As such, LAWA, as the lead CEQA agency for the LAX Master Plan EIS/EIR, has developed appropriate thresholds of significance regarding single event noise effects, based on a comprehensive review of existing studies and research literature pertaining to the issue. It should be noted that the thresholds of significance developed by LAWA are intended solely for use in the CEQA evaluation of the LAX Master Plan, as addressed in this Final EIS/EIR.

4.1.2.1.3.1 Awakenings

Recent research literature addressing awakenings was compiled and evaluated for its applicability to the need to establish single event thresholds of significance.[53] The 1997 Federal Interagency Committee on

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51 Berkeley Keep Jets Over the Bay Committee v. Board of Port Commissioners, (2001) 91 Cal.App.4th 1344.

52 California Department of Transportation, Division of Aeronautics, 2002 California Airport Land Use Planning Handbook, January 2002, 7-30 to 7-34.

53 Among the articles evaluated to assist in the development of single event thresholds of significance for nighttime awakenings were:

Federal Interagency Committee on Aviation Noise (FICAN), Effects of Aviation Noise on Awakenings from Sleep, June 1997, www.fican.org/pages/sleepdst.html.

Fidell, S. et al., "Field Study of Noise-Induced Sleep Disturbance," Journal of Acoustical Society of America, Vol 98, No. 2, Pt. 1, August 1995, 1025-1033.

Fidell, S. et al., "Noise-Induced Sleep Disturbance in Residential Settings: Final Report for the Period July 1992 to February 1994," Wright-Patterson AFB, Ohio, February 1994.

Fields, J.M., "The Relative Effect of Noise at Different Times of Day: An Analysis of Existing Survey Data," NASA Contractor Report 3965, April 1986.

Finegold, L.S. et al., "Community Annoyance and Sleep Disturbance: Updated Criteria for Assessing the Impacts of General Transportation Noise on People," Noise Control Engineering Journal, Vol 42, No. 1, Jan.-Feb. 1994, 25-30.

Finegold, L.S. and Elias, B., "A predictive model of noise induced awakenings from transportation noise sources," Presentation at 2002 International Congress and Exposition on Noise Control Engineering (Internoise 2002), Dearborn, MI., August 19-21, 2002.

Flindell, I.H. et al., "Aircraft Noise and Sleep: 1999 UK Trial Methodology Study," Institute of Sound and Vibration Research, Southhampton, UK, Ref 6131 R01, November 2000.

Lukas, J.S., "Noise and Sleep: A Literature Review and a Proposed Criterion for Assessing Effect," Journal of Acoustical Society of America, Vol 58, No. 6, December 1975, 1232-1242.

Pearsons, K.S., "Predicting Noise-Induced Sleep Disturbance," Journal of Acoustical Society of America, Vol 97, No. 1, January 1995, 331-338.

Smith, A. et al., Noise and Insomnia: A Study of Community Noise Exposure, Sleep Disturbance, Noise Sensitivity and Subjective Reports of Health, United Kingdom Department of Health, March 2002, http://www.doh.gov.uk/hef/airpol/insomnia.htm.

Aviation Noise (FICAN) document was selected as the most generally accepted study of sleep disturbance, basing its findings and formula for the estimation of the proportion of people asleep awakened at various Sound Exposure Levels (SEL) on the compilation of the findings from several previous field studies.

The exterior SEL metric was used to evaluate single event noise levels for nighttime awakening impacts. The single event SEL metric mathematically considers all the noise energy produced by a single operation and compresses that energy to a single second, resulting in a level that is normally several decibels (dB) greater than the maximum noise level recorded during the event. Because residents of the airport environs may sleep with windows open, it was decided to assess the area of awakenings impact based on windows remaining open. Furthermore, it was determined that the threshold should be set at 10 percent of the area population being awakened at least once in ten days (i.e., the threshold is geared toward a relatively small subset of the general population that may be particularly sensitive to single event noise as a cause of nighttime awakening). The INM was used to compute a contour representing the threshold level. The threshold is further discussed in subsection 4.1.4.1.1, *CEQA Thresholds of Significance*, below.

4.1.2.1.3.2 Classroom Disruption

Research literature detailing the effects of aircraft noise on the ability of children to learn was evaluated.[54] It is notable that none of the studies reviewed cited a reliable statistical relationship between the amount of aircraft noise exposure present and the degree of learning difficulty experienced by children at affected schools. Therefore, it was determined that two thresholds of significance should be based on the 1992 Federal Interagency Committee on Noise (FICON) study detailing the degree of speech understanding at various noise levels (in dB) and the amount of time during the school day that these threshold levels were exceeded. The American National Standards Institute published standards for classroom noise in 2002 that provided additional information, but again did not provide a relationship between aircraft noise and classroom disruption. Therefore, a third threshold was established for interior noise levels for the peak hour of operation during the school day. The Maximum Noise Level (L_{max}), Equivalent Noise Level (L_{eq}), and Time Above (TA) predetermined dB levels were used to evaluate the noise impacts at school facilities. Respectively they describe the peak noise level heard during a period of time, the unpenalized average noise level present during a period of time, and the amount of time the noise level at a given location exceeds a specific dB level. The noise levels at schools were computed by the grid analysis option of the INM to estimate the noise levels above or below the established thresholds of significance at the school locations during school hours (i.e., between 8 a.m. and 4 p.m.). The thresholds are further discussed in subsection 4.1.4.1.1, *CEQA Thresholds of Significance*.

United Kingdom Department for Transport, Adverse Effects of Night-Time Aircraft Noise (2000), Aircraft Noise and Sleep Disturbance, July 6, 2001, www.aviation.dft.gov.uk/sleepdisturbance/03.htm.
United Kingdom Department for Transport, Report of a Field Study of Aircraft Noise and Sleep Disturbance, December 1992.
United Kingdom Department for Transport, A Summary of Government Sponsored Research, Aircraft Noise and Sleep Disturbance, July 6, 2001, www.aviation.dft.gov.uk/sleepdisturbance/01.htm.

54 Among the literature reviewed in the assessment of the effects of aircraft noise on the ability of children to learn were the following articles and reports:
American National Standards Institute, Accredited Standards Committee S12, Noise, Standard ANSI12.60-2002, "Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools," 2002.
Cohen, Sheldon, Gary W. Evans, David S. Krantz and Daniel Stokols, "Physiological, Motivational and Cognitive Effects of Aircraft Noise on Children; Moving from the Laboratory to the Field," American Psychologist, Vol 35, March 1980, 231-243.
Ehrlich, Gary, Classroom Acoustics Standard, Wyle White Paper, 2002, www.wyleacoustics.com/acwp3.html.
Evans, Gary W. and Maxwell, Lorraine, "Chronic Noise Exposure and Reading Deficits: The mediating effects of language acquisition," Environment and Behavior, 29(5), 1997, 638-656.
Evans, G.W., Hygge, Staffan and Bullinger, Monika, "Chronic Noise and Psychological Stress," Psychological Sciences, 6(6), 1995, 333-338.
Federal Aviation Administration, Order 5100.38A, Airport Improvement Program Handbook, Section 712c.
Federal Interagency Committee On Noise, Federal Agency Review of Selected Airport Noise Analysis Issues, Table 3.3, page 3-9, August 1992.
Hansen, D.D. and Sanders, L.A., The Adverse Health Impacts of Airport Expansion With Particular Reference to Sea-Tac International Airport, Health Subcommittee of the Environmental Impact Committee of the Regional Coalition on Airport Affairs, 1992, www.rcaanews.org/health.htm.
Stansfield, Stephan., Final Report - West London Schools Study, Aircraft noise at school and children's cognitive performance and stress responses, 2001, http://www.doh.gov.uk/noisepollution/wlondonschools.pdf.
State of Washington Puget Sound Regional Council, Final Decision on Noise Issue, 1996, www.rcaanews.org/mardec.htm.
Hygge, S. et al., Effects of Aircraft Noise on Children's Cognition and Long Term Memory, Presentation to the Federal Interagency Committee on Aircraft Noise, 2001.

4.1.2.2 Road Traffic Noise Methodology

The road traffic noise analysis followed the procedures in Title 23 of the United States Code of Federal Regulations Part 772, "Procedures for Abatement of Highway Traffic Noise and Construction Noise"[55] and FHWA Highway Traffic Noise Analysis and Abatement Policy and Guidance.[56] The study included defining the project impact criteria and identifying existing land uses which may be affected by road traffic noise, the determination of existing and future noise levels, the identification of noise impacts and the examination of alternative noise abatement measures for reducing or eliminating the noise impacts.

4.1.2.2.1 Definition of Impact Criteria and Identification of Noise-Sensitive Land Uses

Traffic noise impacts are defined by the FHWA Highway Traffic Noise Analysis and Abatement Policy and Guidance as, "impacts that occur when the predicted levels approach or exceed the noise abatement criteria (NAC) or when predicted traffic noise levels substantially exceed the existing noise level." In order to adequately assess the noise impact of a proposed project the FHWA states that both criteria must be analyzed.

While the FHWA noise regulations do not define what is a "substantial increase" from existing noise levels, they do provide State Highway Agencies (in this case the California Department of Transportation) with the flexibility to establish their own definition of a "substantial increase." In addition, the City of Los Angeles has also established its own threshold guideline for determining whether or not a project would have a significant impact. Therefore, criteria established by Caltrans and the City of Los Angeles were used as significance thresholds. The FHWA Noise Abatement Criteria are listed in **Table F4.1-1,** Noise Abatement Criteria (NAC) - Federal Highway Administration.

Table F4.1-1

Noise Abatement Criteria (NAC) - Federal Highway Administration

Activity Category	$L_{eq(h)}$	Description of Activities
A	57 Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 Exterior	Picnic areas, recreation areas, playgrounds, active sport areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 Exterior	Developed lands, properties, or activities not included in Categories A or B above.
D	- N/A	Undeveloped lands.
E	52 Interior	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source FHWA, Highway Traffic Noise Analysis and Abatement Policy and Guidance, June, 1995.

4.1.2.2.2 Determination of Existing and Future Noise Levels

The unit of measurement for road traffic noise impacts is the one-hour noise level (energy) average at noise sensitive uses, expressed in decibels as "dBA $L_{eq(h)}$." One-hour L_{eq} values over a 24-hour period are used in the calculation of the CNEL with penalties added to noise occurring during evening and nighttime hours.

55 23 CFR 772, "Procedures for Abatement of Highway Traffic Noise and Construction Noise," United States Code of Federal Regulations, October, 1997.

56 U.S. Department of Transportation, Federal Highway Administration, Highway Traffic Noise Analysis and Abatement Policy and Guidance, June, 1995.

Road traffic noise was initially assessed by comparing existing and future levels at 21 locations of noise sensitive uses. The locations of those receptors were selected because they currently are receiving, or are expected to receive, high levels of road traffic noise during the project period. Receptor sites include schools, playgrounds, churches, hotels, a child-care facility, and residential uses. These uses are located near the major arterial roadways in the study area used by airport-related vehicles and/or proposed to be improved as part of the project alternatives. The major roadways include the San Diego Freeway (I-405), the Century Freeway (I-105), Manchester Avenue, Sepulveda, La Tijera, La Cienega, Century, Aviation, and Airport Boulevards, and Imperial Highway. The locations of these 21 receptor sites are presented in **Figure F4.1-5,** Road Traffic Noise Sensitive Receptor Sites, while another 10 receptor sites, which are located along the proposed LAX Expressway, are presented in Appendix K, *Supplemental Environmental Evaluation for LAX Expressway and State Route 1 Improvements*.

In addition to the original 21 receptors analyzed for Alternatives A, B, and C (i.e., Receptors RD1 through RD21), an additional 10 noise sensitive locations east of the proposed GTC area (separate from the 10 evaluated in Appendix K) were analyzed for roadway noise impacts under Alternative D (Receptors S22 through S31, also shown on **Figure F4.1-5**). These new receptors were established following the development of Alternative D, therefore, all 31 receptors (RD1 through S31) were analyzed for all alternatives. The 10 additional noise sensitive locations were analyzed for Alternatives A, B, C, and the No Action/No Project Alternative as well.

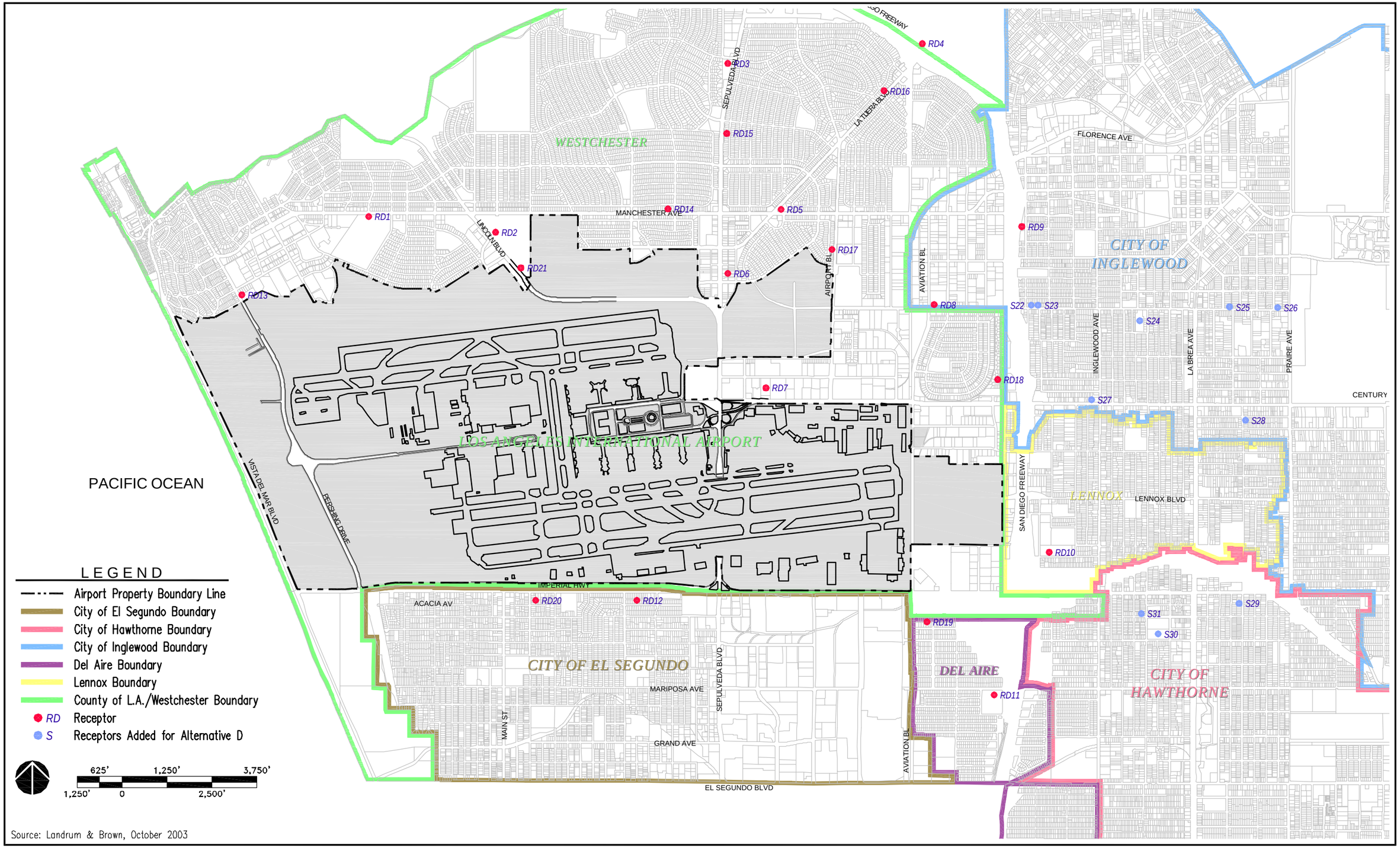
Road traffic peak noise hour L_{eq} was developed using the Federal Highway Administration Highway Traffic Noise Prediction Model, STAMINA 2.0 (Report No. FHWA-RD-77-108). Although the FHWA is currently in the process of replacing the STAMINA Noise Model with the Traffic Noise Model (TNM) for predicting highway traffic noise levels, use of the STAMINA model is currently still acceptable to FHWA. The roadway noise analysis area was divided into five regions each representing a specific section of the roadway system surrounding LAX, with focused analysis on the SR 1 realignment and the LAX Expressway, which is summarized in Appendix K, *Supplemental Environmental Evaluation for LAX Expressway and State Route 1 Improvements*. For each analysis region, a system of nodes and links was developed to represent the existing roadway system. The link/node system was developed using base maps for the LAX area and the grade elevation for each node was determined from topographic maps. For each roadway link, data pertaining to traffic volumes, vehicle classification, and vehicle travel speeds obtained from the from the off-airport surface transportation analysis, was input into the model. In addition, the coordinates of the noise-sensitive receptors associated with each specific analysis region were input into the model, including corresponding alpha and shielding factors.

Alpha factors enable the user to change the sound propagation rate between the source and receptor. Any alpha factor whose value is greater than -1.0 is acceptable, but 0.0 and 0.5, representing hard and soft sites respectively, are the two values that are generally used. The hard site represents a reflective surface, such as pavement and uses a drop-off rate of 3 dB per distance doubling. The soft site represents an absorptive surface and uses a drop-off rate of 4.5 dB per distance doubling. An alpha factor of 0.0 was used for the noise analysis.

Shielding factors are used to apply excess attenuation in decibels between each roadway/receptor pair. Valid values for shielding are the actual number of decibels that a source might be reduced as a result of some attenuation. A default factor of zero (0) was used for the noise analysis.

The data input sheets used to calculate the peak noise hour L_{eq}s in STAMINA 2.0 for Alternative D can be found in Appendices S-C2a, *2008 Roadway Noise Data*, and S-C2b, *2015 Roadway Noise Data*, as *STAMINA 2.0 Roadway Noise Input Forms*.

Road traffic noise was assessed by comparing the existing (1996) baseline noise levels to those of the various future alternatives, using two methods. The first method compared traffic noise only (without aircraft noise) during traffic's peak noise hour; the second method compared roadway and aircraft noise combined, on a daily basis.



Source: Landrum & Brown, October 2003

LAX Master Plan Final EIS/EIR	**Road Traffic Noise Sensitive Receptor Sites**	Figure **F4.1-5**

The initial existing conditions road traffic noise analysis (conducted in 1996) used a coordinate system that was subsequently refined. This new coordinate system was based on more accurate aerial mapping conducted as part of the Master Plan, which is consistent with the State Plane Coordinate System NAD 83 (North American Datum of 1983). Therefore, the existing condition analysis was updated and all of the analysis reflected in this EIS/EIR, both existing (1996) and future, is based on the refined coordinate system.

The EMME/2 traffic model prepared by the off-airport surface transportation team (see Section 4.3, *Surface Transportation*) was used to identify the future hourly traffic conditions during the area road system's Level of Service C conditions. These conditions (numbers of cars and trucks and their speeds) were then input into the STAMINA 2.0 noise model to determine the resulting peak L_{eq} noise levels at each sensitive receptor.

Daily roadway L_{eq} levels were then determined from the peak noise hour analysis. A relationship between the daily levels and the peak hour levels was used to develop a factor for determining future daily levels. The estimated daily L_{eq} for surface traffic was conservatively estimated by assuming that eight (8) percent of the average daily traffic occurred during the peak hour. The typical range of occurrence during the peak hour falls between 7.5 percent and 10 percent. The lower the percentage of the daily energy represented by the peak hour, the higher the daily average would be. Daily levels were determined by applying that factor to the peak hour levels generated by the STAMINA 2.0 model, for both existing (1996) and future conditions. For this analysis, noise levels were measured in terms of equivalent energy level (L_{eq}). L_{eq} is the basic building block for highway and other transportation noise prediction models, the most stable of all the noise descriptors, and the principal metric used to evaluate transportation noise for periods of less than 24 hours. It is the amount of constant energy that contains the same amount of energy as a time varying sound level, over a given time period.

For information purposes, road traffic noise was also combined with aircraft noise to obtain an estimate of the total noise experienced at each noise sensitive receptor. This was done by first converting the peak traffic hour noise levels at each location to a 24-hour noise metric. This allows road traffic noise and aircraft noise to be combined in a consistent noise metric, which is 24-hour L_{eq}. The noise levels at each receptor were then combined for an estimate of total noise.

The Year 2008 was selected as an interim year for traffic and road noise analyses of Alternative D, based on the projection that 2008 will be the peak construction year for Alternative D. The 2008 interim year analysis for Alternative D was felt to be particularly relevant to the EIS/EIR analysis based on the fact that Alternative D would involve substantially more construction activities at and near the existing CTA and local surface transportation system than the other build alternatives; posing a notable potential for changes to local traffic patterns in 2008, and attendant changes in road traffic noise. To allow comparison of Year 2008 Alternative D noise to the No Action/No Project Alternative for informational purposes under NEPA, the noise that occurred with the No Action/No Project Alternative during Year 2008 was estimated. This was done by interpolating the No Action/No Project Alternative noise levels between 2005 and 2015 to obtain 2008 levels.

4.1.2.3 Construction Traffic Noise Methodology

Construction traffic noise was evaluated by comparing the number of construction vehicles planning to use the various project haul routes with the amount of noise energy that would be required to reach the thresholds that define significance. Acoustic energy is additive in nature. For example the energy of two identical trucks is twice as great as that for one truck, and so on. However, the relationship for sound pressure level (SPL) is logarithmic, not arithmetic. For example, when the energy is doubled, the SPL increases by three decibels (3 dBA). Therefore, while the energy is doubled when the second truck appears, the SPL would increase from, say, 50 to 53 dBA.[57] Continuing with this relationship, it would take greater than a 3-fold increase in sound energy to result in a 5 dBA increase; which is the CEQA threshold of significance, and an approximately 16-fold increase in energy would result in a 12 dBA increase; which is the NEPA threshold of significance criterion.

[57] Section 1.1, *The Physics and Measurement of Noise,* of Appendix D, *Aircraft Noise Technical Report,* provides additional explanation of the principle of noise energy doubling.

4.1.2.4 Construction Equipment Noise Methodology

Construction equipment noise was evaluated by determining the noise levels generated by outdoor construction activity and calculating the potential for exposure to noise-sensitive uses. Ambient noise levels (non-construction noise) at the noise-sensitive uses were determined from modeled aircraft noise levels, field measurements, and measurements from the LAWA remote noise monitoring stations. Construction noise levels were based on typical levels contained in the *Draft L.A. CEQA Thresholds Guide,*[58] as derived from USEPA documents. Distances between the noise-sensitive uses and the construction sites were measured and construction noise levels at the sensitive uses were calculated based on standard noise-versus-distance relationships. Impacts were then calculated based on the thresholds of exceedances of ambient noise levels. Based on the fact that sound (under average atmospheric conditions over an open grassy field) dissipates at the rate of 4.5 dBA for each doubling of distance, calculations were made to determine if the noise from the construction equipment substantially exceeded ambient noise levels at locations of the noise-sensitive site. There is evidence to suggest that a 6.0 dBA reduction for doubling of distance is appropriate for point sources such as construction equipment, but this analysis uses the more conservative 4.5 dBA. The effects of topographical and structural shielding were evaluated where appropriate.

4.1.2.5 Automated People Mover (APM) Noise Methodology

An analysis of noise associated with the APM proposed under Alternative D was completed. Such an analysis was not conducted, nor was it warranted, in the analysis of Alternatives A, B, and C because the rail-related improvements proposed under those alternatives, specifically the extension of the Green Line to the proposed West Satellite Concourse, would occur within a completely enclosed subsurface tunnel to be constructed within the limits of airport property. Alternative D, on the other hand, includes both an on-airport APM, between the CTA and the proposed West Satellite Concourse, and an off-airport APM system, between the ITC and the CTA; and between the GTC, the consolidated RAC, and the CTA. The on-airport APM would be underground within the airfield operating area; however, the off-airport APM system would be primarily above-ground and include segments that pass by several existing hotels. As further described below, noise analysis guidelines developed by the U.S. Department of Transportation, Federal Transit Administration (FTA) include hotels as a land use type to be considered in the analysis of potential transit noise impacts.

The APM noise methodology is based on procedures presented in the FTA's Transit Noise and Vibration Assessment Final Report, April 1995 ("FTA Guidance Manual"). As described therein, an initial step in the evaluation process is to conduct screening analyses to determine whether there is the potential for impacts to noise-sensitive uses. In the noise screening analysis conducted for Alternative D, it was determined that some hotels are located within the screening distance set forth by FTA for this type of project. As such, the evaluation process proceeded to the next step; completion of a general noise assessment, which is presented in this section.

4.1.3 Affected Environment/Environmental Baseline

4.1.3.1 Aircraft Noise

As stated above, while the baseline for analysis of project impacts from aircraft noise remains the Year 1996, this EIS/EIR includes additional analyses to present information about Year 2000 conditions. Information about single event noise impacts of nighttime operations on community awakenings and daytime operations on classroom disruptions is also included. Information on Year 2000 conditions is presented for informational purposes to provide an updated comparison benchmark only, and information on single event noise impacts is included in light of *Berkeley Jets*.

4.1.3.1.1 Baseline CNEL Aircraft Noise Exposure

This subsection presents the CNEL contours of the environmental baseline conditions and summarizes the impacts. The 1996 baseline for aircraft noise assessment represents the conditions as they existed in the baseline year 1996. Year 2000 conditions are compared for informational purposes to the 1996 baseline and all projected Year 2015 future aircraft noise conditions.

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[58] City of Los Angeles, Draft L.A. CEQA Thresholds Guide, May 14, 1998.

Almost 11,700 acres, or 77 percent, of the area affected by 65 CNEL noise from LAX is ocean waters or airport property, which are compatible with aircraft noise, as shown in Figure F4.2-5,[59] 1996 Baseline Conditions with ANMP. As discussed in Appendix D*, Aircraft Noise Technical Report,* LAX operates in west flow 95-98 percent of the time. In west flow, takeoffs occur to the west of the airport, with climb out occurring mostly over the ocean. For most aircraft, the climb phase is the noisiest phase of flight. Furthermore, during the late night hours (midnight to 6:30 a.m.) over-ocean procedures are in place that route both arrivals and departures over the bay. These procedures have been in place since the early 1970s. Therefore, cumulative noise exposure is much higher west of the airport than over the populated areas to the east. The existing program of operational noise abatement actions is addressed in subsection 4.1.5 and in Appendix D*, Aircraft Noise Technical Report*.

To permit the maximum map scale in the above-mentioned figure, the contours are shown only where they impact upon land areas. To the north and south, lateral to the airport, the noise exposure pattern principally results from the noise of aircraft either operating on the runway or in the first stages of climb after takeoff.

The bulk of the noise contour pattern over land reflects the approach patterns from the east and is aligned with the layout of the runways. The approach noise spike leading to Runways 24R/L (the north airfield) does not extend as far to the east as the approach spike leading to the south airfield (Runways 25R/L). This difference is largely the result of the more westerly location of the north airfield runways.

Figure F4.1-6, Year 2000 Conditions vs. 1996 Baseline Aircraft Noise Exposure Contours**,** compares the noise contours for the Year 2000 conditions to the 1996 baseline contours. In the Year 2000 conditions, the normal operational flow of the airport is unchanged from 1996 baseline conditions; flights normally land from the east and depart to the west, resulting in extensions of the 65 CNEL noise contour along the centerlines of the instrument approach paths from the east. Owing in part to an increase in the number of operations on the average annual day from 2,075 in 1996 to 2,147 in 2000, but more importantly to the increased number of aircraft weighing more than 300,000 pounds (heavy aircraft) and the reduced number of propeller driven aircraft in the operating fleet, the contours along the approach paths east of the airport are longer than were present in the 1996 baseline.

A factor in the size and shape of portions of the 1996 environmental baseline aircraft noise contours is that they reflect use of older and noisier aircraft. Federal Aviation Regulations, Part 36 (FAR 36) classifies aircraft according to their noise levels - Stage 1, Stage 2, and Stage 3. In accordance with FAR Part 91, applying to civil subsonic turbojet aircraft over 75,000 pounds, the noisiest aircraft, Stage 1, were phased out of the fleet by 1985; and Stage 2 no longer operated at LAX after December 31, 1999.

Thus after the end of 1999, all aircraft weighing more than 75,000 pounds were required to be compliant with the most restrictive provisions of Federal Aviation Regulation Part 36, which specifies the allowable noise levels for aircraft in operation at United States airports. During the 1996 baseline period, approximately 7 percent of all operations at the airport were conducted by older, louder aircraft weighing more than 75,000 pounds that were prohibited by federal "phase out" rules from further operation after December 31, 1999. These older, louder aircraft were individually much louder on takeoff than similarly sized aircraft that remain eligible for operation. Consequently, in the areas north and south of the airport, which are more influenced by takeoff noise than approach noise, the Year 2000 contours are substantially reduced from 1996 baseline conditions. However the area within the contours east of the airport under the approaches is larger as a result of the increased use of the airport by heavy jet aircraft that are frequently louder on approach than smaller jet aircraft. The net difference between 1996 baseline and Year 2000 conditions in the total acreage within the contours, as well as the total acreage off the airport, is presented in **Table F4.1-2**, Aircraft Noise Exposure by Noise Level Range - 1996 Baseline and Year 2000 Conditions. In contrast, owing to the differences in land use and residential population densities in different parts of the area under the contours, the estimated population and number of non-residential noise sensitive parcels are greater for the Year 2000 conditions than for the 1996 baseline conditions.

[59] Noise contours for the Environmental Baseline, No Action/No Project Alternative and each build alternative for 2015 are indicated in figures in Section 4.2, *Land Use*. Contours for interim years, which were developed to indicate changes associated with temporary noise exposure patterns prior to project completion, are presented in Appendix D, *Aircraft Noise Technical Report*.

Table F4.1-2

Aircraft Noise Exposure by Noise Level Range - 1996 Baseline and Year 2000 Conditions

Noise Level Range	Total Acreage Over Land[2]		Off-Airport Area (Acres)[2]		Total Dwellings		Estimated Population		Non-Residential Noise Sensitive Parcels	
	1996	2000	1996	2000	1996	2000	1996	2000	1996	2000
65-70 CNEL	2,848	3,404	2,595	2,994	12,700	12,300	35,100	35,300	53	63
70-75 CNEL	1,591	1,524	620	390	3,700	4,100	12,500	13,800	18	18
75+ CNEL	2,592	2,058	196	23	500	400	1,400	1,200	3	3
Total (above 65 CNEL)[1]	**7,031**	**6,986**	**3,412**	**3,407**	**16,900**	**16,800**	**49,000**	**50,300**	**74**	**84**

[1] Population and dwelling estimates have been rounded to the nearest hundred if greater than 1,000 and to the nearest 10 if less than 1,000. For direct comparative purposes, the population and dwelling unit counts are both estimated based on 1990 census figures. Detailed Year 2000 conditions estimates of population and dwelling unit estimates based on Year 2000 census counts are provided in Technical Report S-1, *Supplemental Land Use Technical Report*.

[2] Acreage totals may not add due to rounding.

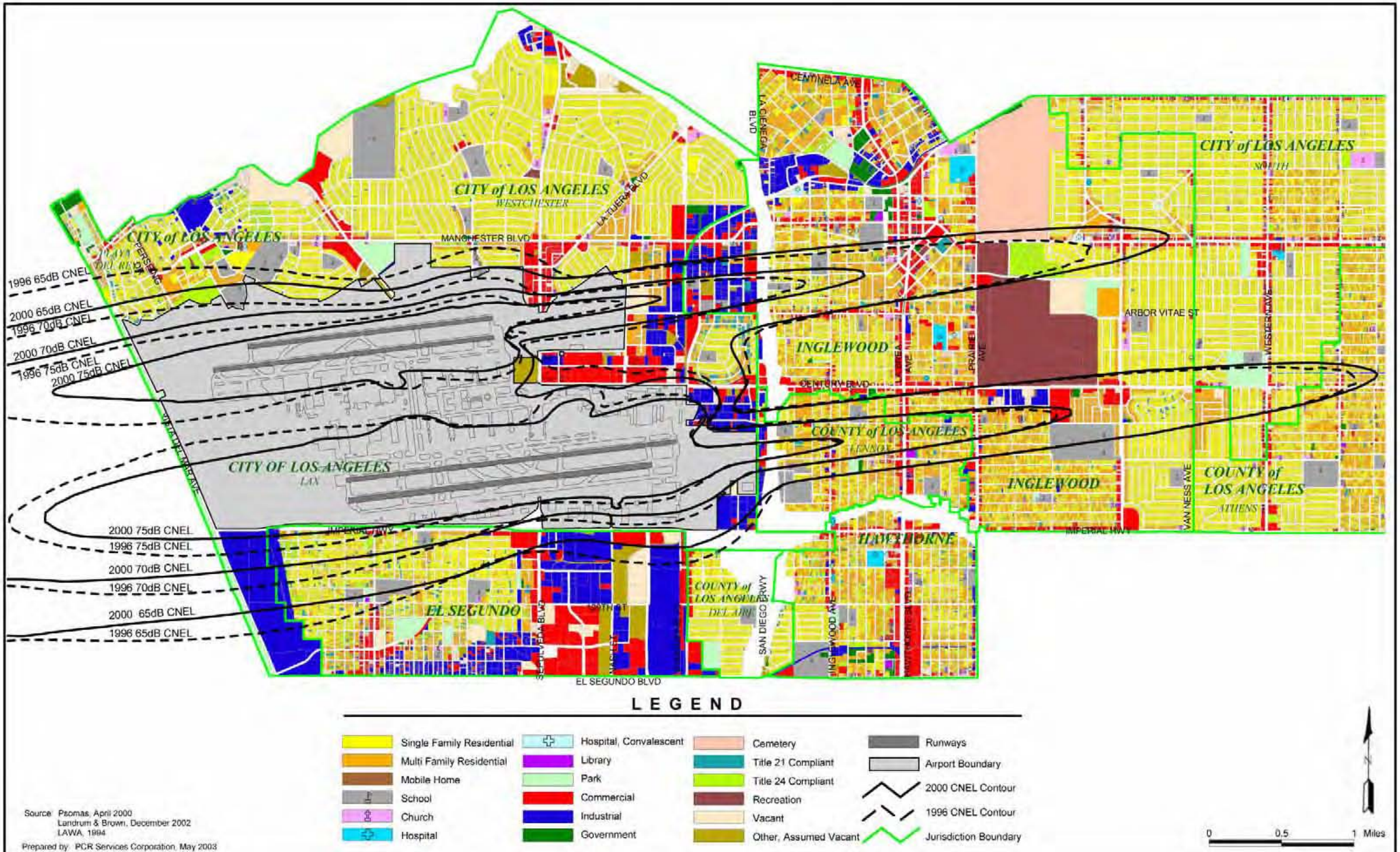
Source: Landrum & Brown with Psomas, 1999; and Landrum & Brown with PCR, 2002.

4.1.3.1.1.1 65 CNEL Contour

The 1996 baseline 65 CNEL contour leading to the north runways from the east extends approximately 10,700 feet east of the I-405, just short of Crenshaw Boulevard. The Year 2000 conditions contour extends approximately 1,800 feet farther east across Crenshaw Boulevard along the same alignment. Along the southern approach, the contour extends approximately 21,000 feet east of the freeway, reaching Normandie Avenue, while the 2000 contour reaches approximately 700 feet farther to the east. The increased length of the contours east of the airport is a result of a greater number of landings to both runway complexes by heavy jet aircraft and a shift of a portion of these heavy jet landings to the north runway complex. A bulge in the contour for both years, located near the east end of the southern runways, is the result of high thrust levels used to initiate takeoff rolls to the west. The bulge falls over warehouse and commercial areas of Lennox between the I-405 and the airport. Along the south side of the airport, the 1996 baseline and Year 2000 conditions contour of 65 CNEL runs westward through El Segundo, but the Year 2000 conditions contour is as much as 450 feet closer to the airport than the 1996 baseline contour. West of the I-405, the approach contours for both 1996 and 2000 leading to the north runways extend over portions of Inglewood and Los Angeles before bulging outward to encompass departure noise from westerly takeoffs from the north runway complex. North of the airport in Westchester, the 1996 baseline contour remains south of Manchester Avenue and the Year 2000 conditions contour lies between 250 and 500 feet closer to the airport than the 1996 baseline contour of 65 CNEL.

4.1.3.1.1.2 70 CNEL Contour

The 70 CNEL contours of the 1996 baseline and Year 2000 conditions are similar in shape to, but smaller than, their respective 65 CNEL contours. To the east of the south airfield complex, the 1996 baseline contour extends about 10,000 feet east of the I-405, in the vicinity of Yukon Avenue, while the contour for the Year 2000 conditions extends about 300 feet farther east to Club Drive, immediately south of Hollywood Park. The 1996 baseline contour east of the north airfield complex extends approximately 1,200 feet into the residential areas east of the freeway, but the contour of the Year 2000 conditions extends an additional 2,200 feet east, reaching South Fir Avenue. West of the I-405, the northern side of both contours falls primarily over the airport and other compatibly used properties. Between the contours approach spikes and west of the freeway, the land is commercially used. On the south side of the airport, both contours remain north of the I-105 between the I-405 and Sepulveda Boulevard. However, west of



LAX Master Plan Final EIS/EIR	**Year 2000 Conditions vs. 1996 Baseline Aircraft Noise Exposure Contours**	Figure **F4.1-6**

Sepulveda Boulevard, the contours broaden to the south, encompassing residential areas of El Segundo. The Year 2000 conditions contour is approximately 400 feet narrower than the 1996 baseline contour along the western extents of both the north and south sides of the airport.

4.1.3.1.1.3 75 CNEL Contour

The 75 CNEL contours along the approach to the southern runways of both the 1996 baseline and Year 2000 conditions project over residential areas of Lennox to approximately 2,000 feet east of the I-405. East of the north airfield complex, the 1996 baseline contour reaches across compatible and residential areas only to Airport Boulevard, 4,700 feet east of the east end of Runway 24R, while the contour of the Year 2000 conditions extends an additional 1,400 feet eastward over airport parking. Elsewhere, west of the I-405, the contours for both years remain entirely over compatibly developed airport property until the 1996 baseline contour passes over a portion of El Segundo between the I-105 and Sycamore Avenue, west of Sepulveda Boulevard. In El Segundo, the Year 2000 conditions contour of 75 CNEL extends into the first block south of the I-105 west of Main Street.

Table F4.1-2 summarizes the exposure of land use to aircraft noise under the 1996 baseline and Year 2000 conditions. The discussion of newly exposed aircraft noise impacts and new mitigation requirements within the communities surrounding the airport is presented in Section 4.2, *Land Use*.

4.1.3.1.2 Comparison to Caltrans Title 21 CNEL Contours

The California Airport Noise Regulations require that public airports in California prepare each quarter a map indicating the noise exposure condition for the previous twelve months. The operational data from which LAWA's Noise Management Division prepared its Fourth Quarter 1996 noise contours provides the foundation for defining the environmental baseline.[60] The Fourth Quarter 1996 data and resulting contours represent the twelve calendar months of the year 1996.

That report relied extensively on the information from the airport's noise monitoring system and the aircraft operations monitoring system for tracking runway use, flight path utilization, daily distribution of flights, and frequency of operations. To that analysis was added noise of ground maintenance run-up activity to form a baseline noise condition for comparison with future conditions. The details of this evaluation are provided in Appendix D*, Aircraft Noise Technical Report.*

The computer-generated noise exposure contours illustrated on the map presented to the California Department of Transportation (Caltrans) in compliance with Title 21 of the State Airport Noise Standards were adjusted at that time with actual measured noise levels for the same period. Thus, the LAWA noise contour in the Fourth Quarter 1996 report is larger than the FAA contour used for the document, because LAWA Quarterly report contours are adjusted, in accordance with California codes, to reflect measured noise levels. Contours adjusted to reflect measurements are not accepted by FAA for environmental documents. For this FEIS/EIR analysis, then, modeled noise levels are not adjusted to reflect measured noise levels. In general, the modeled noise levels produced for this evaluation average approximately one decibel of CNEL quieter than the measured levels. The airport's sound insulation program is based on the slightly larger adjusted contours for 1992 and is expected to continue to be based on adjusted contours in the future.

4.1.3.1.3 Single Event Aircraft Noise Exposure

In addition to the CNEL contours prepared for the 1996 baseline and Year 2000 conditions, new legal developments have required the inclusion of additional information in this EIS/EIR. During the period of preparation of this EIS/EIR for the master plan development at LAX, the California Court of Appeal (in *Berkeley Jets*) found that the noise impacts disclosed by the Oakland International Airport EA/EIR for development of cargo facilities and their attendant nighttime operations were, for CEQA purposes, inadequately addressed by the CNEL metric alone. The court ruled that supplemental single event analyses that had been provided solely as additional material for informational purposes should have been further expanded upon and used to delineate the effects of single event noise resulting from project actions.[61]

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60 Department of Airports Noise Management Bureau, Fourth Quarter 1996 Noise Report, 1997.

61 The approach to single event analysis and its foundation in the *Berkeley Jets* case is provided in subsection 4.1.2.1, *Aircraft Noise Methodology*.

While the court ruled that the effects of single events should be addressed for CEQA purposes, it did not mandate specific standards for the evaluation and determination of the significance of those impacts. The court left to the project sponsor the tasks of determining precisely what types of impacts should be evaluated and of establishing thresholds of significance for those impacts, based on the sponsor's own assessment of what is locally meaningful. After consideration of the available literature regarding the effects of aircraft noise on awakenings and on speech interference, LAWA selected thresholds of significance related to single event noise for application in this EIS/EIR. These thresholds are presented in more detail in subsection 4.1.4.1.1, *CEQA Thresholds of Significance,* and details on the single event analysis are provided in Appendix S-C1, *Supplemental Aircraft Noise Technical Report*.

4.1.3.1.3.1 Nighttime Awakenings

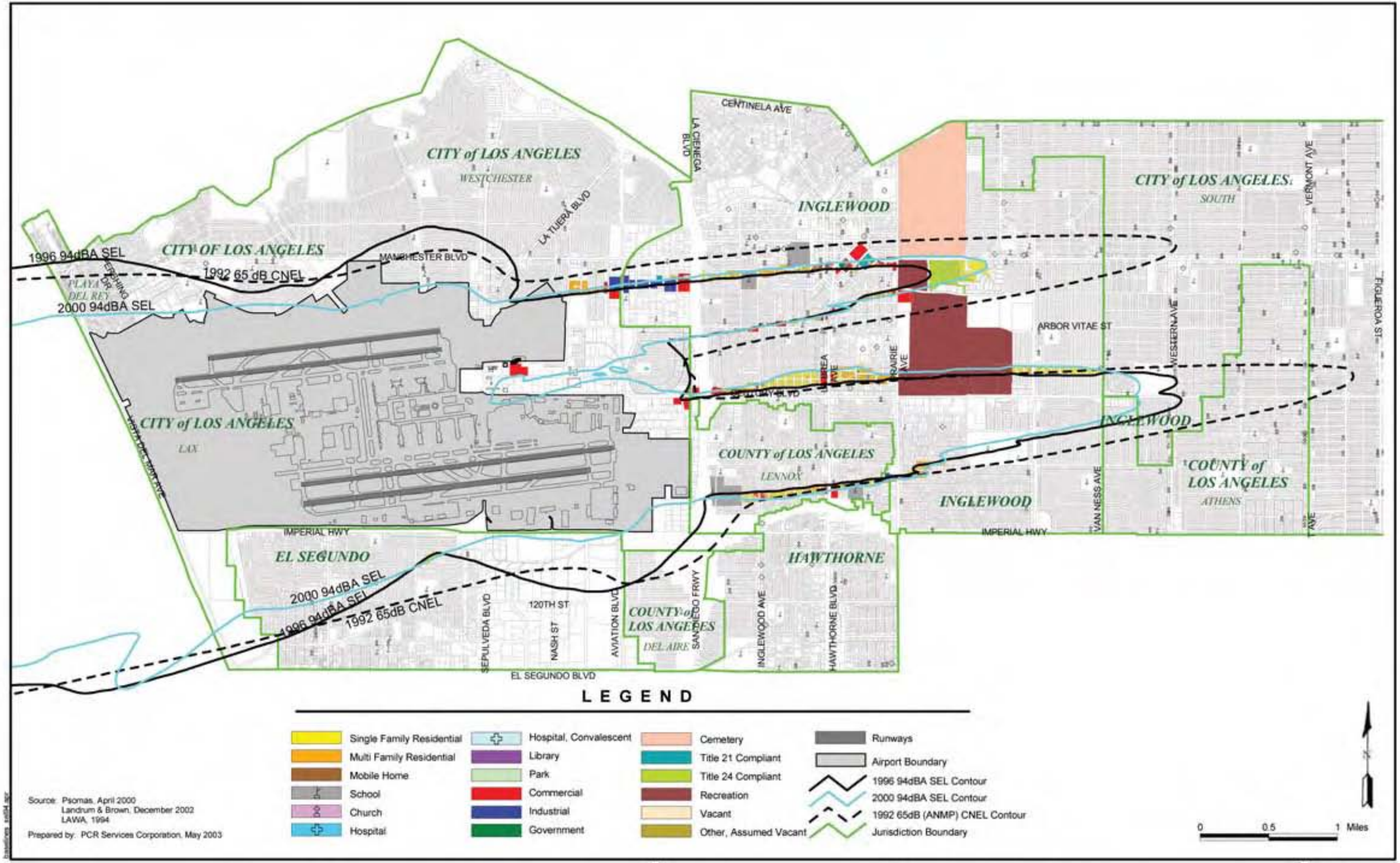
Exposure to exterior single event SEL of 94 dBA, adequate to awaken 10 percent of the persons exposed at least once every ten days, assuming residential windows are open, is a key aspect of the single noise event "threshold of significance" (see subsection 4.1.4.1.1, *CEQA Thresholds of Significance*). The area exposed to such noise is delineated in **Figure F4.1-7**, 2000 94 dBA SEL vs. 1996 94 dBA SEL - Areas Newly Exposed**,** for the 1996 baseline and the Year 2000 conditions. For comparison and reference purposes, the 1992 Aircraft Noise Mitigation Program contour (i.e., "1992 65 dB CNEL" contour), which sets the boundary for residential sound insulation eligibility, is also provided on the figure. For 1996 baseline conditions, the 94 dBA SEL contour east of the I-405 extends eastward along the approach paths to the north and south runway complexes. West of the I-405, the contour is wider than the airport and dominated by bulges around the east ends of the runways and by a spreading pattern from the middles of the runways to the west. Both features are results of noise created during the takeoff process; the first by the spooling up of the engines as the takeoff is initiated, and the second as the aircraft lifts off the ground and the noise rapidly spreads laterally as the dispersion of noise from aircraft in flight is no longer reduced by excessive ground attenuation.

In the Year 2000 conditions, the noise pattern for significant single events at night is both slightly wider and, in the north, longer than for the 1996 baseline along the approaches east of the I-405, but to the west of the I-405, the contours are substantially narrower than 1996 baseline conditions. These changes are the result of additional loud aircraft using the approaches at night, more approaches made to the north runway complex, and the elimination of takeoffs by older, louder aircraft that did not meet the most restrictive noise regulations by the end of 1999.

The estimated number of dwellings located within the 94 dBA SEL contour of the 1996 baseline is 18,800, housing approximately 54,300 persons, while for the Year 2000 conditions, there are an estimated 15,500 dwellings with a population of 50,800. Similar evaluations for the proposed future alternatives are compared to these levels, both in total numbers and in the numbers of newly exposed units.

4.1.3.1.3.2 School Disruption

Schools are disrupted by both single overflights which disrupt speech and by the general intrusiveness of noise that establishes an elevated ambient noise level that can disrupt learning. As described in the subsequent paragraphs on thresholds of significance (subsection 4.1.4.1.1, *CEQA Thresholds of Significance*), schools were identified that were exposed to interior single event maximum noise levels of 55 dBA and 65 dBA, as well as to peak hour average noise levels of 35 dBA $L_{eq(h)}$ or more. **Table F4.1-3,** Schools Exposed to Significant Interior Single Event Noise Levels - 1996 Baseline and Year 2000 Conditions, presents the number of public and private schools within the airport environs that are exposed to the thresholds of significant exterior noise for schools for 1996 baseline and Year 2000 conditions. The name and location of these affected schools is provided in Appendix S-C1, *Supplemental Aircraft Noise Technical Report*, and Technical Report S-1, *Supplemental Land Use Technical Report*. The various future alternatives will be compared to these current conditions, in terms of totals and newly exposed schools.



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2000 94dBA SEL vs. 1996 94dBA SEL
Areas Newly Exposed

Figure
F4.1-7

Table F4.1-3

Schools Exposed to Significant Interior Single Event Noise Levels - 1996 Baseline and Year 2000 Conditions

Impact Category	1996 Baseline	Year 2000 Conditions
Exposure ≥ 55 dBA (L_{max})		
Number of Public Schools	15	11
Number of Private Schools	14	15
Average Number of Events/School	23.7	28.7
Average Seconds/Event	3.6	3.1
Exposure ≥ 65 dBA (L_{max})		
Number of Public Schools	1	1
Number of Private Schools	1	2
Exposure ≥ 35 dBA ($L_{eq(h)}$)		
Number of Public Schools	12	11
Number of Private Schools	13	11

Note: The number of average events above 65 dBA L_{max} (interior) was generally less than 3 and their duration was less than 3 seconds each.

Source: Landrum & Brown with Psomas, 1999 and Landrum & Brown with PCR, 2002.

4.1.3.2 Road Traffic Noise

This subsection discusses the affected baseline environment regarding road traffic noise, presents tables that show the baseline data at receptors sensitive to this noise as well as introducing modeled road traffic noise impact data for each of the alternatives at those receptors, and also presents data showing the resulting noise levels at the receptors when road traffic noise is combined with averaged aircraft noise. As described above in subsection 4.1.2.2, *Road Traffic Noise Methodology,* road traffic noise impacts were modeled for the 2015 planning horizon, and for Alternative D, for the 2008 interim year. Thus, on the tables just referred to in this subsection, modeled road traffic noise impact data is shown for 2015 and for Alternative D, 2008, and modeled aircraft noise values for these years are also given solely to make combined road/aircraft noise values available. The impacts of road traffic noise for each alternative, based on the noise values introduced in these tables, are discussed in subsection 4.1.6, *Environmental Consequences* (specifically subsection 4.1.6.2).

The baseline conditions for road traffic in 1996 generally produced peak hour level of service C (LOS C) conditions, which are considered the noisiest roadway operating conditions (see Section 4.3.2, *Off-Airport Surface Transportation* (subsection 4.3.2.2), for definitions and descriptions of LOS levels). The concept of "levels of service" uses qualitative measures that characterize operational conditions within the flow of traffic. Six levels of service are defined for each type of roadway. They are given letter designations from A to F, with LOS A representing the best operating conditions and LOS F the worst. LOS C is considered an acceptable quality of service, and also has the noisiest mix of high traffic volumes and high speeds. From 1996 to 2000, traffic conditions around the LAX area generally deteriorated, as discussed in Section 4.3.2, *Off-Airport Surface Transportation*. Vehicles make less noise at lower speeds, based on engines operating at lower levels, vehicle drive-trains and tires rotating less, and wind shear being less than at higher speeds. If the deteriorating traffic flow conditions are substantial, there would be a worsening of LOS, consequently resulting in a reduction in the associated road traffic noise levels due to slower vehicle speeds. This condition could potentially produce road noise impacts that would not be identified by using the 1996 baseline.

To ensure that use of a Year 2000 condition would not result in any impacts that were not also identified by using a 1996 baseline condition, the possible impacts resulting from a Year 2000 condition were also identified. Because actual traffic volumes and vehicle speeds for area roads were unavailable for Year 2000 conditions, the Year 2000 road traffic noise conditions were estimated by interpolating between 1996 and forecast No Action/No Project Alternative conditions.[62] That analysis showed that the Year

[62] As described in Appendix S-B, *Existing Baseline Comparison Issues - 1996-2000,* the EIS/EIR description of existing traffic

2000 road noise conditions are very similar to the 1996 conditions. In fact, a check of impacts showed that using Year 2000 conditions data as a baseline would not result in any additional road traffic noise impacts that are not also identified using 1996 conditions as the baseline. Therefore, continued use of 1996 conditions as the environmental baseline is appropriate.

The original 21 noise sensitive receptors (Receptors RD1 through RD21) as well as the additional 10 receptors potentially influenced by Alternative D (Receptors S22 through S31) are listed in **Table F4.1-4**, Peak Hour Road Traffic Noise at Receptor Sites by Alternative (dBA L_{eq}). Receptor RD9 is located at Ashwood Park, which is west of I-405, near La Tijera Boulevard. Because a calculated peak hour noise level was not available at this receptor for Alternative D, the associated noise level was conservatively estimated for that receptor by assuming that the 2015 noise levels for Alternative D would be equal to the large noise levels generated at that location in the 2015 No Action/No Project Alternative. At 77 dBA L_{eq}, that noise level is assumed to be quite high for both Alternative D and the No Action/No Project Alternative. This is a reasonable estimate for Alternative D, since the I-405 traffic, which is the primary generator of traffic noise for Ashwood Park, is expected to have similar volume and speed characteristics in both the No Action/No Project Alternative and Alternative D. Baseline year (1996) noise levels calculated for peak hour road traffic in **Table F4.1-4** range from 46.3 dBA L_{eq} at the Robert F. Kennedy Medical Center on Grevillea Avenue to 75.3 dBA L_{eq} at Ashwood Park near the I-405 and Manchester Boulevard.

Daily (i.e., 24-hour average) road traffic noise levels are presented on **Table F4.1-5**, Daily Road Traffic Noise at Receptor Sites by Alternative (dBA 24-Hour L_{eq}). Baseline year (1996) daily road traffic noise levels range from 43.5 dBA 24-Hour L_{eq} at the Robert F. Kennedy Medical Center on Grevillea Avenue to 72.5 dBA 24-Hour L_{eq} at Ashwood Park.

In adding aircraft noise levels to road traffic noise levels, to indicate total noise exposure, the level of aircraft noise at each receptor is highly dependent on its location relative to 1) the flight paths for arriving and departing aircraft, and 2) the locations of aircraft maintenance (i.e., "engine run-up") hangars. Daily aircraft noise levels at these receptor sites are presented on **Table F4.1-6**, Daily Aircraft Noise at Receptor Sites by Alternative (dBA 24-Hour L_{eq}). Independent of road traffic noise, existing aircraft noise at these sites ranges from 49.7 dBA 24-Hour L_{eq} at St. Jerome Catholic Church and School on La Tijera Boulevard, to 70.2 dBA 24-Hour L_{eq} at the LAX Sheraton Hotel on West Century Boulevard.

Combined road traffic and aircraft noise levels are presented in **Table F4.1-7**, Combined Daily Aircraft and Road Traffic Noise at Receptor Site by Alternative (dBA 24-Hour L_{eq}). The combined noise levels currently range from 52.3 dBA L_{eq} at Robert F. Kennedy Medical Center on Grevillea Avenue to 72.7 dBA L_{eq} at Ashwood Park.

conditions did not undergo a comprehensive update for the Year 2000 because the traffic analysis is based on an adjusted environmental baseline that already accounts for future growth in background traffic.

Table F4.1-4

Peak Hour Road Traffic Noise at Receptor Sites by Alternative (dBA L_{eq})

				Alternative					Alternative			
			1996	NA/NP	A	B	C	1996	NA/NP		D	
Site	Receptor Name	Receptor Location	Baseline	2015	2015	2015	2015	Baseline	2008	2015	2008	2015
RD1	Westchester High School	Manchester Ave., between Redlands & Park Hill Sts.	55.1	56.7	56.8	56.7	56.7	55.1	56.8	56.7	56.6	57.0
RD2	Westchester Playground (Sr. Center)	Lincoln Blvd. at Manchester Ave.	50.2	48.6	48.5	49.5	47.3	50.2	48.7	48.6	49.4	47.9
RD3	Westchester Lutheran Church & School	Sepulveda Blvd. at 77th St.	55.8	52.5	55.0	54.1	54.1	55.8	52.9	52.5	49.7	50.3
RD4	St. Jerome Catholic Church &School	La Tijera Blvd. at Thornburn St.	59.1	57.4	63.2	62.7	59.5	59.1	56.5	57.4	54.7	53.8
RD5	First Baptist Church & Preschool	La Tijera Blvd. at Manchester Ave.	57.9	53.8	54.1	54.4	54.8	57.9	54.6	53.8	55.3	54.9
RD6	Westchester Public Library[1]	Westchester Parkway at Sepulveda Eastway	53.8	50.6	N/A	N/A	N/A	53.8	50.6	50.6	49.6	49.3
RD7	LAX Sheraton Hotel	Century Blvd., near Airport Blvd.	50.1	47.9	54.3	47.0	52.0	50.1	47.8	47.9	47.4	46.0
RD8	University of West Los Angeles	Aviation Blvd. at Arbor Vitae St.	53.9	51.7	54.9	51.5	57.2	53.9	51.7	51.7	52.2	51.9
RD9[2]	Ashwood Park	Ash St., adjacent to I-405 Fwy. at Manchester Ave.	75.3	77.0	76.0	77.0	76.0	75.3	N/A	77.0	N/A	77.0
RD10	Lennox Middle School	Buford Ave., adjacent to I-405 Fwy. at 111th St.	56.3	56.9	57.6	57.0	58.1	56.3	56.6	56.9	53.1	54.1
RD11	Anza School	La Cienega Blvd.& 120th St.	56.4	56.5	56.3	56.9	57.0	56.4	56.6	56.5	57.2	59.3
RD12	Residential	Imperial Ave., near California St.	54.6	53.0	60.9	60.1	60.3	54.6	53.0	53.0	46.8	47.4
RD13	Residential	Pershing Dr., near Waterview St.	50.9	44.4	46.2	45.3	45.8	50.9	44.5	44.4	46.1	45.6
RD14	Residential	Manchester Ave., near Kentwood St.	53.0	50.5	51.2	51.1	51.8	53.0	51.0	50.5	51.5	51.1
RD15	Residential	Sepulveda Blvd., near 83rd St.	56.2	53.4	53.9	53.3	53.3	56.2	53.3	53.4	50.1	50.6
RD16	Residential	La Tijera Blvd., near 78th St.	55.6	52.1	53.4	53.3	53.0	55.6	51.9	52.1	52.2	53.4
RD17	Residential	Airport Blvd., near Interceptor St.	52.6	50.9	51.1	50.0	51.5	52.6	50.8	50.9	51.7	53.7
RD18	Residential	La Cienega Blvd., near 98th St.	56.7	55.3	55.8	55.3	55.4	56.7	55.3	55.3	53.8	54.0
RD19	Residential	116th St., near Judah Ave.	61.5	58.0	55.9	55.9	55.9	61.5	58.3	58.0	55.7	56.7
RD20	Residential	Imperial Ave., at Cypress St.	51.1	50.6	63.4	60.6	60.8	51.1	51.0	50.6	44.3	44.4
RD21[3]	First Flight Child Development Center	Lincoln Blvd., near Westchester Pkwy.	N/A	45.7	53.6	52.2	50.9	N/A	45.8	45.7	46.0	45.4
S22	Residential	675 W. Arbor Vitae St.	56.3	57.6	57.1	57.4	57.3	56.3	58.8	57.6	55.3	58.7
S23	Church	645 W. Arbor Vitae St.	56.3	57.6	57.1	57.3	57.2	56.3	58.8	57.6	55.3	58.7
S24	Beulah Payne Elementary School	215 W. 94th St.	54.4	51.8	51.8	51.9	51.9	54.4	52.5	51.8	51.8	52.6
S25	Residential	405 E. Arbor Vitae St.	60.2	57.6	57.5	58.2	57.8	60.2	59.1	57.6	60.9	58.5
S26	Residential	705 E. Arbor Vitae St.	62.1	59.7	59.6	60.2	59.8	62.1	60.9	59.7	62.4	60.6

Table F4.1-4

Peak Hour Road Traffic Noise at Receptor Sites by Alternative (dBA L_{eq})

				Alternative					Alternative			
			1996	NA/NP	A	B	C	1996	NA/NP		D	
Site	Receptor Name	Receptor Location	Baseline	2015	2015	2015	2015	Baseline	2008	2015	2008	2015
S27	Residential	4821 W. Century Blvd.	62.9	60.0	60.1	60.3	60.2	62.9	59.0	60.0	61.2	60.7
S28	Residential	10108 S. Freeman Ave.	53.9	53.0	52.8	52.8	52.8	53.9	53.1	53.0	52.3	53.3
S29	Residential	11439 S. Freeman Ave.	56.2	52.5	53.2	51.2	52.5	56.2	52.1	52.5	52.8	53.6
S30	Robert F. Kennedy Medical Center	11711 Grevillea Ave.	46.3	44.6	44.7	44.4	44.6	46.3	44.5	44.6	43.9	45.0
S31	Residential	4619 116th St.	50.1	48.5	48.6	48.3	48.5	50.1	48.3	48.5	47.5	48.7

[1] The Westchester Branch Library closed on March 29, 2003. See Section 4.26.4, *Libraries*, for further discussion.
[2] N/A = Not Available. Data for receptor RD9 is unavailable for interim year.
[3] RD21 is analyzed in the project alternatives only.

Source: Landrum & Brown, 2002.

Table F4.1-5

Daily Road Traffic Noise at Receptor Sites by Alternative (dBA 24-Hour L_{eq})

				Alternative					Alternative			
			1996	NA/NP	A	B	C	1996	NA/NP		D	
Site	Receptor Name	Receptor Location	Baseline	2015	2015	2015	2015	Baseline	2008	2015	2008	2015
RD1	Westchester High School	Manchester Ave., between Redlands & Park Hill Sts.	52.3	53.9	54.0	53.9	53.9	52.3	54.0	53.9	56.6	57.0
RD2	Westchester Playground (Sr. Center)	Lincoln Blvd. at Manchester Ave.	47.4	45.8	45.7	46.7	44.5	47.4	45.9	45.8	49.4	47.9
RD3	Westchester Lutheran Church & School	Sepulveda Blvd. at 77th St.	53.0	49.7	52.2	51.3	51.3	53.0	50.0	49.7	49.7	50.3
RD4	St. Jerome Catholic Church &School	La Tijera Blvd. at Thornburn St.	56.3	54.6	60.4	59.9	56.7	56.3	53.7	54.6	54.7	53.8
RD5	First Baptist Church & Preschool	La Tijera Blvd. at Manchester Ave.	55.1	51.0	51.3	51.6	52.0	55.1	51.7	51.0	55.3	54.9
RD6	Westchester Public Library[1]	Westchester Parkway at Sepulveda Eastway	51.0	47.8	N/A	N/A	N/A	51.0	47.8	47.8	49.6	49.3
RD7	LAX Sheraton Hotel	Century Blvd., near Airport Blvd.	47.3	45.1	51.5	44.2	49.2	47.3	45.0	45.1	47.4	46.0
RD8	University of West Los Angeles	Aviation Blvd. at Arbor Vitae St.	51.1	48.9	52.1	48.7	54.4	51.1	48.9	48.9	52.2	51.9
RD9[2]	Ashwood Park	Ash St., adjacent to I-405 Fwy. at Manchester Ave.	72.5	74.2	73.2	74.2	73.2	72.5	N/A	74.2	N/A	77.0
RD10	Lennox Middle School	Buford Ave., adjacent to I-405 Fwy. at 111th St.	53.5	54.1	54.8	54.2	55.3	53.5	53.8	54.1	53.1	54.1
RD11	Anza School	La Cienega Blvd. & 120th St.	53.6	53.7	53.5	54.1	54.2	53.6	53.8	53.7	57.2	59.3
RD12	Residential	Imperial Ave., near California St.	51.8	50.2	58.1	57.3	57.5	51.8	50.2	50.2	46.8	47.4
RD13	Residential	Pershing Dr., near Waterview St.	48.1	41.6	43.4	42.5	43.0	48.1	41.6	41.6	46.1	45.6
RD14	Residential	Manchester Ave., near Kentwood St.	50.2	47.7	48.4	48.3	49.0	50.2	48.2	47.7	51.5	51.1
RD15	Residential	Sepulveda Blvd., near 83rd St.	53.4	50.6	51.1	50.5	50.5	53.4	50.5	50.6	50.1	50.6
RD16	Residential	La Tijera Blvd., near 78th St.	52.8	49.3	50.6	50.5	50.2	52.8	49.1	49.3	52.2	53.4
RD17	Residential	Airport Blvd., near Interceptor St.	49.8	48.1	48.3	47.2	48.7	49.8	48.0	48.1	51.7	53.7
RD18	Residential	La Cienega Blvd., near 98th St.	53.9	52.5	53.0	52.5	52.6	53.9	52.5	52.5	53.8	54.0
RD19	Residential	116th St., near Judah Ave.	58.7	55.2	53.1	53.1	53.1	58.7	55.4	55.2	55.7	56.7
RD20	Residential	Imperial Ave., at Cypress St.	52.3	47.8	60.6	57.8	58.0	52.3	48.2	47.8	44.3	44.8
RD21[3]	First Flight Child Development Center	Lincoln Blvd., near Westchester Pkwy.	N/A	42.9	50.8	49.4	48.1	N/A	42.9	42.9	46.0	45.4

Table F4.1-5

Daily Road Traffic Noise at Receptor Sites by Alternative (dBA 24-Hour L_{eq})

				Alternative						Alternative			
			1996	NA/NP	A	B	C	1996	NA/NP		D	
Site	Receptor Name	Receptor Location	Baseline	2015	2015	2015	2015	Baseline	2008	2015	2008	2015
S22	Residential	675 W. Arbor Vitae St.	53.5	54.8	54.3	54.6	54.5	53.5	56.0	54.8	55.3	58.7
S23	Church	645 W. Arbor Vitae St.	53.5	54.8	54.3	54.5	54.4	53.5	56.0	54.8	55.3	58.7
S24	Beulah Payne Elementary School	215 W. 94th St.	51.6	49.0	49.0	49.1	49.1	51.6	49.7	49.0	51.8	52.6
S25	Residential	405 E. Arbor Vitae St.	57.4	54.8	54.7	55.4	55.0	57.4	56.2	54.8	60.9	58.5
S26	Residential	705 E. Arbor Vitae St.	59.3	56.9	56.8	57.4	57.0	59.3	58.1	56.9	62.4	60.6
S27	Residential	4821 W. Century Blvd.	60.1	57.2	57.3	57.5	57.4	60.1	56.2	57.2	61.2	60.7
S28	Residential	10108 S. Freeman Ave.	51.1	50.2	50.0	50.0	50.0	51.1	50.3	50.2	52.3	53.3
S29	Residential	11439 S. Freeman Ave.	53.4	49.7	50.4	48.4	49.7	53.4	49.2	49.7	52.8	53.6
S30	Robert F. Kennedy Medical Center	11711 Grevillea Ave.	43.5	41.8	41.9	41.6	41.8	43.5	41.6	41.8	43.9	45.0
S31	Residential	4619 116th St.	47.3	45.7	45.8	45.5	45.7	47.3	45.5	45.7	47.5	48.7

[1] The Westchester Branch Library closed on March 29, 2003. See Section 4.26.4, *Libraries*, for further discussion.
[2] N/A = Not Available. Data for Receptor RD9 is unavailable for interim year.
[3] RD21 is analyzed in the project alternatives only.

Source: Landrum & Brown, 2002.

Table F4.1-6

Daily Aircraft Noise at Receptor Sites by Alternative (dBA 24-Hour L_{eq})

				Alternative						Alternative			
			1996	NA/NP	A	B	C	1996	NA/NP		D	
Site	Receptor Name	Receptor Location	Baseline	2015	2015	2015	2015	Baseline	2008	2015	2008	2015
RD1	Westchester High School	Manchester Ave., between Redlands & Park Hill Sts.	58.8	56.4	56.1	57.1	57.2	58.8	56.1	56.4	56.2	55.2
RD2	Westchester Playground (Sr. Center)	Lincoln Blvd. at Manchester Ave.	58.7	56.8	57.9	59.1	58.7	58.7	56.5	56.8	56.7	56.1
RD3	Westchester Lutheran Church & School	Sepulveda Blvd. at 77th St.	52.0	49.4	50.4	50.9	50.7	52.0	49.1	49.4	49.4	49.2
RD4	St. Jerome Catholic Church &School	La Tijera Blvd. at Thornburn St.	49.7	47.2	48.9	49.2	48.7	49.7	47.1	47.2	46.9	47.4
RD5	First Baptist Church & Preschool	La Tijera Blvd. at Manchester Ave.	58.1	55.9	59.1	60.0	59.6	58.1	55.6	55.9	55.8	56.5
RD6	Westchester Public Library[1]	Westchester Parkway at Sepulveda Eastway	64.6	63.5	68.7	69.8	70.3	64.6	63.4	63.5	63.4	65.5
RD7	LAX Sheraton Hotel	Century Blvd., near Airport Blvd.	70.2	69.8	70.8	67.9	67.4	70.2	69.7	69.8	69.7	64.2
RD8	University of West Los Angeles	Aviation Blvd. at Arbor Vitae St.	67.2	68.9	72.1	66.6	67.3	67.2	68.8	68.9	68.2	67.6
RD9[2]	Ashwood Park	Ash St., adjacent to I-405 Fwy. at Manchester Ave.	60.3	60.2	62.5	62.8	63.4	60.3	N/A	60.2	N/A	60.5
RD10	Lennox Middle School	Buford Ave., adjacent to I-405 Fwy. at 111th St.	58.7	56.8	57.9	65.2	57.2	58.7	56.9	56.8	54.6	56.9
RD11	Anza School	La Cienega Blvd. & 120th St.	55.0	51.1	51.5	51.1	51.2	55.0	51.2	51.1	50.0	50.8
RD12	Residential	Imperial Ave., near California St.	64.6	62.9	63.3	61.7	63.3	64.6	62.8	62.9	61.0	62.4
RD13	Residential	Pershing Dr., near Waterview St.	66.0	62.7	61.2	62.7	63.4	66.0	62.4	62.7	62.7	60.7
RD14	Residential	Manchester Ave., near Kentwood St.	60.6	58.2	57.4	57.8	58.2	60.6	57.8	58.2	58.4	57.3
RD15	Residential	Sepulveda Blvd., near 83rd St.	55.3	52.7	53.9	54.3	54.2	55.3	52.3	52.7	52.7	52.6
RD16	Residential	La Tijera Blvd., near 78th St.	51.8	49.2	51.0	51.5	51.0	51.8	49.0	49.2	48.9	49.3
RD17	Residential	Airport Blvd., near Interceptor St.	61.0	60.3	63.3	64.1	64.7	61.0	60.2	60.3	60.0	60.7
RD18	Residential	La Cienega Blvd., near 98th St.	60.0	58.0	59.0	58.9	58.2	60.0	58.3	58.0	58.1	58.3
RD19	Residential	116th St., near Judah Ave.	60.7	56.8	57.1	56.5	57.2	60.7	57.0	56.8	55.5	56.9
RD20	Residential	Imperial Ave., at Cypress St.	68.8	65.2	65.4	63.7	65.9	68.8	65.6	65.2	63.5	65.0
RD21	First Flight Child Development Center	Lincoln Blvd., near Westchester Pkwy.	62.4	60.8	61.8	63.3	63.3	62.4	60.5	60.8	60.7	59.8
S22	Residential	675 W. Arbor Vitae St.	64.1	66.1	68.2	63.5	64.8	64.1	65.6	66.1	59.3	65.9
S23	Church	645 W. Arbor Vitae St.	63.9	65.9	68.0	63.3	64.6	63.9	65.4	65.9	59.6	65.7

Table F4.1-6

Daily Aircraft Noise at Receptor Sites by Alternative (dBA 24-Hour L_{eq})

				Alternative						Alternative			
			1996	NA/NP	A	B	C	1996	NA/NP		D	
Site	Receptor Name	Receptor Location	Baseline	2015	2015	2015	2015	Baseline	2008	2015	2008	2015
S24	Beulah Payne Elementary School	215 W. 94th St.	58.6	60.4	62.5	58.6	59.7	58.6	60.1	60.4	67.2	61.2
S25	Residential	405 E. Arbor Vitae St.	58.7	60.7	62.7	58.9	59.8	58.7	60.4	60.7	65.4	61.2
S26	Residential	705 E. Arbor Vitae St.	57.8	59.7	61.5	58.1	58.9	57.8	59.4	59.7	47.5	60.2
S27	Residential	4821 W. Century Blvd.	57.4	57.3	57.0	60.3	57.4	57.4	58.9	57.3	47.9	57.2
S28	Residential	10108 S. Freeman Ave.	62.9	63.2	60.9	65.7	63.3	62.9	66.0	63.2	49.0	63.0
S29	Residential	11439 S. Freeman Ave.	50.3	49.1	50.6	52.3	49.3	50.3	48.0	49.1	65.2	49.1
S30	Robert F. Kennedy Medical Center	11711 Grevillea Ave.	51.7	49.0	50.1	51.0	49.3	51.7	48.2	49.0	60.0	48.9
S31	Residential	4619 116th St.	52.8	50.2	51.3	52.6	50.5	52.8	49.4	50.2	60.2	50.2

[1] The Westchester Branch Library closed on March 29, 2003. See Section 4.26.4, *Libraries*, for further discussion.
[2] N/A = Not Available. Data for receptor RD9 is unavailable for interim year.

Source: Landrum & Brown, 2002.

Table F4.1-7

Combined Daily Aircraft and Road Traffic Noise at Receptor Site by Alternative (dBA 24-Hour L_{eq})

				Alternative						Alternative			
			1996	NA/NP	A	B	C	1996	NA/NP		D	
Site	Receptor Name	Receptor Location	Baseline	2015	2015	2015	2015	Baseline	2008	2015	2008	2015
RD1	Westchester High School	Manchester Ave., between Redlands & Park Hill Sts.	59.7	58.3	58.2	58.8	58.9	59.7	58.2	58.3	58.2	57.7
RD2	Westchester Playground (Sr. Center)	Lincoln Blvd. at Manchester Ave.	59.0	57.1	58.2	59.3	58.9	59.0	56.8	57.1	57.1	56.4
RD3	Westchester Lutheran Church & School	Sepulveda Blvd. at 77th St.	55.5	52.5	54.4	54.1	54.0	55.5	52.6	52.5	51.3	51.4
RD4	St. Jerome Catholic Church &School	La Tijera Blvd. at Thornburn St.	57.1	55.3	60.7	60.2	57.3	57.1	54.5	55.3	53.1	52.6
RD5	First Baptist Church & Preschool	La Tijera Blvd. at Manchester Ave.	59.9	57.1	59.8	60.6	60.3	59.9	57.1	57.1	57.5	57.8
RD6[1]	Westchester Public Library	Westchester Parkway at Sepulveda Eastway	64.8	63.6	N/A	N/A	N/A	64.8	63.5	63.6	63.5	65.6
RD7	LAX Sheraton Hotel	Century Blvd., near Airport Blvd.	70.2	69.8	70.9	67.9	67.5	70.2	69.7	69.8	69.7	64.2
RD8	University of West Los Angeles	Aviation Blvd. at Arbor Vitae St.	67.3	68.9	72.1	66.7	67.5	67.3	68.8	68.9	68.3	67.7
RD9[2]	Ashwood Park	Ash St., adjacent to I-405 Fwy. at Manchester Ave.	72.7	74.3	73.5	74.5	73.6	72.7	N/A	74.3	N/A	74.3
RD10	Lennox Middle School	Buford Ave., adjacent to I-405 Fwy. at 111th St.	59.8	58.7	59.6	65.5	59.4	59.8	58.6	58.7	56.0	57.9
RD11	Anza School	La Cienega Blvd. & 120th St.	57.4	55.6	55.6	55.8	55.9	57.4	55.7	55.6	55.7	57.5
RD12	Residential	Imperial Ave., near California St.	64.8	63.1	64.4	63.0	64.3	64.8	63.1	63.1	61.1	62.5
RD13	Residential	Pershing Dr., near Waterview St.	66.1	62.7	61.3	62.7	63.4	66.1	62.5	62.7	62.7	60.8
RD14	Residential	Manchester Ave., near Kentwood St.	61.0	58.6	57.9	58.3	58.7	61.0	58.2	58.6	58.8	57.8
RD15	Residential	Sepulveda Blvd., near 83rd St.	57.5	54.8	55.7	55.8	55.7	57.5	54.5	54.8	53.8	53.8
RD16	Residential	La Tijera Blvd., near 78th St.	55.3	52.2	53.8	54.0	53.6	55.3	52.0	52.2	52.2	53.0
RD17	Residential	Airport Blvd., near Interceptor St.	61.3	60.6	63.4	64.2	64.8	61.3	60.5	60.6	60.3	61.1
RD18	Residential	La Cienega Blvd., near 98th St.	60.9	59.1	60.0	59.8	59.2	60.9	59.3	59.1	58.9	59.1
RD19	Residential	116th St., near Judah Ave.	62.8	59.1	58.5	58.1	58.6	62.8	59.3	59.1	57.4	58.7
RD20	Residential	Imperial Ave., at Cypress St.	68.9	65.3	66.6	64.7	66.5	68.9	65.7	65.3	63.5	65.0
RD21[3]	First Flight Child	Lincoln Blvd., near	N/A	60.9	62.1	63.5	63.4	N/A	60.5	60.9	60.8	59.9

Table F4.1-7

Combined Daily Aircraft and Road Traffic Noise at Receptor Site by Alternative (dBA 24-Hour L_{eq})

				Alternative						Alternative			
			1996	NA/NP	A	B	C	1996	NA/NP		D	
Site	Receptor Name	Receptor Location	Baseline	2015	2015	2015	2015	Baseline	2008	2015	2008	2015
	Development Center	Westchester Pkwy.										
S22	Residential	675 W. Arbor Vitae St.	64.5	66.4	68.4	64.0	65.2	64.5	66.1	66.4	60.1	66.3
S23	Church	645 W. Arbor Vitae St.	64.3	66.2	68.2	63.8	65.0	64.3	65.9	66.2	60.4	66.1
S24	Beulah Payne Elementary School	215 W. 94th St.	59.4	60.7	62.7	59.1	60.1	59.4	60.5	60.7	67.3	61.5
S25	Residential	405 E. Arbor Vitae St.	61.1	61.7	63.3	60.5	61.0	61.1	61.8	61.7	66.1	62.3
S26	Residential	705 E. Arbor Vitae St.	61.6	61.5	62.8	60.8	61.1	61.6	61.8	61.5	59.8	62.2
S27	Residential	4821 W. Century Blvd.	61.9	60.2	60.1	62.1	60.4	61.9	60.8	60.2	58.7	60.6
S28	Residential	10108 S. Freeman Ave.	63.2	63.4	61.2	65.8	63.5	63.2	66.1	63.4	52.3	63.2
S29	Residential	11439 S. Freeman Ave.	55.1	52.4	53.5	53.8	52.5	55.1	51.7	52.4	65.3	53.0
S30	Robert F. Kennedy Medical Center	11711 Grevillea Ave.	52.3	49.8	50.7	51.5	50.0	52.3	49.1	49.8	60.1	49.7
S31	Residential	4619 116th St.	53.9	51.5	52.4	53.4	51.7	53.9	50.8	51.5	60.3	51.6

[1] The Westchester Branch Library closed on March 29, 2003. See Section 4.26.4, *Libraries*, for further discussion.
[2] N/A = Not Available. Data for receptor RD9 is unavailable for interim year.
[3] RD21 is analyzed in the project alternatives only.

Source: Landrum & Brown, 2002.

4.1.3.3 Construction Traffic and Equipment Noise

Noise levels from outdoor construction indicate that the noisiest phases of construction are typically during excavation and grading, and that noise levels from equipment with mufflers are typically 86 L_{eq} at 50 feet from the noise source. The area of potential construction noise impact includes all noise-sensitive land uses within 600 feet of the Master Plan boundaries where construction would occur. This distance allows a noise level of 86 L_{eq} at 50 feet to dissipate to approximately 65 L_{eq} assuming buffering from structures and landscaping. Noise-sensitive development susceptible to noise from construction equipment and traffic includes schools and residential areas north of the airport in the Westchester Community, residential areas south of the airport in the City of El Segundo, and residential areas in the City of Inglewood near the proposed LAX Expressway. Ambient noise levels in these areas range between 60 to 66 L_{eq} during daytime hours and 55 to 61 L_{eq} during nighttime hours (10 p.m. to 6 a.m.). Many of these areas are contained within the 1996 65 CNEL contour for aircraft noise (depicted in Figure F4.2-5 in Section 4.2, *Land Use*) and all of the noise-sensitive uses are within the area exposed to 60 CNEL. For comparison purposes, single-event aircraft noise levels in these areas can be expected to have peak noise levels above 85 dBA. Other noise sources such as vehicles and gardening equipment typical to urban areas are also found in these areas.

The 1996 baseline conditions, when compared with Year 2000 conditions, were determined to not have changed overall, within plus or minus one dBA. There were no substantial changes to roadways or traffic volumes between the 1996 and Year 2000 conditions. Likewise, while aircraft noise contours have changed slightly, the changes were determined to not have a substantial effect on total ambient noise. Therefore, it was concluded that continued use of the 1996 baseline as the basis for determining impacts and mitigation under CEQA remains appropriate.

4.1.3.4 APM Noise

Existing sources of rail-related noise in the local area include: (1) the existing terminus of the MTA Green Line located south of I-105, east of Aviation Boulevard; and (2) the Burlington Northern-Santa Fe (BNSF) rail line that extends along the west side of Aviation Boulevard. Neither of these facilities is considered to be a notable noise influence relative to the Master Plan study area, in that the MTA Green Line station is separated from the Master Plan study area by a major freeway (I-105) and the BNSF rail line is situated between a major roadway (Aviation Boulevard) and existing cargo/freight facilities or open land within the clear zone of the airport's south runway complex.

Relative to land use categories that are considered to be sensitive to transit noise, as would occur in conjunction with the APM, the FTA defines three basic noise categories, as follows:

- **Noise Category 1:** Land where quiet is an essential element of the intended purpose. This includes outdoor amphitheaters and landmarks with substantial outdoor use. Most sensitive to changes in L_{eq}.
- **Noise Category 2:** Residences, hotels, hospitals, and other uses where nighttime sensitivity to noise is important. Most sensitive to changes in day-night average sound level (DNL), which is a 24-hour noise average that includes a "penalty" for nighttime noise events and is generally comparable to CNEL.[63]
- **Noise Category 3:** Institutional land uses with primarily daytime and evening use. This includes medical offices, schools, libraries, and churches. Most sensitive to changes in daytime L_{eq}.

Of these three categories, only Noise Category 2 is relevant to the APM noise analysis completed for Alternative D. Land use types included in Noise Categories 1 and 3 do not occur along the proposed APM route. Of the Noise Category 2 land use types, there are several hotels located along Century Boulevard and 98th Street in the vicinity of proposed APM alignments. The names and locations of those hotels are indicated on **Figure F4.1-8**, 2015 Alternative D Landside APM Noise Contours. In evaluating significance of noise impacts associated with a proposed transit project, the FTA noise assessment guidelines and criteria take into account the existing ambient noise levels of the potentially affected uses. **Figure F4.1-8** indicates the approximate existing ambient noise levels for each of the subject hotels in terms of aircraft CNEL values for existing baseline conditions, as derived from Figure F4.2-6, Year 2000

[63] The "penalty" applied for nighttime noise represents a weighting of noise levels occurring in the evening and nighttime hours, based on noise events during those hours being more intrusive than events during daytime hours.

Conditions vs. 1996 Baseline - Areas Newly Exposed, in Section 4.2, *Land Use*. It should be noted that the existing CNEL values that were used in the analysis represent aircraft noise only and do not account for additional noise associated with local roadway traffic. Given the location of the subject hotels, being near the airport runway flight paths, aircraft noise is the predominant noise influence in the area and the additional contribution from local roadway traffic is considered to be relatively minor. This is evidenced by comparing the daily roadway noise level for the LAX Sheraton, identified as Site RD7 in Table F4.1-5 with the daily aircraft noise level for that site in Table F4.1-6, whereby the 1996 Baseline roadway noise level is 47.3 dBA while the 1996 Baseline aircraft noise level is 70.2 dBA.

4.1.4 Thresholds of Significance

4.1.4.1 Aircraft Noise

4.1.4.1.1 CEQA Thresholds of Significance

A significant aircraft noise impact would occur if the direct and indirect changes in the environment that may be caused by the particular project alternative would potentially result in one or more of the following future conditions:

- Noise-sensitive areas are newly exposed to 65 CNEL or greater.
- Noise-sensitive areas within the 65 CNEL contour of a build alternative experience an increase of 1.5 CNEL or greater compared with the 1996 baseline conditions.

The first threshold is derived from the California Airports Noise Standards (Title 21). The second threshold is derived from FAA Order 5050.4A and FAA Order 1050.1D and is accepted here as a CEQA threshold of significance to describe significant increases of noise exposure.

When there are 1.5 CNEL increases within the 65 CNEL contour of a build alternative, compared to the environmental baseline, CEQA has adopted federal standards set forth by FICON criteria (see the following subsection) to require the presentation of sensitive uses experiencing an increase of 3 CNEL when exposed to 60-65 CNEL. Additionally, increases of 5 CNEL in areas exposed to less than 60 CNEL are also to be considered for CEQA analyses.[64] This supplemental information regarding changes of exposure below 65 CNEL does not imply that there is a significant impact under state definitions. This assessment is provided to the public and decision-makers for informational purposes.

Thresholds of significance for single event aircraft noise effects are established solely for use in consideration of noise impacts under CEQA and are not meant for application to federal NEPA evaluations.[65] The threshold of significance for single event awakenings is:

- Dwellings are newly exposed, at an average frequency of once in 10 days, to exterior nighttime SEL sufficient to awaken at least 10 percent of their residents, assuming windows remain open. At LAX, the threshold of significance for exterior nighttime noise is 94 dBA of SEL.

Although there is currently no conclusive data to establish a proven statistical relationship between single overflight event noise and the ability of children to learn in the classroom, two thresholds of significance are applied for CEQA analysis.

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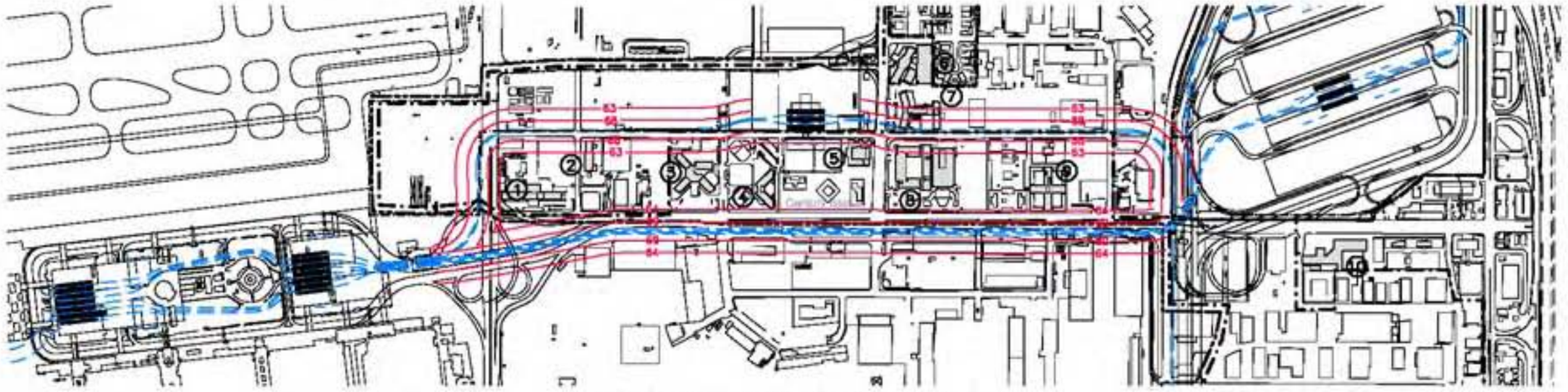
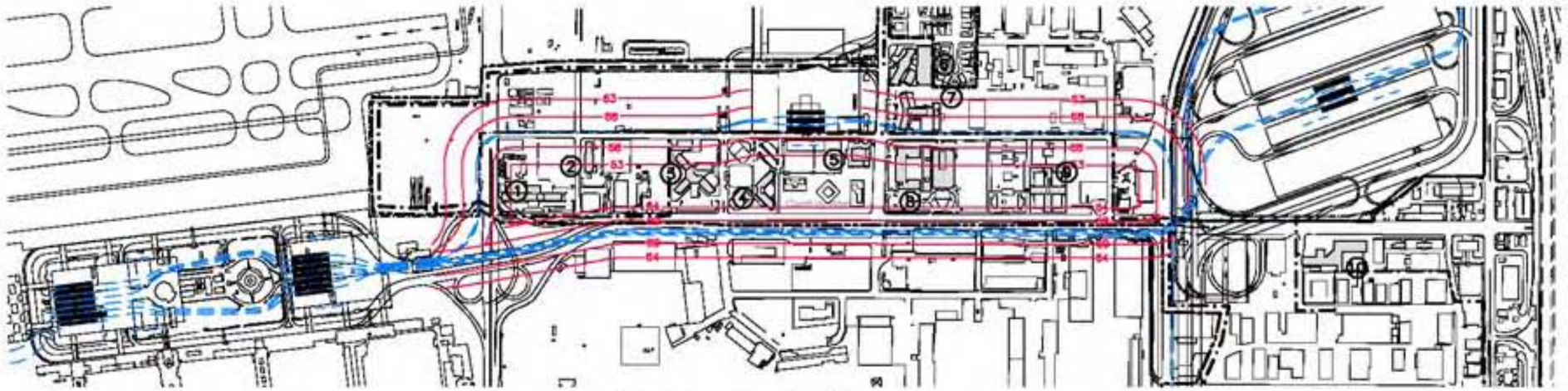
64 City of Los Angeles, Draft L.A. CEQA Thresholds Guide, May 14, 1998.

65 The California Airport Land Use Planning Handbook discusses the relevance of single event noise to land use planning evaluations in the environs of airports in California at pages 7-30 through 7-34, and concludes that no definitive, widely-recognized, single-event noise level guidelines currently exist relative to land use compatibility planning.



Noise Contours for Rubber Tire System



Noise Contours for Steel Wheel System

LEGEND

- LAX Existing Property Line
- LAX Future Property Line
- Conceptual Alignment of Automated People Mover
- 63 — 63dBA CNEL Contour (dBA Levels Selected Based on Relevant Federal Criteria Described in Section 4.1.4.4.2.)

HOTELS		EXISTING AMBIENT NOISE LEVEL
1	Radisson Hotel	68 CNEL
2	Courtyard by Marriott	67 CNEL
3	Sheraton Hotel	69 CNEL
4	Crown Plaza Hotel	69 CNEL
5	Embassy Suites	68 CNEL
6	Renaissance Hotel	67 CNEL
7	Four Points Sheraton	67 CNEL
8	Marriott Hotel	69 CNEL
9	Hilton Hotel	70 CNEL
10	Westin Hotel	70 CNEL

NOTE

Existing Ambient Noise Level based on aircraft noise contours shown in Figure S4.2-2.

200' 400' 1,200'
400' 0 800'

Source: CDM, June 2003

DWG: FIG5_04_01-08.dwg USER: negrahagel DATE: Feb 11, 2004 2:39pm

LAX Master Plan Final EIS/EIR	**2015 Alternative D** **Landside APM Noise Contours**	Figure **F4.1-8**

Schools are newly exposed to exterior noise levels during school hours sufficient to result in interior noise levels of 55 dBA L_{max}, sufficient for momentary disruption of speech intelligibility in classroom teaching situations (assumed to be at 20 feet), and an interior noise level of 65 dBA L_{max}, sufficient to momentarily disrupt speech intelligibility in small group and one-on-one teaching situations (assumed to be at 6 feet). In each case, exposure is measured as having a time above the threshold noise level of 3 seconds or more during the school day. At LAX, the thresholds of significance for school hour (i.e., 8 a.m. to 4 p.m.) speech interference at schools equate to exterior single event maximum noise levels of 84 dBA for general classroom teaching and 94 dBA for small group learning.

- Schools are newly exposed to exterior noise levels during school hours sufficient to result in sustained interruption of classroom teaching through interior noise levels in excess of 35 L_{eq} during an hour. At LAX, the threshold of significance equates to an exterior hourly noise level during school hours of 64 dBA of $L_{eq(h)}$.

The evolution of specific thresholds of significance for single event noise levels at LAX is disclosed in Appendix S-C1, *Supplemental Aircraft Noise Technical Report*. The thresholds of significance for single event aircraft noise were developed and tailored for LAX because: (1) there are no "standard" thresholds of significance, and (2) *Berkeley Jets* and the CEQA Guidelines allow the lead agency to establish suitable thresholds. These thresholds are applicable only to the specific conditions at LAX and should not be generally applied to single event evaluations at other locations.

4.1.4.1.2 Federal Standards

Federal guidelines have been developed to describe the potential impact of noise levels on people. The federal standards for aircraft noise evaluation are formalized in FAA Order 5050.4A, *Airport Environmental Handbook*. Supporting these standards, the FICON has identified 65 DNL as the 24-hour day-night average sound level at which most people become highly annoyed by noise.[66] Although sensitivity to noise is highly subjective, the 65 DNL noise level has been widely adopted as a reasonable criterion for measuring noise compatibility impacts.[67] Under FAA environmental policies and procedures, the federal impact standard is exceeded if analysis shows that the proposed project will cause noise sensitive areas to experience an increase in noise of 1.5 dBA CNEL or more at or above 65 dBA CNEL noise exposure (when comparing the future No Action/No Project condition against the proposed action alternative). The FICON also observed that some people may be highly annoyed by noise levels below 65 DNL, and identified a 3 dBA increase in DNL, which represents a doubling of noise energy, as a change which may be perceptible to people in areas outside of the 65 DNL contour.

When 1.5 dBA increases occur within the 65 DNL contour, the FICON criteria call for the identification of noise-sensitive uses experiencing an increase of 3 dBA within the 60 to 65 DNL contour.[68] This information is provided to the public and decision-makers for informational purposes. The FAA uses this information during its consideration of potential mitigation such as noise abatement flight procedures for these areas. FAA has adopted regulations and guidance governing airport noise compatibility planning which incorporate the FICON criteria.[69]

There are no federal standards or criteria for single event aircraft noise. The thresholds of significance established in subsection 4.1.4.1.1 for single event evaluations are applicable solely to CEQA assessments and do not apply to federal compatibility standards, nor are they intended to suggest the establishment of a new federal standard for single event evaluations.

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66 Federal Interagency Committee On Noise, Federal Agency Review of Selected Airport Noise Analysis Issues (August 1992).

67 California has adopted the Community Noise Equivalent Level (CNEL), which is similar to DNL but applies an additional penalty of 4.77 decibels to operations that take place between 7 p.m. and 9:59 p.m. The use of CNEL as an alternative to DNL is accepted by the federal agencies regulating noise impacts.

68 The FICON report noted that in practice, an increase of 3 dBA or more will not occur in the 60 to 65 DNL contour unless there is at least a 1.5 dBA increase within the 65 DNL contour.

69 U.S. Department of Transportation, Federal Aviation Administration, Land Use Compatibility Guidelines, Federal Aviation Regulation (FAR) Part 150; Federal Aviation Administration, Order 5050.4A, Airport Environmental Handbook, October 1985; Federal Aviation Administration, Order 1050.1D, Policies and Procedure for Considering Environmental Impacts, June 2001.

4.1.4.2 Road Traffic Noise (Including Construction Traffic)

4.1.4.2.1 CEQA Thresholds of Significance

For CEQA purposes, the *Draft L.A. CEQA Thresholds Guide* states that a significant road traffic noise impact would occur if the direct and indirect changes in the environment that may be caused by the particular project alternative would potentially result in one or more of the following future conditions:

- The project alternative results in a noise sensitive receptor newly experiencing an increase of 5 dBA $L_{eq(h)}$ in peak noise hour levels when compared to existing conditions.
- For new highway facilities proposed as part of the project, the project alternative results in a noise sensitive receptor experiencing an hourly L_{eq} of 67 dBA or greater when compared to existing conditions.

These thresholds were adopted because they address the physical impacts of the environment and because they are contained in the Los Angeles Thresholds Guide and in the Traffic Noise Analysis Protocol, respectively (October 1998, California Department of Transportation).

Caltrans has also identified an increase of 12 dBA $L_{eq(h)}$ in peak hour levels compared to future conditions without the project (i.e., the No Action/No Project Alternative) as constituting a "substantial" increase in traffic.[70] However, this is simply a guide for traffic noise and does not constitute a CEQA threshold of significance.

4.1.4.2.2 Federal Standards

FHWA has adopted general standards for assessing noise impacts from highway projects and determining when noise abatement measures are warranted.[71] These standards employ noise abatement criteria (NAC),[72] and also consider whether predicted noise levels would "substantially exceed the existing noise level." However, FHWA does not define the point at which an increase would "substantially exceed" existing noise levels. Instead, FHWA allows State Highway Agencies to establish their own definitions. The Caltrans criteria for a substantial noise increase are addressed, as discussed above.

4.1.4.3 Construction Equipment Noise

4.1.4.3.1 CEQA Thresholds of Significance

A significant noise impact from construction would occur if the direct and indirect changes in the environment that may be caused by the particular project alternative would potentially result in one or more of the following future conditions:

- 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 exterior noise levels 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 anytime on Sunday.

These thresholds were adopted because they address physical impacts on the environment and are included in the *Draft L.A. CEQA Thresholds Guide*.[73]

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70 See http://www.dot.ca.gov/ser/vol1/sec3/physical/ch12noise/chap12noise.htm.

71 U.S. Department of Transportation, Federal Highway Administration, Highway Traffic Noise Analysis and Abatement Policy and Guidance, June, 1995.

72 The NAC are established for different land use activities.

73 City of Los Angeles, Draft L.A. CEQA Thresholds Guide, May 14, 1998.

4.1.4.3.2 Federal Standards

With the exception of federal Occupational Safety and Health Administration (OSHA) requirements for the protection of individual workers from high levels of construction noise, there are no federal standards that address the acceptability of construction equipment noise.

4.1.4.4 APM Noise

4.1.4.4.1 CEQA Thresholds of Significance

A significant APM noise impact would occur if the direct and indirect changes in the environment that may be caused by the particular project alternative would potentially result in the following future condition:

- Noise-sensitive uses are exposed to the following exterior noise impact from APM operations:

Existing Ambient Noise Level (in dBA CNEL)	Noise Impact Exposure from APM Operations (in dBA CNEL)
65	>66
66	>67
67	>67
68	>68
69	>69
70	>69

This threshold was derived from the noise impact criteria set forth in Table 3-1, Noise Levels Defining Impact for Transit Projects, *Transit Noise and Vibration Assessment Final Report,* Federal Transit Administration (April 1995). As described in greater detail below in subsection 4.1.4.4.2, *Federal Standards,* the FTA Guidance Manual includes numerical criteria that define project-related noise impacts in terms of No Impact, Impact, and Severe Impact. Based on these three relative descriptors, the FTA criteria for Severe Impact serve herein as the basis for determining the CEQA threshold of significance.

4.1.4.4.2 Federal Standards

As described above in subsection 4.1.2.5, *Automated People Mover (APM) Noise Methodology,* the FTA Guidance Manual provides a comprehensive basis for identifying and evaluating potential transit noise impacts. The FTA Guidance Manual includes numerical criteria that define project-related noise impacts in terms of No Impact, Impact, and Severe Impact. The criteria use a sliding scale to account for existing ambient noise levels, such that the higher the existing ambient noise level is, the higher the project's noise level can be before it causes an impact. Based on existing ambient noise levels in the study area for the hotels located along Century Boulevard and 98th Street being approximately 67 dBA CNEL to 70 dBA CNEL, the corresponding FTA noise impact assessment criteria for Noise Category 2 land uses are as indicated in **Table F4.1-8**, FTA Noise Impact Assessment Criteria for Noise Category 2.

Table F4.1-8

FTA Noise Impact Assessment Criteria for Noise Category 2

	Project Noise Impact Exposure (dBA)		
Existing Noise Exposure (dBA)	No Impact	Impact	Severe Impact
67	<63	63-67	>67
68	<63	63-68	>68
69	<64	64-69	>69
70	<65	65-69	>69

Source: Table 3-1, Noise Levels Defining Impact for Transit Projects, *Transit Noise and Vibration Assessment Final Report*, Federal Transit Administration (April 1995).

The FTA Guidance Manual includes a discussion of certain considerations in applying the noise impact assessment criteria, such as where on potentially affected properties should the criteria be applied (i.e., the criteria are to be applied outside the building location for residential land use and at the property line

for parks and other such outdoor uses). The Guidance Manual specifically indicates that "for locations where land use activity is solely indoors, noise impact may be less significant if the outdoor-to-indoor reduction is greater than for typical buildings (about 25 dBA with windows closed)."

4.1.5 Master Plan Commitments

The airport has a long history of addressing the problems of aircraft noise. Many of these were dealt with in the airport's adopted Part 150 Noise Compatibility Program of 1985. The program includes 28 measures approved by the FAA. Of these, seven are directly related to the abatement of aircraft noise levels. The remaining 21 measures relate to the implementation of a program to monitor flight operations; provide for programs to mitigate noise in residences and other noise-sensitive uses; propose land use management measures to enhance compatibility; and call for further study of funding mechanisms or airfield modifications. This section addresses only those measures that are directly related to the abatement of aircraft noise through operation or source noise control. Mitigation of impacts at the land uses is discussed in Section 4.2, *Land Use*. The airport also has implemented noise mitigation measures that pre-date the 1985 Part 150 program. The operational elements of the current noise abatement program are:

- Use preferred inboard runways for departures and arrivals and interior parallel Taxiways K and U during the hours between 10:00 p.m. and 7:00 a.m. This measure is intended to move nighttime noise to the interior of the airfield and away from noise-sensitive areas adjacent to the airport to the north and south.
- Weather permitting, between the hours of midnight and 6:30 a.m., use over-ocean procedures. These procedures call for arrivals to be made from the west and departures to the west over Santa Monica Bay during the most sensitive night hours.
- Conduct departures to the west along the runway heading until reaching the coastline. The measure has been the subject of continuing concern to assure better compliance to achieve the desired effect.
- Ban the use of SuperSonic Transport (SST) aircraft at the airport. This measure was originally adopted to eliminate the potential use of the airport by the Concorde and other proposed SST aircraft.
- Restrict run-up activity (i.e., routine aircraft engine maintenance tests that require the operation of an engine at high power for extended periods) between 11:00 p.m. and 6:00 a.m. unless specific approval is granted by airport management.
- Allow the use of reduced thrust departures during west flow operations (i.e., aircraft land and takeoff in a westerly direction). Reduced thrust departures are takeoffs conducted with less than maximum power settings during the takeoff roll and initial climb portion of the operation (until the aircraft reaches approximately 1,000 feet altitude). The intent of this measure is largely one of reducing the noise of aircraft to the sides of the airport while the aircraft is on the ground or in the first stage of climb.
- Discourage the use of reduced thrust departures during east flow operations (i.e., aircraft land and takeoff in an easterly direction).
- Encourage the use of departure cutback procedures in accordance with FAA Advisory Circular 91-53 (now 91-53A). Thrust cutback procedures are techniques that initiate thrust reductions from takeoff power to a lower level (maximum climb thrust or less) during the climb between 1,000 and 3,000 feet of altitude. The intent of the measure is to reduce the loudness of aircraft in the off-airport areas most severely affected by aircraft noise.
- Continue the use of tug and tow procedures (i.e., aircraft are towed by a ground surface vehicle while aircraft engines are off) in the Imperial Terminal area. The Imperial Terminal is a small area west of Sepulveda Boulevard, north of the I-105. The use of engine-off procedures is expected to be continued under all future alternatives where applicable.
- Retain acoustical barrier along the north side of the airfield adjacent to 88th Street in the Emerson Manor community.

As appropriate, all of these measures have been incorporated into the assumed operating conditions of the 1996 baseline and the Year 2000 conditions, and would be continued with the Master Plan. Therefore, the following commitment would be adopted for noise:

- **N-1. Maintenance of Applicable Elements of Existing Aircraft Noise Abatement Program (Alternatives A, B, C, and D).**

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

There are no Master Plan commitments proposed exclusively for road traffic noise and construction equipment noise impacts. However, many of the commitments proposed for roadway traffic and construction traffic, summarized in Section 4.3, *Surface Transportation* (subsections 4.3.1.5 and 4.3.2.5), are also expected to help alleviate roadway and construction equipment noise as well. For example, Commitment ST-16, Designated Haul Routes (Alternatives A, B, C, and D), ensures that every effort will be made to keep construction traffic away from noise sensitive receptors.

4.1.6 Environmental Consequences

As described in the Analytical Framework discussion in the introduction to Chapter 4, the basis for determining impacts under CEQA is different from that of NEPA. Under CEQA, the impacts of a proposed project and alternatives are measured against the "environmental baseline," which is normally the physical conditions that existed at the time the Notice of Preparation was published (i.e., June 1997, or 1996 when a full year of data is appropriate, for the LAX Master Plan Draft EIS/EIR). As such, the CEQA analysis in this Final EIS/EIR uses the environmental baseline, or in some cases an "adjusted environmental baseline," as the basis by which to measure and evaluate the impacts of each alternative. Under NEPA, the impacts of each action alternative (i.e., build alternative) are measured against the conditions that would otherwise occur in the future if no action were to occur (i.e., the "No Action" alternative). As such, the NEPA analysis in this Final EIS/EIR uses the No Action/No Project Alternative as the basis by which to measure and evaluate the impacts of each build alternative (i.e., Alternatives A, B, C, and D) in the future (i.e., at buildout in 2015 or, for construction-related impacts, selected future interim year). Based on this fundamental difference in the approach to evaluating impacts, the nature and significance of impacts determined under CEQA are not necessarily representative of, or applicable to, impacts determined under NEPA. The following presentation of environmental consequences should, therefore, be reviewed and considered accordingly.

4.1.6.1 Aircraft Noise

4.1.6.1.1 No Action/No Project Alternative

The No Action/No Project Alternative assumes the continued use of the airfield in its present configuration, with two runways in both the north and south airfield complexes, each with one independent approach. FAA approved aviation activity forecasts are presented earlier in Table F3-1, Summary of Activity by Alternative - 2015, in Chapter 3, *Alternatives*. As shown in **Table F4.1-9**, Forecast Daily Aircraft Operations (2015), under No Action/No Project conditions the number of approaches by heavy jet aircraft is forecast to nearly double from baseline conditions as a result of increased international operations described in Chapter 3, *Alternatives*. As shown in **Table F4.1-10**, Runway Utilization Proportions by Aircraft Groups, the No Action/No Project scenario assumes a greater number of approaches assigned to the north runway complex (Runways 6R/24L or 6L/24R) in west flow to better balance approaches between the two principal arrival runways and to improve the efficiency of the landing operations. Other operational elements that contribute to the noise exposure pattern for the No Action/No Project condition include the following:

- As in existing conditions, inboard Runways 6R/24L and 7L/25R would be used principally for takeoffs, outboard Runways 6L/24R and 7R/25L principally for landings.
- As in existing conditions, between 10 p.m. and 7:00 a.m., the inboard runways would be preferred for both landings and takeoffs to abate noise on communities north and south of the airport.
- As in existing conditions, between midnight and 6:30 a.m., over-ocean procedures would be used when weather permits to abate noise on communities east of the airport. Aircraft using over-ocean procedures typically land on Runway 6R and take off on Runway 25R.
- Daily aircraft operations would increase from 2,077 under environmental baseline conditions to 2,119 in 2015.

- The number of heavy jets (aircraft weighing more than 300,000 pounds) would double from environmental baseline levels, while the proportion of propeller aircraft in the fleet would shrink to 67 percent of baseline levels by 2015. The proportion of light jets in the fleet mix would shrink slightly.
- Owing to the increased number of international operations by heavy jet aircraft entering the airspace from northwest of the airport, the runway usage would evolve to improve operating efficiency and reduce delay by placing greater numbers of heavy aircraft on the north runways and shifting most propeller operations to the south runways. Operations by light jet aircraft would remain nearly equally distributed between the runways.
- As is presently the case, aircraft maintenance run-up activity would continue to take place on ramps at six locations on the airfield. Five would be between the runways and one would be in the Imperial Cargo Complex south of Runway 25L.
- Improved departure procedures would result in less flight track dispersal for all aircraft until reaching the coastline. These measures would guide all aircraft to the coastline before initiating turns to avoid flights over noise-sensitive areas.
- As a result of FAA changes incorporated since 1996 unrestricted climbs to 5,000 feet taking off to the west would occur, rather than requiring approval to climb above 2,000 feet. The measure would ultimately result in higher altitudes as aircraft circle and pass back over the coastline bound to destinations to the east. This type of operation would not affect the noise contours over land.
- Turboprops that depart to the west would not make turns to the east/southeast below 3,000 feet altitude (MSL). This measure would result in higher altitudes by turboprops as they turn south and then back to the east over the communities immediately south of the airport. The effects of this measure would be beyond the contours of significant noise exposure.

Table F4.1-9

Forecast Daily Aircraft Operations (2015)

Condition	Aircraft Operations by Category[1]				Percent of Annual Operations		
	Heavy Jet	Light Jet	Propeller	Total	Heavy Jet[2]	Light Jet[2]	Propeller[2]
Environmental Baseline	351	1,021	705	2,077	17%	49%	34%
2015 Forecast							
No Action/No Project	706	944	469	2,119	33%	45%	22%
Alternative A	868	1,089	558	2,515	35%	43%	22%
Alternative B	872	1,099	564	2,535	34%	43%	22%
Alternative C	814	1,003	324	2,141	38%	47%	15%
Alternative D	673	932	517	2,122	32%	44%	24%

1 Data represents an average annual day of operation (annual traffic/365).
2 Totals may not equal 100 percent due to rounding.

Source: Landrum & Brown, 1999 SIMMOD output files and 2002 INM output files.

Table F4.1-10

Runway Utilization Proportions by Aircraft Groups

Alternative Condition	Heavy Jets[1]		Light Jets[1]		Propeller Aircraft[1]	
	South Runway Complex	North Runway Complex	South Runway Complex	North Runway Complex	South Runway Complex	North Runway Complex
Environmental Baseline	63%	37%	50%	50%	55%	45%
2015 Forecast						
No Action/No Project	45%	55%	52%	48%	71%	29%
Alternative A	32%	68%	50%	50%	26%	74%
Alternative B	28%	72%	85%	15%	98%	2%
Alternative C	40%	60%	66%	34%	75%	25%
Alternative D	49%	51%	51%	49%	61%	39%

[1] Data for individual runways is provided in Appendix D*, Aircraft Noise Technical Report,* and Appendix SC-1, Supplemental Aircraft Noise Technical Report. The north runway complex includes runways numbered 6/24 and the south complex includes runways numbered 7/25.

Source: Landrum & Brown, 1999 SIMMOD output files and 2002 INM output files.

Figure F4.2-12, No Action/No Project Alternative 2015 vs. 1996 Baseline - Areas Newly Exposed, in Section 4.2, *Land Use,* illustrates the location of the noise exposure patterns for the No Action/No Project condition for the Year 2015. As in the contour for the baseline condition, the noise exposure pattern is shown only where it would potentially affect land areas.

Light turboprop and propeller aircraft are in the same group "Propeller Aircraft" in the table. The No Action/No Project Alternative anticipates no modifications to the existing airfield or terminal complex other than minor improvements currently approved or in the planning stages. Relative to aircraft noise patterns, the most noticeable change from the 1996 baseline to the projected Year 2015 would be an anticipated concentration of international arrivals by heavy aircraft onto the north runway complex, with a commensurate shift of light jet and propeller aircraft from the north runway complex to the south runways to more efficiently manage arrival flows. Compared to the 1996 baseline conditions, these shifts result in a shrinkage of the noise contour pattern along the approach to the south runway complex east of the airport, balanced by an extension to the east of the noise contours along the approach to the north runways. In addition to the modifications of the contour pattern east of the airport, the noise pattern for the 2015 No Action/No Project Alternative is substantially narrower than the 1996 baseline contour pattern north and south of the airport. This contour narrowing is the result of the elimination of older, louder jet aircraft that were phased out of the operating fleet at the end of 1999. The noise exposure pattern for the No Action/No Project condition for the Year 2015 is presented as Figure F4.2-12, No Action/No Project Alternative 2015 vs. 1996 Baseline - Areas Newly Exposed, in Section 4.2, *Land Use*.

4.1.6.1.1.1 Comparison of No Action/No Project Alternative Aircraft Noise and Environmental Baseline

The gradual changes that are expected in the fleet mix and operations at the airport even without the proposed development program will result in differences between noise contours for 1996 baseline and 2015 No Action/No Project conditions. These differences are provided and notable for informational purposes only, and are not applicable to 'significance' findings for CEQA mitigation purposes. Appendix D, *Aircraft Noise Technical Report*, provides more information about these differences. The comparison of the contour patterns for the two conditions yields the following observations for 2015:

- Future aircraft noise contours west of the I-405 would be several hundred feet narrower than those of the 1996 baseline. This would be largely the result of the phase-out of older and noisier (FAR Part 36 Stage 2) aircraft from the operating mix of scheduled carriers. Straight-out departures to the coastline prior to turns would also reduce the land areas affected by aircraft noise. Reduced noise levels would result at the east end of the runways and along the runway sidelines.
- East of the I-405, the contours would be slightly longer along the approach to the north runways as a result of projected increases in international arrivals to that complex, particularly by wide body aircraft that are, individually, generally louder than the smaller jet aircraft that are relocated to the south

runway complex to provide a more efficient arrival flow. The contour along the approach to the north runways would also be wider than the 1996 baseline as a result of the increased use of wide-body airplanes.

- The noise pattern along the approach to the south runways would be slightly narrower and shorter than the 1996 baseline - a reflection of the shifting runway use patterns and the reduction of individual aircraft noise levels.

Table F4.1-11, Noise Exposure Effects - 2015 No Action/No Project Alternative with Comparisons to 1996 Baseline and Year 2000 Conditions, provides an overview of the land area, population, dwellings, and number of non-residential noise-sensitive parcels within the CNEL contours of the No Action/No Project Alternative, as well as the differences between these exposure levels and the 1996 baseline condition. In 2015, the No Action/No Project Alternative would result in a net reduction of the land area within the 65 CNEL contours, as well as the number of dwellings, population, and noise-sensitive public uses falling within the contours.

Table F4.1-11

Noise Exposure Effects - 2015 No Action/No Project Alternative with Comparisons to 1996 Baseline and Year 2000 Conditions

Noise Level Range	Total Acreage Over Land[4]	Off-Airport Area (Acres)[4]	Total Dwellings[1]	Estimated Population[1]	Non-Residential Noise-Sensitive Parcels
2015 No Action/No Project					
65-70 CNEL	2,771	2,096	11,100	31,900	53
70-75 CNEL	1,996	615	3,500	12,200	16
75 ≥ CNEL	1,946	37	60	230	2
65 ≥ CNEL	6,713	2,748	14,660	44,330	71
Change from 1996 Baseline[2]					
65-70 CNEL	-77	-499	-1,600	-3,200	0
70-75 CNEL	405	-5	-200	-300	-2
75 ≥ CNEL	-646	-159	-440	-1,170	-1
65 ≥ CNEL	-318	-663	-2,240	-4,670	-3
Change from Year 2000 Conditions[2,3]					
65-70 CNEL	-633	-898	-1,200	-3,400	-10
70-75 CNEL	472	225	-600	-1,600	-2
75 ≥ CNEL	-112	14	-340	-970	-1
65 ≥ CNEL	-273	-659	-2,140	-5,970	-13

1 Population and dwelling estimates have been rounded to the nearest hundred if greater than 1,000 and to the nearest 10 if less than 1,000.

2 A positive value indicates that the future alternative increases the number of impacts over the 1996 baseline or Year 2000 conditions; a negative number indicates that the future alternative decreases the number of impacts. The number indicates a net difference. Some areas would experience increased noise while other areas would experience a decrease in levels. Section 4.2, *Land Use*, details the number of impacts newly exposed to noise above 65 CNEL.

3 Population and dwelling unit information for the Year 2000 conditions is reported using a year 1990 census data base for CNEL comparisons with other alternatives.

4 Acreage totals may not add due to rounding.

Source: Landrum & Brown with Psomas, 2000 for environmental baseline comparisons; with PCR, 2002 for 2000 comparisons.

4.1.6.1.1.2 Comparison of No Action/No Project Alternative Aircraft Noise to Year 2000 Conditions

Differences between the future No Action/No Project Alternative and Year 2000 conditions are included in **Table F4.1-11** for information and comparison with the changes occasioned by the No Action/No Project Alternative from 1996 baseline conditions.

As is disclosed in Section 4.2, *Land Use*, by 2015, the contour pattern associated with the No Action/No Project Alternative leading to the south runways would shrink slightly from that of the Year 2000

conditions (Figure S2, No Action/No Project Alternative 2015 vs. Year 2000 Conditions Areas Newly Exposed, in Technical Report S-1, *Supplemental Land Use Technical Report)*, and remain almost entirely within the footprint of the Year 2000 conditions contour. The contour leading to the north runways would be approximately the same length, but slightly wider than that of the Year 2000 conditions. This broadening of the north approach contour is a result of the greater use of the north runways for arrivals by heavy aircraft. This shift will result in an area of residential land along the south side of the north approach being exposed to an increase of 1.5 decibels of CNEL.

The No Action/No Project Alternative would provide a net reduction of impacts within the 65 CNEL in all impact categories in comparison to Year 2000 conditions (**Table F4.1-11**). However, as indicated in **Table F4.1-12**, Comparative Noise Impact Changes - No Action/No Project Alternative (Compared to Year 2000 Conditions), approximately 4,000 persons in an estimated 1,300 dwellings would be newly exposed to noise greater than or equal to 65 CNEL by the alternative, as would 12 non-residential noise-sensitive parcels. These impacts are located principally along the south side of the approach to the north runway complex. That area also would be exposed to increases of 1.5 CNEL or more by the No Action/No Project Alternative. Within this area are an estimated 2,000 dwellings and approximately 5,700 residents, as well as 9 non-residential noise-sensitive parcels, including 4 schools, 4 churches, and a park.

Table F4.1-12

Comparative Noise Impact Changes - No Action/No Project Alternative (Compared to Year 2000 Conditions)

	Newly Exposed to ≥65 CNEL	Exposed to 1.5 CNEL Increase
Population	4,000	5,700
Dwelling Units	1,300	2,000
Non-Residential Noise-Sensitive Parcels		
Schools	6	4
Churches	5	4
Hospitals	0	0
Convalescent Hospitals	0	0
Parks	1	1
Libraries	0	0
Total Non-Residential Noise-Sensitive Parcels	**12**	**9**

Source: Landrum & Brown with PCR, 2002.

The shift of the noise contours associated with the No Action/No Project Alternative in 2015, when compared to the Year 2000 conditions, would result in the removal of 9,970 persons, 3,440 dwellings, and 25 noise sensitive public facilities from the area exposed to noise greater than or equal to 65 CNEL.

4.1.6.1.1.3 Comparison of No Action/No Project Alternative Aircraft Noise and 1996 Baseline and Year 2000 Conditions Single Event Effects

Single event noise impacts for the 2015 No Action/No Project condition were evaluated.

4.1.6.1.1.3.1 Nighttime Awakenings

The pattern of single event noise sufficient to result in the awakening of 10 percent of the residents at an average frequency of once every ten days is provided in Figure SB-1, No Action/No Project Alternative 2015 94 SEL vs. ANMP Areas Newly Exposed**,** in Attachment B of Technical Report S-1, *Supplemental Land Use Technical Report*. Based on FAA runway use criteria, SIMMOD results and best aviation planning principles the proportion of easterly departures projected for future conditions at night is greater than has occurred at the airport during recent years, and because departing aircraft are expected to turn to the right after takeoff, the area of exposure of the No Action/No Project Alternative is substantially larger than the areas included within the 94 dBA SEL contour for both 1996 baseline and Year 2000 conditions (as provided in subsection 4.1.3.1.3.1), the numbers of newly exposed dwellings within the contour and projected number of newly exposed persons that could be awakened on any given night are

substantial. **Table F4.1-13,** Single Event Noise Effects on Awakenings - No Action/No Project Alternative Compared to the 1996 Baseline and Year 2000 Conditions, provides a comparison of the relationship between the single event awakenings impacts projected for the No Action/No Project Alternative and baseline and Year 2000 conditions.

Table F4.1-13

Single Event Noise Effects on Awakenings - No Action/No Project Alternative Compared to the 1996 Baseline and Year 2000 Conditions

Impact Category	No Action/No Project Alternative Impact[1]	Newly Exposed		
		Against 1996 Baseline[1]	Against Year 2000 Conditions[2]	Against 1992 ANMP Contour[1]
Exposure ≥ 94 dBA (SEL)				
Number of Dwellings	18,400	6,100	6,200	4,000
Estimated Population	57,700	18,100	18,500	12,600

[1] Impacts for the total population and dwellings within the 94 dBA SEL contour, as well as for newly exposed comparisons to the 1996 baseline and the 1992 ANMP contour are developed using 1990 census data.

[2] Impacts for comparisons of the total population and dwellings newly exposed comparisons to the Year 2000 conditions data are developed using Year 2000 census data.

Note: While the total number of persons and/or dwellings located within the 94 dBA SEL contour may approximate the total numbers present in environmental baseline or Year 2000 conditions, the shift of the location of the 94 dBA SEL contour among the various conditions assessed results in several thousand dwellings (with their associated population) being removed from within the 94 dBA SEL contour for the current conditions, while another large number of dwellings would newly fall within the 94 dBA SEL contour of the future No Action/No Project condition. The great majority of these dwellings fall between the approaches to the north and south runway complexes east of the airport.

Source: Landrum & Brown with PCR, 2002.

The shift of the 94 dBA SEL noise contours associated with the No Action/No Project Alternative in 2015, when compared to the 1996 baseline condition, would result in the removal of 14,700 persons and 6,500 dwellings from within the contour. Compared to the Year 2000 conditions, the No Action/No Project Alternative 94 dBA SEL contour pattern would remove 11,600 persons and 3,300 dwellings from within the area exposed to noise significant nighttime single event noise levels.

The substantial portion of the difference between the No Action/No Project Alternative impacts and those of the baseline (and ANMP) conditions lie between the approaches west of La Brea Avenue, along the south side of the approach to the north runway complex, and under and along a takeoff path leading to the east from the north runways and turning to the right over Hollywood Park.

4.1.6.1.1.3.2 School Disruption

The numbers of schools that would exceed the various noise exposure levels for classroom disruption by single event aircraft noise for the No Action/No Project Alternative are presented in **Table F4.1-14,** Schools Exposed to Various Interior Single Event Noise Levels - No Action/No Project Alternative Compared to the 1996 Baseline and Year 2000 Conditions. These impacts for the No Action/No Project Alternative are provided as a quantitative and qualitative benchmark comparison only. It is notable that the number of schools projected to be impacted in 2015 is fewer than are affected in both 1996 baseline and Year 2000 conditions, but the number of individual events would increase at the schools affected in future years. Table S-31, Average Daily Minutes Above Threshold, Average Number of Daily Events and Average Event Duration (in Seconds) Above 55 Interior dBA Speech Interference Levels, in Appendix S-C1, *Supplemental Aircraft Noise Technical Report*, provides the average of each loud event, under 1996 baseline and Year 2000 conditions, and under the various project alternatives for 2015. Against the 1996 Baseline two schools would be newly exposed above 55 Interior dBA Speech Interference Levels, no schools would be newly exposed above 65 Interior dBA Speech Interference Levels. Also, the table indicates slight changes in the average duration of each loud event from 1996 baseline and Year 2000 conditions to 2015. The names and locations of the affected schools that would be newly exposed to

high noise levels and the mitigation of single event noise levels at specific schools are discussed in Section 4.2, *Land Use*.

Table F4.1-14

Schools Exposed to Various Interior Single Event Noise Levels - No Action/No Project Alternative Compared to the 1996 Baseline and Year 2000 Conditions

Impact Category	No Action/ No Project Alternative Impact	Against 1996 Baseline		Against Year 2000 Conditions	
		Net Change	Newly Exposed	Net Change	Newly Exposed
Exposure ≥ 55 dBA (L_{max})					
Number of Public Schools	9	-5	1	-2	1
Number of Private Schools	11	-3	1	-4	1
Average Number of Events/School	40	+17	NA	+12	NA
Average Seconds/Event	3	0	NA	0	NA
Exposure ≥ 65 dBA (L_{max})					
Number of Public Schools	1	0	0	0	0
Number of Private Schools	0	-1	0	-2	0
Exposure ≥ 35 dBA ($L_{eq(h)}$)					
Number of Public Schools	11	0	1	0	0
Number of Private Schools	15	+2	5	+4	5

Note: The number of average events above 65 dBA L_{max} (interior) was generally less than 3 and their duration was less than 3 seconds each.

Source: Landrum & Brown with Psomas, 1999 and Landrum & Brown with PCR, 2002.

The assessment of the number of schools that would experience interior dBA $L_{eq(h)}$ levels in excess of 35 decibels in the classroom suggests that five or six schools would be newly exposed to this level for the No Action/No Project future condition as measured against the 1996 Baseline and Year 2000 conditions, respectively. The names and locations of these affected schools that would be newly exposed to high noise levels are addressed in Section 4.2, *Land Use*.

4.1.6.1.2 Alternative A - Added Runway North

Alternative A proposes to provide, by 2015, a new third runway in the north airfield complex. The construction of new Runway 6L/24R, with extensions and/or relocations of the four existing runways, would result in substantial changes in the noise exposure pattern at the airport. The aviation activity associated with this alternative is provided earlier in Table F3-1, Summary of Activity by Alternative - 2015, **Table F4.1-9,** and **Table F4.1-10**. The noise exposure impacts associated with the development of Alternative A are provided in **Table F4.1-15**, Noise Exposure Effects - 2015 Alternative A, With Comparisons to 1996 Baseline, Year 2000 Conditions, and 2015 No Action/No Project Alternative Conditions.

Table F4.1-15

Noise Exposure Effects - 2015 Alternative A With Comparisons to 1996 Baseline, Year 2000 Conditions, and 2015 No Action/No Project Alternative Conditions

Noise Level Range	Total Acreage Over Land[4]	Off-Airport Area (Acres)[4]	Total Dwellings[1]	Estimated Population[1]	Non-Residential Noise-Sensitive Parcels
2015 Alternative A					
65-70 CNEL	2,791	2,198	10,900	32,200	59
70-75 CNEL	1,982	662	3,700	11,900	17
75 ≥ CNEL	2,132	69	90	280	3
65 ≥ CNEL	6,905	2,928	14,690	44,380	79
Change from 1996 Baseline[2]					
65-70 CNEL	-57	-397	-1,800	-2,900	6
70-75 CNEL	391	41	0	-600	-1
75 ≥ CNEL	-460	-128	-410	-1,120	0
65 ≥ CNEL	-127	-483	-2,210	-4,620	5
Change from Year 2000 Conditions[2,3]					
65-70 CNEL	-613	-796	-1,400	-3,100	-3
70-75 CNEL	458	272	-400	-1,900	-1
75 ≥ CNEL	74	46	-310	-970	0
65 ≥ CNEL	-81	-479	-2,110	-5,920	-4
Change from No Action/No Project					
65-70 CNEL	20	102	-200	300	6
70-75 CNEL	-14	47	200	-300	1
75 ≥ CNEL	186	32	30	50	1
65 ≥ CNEL	192	180	30	50	8

[1] Population and Dwelling estimates have been rounded to the nearest hundred if greater than 1,000 and to the nearest 10 if less than 1,000.

[2] A positive value indicates that the future alternative increases the number of impacts over the environmental baseline or Year 2000 conditions; a negative number indicates that the future alternative decreases the number of impacts. The number indicates a net difference. Some areas would experience increased noise while other areas would experience a decrease in levels. Section 4.2, *Land Use*, details the number of impacts newly exposed to noise above 65 CNEL.

[3] Population and dwelling unit information for the Year 2000 conditions is reported using a year 1990 census data base for CNEL comparisons with other alternatives.

[4] Acreage totals may not add due to rounding.

Source: Landrum & Brown with Psomas, 2000 for environmental baseline comparisons; with PCR, 2002 for 2000 comparisons.

The changes to the airport's layout and operation under Alternative A that would most substantially change the noise exposure pattern shown in Figure F4.2-18, Alternative A 2015 vs. No Action/No Project Alternative - Areas Newly Exposed, in Section 4.2, *Land Use,* are addressed below:

- New airfield facilities to accommodate a growth from 2,119 operations under the No Action/No Project Alternative to 2,515 under Alternative A, and a major increase of heavy jet aircraft.
- An anticipated shift of 13 percent of the landings by heavy jet aircraft and 45 percent of the propeller aircraft landings from the south runways to the north complex. The intent is to maximize the operational efficiency of the airfield by reducing delays between heavy and light aircraft.
- New Runway 6L/24R with a centerline 400 feet north of the existing Runway 24R centerline. The east end of the new runway would be approximately 1,500 feet west of the existing 24R end and its west end would lie approximately 600 feet east of the current Runway 6L end, providing a full length of 6,700 feet.

The first of these factors would result in a general increase in the overall size of the noise contour over No Action/No Project conditions for the year 2015 by the simple creation of more total noise energy within the airport environs on the average day due to more operations, particularly by heavy jet aircraft (those jets weighing more than 300,000 pounds and principally including wide-body aircraft). Secondly, the pattern of noise exposure would be shifted to increase aircraft noise under the approaches from the east to the

north airfield, due to the increase in operations to two runways, rather than one, there. Noise would be reduced east of the south runways as a result of the transfer of heavy jet arrivals to the north runways.

To take advantage of the presence of new Runway 24R, many propeller aircraft operations would shift from the south to north side of the airport. This would not generate substantial changes to the noise contour pattern north of the airport, but would increase the number of noise events near the Westchester area. Landings by jet aircraft on new Runway 24R, combined with the additional total operations allowed by three independent approaches, would widen the contour by 200 to 300 feet to the north from aircraft reversing their thrust to slow to safe speeds after landing.

- Relocated Runway 6L/24R, moved southward by 400 feet from its present alignment to become Runway 6C/24C. Its length would be 12,000 feet. Its east end would be extended 3,075 feet east of the present end of Runway 24R.

The relocation of the runway to the south would move noise farther from Westchester. The relocation of its east end by a half mile to the east would shift eastward the areas exposed to reverse thrust and to the aircraft that initiate takeoff power at the east end of the runway (although fewer than those that reverse thrust). The eastward shift of the runway would also move the landing threshold to the east. This would lower the path for the final approach to the runway by approximately 150 feet within three miles of the airport and where noise would be increased.

- Relocated Runway 6R/24L. Located 500 feet south of its present alignment, 1,715 feet to the east to provide a full length of 12,000 feet.

This relocation would move noise on the runway farther from the residential areas to the north. This runway would be the primary departure runway in the north airfield complex, and the eastward shift from its departure end would shift to the east a bulge in the noise contours associated with the initiation of takeoff power. While this shift would reduce noise west of Sepulveda Boulevard, areas east of Sepulveda would experience a significant increase in noise exposure compared with No Action/No Project conditions.

- Reconstructed Runway 7L/25R on its present centerline, but at a length of 12,000 feet to balance its utilization with the north airfield.
- Relocated Runway 7R/25L on a centerline 156 feet south of its present alignment with a finished length of 12,000 feet. Its west end would retain the present east/west location, and the east end would be extended 905 feet to the east of the present runway end.

The reconstruction of Runway 7L/25R would have no substantial effect on the noise exposure pattern east or south of the south runways. The relocation of Runway 7R/25L to the south would shift noise to the south by 156 feet, and individual events on the runway would be slightly louder, particularly at locations along Imperial Highway.

- Relocation of aircraft maintenance run-up activity to locations between the runways into ground run-up facilities constructed at these locations.
- Installation of fixed ground power and/or air conditioning service at each aircraft parking position at the terminals.

The consolidation of maintenance run-up activity at locations between the runways and the construction of ground maintenance run-up enclosures would reduce noise levels so that they do not affect the noise contours off the airport. Stationary power sources at the parking positions would eliminate the need for portable generators at each aircraft location and the noise associated with their use.

- Develop instrument departure procedures that guide all westerly departures to the coastline before initiating turns.

The use of advanced Flight Management System (FMS) and/or Global Positioning System (GPS) navigation procedures to better direct departing aircraft along straight-out courses from the runways until reaching the coast would reduce the breadth of the contour pattern north and south of the airport, west of the runway mid-points, by reducing the degree of dispersion along the departure path between takeoff and 3,000 feet altitude. After the runways are relocated in the long-term, these procedures would be redeveloped for the new runway end points.

- Construction of high-speed exits from arrival runways.

This measure is incorporated into the Master Plan configuration to enhance the efficiency of traffic flow, but would also reduce the time an aircraft remains on the runway and require less application of reverse thrust to slow the aircraft. As the aircraft exits the runway toward the interior of the airfield, it would move away from the adjacent residential areas north and south of the complex, thus reducing the noise levels from the arrivals.

4.1.6.1.2.1 Comparison of Alternative A Noise to Environmental Baseline Condition

Differences between the build alternative and the environmental baseline are identified in this section to comply with the comparative requirements set forth by CEQA. **Table F4.1-15** provides the net statistical differences between the build alternative and the environmental baseline, while Figure F4.2-16, Alternative A 2015 vs. 1996 Baseline - Areas Newly Exposed, in Section 4.2, *Land Use*, graphically displays the locations where the noise exposure patterns differ. Mitigation actions are discussed in greater detail in subsection 4.1.8, and in Section 4.2, *Land Use.*

By 2015, the contour pattern leading to the south runways would shrink by about 2,800 feet from that of the environmental baseline (see Figure F4.2-16). The contour leading to the north runways would be about 6,800 feet longer. West of the I-405, and particularly along the south side of the noise exposure pattern where departure noise would be predominant, the contours of Alternative A would be as much as 1,500 feet narrower than the environmental baseline. Along the north side of the contour pattern, the noise level would be narrowed by 200 to 900 feet, except in the area immediately north of the relocated east ends of the north runways. The enlargement of the pattern east of the I-405 would be associated with the increased number of operations accommodated by the alternative and the shift of approach traffic from the south to the north runways. The lower noise levels west of the freeway would result from the elimination of older, marginal Stage 3 aircraft from the commercial fleet.

Alternative A would provide a net reduction of impacts within the 65 CNEL in most categories in comparison to environmental baseline conditions (see **Table F4.1-15**). However, as indicated in **Table F4.1-16**, Significant CEQA Noise Impacts - Alternative A (Compared to Environmental Baseline Conditions), approximately 10,310 persons in an estimated 3,930 dwellings would be newly exposed to noise above 65 CNEL by the alternative in 2015, as would 33 non-residential noise-sensitive parcels. These significant impacts are located principally along the approach to the north runway complex. Additionally, the entire area within the 65 CNEL contour along the approach to the north runway complex would be exposed to significant increases of 1.5 CNEL or more by the alternative. Within this area are an estimated 6,880 dwellings and approximately 18,300 residents, as well as 45 non-residential noise-sensitive parcels, including 17 schools, 19 churches, 5 parks, 2 convalescent hospitals, a hospital, and a library. (Identification of and mitigation for these facilities is discussed in detail in subsections 4.2.6.2 and 4.2.8, *Land Use.*). Additionally, in 2015, 19 non-residential noise-sensitive parcels and 4 regular grid-point sites would be exposed to increases from environmental baseline levels by 3 CNEL or more within the 60-65 CNEL range, and 16 non-residential noise-sensitive parcels and 11 regular grid-points would be exposed to increases of 5 CNEL or more at levels below 60 CNEL. In both cases, the regular grid-points are located in residential areas outside the 65 CNEL contour.

Table F4.1-16

Significant CEQA Noise Impacts - Alternative A
(Compared to Environmental Baseline Conditions)

	Newly Exposed to 65 CNEL	Exposed to 1.5 CNEL Increase
	2015	2015
Population	10,310	18,300
Dwelling Units	3,930	6,880
Non-Residential Noise-Sensitive Parcels		
Schools	11	17
Churches	12	19
Hospitals	1	1
Convalescent Hospitals	2	2
Parks	6	5
Libraries	1	1
Total	**33**	**45**

Source: Landrum & Brown with Psomas, 2000.

4.1.6.1.2.2 Comparison of Alternative A Aircraft Noise to Year 2000 Conditions

Differences between Alternative A and Year 2000 conditions are included in **Table F4.1-15** for information and comparison with the changes occasioned by Alternative A from 1996 baseline and future No Action/No Project Alternative conditions.

As is disclosed in Section 4.2, *Land Use*, by 2015, the contour pattern associated with Alternative A leading to the south runways would shrink slightly from that of the Year 2000 conditions (Figure S4, Alternative A 2015 vs. Year 2000 Conditions - Areas Newly Exposed, in Technical Report S-1, *Supplemental Land Use Technical Report),* and remain almost entirely within the footprint of the Year 2000 conditions contour. The 65 CNEL contour leading to the north runways would be approximately 4,200 feet longer. More importantly, the contour would be shifted southward along the full length of the northerly approach by 500 feet with the relocation of Runway 6R/24L by that distance to the south. This shift would result in a large area of residential land exposed to an increase of 1.5 decibels of CNEL. West of the I-405, and particularly along the south side of the noise exposure pattern where departure noise would be predominant, the contours of Alternative A would be 200 to 400 feet narrower than those of the Year 2000 conditions. Along the north side of the contour pattern, the noise contour would be narrowed slightly, except in the area immediately north of the relocated east ends of the north runways in the vicinity of La Tijera Boulevard. The enlargement of the pattern east of the I-405 also would be associated with the increased number of operations accommodated by Alternative A and the shift of approach traffic from the south to the north runways. The lower noise levels west of the I-405 would result from the elimination of older, marginal Stage 3 aircraft from the commercial fleet.

Alternative A would provide a net reduction of impacts within the 65 CNEL contour in most categories in comparison to Year 2000 conditions (**Table F4.1-15**). However, as indicated in **Table F4.1-17**, Comparative Noise Impact Changes - Alternative A (Compared to Year 2000 Conditions), approximately 9,100 persons in an estimated 3,300 dwellings would be newly exposed to noise greater than or equal to 65 CNEL by Alternative A, as would 21 non-residential noise-sensitive parcels. These impacts are located principally along the approach to the north runway complex. Additionally, the entire area within the 65 CNEL contour along the south side of the approach to the north runway complex would be exposed to increases of 1.5 CNEL or more by the alternative. Within this area are an estimated 4,700 dwellings and approximately 13,400 residents, as well as 27 non-residential noise-sensitive parcels, including 12 schools, 8 churches, 6 parks, and a hospital.

The shift of the noise contours associated with Alternative A in 2015, when compared to the Year 2000 conditions, would result in the removal of 15,020 persons, 5410 dwellings and 26 noise sensitive public facilities from the area exposed to noise greater than or equal to 65 CNEL.

Table F4.1-17

Comparative Noise Impact Changes - Alternative A
(Compared to Year 2000 Conditions)

	Newly Exposed to ≥ 65 CNEL	Exposed to 1.5 CNEL Increase
Population	9,100	13,400
Dwelling Units	3,300	4,700
Non-Residential Noise-Sensitive Parcels		
Schools	8	12
Churches	8	8
Hospitals	1	1
Convalescent Hospitals	0	0
Parks	4	6
Libraries	0	0
Total Non-Residential Noise-Sensitive Parcels	**21**	**27**

Source: Landrum & Brown with PCR, 2002.

4.1.6.1.2.3 Comparison of Alternative A Aircraft Noise Exposure and 2015 No Action/No Project Conditions (FAA/FICON Comparisons)

The comparison of the conditions under the various build alternatives in 2015 to the No Action/No Project conditions for 2015 is provided for NEPA purposes and evaluated against federal compatibility standards. In the case of Alternative A, by Figure F4.2-18, Alternative A 2015 vs. No Action/No Project Alternative - Areas Newly Exposed, Alternative A would result in approximately the same level of impacts within the 65 CNEL contour as future No Action/No Project conditions. However, redistribution of the noise pattern would result in impacts which exceed the federal compatibility standard. Figure F4.2-18 illustrates the potential effects that the projects would have on the noise patterns in the community. Disclosure of these effects is required by NEPA, as set forth in FAA guidance prescribed in FAA Order 5050.4A. The FAA uses this information regarding differences between Alternative A and the future No Action/No Project conditions during its consideration of potential mitigation, such as noise abatement flight procedures should be considered. **Table F4.1-15** provides the total off-airport area, dwellings, population, and non-residential noise-sensitive parcels that fall within the noise contours for Alternative A, as well as a comparison with the No Action/No Project and environmental baseline conditions.

Table F4.1-18, NEPA Noise Impacts - Alternative A (Compared to No Action/No Project Conditions), discloses the population, dwellings, and non-residential noise-sensitive parcels that would be, as a result of the build alternative, newly exposed to noise in excess of 65 CNEL when compared with the No Action/No Project Alternative or experience increases of 1.5 CNEL within the 65 CNEL contour. Mitigation actions for these impacts are discussed in greater detail in subsection 4.1.8 and in Section 4.2, *Land Use.*

Table F4.1-18

NEPA Noise Impacts - Alternative A
(Compared to No Action/No Project Conditions)

	Newly Exposed to 65 CNEL	Exposed to 1.5 CNEL Increase
	2015	2015
Population	9,370	16,040
Dwelling Units	3,520	6,230
Non-Residential Noise-Sensitive Parcels		
Schools	9	11
Churches	9	11
Hospitals	1	1
Convalescent Hospitals	2	0
Parks	8	6
Libraries	1	0
Total	**30**	**29**

Source: Landrum & Brown with Psomas, 2000.

Figure F4.2-18, Alternative A 2015 vs. No Action/No Project Alternative - Areas Newly Exposed, illustrates the noise exposure pattern of Alternative A for the year 2015, compared to the pattern for the No Action/No Project condition of the same year. Several differences are notable.

- An elongated and widened noise pattern leading to the north airfield complex under approaches from the east.

The third approach from the east to the north runways would result in a larger percentage of all approaches over areas east of that complex. Furthermore, the general increase in operational levels and the assignment of a larger proportion of heavy jets to the north complex to increase their separation from light jets and propeller aircraft approaches would generate more frequent operations by the louder, heavy jet aircraft in the area. The easterly relocation of the landing thresholds would also contribute to the easterly shift of the noise pattern. Consequently, much of the area within this portion of the noise contour would be increased by 1.5 CNEL or more along the approach path to Runway 24C from No Action/No Project levels.

- A shortened noise exposure pattern leading to the south airfield complex from the east.

As the noise contour east of the north runways would be enlarged, the contour east of the south runways would be shortened by approximately 2,200 feet from No Action/No Project conditions. While the reassignment of approaches from the south to the north complex would be responsible for this reduction, the increase in total operations would offset most of the reduction. The southerly shift of the outboard arrival runway would substantially increase noise levels along the south side of the approach just east of the San Diego Freeway.

- A relocated bulge associated with takeoff power application from Runways 24L/C.

The relocation of the east end of Runway 24L by 1,715 feet east of its present location would shift the bulge of the noise pattern along the north side of the airport. Along the north side of the contour, east of Sepulveda Boulevard, the noise levels would substantially increase between La Tijera Boulevard and the San Diego Freeway; west of Sepulveda Boulevard, they would be reduced slightly. The change of runway end does not result in equal changes in noise exposure because the build condition includes a new runway and nearly 20 percent more operations than the No Action/No Project case.

- A narrower contour along north side of the airport, west of Lincoln Boulevard.

West of Lincoln Boulevard on the north side of the airport, noise levels would be slightly reduced by the southward relocation of the primary departure runway in the north airfield complex. Even though new Runway 24R would be located closer to Westchester, the departure noise from Runway 24L would dominate in the area.

By 2015, the differences between the CNEL patterns of Alternative A and the No Action/No Project case would result in significant increases of noise exposure (1.5 CNEL or more) on:

- 707 acres of noise-sensitive use off the airport, but located within the 65 CNEL contour.
- An estimated 6,230 dwellings with approximately 16,040 residents.
- 29 non-residential noise-sensitive parcels, including 11 schools, 11 churches, a hospital, and 6 parks.

Additionally, approximately 3,520 dwellings, housing an estimated 9,370 persons, and 30 non-residential noise-sensitive parcels would be newly exposed to noise above 65 CNEL by the alternative, when compared to the No Action/No Project condition for 2015. Six noise-sensitive non-residential parcels (two churches, two schools, a hospital, and a nursing home) would be exposed to increases of 3 CNEL within the 60-65 CNEL contour. No such uses would be exposed to increases of 5 CNEL at levels of less than 60 CNEL.

All noise exposure categories in 65 CNEL would be increased from No Action/No Project conditions by Alternative A (**Table F4.1-15**). Exposures on properties that would be acquired for noise abatement or airport development if the alternative is initiated are excluded from the data.

4.1.6.1.2.4 Comparison of Alternative A Aircraft Noise and 1996 Baseline and Year 2000 Conditions Single Event Effects

Single event noise impacts for the 2015 Alternative A condition were evaluated.

4.1.6.1.2.4.1 Nighttime Awakenings

The pattern of Alternative A single event noise sufficient to result in the awakening of 10 percent of the residents at an average frequency of once every ten days is provided in Figure F4.2-35**,** Alternative A 2015 94 dBA SEL vs. ANMP - Areas Newly Exposed, in Section 4.2, *Land Use*. Because the easterly departures projected for future conditions at night are expected to turn to the right nearer the airport than has been the case during recent years, the area of exposure of Alternative A is substantially larger than the areas included within the 94 dBA SEL contour for both the 1996 baseline and Year 2000 conditions (as provided in subsection 4.1.3.1.3.1), the numbers of newly exposed dwellings within the contour and projected number of newly exposed persons that could be awakened on any given night are substantially increased from 1996 baseline and Year 2000 conditions, as well as from the area included within LAWA's Aircraft Noise Mitigation Program boundary. **Table F4.1-19,** Single Event Noise Effects on Awakenings - Alternative A Compared to the 1996 Baseline and Year 2000 Conditions, provides a comparison of the relationship between the single event awakenings impacts projected for Alternative A and baseline and Year 2000 conditions.

Table F4.1-19

Single Event Noise Effects on Awakenings - Alternative A Compared to the 1996 Baseline and Year 2000 Conditions

Impact Category	Alternative A Impact[1]	Newly Exposed		
		Against 1996 Baseline[1]	Against Year 2000 Conditions[2]	Against 1992 ANMP Contour[1]
Exposure ≥ 94 dBA (SEL)				
Number of Dwellings	17,300	6,800	6,000	5,000
Estimated Population	58,300	21,900	20,800	16,900

[1] Impacts for the total population and dwellings within the 94 SEL contour, as well as for newly exposed comparisons to the 1996 baseline and the 1992 ANMP contour are developed using 1990 census data.

[2] Impacts for comparisons of the total population and dwellings newly exposed comparisons to the Year 2000 conditions data are developed using Year 2000 census data.

Note: While the total number of persons and/or dwellings located within the 94 SEL contour may approximate the total numbers present in environmental baseline or Year 2000 conditions, the shift of the location of the 94 SEL contour among the various conditions assessed results in several thousand dwellings (with their associated population) being removed from within the 94 SEL contour for the current conditions, while another large number of dwellings would newly fall within the 94 SEL contour of the future Alternative A condition. The great majority of these dwellings fall between the approaches to the north and south runway complexes east of the airport and under the approach to the proposed new north runway.

Source: Landrum & Brown with PCR, 2002.

The shift of the 94 dBA SEL noise contours associated with Alternative A in 2015, when compared to the 1996 baseline condition, would result in the removal of 17,900 persons and 8,300 dwellings from within the contour. Compared to the Year 2000 conditions, the Alternative A 94 dBA SEL contour pattern would remove 13,300 persons and 4,200 dwellings from within the area exposed to noise significant nighttime single event noise levels.

The substantial portion of the difference between Alternative A impacts and those of the baseline and ANMP conditions lies between the approaches west of La Brea Avenue, along the south side of the approach to the north runway complex, along the northeast side of the airport where departures to the east use takeoff power for their initial climbs, as well as under a takeoff path leading to the east from the south runways and turning to the right over southern Inglewood. A methodology for mitigation of single event noise effects on awakenings is presented in subsection 4.1.8.1 and in Section 4.2, *Land Use* (subsection 4.2.8). Under CEQA thresholds of significance established by LAWA in response to the *Berkeley Jets* ruling relative to single event impacts, such impacts are significant. There are no NEPA standards for single event noise effects on awakenings.

4.1.6.1.2.4.2 School Disruption

The numbers of schools that would exceed the temporary thresholds of significance for classroom disruption by single event aircraft noise related to Alternative A are presented in **Table F4.1-20,** Schools Exposed to Significant Interior Single Event Noise Levels - Alternative A Compared to the 1996 Baseline and Year 2000 Conditions. Approximately the same total number of schools are projected to be impacted in 2015 as is the case for current (1996 baseline and Year 2000) conditions, but the shift of the single event noise exposure pattern would result in 10 schools being newly exposed to disruptive noise levels above 55 decibels of interior noise and one school being newly exposed to disruptive noise levels above 65 decibels of interior noise when compared to both 1996 baseline and Year 2000 conditions. The names and locations of these affected schools that would be newly exposed to high noise levels are provided in Section 4.2, *Land Use*. Additionally, the average number of individual events at each school would increase by 2015. The average duration of each loud event is not expected to change with time.

Table F4.1-20

Schools Exposed to Significant Interior Single Event Noise Levels - Alternative A Compared to the 1996 Baseline and Year 2000 Conditions

		Against 1996 Baseline		Against Year 2000 Conditions	
Impact Category	**Alternative A Impact**	**Net Change**	**Newly Exposed**	**Net Change**	**Newly Exposed**
Exposure ≥ 55 dBA (L_{max})					
Number of Public Schools	12	-2	5	+1	5
Number of Private Schools	13	-1	5	-2	5
Average Number of Events/School	36	+13	NA	+8	NA
Average Seconds/Event	3	0	NA	0	NA
Exposure ≥ 65 dBA (L_{max})					
Number of Public Schools	0	0	0	-1	0
Number of Private Schools	1	-1	1	-1	1
Exposure ≥ 35 dBA ($L_{eq(h)}$)					
Number of Public Schools	13	+2	3	+2	2
Number of Private Schools	16	+3	6	+3	6

Note: The number of average events above 65 dBA L_{max} (interior) was generally less than 3 and their duration was less than 3 seconds each.

Source: Landrum & Brown with Psomas, 1999 and Landrum & Brown with PCR, 2002.

The assessment of the number of schools that would experience interior dBA $L_{eq(h)}$ levels in excess of 35 decibels in the classroom suggests Alternative A would newly expose nine or eight schools to noise above this threshold of significance for the Alternative A future condition, as measured against the 1996 baseline and Year 2000 conditions respectively. The names and locations of these affected schools that would be newly exposed to high noise levels and the mitigation of single event noise levels at specific schools is discussed in Section 4.2, *Land Use*.

4.1.6.1.3 Alternative B - Added Runway South

Alternative B proposes to provide, by 2015, a third runway in the south airfield complex. The construction of new Runway 7R/25L, accompanied by extensions and/or relocations of the four existing runways would result in substantial changes in the noise exposure pattern at the airport. The aviation activity associated with this alternative is provided earlier in Table F3-1, Summary of Activity by Alternative - 2015, **Table F4.1-9,** and **Table F4.1-10**. The noise exposure impacts associated with the development of Alternative B are provided in **Table F4.1-21**, Noise Exposure Effects - 2015 Alternative B With Comparisons to 1996 Baseline, Year 2000 Conditions, and 2015 No Action/No Project Alternative Conditions.

Table F4.1-21

Noise Exposure Effects - 2015 Alternative B With Comparisons to 1996 Baseline, Year 2000 Conditions, and 2015 No Action/No Project Alternative Conditions

Noise Level Range	Total Acreage Over Land[4]	Off-Airport Area (Acres)[4]	Total Dwellings[1]	Estimated Population[1]	Non-Residential Noise-Sensitive Parcels
2015 Alternative B					
65-70 CNEL	3,553	3,068	15,000	44,800	78
70-75 CNEL	2,183	1,065	4,500	15,600	19
75 ≥ CNEL	2,328	65	190	430	5
65 ≥ CNEL	8,063	4,198	19,690	60,830	102
Change from 1996 Baseline[2]					
65-70 CNEL	704	473	2,300	9,700	25
70-75 CNEL	592	445	800	3,100	1
75 ≥ CNEL	-264	-131	-310	-970	2
65 ≥ CNEL	1,032	786	2,790	11,830	28
Change from Year 2000 Conditions[2,3]					
65-70 CNEL	149	74	2,700	9,500	15
70-75 CNEL	659	675	400	1,800	1
75 ≥ CNEL	270	42	-210	-770	2
65 ≥ CNEL	1,077	791	2,890	10,530	18
Change from No Action/No Project					
65-70 CNEL	781	971	3,900	12,900	25
70-75 CNEL	187	450	1,000	3,400	3
75 ≥ CNEL	382	28	130	200	3
65 ≥ CNEL	1,351	1,449	5,030	16,500	31

1 Population and Dwelling estimates have been rounded to the nearest hundred if greater than 1,000 and to the nearest 10 if less than 1,000.

2 A positive value indicates that the future alternative increases the number of impacts over the environmental baseline or Year 2000 conditions; a negative number indicates that the future alternative decreases the number of impacts. The number indicates a net difference. Some areas would experience increased noise while other areas would experience a decrease in levels. Section 4.2, *Land Use*, details the number of impacts newly exposed to noise above 65 CNEL.

3 Population and dwelling unit information for the Year 2000 conditions is reported using a year 1990 census data base for CNEL comparisons with other alternatives.

4 Acreage totals may not add due to rounding.

Source: Landrum & Brown with Psomas, 2000 for environmental baseline comparisons; with PCR, 2002 for 2000 comparisons.

The increase in operations under Alternative B by 2015 would result in a general increase in the noise energy present on the average day in the airport environs. Figure F4.2-22, Alternative B 2015 vs. No Action/No Project Alternative - Areas Newly Exposed, illustrates the noise pattern and the many areas in which it differs from the No Action/No Project condition. The number of average daily operations accommodated by the alternative is nearly 20 percent greater than under the No Action/No Project condition. The proportion of the average daily fleet composed of heavy aircraft would increase from 17 percent under the environmental baseline to 35 percent under this alternative. The noise levels of heavy aircraft during landing exceed those of light jets and propeller aircraft by several decibels, and thus the average loudness of arrivals would increase. Other elements of Alternative B that contribute to changes in noise exposure are discussed below.

- Shifted runway usage patterns - 85 percent of all light jets and nearly all propeller aircraft use the south runways for landing, while nearly three-fourths of all heavy jets would use the north runways.

To the east of the north runways, the approach noise contour would be lengthened from No Action/No Project conditions by about 6,800 feet. This lengthening would be a combined effect of the greater number of heavy aircraft using the runway and the extension of Runway 24L to the east by nearly 3,000 feet (described below). North of the airport and west of Sepulveda Boulevard, noise exposure would be increased above the No Action/No Project Alternative due to westerly takeoffs and the redistribution of the louder, heavy jet aircraft to the north runways.

- New Runway 7R/25L on a centerline 2,500 feet south of the end of new Runway 25R on a three-degree converging alignment with Runway 25R.

The new runway would be used for arrivals in west flow and departures in east flow so as not to conflict with operations on the relocated existing runways. Its alignment would introduce aircraft noise above 65 CNEL into areas not previously affected, but it would also provide an additional approach to the south runways, leading to the redistribution of arrival traffic to the south runways. It would be expected that the continued and increased use of the north runways for most approaches by heavy jets would ameliorate some of the potential increase of noise east of the south runways. However, the approaches to the south complex would increase from 519 per day in No Action/No Project conditions to 797 with Alternative B. The use of the third runway in the south runway complex would also contribute to noise level increases of several CNEL in that area.

The proposed approach course to new Runway 25L would parallel the approach to Runway 25C until the aircraft would be approximately 1.5 miles from the runway end, at which time it would adjust 3 degrees to the right to assume the final approach course. This course would cause the noise exposure pattern to widen by approximately one-quarter mile along the south side of the noise contour east of the south runways.

- Relocated Runway 7L/25R with a centerline alignment 555 feet north of the present alignment of the runway. 91 feet of the east end of the relocated runway would be shortened for a runway length of 12,000 feet.

The principal effect of moving Runway 25R to the north would be a slight northward shift of the noise contours away from El Segundo. South of the airport, the contours would largely be an effect of departure noise from aircraft using the south complex runways. By moving the departure course away from the community, the noise levels to the south of the airport would be reduced by a small degree (typically less than 1,500 feet at locations off the airport) from No Action/No Project levels.

- Relocated existing Runway 7R/25L as Runway 7C/25C on a centerline 500 feet north of its existing runway centerline. The runway would be 12,000 feet long and 200 feet wide with its east end even with the east end of existing Runway 7R.

This element of Alternative B would result in a northward shift of the noise contours leading to the south runways by 500 feet. The measure would reduce noise east of Sepulveda and south of Imperial because aircraft applying reverse thrust on that runway would be located farther away.

- Relocated/upgraded Runway 6L/24R - 10,000 feet long and 200 feet wide along a centerline 135 feet north of the existing alignment. The east end of the runway would be extended approximately 600 feet east of its existing location; the west end approximately 475 feet west of the existing runway end.
- Relocated/reconstructed Runway 6R/24L - 12,000 feet long and 200 feet wide on a centerline 35 feet north of its existing runway centerline. The east end of the runway would be extended 1.715 feet east of the existing Runway 24L end.

The northward shift of these two runways in the north airfield complex would have little effect on the location of the noise contours. However, their relocation to the east would shift the takeoff noise bulge in the noise contour to the east resulting in increases of several CNEL in off-airport areas near the departure end of the runways.

- Relocated aircraft maintenance run-up activity, from between the north and south runway complexes into newly constructed ground run-up facilities.
- Fixed ground power and/or air conditioning service at each aircraft parking position at the terminals.

The consolidation of maintenance run-up activity at locations between the runway complexes and the construction of ground maintenance run-up enclosures would reduce noise levels so that they do not affect the noise contours off the airport. Stationary power sources at the parking positions would eliminate the need for portable generators at each aircraft location and the resulting noise associated with their use.

- New instrument departure procedures resulting in departing aircraft reaching the coastline before initiating turns.

The use of advanced FMS and/or GPS navigation procedures to better direct departing aircraft along straight-out courses from the runways until reaching the coast would reduce the breadth of the contour pattern north and south of the airport, west of the runway mid-points, by reducing the degree of dispersion along the departure path between takeoff and 3,000 feet altitude. After the runways are relocated in the long-term, these procedures would be redeveloped for the new runway end points.

- High-speed exits from arrival runways.

This measure is incorporated into the Master Plan configuration to enhance the efficiency of traffic flow, but would also reduce the time an aircraft remains on the runway. As the aircraft exits the runway toward the interior of the airfield, it would move away from the adjacent residential areas north and south of the complex, thus reducing the noise levels from the arrival events through both less application of reverse thrust during braking and by increasing the distance between the airport and neighboring sensitive uses.

4.1.6.1.3.1 Comparison of Alternative B Aircraft Noise to Environmental Baseline Condition

The noise contours for the environmental baseline are substantially smaller than the 2015 Alternative B contours. As indicated in Figure F4.2-20, Alternative B 2015 vs. 1996 Baseline - Areas Newly Exposed, the Alternative B contour pattern for 2015 leading to the south runways would be slightly shorter, but considerably wider, than the environmental baseline's. Two spikes along the two approaches to the south runways appear in the 70 and 75 CNEL; while the environmental baseline has only one along the approach to Runway 25L. The noise level contour leading to the north runways would be longer and wider and approximately 1 to 3 CNEL louder than the environmental baseline. Between I-405 and Sepulveda Boulevard, contours along the north side of the airport would be larger than the environmental baseline as a result of the relocation of the departure end of Runway 25L to the east. West of Sepulveda Boulevard, the contours along the north side of the airport would be comparable to those of the environmental baseline. Over locations south of the airport, the noise levels of the alternative would be as much as 1,500 feet narrower, a function of the continued phase out of older and noisier marginal Stage 3 aircraft weighing more than 75,000 pounds. The data in **Table F4.1-21** indicates that by 2015 most noise exposure categories would experience a net increase from environmental baseline conditions.

Table F4.1-22, Significant CEQA Noise Impacts - Alternative B (Compared to Environmental Baseline Conditions), indicates the significant impacts associated with Alternative B in 2015, when compared to the environmental baseline condition. Impacts newly exposed to noise above 65 CNEL would include approximately 24,370 people in about 7,810 residences, as well as 48 non-residential noise-sensitive parcels. Additionally, areas along all three approaches from the east would be exposed to significant increases of 1.5 CNEL or more by the alternative, including almost all of the approach to the north runway complex. The areas of 1.5 CNEL increase leading to the south runway complex lie laterally to the environmental baseline contour under the new approach to Runway 25L and the relocated approach to Runway 25C. Along the north side of the contour pattern are two areas that also would be exposed to increases of 1.5 CNEL or more -- immediately north of the east end of the north runway complex and north of the mid-point of the runways. Within these areas are an estimated 11,840 dwellings and approximately 37,310 residents, as well as 65 non-residential noise-sensitive parcels, including 29 schools, 24 churches, 6 parks, 4 convalescent hospitals, a hospital, and a library. Identification of and mitigation for these facilities is discussed in detail in subsections 4.2.6.3 and 4.2.8 of the *Land Use* section. Additionally, in 2015, 15 non-residential noise-sensitive parcels and 3 regular grid-point sites would be exposed to increases from environmental baseline levels by 3 CNEL or more within the 60-65 CNEL range, and 27 non-residential noise-sensitive parcels and 12 regular grid-points would be exposed to increases of 5 CNEL or more at levels below 60 CNEL. In both cases, the regular grid-points are located in residential areas outside the 65 CNEL contour.

Table F4.1-22

Significant CEQA Noise Impacts - Alternative B
(Compared to Environmental Baseline Conditions)

	Newly Exposed to 65 CNEL	Exposed to 1.5 CNEL Increase
	2015	2015
Population	24,370	37,310
Dwelling Units	7,810	11,840
Non-Residential Noise-Sensitive Parcels		
Schools	19	29
Churches	17	24
Hospitals	1	1
Convalescent Hospitals	4	4
Parks	6	6
Libraries	1	1
Total	**48**	**65**

Source: Landrum & Brown with Psomas, 2000.

4.1.6.1.3.2 Comparison of Alternative B Aircraft Noise to Year 2000 Conditions

Differences between Alternative B and Year 2000 conditions are included in **Table F4.1-21** for information and comparison with the changes occasioned by Alternative B from 1996 baseline and future No Action/No Project Alternative conditions.

As is disclosed in Section 4.2, *Land Use*, by 2015, the contour pattern associated with Alternative B (Figure S6, Alternative B 2015 vs. Year 2000 Conditions - Areas Newly Exposed, in Technical Report S-1, *Supplemental Land Use Technical Report*) would expose several large areas to increases of more than 1.5 CNEL within the 65 CNEL contour and newly expose even more area to that contour level. The contour would become wider to the north, reflecting the northward shift of the outboard runway in the north airfield. In contrast, the contour would shrink along the south side of the airport as a result of the northward relocation of the two existing runways in the south airfield. The contour leading to the north runways from the east would be approximately 4,000 feet longer and 300 to 400 feet wider than is the case in the Year 2000 conditions. The relocation of the east ends of the north runways to the east would generate a bulge of noise above 65 CNEL over the residential area near La Tijera and Manchester Boulevards that is not present in 2000. Off-airport changes in the future aircraft noise pattern from Year 2000 conditions that are associated with the south runways are entirely located east of the I-405. Substantial areas north and south of the area currently exposed to noise above 65 CNEL are newly included within the 65 CNEL contour along the full length of the new approaches to relocated Runway 25C and new Runway 25L.

Alternative B would result in an increase of impacts within the 65 CNEL contour in all categories in comparison to Year 2000 conditions (**Table F4.1-21**), including approximately 10,530 more persons in approximately 2,890 more dwellings, as well as 18 more noise sensitive uses. As indicated in **Table F4.1-23**, Comparative Noise Impact Changes - Alternative B (Compared to Year 2000 Conditions), approximately 24,500 persons in an estimated 8,000 dwellings would be newly exposed to noise greater than or equal to 65 CNEL by Alternative B, as would 45 non-residential noise-sensitive parcels. These impacts are located principally along the approach to the north runway complex. Additionally, the entire area within the 65 CNEL contour along the south side of the approach to the north runway complex would be exposed to increases of 1.5 CNEL or more by the alternative. Within this area are an estimated 10,600 dwellings and approximately 34,700 residents, as well as 72 non-residential noise-sensitive parcels, including 34 schools, 23 churches, 9 parks, 4 convalescent hospitals, a library, and a hospital.

The shift of the noise contours associated with Alternative B in 2015, when compared to the Year 2000 conditions, would result in the removal of 13,970 persons, 5,110 dwellings and 27 noise sensitive public facilities from the area exposed to noise greater than or equal to 65 CNEL.

Table F4.1-23

Comparative Noise Impact Changes - Alternative B
(Compared to Year 2000 Conditions)

	Newly Exposed to ≥ 65 CNEL	Exposed to 1.5 CNEL Increase
Population	24,500	34,700
Dwelling Units	8,000	10,600
Non-Residential Noise-Sensitive Parcels		
Schools	22	34
Churches	13	23
Hospitals	1	1
Convalescent Hospitals	2	4
Parks	7	9
Libraries	0	1
Total Non-Residential Noise-Sensitive Parcels	**45**	**72**

Source: Landrum & Brown with PCR, 2002.

4.1.6.1.3.3 Comparison of Alternative B Aircraft Noise Exposure and 2015 No Action/No Project Conditions (FAA/FICON Comparisons)

Table F4.1-24, NEPA Noise Impacts - Alternative B (Compared to No Action/No Project Conditions), discloses the population, dwellings, and non-residential noise-sensitive parcels that would be, as a result of Alternative B, newly exposed to noise in excess of 65 CNEL or experience increases of 1.5 CNEL within the 65 CNEL contour. Mitigation actions for these impacts are discussed in greater detail in subsection 4.1.8 and in Section 4.2, *Land Use*.

Table F4.1-24

NEPA Noise Impacts - Alternative B
(Compared to No Action/No Project Conditions)

	Newly Exposed to 65 CNEL	Exposed to 1.5 CNEL Increase
	2015	**2015**
Population	23,260	35,870
Dwelling Units	7,750	11,470
Non-Residential Noise-Sensitive Parcels		
Schools	16	25
Churches	13	22
Hospitals	1	1
Convalescent Hospitals	4	4
Parks	7	6
Libraries	1	1
Total	**42**	**59**

Source: Landrum & Brown with Psomas, 2000.

Figure F4.2-22, Alternative B 2015 vs. No Action/No Project Alternative - Areas Newly Exposed, compares the 2015 Alternative B noise contours to the No Action/No Project contours for that year and illustrates areas exposed to significant changes of noise exposure. In summary, Alternative B would result in substantially more impacts within the 65 CNEL contour in all categories as compared to future No Action/No Project conditions. The redistribution of the noise pattern leading to three separate approaches, each of which is made to a new or relocated runway, as well as the relocation of the outboard runway in the north airfield by several hundred feet to the north, would result in approximately 23,260 persons in an estimated 7,750 dwellings being newly exposed to noise above 65 CNEL by Alternative B, as would 42 non-residential noise-sensitive parcels. These impacts which exceed the federal compatibility standard are located principally along the approach to the north runway complex.

Additionally, the south half of the area within the 65 CNEL contour along the approach to the north runway complex would be exposed to increases of 1.5 CNEL or more by the alternative. In more detail, several areas of noticeable change are evident.

- An elongated and widened noise pattern leading to the north airfield complex under approaches from the east.

The general increase in operational levels and the assignment of a larger proportion of heavy jets to the north complex would generate more frequent operations by the louder heavy jet aircraft over Inglewood. Also, the easterly relocation of the landing thresholds from their No Action/No Project locations contributes to the easterly shift of the noise pattern.

The noise contour would be lengthened by about 4,800 feet along the approach path to Runway 24R from No Action/No Project levels.

- A widened noise exposure pattern leading to the south airfield complex from the east.

The addition of a third approach runway in the south airfield complex would not increase the length of the approach contour east of the airport, but it would widen the contour to reflect landings to the new facility. Within the final approach course to the new runway, the contour would be widened over Hawthorne and Lennox by approximately 1,300 feet between Prairie Avenue and Aviation Boulevard. This increased noise exposure would total 1.5 CNEL or more within the entire contour area that has been widened.

In addition to the widening of the contour along its south side, the north side of the contour pattern leading to the south runways would widen from No Action/No Project conditions. This would result from the northward relocation of Runway 7C/25C (currently 7L/25R) that would remain a principal landing runway in the south airfield.

- Relocated bulge associated with takeoff power application from Runways 24L/R.

The relocation of the east end of Runway 24L by 1,715 feet east of its present location causes a shift to the east in the bulge of the noise pattern in Westchester along the north side of the airport. East of Sepulveda, the noise levels increase by as much as 6 CNEL. West of Sepulveda noise levels would be unchanged, owing to the increased number of heavy aircraft using the north complex and 20 percent more operations.

- Wider contour along north side of airport west of Sepulveda Boulevard.

West of Lincoln Boulevard in Westchester north of the airport, Alternative B noise levels would be increased by 1 or 2 CNEL by the greater usage of the north runways by heavy jet aircraft for takeoffs to the west. Beginning takeoff 3,000 feet farther east would result in aircraft being higher as they pass the areas west of Sepulveda Boulevard, reducing ground absorption and increasing noise levels. The increase in noise levels in that area is attributable more to the increased altitude of the aircraft than it is to the northerly relocation of the runways.

- Narrower contour along the south side of the airport west of Sepulveda Boulevard.

The northward relocation of the two existing runways in the south airfield complex would slightly reduce departure noise in El Segundo west of Sepulveda Boulevard.

Table F4.1-21 provides the land area, dwellings, population and number of noise-sensitive facilities exposed to noise of various levels for the alternative, and compares that data to the No Action/No Project and environmental baseline condition. The changes to the 2015 CNEL pattern between Alternative B and the No Action/No Project condition would result in significant increases of noise exposure (1.5 CNEL or more) on:

- 1,425 acres of noise-sensitive land located within the 65 CNEL contour.
- An estimated 11,470 dwellings with 35,870 residents (see **Table F4.1-24**).
- 59 non-residential noise-sensitive parcels, including 25 schools, 22 churches, a hospital, 4 nursing homes, 6 parks, and a library.

Additionally, Alternative B would expose 3 schools, 13 churches, a library, a park, a hospital, and 3 regular grid-points to increases of 3 CNEL or more between 60 and 65 CNEL. Eighteen of these sites would be located along the south lobe of the contour pattern and would be largely affected by approaches

to new Runway 25L. The remaining four locations would be adjacent to the bulge in the departure noise pattern at the east end of the north runways. Furthermore, 4 schools, 12 churches, a hospital, a library, and 10 regular grid-points would be exposed to increases of 5 CNEL below the 60 CNEL level; all are located south or east of the 65 CNEL contour indicated in Figure F4.2-22, Alternative B 2015 vs. No Action/No Project Alternative - Areas Newly Exposed.

4.1.6.1.3.4 Comparison of Alternative B Aircraft Noise and 1996 Baseline and Year 2000 Conditions Single Event Effects

Single event noise impacts for the 2015 Alternative B condition were evaluated.

4.1.6.1.3.4.1 Nighttime Awakenings

The pattern of Alternative B single event noise sufficient to result in the awakening of 10 percent of the residents at an average frequency of once every ten days is provided in Figure F4.2-36, Alternative B 2015 94 dBA SEL vs. ANMP - Areas Newly Exposed**,** in Section 4.2, *Land Use*. Because the easterly departures projected for future conditions at night are expected to turn to the right nearer the airport than has been the case during recent years, the area of exposure of Alternative B is substantially larger than the areas included within the 94 dBA SEL contour for both 1996 baseline and Year 2000 conditions (as provided in subsection 4.1.3.1.3.1), the numbers of newly exposed dwellings within the contour and projected number of newly exposed persons that could be awakened on any given night are substantially increased from 1996 baseline or Year 2000 conditions. **Table F4.1-25,** Single Event Noise Effects on Awakenings - Alternative B Compared to the 1996 Baseline and Year 2000 Conditions, provides a comparison of the relationship between the single event awakenings impacts projected for Alternative B and baseline and Year 2000 conditions.

Table F4.1-25

Single Event Noise Effects on Awakenings -
Alternative B Compared to the 1996 Baseline and Year 2000 Conditions

Impact Category	Alternative B Impact[1]	Newly Exposed		
		Against 1996 Baseline[1]	Against Year 2000 Conditions[2]	Against 1992 ANMP Contour[1]
Exposure ≥ 94 dBA (SEL)				
Number of Dwellings	16,700	7,500	6,400	5,400
Estimated Population	56,400	23,900	21,400	18,000

[1] Impacts for the total population and dwellings within the 94 dBA SEL contour, as well as for newly exposed comparisons to the 1996 baseline and the 1992 ANMP contour are developed using 1990 census data.

[2] Impacts for comparisons of the total population and dwellings newly exposed comparisons to the Year 2000 conditions data are developed using Year 2000 census data.

Note: While the total number of persons and/or dwellings located within the 94 dBA SEL contour may approximate the total numbers present in 1996 baseline or Year 2000 conditions, the shift of the location of the 94 dBA SEL contour among the various conditions assessed results in several thousand dwellings (with their associated population) being removed from within the 94 dBA SEL contour for the current conditions, while another large number of dwellings would newly fall within the 94 dBA SEL contour of the future Alternative B condition. The great majority of these dwellings fall between the approaches to the north and south runway complexes east of the airport and under the approach to the proposed new south runway.

Source: Landrum & Brown with PCR, 2002.

The substantial portion of the difference between the Alternative B impacts and those of the baseline (and ANMP) conditions lies between the approach paths west of Hollywood Park, along the north side of the approaches to the south airfield complex, in an area northeast of the airport where takeoffs to the east from the north runways use takeoff power, as well as under a takeoff path leading to the east from the south runways and turning to the right over southern Inglewood. A methodology for mitigation of these impacts is presented in subsection 4.1.8.1 below and Section 4.2, *Land Use* (subsection 4.2.8). Under CEQA thresholds of significance established by LAWA in response to the *Berkeley Jets* ruling relative to

single event impacts, these impacts are significant. There are no NEPA standards for single-event noise effects on awakenings.

The shift of the 94 dBA SEL noise contours associated with Alternative B in 2015, when compared to the 1996 baseline condition, would result in the removal of 21,800 persons and 9,600 dwellings from within the contour. Compared to the Year 2000 conditions, the Alternative B 94 dBA SEL contour pattern would remove 15,800 persons and 5,200 dwellings from within the area exposed to significant nighttime single event noise levels.

4.1.6.1.3.4.2 School Disruption

The numbers of schools that would exceed the temporary thresholds of significance for classroom disruption by single event aircraft noise are presented in **Table F4.1-26,** Schools Exposed to Significant Interior Single Event Noise Levels - Alternative B Compared to the 1996 Baseline and Year 2000 Conditions. While the number of schools projected to be impacted above 55 dBA L_{max} by Alternative B in 2015 are fewer than are affected currently (1996 baseline and Year 2000 conditions), eight schools would be newly exposed by the shifting of the noise exposure pattern. The number of schools projected to be newly exposed above 65 dBA L_{max} by Alternative B in 2015 would be two schools. The names and locations of these affected schools that would be newly exposed to high noise levels are provided in Section 4.2, *Land Use*. Additionally, the average number of individual events would increase at the schools with the increase of operations projected for future years. The average duration of each loud event is not expected to change with time.

Table F4.1-26

Schools Exposed to Significant Interior Single Event Noise Levels - Alternative B Compared to the 1996 Baseline and Year 2000 Conditions

Impact Category	Alternative B Impact	Against Environmental Baseline		Against Year 2000 Conditions	
		Net Change	Newly Exposed	Net Change	Newly Exposed
Exposure ≥ 55 dBA (L_{max})					
Number of Public Schools	12	-2	5	+1	5
Number of Private Schools	11	-3	3	-4	3
Average Number of Events/School	47	+23	NA	+18	NA
Average Seconds/Event	3	0	NA	0	NA
Exposure ≥ 65 dBA (L_{max})					
Number of Public Schools	1	0	0	0	0
Number of Private Schools	2	+1	2	0	2
Exposure ≥ 35 dBA ($L_{eq(h)}$)					
Number of Public Schools	15	+4	5	+4	4
Number of Private Schools	16	+3	6	+5	6

Note: The number of average events above 65 dBA L_{max} (interior) was generally less than 3 and their duration was less than 3 seconds each.

Source: Landrum & Brown with Psomas, 1999 and Landrum & Brown with PCR, 2002.

The assessment of the number of schools that would experience interior dBA $L_{eq(h)}$ levels in excess of 35 dBA $L_{eq(h)}$ in the classroom suggests that Alternative B would newly expose 11 or 10 schools to this threshold of significance for the Alternative B future conditions, as measured against the 1996 baseline and Year 2000 conditions, respectively. The names and locations of these affected schools that would be newly exposed to high noise levels and the mitigation of single event noise levels at specific schools is discussed in Section 4.2, *Land Use*.

4.1.6.1.4 Alternative C - No Additional Runway

Alternative C maintains the existing four-runway configuration but lengthens, widens, and separates them to provide greater flexibility of use. The aviation activity associated with this alternative is provided earlier in Table F3-1, Summary of Activity by Alternative - 2015, **Table F4.1-9,** and **Table F4.1-10**. As a

consequence of these changes, the noise exposure pattern would be modified from 1996 baseline and the future No Action/No Project Alternative conditions. The noise exposure impacts associated with the development of Alternative C are provided in **Table F4.1-27**, Noise Exposure Effects - 2015 Alternative C With Comparisons to 1996 Baseline, Year 2000 Conditions and 2015 No Action/No Project Alternative Conditions.

Table F4.1-27

Noise Exposure Effects - 2015 Alternative C With Comparisons to 1996 Baseline, Year 2000 Conditions and 2015 No Action/No Project Alternative Conditions

Noise Level Range	Total Acreage Over Land[4]	Off-Airport Area (Acres)[4]	Total Dwellings[1]	Estimated Population[1]	Non-Residential Noise-Sensitive Parcels
2015 Alternative C					
65-70 CNEL	2,915	2,220	11,500	33,800	59
70-75 CNEL	2,148	623	3,100	10,600	16
75 ≥ CNEL	2,021	29	40	180	2
65 ≥ CNEL	7,084	2,872	14,640	44,580	77
Change from 1996 Baseline[2]					
65-70 CNEL	67	-375	-1,200	-1,300	6
70-75 CNEL	557	3	-600	-1,900	-2
75 ≥ CNEL	-571	-167	-460	-1,220	-1
65 ≥ CNEL	53	-539	-2,260	-4,420	3
Change from Year 2000 Conditions[2,3]					
65-70 CNEL	-489	-774	-800	-1,500	-4
70-75 CNEL	624	233	-1,000	-3,200	-2
75 ≥ CNEL	-37	6	-360	-1,020	-1
65 ≥ CNEL	98	-535	-2,160	-5,720	-7
Change from No Action/No Project					
65-70 CNEL	144	124	400	1,900	6
70-75 CNEL	152	8	-400	-1,600	0
75 ≥ CNEL	76	-8	-20	-50	0
65 ≥ CNEL	371	124	-20	250	6

[1] Population and Dwelling estimates have been rounded to the nearest hundred if greater than 1,000 and to the nearest 10 if less than 1,000.

[2] A positive value indicates that the future alternative increases the number of impacts over the 1996 baseline or Year 2000 conditions; a negative number indicates that the future alternative decreases the number of impacts. The number indicates a net difference. Some areas would experience increased noise while other areas would experience a decrease in levels. Section 4.2, *Land Use*, details the number of impacts newly exposed to noise above 65 CNEL.

[3] Population and dwelling unit information for the Year 2000 conditions is reported using a year 1990 census data base for CNEL comparisons with other alternatives.

[4] Acreage totals may not add due to rounding.

Source: Landrum & Brown with Psomas, 2000 for environmental baseline comparisons; with PCR, 2002 for 2000 comparisons.

The elements of this alternative that would have an effect on the noise pattern are indicated below.

- Based on the planning assumptions detailed for each alternative in Chapter 3, *Alternatives*, the projected number of operations that could be accommodated on an average day in 2015 would be 2,141, compared with 2,119 for the No Action/No Project Alternative. Modification of the operating fleet mix would include an increase in the proportion of heavy jet aircraft from 33 percent in the No Action/No Project Alternative to 38 percent under this alternative; reduction of the number of propeller aircraft in the mix from 22 percent to 15 percent.
- Owing to the projected increase in international operations entering the airspace northwest of the airport, the proportion of heavy jet aircraft using the north runways would increase; the south runways would be used more frequently by light jets and propeller aircraft than under the No Action/No Project

case. The shift would be by about 5 percent from No Action/No Project usage for both heavy and propeller aircraft, and by 14 percent for light jet aircraft.

The small projected increase of only 1 percent in the absolute number of average day operations would, by itself, result in little change in the noise exposure pattern, but the increase of the size of aircraft to accommodate more passengers with a relatively static number of operations would result in louder individual noise event levels, and consequently greater total noise energy levels and slightly increased contours. Although Alternative C forecasts 108 more operations by heavy jet aircraft on the average annual day, the change of utilization and the different fleet mixes do not appear to be extensive enough to have substantial effects on the size or shape of the noise contour pattern shown in Figure F4.2-26, Alternative C 2015 vs. No Action/No Project Alternative - Areas Newly Exposed.

- Runway 6L/24R would be relocated 350 feet north of its present alignment, lengthened to 9,400 feet, and widened to 200 feet wide. The west end of the reconstructed runway would be 500 feet west of the present end of Runway 6L.
- Runway 6R/24L would be extended 2,900 feet to the east along its existing centerline. The length would be 12,000 feet with a width of 200 feet. The runway's west end would be shortened by 1,185 feet.

The relocation of Runway 6L/24R to the north would cause the north side of the noise contour to widen east of the north runways by the amount of the shift, whereas the retention of Runway 24L on its present alignment would cause the south edge of the approach contour to remain in its No Action/No Project position. The contour along the north side of the airport would be widened by the width of the runway shift. The extension of Runway 6R/24L to the east would cause a bulge that reflects noise from the initiation of takeoff thrust near the east end of the runway to shift eastward by the length of the extension.

- A widened Runway 7R/25L to 200 feet along a centerline 50 feet south of the present alignment, retaining its present length of 11,096 feet.

The southward shift of Runway 7R/25L would shift the contours along the south side of the airport or under the approaches to the south runways by 50 feet to the south.

- Relocated aircraft maintenance run-up activity from the existing location between the runways into newly constructed ground run-up facilities.
- Fixed ground power and/or air conditioning service at each aircraft parking position at the terminals.

The consolidation of maintenance run-up activity at locations between the runways and the construction of ground maintenance run-up enclosures would reduce noise levels so that they do not affect the noise contours off the airport. Stationary power sources at the parking positions would eliminate the need for portable generators at each aircraft location and the resulting noise associated with their use.

- New procedures would ensure that all westerly departures reach the coastline before initiating turns.

The use of advanced FMS and/or GPS navigation procedures to better direct departing aircraft along straight-out courses from the runways until reaching the coast would reduce the single-event impacts from early turns to the north or south over residential areas. The measure would slightly reduce the breadth of the contour pattern north and south of the airport, west of the runway mid-points, by reducing the degree of dispersion along the departure path between takeoff and 3,000 feet altitude. After the runways are relocated in the long-term, these procedures are assumed to be redeveloped for the new runway end points.

- High-speed exits from arrival runways.

This measure would reduce the time an aircraft remains on the runway. As the aircraft exits the runway toward the interior of the airfield, it would move away from the adjacent residential areas north and south of the complex, thus reducing the noise levels from arrivals.

4.1.6.1.4.1 Comparison Of Alternative C Aircraft Noise to Environmental Baseline Conditions

The noise contours for Alternative C in 2015 are illustrated in Figure F4.2-24, Alternative C 2015 vs. 1996 Baseline - Areas Newly Exposed. Alternative C would provide a net reduction of impacts within the 65 CNEL contour in nearly all impact categories in comparison to 1996 baseline conditions. However, approximately 7,150 persons in an estimated 2,620 dwellings would be newly exposed to noise above 65

CNEL by Alternative C, as would 23 non-residential noise-sensitive parcels. These significant impacts are located principally along the northern side of the airport and on both sides of the approach to the north runway complex. Additionally, the area within the 65 CNEL contour along the north side of the approach to the north runway complex and along the north boundary of the airport would be exposed to significant increases of 1.5 CNEL or more by the alternative. Within this area are an estimated 2,080 dwellings and approximately 5,100 residents, as well as 16 non-residential noise-sensitive parcels. The area along the approach to the north runway complex from the east is the most affected by the alternative, owing to the increase in its use by international wide-body jet aircraft arrivals. The contour is broadened along the full reach of the north approach lobe, adding new population, dwellings, and non-residential noise-sensitive parcels within the 65 CNEL contour. Along the north side of the contour pattern, noise levels would be increased by more than 1.5 CNEL over an area extending from La Tijera Boulevard on the west nearly to the east end of the contour pattern. Also, an area west of Lincoln Boulevard would experience an increase of more than 1.5 CNEL within the 65 CNEL contour. **Table F4.1-28**, Significant CEQA Noise Impacts - Alternative C (Compared to Environmental Baseline Conditions), details these significant impacts. In addition to these significant impacts, a church and a regular grid-point would be exposed to increases of 3 CNEL or more between 60 and 65 CNEL. These are located immediately north of the relocated east end of the north runway complex. No locations would be exposed to increases of 5 CNEL or more below 60 CNEL by this alternative.

Table F4.1-28

Significant CEQA Noise Impacts - Alternative C
(Compared to Environmental Baseline Conditions)

	Newly Exposed to 65 CNEL	Exposed to 1.5 CNEL Increase
	2015	2015
Population	7,150	5,100
Dwelling Units	2,620	2,080
Non-Residential Noise-Sensitive Parcels		
Schools	8	6
Churches	7	6
Hospitals	0	0
Convalescent Hospitals	3	1
Parks	4	3
Libraries	1	0
Total	**23**	**16**

Source: Landrum & Brown with Psomas, 2000.

4.1.6.1.4.2 Comparison of Alternative C Aircraft Noise to Year 2000 Conditions

Differences between Alternative C and Year 2000 conditions are included in **Table F4.1-27** for information and comparison with the changes occasioned by Alternative C from 1996 baseline and future No Action/No Project Alternative conditions.

As is disclosed in Section 4.2, *Land Use*, by 2015, the length of the contour pattern associated with Alternative C leading to the south runways would shrink slightly from that of the Year 2000 conditions (Figure S8, Alternative C 2015 vs. Year 2000 Conditions - Areas Newly Exposed, in Technical Report S-1, *Supplemental Land Use Technical Report*) and remain almost entirely within the footprint of the Year 2000 conditions contour. The contour leading to the north runways would be approximately the same length, but would become wider than the Year 2000 conditions contour by 200 to 300 feet. The broadening of the contour in that area would be the result of a greater concentration of heavy aircraft along the approach to the north runways than was the case in the Year 2000 conditions, as well as the shift of the outboard runway in the north airfield to a location 350 feet north of its present position. The relocation is reflected along the full length of the noise contour on the north side of the airport as the pattern shifts as much as 700 feet to the north from its Year 2000 conditions location. This shift will result in an area of residential land along both sides of the northly approach and along the north boundary of the airport being exposed to an increase of 1.5 decibels of CNEL.

Alternative C would provide a net reduction of impacts within the 65 CNEL contour in most categories in comparison to Year 2000 conditions (**Table F4.1-27**) totaling approximately 5,700 fewer persons in 2,200 fewer dwellings and 7 fewer noise sensitive uses. However, as indicated in **Table F4.1-29**, Comparative Noise Impact Changes - Alternative C (Compared to Year 2000 Conditions), approximately 6,800 persons in an estimated 2,600 dwellings would be newly exposed to noise greater than or equal to 65 CNEL by Alternative C, as would 17 non-residential noise-sensitive parcels. These impacts are located principally along the approach to the north runway complex. Additionally, the entire area within the 65 CNEL contour along the south side of the approach to the north runway complex would be exposed to increases of 1.5 CNEL or more by Alternative C. Within this area are an estimated 2,500 dwellings and approximately 6,700 residents, as well as 18 non-residential noise-sensitive parcels, including 8 schools, 4 churches, 5 parks, and a convalescent hospital.

Table F4.1-29

Comparative Noise Impact Changes - Alternative C
(Compared to Year 2000 Conditions)

	Newly Exposed to ≥ 65 CNEL	Exposed to 1.5 CNEL Increase
Population	6,800	6,700
Dwelling Units	2,600	2,500
Non-Residential Noise-Sensitive Parcels		
Schools	9	8
Churches	3	4
Hospitals	0	0
Convalescent Hospitals	1	1
Parks	4	5
Libraries	0	0
Total Non-Residential Noise-Sensitive Parcels	**17**	**18**

Source: Landrum & Brown with PCR, 2002.

The shift of the noise contours associated with Alternative C in 2015, when compared to the Year 2000 conditions, would result in the removal of 10,220 persons, 3,860 dwellings and 24 noise sensitive public facilities from the area exposed to noise greater than or equal to 65 CNEL.

4.1.6.1.4.3 Comparison Of Alternative C Aircraft Noise Exposure and No Action/No Project Conditions (FAA/FICON Comparisons)

Alternative C would result in only slightly elevated impacts within the 65 CNEL contour as compared to future No Action/No Project Alternative conditions. The redistribution of the noise pattern, particularly leading to a relocated outboard runway in the north airfield, would result in virtually all of the associated impact changes. Owing to that relocation, approximately 6,000 persons in an estimated 2,400 dwellings would be newly exposed to noise above 65 CNEL by Alternative C, as would 21 non-residential noise-sensitive parcels. These impacts which exceed the federal compatibility standard are located in areas affected by the relocated north runway. Additionally, the same area would be exposed to increases of 1.5 CNEL or more by Alternative C. Within this area are an estimated 2,300 dwellings and approximately 4,600 residents, as well as 18 non-residential noise-sensitive parcels.

A comparison of the No Action/No Project and Alternative C noise patterns indicated in Figure F4.2-26 reveals slight differences as follows: The pattern in Inglewood along the north side of the approach to the north runways would be shifted northward by the 350-foot distance that Runway 24R would be relocated.

- The contour shift with the relocation of the east end of Runway 24L in Alternatives A and B would also be present in Alternative C. The effect results in noise levels as much as 5 CNEL higher than 2015 No Action/No Project Alternative conditions on the area of Westchester east of Sepulveda Boulevard.

- The contour pattern under the approach to the south runways would be slightly shorter than the No Action/No Project condition, while the pattern leading to the north runways would be slightly longer. This results from additional use of the north runways by heavy aircraft.
- The noise levels along the north side of the airport in Westchester, west of Lincoln Boulevard, would be increased by about 1 CNEL from more direct exposure to aircraft during their takeoff climbs from Runway 24L.
- The area around a run-up enclosure at the southeast corner of the airport would be exposed to noise from that facility that exceeds the No Action/No Project levels. The area of increased 65 CNEL exposure would be limited to about two blocks of land off the airport.

Although **Table F4.1-27** indicates little net change in the noise exposure effects within the 65, 70, and 75 CNEL contours for Alternative C, **Table F4.1-30,** NEPA Noise Impacts - Alternative C (Compared to No Action/No Project Conditions), demonstrates the significant differences between the two conditions. The expansion of the noise contour to the north would result in the inclusion of approximately 6,000 new persons in 2,420 new dwellings, as well as 21 new non-residential noise-sensitive parcels within the 65 CNEL contour. Alternative C, in comparison to the No Action/No Project condition would the expose the following sensitive uses, located within the 65 CNEL, to increases of 1.5 CNEL or more:

- 267 acres of off-airport land used for noise-sensitive purposes within the 65 CNEL contour
- 2,330 dwelling units housing an estimated 4,610 persons
- 16 non-residential noise-sensitive parcels, including 6 churches, 6 schools, a nursing home, and 3 parks.

Table F4.1-30

NEPA Noise Impacts - Alternative C
(Compared to No Action/No Project Conditions)

	Newly Exposed to 65 CNEL	Exposed to 1.5 CNEL Increase
	2015	2015
Population	6,000	4,610
Dwelling Units	2,420	2,330
Non-Residential Noise-Sensitive Parcels		
Schools	9	6
Churches	3	6
Hospitals	0	0
Convalescent Hospitals	3	1
Parks	5	3
Libraries	1	0
Total	**21**	**16**

Source: Landrum & Brown with Psomas, 2000.

All of these significantly affected areas would be located along the north side of the noise contour and in the vicinity of the relocated end of Runway 24L. In addition to the significant impacts detailed above and in the tables, 5 locations (4 churches and a regular grid-point) located north of the relocated east end of Runway 24L would be exposed to increases of 3 CNEL or more between 60 and 65 CNEL. No locations would be exposed to increases of 5 CNEL below 60 CNEL by the alternative.

4.1.6.1.4.4 Comparison of Alternative C Aircraft Noise and 1996 Baseline and Year 2000 Conditions Single Event Effects

Single event noise impacts for the 2015 Alternative C condition were evaluated.

4.1.6.1.4.4.1 Nighttime Awakenings

The pattern of single event noise sufficient to result in the awakening of 10 percent of the residents at an average frequency of once every ten days is provided in Figure F4.2-37, Alternative C 2015 94 dBA SEL vs. ANMP - Areas Newly Exposed, in Section 4.2, *Land Use*. Because the easterly departures projected

for future conditions at night are expected to turn to the right nearer the airport to achieve greater operational efficiency for increased numbers of flights during east operations than has been the case during recent years, the area of exposure of Alternative C is substantially larger than the areas included within the 94 dBA SEL contour for both 1996 baseline and Year 2000 conditions (as provided in subsection 4.1.3.1.3.1), the numbers of newly exposed dwellings within the contour and projected number of newly exposed persons that could be awakened on any given night are substantially increased from 1996 baseline and Year 2000 conditions. **Table F4.1-31**, Single Event Noise Effects on Awakenings - Alternative C Compared to the 1996 Baseline and Year 2000 Conditions, provides a comparison of the relationship between the single event awakenings impacts projected for Alternative C and baseline and Year 2000 conditions.

Table F4.1-31

Single Event Noise Effects on Awakenings -
Alternative C Compared to the 1996 Baseline and Year 2000 Conditions

Impact Category	Alternative C Impact[1]	Newly Exposed: Against 1996 Baseline[1]	Newly Exposed: Against Year 2000 Conditions[2]	Newly Exposed: Against 1992 ANMP Contour[1]
Exposure ≥ 94 dBA (SEL)				
Number of Dwellings	16,900	6,600	5,900	4,600
Estimated Population	54,500	19,200	17,700	14,200

[1] Impacts for the total population and dwellings within the 94 dBA SEL contour, as well as for newly exposed comparisons to the 1996 baseline and the 1992 ANMP contour are developed using 1990 census data.

[2] Impacts for comparisons of the total population and dwellings newly exposed comparisons to the Year 2000 conditions data are developed using Year 2000 census data.

Note: While the total number of persons and/or dwellings located within the 94 dBA SEL contour may approximate the total numbers present in environmental baseline or Year 2000 conditions, the shift of the location of the 94 dBA SEL contour among the various conditions assessed results in several thousand dwellings (with their associated population) being removed from within the 94 dBA SEL contour for the current conditions, while another large number of dwellings would newly fall within the 94 dBA SEL contour of the future Alternative C condition. The great majority of these dwellings fall between the approaches to the north and south runway complexes east of the airport.

Source: Landrum & Brown with PCR, 2002.

The shift of the 94 dBA SEL noise contours associated with Alternative C in 2015, when compared to the 1996 baseline condition, would result in the removal of 19,000 persons and 8,500 dwellings from within the contour. Compared to the Year 2000 conditions, the Alternative C 94 dBA SEL contour pattern would remove 14,000 persons and 4,500 dwellings from within the area exposed to significant nighttime single event noise levels.

The substantial portion of the difference between Alternative C impacts and those of the baseline and ANMP conditions lies between the approaches west of Van Ness Avenue, along the north side of the approach to the north runway complex, and under a takeoff path leading to the east from the north runways and turning to the right over Inglewood. A methodology for mitigation of single event noise effects on awakening is presented in subsection 4.1.8.1 below, and Section 4.2, *Land Use* (subsection 4.2.8). Under CEQA thresholds of significance established by LAWA in response to the *Berkeley Jets* ruling relative to single event impacts, these impacts are significant. There are no NEPA standards for single event noise effects on awakenings.

4.1.6.1.4.4.2 School Disruption

The numbers of schools that would exceed the temporary thresholds of significance for classroom disruption by single event aircraft noise are presented in **Table F4.1-32,** Schools Exposed to Significant Interior Single Event Noise Levels - Alternative C Compared to the 1996 Baseline and Year 2000 Conditions. The total number of schools projected to be impacted by Alternative C in 2015 are fewer than are affected currently (1996 baseline or Year 2000 conditions), but the shift of the single event noise

exposure pattern associated with the increased numbers of heavy jet arrivals to the north runway complex would result in five or three schools being newly exposed to disruptive noise levels above 55 decibels of interior noise (compared against 1996 baseline or Year 2000 conditions, respectively). Additionally, the shift of the single event noise exposure pattern would result in two or one schools being newly exposed to disruptive noise levels above 65 decibels of interior noise (compared against 1996 baseline or Year 2000 conditions, respectively). The names and locations of these affected schools that would be newly exposed to high noise levels are provided in Section 4.2, *Land Use*. The average duration of each loud event is not expected to change with time.

Table F4.1-32

Schools Exposed to Significant Interior Single Event Noise Levels - Alternative C Compared to the 1996 Baseline and Year 2000 Conditions

Impact Category	Alternative C Impact	Against Environmental Baseline		Against Year 2000 Conditions	
		Net Change	Newly Exposed	Net Change	Newly Exposed
Exposure ≥ 55 dBA (L_{max})					
Number of Public Schools	10	-4	3	-1	2
Number of Private Schools	13	-1	2	-2	1
Average Number of Events/School	42	+18	NA	+13	NA
Average Seconds/Event	3	0	NA	0	NA
Exposure ≥ 65 dBA (L_{max})					
Number of Public Schools	1	0	0	0	0
Number of Private Schools	1	0	2	-1	1
Exposure ≥ 35 dBA ($L_{eq(h)}$)					
Number of Public Schools	12	+1	2	+1	1
Number of Private Schools	16	+3	6	+5	6

Note: The number of average events above 65 dBA L_{max} (interior) was generally less than 3 and their duration was less than 3 seconds each.

Source: Landrum & Brown with Psomas, 1999 and Landrum & Brown with PCR, 2002.

The assessment of the number of schools that would experience interior dBA $L_{eq(h)}$ levels in excess of 35 decibels in the classroom suggests that eight or seven schools would be newly exposed to this threshold of significance for the Alternative C future condition, as measured against the 1996 baseline and against Year 2000 conditions, respectively. The names and locations of these affected schools that would be newly exposed to high noise levels and the mitigation of single event noise levels at specific schools is discussed in subsection 4.2.6.4 and subsection 4.2.8, *Land Use*.

4.1.6.1.5 Alternative D - Enhanced Safety and Security Plan

A complete description of the facilities associated with Alternative D is provided in Chapter 3, *Alternatives*. Aviation activity associated with Alternative D is provided earlier in Table F3-1, Summary of Activity by Alternative - 2015, **Table F4.1-9**, and **Table F4.1-10**. In summary, Alternative D proposes the retention of a four-runway airfield layout with modifications to the terminal core and airfield access taxiways that would allow improved operational efficiencies. The elements of this alternative that would have an effect on the noise pattern are indicated below.

- The projected number of operations that could be accommodated on an average day in 2015 would be 2,122, nearly identical to the number for the average annual day of the No Action/No Project Alternative (2,119). The operating fleet mix would remain comparable to the No Action/No Project Alternative mix with 32 percent of the activity by heavy jet aircraft and propeller aircraft comprising 24 percent of the mix.
- The proportion of heavy jet aircraft using the north runways would increase from 1996 baseline and Year 2000 conditions, but not as much as is projected for the future No Action/No Project Alternative. The south runways would be used more frequently by propeller aircraft than during 1996 baseline or Year 2000 conditions, but light jets would remain approximately equally balanced between the two

runway complexes. The shift would be by about 3 percent from 1996 baseline usage for heavy jet aircraft, and by approximately 10 percent for propeller aircraft.

The small increase in the number of average daily operations would cause almost no change in the noise exposure pattern by itself, but the increase of the size of aircraft would result in louder individual noise events, and consequently greater total noise energy levels and slightly increased contour size. The change of utilization and the different fleet mixes do not appear to be extensive enough to have substantive effects on the size or shape of the noise contour pattern shown in Figure F4.2-29, Alternative D 2015 vs. No Action/No Project Alternative - Areas Newly Exposed, in Section 4.2, *Land Use*. Compared to the 1996 baseline (see Figure F4.2-28, Alternative D 2015 vs. 1996 Baseline - Areas Newly Exposed, in Section 4.2, *Land Use*) and Year 2000 conditions, the contour pattern for Alternative D shows greater differences along the approach to the north runway complex.

- Runway 6L/24R would remain on its present alignment, but be lengthened to 10,420 feet through the addition of 1,495 feet on its west end, and be widened to 200 feet wide. Owing to better airfield operating efficiencies, it would be used primarily as an arrival runway in both east and west traffic flows, although some departures will take place there during peak departure periods or during closure of other runways for maintenance or construction.
- Runway 6R/24L would be relocated 340 feet south of its present alignment and extended 1,280 feet to the east and 135 feet to the west to achieve a total length of 11,700 feet. Owing to better airfield operating efficiencies, it would be used primarily as a departure runway in both east and west traffic, although some landings will be made there during peak arrival periods or during closure of other runways for maintenance or construction.

The relocation of Runway 24L to the south would cause the south side of the noise contour to widen east of the north runways by the amount of the shift, whereas the retention of Runway 24R on its present alignment would cause the north edge of the approach contour to remain virtually unchanged from its current or No Action/No Project Alternative future positions. The contour bulge near La Tijera and Manchester Boulevards would shift slightly east with the relocation of the east end of Runway 24L to the east, reflecting the initiation of takeoff thrust from that location.

- Runway 7R/25L would be widened to 200 feet along a centerline 50 feet south of the present alignment, retaining its present length of 11,090 feet.

The southward shift of Runway 25L would shift the contours along the south side of the airport or under the approaches to the south runways by 50 feet to the south.

- Relocated aircraft maintenance run-up activity from the existing location between the runways into newly constructed ground run-up facilities.
- Fixed ground power and/or air conditioning service at each aircraft parking position at the terminals.

The consolidation of maintenance run-up activity at locations between the runways and the construction of ground maintenance run-up enclosures would reduce noise levels so that they do not affect the noise contours off the airport. Stationary power sources at the parking positions would eliminate the need for portable generators at each aircraft location and the resulting noise associated with their use.

- New procedures would ensure that all westerly departures reach the coastline before initiating turns.

The use of advanced navigation procedures to better direct departing aircraft along straight-out courses from the runways until reaching the coast would reduce the single-event impacts from early turns to the north or south over residential areas. The measure would slightly reduce the breadth of the contour pattern north and south of the airport, west of the runway mid-points. These procedures are assumed to be redeveloped for the new runway end points.

- High-speed exits from arrival runways.

This measure would reduce the time an aircraft remains on the runway. As the aircraft exits the runway toward the interior of the airfield, it would move away from the adjacent residential areas north and south of the complex, thus reducing the noise levels from arrivals.

The noise exposure statistics associated with Alternative D are presented in **Table F4.1-33,** Noise Exposure Effects - 2015 Alternative D With Comparisons to 1996 Baseline, Year 2000 Conditions, and 2015 No Action/No Project Alternative Conditions.

Table F4.1-33

Noise Exposure Effects - 2015 Alternative D With Comparisons to 1996 Baseline, Year 2000 Conditions, and 2015 No Action/No Project Alternative Conditions

Noise Level Range	Total Acreage Over Land[4]	Off-Airport Area (Acres)[4]	Total Dwellings[1]	Estimated Population[1]	Non-Residential Noise-Sensitive Parcels
2015 Alternative D					
65-70 CNEL	2,829	2,210	11,100	34,200	54
70-75 CNEL	1,888	565	2,400	8,700	13
75 ≥ CNEL	1,899	95	20	80	2
65 ≥ CNEL	6,616	2,870	13,520	42,980	69
Change from 1996 Baseline[2]					
65-70 CNEL	-19	-385	-1,600	-900	1
70-75 CNEL	297	-55	-1,300	-3,800	-5
75 ≥ CNEL	-693	-101	-480	-1,320	-1
65 ≥ CNEL	-415	-542	-3,380	-6,020	-5
Change from Year 2000 Conditions[2,3]					
65-70 CNEL	-575	-784	-1,200	-1,100	-9
70-75 CNEL	364	175	-1,700	-5,100	-5
75 ≥ CNEL	-159	72	-380	-1,120	-1
65 ≥ CNEL	-370	-537	-3,280	-7,320	-15
Change from No Action/No Project					
65-70 CNEL	58	114	0	2,300	1
70-75 CNEL	-108	-50	-1,100	-3,500	-2
75 ≥ CNEL	-47	58	-40	-150	0
65 ≥ CNEL	-97	122	-1,140	-1,350	-1

[1] Population and Dwelling estimates have been rounded to the nearest hundred if greater than 1,000 and to the nearest 10 if less than 1,000.

[2] A positive value indicates that the future alternative increases the number of impacts over the 1996 baseline or Year 2000 conditions; a negative number indicates that the future alternative decreases the number of impacts. The number indicates a net difference. Some areas would experience increased noise while other areas would experience a decrease in levels. Section 4.2, *Land Use*, details the number of impacts newly exposed to noise above 65 CNEL.

[3] Population and dwelling unit information for the Year 2000 conditions is reported using a year 1990 census data base for CNEL comparisons with other alternatives.

[4] Acreage totals may not add due to rounding.

Source: Landrum & Brown with Psomas, 2000 for environmental baseline comparisons; with PCR, 2002 for Year 2000 comparisons and Alternative D analysis.

4.1.6.1.5.1 Comparison of Alternative D Aircraft Noise to Environmental Baseline Conditions

As indicated in Figure F4.2-28, Alternative D 2015 vs. 1996 Baseline - Areas Newly Exposed, in Section 4.2, *Land Use*, the relocation of Runway 24R to the south would cause the noise pattern east of the north runway complex to shift to the south along a narrow strip on the south side of the approach contour. North of the relocated end of Runway 24L, the noise levels would increase by as much as 3 CNEL over 1996 baseline conditions, owing to the eastward shift of the start of takeoff rolls. **Table F4.1-34**, Significant CEQA Noise Impacts in 2015 - Alternative D (Compared to 1996 Baseline Conditions), indicates that within this area of significant (1.5 CNEL) increase are approximately 5,000 persons in an estimated 1,700 dwellings. This condition triggers a duty to mitigate under CEQA. Also on the 184 acres of off-airport noise-sensitive land within the 65 CNEL contour are five churches, two schools, and a hospital. Additionally, the impacts of Alternative D include approximately 5,100 persons in an estimated 1,700 dwellings, as well as 19 non-residential noise-sensitive parcels that would be newly exposed to noise greater than or equal to 65 CNEL. Alternative D would expose seven parcels to increases of more than 3 CNEL between 60 and 65 CNEL, while none would be exposed to increases of more than 5 CNEL below 60 CNEL over the 1996 baseline condition.

The shift of the noise contours associated with Alternative D in 2015, when compared to the 1996 baseline, would result in the removal of 11,120 persons, 5,080 dwellings and 23 noise sensitive public facilities from the area exposed to noise greater than or equal to 65 CNEL.

Table F4.1-34

Significant CEQA Noise Impacts in 2015 - Alternative D
(Compared to 1996 Baseline Conditions)

	Newly Exposed to ≥ 65 CNEL	Exposed to 1.5 CNEL Increase
Population	5,100	5,000
Dwelling Units	1,700	1,700
Non-Residential Noise-Sensitive Parcels		
Schools	8	2
Churches	8	5
Hospitals	1	1
Convalescent Hospitals	2	0
Parks	0	0
Libraries	0	0
Total Non-Residential Noise-Sensitive Parcels	**19**	**8**

Source: Landrum & Brown with PCR, 2002.

4.1.6.1.5.2 Comparison of Alternative D Aircraft Noise to Year 2000 Conditions

Differences between Alternative D and Year 2000 conditions are included in **Table F4.1-33** for information and comparison with the changes occasioned by Alternative D from 1996 baseline and future No Action/No Project Alternative conditions.

As is disclosed in Section 4.2, *Land Use*, by 2015, the length of the contour pattern associated with Alternative D leading to the south runways would shrink slightly from that of the Year 2000 conditions (Figure S10, Alternative D 2015 vs. Year 2000 Conditions - Areas Newly Exposed, in Technical Report S-1, *Supplemental Land Use Technical Report*), but shift along the approach to the north runways to expose new areas to noise above 65 CNEL. The contour leading to the north runways would become wider than the Year 2000 conditions contour by 300 to 400 feet, the result of the relocation of the inboard runway (Runway 6R/24L) southward by 338 feet. The area north of the relocated east end of the north runways and a narrow sliver of land along the north side of the approach to the south runways are the only other areas that are projected to fall within the 65 CNEL that are not now so affected. The shift in the north airfield would result in portions of residential areas being exposed to an increase of 1.5 decibels of CNEL.

Alternative D would provide a net reduction of impacts within the 65 CNEL count in most categories in comparison to Year 2000 conditions (**Table F4.1-33**) totaling approximately 7,320 fewer persons in 3,280 fewer dwellings and 15 fewer noise sensitive uses. However, as indicated in **Table F4.1-35**, Comparative Noise Impact Changes - Alternative D (Compared to Year 2000 Conditions) the runway shifts in the north airfield would result in approximately 4,300 persons in an estimated 1,300 dwellings becoming newly exposed to noise greater than or equal to 65 CNEL by the alternative, as would 10 non-residential noise-sensitive parcels. Additionally, much of the area within the 65 CNEL contour along the south side of the approach to the north runway complex would be exposed to increases of 1.5 CNEL or more by the alternative, as would the area north of the relocated east ends of the north runways. Within this area are an estimated 1,400 dwellings and approximately 4,400 residents, as well as 11 non-residential noise-sensitive parcels, including 3 schools, 5 churches, 1 hospital, and 2 parks.

Table F4.1-35

Comparative Noise Impact Changes - Alternative D
(Compared to Year 2000 Conditions)

	Newly Exposed to ≥ 65 CNEL	Exposed to 1.5 CNEL Increase
Population	4,300	4,400
Dwelling Units	1,300	1,400
Non-Residential Noise-Sensitive Parcels		
Schools	4	3
Churches	5	5
Hospitals	1	1
Convalescent Hospitals	0	0
Parks	0	2
Libraries	0	0
Total	**10**	**11**

Source: Landrum & Brown with PCR, 2002.

The shift of the noise contours associated with Alternative D in 2015, when compared to the Year 2000 conditions, would result in the removal of 11,620 persons, 4,580 dwellings and 72 noise sensitive public facilities from the area exposed to noise greater than or equal to 65 CNEL.

4.1.6.1.5.3 Comparison of Alternative D Aircraft Noise to No Action/No Project Conditions

A comparison of the No Action/No Project Alternative and Alternative D noise contours indicated in Figure F4.2-29, Alternative D 2015 vs. No Action/No Project Alternative - Areas Newly Exposed, in Section 4.2, *Land Use*, reveals little difference between the aircraft noise exposure patterns. The minor differences are as follows:

- The contour shift with the relocation of the east end of Runway 24L in Alternatives A, B, and C would also be present in Alternative D, although its effect would not be as pronounced as with the other build alternatives. The effect results in noise levels as much as 1.5 CNEL higher than the projected future No Action/No Project Alternative conditions in the area of Westchester east of Sepulveda Boulevard.
- The relocation of the departure runway in the north airfield (Runway 24L) would result in a slight southerly shift along the contour of the approaches to the north airfield. Although Runway 24L would be used primarily by takeoffs, a proportion of the arrivals would remain on that runway, resulting in the contour shift. Further, during the limited periods when east traffic flow is active, inboard Runway 6R would be one of the two principal takeoff runways to the east, further contribution to the contour shift in the area.
- The contour pattern under the approach to the south runways would be slightly shorter than the No Action/No Project Alternative condition, while the pattern leading to the north runways would be nearly the same length as the No Action/No Project Alternative contour.
- The noise levels along the north side of the airport in Westchester, west of Sepulveda Boulevard, would be decreased by approximately 1 CNEL by virtue of the relocation of the primary departure runway in the north airfield (Runway 24L) by more than 300 feet to the south. In contrast, contours south of the airport would remain virtually unchanged from No Action/No Project Alternative conditions.
- **Table F4.1-33** indicates net reductions in the noise exposure impacts on population and dwellings from the 2015 No Action/No Project condition within the contours for Alternative D. **Table F4.1-36,** NEPA Noise Impacts - Alternative D (Compared to No Action/No Project Conditions) demonstrates the differences between the two conditions. The minor shifts of the noise contour would result in approximately 2,000 newly exposed persons and 670 newly exposed dwellings, as well as 9 newly exposed non-residential noise-sensitive parcels, falling within the 65 CNEL contour. Alternative D, in comparison to the No Action/No Project Alternative condition would expose the following sensitive uses, located within the 65 CNEL contour, to increases of 1.5 CNEL or more:

- 128 acres of off-airport land used for noise-sensitive purposes within the 65 CNEL contour.
- 110 dwelling units housing an estimated 250 persons.
- 4 non-residential noise-sensitive parcels, including a school and 3 parks.

Table F4.1-36

NEPA Noise Impacts - Alternative D (Compared to No Action/No Project Conditions)

	Newly Exposed to ≥ 65 CNEL	Exposed to 1.5 CNEL Increase
Population	2,000	250
Dwelling Units	670	110
Non-Residential Noise-Sensitive Parcels		
Schools	4	1
Churches	3	0
Hospitals	1	0
Convalescent Hospitals	1	0
Parks	0	3
Libraries	0	0
Total Non-Residential Noise-Sensitive Parcels	**9**	**4**

Source: Landrum & Brown with Psomas, 2000, and Landrum & Brown with PCR, 2002.

All of these areas affected by increases of 1.5 CNEL would be located along the north side of the noise contour and in the vicinity of the relocated end of Runway 24L, south of La Tijera and east of Sepulveda Boulevards. No locations would be exposed to increases of 3 CNEL between 60 and 65 CNEL.

The shift of the noise contours associated with Alternative D in 2015, when compared to the 2015 No Action/No Project Alternative conditions, would result in the removal of 3,350 persons, 1,810 dwellings, and 10 noise sensitive public facilities from the area exposed to noise greater than or equal to 65 CNEL.

4.1.6.1.5.4 Comparison of Alternative D Aircraft Noise and 1996 Baseline and Year 2000 Conditions Single Event Effects

Single event noise impacts for the 2015 Alternative D condition were evaluated.

4.1.6.1.5.4.1 Nighttime Awakenings

The pattern of Alternative D single event noise sufficient to result in the awakening of 10 percent of the residents at an average frequency of once every ten days is provided in Figure F4.2-38, Alternative D 2015 94 dBA SEL vs. ANMP - Areas Newly Exposed, in Section 4.2, *Land Use*. As in all other future scenarios, the easterly departures projected at night are expected to turn to the right nearer the airport than has been the case during recent years, resulting in the area of exposure east of the airport being substantially larger than the areas included within the 94 dBA SEL contour for both 1996 baseline and Year 2000 conditions (as provided in subsection 4.1.3.1.3.1). The total numbers of persons and dwellings within the 94 dBA SEL contour are comparable to the totals for 1996 baseline and Year 2000 conditions, although the areas exposed differ substantially, resulting in large numbers of newly exposed dwellings and persons. The shift in area of exposure will result in a substantial number of dwellings and persons being newly exposed to single event noise events at night above 94 dBA SEL, when compared to the 1996 baseline, Year 2000 conditions and LAWA's Aircraft Noise Mitigation Program area of eligibility. **Table F4.1-37,** Single Event Noise Effects on Awakenings - Alternative D Compared to the 1996 Baseline and Year 2000 Conditions, provides a comparison of the relationship between the projected single event awakenings impacts projected for Alternative D, and baseline and Year 2000 conditions.

Table F4.1-37

Single Event Noise Effects on Awakenings - Alternative D Compared to the 1996 Baseline and Year 2000 Conditions

Impact Category	Alternative D Impact[1]	Newly Exposed		
		Against 1996 Baseline[1]	Against Year 2000 Conditions[2]	Against 1992 ANMP Contour[1]
Exposure ≥ 94 dBA (SEL)				
Number of Dwellings	16,300	6,000	5,000	4,100
Estimated Population	53,000	18,000	15,600	13,200

[1] Impacts for the total population and dwellings within the 94 dBA SEL contour, as well as for newly exposed comparisons to the 1996 baseline and the 1992 ANMP contour are developed using 1990 census data.

[2] Impacts for comparisons of the total population and dwellings newly exposed comparisons to the Year 2000 conditions data are developed using Year 2000 census data.

Note: While the total number of persons and/or dwellings located within the 94 SEL contour may approximate the total numbers present in environmental baseline or Year 2000 conditions, the shift of the location of the 94 dBA SEL contour among the various conditions assessed results in several thousand dwellings (with their associated population) being removed from within the 94 dBA SEL contour for the current conditions, while another large number of dwellings would newly fall within the 94 dBA SEL contour of the future Alternative D condition. The great majority of these dwellings fall between the approaches to the north and south runway complexes east of the airport.

Source: Landrum & Brown with PCR, 2002.

The pattern of exposure to noise above 94 SEL infills the area between the runway approaches, based on FAA runway use guidelines resulting in additional easterly departures projected during the night hours and assumed turns to the right by Asia-bound shortly after departure. The shift of the 94 dBA SEL noise contours associated with Alternative D in 2015, when compared to the 1996 baseline condition, would result in the removal of 19,300 persons and 8,500 dwellings from within the contour. Compared to the Year 2000 conditions, the Alternative D 94 dBA SEL contour pattern would remove 13,400 persons and 4,200 dwellings from within the area exposed to significant nighttime single event noise levels.

The pattern of exposure to nighttime single events of 94 dBA SEL by Alternative D is similar to that of the No Action/No Project Alternative and Alternative C. The difference between Alternative D impacts and those of the baseline and ANMP conditions is a result of the changed configuration of the Alternative D runways and different aircraft mix. The substantial portion of the difference lies between the approaches west of Van Ness Avenue, along the north side of the approach to the north runway complex, and under a takeoff path leading to the east from the north runways and turning to the right over Inglewood. A methodology for mitigation of single event noise effects on awakening is presented in Section 4.2, *Land Use* (subsection 4.2.8).

4.1.6.1.5.4.2 School Disruption

Information about the schools that would exceed the temporary thresholds of significance for classroom disruption by single event aircraft noise is presented in **Table F4.1-38,** Schools Exposed to Significant Interior Single Event Noise Levels - Alternative D Compared to the 1996 Baseline and Year 2000 Conditions. The number of schools projected to be impacted above the 55 dBA L_{max} threshold by Alternative D in 2015 is less than are affected currently (1996 baseline and Year 2000 conditions). However, the shift of the single event noise exposure pattern associated with the modified runway configuration and aircraft mix assumed for Alternative D would result in two or three schools being newly exposed to noise above 55 decibels (compared to 1996 baseline and Year 2000 conditions, respectively) and no schools being newly exposed to noise above 65 decibels (compared to 1996 baseline and Year 2000 conditions, respectively). The names and locations of these affected schools that would be newly exposed to high noise levels are provided in Section 4.2, *Land Use*. Additionally, the number of individual events would increase at the affected schools in future years. Because the east end of Runway 24L is relocated several hundred feet to the east, the average duration of each loud event is also expected to increase from three to six seconds because the average landing overflights above the impacted schools are slightly lower in altitude, resulting in a longer period of exposure at each.

Table F4.1-38

Schools Exposed to Significant Interior Single Event Noise Levels - Alternative D Compared to the 1996 Baseline and Year 2000 Conditions

Impact Category	Alternative D Impact	Against 1996 Baseline		Against Year 2000 Conditions	
		Net Change	Newly Exposed	Net Change	Newly Exposed
Exposure ≥ 55 dBA (L_{max})					
Number of Public Schools	9	-5	1	-2	2
Number of Private Schools	10	-4	1	-5	1
Average Number of Events/School	40	+16	NA	+11	NA
Average Seconds/Event	6	+3	NA	+3	NA
Exposure ≥ 65 dBA (L_{max})					
Number of Public Schools	1	0	0	0	0
Number of Private Schools	1	0	0	-1	0
Exposure ≥ 35 dBA ($L_{eq(h)}$)					
Number of Public Schools	11	+1	2	+1	1
Number of Private Schools	16	+3	6	+5	6

Note: The number of average events above 65 dBA L_{max} (interior) was generally less than 3 and their duration was less than 3 seconds each.

Source: Landrum & Brown with Psomas, 1999 and Landrum & Brown with PCR, 2002.

The assessment of the number of schools that would experience interior dBA $L_{eq(h)}$ levels in excess of 35 decibels in the classroom suggests that eight or seven schools would be newly exposed to this threshold of significance for the Alternative D future condition, as measured against the 1996 baseline and Year 2000 conditions, respectively. The names and locations of these affected schools that would be newly exposed to high noise levels and the mitigation of single event noise levels at specific schools is discussed in subsection 4.2.6.5 and subsection 4.2.8, of Section 4.2, *Land Use*.

4.1.6.1.6 Comparison of Aircraft Noise - All Alternatives

Table F4.1-39, Total Aircraft Noise Exposure Effects Within 65 CNEL - All Alternatives in 2015, compares the noise exposure levels of each alternative for the total level of exposure within the 65 CNEL contour for the Year 2015. The density of the population is not constant across the area exposed to noise above 65 CNEL or more. Consequently, while the area of exposure may be similar among alternatives, the numbers of persons or dwellings or noise sensitive public uses may vary substantially. For example, because the Alternative D CNEL pattern covers more of Hollywood Park, it would expose fewer dwellings and population to noise compatibility impacts than the No Action/No Project Alternative, even though it exposes slightly more off-airport land to noise above 65 CNEL. However, more persons and dwellings would be newly exposed to noise impacts under Alternative D than under the No Action/No Project Alternative because the contour shifts in accordance with the reconfiguration of the runway pattern. Of the four build alternatives, Alternative D would result in the fewest impacts. Although Alternatives C and D have nearly identical areas off the airport exposed to noise above 65 CNEL, the different runway configurations of each alternative expose areas of different population density. Alternatives A and C would have comparable levels of exposure in the year 2015 except for newly exposed population. Alternative A would expose 56 percent more new population to 65 CNEL than Alternative C, when measured against the No Action/No Project Alternative. Alternative C would have slightly more population and slightly fewer dwelling units within the 65 CNEL contour than Alternative A. Alternative B would expose approximately 36 percent more population and dwellings to noise above the 65 CNEL contour than the other build alternatives, and increase the population newly exposed to noise above 65 CNEL from the environmental baseline by 341% more than Alternative C and 478% more than Alternative D.

The table also provides a summary of the impacted population, dwellings, and noise sensitive uses that would be removed from within the 65 CNEL contour with the implementation of the various future alternatives. Generally, Alternative A would provide relief to the largest number of persons currently

impacted, followed in order by Alternative B, Alternative C, Alternative D, and the No Action/No Project Alternative.

Table F4.1-39

Total Aircraft Noise Exposure Effects Within 65 CNEL - All Alternatives in 2015

	No Action/No Project	Alternative A	Alternative B	Alternative C	Alternative D
Acres Off the Airport	2,748	2,928	4,198	2,872	2,870
Dwellings	14,660	14,690	19,690	14,640	13,520
Population	44,330	44,380	60,830	44,580	42,980
Non-Residential Noise-Sensitive Parcels	71	79	102	77	69
Population Newly Exposed to 65≥ CNEL					
From 1996 Baseline	4,720	10,310	24,370	7,150	5,100
From No Action/No Project Conditions	--	9,370	23,260	6,000	2,000
Dwellings Newly Exposed to 65≥ CNEL					
From 1996 Baseline	1,610	3,930	7,810	2,620	1,700
From No Action/No Project Conditions	--	3,520	7,750	2,420	670
Non-Residential Noise-Sensitive Parcels Newly Exposed to 65≥ CNEL					
From 1996 Baseline	17	33	48	23	19
From No Action/No Project Conditions	--	30	42	21	9
Population Removed from 65≥ CNEL					
From 1996 Baseline	9,390	14,930	12,540	11,570	11,120
From No Action/No Project Conditions	--	9,320	6,860	5,750	3,350
Dwellings Removed from 65≥ CNEL					
From 1996 Baseline	3,850	6,140	5,020	4,880	5,080
From No Action/No Project Conditions	--	3,490	2,720	2,440	1,810
Non-Residential Noise-Sensitive Parcels Removed from 65≥ CNEL					
From 1996 Baseline	25	28	20	20	23
From No Action/No Project Conditions	--	22	12	25	10

Source: Landrum & Brown with Psomas, 2003.

Table F4.1-40, Significant Increase of 1.5 CNEL Within 65 CNEL of Build Alternatives Over 1996 Baseline Conditions (CEQA Comparison), summarizes the significant impacts (increases of 1.5 CNEL or more within the 65 CNEL contour) associated with each build alternative relative to the 1996 baseline. The table reveals that for CEQA comparisons, Alternatives C and D would have substantially fewer impacts than Alternatives A or B. Although the total population exposed to 1.5 CNEL increases under Alternatives C and D are approximately equal, the distribution of impacts on single and multi-family dwellings indicates that Alternative D would affect nearly 400 fewer dwellings than Alternative C. **Table F4.1-41**, Increase of 1.5 CNEL Within 65 CNEL of Build Alternatives Over No Action/No Project Conditions (NEPA Comparison), provides a similar summary of impacts relative to the No Action/No Project condition. This table also reveals that Alternative D, because of the varying population densities throughout the airport environs and different runway configurations, would result in substantially fewer impacts in the long term than any of the other three build alternatives.

Table F4.1-40

Significant Increase of 1.5 CNEL Within 65 CNEL of Build Alternatives Over 1996 Baseline Conditions (CEQA Comparison)

Effect Category	Alternative A	Alternative B	Alternative C	Alternative D
Acres of Sensitive Use Off-Airport	623	1,227	248	184
Dwellings	6,880	11,840	2,080	1,700
Population	18,300	37,310	5,100	5,000
Non-Residential Noise-Sensitive Parcels	45	65	16	8

Source: Landrum & Brown with PCR, 2003.

Table F4.1-41

Increase of 1.5 CNEL Within 65 CNEL of Build Alternatives Over No Action/No Project Conditions (NEPA Comparison)

Effect Category	Degree of Change			
	Alternative A	Alternative B	Alternative C	Alternative D
Acres of Sensitive Use Off-Airport	707	1,425	267	128
Dwellings	6,230	11,470	2,330	110
Population	16,040	35,870	4,610	250
Non-Residential Noise-Sensitive Parcels	29	59	16	4

Source: Landrum & Brown with PCR, 2003.

Table F4.1-42, Single Event Impacts of All Future Alternatives, provides a comparative summary of the numbers of people and dwelling units in the areas subject to potential awakenings, and schools that would fall within the areas exposed to single event noise above the single event thresholds of significance developed for this analysis of the build alternatives (Alternatives A, B, C, and D). Also provided in the subject table for informational purposes is a comparison of the No Action/No Project Alternative to the various noise levels. As is the case with the CNEL comparisons, Alternative D, because of the varying population densities throughout the airport environs and different runway configurations, results in the fewest total impacts in terms of nighttime awakening potential or on disruptions of schools by single events.

Table F4.1-42

Single Event Impacts of All Future Alternatives

	No Action/No Project	Alternative A	Alternative B	Alternative C	Alternative D
Awakenings - Exposure to $\geq$ 94 SEL at Night					
Population	57,700	58,300	56,400	54,500	53,000
Dwelling Units	18,400	17,300	16,700	16,900	16,300
Schools - Exposure to Interior Noise of					
$\geq$ 55 dBA L_{max}	20	25	23	23	19
$\geq$ 65 dBA L_{max}	1	1	3	2	2
$\geq$ 35 dBA $L_{eq(h)}$	26	29	31	28	27

Source: Landrum & Brown with PCR, 2002.

Further information about the comparative effects of the various alternatives on the potential awakenings in the airport environs is provided by **Table F4.1-43,** Single Event Awakenings Impacts of All Future Alternatives Newly Exposed From 1996 Baseline and Year 2000 Conditions Levels. **Table F4.1-43** indicates that Alternative D would newly expose fewer persons and dwellings than any of the other three build alternatives, and have comparable results compared to the future No Action/No Project Alternative condition. It is these increased impacts above the 1996 baseline that potentially are the targets of any mitigation program associated with single event awakenings in the areas surrounding the airport. Subsection 4.1.8.1 below and Section 4.2, *Land Use* (subsection 4.2.8) provide mitigation actions to address these impacts.

Table F4.1-43

Single Event Awakenings Impacts of All Future Alternatives Newly Exposed From 1996 Baseline and Year 2000 Conditions Levels

Awakenings -Exposure to ≥94 dBA SEL at Night	No Action/No Project	Alternative A	Alternative B	Alternative C	Alternative D
Population					
Compared to Environmental Baseline	+ 18,100	+ 21,900	+ 23,900	+ 19,200	+ 18,000
Compared to Year 2000 Conditions	+ 18,500	+ 20,800	+ 21,400	+ 17,700	+ 15,600
Compared to Aircraft Noise Mitigation Program	+ 12,600	+ 16,900	+ 18,000	+ 14,200	+ 13,200
Dwelling Units					
Compared to Environmental Baseline	+ 6,100	+ 6,800	+ 7,500	+ 6,600	+ 6,000
Compared to Year 2000 Conditions	+ 6,200	+ 6,000	+ 6,400	+ 5,900	+ 5,000
Compared to Aircraft Noise Mitigation Program	+ 4,000	+ 5,000	+ 5,400	+ 4,600	+ 4,100

Source: Landrum & Brown with PCR, 2002.

4.1.6.2 Road Traffic Noise

4.1.6.2.1 No Action/No Project Alternative

Road traffic noise is highly dependent on the magnitude of traffic volumes -- particularly trucks -- and traffic speeds. If speeds remain constant, road traffic noise will typically increase with increasing traffic volumes, based on roadway noise physics and principles. However, as speeds decrease, road noise also decreases. In congested areas such as Los Angeles, increasing traffic volumes are generally accompanied by decreasing speeds during the peak hour, because many roadways are already congested during that time. Therefore, most roads on the west side of Los Angeles will emit less noise in the future, as they become more congested and travel speeds decrease.

The No Action/No Project Alternative assumes the continued use of the existing roadway network with no major changes to the roadway network. Examination of peak hour road traffic noise levels in **Table F4.1-4**, presented earlier in subsection 4.1.3.2, indicates that 6 of the 31 receptors analyzed for 2008 and 2015 experience an increase in noise under the No Action/No Project Alternative. The remaining 25 receptors experience a decrease in peak hour noise as a result of the No Action/No Project Alternative. In 2015, No Action/No Project peak hour noise levels range from 44.4 L_{eq} at a residential property on Pershing Drive near Waterview Street to 77.0 L_{eq} at Ashwood Park on Ash Street.

Daily road traffic noise levels are presented on **Table F4.1-5**. The same six receptors that experience an increase in peak hour noise, as described above, would also experience an increase in daily road traffic noise. In 2015, No Action/No Project Alternative daily road traffic noise levels range from 41.6 24-Hour L_{eq} at the residential property on Pershing Drive near Waterview Street to 74.2 24-Hour L_{eq} at Ashwood Park.

Daily aircraft noise levels at the receptor sites are presented on **Table F4.1-6**. Seven receptors experience an increase in daily aircraft noise. In 2015, No Action/No Project Alternative daily aircraft noise levels range from 47.2 24-Hour L_{eq} at the St. Jerome Church and School to 69.8 at the LAX Sheraton Hotel.

Combined road traffic and aircraft noise levels, in terms of 24-Hour L_{eq}, are presented on **Table F4.1-7**. Seven receptors would experience an increase in combined road traffic and aircraft noise levels. By 2015, the location experiencing the lowest noise would be the Kennedy Medical Center at 49.7 24-Hour L_{eq}, while Ashwood Park would experience the highest combined noise levels at 74.3 24-Hour L_{eq}.

4.1.6.2.2 Alternative A - Added Runway North

Examination of the peak hour noise levels in **Table F4.1-4** indicates that Alternative A would exceed the CEQA thresholds for significant impacts at Receptors RD12 and RD20. These receptors are residential areas south of the I-105 near California Street and at Cypress Street, respectively. At RD12, the peak hour noise levels would be 6.3 dBA L_{eq} greater than the 1996 baseline peak hour noise levels in 2015.

Receptor RD20 would be 12.3 dBA L_{eq} greater than the 1996 baseline noise levels in 2015. This impact would be significant. (Receptor RD20 would also meet Caltrans' criteria for a substantial increase, with an expected peak hour noise increase of 12.8 dBA L_{eq} over the No Action/No Project Alternative in 2015.) The increase in noise levels from the 1996 baseline and No Action/No Project condition to Alternative A along the I-105 is due to the combined effect of an increased number of trucks and higher speeds on the new ring road.

At the 10 new noise receptor locations (Receptors S22 through S31) that were evaluated, no receptor would experience a peak hour noise increase of 5 dBA L_{eq} or greater when comparing the Alternative A conditions to 1996 baseline conditions. Also, none of these receptors would exceed the CEQA threshold of 67 dBA. Therefore, for Alternative A, all impacts at these 10 additional receptor locations are less than significant. Also, none of the 10 new receptors would experience an increase of 12 dBA L_{eq} or greater between Alternative A and the No Action/No Project Alternative, the Caltrans criteria for a substantial noise increase.

However, the information in Appendix K, *Supplemental Environmental Evaluation for LAX Expressway and State Route 1 Improvements* shows that the following four sites would experience noise levels that exceed the NAC of 67 dBA or higher:

- Residence near Hillcrest Boulevard and Ash Avenue.
- Residence near Ash Avenue and Nectarine Street.
- Residence near Midfield Avenue and Benjamin Avenue.
- Ashwood Park, near Ash Avenue and Kelso Street.

4.1.6.2.3 Alternative B - Added Runway South

Examination of the peak hour noise levels in **Table F4.1-4** indicates that Alternative B would exceed the CEQA thresholds for significant impacts at Receptors RD12 and RD20. These receptors are residential areas south of the I-105 near California Street and at Cypress Street, respectively. At RD12, the peak hour noise levels would be 5.5 dBA L_{eq} greater than the 1996 baseline peak hour noise levels in 2015. Receptor RD20 would be 9.5 dBA L_{eq} greater than the 1996 baseline noise levels and 2015. This impact would be significant. The increase in noise levels from the 1996 baseline and No Action/No Project condition to Alternative B along the I-105 is due to the combined effect of an increased number of trucks and higher speeds on the new ring road.

At the 10 new noise receptor locations that were evaluated (S22 through S31), no receptor would experience a peak hour noise increase of 5 dBA L_{eq} or greater when comparing Alternative B conditions to 1996 baseline conditions. Additionally, none of these receptors would exceed the CEQA threshold of 67 dBA. Therefore, for Alternative B, all impacts at these 10 additional receptor locations are less than significant. Also, no receptor would experience an increase of 12 dBA L_{eq} or greater between Alternative B and the No Action/No Project Alternative, the Caltrans criteria for a substantial noise increase.

However, the information in Appendix K, *Supplemental Environmental Evaluation for LAX Expressway and State Route 1 Improvements* shows that the following four sites would experience noise levels that exceed the NAC of 67 dBA on higher:

- Residence near Hillcrest Boulevard and Ash Avenue.
- Residence near Ash Avenue and Nectarine Street.
- Residence near Midfield Avenue and Benjamin Avenue.
- Ashwood Park, near Ash Avenue and Kelso Street.

4.1.6.2.4 Alternative C - No Additional Runway

Examination of the peak hour noise levels in **Table F4.1-4** indicates that Alternative C would exceed the CEQA thresholds for significant impacts at Receptors RD12 and RD20. These receptors are residential areas south of the I-105 near California Street and at Cypress Street, respectively. At RD12, the peak hour noise levels would be 5.7 dBA L_{eq} greater than the 1996 baseline peak hour noise levels in 2015. Receptor RD20 would be 9.7 dBA L_{eq} greater than the baseline 1996 noise levels in 2015. This impact would be significant. The increase in noise levels from the 1996 baseline and No Action/No Project

condition to Alternative C along the I-105 is due to the combined effect of an increased number of trucks and higher speeds on the new ring road.

At the 10 new noise receptor locations that were evaluated (S22 through S31), no receptor would experience a peak hour noise increase of 5 dBA L_{eq} or greater when comparing Alternative C conditions to 1996 baseline conditions. Additionally, none of these receptors would exceed the CEQA threshold of 67 dBA. Therefore, for Alternative C, all impacts at these 10 additional receptor locations are less than significant. Also, no receptor would experience an increase of 12 dBA L_{eq} or greater between Alternative C and the No Action/No Project Alternative, the Caltrans criteria for a substantial noise increase.

However, the information in Appendix K, *Supplemental Environmental Evaluation for LAX Expressway and State Route 1 Improvements* shows that the following four sites would experience noise levels that exceed the NAC of 67 dBA on higher:

- Residence near Hillcrest Boulevard and Ash Avenue.
- Residence near Ash Avenue and Nectarine Street.
- Residence near Midfield Avenue and Benjamin Avenue.
- Ashwood Park, near Ash Avenue and Kelso Street.

4.1.6.2.5 Alternative D - Enhanced Safety and Security Plan

Alternative D is unique in that it transfers most of the passengers' vehicular activity from the CTA to the east side of the airport, near I-405. As a result, much of the existing road traffic noise patterns also adjust, with airport traffic oriented more toward the east and non-airport traffic backfilling the vacated roadway capacity to the west. Therefore, many of the road traffic noise patterns experienced under the 1996 baseline conditions, the No Action/No Project Alternative, and Alternatives A, B, and C change with Alternative D.

Examination of the peak hour noise levels in **Table F4.1-4** indicates no increases of 5 dBA L_{eq} or greater between Alternative D and 1996 baseline conditions. Twenty-five and 24 of the 31 receptors in 2008 and 2015, respectively, experience a decrease in noise when Alternative D is compared to 1996 baseline conditions. Because no highway improvement projects, such as the LAX Expressway proposed under Alternatives A, B, and C, are proposed in Alternative D, the CEQA threshold of an hourly L_{eq} of 67 dBA or greater when compared to existing conditions does not apply to Alternative D. Therefore, road traffic noise impacts associated with Alternative D would be less than significant relative to CEQA. Two receptors would experience a slight increase in road traffic noise levels in 2008 (maximum increase is 0.7 dBA), but a reduction in road traffic noise in 2015. The remaining receptors would experience noise level increases in 2015, compared to 1996 baseline conditions; however the maximum increase would only be 2.9 dBA.

Also, examination of the peak hour noise levels in **Table F4.1-4** indicates no increase of 12 dBA L_{eq} between Alternative D and the No Action/No Project Alternative. The maximum increase in 2015 would be 2.8 dBA (Receptors RD11 and RD17). Further, 12 of the receptors would experience a decrease in road traffic noise compared to the No Action/No Project Alternative in 2015. Therefore, road traffic noise impacts associated with Alternative D would not be considered substantial according to Caltrans.

4.1.6.3 Construction Traffic Noise (Off-Airport)

Construction traffic noise would be generated by both trucks and employee vehicles. As part of the Master Plan, commitments would be made which shift trips to off-peak hours, encourage remote parking, and minimize employee car trips. Additionally, construction-related trucks would be restricted to designated routes ensuring that these vehicles utilize the nearby freeways and major arterials to the maximum extent and minimize use of local roadways.

If traffic conditions on a road are good (LOS A or B) sound levels increase at a rate of 3 dBA per doubling of traffic volume. However, when traffic conditions are already at LOS C, D, E, or F, increased traffic volumes (including construction traffic) result in decreasing speeds, and traffic noise gets progressively quieter based on reduced engine operation levels, reduced drive-train and tire rotations, and reduced wind shear. On roads with good traffic conditions, roadway traffic volumes would have to increase at more than a 3-fold rate to reach the CEQA threshold of significance of a 5 dBA increase. Traffic would

have to increase 16-fold over the No Action/No Project Alternative volumes to meet criteria for a substantial noise increase of 12 dBA.

The construction routes for all build alternatives would be intentionally designated for freeways and major arterials around the airport, avoiding minor arterials and local streets. These freeways and major arterials are high-volume routes that are already at LOS C or worse. Therefore, construction traffic would not trigger an exceedance of either the CEQA construction traffic noise threshold or the federal standards for substantial increase in traffic noise. As a result, this noise impact is expected to be less than significant for all build alternatives. (The analysis of construction traffic relative to off-airport surface transportation conditions is presented in Section 4.3.2, *Off-Airport Surface Transportation*.)

4.1.6.4 Construction Equipment Noise (Off-Airport)

4.1.6.4.1 No Action/No Project Alternative

Construction near noise-sensitive uses associated with this alternative includes the LAX Northside project, the demolition of the Belford and Manchester Square residential areas under the Airport Noise Mitigation Program, and the development of Continental City. The noise-sensitive uses closest to the Belford Area are multi-family dwellings located to the northeast across Arbor Vitae on Ramsgate and Morley Streets. The closest distance to demolition activities is approximately 450 feet. Outdoor construction of 86 dBA at 50 feet potentially could generate noise levels of 72 dBA at 450 feet. The potentially affected residential areas are within the 1996 and No Action/No Project 70 CNEL contour for aircraft noise. Ambient noise is estimated at 68 dBA L_{eq} and therefore 4 dBA L_{eq} less than the construction noise. Demolition is not expected to occur during nighttime hours. Arbor Vitae Street and large warehouse uses separate the two areas, and these would both mask and buffer the noise in the residential areas.

The noise-sensitive uses closest to Manchester Square are single-family dwellings located 1,000 feet or more to the east across La Cienega Boulevard and the I-405 in the City of Inglewood within the 1996 and No Action/No Project 65 CNEL contour. Construction noise of 86 L_{eq} would dissipate to approximately 67 L_{eq} at that distance, and the roadway and other noise would mask any construction noise.

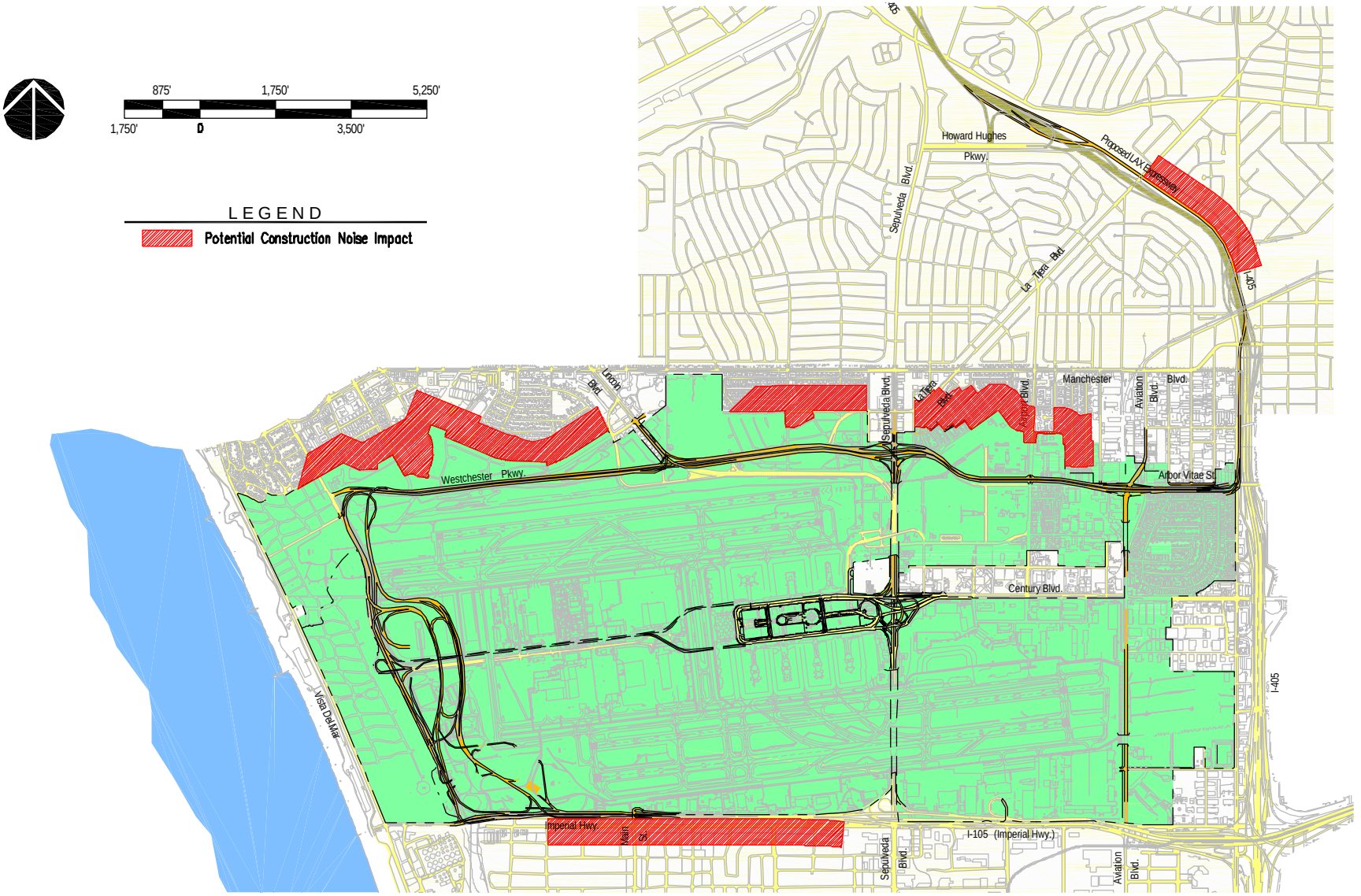
The noise-sensitive uses closest to Continental City are single-family dwellings located 1,000 feet or more to the south across Imperial Highway in the community of Del Aire within the 1996 65 CNEL contour and within the 60 CNEL for the No Action/No Project Alternative. Additionally there is considerable ambient noise from the freeway, the railway Metropolitan Transit Authority (MTA) Green Line, and Imperial Highway. Ambient noise levels are estimated at 65 dBA L_{eq}. Construction noise of 86 L_{eq} would dissipate to approximately 67 L_{eq} at that distance, and the roadway and other noise would mask any construction noise.

Noise-sensitive uses abut the LAX Northside project all along its northerly border in areas where the CNEL from aircraft noise is within both the 1996 and No Action/No Project 60 CNEL and partially within the 1996 65 CNEL contour. Accordingly, ambient noise levels are estimated at 62 to 66 dBA. Construction would occur throughout the period until 2015, but nighttime activities are not anticipated. Outdoor construction noise at 86 L_{eq} would dissipate to 67 dBA (5 dB above ambient) within 800 feet if there were no obstructions. However, considering the built-up residential area with houses and the existing berms and landscaping, it is estimated that construction noise would dissipate to no more than 67 dBA within 600 feet of the noise source. A noise level of 67 L_{eq} would be 5 dBA above the lowest ambient noise of 62 L_{eq}. Accordingly, all noise-sensitive residential and school uses within 600 feet of the LAX Northside project would be affected, as depicted in **Figure F4.1-9**, Potential Construction Noise Impacts - No Action/No Project Alternative and Alternatives A, B, and C.

4.1.6.4.2 Alternatives A, B, and C

Noise from construction activities and equipment has the potential to exceed ambient levels in noise-sensitive residential areas. Aircraft and other ambient noise under Alternatives A, B, and C would not differ significantly in potentially affected areas.

Construction in Belford and Manchester Square would have the same consequences as demolition under the No Action/No Project Alternative, and would create less-than-significant impacts. Construction of airport facilities along the I-105 near the Continental City site would create the same less-than-significant impacts as construction of the Continental City site under the No Action/No Project Alternative.



LAX Master Plan **Final EIS/EIR**	**Potential Construction Noise Impacts - No Action/ No Project Alternative and Alternatives A, B, and C**	Figure **F4.1-9**

Construction of the Westchester Southside project would have the same impacts as in the No Action/No Project Alternative, but to a somewhat lesser extent owing to the decrease in density of the project. Construction noise would potentially exceed ambient levels by 5 dBA L_{eq} or more in noise-sensitive areas within 600 feet of construction sites as depicted in **Figure F4.1-9**. Although noise from construction would be temporary and transitory, this is a significant impact and mitigation is provided.

Additional demolition and construction would occur near noise-sensitive residential areas in the City of El Segundo (where the southerly stretch of the ring road would be constructed), in the community of Westchester (where the northerly stretch of the ring road would be constructed), and in the City of Inglewood (where the LAX Expressway would be constructed). Some nighttime construction activity would be expected with such fast-track roadway projects. These areas are nearly identical for all alternatives except for minor differences along the ring road between La Cienega and Sepulveda Boulevards. Daytime ambient noise levels in all these areas are estimated at 65 dBA L_{eq} or higher owing to both roadway and aircraft noise. Nighttime ambient levels are estimated to be 5 dB lower. Construction noise of 70 dBA L_{eq} or higher would potentially extend 600 feet from all construction sites. Construction noise of 65 dBA L_{eq} would potentially extend 1,200 feet from all construction sites. However, due to the built up area of homes and landscaping, it is estimated that construction noise of 65 dBA would extend no farther than 600 feet from all construction sites. This would potentially create a significant impact on homes and other noise-sensitive uses located within 600 feet of nighttime construction activities, as illustrated in **Figure F4.1-9**. The built up nature of the area would most likely diminish the sound much closer than 600 feet, but the more conservative distance is utilized to demonstrate a worst case.

4.1.6.4.3 Alternative D - Enhanced Safety and Security Plan

Construction near noise-sensitive uses associated with Alternative D includes the development of airport property north of Westchester Parkway and west of Sepulveda Boulevard, the RAC, the ANMP acquisition area (Belford), the GTC (Manchester Square), and on-site cargo facilities near the airport's southern boundary.

Noise-sensitive uses abut the airport property north of Westchester Parkway and west of Sepulveda Boulevard. Ambient noise levels are estimated to be between 62 dBA L_{eq} and 66 dBA L_{eq} during daytime hours. Outdoor construction noise levels of 86 dBA L_{eq} at 50 feet would dissipate to 67 dBA (5 dBA above ambient) at a distance of 900 feet without attenuation due to topography and shielding. Considering the built-up residential area with houses and the existing berms and landscaping, it is estimated that construction equipment noise would dissipate to no more than 67 dBA L_{eq} within 600 feet of the noise source. Accordingly, all noise-sensitive uses within 600 feet of the construction activities would be significantly impacted, as depicted in **Figure F4.1-10**, Potential Construction Noise Impacts - Alternative D.

Residential land uses abut the RAC to the north. Ambient noise levels in this area are estimated to be between 62 dBA L_{eq} and 66 dBA L_{eq} during daytime hours. Considering the built-up residential area with houses and existing landscaping, it is estimated that construction equipment noise would dissipate to no more than 67 dBA L_{eq} within 600 feet of the noise source. Accordingly, all noise-sensitive uses within 600 feet of the construction activities would be significantly impacted, as depicted in **Figure F4.1-10**.

The nearest residences to the ANMP acquisition area are residences located to the northeast across Arbor Vitae on Ramsgate and Morley Streets. The closest location to demolition activities is approximately 450 feet. Outdoor construction of 86 dBA at 50 feet potentially could generate noise levels of 72 dBA at 450 feet. The potentially affected residential areas are within the 1996 and No Action/No Project Alternative 70 dBA CNEL contour for aircraft noise. Ambient noise is estimated at 68 dBA L_{eq} and therefore 4 dBA less than the construction equipment noise. Demolition is not expected to occur during nighttime hours. Arbor Vitae Street and local warehouse uses separate the two areas, and these would both mask and buffer the noise in the residential areas. This area would have a less than significant impact from construction equipment noise.

The noise-sensitive uses closest to the proposed GTC are single-family dwellings located 1,000 feet or more to the east across La Cienega Boulevard and the I-405 in the City of Inglewood within the 1996 and No Action/No Project Alternative 65 dBA CNEL aircraft noise contour. Construction equipment noise of 86 dBA L_{eq} would dissipate to approximately 66 dBA L_{eq} at that distance, and the road traffic and other

noise would mask any construction noise. This area would have a less than significant impact from construction equipment noise.

The nearest noise-sensitive land uses to the proposed on-site cargo facilities are located approximately 500 feet away, south of the I-105. Daytime ambient noise levels at these locations are estimated to be 65 dBA L_{eq} or higher, owing to both road traffic and aircraft noise. Construction noise of 70 dBA L_{eq} or higher would potentially occur 600 feet from construction activities, because there is no substantial shielding between the noise source and the noise-sensitive receptors. Consequently, first-row residences within 600 feet of nearby cargo facility construction would be significantly impacted by construction equipment noise.

4.1.6.5 APM Noise

4.1.6.5.1 No Action/No Project Alternative

The No Action/No Project Alternative would not include an APM system; hence, there would be no APM noise impacts for this scenario.

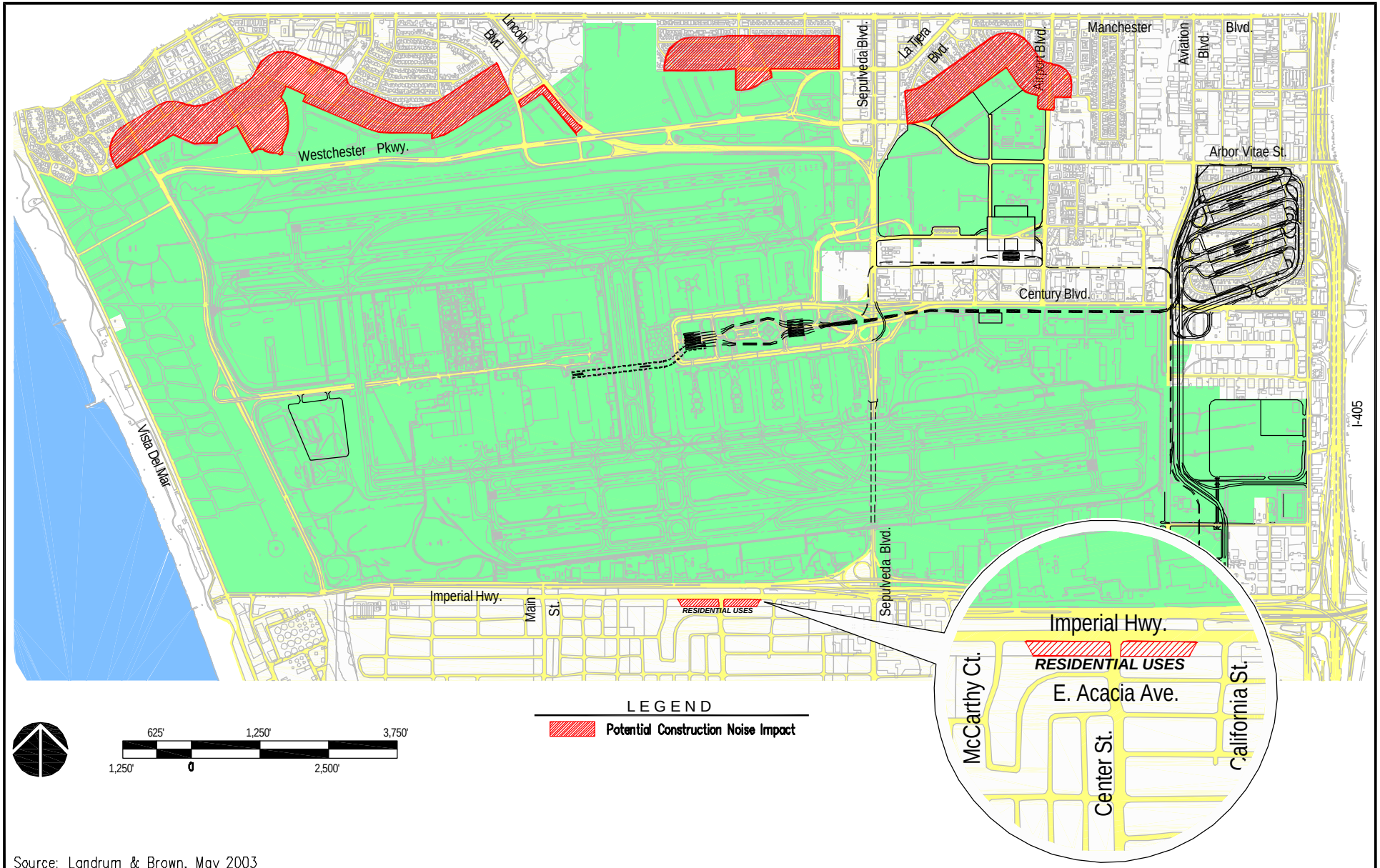
4.1.6.5.2 Alternatives A, B, and C

As indicated above in subsection 4.1.2.5 regarding the methodology for the APM noise analysis, extension of the MTA Green Line proposed under Alternatives A, B, and C would occur within a completely enclosed tunnel to be constructed within the limits of airport property. No notable APM noise impacts would occur.

4.1.6.5.3 Alternative D - Enhanced Safety and Security Plan

The projected noise levels associated with operation of the APM routes proposed along Century Boulevard (i.e., the APM route for the GTA-CTA connection) and 98th Street (i.e., the APM route for the ITC-RAC-CTA connection) were determined using the procedures and equations presented in Chapter 5 of the FTA Guidance Manual. The APM system for Alternative D includes the following design characteristics, as related to design factors considered in the calculation of operational noise levels using the FTA Guidance Manual.

- **APM Route Alignments**: For the segment of the ITC-RAC-CTA route between Aviation Boulevard and Sepulveda Boulevard (i.e., the segment in proximity to the existing hotels), the APM route alignment was assumed to be along the north side of 98th Street. For the segment of the GTC-CTA route between Aviation Boulevard and Sepulveda Boulevard, the AMP route alignment was assumed to be within the median between Century Boulevard and Avion Drive.
- **System Design**: Either rubber tire vehicles operating on an aerial concrete guideway, or steel-wheel on welded track with resiliently supported ties.
- **Maximum Speed**: 45 miles per hour for rubber-tire system and 55 miles per hour for steel-wheel system used as a conservative assumption for both routes, although the speed for the segment of ITC-RAC-CTA route in proximity of existing hotels would be substantially less than assumed based on the deceleration/acceleration that would occur at the RAC stop.
- **Number of Vehicles (Cars) per Train**: Six for rubber-tire system and 4 for steel-wheel system
- **Number of Train Passbys (Trips) During the Day (7:00 a.m. to 10:00 p.m.):**
  - ITC-RAC-CTA Route - 870
  - GTC-CTA Route - 885
- **Number of Train Passbys (Trips) During the Night (10:00 p.m. to 7:00 a.m.):**
  - ITC-RAC-CTA Route - 276
  - GTC-CTA Route - 339



Source: Landrum & Brown, May 2003

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Based on the above assumptions and using the noise calculation procedures identified in the FTA Guidance Manual, the APM noise exposure levels at 50 feet from route centerline for the rubber tire system would be 71.0 dBA Ldn along the modeled ITC-RAC-CTA route and 71.7 dBA Ldn along the modeled GTC-CTA route, and for the steel wheel system would be 73.0 dBA Ldn and 73.8 dBA Ldn, respectively. Using FTA protocol for calculating noise levels at specific distances, the APM noise exposure for each of the subject hotels was estimated. **Table F4.1-44**, APM Noise Impacts, indicates the unshielded noise levels at each existing hotel located along the APM routes, as estimated at the hotel's nearest point to the APM route, and **Figure F4.1-8** shows the approximate noise contours, in CNEL, along the subject APM routes.

Table F4.1-44

APM Noise Impacts

Hotel	Nearest APM Route	APM Noise Level (dBA Ldn)[1]		Relationship to FTA Noise Impact Assessment Criteria[2]		
		Rubber Tire (RT)	Steel Wheel (SW)	No Impact	Impact	Severe Impact
1. Radisson Hotel	ITC-RAC-GTC	63.0	64.0	RT/SW		
2. Courtyard by Marriott	ITC-RAC-GTC	68.0	70.4			**RT/SW[3]**
3. Sheraton Hotel	GTC-CTA	60.7	63.3	RT/SW		
4. Crown Plaza Hotel	GTC-CTA	64.7	66.4		RT/SW	
5. Embassy Suites	ITC-RAC-GTC	63.0	64.0		RT/SW	
6. Renaissance Hotel	ITC-RAC-GTC	57.0	58.0	RT/SW		
7. Four Points Sheraton	ITC-RAC-GTC	75.5	77.2			**RT/SW[3]**
8. Marriott Hotel	ITC-RAC-GTC	64.0	65.4		RT/SW	
9. Hilton Hotel	GTC-CTA	64.7	66.3	RTX	SW	
10. Westin Hotel	GTC-CTA	53.1	54.3	RT/SW		

RT = Rubber Tire.
SW = Steel Wheel.

1 Assumes direct noise exposure with no intervening shielding.
2 Level of Impact based on criteria presented in subsection 4.1.4.4.2, *Federal Standards*.
3 Bold type indicates CEQA significant impact.

Source: Camp Dresser & McKee Inc., 2003.

Based on the information presented in **Table F4.1-44**, two of the 10 existing hotels located in proximity of the proposed APM routes would be significantly impacted by unshielded APM noise. Relative to federal standards, three to four of the 10 hotels would be impacted, and two would be considered severely impacted by unshielded APM noise. As discussed above in subsection 4.1.4.4.2, *Federal Standards*, the FTA Guidance Manual indicates that noise may be less impactive for land use activity that is solely indoors if the outdoor-to-indoor reduction is greater than for typical buildings (about 25 dBA with windows closed). All of the hotels identified above in **Table F4.1-44** are located in close proximity to LAX and are, and have long been, exposed to high levels of aircraft noise (i.e., greater than 65 CNEL). It is very likely that the existing noise attenuation features of most, if not all, of the subject hotels currently provide outdoor-to-indoor noise reductions of 25 dBA or more.

4.1.7 Cumulative Impacts

The cumulative impacts related to noise associated with the No Action/No Project Alternative and Alternatives A, B, C, or D in combination with other past, present, and probable future projects are described below.

4.1.7.1 No Action/No Project Alternative

The analysis of aircraft noise and road traffic noise included all of the air and road traffic activity that contributes to noise exposure around LAX. That is, no other projects are expected to create additional and cumulative aircraft noise within the noise contours of LAX. Also, the road traffic noise analysis was

based on a traffic analysis that already included the traffic generated by all future regional projects, and was therefore cumulative.

The potential cumulative impacts of construction traffic noise were reviewed, since other area projects such as Playa Vista are anticipated to create construction traffic noise at the same time as the No Action/No Project Alternative. Because sound levels increase at a rate of 3 dBA with each doubling of sound energy, traffic volumes would have to increase approximately 3-fold over baseline volumes to reach the CEQA threshold of significance criteria of a 5 dBA increase. It is not anticipated that construction traffic from other projects in the area would triple the existing traffic volumes on area streets, considering the relatively high background traffic volumes they currently experience. As a result, it is not anticipated that Playa Vista or any other area project, alone or in combination with the No Action/No Project Alternative, would generate this large amount of construction traffic on any haul route.

Further, the impacts of construction equipment noise could create a cumulative impact if any other area project were located near the noise impact areas exposed to No Action/No Project Alternative construction noise. With one possible exception, it is not anticipated that any construction project would take place within the anticipated influence area of the No Action/No Project Alternative. The possible exception is the El Segundo Corporate Campus project, located between Nash and Douglas Streets in El Segundo, which is planned for construction during the LAX Master Plan project. However, no noise-sensitive land uses exist within the combined influence area of these two projects.

4.1.7.2 Alternatives A, B, and C

The cumulative effects of noise from aircraft, construction, and road traffic noise are not expected to be significant. The combination of road traffic noise and aircraft noise was discussed above and the impacts would not be significant. Construction traffic and equipment noise does not occur in areas where aircraft noise increases, and to a large degree the existing aircraft noise would serve to mask much of the construction traffic and equipment noise. Aircraft noise patterns shift to match shifts in flight tracks, and sensitive uses newly exposed to aircraft noise are not in the same locations where construction traffic and equipment noise would occur. Therefore, there are no significant noise impacts associated with the accumulation of aircraft, road traffic, and construction traffic and equipment noise.

The cumulative noise impacts of Alternatives A, B, and C are similar to the No Action/No Project Alternative. The anticipated haul routes for Alternatives A, B, and C, the El Segundo Corporate Campus project, and the Playa Vista project would be the major freeways and arterial roads near each project. The haul routes for Playa Vista concentrate primarily on the SR 90 corridor. The haul routes for Alternatives A, B, and C would be concentrated on I-105 and the arterial roads feeding the airport from I-405. The likely haul routes for the El Segundo Corporate Campus project would be concentrated on I-105. It is not anticipated that the haul routes would substantially overlap. Further, the large traffic increase requirements to trigger a significant impact (3 times the baseline traffic volumes for CEQA and 16 times the No Action/No Project Alternative volumes for NEPA) render the potential for a significant impact from these alternatives as extremely remote. As a result, this is a less than significant impact.

Also the conclusion regarding construction equipment noise in the No Action/No Project Alternative applies to Alternatives A, B, and C as well. That is, no other project is expected to take place within the LAX projects' noise influence areas, where noise-sensitive facilities exist. Therefore, this impact is expected to be less than significant.

4.1.7.3 Alternative D - Enhanced Safety and Security Plan

The aircraft and road traffic noise related conclusions for Alternatives A, B, and C also apply to Alternative D. The cumulative effects of noise from aircraft, construction, and road traffic noise are not expected to be significant. The combination of road traffic noise and aircraft noise was discussed above and the impacts would not be significant. Construction traffic and equipment noise does not occur in areas where aircraft noise increases, and to a large degree, the existing aircraft noise would serve to mask much of the construction traffic and equipment noise. Aircraft noise patterns shift to match shifts in flight tracks, and sensitive uses newly exposed to aircraft noise are not in the same locations where construction traffic and equipment noise would occur. Therefore, there are no significant noise impacts associated with the accumulation of aircraft, road traffic, and construction traffic and equipment noise.

The cumulative road traffic noise impacts of Alternative D are similar to the No Action/No Project Alternative. The anticipated haul routes for Alternative D, the El Segundo Corporate Campus project and the Playa Vista project would be the major freeways and arterial roads near each project. The haul routes for Playa Vista would be concentrated primarily on the SR-90 corridor. The haul routes for Alternative D are concentrated on the I-405, I-105 and the arterial roads feeding the airport from the I-405. The likely haul routes for the El Segundo Corporate Campus project would be concentrated on I-105. Some haul routes may overlap on freeways and major arterials; however, traffic on those routes is already substantial, with levels of service (LOS) at C or worse. In that case, although additional construction traffic may cause a significant impact to traffic conditions, it would make the noise on these routes quieter. Further, even if the traffic conditions on the haul routes are good (LOS A or B), the large traffic increase requirements to trigger a significant impact (three times the baseline traffic volumes for CEQA) render the potential for a significant impact from these alternatives as extremely remote. As a result, this is a less than significant impact.

Also the conclusion regarding construction equipment noise in the No Action/No Project Alternative applies to Alternative D as well. That is, no other project is expected to take place within the LAX projects' noise influence areas, where noise-sensitive uses exist. Therefore, this is a less than significant impact, and there would be no significant cumulative construction traffic or equipment noise impacts.

4.1.8 Mitigation Measures

4.1.8.1 Aircraft Noise

The mitigation of aircraft noise may be accomplished in two general ways, 1) by affecting the loudness of the noise source and/or its distance from the receptor on the ground, to lower the noise level at the receptor or 2) conversely, by modifying the receptor to make it less affected by noise. This subsection discusses potential abatement of noise by modifications of the *noise source.* Section 4.2, *Land Use*, discusses the modification of the *noise-sensitive receptors* for noise mitigation.

The DOT/FAA Aviation Noise Abatement Policy of 1976, the Airport Safety and Noise Abatement Act of 1979, and the Airport Noise and Capacity Act of 1990 have outlined the framework needed to assure a coordinated approach to tackling the difficult task of noise abatement and mitigation of noise impacts.

Additional guidance is provided in the Caltrans *Airport Land Use Planning Handbook,*[74] published in 1993 to assist communities in addressing the compatibility between airports and their neighbors. Responsibilities are shared among the airport users, aircraft manufacturers, airport proprietors, federal and state governments, and local governments of communities near the airport.

Noise abatement measures should reduce noise impacts; provide benefits that exceed their costs; comply with federal, state, and local law; and be safe for aircraft operators, passengers, and residents under the routes of flight. If the level of aircraft noise impacts in the airport vicinity is to be reduced, good faith efforts are required from all responsible parties including airport and aviation system managers, owners and operators of aircraft, and land use regulatory agencies. For noise abatement, this section is concerned with measures that would alter the use or configuration of air space, runways, flight tracks, and airport facilities so as to reduce or shift the location of noise. Such techniques tend to produce one of two general effects. They either reduce the overall size of the noise contours or they move the noise to other areas.

To reduce the overall noise levels around an airport, it is necessary to reduce the total sound energy emitted by the aircraft activity at the airport. This can be accomplished through either the modification of aircraft operating procedures or the imposition of restrictions on the number, type of aircraft, or time of operation allowed at the airport. These measures are often difficult to implement and enforce, as they can erode aircraft operational safety margins or discriminate against certain operators and cause an undue burden on interstate commerce.

As a result, it is often more effective and less disruptive to try to move the noise source (aircraft or surface vehicles) to areas that are either compatible or more distant from-noise sources. This opportunity is usually realized through runway use and flight routing techniques or through noise barriers.

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[74] California Department of Transportation, Division of Aeronautics, Airport Land Use Planning Handbook, January 2002.

The Caltrans *Airport Land Use Planning Handbook* and FAA Advisory Circular 150/5020-1, *Noise Control and Compatibility Planning for Airports* (8/5/83), provide lists of noise abatement measures that might prove to be effective in different situations. Caltrans suggests the modification of airport facilities, controls on airport capacity, and restrictions on individual aircraft operations. To evaluate the potential utility of these measures on the situation presented at LAX, each was evaluated for its potential to reduce the impacts within the contours of significant noise exposure, the expected effect on cost or benefit associated with its implementation, the effects each might have on the safety of operation, and the authority for implementation. In several cases, LAWA's ability to restrict operations for noise abatement is subject to the review and approval of the FAA under Title 14, CFR Part 161.[75]

The measures evaluated for noise abatement are summarized in **Table F4.1-45**, Potential Aircraft Noise Abatement Measures for Development Alternatives. All of these measures are generally applicable to all the build alternatives with only minor accommodations to the specific configuration of any one alternative. The measures indicated in the table were used for initial screening of noise abatement and mitigation alternatives.

Table F4.1-45

Potential Aircraft Noise Abatement Measures for Development Alternatives

Potential Measure	Potential to Reduce Significant Noise Impacts	Expected Benefit of Using Measure	Enhancement of Safety	Authority Present to Implement Without Additional Study/Approval
Facility Modification				
Displace runway thresholds	Limited reduction of approach noise	Additional benefit unlikely	Limited	Included in Master Plan alternatives
Increase approach slope angle	Limited reduction of approach noise	Long term cost likely exceeds benefits	Opposed as unsafe by some operators/pilots	No - FAA airspace review required
Construct new runways for small aircraft	Incorporated in Alternatives A and B; not feasible in Alternatives C or D			
Relocate pre-flight run-ups	No	Additional benefit unlikely	No effect	Included in Master Plan build alternatives
Relocate maintenance run-ups	Limited effect except to single events	Additional benefit unlikely	No effect	Included in Master Plan build alternatives
Construct Ground Run-up Enclosures for run-ups	Yes - reduces single events from run-ups by up to 20 dB	Net benefit likely for single events of ground noise	No effect	Included in Master Plan build alternatives
Install fixed ground power and/ or air conditioning at each parking position	Limited reduction of single events	Additional benefit unlikely	No effect	Included in Master Plan build alternatives
Construct training helipad in remote areas of airport	Not applicable	Additional benefit unlikely	No effect	Yes
Construct noise barriers	Limited help to adjacent land; little benefit to properties more remote from source.	Net benefit likely for single events of ground noise	No effect	Yes
Relocate runways	Mixed results dependent on alternative	Additional benefit unlikely	No effect	Included in Master Plan build alternatives
Construct high-speed exits	Limited reduction of landing noise	Additional benefit unlikely	No effect	Included in Master Plan build alternatives
Capacity Modification				
Limit the volume of aircraft operations	Questionable	Conflicts with purpose and need	No effect	Requires Part 161 Study
Establish a maximum cumulative noise level triggering additional restrictions	Yes	Conflicts with purpose and need	No effect	Requires Part 161 Study
Reschedule to daytime hours	Yes	Additional delay cost likely to offset any noise reduction	No effect	Requires Part 161 Study

[75] Title 14, CFR, Part 161, provides guidance on the process airport operators must follow prior to the implementation of any measure that restricts a potential user's access to a public airport. In general, any measure that restricts access by an aircraft certified as meeting stage 2 or stage 3 noise levels is subject to the requirements of Part 161.

Table F4.1-45

Potential Aircraft Noise Abatement Measures for Development Alternatives

Potential Measure	Potential to Reduce Significant Noise Impacts	Expected Benefit of Using Measure	Enhancement of Safety	Authority Present to Implement Without Additional Study/Approval
Operational Modifications				
Rotational runway use	No	Greater impacts certain with any more east flow	Reduced safety from operations against winds	Requires detailed study of airspace and operations effects
Establish preferred flight corridors	Yes	Additional benefit unlikely	No substantial effect	No - FAA airspace review required
Designate preferential runways	Yes	Continued net benefit likely	No substantial effect	No - FAA airspace review required
Expand hours of over-ocean operations to 11:00 p.m. to 6:30 a.m.	Limited	Long term cost likely exceeds benefits	No substantial effect	No - FAA airspace review required
Designate preferred training runway	Not applicable	No effect	No substantial effect	Yes, with ATC agreement
Limit traffic pattern to one-side of the airport	Not applicable	No effect	No substantial effect	Yes, with ATC agreement
Increase pattern altitude	Not applicable	No effect	No substantial effect	No - FAA airspace review required
Restrict turns until aircraft have reached designated locations	Yes	Continued net benefit likely	No substantial effect	No - FAA airspace review required
Modify visual procedures	Yes	Continued net benefit likely	No substantial effect	No - FAA airspace review required
Modify instrument procedures	Limited	Additional benefit unlikely	No substantial effect	No - FAA airspace review required
Establish helicopter routes	Minimal	Additional benefit unlikely	May improve safety via better separation	No - FAA airspace review required
Encourage use of limited thrust reverse on landing	Limited	Long term cost likely exceeds benefits	Opposed as unsafe by some operators/pilots	Yes, with user participation
Limit training operations	Not applicable	Additional benefit unlikely	No effect	Yes
Prohibit intersection departures	Yes	Additional benefit unlikely	No effect	Yes, with ATC agreement
Encourage intersection departures where appropriate	Limited and site specific	Additional benefit unlikely	Opposed as unsafe by some operators/pilots	Yes, with ATC agreement
Restrict/prohibit night activity	Yes	Conflicts with purpose and need	No effect	Requires Part 161 Study
Restrict/prohibit louder aircraft	Yes	Conflicts with purpose and need	No effect	Requires Part 161 Study
Base landing fees on noise levels	Unlikely to have beneficial effect on fleet composition	Additional benefit unlikely	No effect	Requires Part 161 Study
Limit allowable aircraft weights	Unlikely to substantially reduce noise levels	Conflicts with purpose and need	No effect	Requires Part 161 Study
Encourage maximum climb takeoff procedures	No	Additional benefit unlikely	Not a standard procedure - reduced safety	Yes, with user participation
Use noise abatement takeoff procedures	Unlikely to reduce noise over land areas to the west. Limited benefit to the east	Continued net benefit likely	Accepted and/or standard procedure	Yes, with user participation
Restrict use of ground power equipment (GPU)	Limited benefit	Additional benefit unlikely	No effect	Yes
Expand area of tug/tow operation in Imperial cargo complex	Limited benefit to small area near source.	Net benefit likely for single events of ground noise	No effect	Yes

Source: Landrum & Brown, 2000.

After a screening process, the following mitigation measures were selected for implementation. Following the measures is a discussion of each alternative and of considerations for mitigating its impacts that informed the process of screening and selecting mitigation measures.

- **MM-N-1. Reserve Runway 6L/24R for Arrival Traffic Only (Alternative A).**

  Reserve Runway 6L/24R for arrival traffic only, during normal operating conditions,[76] after construction and commissioning for use.

- **MM-N-2. Reserve Runway 25L for Arrival Traffic (Alternative B).**

  Reserve Runway 25L for arrival traffic only after construction.

- **MM-N-3. Reserve Runway 7R for Departure Traffic (Alternative B).**

  Reserve Runway 7R for departure traffic only after construction.

- **MM-N-4. Update the Aircraft Noise Abatement Program Elements as Applicable to Adapt to the Future Airfield Configuration (Alternatives A, B, C, and D).**

  When existing runways are relocated or reconstructed as part of the Master Plan, the aircraft noise abatement actions associated with those runways shall be modified and re-established as appropriate to assure continuation of the intent of the existing program.

Mitigation actions are proposed to ameliorate the effects of single overflight events on nighttime awakenings and on the disruption of classroom learning environments. Mitigation Measures MM-LU-2 through MM-LU-4 presented in Section 4.2, *Land Use*, serve to mitigate such impacts. Additionally, to mitigate the noise from single event overflights, the following mitigation measure is proposed:

- **MM-N-5. Conduct Part 161 Study to Make Over-Ocean Procedures Mandatory (Alternatives A, B, C, and D).**

  A 14 CFR Part 161 Study shall be initiated to seek federal approval of a locally-imposed Noise and Access Restriction on departures to the east during Over-Ocean Operations, or when Westerly Operations remain in effect during the Over-Ocean Operations time period.

Alternative A - Added Runway North

By 2015, Alternative A would entail a southward shift of the centerlines of Runways 6R/24L, 6C/24C (now 6L/24R) and 7R/25L. New Runway 6L/24R is planned 400 feet north of the existing Runway 24R centerline. Each would have an FMS/GPS or RNAV procedure for westerly departures from each relocated runway end to accomplish the same goal that aircraft reach the coastline before making turns.

The Master Plan assumes that new Runway 6L/24R would be used only for arrivals. Consequently, departures from the north runway complex would be assigned to either Runway 24C/06C or 24L/06R. The new runway would be 400 hundred feet closer to the residential areas of Westchester than the existing runways in the north airfield complex. Even though its use for arrivals only is a Master Plan forecast, it may be formalized as a mitigation commitment for noise abatement by agreement between the airport and FAA at the time of construction.

The noise abatement measures presented in subsection 4.1.5, Master Plan Commitments, will be continued in their present form or will be modified as appropriate to the reconfiguration of the runways. Departure procedures will be shifted with the relocations of runways, and runway use schemes will continue as presently formed. All other current measures will be continued unchanged. Land use measures to mitigate noise impacts are identified and discussed in Section 4.2, *Land Use*.

In view of the evaluation of noise abatement options detailed in Appendix D*, Aircraft Noise Technical Report,* the only additional operational measure for noise abatement of Alternative A is Mitigation Measure MM-N-1, Reserve Runway 6L/24R For Arrival Traffic Only (Alternative A).

[76] Normal operational conditions assume that all runways are available for use.

Alternative B - Added Runway South

By 2015, Alternative B would construct new Runway 7R/25L in the south airfield complex, and relocate other runways. As each runway is relocated, new or replacement procedures would be established for westerly departures from each relocated runway end so that aircraft reach the coastline before making turns.

The Master Plan assumes that new Runway 7R/25L would be used only for arrivals in west flow, and in east flow for less than one percent of total annual departures with no arrivals from the west. The west end of the new runway would be several hundred feet closer to the residential areas of El Segundo than the existing runways in the south airfield complex; the majority of the runway length would be north of compatibly developed land between Sepulveda and Aviation Boulevards. Even though the use of Runway 25L for arrivals only is a Master Plan assumption, it may be formalized as a mitigation commitment for noise abatement by agreement between the airport and FAA at the time of construction. Similarly, Runway 7R may be limited to departures only to prevent arrival overflights of El Segundo.

In east flow, the runway is assumed to accommodate an overflow of peak hour departure on the south runway complex, averaging less than eight takeoffs by light commuter jet and prop aircraft per average annual day, but approximately 150 per day in periods of extended east flow operation. The effect on the noise contour associated with these departures would lie largely over the airport, with almost no effect on the commercial, office, and light industrial property southeast of the airport.

A potential mitigation action suggests that this runway not be used for departures to the east after it is constructed and that any departures projected for the runway be transferred to Runway 7L. An estimate of the effects of limiting Runway 7R/25L to west flow arrivals (Appendix D*, Aircraft Noise Technical Report, Section 8*) suggests that the average delay for all east flow departures would be increased by two to three minutes (or a total of up to 1,150 hours annually) with an associated annual cost for additional ground delay of more than $2,000,000. Since virtually no change is anticipated to the average annual noise contour as a result of this measure, the measure is not considered cost beneficial.

The noise abatement measures presented in subsection 4.1.5, Master Plan Commitments, will be continued in their present form or will be modified as appropriate to the reconfiguration of the runways. Departure procedures will be shifted with the relocations of runways, and runway use schemes will continue as presently formed. All other current measures will be continued unchanged. Land use measures to mitigate noise impacts are identified and discussed in Section 4.2, *Land Use*.

In view of the evaluation of noise abatement options detailed in Appendix D*, Aircraft Noise Technical Report*, the only feasible additional operational aircraft noise abatement measures for Alternative B in the year 2015 are presumed to be part of the basic Master Plan alternative, but would be enhanced by formal adoption of Mitigation Measure MM-N-2, Reserve Runway 25L for Arrival Traffic (Alternative B), and Mitigation Measure MM-N-3, Reserve Runway 7R for Departure Traffic (Alternative B).

Alternative C - No Additional Runway

As was the case with Alternatives A and B, the extension of Runway 24L would shift a bulge of significant noise levels above 65 CNEL by two to three thousand feet to the east, into an area that would not be exposed to levels of 65 CNEL under the No Action/No Project conditions. As discussed earlier, the retention of the environmental baseline or No Action/No Project runway end as a takeoff initiation position for aircraft capable of using the available runway length for departure (9,100 feet) would not substantially relieve that increase (see Appendix D*, Aircraft Noise Technical Report*).

The first phase of development of Alternative C also includes the relocation of Runway 6L/24R 350 feet to the north. If the runway were limited to arrival operations to limit increased noise on residences north of the airport the noise pattern along the approach from the east to the north complex would shift by 300 feet to the north. While some locations would benefit from the measure, the net effect would be to increase the noise impacts on residences and noise-sensitive uses over the Master Plan Alternative C conditions.

The noise abatement measures presented in subsection 4.1.5, Master Plan Commitments, will be continued in their present form or will be modified as appropriate to the reconfiguration of the runways. Departure procedures will be shifted with the relocations of runways, and runway use schemes will continue as presently formed. All other current measures will be continued unchanged. Land use measures to mitigate noise impacts are identified and discussed in Section 4.2, *Land Use*.

Alternative C would also relocate Runway 6R/24L northward by 350 feet from its current centerline. Other redevelopment plans call for a southward shift in the centerline of Runway 7R/25L by 50 feet. Existing Runway 7L/25R would not be relocated. To continue noise abatement techniques, new/replacement procedures are assumed for westerly departures from each relocated runway end to ensure that aircraft reach the coastline before making turns. No additional operational measures that would reduce noise levels while maintaining operational efficiency were found.

Alternative D - Enhanced Safety and Security Plan

As was the case with Alternatives A, B and C, the extension of Runway 24L would shift a bulge of significant noise levels above 65 CNEL to the east, into an area that would not be exposed to levels of 65 CNEL under the No Action/No Project conditions. As discussed earlier, the retention of the environmental baseline or No Action/No Project runway end as a takeoff initiation position for aircraft capable of using the available runway length for departure (9,100 feet) would not substantially relieve that increase (see Appendix D*, Aircraft Noise Technical Report*).

The first phase of development of Alternative D also includes the relocation of Runway 7L/25R 50 feet to the south. If the runway were limited to arrival operations to limit increased noise on residences south of the airport the noise pattern along the approach from the east to the south complex would shift by 50 feet to the south. While some locations would benefit from the measure, the net effect would be to increase the noise impacts on residences and noise-sensitive uses over the Master Plan Alternative D conditions.

The noise abatement measures presented in subsection 4.1.5, Master Plan Commitments, will be continued in their present form or will be modified as appropriate to the reconfiguration of the runways. Departure procedures will be shifted with the relocations of runways, and runway use schemes will continue as presently formed. All other current measures will be continued unchanged. Land use measures to mitigate noise impacts are identified and discussed in Section 4.2, *Land Use*.

Alternative D would also relocate Runway 6L/25R southward by 338 feet from its current centerline. If that runway were limited to takeoffs to the west, the noise contour would not shift as much as projected for Master Plan Alternative D, but in implementing that restriction, the capacity of the airfield would be degraded. To continue noise abatement techniques, new/replacement procedures are assumed for westerly departures from each relocated runway end to ensure that aircraft reach the coastline before making turns. No additional operational measures that would reduce noise levels while maintaining operational efficiency were found.

4.1.8.2 Road Traffic Noise

Future unattenuated noise levels associated with receptors RD12 and RD20, located south of the I-105 near California Street and at Cypress Street, are expected to be significant in Alternatives A, B, and C. The noise impact evaluation focused on noise abatement measures consisting of the construction of acoustically opaque noise barriers referred to generically as soundwalls. Noise barriers are solid structures constructed between a highway (i.e., noise source) and noise sensitive areas (noise receptors) along the highway. Noise barriers can be built from wood, stucco, concrete, masonry, metal or other materials and, as much as possible, are constructed to be visually compatible with the surrounding areas.

The following mitigation measure has been developed to address road traffic noise from the actions prescribed for Alternatives A, B, and C.

- **MM-N-6. Construct Noise Barrier (Soundwall) Adjacent to Areas Significantly Impacted by Road Traffic Noise (Alternatives A, B, and C).**

  In order to mitigate the significant impacts of increased road traffic noise along the I-105, a soundwall shall be constructed between the noise source (i.e., the highway) and nearby noise-sensitive receptors (i.e., existing homes and a school located south of the I-105, between Pershing Avenue and Sepulveda Boulevard).

  Due to the varying elevations of the residential units relative to the I-105, the actual height and recommended locations of the barrier necessary to break the line-of-sight between noise source and receptor will vary. For residential areas at the same elevation as the I-105, an 8+-foot tall soundwall shall be located along the south side of the I-105 right-of-way. For those noise sensitive areas that are elevated above the I-105, a soundwall constructed along the south side of the highway would

need to be unreasonably tall (i.e., 20 to 25 feet) to break the line-of-sight between noise source and receptor; however, a much shorter soundwall could be located closer to the residential units in a location that obstructs all road noise, and shall not exceed eight feet in height. **Figure F4.1-11**, Soundwall Mitigation Benefits Depending on Elevation, illustrates the recommended soundwall configuration for both equal and unequal elevations. To eliminate the undesirable end effects of noise that could escape around the barrier, the barrier shall extend four times as far in each direction as the distance from the noise sensitive areas to the barrier or to Pershing Drive on the west and Sepulveda Boulevard on the east.

The specific location, height, and design of the subject soundwall shall be determined in conjunction with the detailed design and engineering of the southern segment of the proposed ring road.

4.1.8.3 Construction Equipment Noise

To mitigate the adverse affects of noise from construction equipment, the following mitigation measures are proposed:

- **MM-N-7. Construction Noise Control Plan (Alternatives A, B, C, and D).**

  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 can shield construction noise.

- **MM-N-8. Construction Staging (Alternatives A, B, C, and D).**

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

- **MM-N-9. Equipment Replacement (Alternatives A, B, C, and D).**

  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 (Alternatives A, B, C, and D).**

  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; any time on Sunday or Holidays).

4.1.8.4 APM Noise

The following mitigation measure will address APM noise associated with Alternative D.

- **MM-N-11. Automated People Mover (APM) Noise Assessment and Control Plan (Alternative D).**

  In conjunction with detailed design and engineering of the proposed APM system, a noise control plan shall be prepared specifying noise attenuation measures to reduce APM noise levels at the two significantly impacted hotels to acceptable levels (i.e., less than 67 dBA CNEL for the Courtyard by Marriott and the Four Points Sheraton). Potential options for such noise control/reduction include, but are not limited to, the following:

  - Measures That Mitigate Noise At The Source
    - Stringent vehicle and equipment noise specifications
    - Operational restrictions
    - Vehicle skirts (i.e., steel/fiberglass panels that extend down to enclose wheel and undercarriage noise)
    - Undercar sound absorption
    - Limited turning radii

- Measures That Mitigate Noise Along The Source-To-Receptor Propagation Path
  - Sound barriers close to vehicles
  - Sound barriers at Right-of-Way line
  - Alteration of horizontal and vertical alignments (i.e., altering the height or path of the APM alignment to reduce the exposure of noise sensitive receptors)
  - Acquisition of buffer zones
  - Resilient support on aerial guideway
- Measures That Mitigate Noise At The Receptor
  - Construction of sound barriers within affected properties
  - Building noise insulation or insulation upgrades

4.1.9 Level of Significance After Mitigation

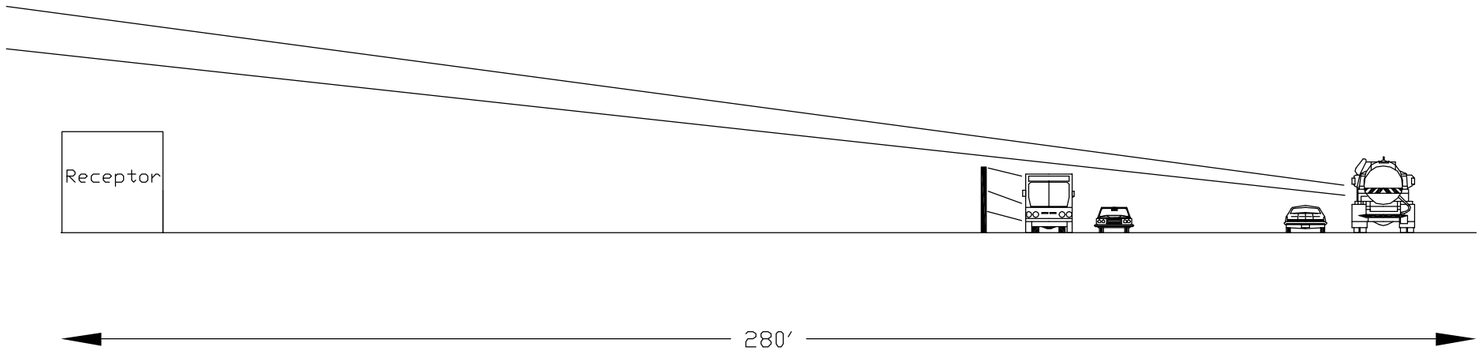
4.1.9.1 Alternatives A, B, and C

4.1.9.1.1 Aircraft Noise

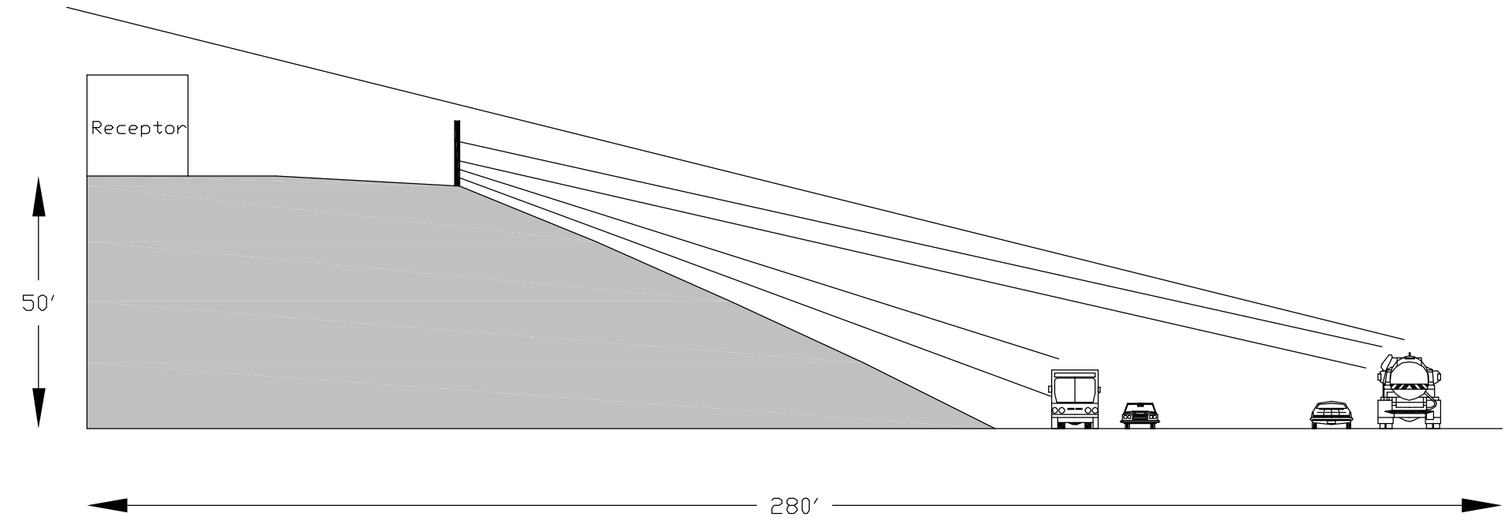
Although Master Plan Commitment N-1 and Mitigation Measures MM-N-1 through MM-N-4 would reduce aircraft noise impacts relative to CNEL, the residual impact would not be less than significant. As such, a significant and unavoidable impact from aircraft noise is expected. Mitigation Measure MM-LU-1 will add all dwellings that are newly exposed to noise above 65 CNEL to the Airport Noise Mitigation Program area of eligibility. Furthermore, Mitigation Measures MM-LU-2 and MM-N-5 would contribute to the reduction of impacts associated with nighttime awakenings through the submission of a Part 161 application for the elimination of easterly departures during the hours of over-ocean procedures, and adding areas that remain affected by noise above 94 dBA SEL exterior noise levels during other nighttime periods to the ANMP area of eligibility. Mitigation Measures MM-LU-3 and MM-LU-4 would mitigate schools that are impacted by significant single event levels through further study of the relationship between learning and aircraft noise exposure levels, and the subsequent sound insulation of schools where the impacts are shown to be significant. These actions would reduce substantially the impacts of both cumulative (i.e., combined aircraft events) and single event aircraft noise, as defined in subsection 4.1.4.1.1, *CEQA Thresholds of Significance*, but will not eliminate them as further discussed in subsection 4.2.9 of Section 4.2, *Land Use*. Therefore, significant and unavoidable single event impacts, as categorized for CEQA purposes only, would remain within the airport environs.

4.1.9.1.2 Road Traffic Noise

With Mitigation Measure MM-N-6, and those identified in Appendix K, road traffic noise impacts would be mitigated to less than significant levels.



Recommended Soundwall Location Equal Elevation



Recommended Soundwall Location on Varying Elevation

0 30 60

GRAPHIC SCALE IN FEET

Source: Landrum & Brown, March 2003

LAX Master Plan Final EIS/EIR	**Soundwall Mitigation Benefits Depending on Elevation**	Figure **F4.1-11**

4.1.9.1.3 Construction Equipment Noise

Even with Mitigation Measures MM-N-7 through MM-N-10 construction equipment operations would create noise levels over extended periods of time that are more than 5 dBA L_{eq} higher than ambient levels near sensitive residential areas and schools. This is a significant and unavoidable impact.

4.1.9.2 Alternative D - Enhanced Safety and Security Plan

4.1.9.2.1 Aircraft Noise

Although Master Plan Commitment N-1 and Mitigation Measure MM-N-4 would reduce aircraft noise impacts relative to CNEL, the residual impact would not be less than significant. As such, a significant and unavoidable impact from aircraft noise is expected. Mitigation Measure MM-LU-1 will add all dwellings that are newly exposed to noise above 65 CNEL to the Airport Noise Mitigation Program area of eligibility. Furthermore, Mitigation Measures MM-LU-2 and MM-N-5 would contribute to the reduction of impacts associated with nighttime awakenings through the submission of a Part 161 application for the elimination of easterly departures during the hours of over-ocean procedures, and adding areas that remain affected by noise above 94 dBA SEL exterior noise levels during other nighttime periods to the ANMP area of eligibility. Mitigation Measures MM-LU-3 and MM-LU-4 would mitigate schools that are impacted by significant single event levels through further study of the relationship between learning and aircraft noise exposure levels, and the subsequent sound insulation of eligible schools without avigation easements where the impacts are shown to be significant. These actions would reduce substantially the impacts of both cumulative (i.e., combined aircraft noise events) and single event aircraft noise, as defined in subsection 4.1.4.1.1, *CEQA Thresholds of Significance*, but will not eliminate them as further discussed in subsection 4.2.9 of Section 4.2, *Land Use*. Therefore, significant and unavoidable single event impacts, as categorized for CEQA purposes only, would remain within the airport environs.

4.1.9.2.2 Road Traffic Noise

All road traffic noise impacts associated with Alternative D are less than significant and therefore do not require mitigation measures.

4.1.9.2.3 Construction Equipment Noise

Even with Mitigation Measures MM-N-7 through MM-N-10, construction equipment operations would create noise levels over extended periods of time that are more than 5 dBA L_{eq} higher than ambient levels near sensitive residential areas and schools. This is a significant and unavoidable impact.

4.1.9.2.4 APM Noise

With implementation of Mitigation Measure MM-N-11, APM noise impacts would be reduced to a level that is less than significant.

4.1.10 Environmental Impacts of Road Traffic Noise Mitigation Measure

Mitigation Measure MM-N-6 proposes the development of a soundwall along the south side of the I-105 or, for those segments of the highway where nearby noise-sensitive uses are located at elevations that are well above those of the highway, in areas south of the highway. Inasmuch as the effectiveness of the soundwall relies on constructing a solid barrier within the sound propagation path between the noise source and noise-sensitive receptors implementation of this mitigation measure could result in visual impacts to the existing homes and other uses located along the south side of the I-105. As illustrated by **Figure F4.1-11**, the potential impacts would generally be less along those areas where the highway is at the same general elevation as the receptor, thereby allowing the soundwall to be constructed close to the highway and away from the receptor. However, in areas with substantial elevation differences between the highway and sensitive noise receptors, it may be necessary to locate the soundwall in close proximity to the receptors in order to achieve the necessary noise reduction. Although visual impacts are the most notable potential impact associated with the subject soundwall, other potential impacts areas could include short-term construction-related noise, air quality, hydrology, and water quality impacts.

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