Los Angeles International Airport

May 2014

LAX
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Los Angeles International Airport

14 C.F.R. Part 161
Application for Approval
of a
Runway Use Restriction

May 2014

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1 World Way
Los Angeles, CA 90045

EXECUTIVE SUMMARY

The City of Los Angeles (the "City") has sought for many years to reduce the noise impacts of night-time aircraft operations at Los Angeles International Airport ("LAX"). One target of the City's noise-reduction efforts has been "non-conforming operations" – departures to the east when LAX is in Over-Ocean or Westerly Operations at night. These non-conforming operations do not occur often, but when they do occur, they are likely, according to established estimation procedures, to cause thousands of awakenings in communities near LAX. Consistent with its commitments to the local community, the City has attempted to reduce the number of non-conforming operations through a variety of voluntary programs. These efforts have not been completely successful; various air carriers continue, from time to time, to engage in non-conforming operations.

This application seeks approval from the Federal Aviation Administration (the "FAA") for the City to adopt a new ordinance that would require all aircraft operators to comply with prevailing flows whenever LAX is in Over-Ocean or Westerly Operations from midnight to 6:30 a.m. This runway use restriction, if approved by the FAA, would eliminate non-conforming operations and the awakenings they are estimated to cause.

Consistent with the requirements of the Airport Noise and Capacity Act of 1990 ("ANCA") and the FAA's implementing regulations, Title 14 of the Code of Federal Regulations, Part 161 (14 C.F.R. Part 161 or "Part 161"), the City's application carefully describes the noise problem caused by non-conforming operations today and how it would be mitigated by the proposed runway use restriction; explains the elaborate efforts the City has made and continues to make to reduce the noise impacts of aircraft operations at LAX; details the scientific analysis the City has made of the sleep disturbance caused by non-conforming operations and explains how the proposed restriction addresses environmental justice concerns; shows why the benefits of the proposed runways use restriction are adequate to justify its costs; and demonstrates with substantial evidence that all six of the statutory conditions imposed by ANCA for approval of the proposed runway use restriction have been satisfied.

Unlike many access restrictions that the FAA has reviewed, the runway use restriction proposed by the City would not ban any flights or cause air carriers to cancel service or divert flights to alternate airports. All the proposed ordinance requires is that all aircraft operators conform their departures to prevailing flows at LAX. Although the proposed ordinance would only affect an average of about 65 flights each year – or about one in ten thousand operations at LAX – it would provide significant relief to residents adversely affected by these non-conforming nighttime operations. The City urges the FAA to approve its application and authorize the City to implement its proposed runway use restriction.

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1 INTRODUCTION

The City of Los Angeles, the proprietor of Los Angeles International Airport (LAX), has a long-standing goal to minimize noise impacts associated with nighttime aircraft operations at the Airport. Los Angeles World Airports (LAWA) is the City department that operates LAX under the governance of a seven-member Board of Airport Commissioners (BOAC).[1] The BOAC and the LAX/Community Noise Roundtable have determined over the last several years that a noise problem exists when late night flights depart to the east over densely populated portions of Los Angeles and neighboring communities when all other aircraft are either departing to the west over the ocean or are arriving from the west, also over the ocean.[2] This flow condition is referred to as "Over-Ocean Operations[3]". Over Ocean Operations is a voluntary noise mitigation measure that has been in existence in its present form since 1974 (interrupted only by the FAA controllers' strike in 1981), and significantly reduces, but does not eliminate, flights over neighborhoods east of the Airport. A similar disturbance from east departures also occurs when aircraft, both departures and arrivals, are in a westerly flow, referred to as Westerly Operations[4]. Because these "non-conforming" departures to the east continue to occur and cause disturbance to the communities east and south of LAX, the City proposes to adopt a runway use restriction to eliminate the easterly departures of *all* aircraft (with certain limited exemptions) between the hours of 12:00 midnight and 6:30 a.m. when the Airport is in Over-Ocean Operations or in Westerly Operations.[5]

The Airport Noise and Capacity Act of 1990 ("ANCA") directed the Secretary of Transportation to establish a national aviation noise policy that included regulation of processes for reviewing airport noise and access restrictions on aircraft operations with adequate public notice and opportunity for comment.[6] The FAA implemented this policy through Title 14 of the Code of Federal Regulations, Part 161 (14 C.F.R. Part 161) or "Part 161".[7] This report presents documentation addressing ANCA and Part 161 requirements for the proposed runway use restriction.

[1] As one of a system of three airports that also includes LA/Ontario International (ONT) and Van Nuys (VNY).

[2] The LAX/Community Noise Roundtable was created in September 2000 and is intended to reduce and mitigate the adverse noise impacts that the users of Los Angeles International Airport create on the surrounding communities and their environs.

[3] Over-Ocean Operations is defined as the operational flow condition in which aircraft arrive from the west and depart to the west over the Pacific Ocean. Over Ocean Operations is applicable during the hours of midnight to 6:30 a.m. and when the tailwind component of the wind is 10 knots or less, the braking action on the runway is reported to be "good" or better, the cloud bases at the western boundary of the airport are above 400 feet, and the Runway Visual Range (RVR) is greater than 2,400 feet. Over Ocean Operations exists as a voluntary preferential runway use program to minimize aircraft operations over populated areas to the east of LAX during the late-night/early-morning bedtime hours.

[4] Westerly Operations is defined as the operational flow condition in which aircraft arrive from the east and depart to the west. LAX is most often in this configuration, except during the period from midnight to 6:30 a.m.

[5] Non-conforming operations are defined as aircraft departures to the east between midnight and 6:30 a.m. when LAX is operating in either Over-Ocean Operations or Westerly Operations.

[6] Pub. L. No. 101-508, 104 Stat. 1388, as re-codified at 49 United States Code (U.S.C.) 47521- 47533

[7] 14 C.F.R. Part 161, "Notice and Approval of Airport Noise and Access Restrictions."

The report is in two volumes. This volume presents the application for the proposed runway use restriction for Los Angeles International Airport, as required by the specific provisions of Part 161. A separate volume includes the Appendices referenced in this application.

The City contracted with the consulting firm of Harris Miller Miller & Hanson Inc. (HMMH) to assist in completing the technical work required for the Part 161 application. HMMH subcontracted with Simat, Helliesen & Eichner, Inc. (SH&E), an ICF International company, for aircraft operations forecasting and cost-benefit analyses, and with Dakota Communications for the public consultation process. Other subcontractors provided support for the project website and document production. Anderson & Kreiger LLP and the Office of the City Attorney of the City of Los Angeles provided legal guidance in connection with the preparation of this application.

In accordance with Part 161 § 311(d), LAWA is required to provide a "statement as to whether the airport requests, in the event of disapproval of the proposed restriction or any alternatives, that the FAA approve any portion of the restriction or any alternative that meets the statutory requirements for approval." LAWA has reviewed the restriction with regard to this requirement and consequently states that it does not request FAA partial approval of any portion of the restriction that meets the statutory requirements. The full restriction as stated in this Application must be evaluated and approved in order to provide the stated noise benefits to the neighboring communities.

1.1 Background

In December 1972, the BOAC adopted Resolution 7467 that instituted a preferential runway program for LAX.[8] The resolution established a runway use restriction for east arrivals of what it termed "non-Part 36 certificated" aircraft and all west-to-east departures between 11:00 p.m. and 6:00 a.m. when the airport was in Over-Ocean Operations or Westerly Operations.[9] Exceptions were permitted when LAX was below authorized landing minimums or there was a 10-knot tailwind component for arrivals. This resolution was amended in 1974 (Resolution 8372) to shorten the effective hours to 12:00 midnight to 6:30 a.m. and to establish minimum ceiling, visibility, and tailwind components for over-ocean arrivals.[10]

[8] Los Angeles Board of Airport Commissioners, Resolution No. 7467, December 20, 1972.

[9] The FAA has established aircraft noise criteria in 14 CFR Part 36, "Noise Standards: Aircraft Type and Airworthiness Certification." For "large" aircraft (with maximum takeoff weights of 12,500 pounds or more) and turbojet-powered aircraft, Part 36 identifies four aircraft noise "stages:" Stage 1 aircraft, which have never been shown to meet any noise standards, because they have never been tested, or because they have been tested and failed to meet any standards; Stage 2 aircraft, which meet original noise limits set in 1969; Stage 3 aircraft, which meet more stringent limits established in 1977; and Stage 4 aircraft, which meet the most stringent limits established in 2005.

FAA did not introduce the "stage" terminology until the adoption of the quieter Stage 3 class in 1977. Therefore, the 1972 BOAC resolution differentiated between what are now termed "Stage 1" and "Stage 2," by calling them "non-certificated" and "certificated." FAA banned all commercial and general aviation Stage 1 and 2 aircraft over 75,000 pounds from operation in the U.S. at the end of 1999 (with limited and extraordinary exemptions). In the "FAA Modernization and Reform Act of 2012," Congress set a deadline for banning all lighter Stage 1 and 2 jet operations by the end of 2015.

The "non-certificated" (Stage 1) jets to which the 1972 BOAC resolution applied were on the order of 20 to 30 decibels louder than current Stage 3 and 4 jets operating at LAX, as measured under Part 36 protocols; in more lay terms, the non-certificated aircraft would generally be perceived to be at least four to eight times as loud as current aircraft of equivalent (or far greater) weights.

[10] Los Angeles Board of Airport Commissioners, Resolution No. 8372, June 7, 1974.

In early August 1981, a strike by FAA air traffic controllers resulted in temporary suspension of the Over-Ocean Operations procedure due to safety considerations. However, by September 1981, the BOAC initiated Resolution 12770 to direct communication with the FAA and to obtain a date when the nighttime Over-Ocean Operations measure would be re-implemented.[11] A 1984 Airport Noise Control and Land Use Compatibility (ANCLUC) study recommended extending the hours of Over Ocean Operations to 11:00 p.m. to 6:30 a.m. in the short term and within five years, extend the effective hours to 10:00 p.m. to 7:00 a.m. if there were no adverse effects on the overall air traffic system. The BOAC passed Resolution 14340 adopting the ANCLUC recommendations in June of that year, but a May 14, 1985 letter from then-FAA Administrator McClure to Clifton Moore, General Manager (now referred to as Executive Director) of the City's Department of Airports (now referred to as LAWA) indicated that the measure would have to "receive further FAA review before approval or disapproval".[12] The extended hours were never adopted, but Over-Ocean Operations remains in effect between 12:00 midnight and 6:30 a.m.

In California, the State Department of Transportation, Division of Aeronautics (Caltrans), developed Noise Standards (Title 21, Subchapter 6) in accordance with Article 3, Chapter 4, Part 1, Division 9 of the Public Utilities Code for all airports operating under a valid state permit.[13] The County, within which an airport boundary lies, can declare that airport to have a noise problem by adopting a resolution and forwarding it to Caltrans. LAX has been declared a "noise problem airport" under Title 21 and as such, must file quarterly noise reports to the County, which then forwards the reports to Caltrans. In addition, LAX is required to develop and implement programs to reduce the noise impact area of the airport over a reasonable period of time and in the interim must apply for and receive a variance from the State's airport noise standard, which requires that there be no incompatible land uses within the 65 dB CNEL contour. Variances are granted for a maximum of three years with renewals based on full justification. The most recent variance for the operation of LAX was granted, effective February 13, 2011. Under it, LAX is to "continue in full force and effect the implementation and enforcement of the following existing noise abatement policies to the extent of its authority". The list includes "Over-Ocean Operations between 0000 and 0630 [24-hour time designations for 12:00 midnight to 6:30 a.m.], weather and operational conditions permitting."[14]

The most recent LAX Aircraft Noise Abatement Operating Procedures and Restrictions continue to specify arrival and departure procedures for Westerly, Easterly, and Over-Ocean Operations.[15] Between midnight and 6:30 a.m., all aircraft utilize the inboard runways to the extent feasible with Runways 24L and 25R used for departures and Runways 6R and 7L for arrivals (shown later in Figure 3), with deviations permitted due to "aircraft emergencies, adverse weather, or field construction and maintenance work." Nothing in the procedures "shall limit the discretion of either ATC or the pilot with respect to the full utilization of the airport facilities in an unusual situation."

Over the many years that it has been in effect, the Over-Ocean Operations runway use program has kept many late night flights over the water as they arrive or depart from the Airport. Yet, because it

[11] Los Angeles Board of Airport Commissioners, Resolution No. 12770, September 9, 1981.

[12] Los Angeles Board of Airport Commissioners, Resolution No. 14340, June 6, 1984.

[13] California Department of Transportation, Division of Aeronautics, Title 21, "Subchapter 6. Noise Standards", March 10, 1990.

[14] Department of Transportation, State of California, Noise Variance, Case No. L2010041216, January 14, 2011.

[15] Los Angeles World Airports, LAX, "Aircraft Noise Abatement Operating Procedures and Restrictions", September 2010.

is voluntary, pilots occasionally request to depart to the east over the City and surrounding communities causing disturbance of sleep.

If implemented, the new noise rule would replace the current voluntary program and restrict non-conforming easterly departures *any* time the airport is in a westerly flow or in over-ocean flow between midnight and 6:30 a.m.

1.2 Non-Conforming Operations

During Over-Ocean and Westerly Operations, if the FAA receives a request from a pilot wanting to depart to the east, opposite to the existing flow of traffic, air traffic controllers clear the taxiway and surrounding airspace and accommodate the request as efficiently as possible. In most cases, these requests come from flights to Pacific Rim destinations. The aircraft is cleared to taxi and eventually takes off on Runway 7L, the in-board runway on the southern side of the Airport, and at 12,091 feet, the longest of all four west-to-east runways. After takeoff, the FAA controller typically directs the pilot to make a right turn of 180 degrees, heading the Pacific-bound aircraft back towards the general flow of other westerly traffic as soon as practical. However, to maintain safe separation from conforming departures that have been taking off to the west over the ocean and arrivals that have been approaching from the west over the ocean, these pilot requests and FAA-directed headings result in the large, heavy-weight aircraft making wide, sweeping turns to the south at low altitudes over nearby communities that are otherwise unaccustomed to *any* overflights during these nighttime hours. The non-conforming flights are eventually merged with other Pacific Rim traffic well west of the southern California coastline.

Over the past 10 years, the number of non-conforming departures has averaged 65 per year, or 0.1% of the nearly 57,000 total nighttime departures projected to occur at LAX in 2013.[16] They comprise a slightly larger proportion of late-night flights, accounting for 0.2% of the departures between midnight and 6:30 a.m. when Over-Ocean or Westerly Operations are in effect. In addition, they are spread out over an average of only 30 nights per year when the tailwind component is less than 10 knots. Should a tailwind component increase to greater than 10 knots, the FAA reverses the operation of the airport to an easterly flow, at which point a late-night easterly departure is no longer classified as “non-conforming”.

It is when the tailwind component is between 0 and 10 knots that pilots of large, heavy aircraft request non-conforming easterly departures to maximize their headwind component and meet minimum takeoff length requirements for the weight of the aircraft. Historically the operators requesting to depart contrary to current flow conditions are long-haul passenger and cargo carriers with heavily loaded aircraft heading to destinations such as Sydney, Singapore, Tokyo and Beijing. These non-conforming operations tend to occur in groups with as many as ten non-conforming operations occurring within a single night.

1.3 Need for and Goal of the Restriction

The proposed runway use restriction presented in this document addresses one very specific goal:

> ***To reduce the occurrence of nighttime awakenings for residents living near Los Angeles International Airport by eliminating non-conforming easterly departures between midnight and 6:30 a.m. when the airport is in Over-Ocean Operations or Westerly Operations.***

[16] Defined as 10:00 p.m. to 7:00 a.m. in calculations of Community Noise Equivalent Level (CNEL), the State-mandated noise exposure metric used in California.

To illustrate the need for and reasonableness of a restriction on non-conforming departures, during a recent one- hour period from midnight to 1:00 a.m. on the night of January 27, 2012, 24 air carrier jets, including an Airbus A-380, Boeing 747-400, 777-200 and 767-200 aircraft as well as several smaller types, departed LAX during Over-Ocean Operations. Seventeen of those departed to the west over water, conforming to LAWA's voluntary noise abatement procedure. Operators of the remaining seven aircraft, including two 747-400s, two 777-200s, two 777 freighters, and a 767-300, chose to depart to the east as non-conforming flights. These non-conforming operations elicited 35 noise complaints from residents during that one-hour period.

The ANSI standard for determining awakenings from outdoor noise sources was used to estimate the impact of these non-conforming January 27, 2012 flights within the Airport Noise Study Area (ANSA).[17] We compared (1) all nighttime operations as actually flown at the actual time flown that night with (2) those operations, except moving the seven non-conforming operations to depart west. The difference between these two scenarios showed that an estimated 8,627 awakenings occurring in scenario (1) would have been eliminated if the proposed restriction had been in place. This estimate may be conservative because the non-conforming night-time operations that are the target of the proposed restriction are, by definition, irregular occurrences and may cause awakening in more people than do regular daily aircraft operations. The restriction proposed in this Application is expected to eliminate 18,000 annual awakenings within the Airport Noise Study Area, which is defined in Section 6.2. Section 6.4 and Appendix K provide additional information related to the analyses of awakenings conducted for this Application.

Figure 1 depicts the operations at LAX between midnight and 1:00 a.m. as well as the locations of the complainants for the night of January 27, 2012. The figure highlights one of the seven non-conforming flight tracks and lists information on the aircraft type, runway used, and wind conditions at the time it departed.

Because there are so few aircraft that depart east during Over-Ocean and Westerly Operations, and because the airport is rarely in an easterly flow, communities have come to expect no aircraft departures over their homes during late-night hours. On those nights when non-conforming operations do occur, residents are awakened. These awakenings, however, are avoidable.

A non-conforming flight could, for example, offload passengers and/or cargo for the next flight and safely request a conforming departure to the west; or the departure could be delayed until the unfavorable winds subside. Supporting analyses of such statements are included in Sections 6 and 7 of this Application and its related appendices.

To aid in promoting the nighttime preferential runway use program, LAWA provides letters to operators of non-conforming departures. Figure 2 presents a copy of the letter sent to the airline that operated the highlighted non-conforming flight. Figure 1 was sent with the letter to illustrate the operation of concern.

The restriction proposed in this Application mandates, rather than makes voluntary, the use of Over-Ocean Operations and/or Westerly Operations from midnight to 6:30 a.m., but is not intended to inhibit operators from using the airport and, instead, requires compliance with existing operational flow conditions within which the Airport is operating. The restriction proposed in this Application will complement the extensive existing nighttime noise abatement and mitigation program at LAX. Section 4 of this Application provides a detailed description of the existing program.

[17] American National Standard, ANSI / ASA S12.9-2008 / Part 6, "Quantities and Procedures for Description and Measurement of Environmental Sound — Part 6: Methods for Estimation of Awakenings Associated with Outdoor Noise Events Heard in Homes." This Standard is available for purchase at: http://webstore.ansi.org/.

Figure 1 Non-Conforming Flight Tracks on January 27, 2012

Source: LAWA

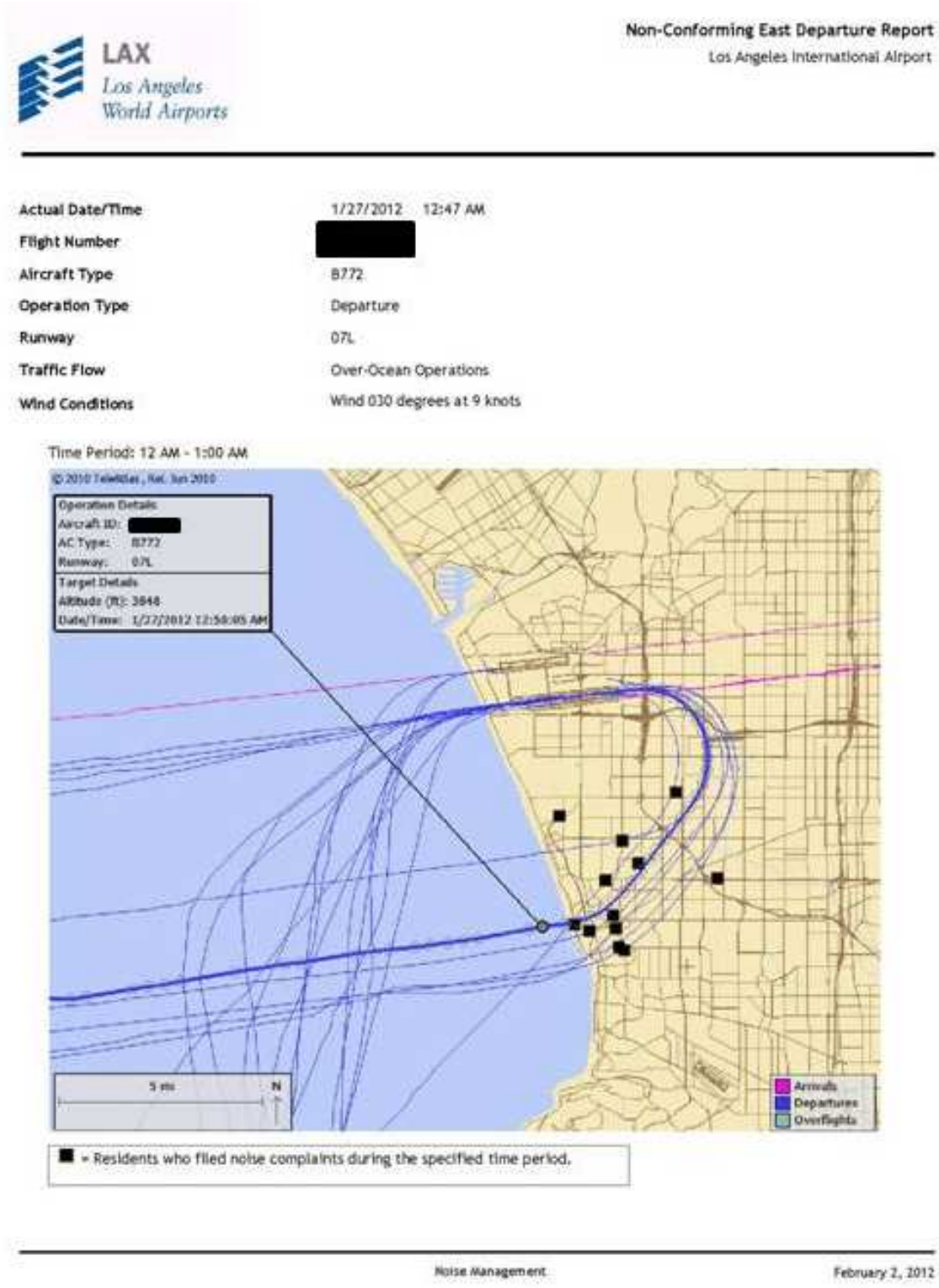
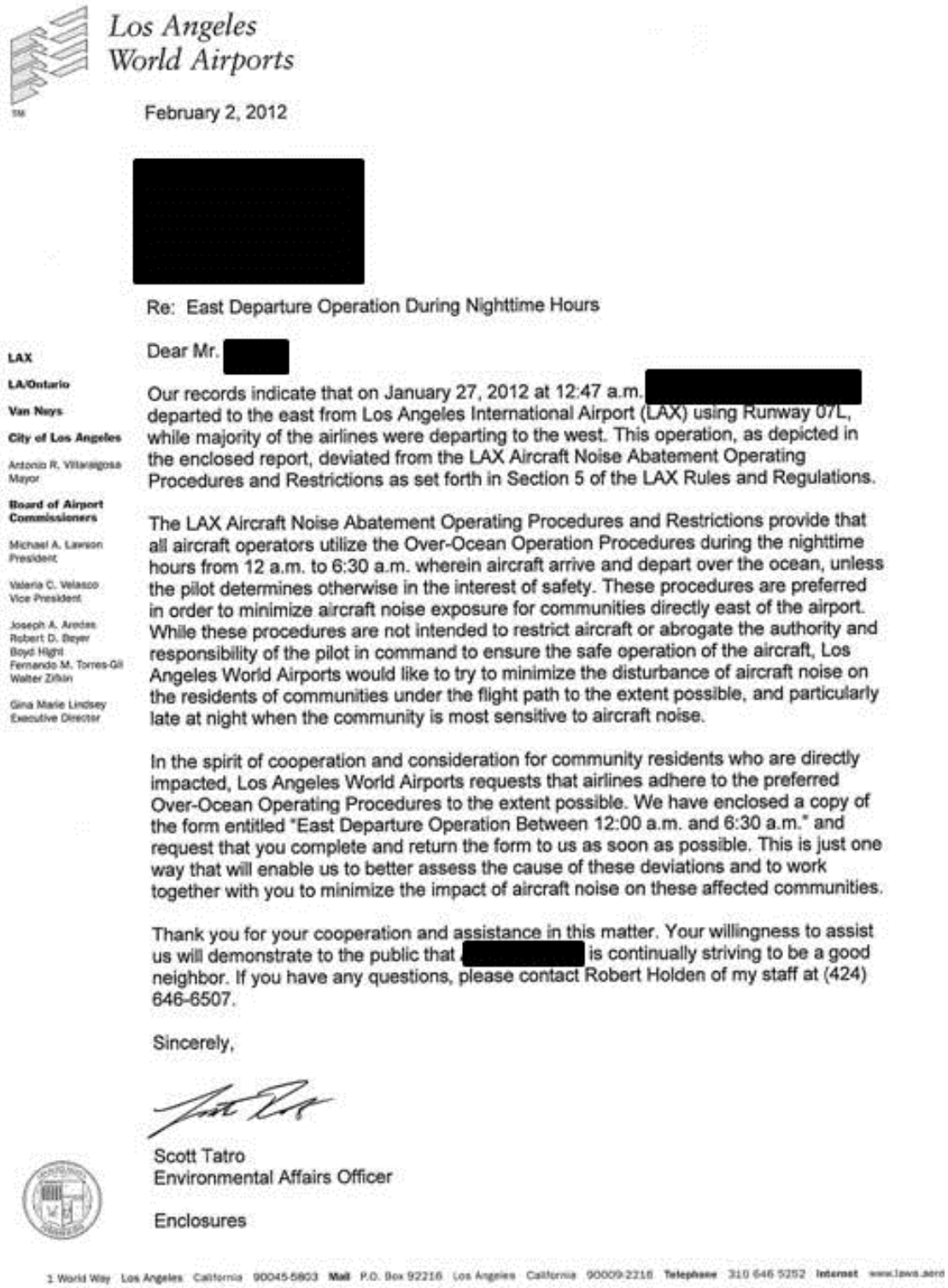


Figure 2 Example Letter to Airlines on East Departures
Source: LAWA



Los Angeles
World Airports

February 2, 2012

[redacted]

Re: East Departure Operation During Nighttime Hours

Dear Mr. [redacted]

Our records indicate that on January 27, 2012 at 12:47 a.m. [redacted] departed to the east from Los Angeles International Airport (LAX) using Runway 07L, while majority of the airlines were departing to the west. This operation, as depicted in the enclosed report, deviated from the LAX Aircraft Noise Abatement Operating Procedures and Restrictions as set forth in Section 5 of the LAX Rules and Regulations.

The LAX Aircraft Noise Abatement Operating Procedures and Restrictions provide that all aircraft operators utilize the Over-Ocean Operation Procedures during the nighttime hours from 12 a.m. to 6:30 a.m. wherein aircraft arrive and depart over the ocean, unless the pilot determines otherwise in the interest of safety. These procedures are preferred in order to minimize aircraft noise exposure for communities directly east of the airport. While these procedures are not intended to restrict aircraft or abrogate the authority and responsibility of the pilot in command to ensure the safe operation of the aircraft, Los Angeles World Airports would like to try to minimize the disturbance of aircraft noise on the residents of communities under the flight path to the extent possible, and particularly late at night when the community is most sensitive to aircraft noise.

In the spirit of cooperation and consideration for community residents who are directly impacted, Los Angeles World Airports requests that airlines adhere to the preferred Over-Ocean Operating Procedures to the extent possible. We have enclosed a copy of the form entitled "East Departure Operation Between 12:00 a.m. and 6:30 a.m." and request that you complete and return the form to us as soon as possible. This is just one way that will enable us to better assess the cause of these deviations and to work together with you to minimize the impact of aircraft noise on these affected communities.

Thank you for your cooperation and assistance in this matter. Your willingness to assist us will demonstrate to the public that [redacted] is continually striving to be a good neighbor. If you have any questions, please contact Robert Holden of my staff at (424) 646-6507.

Sincerely,

Scott Tatro
Environmental Affairs Officer

Enclosures

LAX
LA/Ontario
Van Nuys
City of Los Angeles
Antonio R. Villaraigosa
Mayor
Board of Airport Commissioners
Michael A. Lawson
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1.4 The City's Additional Commitments to a Noise Rule

Beyond the goal of reducing the occurrence and frequency of nighttime awakening for residents living near LAX, the City has a number of other related commitments pertaining to the adoption of the proposed restriction. The request for the restriction proposed in this Application would (1) adhere to BOAC goals implied in the resolutions identified in the preceding section to reduce late-night overflights and noise impacts east of the Airport; (2) accommodate the LAX/Community Noise Roundtable Work Program goal, originally initiated in October 2000, to eliminate easterly departures between midnight and 6:30 a.m. when LAX is not in Easterly Operations; (3) abide by the provision of the LAX Master Plan lawsuit Stipulated Settlement Agreement (Case No. RIC 426822) between the City and several plaintiffs, which required the City, upon completion of the Study, to seek FAA approval of various penalties that can be imposed on airlines whose flights violate nighttime over-ocean policies and procedures and to expedite processing of this Part 161 study; (4) address the designation of this Part 161 Application as a mitigation measure in the Mitigation Monitoring and Reporting Program of the LAX Master Plan Environmental Impact Report / Environmental Impact Statement; and (5) fulfill the City's commitment in the LAX Master Plan Community Benefits Agreement (CBA) to conduct this Part 161 study and submit a complete application to the FAA if the study finds the proposed restriction complies with the statutory requirements of ANCA and the Part 161 regulations.

1.5 Stage 3 Restriction Analysis and Notice Requirements

ANCA and Part 161 prescribe the analysis, notice and procedural requirements that must be satisfied by applications to impose a noise or access restriction on the use of Stage 3 aircraft. They are summarized below.

1.5.1 ANCA Notice and Analysis Requirements

ANCA provides a succinct summary of the notice and analysis requirements that apply to Stage 3 use restrictions:[18]

- Stage 3 aircraft.—
    - An airport noise or access restriction on the operation of Stage 3 aircraft not in effect on October 1, 1990, may become effective only if the restriction has been agreed to by the airport proprietor and all aircraft operators or has been submitted to and approved by the Secretary of Transportation after an airport or aircraft operator's request for approval as provided by the program established under this section. Restrictions to which this paragraph applies include—
        - restriction on noise levels generated on either a single event or cumulative basis;
        - a restriction on the total number of Stage 3 aircraft operations;
        - noise budget or noise allocation program that would include Stage 3 aircraft;
        - a restriction on hours of operations; and
        - any other restriction on Stage 3 aircraft

Part 161 expands on these notice and analysis requirements which are summarized below.

[18] 49 U.S.C. § 47524(c).

1.5.2 Part 161 Stage 3 Restriction Notice Requirements

Part 161.303(c) provides explicit guidance regarding the required elements of the public notice for a Stage 3 restriction. These items, and the Sections of this document that address them, include:

- The name of the airport and associated cities and states (Section 2).
- A clear, concise description of the proposed restriction, including a statement that it will be a mandatory Stage 3 restriction (item 2 of, "Sample Notice", in Section 2) where the complete text of the restriction, and any sanctions for noncompliance, are available for public inspection (Section 2).
- A brief discussion of the specific need for, and goal of, the restriction (Section 1.3).
- Identification of the operators and the types of aircraft expected to be affected (Section 7).
- The proposed effective date of the restriction, the proposed method of implementation (e.g., city ordinance, airport rule, lease, or other document), and any proposed enforcement mechanism (Section 3).
- An analysis of the proposed restriction, in accordance with Sec. 161.305 of this part, or an announcement regarding where the analysis is available for public inspection (Sections 2 and 6).
- An invitation to comment on the proposed restriction and the analysis, with a minimum 45-day comment period (Section 2).
- Information on how to request a copy of the complete text of the restriction, including any sanctions for noncompliance, and the analysis, if not included with the notice (Section 2).
- The address for submitting comments to the airport operator, including identification of a contact person at the airport (item 9 of, "Sample Notice", in Section 2).

1.5.3 Part 161 Stage 3 Restriction Analysis Requirements

Part 161.305 ("Required analysis and conditions for approval of proposed restrictions") provides the following guidance related to analysis requirements for a Stage 3 restriction, beyond that specified in ANCA:

- Each applicant proposing a noise or access restriction on Stage 3 operations shall prepare and make available for public comment an analysis that supports, by substantial evidence, that the six statutory conditions for approval have been met for each restriction and any alternatives submitted.
- The applicant shall provide:
    - The complete text of the proposed restriction and any submitted alternatives, including the proposed wording in a city ordinance, airport rule, lease, or other document, and any sanctions for noncompliance (Section 3);
    - Maps denoting the airport geographic boundary, and the geographic boundaries and names of each jurisdiction that controls land use within the airport noise study area (Section 6);
    - An adequate environmental assessment of the proposed restriction or adequate information supporting a categorical exclusion in accordance with FAA orders and procedures regarding compliance with the National Environmental Policy Act of 1969 (Section 6);

- A summary of the evidence in the submission supporting the six statutory conditions for approval (Section 6, 7 and 8); and
- An analysis of the restriction, demonstrating by substantial evidence that the statutory conditions are met (Sections 6, 7, and 8).

ANCA and Part 161.305(e)(2) require the analysis to be of sufficient detail to allow the FAA to evaluate the merits of the restriction based on the following essential elements:[19]

- The restriction is reasonable, non-arbitrary, and nondiscriminatory
- The restriction does not create an unreasonable burden on interstate or foreign commerce
- The proposed restriction maintains safe and efficient use of the navigable airspace
- The proposed restriction does not conflict with any existing Federal statute or regulation
- The applicant has provided adequate opportunity for public comment on the proposed restriction
- The proposed restriction does not create an unreasonable burden on the national aviation system

Section 8 of this Application addresses these requirements.

1.5.4 Part 161 Stage 3 Restriction Application Procedure

Part 161.311, "Application procedure for approval of proposed restriction", provides the information required for each Stage 3 restriction and alternative restriction submittal to the FAA for review and approval:

- A summary of evidence of the fulfillment of conditions for approval, as specified in §161.305;
- An analysis as specified in §161.305, as appropriate to the proposed restriction;
- A statement that the entity submitting the proposal is the party empowered to implement the restriction, or is submitting the proposal on behalf of such party; and
- A statement as to whether the airport requests, in the event of disapproval of the proposed restriction or any alternatives, that the FAA approve any portion of the restriction or any alternative that meets the statutory requirements for approval.

1.6 Organization of this Document

In summary, this document addresses major categories of Part 161 requirements related to notice and analysis for a Stage 3 restriction, in the following sections:

- Information related to public review and comment opportunities (Section 2)
- Description of the proposed restriction (Section 3)
- Overview of noise compatibility planning at LAX (Section 4)
- Development of 2013 and 2018 LAX operations forecasts (Section 5)
- Noise analysis of the proposed restriction (Section 6)
- Comparison of the benefits and costs of proposed restriction (Section 7)
- Review of statutory conditions required by Part 161 (Section 8)

[19] 49 U.S.C. § 47524(c)(2), 14 C.F.R. Part 161.305(e)(2).

2 OPPORTUNITIES FOR PUBLIC REVIEW AND COMMENT

Section 2 of this Application demonstrates that the City has fully complied with the notice requirements of Part 161.

2.1 Part 161 Notice Process Requirements

Part 161 Subpart D identifies the following process-related "Notice, Review, and Approval Requirements for Stage 3 Restrictions:"

- A*t least 45 days prior to the date of submittal of the restriction to the FAA,* the airport operator must publish the notice in newspaper(s) of general circulation throughout the airport noise study area; post notice at prominent locations accessible to airport users and the public; and directly send written notices (§161.303(b)). The written notices must go to:
    - aircraft operators providing scheduled passenger or cargo service at the airport; operators of aircraft based at the airport; potential new entrants that are known to be interested in serving the airport; and aircraft operators known to be routinely providing nonscheduled service that may be affected by the proposed restriction;
    - the FAA
    - each Federal, state, and local agency with land-use control jurisdiction within the airport noise study area fixed-base operators and other airport tenants whose operations may be affected by the proposed restriction[20]
    - community groups and business organizations that are known to be interested in the proposed restriction
- The notice must include "[a]n invitation to comment on the proposed restriction and analysis, with a minimum *45-day comment period*" (§161.303(c)(7)).
- The airport operator may propose alternative restrictions, including partial implementation of any proposal, and indicate an order of preference. If alternative restriction proposals are submitted, the previous stated requirements (Section 1.5.1) need to address the alternative proposals where appropriate (§161.303(d)).
- The airport operator must "establish a public docket or similar method for receiving and considering comments, and shall make comments available for inspection by interested parties upon request. Comments must be retained as long as the restriction is in effect" (§161.307).
- If the airport operator makes substantial changes to a proposed restriction or the analysis prior to the effective date of the restriction, the airport operator shall initiate new notice in accordance with the procedures in §161.303(c).
- If the airport operator makes a substantial change to the proposed restriction or the analysis during the 180-day waiting period, the airport must notify the FAA in writing that it is withdrawing the proposal from the review process until additional analysis, public review, and documentation of public review are complete. Resubmission will start a new 180-day review (§161.309).

[20] "Airport noise study area means that area surrounding the airport within the noise contour selected by the applicant for study and must include the noise contours required to be developed for noise exposure maps specified in 14 C.F.R. Part 150." (§161.5) At LAX, this is the area within the 65 decibel (dB) Community Noise Equivalent Level (CNEL) contour.

- Within 30 days of receipt of an application, the FAA will determine whether the application is complete in accordance with §161.311. Once that determination has been made the FAA notifies the applicant that it intends to act on the proposed restriction and publishes notice of the proposed restriction in the Federal Register inviting interested parties to comment within 30 days. The 180-day review period begins on the date of original FAA receipt of the application (§161.313(b)).
- The FAA will deny the application and return it to the airport operator if the submitted proposals are incomplete, the application has been returned twice for reasons other than completion of the documentation, or the applicant chooses to not complete the application (§161.313(c)(5)).

Sections 2.2 through 2.5 describe the City's plans to address these items.

The following is the official notice used to announce the proposed restriction. A Spanish translation of this notice was also available on the Spanish version of the project website and at the locations identified in the notice. The analysis report was only available in English.

Los Angeles World Airports
NOTICE OF PROPOSED AIRPORT USE RESTRICTION: "RUNWAY USE RESTRICTION"
at
Los Angeles International Airport, Los Angeles, California

Los Angeles World Airports (LAWA) hereby provides notice of its proposal to establish a runway use restriction at Los Angeles International Airport (LAX) that restricts easterly departures of all aircraft, with certain exemptions, between the hours of 12:00 midnight and 6:30 a.m. when LAX is in the "Over-Ocean" or "Westerly" operations mode.

Title 14 of the Code of Federal Regulations Part 161 (14 C.F.R. Part 161), "Notice and Approval of Airport Noise and Access Restrictions," defines analysis, notice, and approval requirements for airport operators proposing use restrictions that affect any aircraft shown to comply with 14 C.F.R. Part 36 Stage 3 requirements. LAWA has prepared a report titled "Los Angeles International Airport Part 161 Application for Approval of a Runway Use Restriction" that addresses the requirements in full.

This notification addresses Part 161.303(c) requirements for published and posted notices including the following information:

1. *The name of the airport and associated cities and states:*

Los Angeles International Airport, Los Angeles, California

2. *A clear, concise description of the proposed restriction (and any alternatives, in order of preference), including a statement that it will be a mandatory Stage 3 restriction, and where the complete text of the restriction, and any sanctions for noncompliance, are available for public inspection:*

The proposed restriction is a ban on all aircraft departures to the east, including but not limited to Stage 3 aircraft, with certain exemptions, from 12:00 midnight to 6:30 a.m. when the airport is in Over-Ocean or Westerly Operations. During these conditions, all aircraft will be permitted to depart to the west. Item 6 provides further details on public review opportunities.

3. *A brief discussion of the specific need for, and goal of, the restriction.*

To reduce the occurrence and frequency of nighttime awakenings for residents living near Los Angeles International Airport by eliminating non-conforming operations between midnight and 6:30 a.m. when the airport is in Over-Ocean Operations or Westerly Operations.

4. *Identification of the operators and the types of aircraft expected to be affected:*

Section 7 of the LAX 14 C.F.R. Part 161 application identifies the operators and types of aircraft affected. In summary, the restriction will affect any passenger, cargo, or general aviation aircraft, whose operators would, absent the restriction, seek between midnight and 6:30 a.m. to depart to the east when LAX is in Over-Ocean or Westerly Operations. Historical information indicates very few operations would be affected; in the 130-month period (nearly 11 years) from June 2000 through March 2010, 699 aircraft departures (or an average of 65/year) would have been affected if this rule had been in effect.

5. *The proposed effective date of the restriction, the proposed method of implementation (e.g., city ordinance, airport rule, lease or other document), and any proposed enforcement mechanism:*

The proposed effective date is estimated to be December 1, 2013. Implementation will be through a City of Los Angeles ordinance with enforcement similar to other airport restrictions.

6. *An analysis of the proposed restriction, in accordance with Section 161.305, or an announcement regarding where the analysis is available for public inspection:*

The Notice and Draft LAX Part 161 Study application and supporting materials are available for public inspection at the following locations:

- On-line at www.laxpart161.com/
- LAWA Environmental Services Division at LAX – 7301 World Way West, Room 312, Los Angeles, CA 90045, Monday through Friday, 7:30 AM to 4:00 PM
- Inglewood Public Library – 101 W. Manchester Blvd., Inglewood, CA 90301
- County of Los Angeles Public Library – 4359 Lennox Blvd., Lennox, CA 90304
- Mark Ridley Thomas Constituent Services Center - 8475 S. Vermont Ave., Los Angeles, CA 90044
- Westchester – Loyola Village Branch Library, 7114 W. Manchester Ave., Los Angeles, CA 90045
- City Halls, which will receive an electronic copy on disk, include:
    - City of Bell
    - City of Bellflower
    - City of Bell Gardens
    - City of Carson
    - City of Commerce
    - City of Compton
    - City of Cudahy
    - City of Culver City
    - City of Downey
    - City of El Segundo
    - City of Gardena
    - City of Hawthorne
    - City of Hermosa Beach
    - City of Huntington Park
    - City of Inglewood
    - City of Lakewood
    - City of Lawndale
    - City of Lomita
    - City of Los Angeles, Office of Mayor
    - City of Lynwood
    - City of Manhattan Beach
    - City of Maywood
    - City of Montebello
    - Palos Verdes Estates
    - City of Paramount
    - Rancho Palos Verdes
    - City of Redondo Beach
    - Rolling Hills Estates
    - City of Rolling Hills
    - City of Santa Monica
    - City of Seal Beach
    - Signal Hill
    - City of South Gale
    - City of Torrance
    - City of Verno

7. *An invitation to comment on the proposed restriction and analysis, with a minimum 45-day comment period:*

LAWA will accept comments on the proposed restriction and analysis until 5 p.m. on December 17, 2012. Written comments must be submitted to the addresses identified in item 9.

8. *Information on how to request a copy of the complete text of the restriction, including any sanctions for noncompliance, and the analysis (if not included with this notice):*

The complete text of the restriction, including any exemptions and sanctions for non-compliance is provided in Section 3 of the LAX 14 C.F.R. Part 161 Report, which is available for public inspection at locations identified in item 6.

9. *The address for submitting comments to the airport operator proposing the restriction, including identification of a contact person:*

Comments may be submitted online at www.laxpart161.com/en/Comments.cfm or in writing to the following contact:

Mr. Scott Tatro
Los Angeles World Airports
1 World Way, P.O. Box 92216
Los Angeles, CA 90009-2216
Email: laxpart161@lawa.org

2.2 Publication of Notice

At the outset of the notice period, the City published notice of the proposed restriction in English and in Spanish (where appropriate) in the following publications, which exceed Part 161 requirements to "publish the notice in newspaper(s) of general circulation throughout the airport noise study area:

- California Crusader News
- Culver City News
- Daily Breeze
- El Segundo Herald
- Inglewood Today
- La Opinion
- Los Angeles Sentinel
- Our Weekly
- Palos Verdes Peninsula News
- The Argonaut

The City also provided a press release with notice of the proposed restriction to the following media outlets:

- KTTV Fox 11
- KABC 7
- KCBS 2/KCAL 9
- KTLA CW 5
- KNBC 4
- LA Cityview Ch 35
- KMEX 34
- KCET 28
- KNX 1070 AM
- KPFK FM
- KCRW FM
- KFI 640 AM
- KABC 740 AM

2.3 Written Notice

The City mailed written notices to the parties identified in the following major categories:

- Aircraft operators providing scheduled passenger or cargo service at the airport; operators of aircraft based at the airport; potential new entrants that are known to be interested in serving the

airport; aircraft operators known to be routinely providing nonscheduled service that may be affected by the proposed restriction

- BOAC members
- City Councils in the local area
- LAX/Community Noise Roundtable members
- Los Angeles County Supervisors
- State Legislators that have constituents in the local area
- U.S. Congressional Delegation
- FAA Offices
- California Department of Transportation (Caltrans) Division of Aeronautics
- Federal, state, and local agencies with local land-use jurisdiction in the
- LAX fixed-base operators
- Chambers of Commerce
- Los Angeles Neighborhood Councils
- Southern California Association of Governments (SCAG)
- Los Angeles Area Advisory Committee
- Other business organizations
- Libraries
- Inquiries from Part 161 Website

2.4 On-Airport Posting Locations

The published notice was displayed throughout the notice period at the LAWA Administrative Offices (east) display case at:

- Los Angeles International Airport, 1 World Way, Los Angeles, CA 90045

2.5 Public Review Locations

This draft document was available for public review throughout the notice period at the following locations:

- On-line at www.laxpart161.com/
- LAWA Environmental Services Division at LAX – 7301 World Way West, Room 312, Los Angeles, CA 90045, Monday through Friday, 7:30 AM to 4:00 PM
- Inglewood Public Library – 101 W. Manchester Blvd., Inglewood, CA 90301
- County of Los Angeles Public Library – 4359 Lennox Blvd., Lennox, CA 90304
- Mark Ridley Thomas Constituent Services Center - 8475 S. Vermont Ave., Los Angeles, CA 90044

- Westchester – Loyola Village Branch Library, 7114 W. Manchester Ave., Los Angeles, CA 90045
- City Halls, which received an electronic copy on disk, include:
    - City of Bell
    - City of Bellflower
    - City of Bell Gardens
    - City of Carson
    - City of Commerce
    - City of Compton
    - City of Cudahy
    - City of Culver City
    - City of Downey
    - City of El Segundo
    - City of Gardena
    - City of Hawthorne
    - City of Hermosa Beach
    - City of Huntington Park
    - City of Inglewood
    - City of Lakewood
    - City of Lawndale
    - City of Lomita
    - City of Los Angeles, Office of Mayor
    - City of Lynwood
    - City of Manhattan Beach
    - City of Maywood
    - City of Montebello
    - Palos Verdes Estates
    - City of Paramount
    - Rancho Palos Verdes
    - City of Redondo Beach
    - Rolling Hills Estates
    - City of Rolling Hills
    - City of Santa Monica
    - City of Seal Beach
    - Signal Hill
    - City of South Gale
    - City of Torrance
    - City of Vernon

2.6 Adequate Time Period for Comment

All interested parties were invited to comment on the proposed restriction and analysis over a 45-day period, from November 1, 2012 through December 17, 2012, to ensure all interested parties had opportunity to review the notice and analysis, while maintaining adequate opportunity for the City to review and consider the comments prior to submitting the document to the FAA for review.

2.7 FAA Federal Register Notice

Upon determination of completeness, the FAA will publish notice of the proposed restriction in the Federal Register, consistent with Part 161 § 313(b).

2.8 Comment Docket

Part 161.307 requires that the City establish a formal process for receiving, considering, and retaining comments on a proposed noise rule, including the following three actions:

- The City must "establish a public docket or similar method for receiving and considering comments."
- The City must "make comments available for inspection by interested parties upon request."
- The comments "must be retained as long as the restriction is in effect."

Part 161 does not provide guidance on the particular steps that should be taken to satisfy these requirements. The City has established the following procedures to ensure that both the letter and spirit of the Part 161 requirements are satisfied.

The docket will be maintained by the primary LAWA contact identified in Section 2.1. Interested parties may contact that representative to arrange for an opportunity to review the docket.
The docket will include the following principal components related to comments submitted in hard copy or electronically:

- A hard-copy compilation of all written comments, including the original physical copies of all written comments and printed copies of all electronically submitted comments, will be retained in a single file. Comments will be filed (and numbered) sequentially in the order received.
- An electronic file that contains all comments received electronically and scanned copies of written comments. The file names will include the comment sequence number.
- A corresponding log of all comments, including the commenter's name, organization represented (if relevant), and contact information provided (e.g., address, telephone, email, etc.), date of comment, date comment received, and comment sequence number.

The docket will include the following principal components related to formal City notices regarding opportunities to comment on the proposed restriction:

- A hard-copy compilation of all notices, including physical copies of hard-copy notices and printed copies of all electronic notices, will be retained in a single file, in chronological order.
- An electronic file that contains copies of all electronic notices and scanned copies of printed notices. The file names will include the notice date.
- A corresponding index of all notices, including the date and distribution mechanism (e.g., posting location, mailing list, publication location, etc.).

The docket will include the following principal components related to public meetings organized by the City for the purpose of obtaining comments on the proposed restriction:

- A hard-copy compilation of all meeting notices, meeting summaries, and attendance sheets, including physical copies of hard-copy materials and printed copies of all electronic materials, will be retained in a single file, in chronological order.
- An electronic file that contains copies of all electronic meeting notices, summaries, and attendance lists, and scanned copies of printed notices. The file names will include the notice date.
- A corresponding index of all meeting notices, meeting summaries, and attendance sheets, including the date and distribution mechanism (e.g., posting location, mailing list, publication location, etc.).

The City will retain each component of the public docket as long as the restriction is in effect.

2.9 Presentations and Public Workshops/Meetings

To provide the widest dissemination to interested parties and stakeholders, LAWA made numerous presentations on behalf of the City to the LAX/Community Noise Roundtable and held public meetings in workshop format to permit the general public to ask specific questions of study team members. Table 1 summarizes the information presented and discussed at the meetings. As the table notes, the final public meeting was held during the 45-day review period.

Documentation of comments via the Part 161 Noise Hotline and On-line Comment form are provided in Appendix A. Appendix B provides supplemental information on public outreach documentation. Appendix C provides supplemental information on the 2012 Public Workshop/Meeting and public comments received during the final draft review process.

Table 1 Listing of Presentations and Community Information Workshops
Source: LAWA, HMMH

Date	Topics
March 17, 2004	Initial concept briefing to Roundtable on objectives, process, elements, statutory conditions to satisfy, etc.
June 8, 2005	Project team briefing to Roundtable on team members; proposed restriction; project process, insights, and tasks; and public outreach
February 2, 2006	Master Plan stakeholder liaison meeting on project status of data collection, sleep disturbance research, study area definition, and CNEL contour development
November 14, 2006	Public community workshop/meeting in South Los Angeles to introduce project and status to the community and receive public comment
November 15, 2006	Public community workshop/meeting in Inglewood to introduce project and status to the community and receive public comment
November 16, 2006	Public community workshop/meeting in Lennox to introduce project and status to the community and receive public comment
April 13, 2011	Status briefing to Roundtable summarizing original approach and results and laying out current efforts to finalize and submit to FAA in 2012
January 11, 2012	Project update and status briefing to Roundtable
March 14, 2012	Project update and results briefing to Roundtable
November 8, 2012	Presentation of Project Results to Los Angeles Area Advisory Committee
November 13, 2012	Public community workshop/meeting at the Flight Path Learning Center at LAX
November 14, 2012	Project briefing of report highlights to Roundtable

2.10 Comments by Interested Parties

Part 161.307 requires that the applicant provide a summary of any comments received and provide copies of any comments to the FAA upon request. LAWA received 2 comments at the public workshop and 12 comments during the 45-day public review period from individuals or organizations as listed in Table 2. Rather than summarize the comments, Appendices C.7 and C.8 contain the full submitted comments with LAWA acknowledgements and responses.

Table 2 List of Comments Received
Source: LAWA

Public Workshop	Public Review Period	
Tigert, Christina	Airlines for America	Federal Express
Bickhart, Jim	LAX/Community Noise Roundtable	Ladera Heights Civic Association
	Cargo Airline Association	Alliance for a Regional Solution to Airport Congestion
	Nishiyama, Yasuo	Cavalier, Richard
	Buchalter Nemer	Tucker, Shelley
	Shute, Mihaly & Weinberger LLP	Trent, Rob

3 DESCRIPTION OF THE PROPOSED RESTRICTION

The City proposes to establish a runway use restriction at Los Angeles International Airport (LAX) that would restrict easterly departures of all aircraft, with certain exemptions, between the hours of 12:00 midnight and 6:30 a.m. when the airport is in Over-Ocean Operations or when it remains in Westerly Operations during these hours. This restriction will be implemented through a City Ordinance which will define the restriction, any exemptions and the enforcement provisions for implementation.

The proposed ordinance provides limited exemptions to the proposed runway use restriction for:

- Aircraft operated by the U.S. Armed Forces and any government-owned or -operated aircraft involved in law enforcement, emergency, fire or search/rescue operations
- Aircraft engaged in a bona fide medical or life-saving emergency for which the Aircraft Operator provides acceptable evidence in writing to the General Manager within seventy-two (72) hours prior to or subsequent to said departure[21]
- Any departure of an aircraft when the FAA has directed that the Airport operate in Easterly Operations, and recorded such in their daily log file.

There is no reason to expect that these exemptions will dilute the effectiveness of the proposed restriction. LAWA has kept records of non-conforming operations for over ten years and has no evidence that these kinds of flights have ever departed to the east when LAX is in Over-Ocean Operations or Westerly Operations during the nighttime hours covered by the proposed restriction.

The following proposed ordinance describes specific details of each exemption and other implementation requirements.[22]

ORDINANCE NO. ###.###

An Ordinance approving a Regulation adopted by Resolution No. ##### of the Board of Airport Commissioners for the Department of Airports of the City of Los Angeles, which Resolution established a partial restriction on runway use for all aircraft operating at Los Angeles International Airport during certain hours.

THE PEOPLE OF THE CITY OF LOS ANGELES
DO ORDAIN AS FOLLOWS:
LOS ANGELES INTERNATIONAL AIRPORT
REGULATION FOR PARTIAL RESTRICTION ON RUNWAY USE

Sec. 1. The Regulation adopted by Resolution No. ##### of the Board of Airport Commissioners on Month DD, YYYY, is hereby approved. Said Regulation contained in said resolution provides for the establishment of a partial restriction on runway use at Los Angeles International Airport (hereinafter "Airport") and is set forth as follows:

[21] According to the Section 23.1 of the Administrative Code of the City of Los Angeles and Section 604 of the Charter of the City of Los Angeles, the "General Manager" is the Executive Director of the City of Los Angeles Department of Airports.

[22] This ordinance is subject to the approval of the Board of Airport Commissioners and the City Council for the City of Los Angeles.

SECTION 1. PURPOSE: The purpose of this Regulation is to reduce aircraft noise disturbance in communities surrounding the Airport, which are most impacted by easterly departures of aircraft between the hours of 12:00 Midnight and 6:30 a.m. when the Airport is in Over-Ocean Operations, or when it remains in Westerly Operations during these hours.

SECTION 2. EFFECTIVE DATE: This Regulation shall take effect on the date it becomes effective as an ordinance and shall remain in full force and effect until amended, modified, or repealed.

SECTION 3. DEFINITIONS: Except where the context otherwise requires, the following terms, when used in this Regulation, shall be defined as follows:

(a) Aircraft – Any fixed-wing airplane driven by any method of propulsion including, but not limited to, one or more propeller, turbojet, or turbofan engines.

(b) Airport – Los Angeles International Airport, also known as LAX.

(c) Arrival – The movement of an Aircraft as it approaches the Airport to land and ending when it exits the runway on which it touches down and rolls out.

(d) General Manager – the "Executive Director," of the City of Los Angeles Department of Airports as described by the Section 23.1 of the Administrative Code of the City of Los Angeles and Section 604 of the Charter of the City of Los Angeles.

(e) Board – Board of Airport Commissioners for the Department of Airports of the City of Los Angeles as described by the Section 23.1 of the Administrative Code of the City of Los Angeles and Section 600 of the Charter of the City of Los Angeles.

(f) Departure – The movement of an Aircraft from the time it commences its start-of-takeoff roll at the Airport.

(g) Easterly Departure – An Aircraft Departure using Runways 6L, 6R, 7L, or 7R.

(h) Easterly Operations – The Airport flight pattern under which aircraft arrivals are from the west and departures are to the east, using Runways 6L, 6R, 7L, or 7R.

(i) FAA – Federal Aviation Administration.

(j) Operator – The entity responsible for an Aircraft Arrival or Departure at the Airport.

(k) Over-Ocean Operations – The Airport flight pattern under which Aircraft Arrivals are from the west on Runways 6L, 6R, 7L, or 7R and Aircraft Departures are to the west on Runways 24L, 24R, 25L, or 25R, with Runways 6R, 7L, 24L, and 25R, preferred, with Runway 6R most commonly used for Arrivals and Runway 25R most commonly used for Departures.

(l) Westerly Operations – The Airport flight pattern under which Aircraft Arrivals are from the east and departures are to the west, using Runways 24L, 24R, 25L, or 25R.

For the purposes of this Regulation, all times are local Pacific Standard Time, unless Daylight Savings Time is in force and, in such event, it shall be used.

SECTION 4. APPLICABILITY: This Regulation shall be applicable in all respects to each and every Aircraft that operates now or may operate in the future at the Airport.

SECTION 5. PARTIAL RESTRICTION ON RUNWAY USE: From the effective date of this Regulation, no Aircraft Operator shall conduct a Departure on Runways 6L, 6R, 7L, or 7R at the Airport between the hours of 12:00 Midnight and 6:30 a.m. when the Airport is in Over-Ocean Operations, or when it remains in Westerly Operations during these hours, unless instructed otherwise by an FAA Air Traffic Controller or unless specifically exempted under Section 6 below.

SECTION 6. EXEMPTIONS. The following Aircraft Departures are exempt from the Partial Restriction on Runway Use:

(a) Any Departure of an Aircraft operated by any branch of the United States Armed Forces.

(b) Any Departure of a government-owned or -operated aircraft involved in law enforcement, emergency, fire, or search & rescue operations.

(c) Any Departure of an Aircraft engaged in a bona fide medical or life-saving emergency, provided that the Aircraft Operator submits acceptable evidence in writing to the General Manager within seventy-two (72) hours after said Departure.

(d) Any Departure of an Aircraft when the FAA has directed that the Airport operate in Easterly Operations.

SECTION 7. CIVIL PENALTIES. Civil penalties for violation of this Regulation shall be as follow:

(a) In addition to any other remedy provided for by this Regulation or elsewhere, any Operator who violates this Regulation shall be liable for a civil penalty not to exceed two thousand five hundred dollars ($2,500).

(b) Any Operator who violates any provision of this Regulation for a second time within one year of a prior violation shall be liable for a civil penalty not to exceed five thousand dollars ($5,000) upon such second violation.

(c) Any Operator who violates any provision of this Regulation for a third time within three (3) years of the first violation shall be liable for a civil penalty not to exceed ten thousand dollars ($10,000) upon such third violation. For each subsequent violation within three (3) years of the first violation, the Operator shall be liable for an additional civil penalty not to exceed ten thousand dollars ($10,000) for each violation.

(d) Civil penalties shall be assessed and may be recovered in a civil action brought by the City of Los Angeles in any court of competent jurisdiction in Los Angeles County. Funds recovered thereby shall be placed in the Airport Revenue Fund.

SECTION 8. OTHER ENFORCEMENT.

(a) The provisions of this regulation may be judicially enforced by injunction or other relief deemed appropriate by any court of competent jurisdiction.

(b) The remedies described herein shall be cumulative, and the election to seek any remedy shall not be a waiver of other remedies nor a bar to seek more than one remedy for the same violation of this Regulation.

SECTION 9. SAVINGS CLAUSE. If any section, subsection, sentence, clause or phrase of this Regulation is for any reason held to be invalid or unconstitutional by the decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions of this Regulation. The City Council hereby declares that it would have passed this Regulation and each section, subsection, sentence, clause and phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses, or phrases be declared invalid or unconstitutional.

SECTION 10. DESIGNATED OFFICERS AND EMPLOYEES. The General Manager, and any other City employees designated by the General Manager, shall have the duty and authority to enforce the provisions of this Regulation.

Sec. 2. The City Clerk shall certify to the passage of this ordinance and have it published in accordance with Council policy, either in a daily newspaper circulated in the City of Los Angeles or

by posting for ten days in three public places in the City of Los Angeles: one copy on the bulletin board located at the Main Street entrance to the Los Angeles City Hall; one copy on the bulletin board located at the Main Street entrance to the Los Angeles City Hall East; and one copy on the bulletin board located at the Temple Street entrance to the Los Angeles County Hall of Records.

I hereby certify that this ordinance was passed by the Council of the City of Los Angeles, at its meeting of _____.

JUNE LAGMAY, City Clerk

By_____
Deputy

Approved_____ _____
Mayor

Approved as to Form and Legality

CARMEN A. TRUTANICH, City Attorney

By_____
RAYMOND S. ILGUNAS
Assistant City Attorney

Date_____

File No. _____

4 OVERVIEW OF NOISE COMPATIBILITY PLANNING AT LAX

The City considers noise compatibility planning to be a high-priority and an on-going process at LAX. Over the last half century, LAWA has established an extensive noise compatibility program. Major elements of the program include:

- Noise abatement measures to reduce noise exposure or shift it away from sensitive land uses
- Remedial land use measures to address residual incompatible land uses
- Preventive land use measures to deter introduction of new incompatible land uses

LAWA devotes significant attention, staff, and financial resources to program administration, publicity, implementation, monitoring, enforcement, review, and refinement. These program elements are implemented by numerous City staff including the Noise Management section of the LAWA Environmental Services Division, and other LAWA and City administrative, operations, public affairs, and legal staff. The Noise Management section operates an extensive noise and operations monitoring system at LAX, as well as at Van Nuys Airport (VNY) and LA/Ontario International Airport (ONT). The system supports program monitoring and administration, pilot training, reporting, complaint analysis, and other program implementation functions.

Sections 4.2, 4.3, and 4.4 which follow, describe the existing elements of the LAX noise management program and establish the fact that comprehensive mitigation efforts have been on-going at LAX for many years.

4.1 LAX's Mitigation Monitoring and Reporting Program

A 1993 LAWA report titled "Overview of Noise Management History and Issues" summarized the chronology of noise reduction efforts the City had undertaken at LAX up to that year, including measures such as straight-out departures to the west, engine run-ups only in designated maintenance areas, early measures addressing easterly takeoffs of jet aircraft, and raising the glide slope angle from 2.75 to 3.00 degrees.[23] All date back to initial actions taken in 1959. A pilot study of residential sound insulation treatments was undertaken in 1967. Resolution (No. 5456) adopted by the Los Angeles Board of Airport Commissioners in 1969 resolved that "no aircraft hereafter developed for use in commercial aviation shall be permitted the use of Los Angeles International Airport in the event that such aircraft imposes total noise levels upon adjacent communities which would exceed the total noise level created by the current Boeing 707-320-C"[24]. Today, that action would require review and approval by FAA under Part 161.

Subsequent measures included issuance of a contract for the airport's first noise monitoring system in 1971; a 1972 contract to study the effectiveness of a noise barrier along the north side of the airfield; and a 1984 resolution requiring aircraft over 65,000 pounds to be towed in and out of Imperial Terminal.

[23] Noise Management Bureau of the Los Angeles Department of Airports, "Overview of Noise Management History and Issues", November 1993, pages 1-10.

[24] *Ibid*, page 2.

Additional measures at LAX have focused on the funding of sound insulation and/or land recycling programs in the cities of Los Angeles, Inglewood, and El Segundo, and the County of Los Angeles, and on further enhancements to the earlier noise and operations monitoring system.

Most recently, noise mitigation at LAX has been governed by commitments stemming from the FAA's approval of the December 2004 LAX Master Plan Program. Pursuant to the National Environmental Policy Act (NEPA), the FAA's Record of Decision includes a monitoring and enforcement program for each mitigation measure.[25] In addition, the California Environmental Quality Act (CEQA) requires the LAWA to establish a Mitigation Monitoring and Reporting Program (MMRP) for mitigation measures adopted as part of the Master Plan environmental review process to mitigate or avoid significant effects on the environment.[26] The MMRP is designed to comply with these requirements by ensuring that the mitigation measures identified in the Final EIS/EIR are implemented.[27] Section 4.2, which follows, describes existing noise abatement measures currently covered under the Master Plan Program, Section 4.3 describes existing land use compatibility measures, and Section 4.4 describes existing program measures.[28]

The following sections provide descriptions of noise abatement, land use compatibility and program measures that reference particular runways. Figure 3 provides a current Airfield Diagram for reference to the location of the runways at LAX.

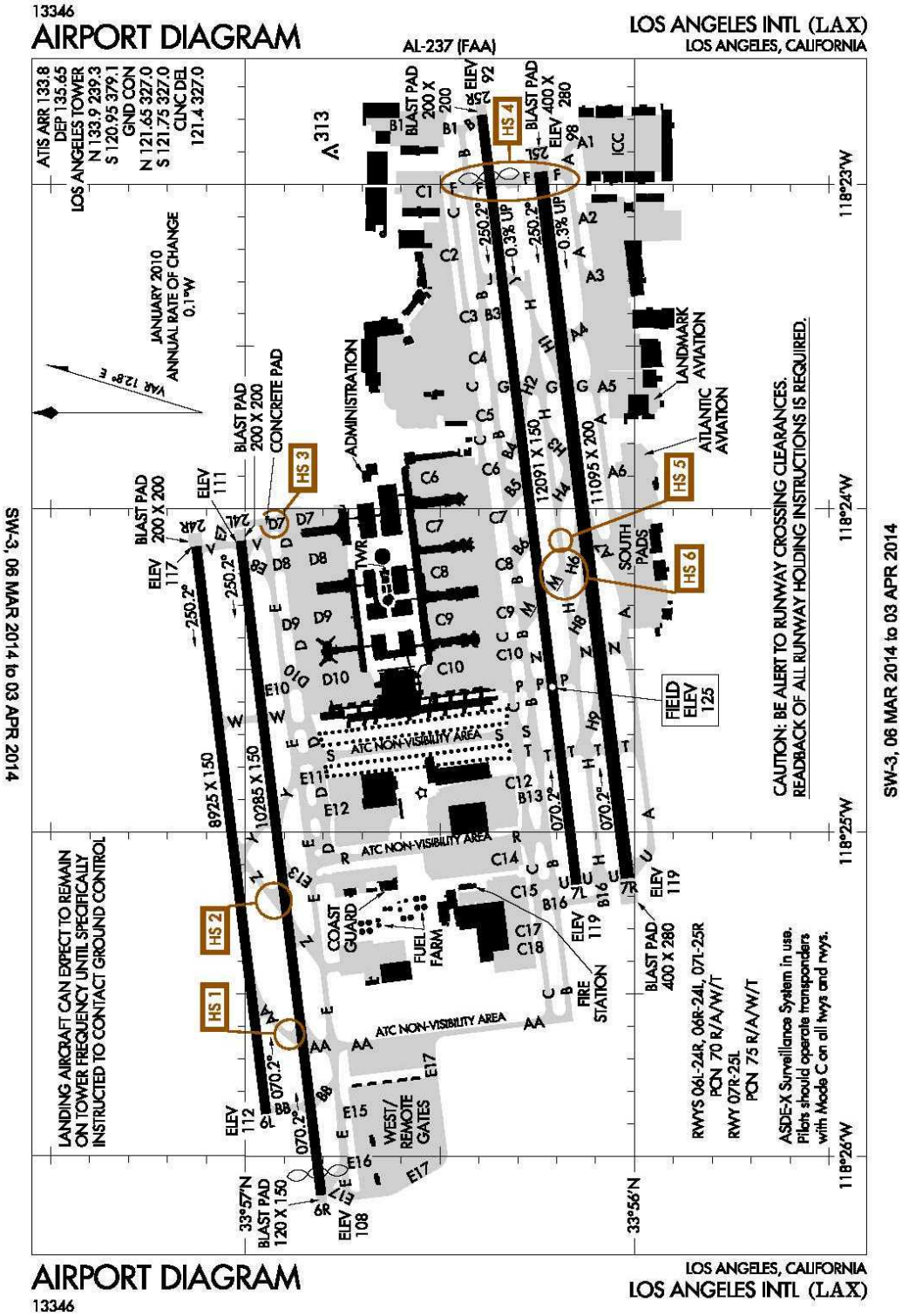
[25] 40 C.F.R. 1505.2(c)

[26] California Public Resources Code, Sec. 21081.6(a)

[27] www.laxmasterplan.org/docs/mmrp

[28] Much of the following information was provided by www.boeing.com/commercial/noise/losangeles.html

Figure 3 LAX Airport Diagram
Source: FAA SW-3, 06 Mar 2014 to 03 Apr 2014



4.2 Existing LAX Noise Abatement Measures

A commitment under the MMRP is the maintenance of applicable elements of the existing Aircraft Noise Abatement Program (ANAP). Noise abatement measures and related actions under the ANAP include the following:

- Over-Ocean Operations
- Early turn restrictions
- Helicopter operating procedures
- Preferential runway use
- Special procedures for aircraft operating at the Imperial Terminal
- Engine run-up restrictions

The following text describes each of these measures.

4.2.1 Over-Ocean Operations

To minimize the nighttime noise impacts of LAX aircraft operations between midnight and 6:30 a.m., aircraft approach LAX to the east from over the Pacific Ocean and depart to the west over the Ocean, unless Air Traffic Control (ATC) determines that weather and/or airport operational conditions are unsafe for such operations. The Over-Ocean Operations noise abatement procedure seeks to have aircraft operations over the Pacific Ocean rather than over people's homes during the night.

Operations that do not conform to this measure are the focus of this Part 161 notice, analysis, and application submission. Sections 1.1, 1.2, and 1.3 present a detailed description of the measure, its background, and the need for and goal of the proposed restriction. For conciseness, that discussion is not repeated here.

As discussed in Section 4.5, the City has pursued nonrestrictive options to achieve the goal of this proposed restriction that have proved to be unsuccessful.

4.2.2 Early Turn Restrictions

All aircraft departing to the west are to maintain runway heading until past the shoreline before commencing any turns, unless specifically instructed otherwise by ATC. LAWA staff monitor all early turns to the north and south on a routine basis and use recordings of ATC communications to determine if ATC staff instructed the pilot to make the early turn. The LAWA staff send notification letters and graphics to the airlines and generate a monthly report and distribute it to interested communities, the FAA, and other interested parties.

4.2.3 Helicopter Operating Procedures

Helicopter operators must comply with the ATC requirements and procedures pertaining to helicopter routes and altitudes within the Los Angeles Class B Airspace. Operators arriving or departing LAX must carry a current Helicopter Route Chart and use the flight routes designated by the FAA for Visual Flight Rules (VFR) and Special Visual Flight Rules (SVFR) operations. Operators are requested to use the southerly (industrial) route when arriving or departing LAX during SVFR operations, unless instructed otherwise by ATC. In addition to using FAA-designated flight routes, operators will maintain an altitude of 2,000 feet, weather, traffic and safety permitting. Operators shall use noise abatement approach and departure flight techniques and avoid nighttime

(10:00 p.m. to 7:00 a.m.) operations except in extreme emergency cases. Except for FAA certification flights, LAX restricts helicopter training operations such as touch-and-goes, stop- and-goes, and low approaches.

4.2.4 Preferential Runway Use

During the noise sensitive hours of 10:00 p.m. to 7:00 a.m., ATC maximizes use of the inboard Runways 6R/24L and 7L/25R and inboard Taxiways E and C, respectively. At all other times, the inboard runways are preferred over the outboard runways for departures and, except as required for Over-Ocean Operations, the outboard runways are preferred over the inboard runways for arrivals.

In addition, intersection takeoffs are only to be used when they improve the overall efficiency of the traffic flow, and even then, are only to be accomplished from Taxiways E-8 and F when the Airport is operating in west flow. No intersections takeoffs are permitted during east flow.

4.2.5 Imperial Terminal Procedures

All turboprops over 65,000 pounds Maximum Gross Landing Weight and all turbojets, regardless of weight, arriving at the Imperial Terminal are required to shut down their engines on Taxiway A and be towed to their assigned parking position. On departure, these aircraft also are towed to the taxiway and positioned facing east or west prior to starting engines. Jet engine runs and run-ups, and turbine-based ground power units are restricted on the Imperial Terminal ramp and Auxiliary Power Units (APUs) may only be operated when required during tow-in or -out.

4.2.6 Engine Run-up Restrictions

Run-ups for maintenance or test purposes of **e**ngines mounted on aircraft are restricted between the hours of 11:00 p.m. and 6:00 a.m. unless waived on an individual case basis by the Executive Director, or the Director's duly authorized representative, subject to the following conditions:

- The engine(s) will be run in a sound suppression unit that will reduce the sound level at the airport perimeter to 8 dB or less above the ambient background level in surrounding residential areas at the time the run-up is conducted.
- A single engine will not be operated to exceed idle power at each leasehold area. If more than one engine is to be checked, each engine must be checked separately.
- APUs will be operated only for maintenance and preflight checks.

Idle engine checks are to be operated at the minimum time required on an aircraft to accomplish the necessary maintenance or preflight check.

Maintenance or test running of jet engines not mounted on an aircraft is restricted unless performed in a test cell of adequate design. The test cell must reduce noise levels to meet specified criteria at a distance of 250 feet from the center of the test cell.

4.3 Existing LAX Compatible Land Use Measures

The City of Los Angeles and State of California programs and regulations include the following compatible use measures that are applicable at LAX:

- Sound insulation
- Land recycling

- Compatible building codes
- Noise disclosure

The following text describes each of these measures.

4.3.1 Sound Insulation

LAWA has established an Airport Noise Mitigation Program (ANMP) at LAX to sound insulate existing incompatible land uses within the 65 dB CNEL contour. LAWA provides funding and program supervision for the Cities of Inglewood and El Segundo, and the County of Los Angeles. These jurisdictions implement the mitigation programs in accordance with LAWA and FAA requirements while retaining authority in the design, conduct and progress of their programs and in the choice of mitigation methods. LAWA directly manages the mitigation programs for the properties within the jurisdiction of the City of Los Angeles.

LAWA is responsible for reporting the progress of all of the mitigation programs as required under the Noise Variance issued by the State of California, in accordance with California Code of Regulations (CCR) Title 21, State Noise Standards. The latest annual information was included in the second quarter 2011 Quarterly Noise Report LAWA prepared for the County and Los Angeles and the California Department of Transportation with the following statistics:

- 9,716 residential units (3,642 single-family, 6,072 multi-family, and 2 other) have been sound insulated through May 2009.
- 17,578 remaining residential units (5,354 single-family and 12,224 multi-family) are proposed to be sound insulated.

4.3.2 Land Recycling

Land recycling consists of acquisition of incompatible property and conversion of that property to compatible land use, such as commercial or industrial. It involves purchase of land, relocation of residents, demolition or relocation of structures, and resale of the property, with proceeds funding further mitigation. LAWA prepares an annual report on the program terms and status. The latest annual information (current through May 2009) was included in the second quarter 2009 report to the California Department of Transportation with the following statistics:[29]

- 2,686 residential units (296 single-family, 2,339 multi-family, and 51 other) have been made compatible by land recycling through May 2009.
- 2,289 remaining residential units (319 single-family and 1,970 multi-family) are proposed to be made compatible by land recycling.

4.3.3 Compatible Building Code

Each surrounding, noise-impacted jurisdiction has been encouraged to adopt policies to prevent new incompatible land uses. The Cities of Los Angeles, El Segundo, and Inglewood, and the County of Los Angeles adopted necessary ordinances or amended building codes to require new dwellings or significant remodeling to existing dwellings within the 65 dB CNEL noise contour to incorporate sound insulation materials to achieve a 45 dB (CNEL or DNL, consistent with the noise element of the local general plan) interior noise level. There are also requirements for dwellings within the 60 dB CNEL noise contour. The City of Los Angeles Municipal Code requires acoustical analysis and

[29] Latest update provided by the City of Inglewood reflects progress through 12/31/2005.

written approval for new construction and alterations and additions to existing structures as the following excerpt describes: [30]

1207 Sound Transmission

1207.1 Purpose and scope. The purpose of this section is to establish uniform minimum noise insulation performance standards to protect persons within new hotels, motels, dormitories, residential care facilities, apartment houses, dwellings, private schools, and places of worship from the effects of excessive noise, including but not limited to, hearing loss or impairment and interference with speech and sleep.

1207.11 Exterior sound transmission control

1207.11.1 Application consistent with local land-use standards. All structures identified in Section 91.1208.1.1 located in noise critical areas, such as proximity to highways, county roads, city streets, railroads, rapid transit lines, airports or industrial areas shall be designed to prevent the intrusion of exterior noises beyond prescribed levels. Proper design shall include, but shall not be limited to, orientation of the structure, setbacks, shielding and sound insulation of the building itself.

1207.11.2 Allowable interior noise levels. Interior noise levels attributed to exterior sources shall not exceed 45dB in any habitable rooms, classrooms, residential care facilities and places of worship. The noise metric shall be either the day-night average sound level (L_{dn}) or the community noise equivalent level (CNEL), consistent with the noise element of the local general plan.

Worst-case noise levels, either existing or future, shall be used as the basis for determining compliance with this section. Future noise levels shall be predicted for a period of at least 10 years from the time of building permit application.

1207.11.3. Airport noise sources. Residential structures and all other structures identified in Section 91.1208.1.1 located where the annual L_{dn} or CNEL (as defined in Title 21, Subchapter 6, California Code of Regulations) exceeds 60 dB, shall require an acoustical analysis showing that the proposed design will achieve prescribed allowable interior level.

EXCEPTION: New single family detached dwellings and all non- residential noise sensitive structures located outside the noise impact boundary of 65 dB CNEL are exempt from Section 91.1208.

Alterations or additions to all noise sensitive structures, within the 65 dB and greater CNEL shall comply with the Section 91.1208. If the addition or alternation cost exceeds 75% of the replacement cost of the existing structure, then the entire structure must comply with Section 91.1208.

For public-use airports or heliports, the L_{dn} or CNEL shall be determined from the Aircraft Noise Impact Area Map prepared by the Airport Authority. For military bases, the L_{dn} shall be determined from the facility Air Installation Compatible Use Zone (AICUZ) plan. For all other airports or heliports, or public-use airports or heliports for which a land-use plan has not been developed, the L_{dn} or CNEL shall be determined from the noise element of the general plan of the local jurisdiction.

When aircraft noise is not the only significant source, noise levels from all sources shall be added to determine the composite site noise level.

[30] 2008 City of Los Angeles Building Code, Volume 1, January 2008, pages 550R-552R.

1207.11.4 Other noise sources. All structures identified in Section 91.1208.1.1 located where the L_{dn} or CNEL exceeds 60 dB shall require an acoustical analysis showing that the proposed design will limit exterior noise to the prescribed allowable interior level. The noise element of the local general plan shall be used to the greatest extent possible to identify sites with noise levels potentially greater than 60 dB.

1207.12 Compliance. Evidence of compliance shall consist of submittal of an acoustical analysis report, prepared under the supervision of a person experienced in the field of acoustical engineering, with the application for a building permit for all structures identified in Section 91.1208.1.1 or the use of prescriptive standards for residential structures in the Los Angeles County Building Code Manual. The report shall show topographical relationships of noise sources and dwelling sites, identification of noise sources and their characteristics, predicted noise spectra and levels at the exterior of the proposed structure considering present and future land usage, basis for the prediction (measured or obtained from published data), noise attenuation measures to be applied, and an analysis of the noise insulation effectiveness of the proposed construction showing that the prescribed interior level requirements are met.

If interior allowable noise levels are met by requiring that windows be inoperable or closed, the design for the structure must also specify a ventilation or air-conditioning system to provide a habitable interior environment. The ventilation system must not compromise the interior room noise reduction.

4.3.4 Noise Disclosure

Section 11010 of the State of California Business and Professions Code requires any person who intends to offer subdivided lands within California for sale or lease to file with the Department of Real Estate an application for a public report that includes, among other things, the location of all existing airports and of all proposed airports shown on the general plan of any city or county located within 2 statute miles of the subdivision. A copy of the report must be given to the prospective purchaser by the owner, sub-divider, or agent prior to the execution of a binding contract or agreement for the sale or lease of any lot or parcel in a subdivision or upon request by any member of the public.

If the property to be subdivided is located within an airport influence area (e.g., within the 65 dB CNEL contour at LAX), the following statement shall be included in the notice of intention:

NOTICE OF AIRPORT IN VICINITY

> This property is presently located in the vicinity of an airport, within what is known as an airport influence area. For that reason, the property may be subject to some of the annoyances or inconveniences associated with proximity to airport operations (for example: noise, vibration, or odors). Individual sensitivities to those annoyances can vary from person to person. You may wish to consider what airport annoyances, if any, are associated with the property before you complete your purchase and determine whether they are acceptable to you. (B) For purposes of this section, an "airport influence area," also known as an "airport referral area," is the area in which current or future airport-related noise, overflight, safety, or airspace protection factors may significantly affect land uses or necessitate restrictions on those uses as determined by an airport land use commission.[31]

The California Department of Transportation Legal Division interprets existing law to require sellers of residential property to provide a notice of proximity to airports to prospective buyers, as reported in the California Airport Land Use Planning Handbook (January 2002) and provided below:[32]

> California state real estate law requires that sellers of real property disclose "any fact materially affecting the value and desirability of the property" (California Civil Code, Section 1102.1(a)). While this general requirement leaves to the property seller the decision as to whether airport-related information constitutes a fact warranting disclosure, other sections of state disclosure law specifically mention airports. Section 1102.17 of the Civil Code says that: "The seller of residential real property subject to this article who has actual knowledge that the property is affected by or zoned to allow industrial use described in Section 731a of the Code of Civil Procedure shall give written notice of that knowledge as soon as practicable before transfer of title."
>
> Section 731a of the Code of Civil Procedure then specifies: "Whenever any city, city and county, or county shall have established zones or districts under authority of law wherein certain manufacturing or commercial or airport uses are expressly permitted, except in an action to abate a public nuisance brought in the name of the people of the State of California, no person or persons, firm or corporation shall be enjoined or restrained by the injunctive process from reasonable and necessary operation in any such industrial or commercial zone or airport of any use expressly permitted therein, nor shall such use be deemed a nuisance without evidence of the employment of unnecessary and injurious methods of operation…."

The interpretation of the Department of Transportation Legal Division is that these sections of the law establish a requirement for disclosure of information regarding the effects of airports on nearby property provided that the seller has "actual knowledge" of such effects. ALUCs have particular expertise in defining where airports have effects on surrounding lands. ALUCs thus can give authority to this disclosure requirement by establishing a policy indicating the geographic boundaries of the lands deemed to be affected by airport activity. In most cases, this boundary will coincide with commission's planning boundary for an airport (the airport area of influence). Furthermore, ALUCs should disseminate information regarding their disclosure policy and its significance by formally mailing copies to local real estate brokers and title companies. Having received this

[31] California Business and Professions Code, Section 11010.(b)(13)(A & B) http://www.leginfo.ca.gov/.html/bpc_table_of_contents.html

[32] State of California, Department of Transportation, Division of Aeronautics, "California Airport Land Use Planning Handbook", January 2002, pp. 3-26 - 3-27.

information, the brokers would be obligated to tell sellers that the facts should be disclosed to prospective buyers.

4.4 Existing Program Measures

LAWA has the following program measures in place to assist in managing any noise impact on its neighboring communities:

- Aircraft Noise Community Response Program
- In-Flight Monitoring Program
- LAX/Community Noise Roundtable

4.4.1 Aircraft Noise Community Response Program

LAWA maintains a noise complaint phone line (424-64NOISE) and a noise complaint form on the Airport's web site that are available 24 hours a day, seven days a week for concerned residents to contact the Airport. LAWA also provides a web-based flight tracking system where the public can research a particular aircraft operation that may have caused a disturbance and provides a link to submit a complaint with the specific aircraft data included. In addition, complaints received through general communications via email or fax, are logged in the noise complaint database. Currently, staff investigate one incident of disturbance per noise complaint and a maximum of five noise complaints per person per month. Response letters are provided to those residents requesting a written response to their noise complaints. A summary report is generated each month and is available on the LAWA web site.

4.4.2 In-Flight Monitoring Program

LAWA monitors specific arrival and departure procedures for compliance with described minimum altitudes and/or location of aircraft, as established by the FAA or contained in the Aircraft Noise Abatement Operating Procedures and Restrictions section of the LAX Rules and Regulations. In addition to the regular monthly and quarterly programs previously described, these ad hoc monitoring efforts include reviews of the following procedures:

- Short Turns (On North arrivals, turns to base leg prior to the Harbor Freeway)
- Monterey Park Overflights (Extended downwind approach legs)
- Go-arounds (Either ATC- or pilot-initiated; non-runway headings)
- Loop Departure Procedure (Improperly flown loop departures overflying communities south of LAX)
- Palos Verdes Peninsula Overflights (Southbound turboprops and jets avoid overflying communities unless directed by ATC)

4.4.3 LAX/Community Noise Roundtable

The LAX/Community Noise Roundtable was created in September 2000 and is intended "to identify noise concerns in the surrounding communities and to recommend courses of action to LAWA, the FAA, or other responsible entity that could reduce noise over affected communities without shifting

noise from one community to another"[33]. Membership of the Roundtable consists of local elected officials and staff, representatives of congressional offices, members of recognized community groups, the FAA (a non-voting member), airline representatives and LAWA Management. This forum provides a mechanism that attempts to ensure cooperation between the Airport and local impacted communities in achieving noise reduction to those communities wherever possible without shifting noise from one community to another.

4.5 Nonrestrictive Alternatives to the Proposed Runway Use Restriction

Three of the five Aircraft Noise Abatement Program measures presented in Section 4.2 directly seek to reduce aircraft noise exposure during nighttime hours. The non-conforming operations frustrate LAWA's efforts to minimize the communities' exposure to nighttime aircraft noise.

LAWA has aggressively pursued nonrestrictive means of accomplishing the goal of the proposed runway use restriction with some success in reducing or eliminating the non-conforming operations at LAX. Section 1.1 summarized the voluntary noise abatement procedural steps that LAWA has undertaken through formal FAA programs (including the "ANCLUC" and Part 150 processes) to work with the FAA and operators to establish nonrestrictive procedures to reduce or eliminate non-conforming operations. LAWA also has made efforts to work with operators to educate them on the importance of compliance, to understand the reasons for non-conforming operations, and to seek means for cooperatively increasing compliance.

LAWA's efforts also have included continuing monitoring and identification of non-conforming operations. Since, as discussed in Section 6, the non-conforming operations occur relatively infrequently and are almost exclusively for a specific category of operations; i.e., long-haul night departures by heavily loaded aircraft to Pacific Rim destinations, LAWA is able to assemble very accurate and complete records of non-conforming flights. LAWA reports on those operations to the LAX/Community Noise Roundtable and publicizes the information on the Noise Management page of the LAX website. One objective of this monitoring and reporting is to continue to educate operators on the significance of the issue and the need to cooperatively minimize non-conforming operations.

To act as a further reminder to operators of the importance of minimizing non-conforming operations, starting in September 2011, LAWA instituted a program whereby each operator conducting one or more non-conforming operations is immediately sent a letter requesting that the operator provide information on each of the easterly departures. For each non-conforming operation that the operator conducted, LAWA provides a form that contains the date and time of the operation, the operator name and flight number, and the aircraft type. The form includes blanks for the operator to complete and return – on a voluntary basis – containing the following information: the engine type/engine configuration, the runway requested, the wind speed and direction at the time of departure, the airport destination, the reason for the east departure, the weight of the aircraft on departure, and the amount of fuel on board the aircraft. Appendix D contains a sample letter and form that would be sent to non-conforming operators.

Table 3 summarizes the numbers of non-conforming east departures conducted during the first 12 months of this program, the numbers of letters sent to operators and the number of responses received from the operators.

[33] LAX/Community Noise Roundtable By-Laws, Article II – Mission, Approved by the Roundtable May 8, 2002 and amended March 9, 2011.

Table 3 Summary of Voluntary Non-Conforming Operations Reporting
Source: LAWA, 2011 and 2012

	2011				2012							
	Sep	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**
Number of East Departures	4	2	19	1	7	3	2	1	10	4	0	1
Number of Letters Sent*	3	1	13	1	6	3	2	1	7	4	0	1
Number of Responses Received	1	1	8	1	2	1	2	1	4	0	0	1

* Some letters include multiple operations.

As evidenced by the January response when all seven non-conforming departures for the month occurred in a single 30-minute period after midnight on the night of the 27th (see Sections 1.2 and 1.3), these voluntary implementation mechanisms and efforts to educate and remind operators of the significance of voluntary compliance with the Over-Ocean Operations program do not prevent the continuing occurrence of non-conforming operations. The City has concluded that voluntary mechanisms are insufficient and that a mandated runway use restriction is the only feasible course of action to eliminate these non-conforming operations.

5 DEVELOPMENT OF 2013 AND 2018 LAX OPERATIONS FORECASTS

The analysis years for the Part 161 Application are 2013 (the initial year of application submission to the FAA) and 2018 (five years beyond the application submission). No single data source provides all the information needed to develop the fleet inputs for the INM, which requires average daily arrivals and departures by aircraft type and by time of day. Therefore, it is necessary to use several available data sources to compile a base-year fleet mix with the required inputs for noise impact analyses. These data sources include:

- LAX airport records
- USDOT T100 data
- OAG passenger and all cargo schedules
- FAA Air Traffic Control Tower (ATCT or Tower) counts
- FAA ASDI information (via FlightAware.com)
- FAA Enhanced Traffic Management System counts
- ACAS airline fleet data
- Industry forecasts prepared by Airbus, Boeing, and the FAA

Details of the methodology and assumptions for developing the 2013 and 2018 aircraft operations for LAX under current operating conditions and with the proposed restriction can be found in Appendix J. The FAA reviewed and approved the forecasts on September 24, 2012; their letter is also included in Appendix J.

5.1 Estimation of 2013 Base Year LAX Aircraft Operations

A review of the annual aircraft operations from 1990 through 2010 was used to study the changes due to economic conditions and the 9/11 terrorist attacks. These trends provided a pattern of operations that led to the projection of approximately 594,000 annual operations for the base year 2013, or about 1,627 operations per day. Approximately 270 of the daily operations are forecast to occur at night between 10:00 p.m. and 7:00 a.m., and approximately 156 of those are expected to be departures.

The aircraft fleet mixes for domestic and international passenger operations and all cargo operations were developed based on information gathered from other data sources. Table 4 shows a breakdown by aircraft group with annual-average day arrival and departure operations distributed in the three periods – day, evening, and night – required for CNEL noise calculations. The aircraft groups are identified by short identifiers as follows:

- LNB – Large Narrow Body Jet
- LWB – Large Wide Body Jet
- NJH1 – Helicopter at Pad1
- NJH2 – Helicopter at Pad2
- NJT – Non-Jet
- SJT – Small Jet
- SNB – Small Narrow Body Jet
- SWB – Small Wide Body Jet

Table 4 Annual-Average Day Aircraft Operations at LAX for 2013 by Aircraft Group
Source: SH&E, Inc., HMMH

Aircraft Group	Annual-Average Day Operations 2013					
	Arrivals			Departures		
	Day	Evening	Night	Day	Evening	Night
LNB	46.625	25.442	19.439	60.052	2.872	28.581
LWB	56.627	15.003	16.727	44.169	9.863	34.325
NJH1	0.181	0.012	0.006	0.187	0.006	0.006
NJH2	0.086	0.020	0.000	0.106	0.000	0.000
NJT	53.650	8.268	5.903	50.045	10.158	7.619
SJT	59.288	15.491	4.704	60.866	9.647	8.970
SNB	289.297	96.260	54.145	309.705	65.567	64.430
SWB	22.000	10.997	13.290	32.145	2.288	11.855
Total	**527.755**	**171.492**	**114.215**	**557.275**	**100.400**	**155.786**

Table 5 breaks these down into individual aircraft types with related operations. Profile stage numbers or stage lengths were determined by reviewing departure destinations and the approximate distance from LAX. The distances were then converted to departure stage lengths as defined in the INM 7.0 User's Guide. Stage lengths are nominal surrogates for aircraft takeoff weights with the higher stage lengths corresponding to heavier aircraft takeoff weights.

Table 5 Annual-Average Day Aircraft Operations at LAX for 2013 by INM Aircraft Type
Source: SH&E Inc., HMMH

INM Aircraft Type	Profile or Stage Length	Annual-Average Day Operations 2013					
		Arrivals			Departures		
		Day	Evening	Night	Day	Evening	Night
757300	1	3.000	4.000	1.285	0.000	0.000	0.000
757300	2	0.000	0.000	0.000	0.000	0.000	0.000
757300	3	0.000	0.000	0.000	1.000	0.000	2.427
757300	4	0.000	0.000	0.000	3.000	0.000	1.858
757PW	1	30.570	11.858	9.858	2.855	0.573	1.000
757PW	2	0.000	0.000	0.000	3.142	0.000	2.715
757PW	3	0.000	0.000	0.000	3.000	0.000	0.142
757PW	4	0.000	0.000	0.000	28.858	1.142	8.858
757RR	1	5.000	4.000	5.573	0.000	0.000	0.000
757RR	3	0.000	0.000	0.000	3.000	0.000	3.000
757RR	4	0.000	0.000	0.000	6.573	1.000	1.000
A321-232	1	8.000	5.573	2.715	2.000	0.142	1.000
A321-232	4	0.000	0.000	0.000	6.573	0.000	6.573
DC870	1	0.052	0.006	0.009	0.046	0.012	0.009
KC135R	1	0.003	0.006	0.000	0.006	0.003	0.000
74720B	1	0.055	0.578	0.017	0.035	0.003	0.040
74720B	4	0.000	0.000	0.000	0.000	0.000	0.573
747400	1	11.427	5.573	5.425	0.285	0.000	2.000
747400	2	0.000	0.000	0.000	0.000	0.000	0.000
747400	3	0.000	0.000	0.000	0.000	0.000	0.000
747400	4	0.000	0.000	0.000	1.427	0.000	0.712
747400	7	0.000	0.000	0.000	7.142	1.000	4.384
747400	8	0.000	0.000	0.000	1.285	0.000	2.244
747400	9	0.000	0.000	0.000	0.000	0.000	1.832

INM Aircraft Type	Profile or Stage Length	Annual-Average Day Operations 2013					
		Arrivals			Departures		
		Day	Evening	Night	Day	Evening	Night
777200	1	14.000	2.282	0.573	0.000	0.000	0.000
777200	4	0.000	0.000	0.000	2.000	0.000	0.000
777200	6	0.000	0.000	0.000	0.000	0.000	0.427
777200	7	0.000	0.000	0.000	6.573	1.427	2.395
777200	8	0.000	0.000	0.000	2.427	0.000	0.994
777200	9	0.000	0.000	0.000	0.573	0.000	0.000
777300	1	4.715	1.000	0.000	0.000	0.000	0.000
777300	7	0.000	0.000	0.000	3.000	1.000	1.715
777M	1	10.288	3.000	1.715	0.000	0.000	0.000
777M	M*	0.000	0.000	0.000	7.288	0.000	7.693
A330-301	1	4.285	0.000	1.000	0.000	0.000	0.000
A330-301	4	0.000	0.000	0.000	2.000	0.000	0.000
A330-301	7	0.000	0.000	0.000	2.285	0.000	1.000
A340-211	1	3.427	0.285	0.000	0.000	0.000	0.000
A340-211	6	0.000	0.000	0.000	1.285	0.000	0.427
A340-211	7	0.000	0.000	0.000	0.715	1.285	0.000
A340-642	1	3.140	2.285	0.855	0.000	0.000	0.427
A340-642	2	0.000	0.000	0.000	0.285	0.000	0.285
A340-642	3	0.000	0.000	0.000	0.000	0.142	0.000
A340-642	4	0.000	0.000	0.000	0.000	0.000	0.427
A340-642	6	0.000	0.000	0.000	0.000	0.000	0.000
A340-642	7	0.000	0.000	0.000	1.997	2.430	0.285
A380-841	1	1.858	0.000	1.142	0.000	0.000	0.000
A380-841	7	0.000	0.000	0.000	1.000	0.000	0.000
A380-841	8	0.000	0.000	0.000	0.000	0.000	2.000
A380-861	1	1.000	0.000	0.000	0.000	0.000	0.000
A380-861	7	0.000	0.000	0.000	1.000	0.000	0.000
DC1010	1	1.145	0.000	2.288	0.000	0.715	0.000
DC1010	2	0.000	0.000	0.000	0.000	0.000	0.000
DC1010	3	0.000	0.000	0.000	0.000	0.715	0.715
DC1010	4	0.000	0.000	0.000	0.000	0.000	1.288
MD11GE	1	1.288	0.000	3.712	0.000	0.000	0.000
MD11GE	3	0.000	0.000	0.000	0.712	0.573	1.573
MD11GE	4	0.000	0.000	0.000	0.855	0.573	0.715
B212	1	0.017	0.003	0.000	0.020	0.000	0.000
BO105	1	0.014	0.003	0.000	0.017	0.000	0.000
S76	1	0.026	0.003	0.000	0.029	0.000	0.000
SA365N	1	0.124	0.003	0.006	0.121	0.006	0.006
B206L	1	0.035	0.009	0.000	0.043	0.000	0.000
H500D	1	0.003	0.000	0.000	0.003	0.000	0.000
S70	1	0.012	0.003	0.000	0.014	0.000	0.000
SA350D	1	0.037	0.009	0.000	0.046	0.000	0.000
1900D	1	4.342	0.072	0.003	4.282	0.003	0.132
BEC58P	1	0.268	0.052	0.052	0.259	0.058	0.055
C130	1	0.009	0.003	0.000	0.009	0.000	0.003
CNA172	1	0.032	0.009	0.012	0.046	0.000	0.006
CNA182	1	0.003	0.009	0.003	0.014	0.000	0.000

INM Aircraft Type	Profile or Stage Length	Annual-Average Day Operations 2013					
		Arrivals			Departures		
		Day	Evening	Night	Day	Evening	Night
CNA206	1	0.072	0.003	0.006	0.072	0.006	0.003
CNA208	1	0.288	0.069	0.023	0.285	0.043	0.052
CNA441	1	0.124	0.009	0.014	0.098	0.020	0.029
CNA510	1	0.216	0.066	0.046	0.239	0.055	0.035
CVR580	1	0.000	0.715	0.000	0.000	0.000	0.715
DHC6	1	0.650	0.121	0.086	0.590	0.121	0.147
DHC830	1	7.000	0.858	0.000	5.000	2.858	0.000
DO228	1	0.112	0.020	0.014	0.092	0.026	0.029
EMB120	1	39.699	6.137	5.573	38.268	6.858	6.282
GASEPF	1	0.023	0.000	0.006	0.020	0.003	0.006
GASEPV	1	0.135	0.035	0.012	0.135	0.020	0.026
PA28	1	0.012	0.000	0.000	0.000	0.006	0.006
PA31	1	0.006	0.006	0.000	0.006	0.000	0.006
SD330	1	0.662	0.086	0.055	0.630	0.083	0.089
CIT3	1	0.132	0.012	0.017	0.129	0.012	0.020
CL600	1	3.159	0.552	0.345	3.216	0.342	0.498
CL601	1	9.851	2.204	0.132	9.906	1.121	1.161
CNA500	1	0.616	0.104	0.078	0.613	0.098	0.086
CNA55B	1	1.430	0.247	0.152	1.484	0.178	0.167
CNA750	1	1.605	0.279	0.150	1.712	0.141	0.181
ECLIPSE500	1	0.032	0.012	0.009	0.040	0.000	0.012
EMB14L	1	31.003	9.858	2.000	28.145	6.000	3.715
EMB14L	2	0.000	0.000	0.000	3.858	0.000	1.142
F10062	1	1.174	0.201	0.170	1.246	0.132	0.167
F-18	1	0.009	0.000	0.000	0.009	0.000	0.000
FAL20	1	0.023	0.000	0.003	0.026	0.000	0.000
GIIB	1	0.371	0.115	0.115	0.391	0.072	0.138
GIV	1	2.897	0.765	0.446	3.035	0.547	0.526
GV	1	1.881	0.354	0.429	2.014	0.265	0.385
IA1125	1	0.314	0.043	0.032	0.296	0.058	0.035
LEAR25	1	0.213	0.049	0.037	0.204	0.046	0.049
LEAR35	1	3.426	0.498	0.463	3.418	0.449	0.521
MU3001	1	1.154	0.198	0.127	1.125	0.187	0.167
7373B2	1	27.433	7.000	4.288	18.858	5.573	1.573
7373B2	2	0.000	0.000	0.000	5.573	2.573	0.715
7373B2	3	0.000	0.000	0.000	3.000	0.000	0.000
7373B2	4	0.000	0.000	0.000	0.858	0.000	0.000
737400	1	5.858	0.000	0.427	0.000	0.000	0.000
737400	2	0.000	0.000	0.000	4.285	1.285	0.000
737400	3	0.000	0.000	0.000	0.715	0.000	0.000
737500	1	4.003	1.715	1.000	1.573	1.858	0.715
737500	2	0.000	0.000	0.000	0.000	0.000	0.000
737500	3	0.000	0.000	0.000	1.858	0.715	0.000
737700	1	53.430	12.427	9.003	24.285	10.145	3.003
737700	2	0.000	0.000	0.000	7.570	1.000	0.000
737700	3	0.000	0.000	0.000	14.000	1.000	2.000
737700	4	0.000	0.000	0.000	8.142	0.858	2.858

INM Aircraft Type	Profile or Stage Length	Annual-Average Day Operations 2013					
		Arrivals			Departures		
		Day	Evening	Night	Day	Evening	Night
737800	1	63.134	26.852	14.715	8.997	4.000	0.715
737800	2	0.000	0.000	0.000	15.288	4.715	1.715
737800	3	0.000	0.000	0.000	18.849	1.142	5.712
737800	4	0.000	0.000	0.000	26.427	3.285	11.855
737800	5	0.000	0.000	0.000	1.000	0.000	1.000
A319-131	1	20.707	7.995	8.430	4.858	0.142	1.000
A319-131	2	0.000	0.000	0.000	8.852	1.715	0.570
A319-131	3	0.000	0.000	0.000	6.425	0.000	2.430
A319-131	4	0.000	0.000	0.000	5.282	1.285	4.573
A320-211	1	24.715	11.288	7.712	5.142	2.000	0.000
A320-211	2	0.000	0.000	0.000	2.858	0.858	0.427
A320-211	3	0.000	0.000	0.000	4.715	0.000	0.715
A320-211	4	0.000	0.000	0.000	17.142	3.000	6.858
A320-232	1	16.279	6.570	3.715	6.140	0.570	1.000
A320-232	2	0.000	0.000	0.000	1.997	0.000	0.000
A320-232	3	0.000	0.000	0.000	1.715	0.000	0.000
A320-232	4	0.000	0.000	0.000	8.430	1.427	5.285
BAC111	1	0.029	0.000	0.003	0.029	0.003	0.000
CRJ9-ER	1	68.710	21.414	2.852	38.145	9.000	5.997
CRJ9-ER	2	0.000	0.000	0.000	18.989	3.564	1.715
CRJ9-ER	3	0.000	0.000	0.000	10.710	3.855	1.000
MD83	1	5.000	1.000	2.000	1.000	0.000	0.000
MD83	2	0.000	0.000	0.000	1.000	0.000	0.000
MD83	3	0.000	0.000	0.000	5.000	0.000	1.000
767300	1	14.285	8.855	5.570	0.142	0.000	0.142
767300	3	0.000	0.000	0.000	4.142	0.000	1.282
767300	4	0.000	0.000	0.000	17.427	0.715	3.712
767300	6	0.000	0.000	0.000	0.573	0.000	0.570
767CF6	1	6.858	2.142	4.003	0.715	0.000	0.715
767CF6	3	0.000	0.000	0.000	0.000	0.000	0.140
767CF6	4	0.000	0.000	0.000	8.573	1.573	1.285
A300-622R	1	0.858	0.000	2.003	0.573	0.000	0.573
A300-622R	3	0.000	0.000	0.000	0.000	0.000	0.715
A300-622R	4	0.000	0.000	0.000	0.000	0.000	1.000
A300B4-203	1	0.000	0.000	1.715	0.000	0.000	0.000
A300B4-203	3	0.000	0.000	0.000	0.000	0.000	1.715
	Total	**527.755**	**171.492**	**114.215**	**557.275**	**100.400**	**155.608**

*Note: “M” is an FAA-approved User-defined profile – see Appendix H

5.2 Forecast Growth in LAX Aircraft Operations

Growth assumptions for each of the major market segments (domestic passenger, international passenger, all cargo, and GA) of aircraft activity at LAX were developed based on a review of historic trends at LAX and the outlook for the United States aviation industry. Details of the development of the forecast are presented in Appendix J.

Table 6 shows the breakdowns by aircraft group for 2018 with annual-average day arrival and departure operations distributed in the three periods – day, evening, and night. Table 7 shows the breakout by INM aircraft type.

Table 6 Annual-Average Day Aircraft Operations at LAX for 2018 by Aircraft Group
Source: SH&E, Inc., HMMH

Aircraft Group	Annual-Average Day Operations 2018					
	Arrivals			Departures		
	Day	Evening	Night	Day	Evening	Night
LNB	45.483	24.442	18.866	57.338	2.872	28.581
LWB	67.480	16.863	18.867	52.315	11.718	39.178
NJH1	0.185	0.015	0.023	0.202	0.015	0.006
NJH2	0.087	0.021	0.000	0.096	0.012	0.000
NJT	54.572	8.261	5.899	50.995	10.139	7.598
SJT	51.895	12.750	4.723	52.712	8.654	8.001
SNB	338.710	112.978	58.855	373.978	66.564	70.000
SWB	22.858	11.570	14.290	32.288	2.430	14.000
Total	**581.269**	**186.900**	**121.524**	**619.923**	**102.405**	**167.365**

Table 7 Annual-Average Day Aircraft Operations at LAX for 2018 by INM Aircraft Type
Source: SH&E Inc., HMMH

INM Aircraft Type	Profile or Stage Length	Annual-Average Day Operations 2018					
		Arrivals			Departures		
		Day	Evening	Night	Day	Evening	Night
757300	1	3.000	4.000	1.285	0.000	0.000	0.000
757300	2	0.000	0.000	0.000	0.000	0.000	0.000
757300	3	0.000	0.000	0.000	1.000	0.000	2.427
757300	4	0.000	0.000	0.000	3.000	0.000	1.858
757PW	1	29.427	11.858	9.858	2.855	0.573	1.000
757PW	2	0.000	0.000	0.000	3.142	0.000	2.715
757PW	3	0.000	0.000	0.000	3.000	0.000	0.142
757PW	4	0.000	0.000	0.000	27.715	1.142	8.858
757RR	1	5.000	3.000	5.000	0.000	0.000	0.000
757RR	3	0.000	0.000	0.000	3.000	0.000	3.000
757RR	4	0.000	0.000	0.000	5.000	1.000	1.000
A321-232	1	8.000	5.573	2.715	2.000	0.142	1.000
A321-232	4	0.000	0.000	0.000	6.573	0.000	6.573
DC870	1	0.053	0.006	0.009	0.047	0.012	0.009
KC135R	1	0.003	0.006	0.000	0.006	0.003	0.000
74720B	1	0.056	0.006	0.018	0.035	0.003	0.041
747400	1	12.422	5.430	5.140	0.570	0.000	1.285
747400	2	0.000	0.000	0.000	0.000	0.000	0.000
747400	3	0.000	0.000	0.000	0.000	0.000	0.000
747400	4	0.000	0.000	0.000	1.427	0.000	1.570
747400	7	0.000	0.000	0.000	6.855	0.285	4.838
747400	8	0.000	0.000	0.000	1.573	0.285	2.408
747400	9	0.000	0.000	0.000	0.000	0.000	1.838
777200	1	14.003	2.855	1.000	0.000	0.000	0.000
777200	4	0.000	0.000	0.000	2.000	0.000	0.000

INM Aircraft Type	Profile or Stage Length	Annual-Average Day Operations 2018					
		Arrivals			Departures		
		Day	Evening	Night	Day	Evening	Night
777200	6	0.000	0.000	0.000	0.000	0.000	0.427
777200	7	0.000	0.000	0.000	6.003	1.427	2.962
777200	8	0.000	0.000	0.000	3.000	0.000	0.992
777200	9	0.000	0.000	0.000	1.000	0.000	0.000
777300	1	5.000	1.000	0.000	0.000	0.000	0.000
777300	7	0.000	0.000	0.000	3.000	1.000	2.000
777M	1	14.000	3.145	1.858	0.000	0.000	0.000
777M	M*	0.000	0.000	0.000	8.573	0.000	10.381
A330-301	1	4.715	0.000	2.000	0.000	0.000	0.000
A330-301	4	0.000	0.000	0.000	3.000	0.000	0.000
A330-301	7	0.000	0.000	0.000	2.715	0.000	1.000
A330-343	1	4.000	0.000	0.000	0.000	0.000	0.000
A330-343	7	0.000	0.000	0.000	2.000	2.000	0.000
A340-211	1	3.427	0.285	0.000	0.000	0.000	0.000
A340-211	6	0.000	0.000	0.000	1.285	0.000	0.427
A340-211	7	0.000	0.000	0.000	0.715	1.285	0.000
A340-642	1	4.140	3.142	2.567	0.000	0.000	1.855
A340-642	2	0.000	0.000	0.000	0.285	0.000	0.285
A340-642	3	0.000	0.000	0.000	0.000	0.142	0.000
A340-642	4	0.000	0.000	0.000	0.000	0.000	0.427
A340-642	6	0.000	0.000	0.000	0.000	0.000	0.000
A340-642	7	0.000	0.000	0.000	3.712	1.715	1.411
A380-841	1	2.858	1.000	1.142	0.000	0.000	0.000
A380-841	7	0.000	0.000	0.000	2.000	1.000	0.000
A380-841	8	0.000	0.000	0.000	0.000	0.000	1.995
A380-861	1	1.000	0.000	0.000	0.000	0.000	0.000
A380-861	7	0.000	0.000	0.000	1.000	0.000	0.000
DC1010	1	0.573	0.000	1.573	0.000	0.715	0.000
DC1010	3	0.000	0.000	0.000	0.000	0.715	0.000
DC1010	4	0.000	0.000	0.000	0.000	0.000	0.715
MD11GE	1	1.288	0.000	3.570	0.000	0.000	0.000
MD11GE	3	0.000	0.000	0.000	0.712	0.573	1.573
MD11GE	4	0.000	0.000	0.000	0.855	0.573	0.573
B212	1	0.018	0.003	0.006	0.023	0.003	0.000
BO105	1	0.015	0.003	0.006	0.021	0.003	0.000
S76	1	0.026	0.006	0.006	0.035	0.003	0.000
SA365N	1	0.126	0.003	0.006	0.123	0.006	0.006
B206L	1	0.035	0.009	0.000	0.035	0.009	0.000
H500D	1	0.002	0.000	0.000	0.002	0.000	0.000
S70	1	0.012	0.003	0.000	0.015	0.000	0.000
SA350D	1	0.038	0.009	0.000	0.044	0.003	0.000
1900D	1	4.349	0.073	0.003	4.287	0.003	0.135
BEC58P	1	0.278	0.053	0.053	0.270	0.059	0.056
C130	1	0.009	0.003	0.000	0.009	0.000	0.003
CNA172	1	0.032	0.009	0.012	0.047	0.000	0.006
CNA182	1	0.003	0.009	0.003	0.015	0.000	0.000
CNA206	1	0.073	0.003	0.006	0.073	0.006	0.003

INM Aircraft Type	Profile or Stage Length	Annual-Average Day Operations 2018					
		Arrivals			Departures		
		Day	Evening	Night	Day	Evening	Night
CNA208	1	0.311	0.073	0.026	0.308	0.046	0.055
CNA441	1	0.114	0.009	0.015	0.091	0.018	0.029
CNA510	1	0.237	0.074	0.051	0.263	0.061	0.038
CVR580	1	0.000	0.715	0.000	0.000	0.000	0.715
DHC6	1	0.405	0.085	0.064	0.367	0.083	0.104
DHC830	1	8.000	0.858	0.000	6.000	2.858	0.000
DO228	1	0.078	0.014	0.010	0.064	0.018	0.020
EMB120	1	39.699	6.137	5.573	38.268	6.858	6.282
GASEPF	1	0.023	0.000	0.006	0.021	0.003	0.006
GASEPV	1	0.138	0.035	0.012	0.138	0.021	0.026
PA28	1	0.012	0.000	0.000	0.000	0.006	0.006
PA31	1	0.006	0.006	0.000	0.006	0.000	0.006
SD330	1	0.806	0.106	0.067	0.768	0.102	0.109
CIT3	1	0.067	0.006	0.009	0.066	0.006	0.010
CL600	1	3.446	0.614	0.376	3.513	0.380	0.541
CL601	1	3.180	0.264	0.168	3.254	0.151	0.208
CNA500	1	0.654	0.111	0.082	0.650	0.105	0.092
CNA55B	1	1.520	0.263	0.161	1.579	0.188	0.177
CNA750	1	1.938	0.341	0.183	2.072	0.171	0.219
ECLIPSE500	1	0.032	0.012	0.009	0.041	0.000	0.012
EMB14L	1	30.003	9.000	2.000	28.145	6.000	3.715
EMB14L	2	0.000	0.000	0.000	2.000	0.000	1.142
F10062	1	1.017	0.169	0.154	1.072	0.111	0.157
F-18	1	0.009	0.000	0.000	0.009	0.000	0.000
FAL20	1	0.023	0.000	0.003	0.026	0.000	0.000
GIIB	1	0.060	0.023	0.019	0.067	0.012	0.023
GIV	1	3.074	0.819	0.477	3.229	0.581	0.560
GV	1	2.236	0.423	0.508	2.394	0.315	0.458
IA1125	1	0.224	0.029	0.029	0.218	0.037	0.028
LEAR25	1	0.061	0.011	0.010	0.058	0.011	0.013
LEAR35	1	3.168	0.460	0.407	3.166	0.393	0.477
MU3001	1	1.183	0.205	0.128	1.154	0.194	0.168
7373B2	1	28.290	7.000	4.288	18.858	5.573	1.573
7373B2	2	0.000	0.000	0.000	5.430	2.573	0.715
7373B2	3	0.000	0.000	0.000	4.000	0.000	0.000
7373B2	4	0.000	0.000	0.000	0.858	0.000	0.000
737400	1	5.858	0.000	0.427	0.000	0.000	0.000
737400	2	0.000	0.000	0.000	4.285	1.285	0.000
737400	3	0.000	0.000	0.000	0.715	0.000	0.000
737500	1	4.003	1.715	1.000	1.573	1.858	0.715
737500	2	0.000	0.000	0.000	0.000	0.000	0.000
737500	3	0.000	0.000	0.000	1.858	0.715	0.000
737700	1	63.005	13.285	9.003	27.715	10.145	3.003
737700	2	0.000	0.000	0.000	8.427	1.000	0.000
737700	3	0.000	0.000	0.000	17.430	1.000	2.000
737700	4	0.000	0.000	0.000	10.858	0.858	2.858
737800	1	85.279	35.425	20.288	11.712	4.000	0.715

INM Aircraft Type	Profile or Stage Length	Annual-Average Day Operations 2018					
		Arrivals			Departures		
		Day	Evening	Night	Day	Evening	Night
737800	2	0.000	0.000	0.000	18.145	4.715	2.715
737800	3	0.000	0.000	0.000	25.564	1.142	6.712
737800	4	0.000	0.000	0.000	46.285	3.285	14.000
737800	5	0.000	0.000	0.000	1.000	0.000	1.000
A319-131	1	24.852	10.140	9.285	5.858	0.142	1.000
A319-131	2	0.000	0.000	0.000	9.282	1.715	0.570
A319-131	3	0.000	0.000	0.000	10.142	0.000	3.000
A319-131	4	0.000	0.000	0.000	6.282	1.285	5.000
A320-211	1	28.715	12.715	7.997	5.142	2.000	0.000
A320-211	2	0.000	0.000	0.000	4.858	0.858	0.427
A320-211	3	0.000	0.000	0.000	4.715	0.000	0.715
A320-211	4	0.000	0.000	0.000	20.427	3.000	7.285
A320-232	1	19.995	8.570	3.715	6.140	0.570	1.000
A320-232	2	0.000	0.000	0.000	1.997	0.000	0.000
A320-232	3	0.000	0.000	0.000	2.715	0.000	0.000
A320-232	4	0.000	0.000	0.000	12.430	1.427	5.285
A320-232	5	0.000	0.000	0.000	0.715	0.000	0.000
BAC111	1	0.000	0.000	0.000	0.000	0.000	0.000
CRJ9-ER	1	78.712	24.129	2.852	45.288	10.000	6.997
CRJ9-ER	2	0.000	0.000	0.000	22.132	3.564	1.715
CRJ9-ER	3	0.000	0.000	0.000	11.142	3.855	1.000
767300	1	14.858	9.427	6.285	0.142	0.000	0.142
767300	2	0.000	0.000	0.000	0.000	0.000	0.000
767300	3	0.000	0.000	0.000	4.142	0.000	1.995
767300	4	0.000	0.000	0.000	17.427	0.715	4.288
767300	6	0.000	0.000	0.000	0.573	0.000	1.142
767CF6	1	7.142	2.142	4.003	0.715	0.000	0.715
767CF6	3	0.000	0.000	0.000	0.000	0.000	0.142
767CF6	4	0.000	0.000	0.000	8.715	1.715	1.285
A300-622R	1	0.858	0.000	4.003	0.573	0.000	0.573
A300-622R	3	0.000	0.000	0.000	0.000	0.000	2.715
737800	3	0.000	0.000	0.000	25.564	1.142	6.712
	Total	**581.269**	**186.900**	**121.524**	**619.923**	**102.405**	**167.186**

*Note: “M” is an FAA-approved User-defined profile – see Appendix H

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6 NOISE ANALYSIS OF PROPOSED RESTRICTION

This section provides information on the non-conforming easterly departures that occur from time to time when LAX is in Over-Ocean or Westerly Operations. Following the non-conforming operations analysis is a description of the Airport Noise Study Area (ANSA) for which land use compatibility, noise complaints, sleep disturbance and environmental justice is analyzed and presented.

6.1 Non-Conforming Operations Analysis

To identify the noise benefits of restricting easterly departures from midnight to 6:30 a.m. when LAX is in Over-Ocean or Westerly Operations, the adverse noise impacts that non-conforming flights have on residents of nearby communities within the ANSA need to be clearly understood.

First and foremost, flights of this type are not typical. With predominant on-shore winds occurring more than 90% of the time and with its FAA-approved 10-knot tailwind waiver, LAX primarily operates in a westerly flow up until midnight when, under most wind and weather conditions, the flow shifts to Over-Ocean Operations. In this configuration, aircraft continue to depart west over the Ocean, but arrivals, which prior to midnight had been making long straight-ins to Runways 25L and 24R, are typically vectored to the north, routed out over the ocean and turned back inbound to land on 6L or 7R. In this configuration, essentially all traffic coming into or departing out of LAX is over the water. Thus, when a non-conforming departure to the east occurs, it overflies communities late at night that otherwise are receiving little or no noise.

To emphasize the predominance of west flow traffic, for the one-year period from 1 April 2010 through 31 March 2011, flight tracks of more than 517,000 operations were captured by LAWA's Noise and Operations Monitoring System and analyzed for trends. Of that total, 260,519 were departures, 255,606 of which took off to the west. The remaining 4,913 (less than 2%) took off to the east. A still smaller subset, 540 east departures, occurred between midnight and 6:30 a.m., most of which took place when the easterly winds were greater than 10 knots. Only 56 of the more than 517,000 operations were east departures between midnight and 6:30 a.m. when east winds were less than 10 knots and all other departures were taking off to the west in conformance with LAWA's voluntary runway use program. These few non-conforming flights are the subject of the proposed restriction.

The disruptive nature of this small number of flights is illustrated by the four figures that follow. Figure 4, depicts a density plot of radar data during Westerly Operations showing the relative frequency with which aircraft follow various routes of flight and converge on certain navigational fixes during the mostly- day, evening, and early nighttime hours of 6:30 a.m. to 12 midnight. Though a majority of west flow traffic occurred on 359 out of 365 days in the one-year sample of radar data, Figure 4 is based on a 47-day subset of the total. Warmer colors indicate a high density of traffic, while greens and blues indicate lower densities. For reference, the two thin parallel flight paths east of LAX are from aircraft arriving on straight-in approaches to land. North of the Airport, the parallel swath of warm colors is also caused by arriving aircraft, in this case coming into the area from the northwest and joining a "downwind leg" before being given 180-degree right turns by air traffic controllers as aircraft are dispersed in shades of blue and merged with the arrival stream coming in from the east. Departures in west flow initially head straight out over water, and if travelling to Pacific Rim destinations, continue in a westerly direction, spreading out as they leave the local area; traffic to Mexico and most points east make precise turns to the south, climbing past

Palos Verdes and Rolling Hills before heading back over land to make further left turns to a navigational fix near Los Alamitos. Some departures also make tight left turns in a teardrop pattern and climb back over the top of LAX for destinations to the northeast.

While these details are important, the point of the graphic is to illustrate the vast area from the I-105 Freeway south to Long Beach, and from Redondo Beach eastward to Lakewood which is almost completely free of aircraft in and out of LAX during west flow operation. Communities in this area enjoy numerous evenings and early nighttime hours of relatively few overflights from LAX.

Figure 5 depicts a similar display of radar flight tracks, but in this case for the late-night hours of midnight to 6:30 a.m. when the traffic flow shifts to Over-Ocean Operations. The density plot here is based on the 25 days of radar data in the one-year sample, each of which included at least one non-conforming flight. The color scheme is the same as in Figure 4, but with fewer operations occurring during the late nighttime hours, there are fewer areas of red and orange.

Note now, as landings approach LAX from the east, pastel blue colors show that the majority of arrivals make slight right turns, diverging off of the long straight-in approaches that were occurring prior to midnight, and instead, converge on a navigational waypoint north of Marina del Rey. The arrivals then proceed out over the water and are given left turns back inbound to land to the east on runways 6L or 7R. Departures continue to follow routes similar to those of normal Westerly Operations, generally taking off from 25R to head westbound to the Pacific Rim destinations, or make left turns to the south, climbing past Rolling Hills before turning eastbound in the vicinity of Long Beach. As in Figure 4, these flight routings leave large areas to the south and southeast of LAX largely without overflights at night.

A final feature of Figure 5, however, is the set of individual radar flight tracks – one for each of the 56 non-conforming flights that occurred on the 25 nights of Over-Ocean Operations. Here, the unique nature of these operations is apparent when compared to the normal operational flow conditions during the late-night hours. It is evident why each of the non-conforming aircraft may cause sleep disturbance for communities to the south and southeast of LAX, including Lennox, Hawthorne, Gardena, Lawndale, Alondra Park, West Compton, Manhattan Beach, Hermosa Beach, Redondo Beach and others. These operations are effectively the only aircraft to overfly this entire area at night, either during Westerly or Over-Ocean Operations periods. Altitudes of the non-conforming aircraft as they made their initial right turns after takeoff, ranged from 1,600 feet MSL for aircraft making southbound turns over Hawthorne, to as much as 3,000 to 5,000 feet MSL for aircraft making southbound turns over Lynwood. Later, as the same aircraft crossed the shoreline, they tended to be at altitudes ranging from as low as 3,300 to 3,500 feet MSL but also up to as high as 4,500 to 9,000 feet MSL.

The third figure to illustrate the unique characteristics of these non-conforming departures is Figure 6. It depicts the 540 east departures that occurred between midnight and 6:30 a.m. during the one-year sample period, but divides them into conforming and non-conforming operations. The 484 conforming flights -- Easterly Operations -- occurred on just 12 days out of the year and are shown in green. Those aircraft take off from both departure runways 6R and 7L and are given instructions by air traffic controllers to turn left or right towards their respective destinations. Those heading to Pacific Rim destinations are generally vectored to the south and then west over communities of Willow Brook, Compton, Carson and Palos Verdes Estates. The 56 non-conforming flights that occurred during Over Ocean Operations on 25 days out of the year are shown in blue. They take off almost exclusively from runway 7L and because almost all are heading to Pacific Rim or Mexican destinations, they are given right turns after takeoff and they tend to make their turns tighter than the easterly departures that occur during Easterly Operations. Communities overflown by the non-

conforming flights include Hawthorne, West Athens, Gardena, Lawndale, Alondra Park, Hermosa Beach and Redondo Beach. The earlier, tighter turns also result in overflights at lower altitudes.

To compare the altitudes of non-conforming flights with those of Easterly Operations, a "gate" (or vertical plane) perpendicular to the ground has been placed across the set of westbound flight tracks, shown by the black line segment in Figure 6. The gate extends from El Segundo, just south of LAX, in a southeasterly direction to just north of Long Beach. The slanted placement of the gate is intended to capture the aircraft at approximately equal distances along their flight tracks so that they have had approximately the same amount of time to climb.

Figure 7 shows a plot of the points where each flight track passes through the gate. The figure is viewed as if the aircraft are flying out of the page towards the reader, with El Segundo to the left and Long Beach to the right. Gate penetrations towards the left side of the plot represent aircraft that made relatively tight turns after takeoff; those to the right made wider sweeping turns. Altitudes are displayed in terms of feet above field elevation (AFE); as in Figure 6, conforming Easterly Operations are shown in green while non-conforming Over-Ocean Operations are in blue. Immediately noticeable from the coloration is the pattern of 56 non-conforming flights. They tend to be towards the lower left quadrant, indicating that the aircraft generally made tight right turns after takeoff and remained one to five miles south of El Segundo at altitudes from 2,000 to 6,000 feet AFE as they headed westward towards the Ocean. In comparison, conforming Easterly Operations in green tended towards the upper right quadrant, some five to nine miles south of El Segundo at altitudes of 6,000 to 11,000 feet AFE.

Figure 7 also shows a pair of linear regression trend lines through the two sets of data – the non-conforming flights clearly indicating that the wider (farther south) the aircraft were in their turns, the higher they were in altitude. The mean altitude of all conforming flights was 8,197 feet AFE; that of the non-conforming flights was 4,663 feet AFE.

Comparing the non-conforming flights to the normal operational flow conditions, as was done in Figures 4 thru 7, clearly shows the unique characteristics of these non-conforming operations.

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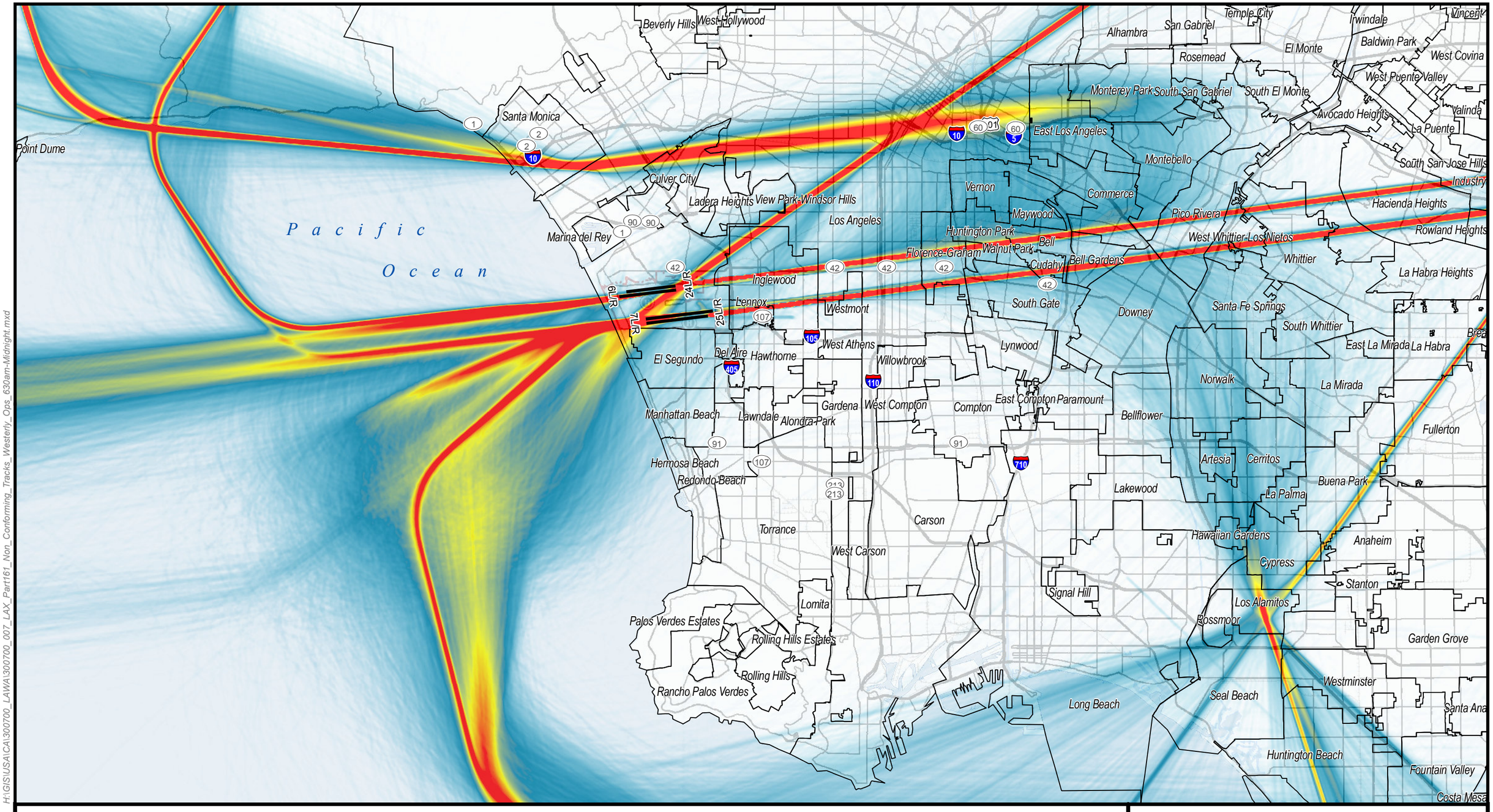


H:\GIS\USA\CA\300700_LAWA\300700_007_LAX_Part161_Non_Conforming_Tracks_Westerly_Ops_630am-Midnight.mxd

Note: All area shown on this figure is within the jurisdictional boundaries of both the City of Los Angeles and Los Angeles County.

Basemap: Los Angeles World Airports (LAWA), Southern California Association of Governments (SCAG), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS)

N

0 2 4 Nautical Miles

- Airport Boundary
- Runway / Taxiway
- Helicopter Pad
- River / Streams
- Roads
- Railroad
- Jurisdictional Boundaries

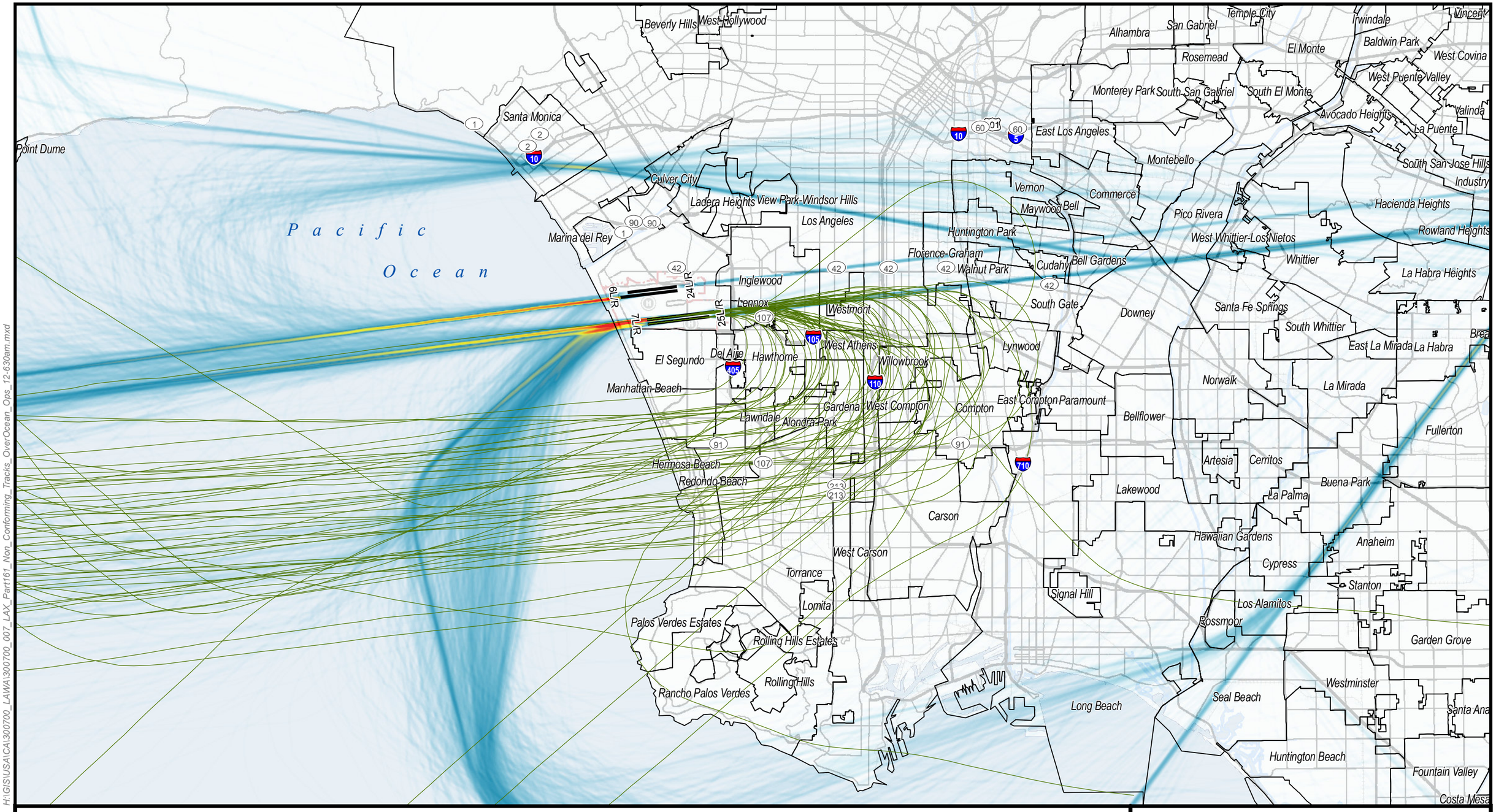
Flight Track Density: Low – Medium – High

LAX
Los Angeles World Airports

Figure 4

Density Plot of Westerly Operations (6:30 A.M. - 12 Midnight)

HARRIS MILLER MILLER & HANSON INC.



H:\GIS\USA\CA\300700_LAWA\300700_007_LAX_Part161_Non_Conforming_Tracks_OverOcean_Ops_12-630am.mxd

Note: All area shown on this figure is within the jurisdictional boundaries of both the City of Los Angeles and Los Angeles County.

Basemap: Los Angeles World Airports (LAWA), Southern California Association of Governments (SCAG), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS)

N

0 2 4 Nautical Miles

- Airport Boundary
- Runway / Taxiway
- Helicopter Pad
- River / Streams
- Roads
- Railroad
- Jurisdictional Boundaries
- Non-Conforming Tracks

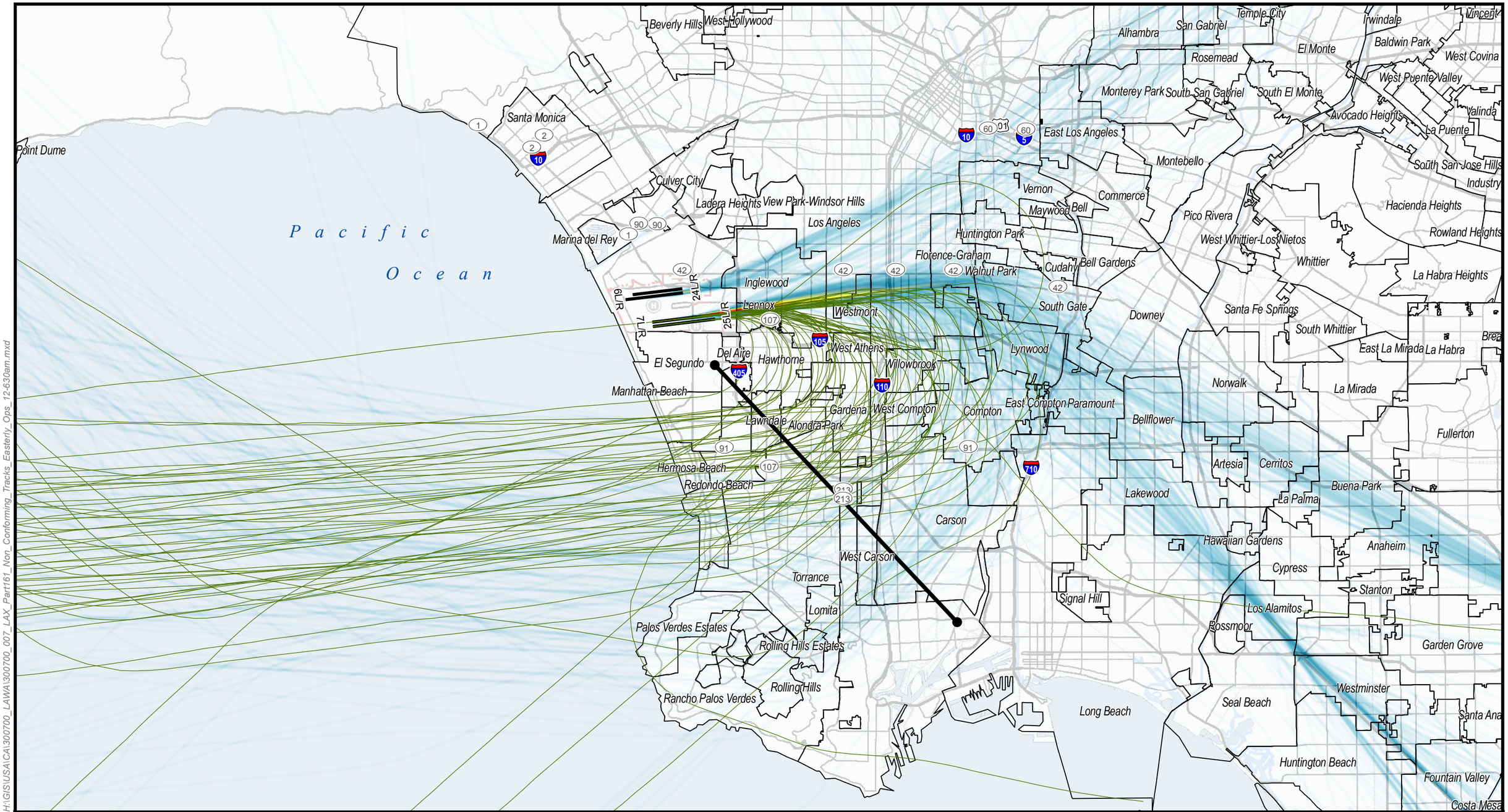
Flight Track Density: Low — Medium — High

LAX
Los Angeles World Airports

Figure 5

Individual Non-Conforming Flights Compared to Density Plot of Over-Ocean Operations (12 Midnight - 6:30 A.M.)

HARRIS MILLER MILLER & HANSON INC.



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Note: All area shown on this figure is within the jurisdictional boundaries of both the City of Los Angeles and Los Angeles County.

Basemap: Los Angeles World Airports (LAWA), Southern California Association of Governments (SCAG), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS)

N

0 2 4 Nautical Miles

- Airport Boundary
- Runway / Taxiway
- Helicopter Pad
- River / Streams
- Roads
- Railroad
- Jurisdictional Boundaries
- Non-Conforming Tracks
- Gate Location

Flight Track Density: Low – Medium – High

LAX
Los Angeles World Airports

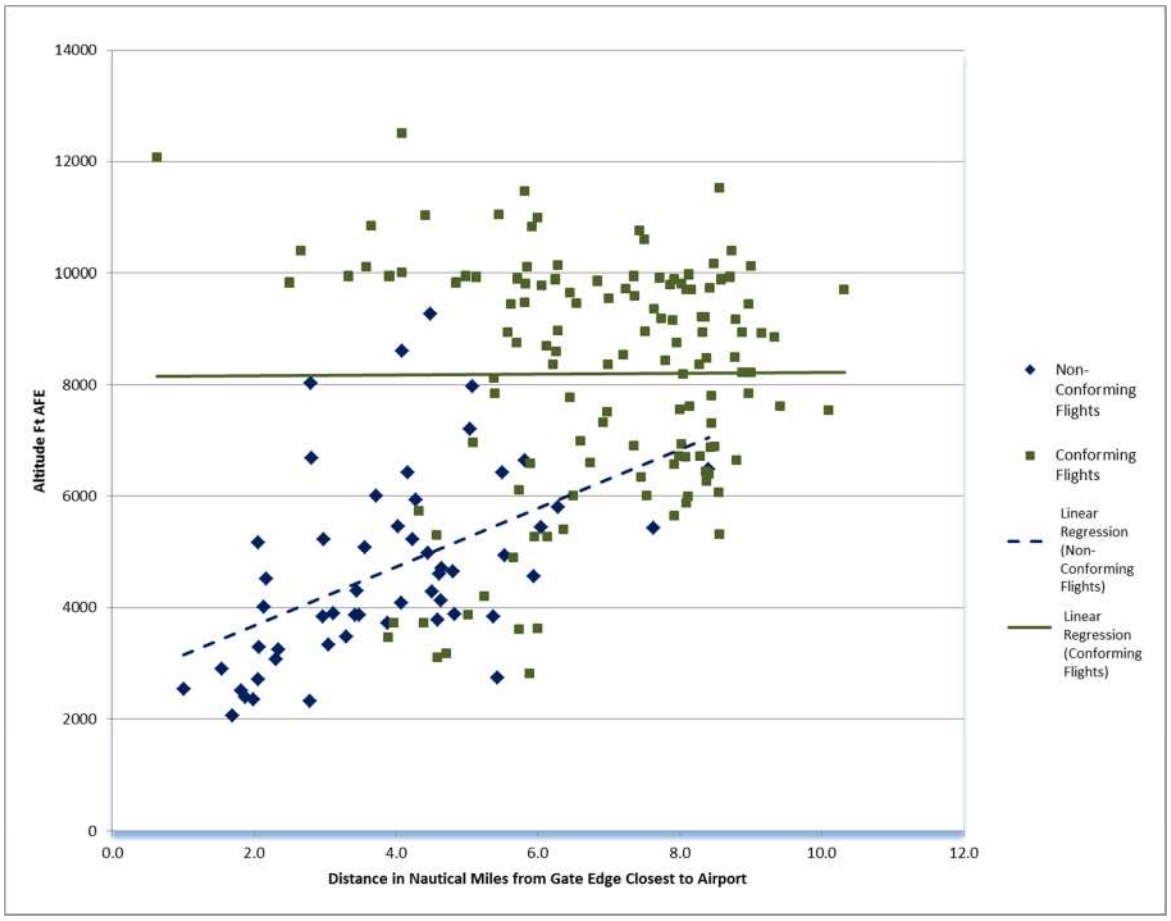
Figure 6

Individual Non-Conforming Flights Compared to Density Plot of Easterly Operations (12 Midnight - 6:30 A.M.)

HARRIS MILLER MILLER & HANSON INC.

Figure 7 Comparison of Conforming and Non-Conforming East Departures between Midnight and 6:30 a.m.

Source: HMMH Analysis



LAWA has been tracking non-conforming takeoffs of these kinds since June, 2000. The operations are reported monthly, posted to LAWA's website and discussed at LAX Community Roundtable meetings. Through December 2011, there have been 736 non-conforming departures on 272 nights. They occur throughout the year as shown in Figure 8, with ten of the twelve months averaging more than 30 non-conforming operations over the 10-year reporting period.

Interestingly, the hotter months of July and August, when higher temperatures degrade aircraft performance and result in longer takeoff rolls (and thus, potentially increase the need to request easterly departures more often), the numbers of non-conforming flights were at their lowest. Subsequent interviews with the eight carriers responsible for most of the non-conforming flights provides some insight – one of the operators actually plans for the higher temperatures and poorer performance of the aircraft by selling fewer seats during the summer, thus reducing the takeoff weight and the need to request an easterly departure.

Figure 9 shows the number of occurrences by year since 2000, ranging from a high of 125 in 2004, to a low of 26 in 2009, and averaging approximately 65 flights per year. The annual numbers of non-conforming flights are unrelated to total annual operational counts, but are driven instead by wind conditions. As a result, the 65-flight average was used when examining the benefits and costs of the proposed restriction, as discussed later in this Application and supporting Appendices.

Figure 8 Total Numbers of Non-Conforming Flights by Month (June 2000 – December 2011)

Source: LAWA

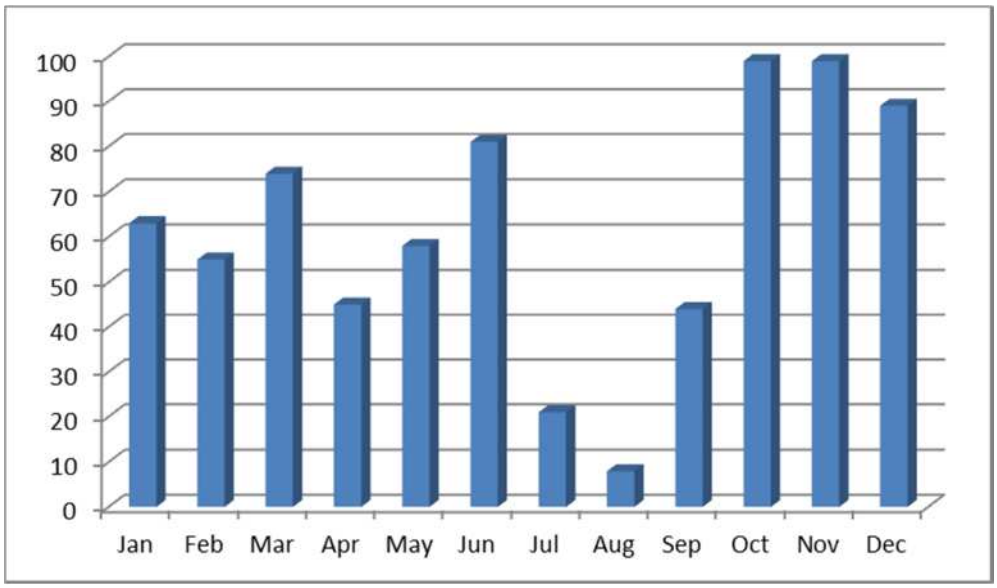
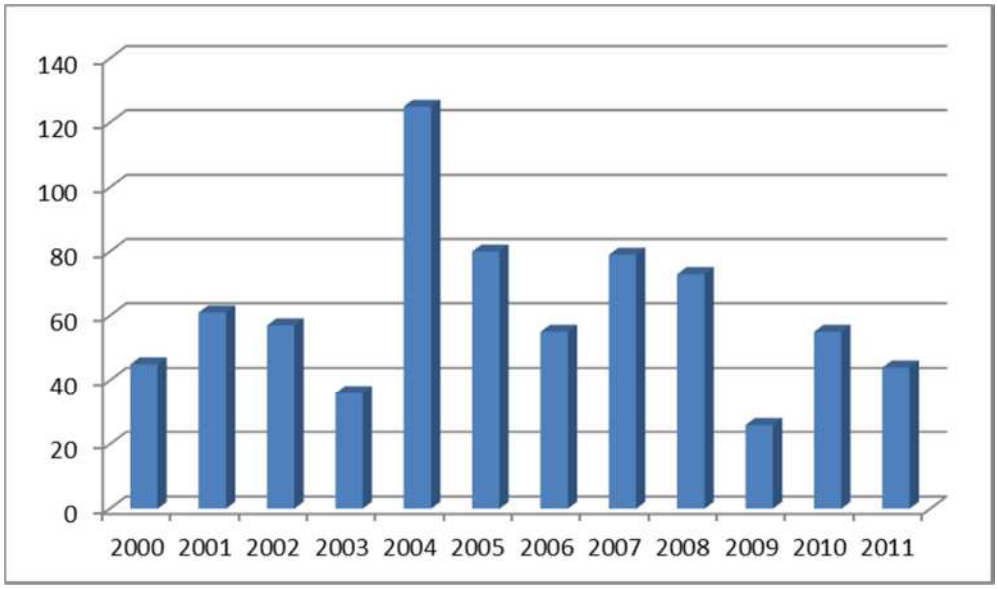


Figure 9 Number of Non-Conforming Flights by Year (June 2000 – December 2011)

Source: LAWA



Note: The year 2000 does not include a complete year of data (only June-Dec 2000)

6.2 Airport Noise Study Area Definition

Part 161 requires airport operators proposing a noise or access restriction affecting Stage 3 aircraft to identify an "airport noise study area" in accordance with FAA specifications, methods, and criteria specified in Part 150 for establishing airport-related noise exposure and for determining land use compatibility. [34, 35, 36]

Part 161 defines the "airport noise study area" (ANSA) as the "area surrounding the airport within the noise contour selected by the applicant for study and must include the noise contours required to be developed for noise exposure maps specified in 14 CFR Part 150".[37] The ANSA chosen by LAWA for use in this Application is the 65 dB CNEL contour. This is consistent with Part 150 and complies with Part 161.

The ANSA is provided in this section as LAX aircraft noise exposure contours presented over a land use base map to comply with §161.9 and §161.11 of Part 161. The land uses are presented in categories that are relevant to determination of compatibility of the uses with aircraft noise exposure. The land use data were obtained in geographic information system (GIS) file formats from four primary sources:

- Land use data from Southern California Association of Governments (SCAG)[38]
- Roadway delineations from Environmental Systems Research Institute (ESRI)[39]
- Water features and names, and government jurisdiction boundaries from United States Geological Survey (USGS)[40]
- Year 2010 U.S. census data for dwelling units and population from the USGS.[41]

In developing the noise contours for this ANSA, LAWA believes that there are no projects stemming from either the Draft Environmental Assessment (DEA) for the Runway 7L/25R Runway

[34] §161.305 "Required analysis and conditions for approval of proposed restriction."

[35] §161.9, "Designation of noise description methods," states: "(a) The sound level at an airport and surrounding areas, and the exposure of individuals to noise resulting from operations at an airport, must be established in accordance with the specifications and methods prescribed under Appendix A of 14 C.F.R. part 150; and (b) Use of computer noise models to create noise contours must be in accordance with the criteria prescribed under Appendix A of 14 C.F.R. part 150."

[36] §161.11, "Identification of land uses in airport noise study area," states: "For the purposes of this part, uses of land that are normally compatible or noncompatible with various noise-exposure levels to individuals around airports must be identified in accordance with the criteria prescribed under Appendix A of 14 C.F.R. part 150."

[37] §161.5 "Definitions."

[38] Southern California Association of Governments (SCAG), "LA County Land Use 2000," provided in ESRI shape file format.

[39] Environmental Systems Research Institute (ESRI) StreetMap Pro DVD, "Data & Maps 2007."

[40] United States Geological Survey (USGS), "Geographic Names Information System" (GNIS), http://geonames.usgs.gov/domestic/index.html, and "National Map Seamless Server," http://seamless.usgs.gov/index.php.

[41] USGS census block data, downloaded from ESRI "Census 2000 Tiger Line" data source, http://arcdata.esri.com/data/tiger2000/tiger_download.cfm.

Safety Area (RSA) and Associated Improvements Project or from the LAX Specific Plan Amendment Study (SPAS) that are currently approved for construction and that need to be considered in this Revised Application. Since the submittal of the original Application in January 2013, the FAA issued a Finding of No Significant Impact (FONSI) and Record of Decision (ROD) for the DEA for the RSA.[42] However, LAWA must complete an Environmental Impact Report (EIR) to satisfy California environmental requirements before proceeding with construction. Furthermore, even if the Preferred Alternative in the DEA for the RSA were to be approved in the near future, the noise analysis in the DEA shows that it has no material effect on the CNEL contours. Thus, LAWA assumes its construction would have no material effect on the results of the Part 161 analysis. While LAWA has approved the SPAS, it has not initiated project-level CEQA analysis of any of its components nor has LAWA requested that the FAA initiate National Environmental Policy Act review that would be necessary before any SPAS projects can be approved.

6.2.1 Status Quo 2013 and 2018 CNEL Contours

Part 161 states that "[u]se of computer models to create noise contours must be in accordance with the criteria prescribed under Appendix A of 14 C.F.R. Part 150."[43] Part 150 Appendix A "provides for the use of the FAA's Integrated Noise Model (INM) or an FAA approved equivalent, for developing standardized noise exposure maps and predicting noise impacts."[44]

The analysis presented in this section followed the procedures, standards, and methodology set forth in Part 150 Appendix A (and other sections of the regulation) for determining and documenting the exposure of individuals to aircraft noise, including application of the most recent release of the INM available at the time; i.e., Version 7.0b. It also followed available FAA guidance for application of the Part 150 regulation.

Section 5 of this report presents forecasts of aircraft operations at LAX for 2013 and 2018 "status quo" conditions; i.e., without introduction of the proposed restriction, and describes the manner in which these forecasts were adjusted to reflect the anticipated effect of the proposed restriction.

Appendix H identifies and summarizes all other required modeling inputs to the INM to include data sources, data refinement, and FAA approvals (where required).

Figure 10 and Figure 11 depict the status quo CNEL contours for the 2013 year of submittal and 2018 five-year forecast case, respectively.

6.2.2 Proposed Restriction 2013 and 2018 CNEL Contours

The development of proposed restriction contours for 2013 and 2018 required determining the number of non-conforming flights by aircraft operations, fleet mix, runway use and flight tracks.

The over 10 years of historical LAX non-conforming flight data supplied in the LAWA East Departures Gate Penetration Report show that during most months, there was at least one non-conforming flight operation, while on average non-conforming flights occur on 30 different days

[42] Finding of No Significant Impact and Record of Decision, Proposed Runway 7L/25R Safety Area Project and Associated Improvements, Los Angeles International Airport, Los Angeles, Los Angeles County, California, U.S. Department of Transportation, Federal Aviation Administration, Western Pacific Region, September 5, 2013.

[43] Ibid., §161.9, "Designation of noise description methods."

[44] Ibid., §150.1(b), "Purpose."

each year with an annual average of 65 non-conforming operations.[45] There is year-to-year variability based on mostly wind conditions. Since variations in wind conditions are not predictable, the assumption was made that there would be no change in the annual-average number of non-conforming operations in both the 2013 year of submittal and 2018 future year cases.

A recent 12-month period from April 2010 through March 2011 was used to determine allocation of annual-average non-conforming operations including appropriate aircraft flight tracks and fleet mix to use as the basis for analyses of the proposed restriction. Table 8 below provides the non-conforming operations by aircraft type assigned to the non-conforming operations in 2013. The annual average of 65 non-conforming operations was derived from the 56 non-conforming operations contained in the recent 12-month period.

Table 8 Current LAX Non-Conforming Flights Fleet Mix
Source: LAX ANOMS, HMMH

Aircraft	April 2010-March 2011		2013 Annual Average
	Operations	Percentage	Operations
B744	35	62.5%	41
B772	12	21.4%	14
B77W/L	7	12.5%	8
B763	1	1.8%	1
B762	1	1.8%	1
Total	**56**	**100.0%**	**65**

Note: The 2013 annual-average operations in the last column are rounded based on an annual average of 65 operations

To reflect forecast changes to the overall fleet in 2018, the non-conforming operations fleet mix was adjusted to reflect the retirement of the older Boeing 767-200 aircraft and the introduction of Airbus A340-642 (A340) and A380-841 (A388) aircraft (Appendix J).

The April 2010-March 2011 historical data do not include the newly introduced A388 and A340 aircraft types that are forecast to conduct non-conforming operations in 2018. These new aircraft types were placed on analogous flight tracks within the same set of 56 tracks used for the 2013 modeling. A388 and A340 operations were placed on representative B744 flight tracks.

Table 9 shows the non-conforming fleet mix as represented in the 2018 forecast.

[45] LAWA publishes an East Departures Report each month to provide information on non-conforming flights to the public and the LAX/Community Noise Roundtable. It is also included on the LAX Noise Management website.

Table 9 Future LAX Non-Conforming Flights Fleet Mix
Source: SH&E Inc., HMMH

Aircraft	LAX P161 2018 Forecast Operations	
	Operations	Percentage
B744	21	32.3%
B77W/L	18	27.7%
B772	17	26.2%
A340	6	9.2%
A388	2	3.1%
B763	1	1.5%
Total	**65**	**100.0%**

To determine a broad average runway use for the non-conforming operations, the same 10-plus years of historical LAX non-conforming flight data were used. Table 10 indicates that over 98% of the total non-conforming operations originated from the south complex (Runways 7R and 7L).

Table 10 LAX Non-Conforming Flights June 2000-March 2011
Source: HMMH

Runway	Operations	Percent	Annual-Average Operations
6R	13	1.9%	1.2
7R	98	14.0%	9.0
7L	588	84.1%	54.3
TOTAL	**699**	**100.0%**	**64.5**

Additionally, through March 2011, the last non-conforming operation on Runway 6R occurred in November 2008, suggesting that current conditions further reduce or eliminate the frequency of non-conforming operations departing from the north complex (Runways 6R and 6L). Therefore, all non-conforming operations were modeled on the south runways (Runway 7L and 7R) as indicated in Table 11.

Table 11 Modeled LAX Non-Conforming Operations Runway Distribution
Source: HMMH

Runway	April 2010-March 2011		2013 Annual Operations Runway Distribution	2018 Annual Operations Runway Distribution
	Operations	Percentage		
7R	9	16.1%	11	11
7L	47	83.9%	54	54
Total	**56**	**100.0%**	**65**	**65**

Note: The annual-average operations in the last two columns are rounded based on an annual average of 65 operations.

Figure 12 and Figure 13 depict the CNEL contours assuming implementation of the proposed restriction, for 2013 and 2018 annual operations, respectively. The contours with the proposed restriction in place reflect the changes in runway use described in Appendix H.

Figure 14 identifies those homes currently sound insulated and those homes currently in process to receive sound insulation through existing Airport Improvement Program grants in relation to the CNEL 65 dB contours for 2013 and 2018, with and without the proposed restriction. LAWA is unable at this time to identify additional homes that may be sound insulated by the end of 2018 due to unknown funding. Note, however, LAWA conservatively assumed that all residences within the ANSA were sound insulated in all calculations of sleep awakenings, so that sound insulation was not relevant to the analyses.

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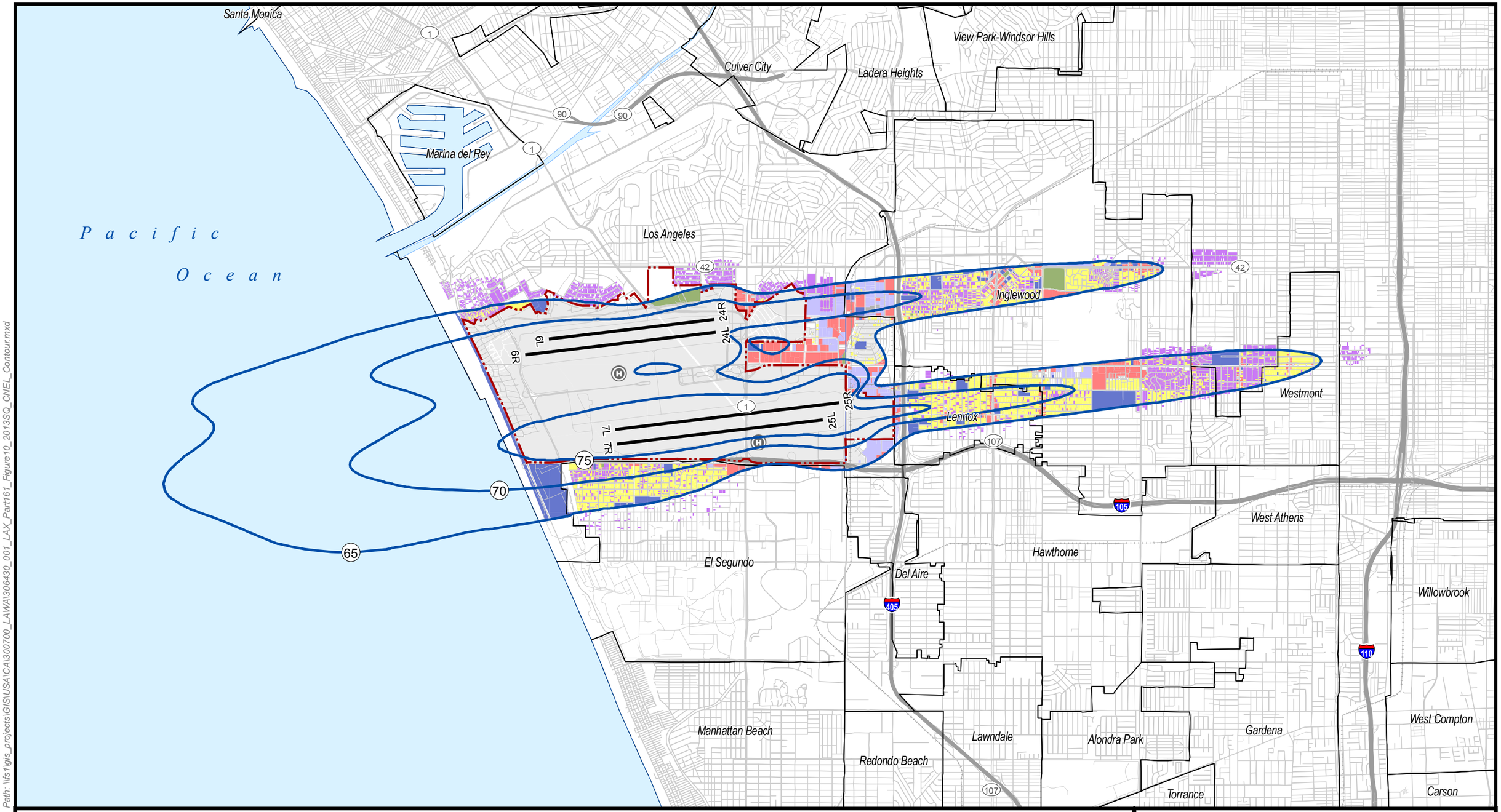

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Note: All area shown on this figure is within the jurisdictional boundaries of both the City of Los Angeles and Los Angeles County.

Basemap: Los Angeles World Airports (LAWA), Southern California Association of Governments (SCAG), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS)

N

0 5,000 10,000 Feet

- Airport Boundary
- Runway / Taxiway
- Helicopter Pad
- River / Streams
- Roads
- Railroad
- Jurisdictional Boundaries
- 2013 Status Quo CNEL Contours
- Previously Sound-Insulated Residential Parcels (Compatible)
- Residential (Non-Compatible)
- Public Use
- Recreational / Open Space
- Commercial Use
- Manufacturing and Production
- Vacant, Utility, Transportation
- Water

LAX
Los Angeles World Airports

2013 Status Quo CNEL Contours

Figure 10

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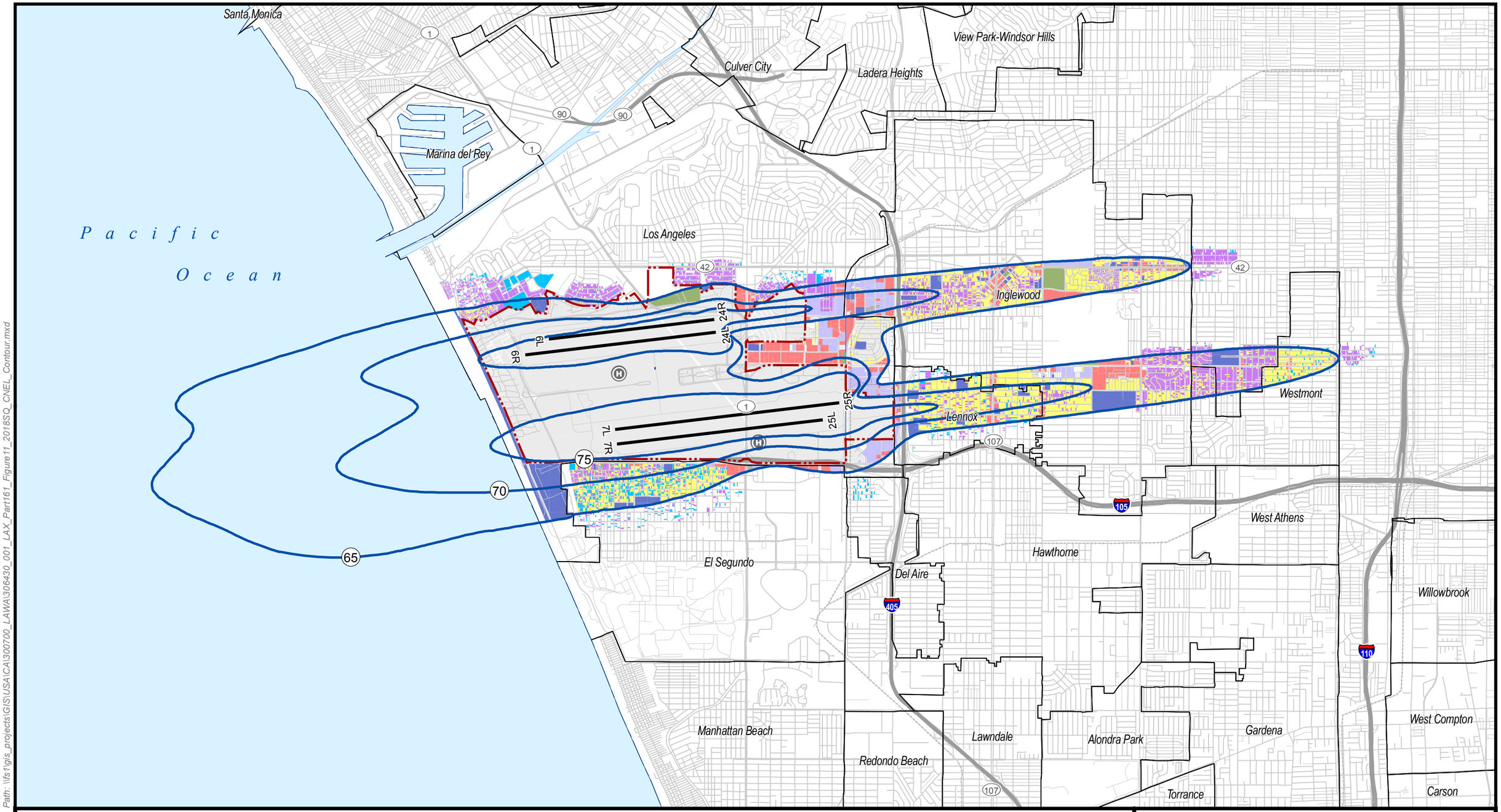

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Note: All area shown on this figure is within the jurisdictional boundaries of both the City of Los Angeles and Los Angeles County.

Basemap: Los Angeles World Airports (LAWA), Southern California Association of Governments (SCAG), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS)

N

0 5,000 10,000 Feet

- Airport Boundary
- Runway / Taxiway
- Helicopter Pad
- River / Streams
- Roads
- Railroad
- Jurisdictional Boundaries

- 2018 Status Quo CNEL Contours
- Jurisdictional Boundaries
- Previously Sound-Insulated Residential Parcels (Compatible)
- Parcels Identified for Future Sound Insulation (Compatible)

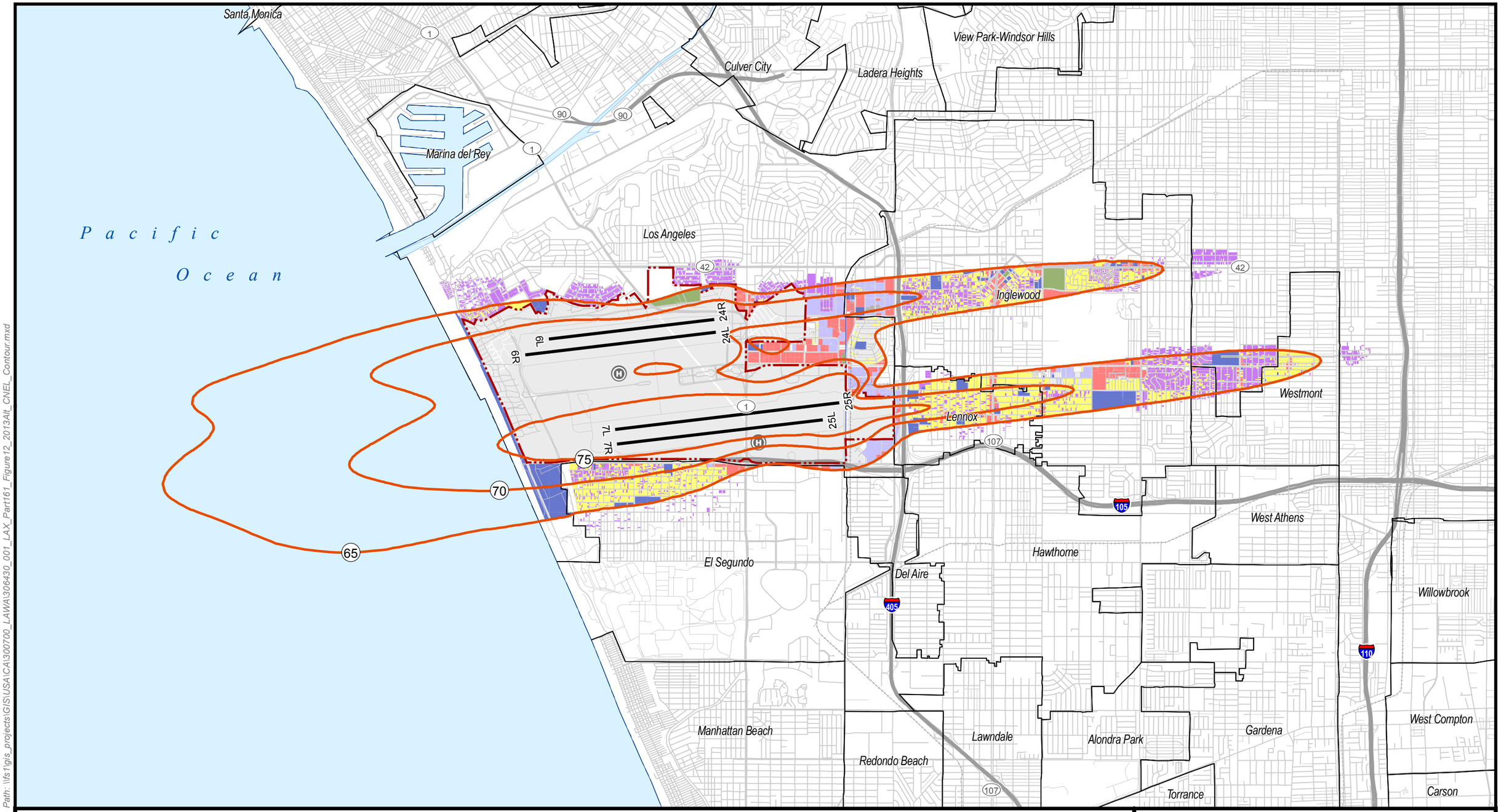
- Residential (Non-Compatible)
- Public Use
- Recreational / Open Space
- Commercial Use
- Manufacturing and Production
- Vacant, Utility, Transportation
- Water

LAX
Los Angeles World Airports

2018 Status Quo CNEL Contours

Figure 11

HARRIS MILLER MILLER & HANSON INC.



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Note: All area shown on this figure is within the jurisdictional boundaries of both the City of Los Angeles and Los Angeles County.

Basemap: Los Angeles World Airports (LAWA), Southern California Association of Governments (SCAG), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS)

N

0 5,000 10,000 Feet

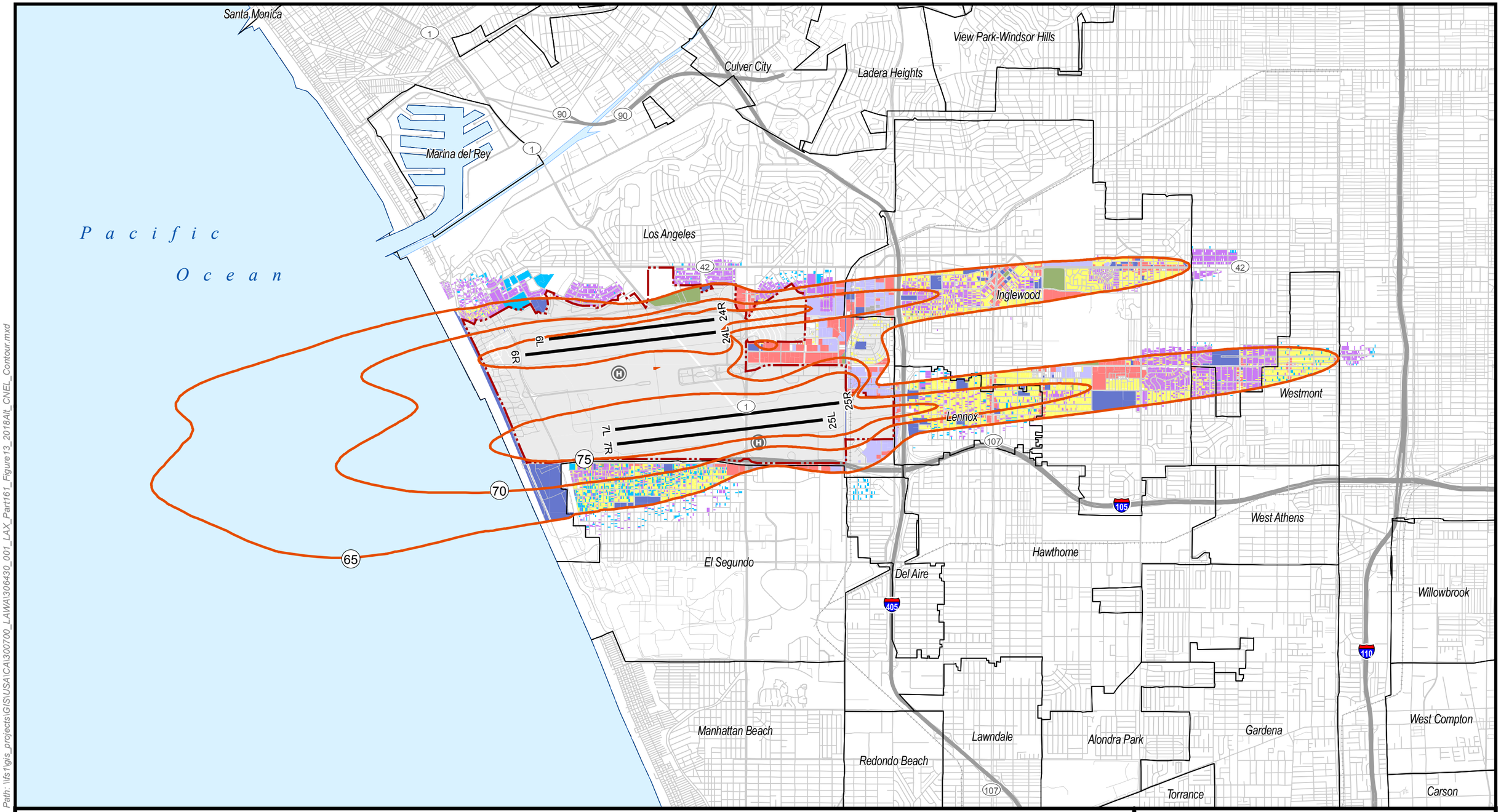
- Airport Boundary
- Runway / Taxiway
- Helicopter Pad
- River / Streams
- Roads
- Railroad
- Jurisdictional Boundaries
- 2013 CNEL Contours with Proposed Runway Use Restriction
- Previously Sound-Insulated Residential Parcels (Compatible)
- Residential (Non-Compatible)
- Public Use
- Recreational / Open Space
- Commercial Use
- Manufacturing and Production
- Vacant, Utility, Transportation
- Water

LAX
Los Angeles World Airports

2013 CNEL Contours with Proposed Runway Use Restriction

Figure 12

HARRIS MILLER MILLER & HANSON INC.



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Note: All area shown on this figure is within the jurisdictional boundaries of both the City of Los Angeles and Los Angeles County.

Basemap: Los Angeles World Airports (LAWA), Southern California Association of Governments (SCAG), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS)

N

0 5,000 10,000 Feet

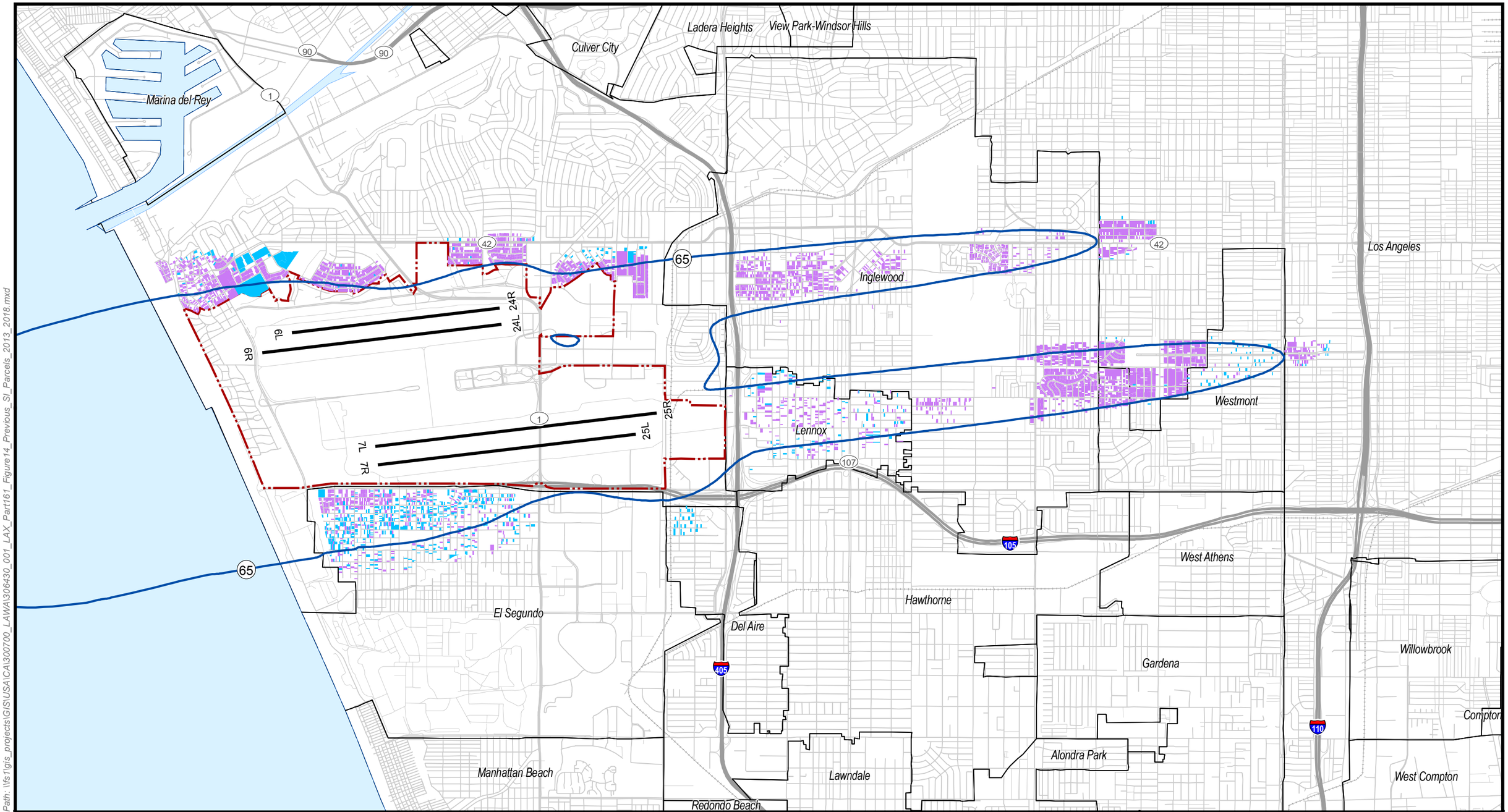
- Airport Boundary
- Runway / Taxiway
- Helicopter Pad
- River / Streams
- Roads
- Railroad
- Jurisdictional Boundaries
- 2018 CNEL Contours with Proposed Runway Use Restriction
- Jurisdictional Boundaries
- Previously Sound-Insulated Residential Parcels (Compatible)
- Parcels Identified for Future Sound Insulation (Compatible)
- Residential (Non-Compatible)
- Public Use
- Recreational / Open Space
- Commercial Use
- Manufacturing and Production
- Vacant, Utility, Transportation
- Water

LAX
Los Angeles World Airports

2018 CNEL Contours with Proposed Runway Use Restriction

Figure 13

HARRIS MILLER MILLER & HANSON INC.



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Note: All area shown on this figure is within the jurisdictional boundaries of both the City of Los Angeles and Los Angeles County.

Basemap: Los Angeles World Airports (LAWA), Southern California Association of Governments (SCAG), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS)

N

0 2,000 4,000 Feet

- Airport Boundary
- Runway / Taxiway
- River / Streams
- Roads
- Railroad
- Jurisdictional Boundaries
- Airport Noise Study Area
- Parcels Identified for Future Sound Insulation
- Previously Sound-Insulated Residential Parcels

LAX
Los Angeles World Airports

Parcels Previously Sound Insulated and Identified for Future Sound Insulation in Relation to the Airport Noise Study Area

Figure 14

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6.3 Noise Complaint Analysis

As described in Section 4.4.1, LAWA maintains a robust community response program that seriously considers all community complaints regarding aircraft noise and is diligent in providing responses. Since 2002, LAWA identifies complaints specifically related to the non-conforming operations and, during the first ten years of monitoring, received 591 complaints at the locations shown in Figure 15. Of the 591 complaints, the highest percentage came from the beach communities of Manhattan Beach (97), Hermosa Beach (67), and Redondo Beach (185). The remaining communities in which LAWA received complaints from non-conforming operations are Inglewood (64), Hawthorne (44), Gardena (17), Torrance (40), and Palos Verdes Estates and Rancho Palos Verdes (20). The complainant locations are clearly indicative of the wide-ranging effect these non-conforming departures cause during otherwise quiet late night hours.

Based on a ten-year analysis of complaints, Table 12 shows the number of noise complaints by CNEL with 11 complaints located within the ANSA.

Table 12 Summary of Noise Complaints for Non-Conforming Operations
Source: LAWA HMMH

CNEL (dB)	Number of Noise Complaints
<65	580
65 – 70	10
70 – 75	1
>75	0
Total > 65	11
Total	591
Note: Additional complaints were not included in above numbers due to lack of corresponding addresses for mapping purposes.	

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Path: \\fs1\gis_projects\GIS\USA\CA\306430_001_LAX_Part161\300700_LAWA\CA\Figure15_Non_Conforming_Tracks_and_Ops_Complaints.mxd

Pacific Ocean

Santa Monica
Culver City
Ladera Heights
View Park-Windsor Hills
Los Angeles
Marina del Rey
Inglewood
Westmont
Lennox
West Athens
El Segundo
Del Aire
Hawthorne
Willowbrook
Manhattan Beach
Gardena
West Compton
Lawndale
Alondra Park
Hermosa Beach
Redondo Beach
Lynwood
Compton
East Compton
Paramount
Bellflower
Carson
West Carson
Torrance
Lomita
Palos Verdes Estates
Rolling Hills Estates
Rolling Hills
Rancho Palos Verdes
Long Beach
Signal Hill
Lakewood
Artesia
Cerritos
Norwalk
La Mirada
Fullerton
Buena Park
La Palma
Hawaiian Gardens
Anaheim
Cypress
Stanton
Rossmoor
Los Alamitos
Garden Grove
Westminster
Seal Beach
Huntington Beach
Fountain Valley
Costa Mesa
Santa Ana
East La Mirada
La Habra
Brea
South Whittier
Santa Fe Springs
Downey
South Gate
Florence-Graham
Walnut Park
Huntington Park
Maywood
Vernon
Commerce
Bell
Cudahy
Bell Gardens
Pico Rivera
Montebello
East Los Angeles
Monterey Park
Rosemead
South El Monte
Avocado Heights
La Puente
Valinda
South San Jose Hills
Industry
Hacienda Heights
Rowland Heights
West Whittier-Los Nietos
Whittier
La Habra Heights

24L/R
6L/R
7L/R
25L/R

Basemap: Los Angeles World Airports (LAWA), Southern California Association of Governments (SCAG), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS)

Airport Boundary
Runway / Taxiway
River / Streams
Roads
Railroad
Jurisdictional Boundaries
Complaints of Non-Conforming Operations
Non-Conforming Tracks
Airport Noise Study Area

N
0 10,000 20,000 Feet

LAX
Los Angeles World Airports

Complaints of Non-Conforming Operations and Non-Conforming Flight Tracks Relative to the Airport Noise Study Area

Figure 15

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6.4 Sleep Disturbance Analysis

Part 161 requires that an application for any proposed noise and access restriction show evidence that a current or projected noise problem exists and that the proposed action can relieve the problem.[46] The problem addressed in this Application is that the noise produced by the small number of late night non-conforming flights, such as those identified in the prior section, are estimated, based on accepted modeling techniques, to cause people living in the vicinity of LAX to be awakened in large numbers.

The sleep awakening standard developed by the American National Standards Institute, Inc. (ANSI), provides a statistically-based method for quantifying these effects.[47] Likely reductions in sleep disturbance are developed by restricting the non-conforming easterly nighttime departures and comparing them to the unrestricted scenario.[48] This approach is not the same as that used in the Burbank Part 161 application.[49] Unlike the Burbank approach, the one used here has been accepted by ANSI as its current standard for determining the probability of awakenings.

The current ANSI standard has been reviewed by the Federal Interagency Committee on Aviation Noise (FICAN). The FAA is a member of FICAN and convened FICAN to be responsible for interagency coordination on matters related to aviation noise research. In December 2008, FICAN recommended "the use of this new estimation procedure for future analyses of behavioral awakening from aircraft noise. FICAN recognizes that additional sleep disturbance research is underway by various research organizations, and results of that work may result in additional changes to FICAN's position. Until that time, FICAN recommends the use of ANSI S12.9-2008." [50] (See Appendix L.) FICAN has not subsequently changed its position.

Appendix K describes the origins of the methods used in the ANSI Standard, the development of the Standard, the application of the Standard to a change in nighttime operations, and the application of the Standard to assess awakenings caused by the non-conforming operations. The methods of the Standard were used to compute the probabilities that people might be awakened by late night easterly departures, and the probabilities were applied to similarly-exposed groups of people, by census block, to estimate the reduction in the number of people that may be awakened if those departures did not occur.

Sleep awakenings at every population centroid within the defined ANSA were estimated, first with the non-conforming flights occurring as now (status quo), and then again with the flights using westerly departure routes, as if complying with the proposed use restriction and conforming to Over-

[46] 14 C.F.R. Part 161 §161.305 (e)(2)(i)(A)(1)

http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=656605685737f98d79e914c61903d16f&rgn=div8&view=text&node=14:3.0.1.3.29.4.3.3&idno=14

[47] American National Standard, ANSI / ASA S12.9-2008 / Part 6, "Quantities and Procedures for Description and Measurement of Environmental Sound — Part 6: Methods for Estimation of Awakenings Associated with Outdoor Noise Events Heard in Homes." This Standard is available for purchase at: http://webstore.ansi.org/.

[48] By FAA definition, nighttime is the time period between 10 p.m. and 7 a.m.

[49] The Burbank-Glendale-Pasadena Airport Authority's Part 161 Study, Section 4.7.1.1 Reduced Sleep Disturbance, Page 4-38, Released January 28, 2009, http://www.burbankairport.com/noise/noise-issues/part-161.html.

[50] FICAN, December 2008, http://www.fican.org/pdf/FICAN_Sleep_Dec08.pdf

Ocean Operations. Centroids experiencing differences in awakenings from one scenario to the other (both decreases as well as increases) were then plotted and are shown for 2018 in Figure 16.

These data have also been parsed into 5-dB increments of CNEL from 75 to 70 dB and from 70 to 65 dB, the lowest of these values representing the limit of the ANSA for 2018. The results are provided in Table 13 for 2018 and show the reduction in awakenings that are estimated to occur with implementation of the proposed restriction.

Table 13 Sleep Awakenings within the ANSA by CNEL
Source: HMMH and 2010 Census Data

CNEL (SQ) (dB)	Sleep Awakenings by Population			Sleep Awakenings by Housing Units		
	Proposed Restriction	Status Quo	Change	Proposed Restriction	Status Quo	Change
65 to <70	17,399	17,434	-35	6,241	6,252	-11
70 to <75	9,057	9,073	-15	2,667	2,670	-4
Total ≥ 65	26,457	26,507	-50	8,908	8,923	-15

Note: May not add or subtract exactly due to rounding; population and housing counts determined using census block centroids (See Appendix K, original Application, for a description of the complete process)

The impacts of noise on sleep occurs not on an "annual average day" but on a limited number of days – about 30 days (nights) per year. One recent night, January 27, 2012, was analyzed and the results are reported in Appendix K. Because sleep disturbance is most likely when a sequence of several nighttime events occur, estimation of the awakenings is most important during those nights with non-conforming flights, not during an annual average night. Use of an annual average day very likely underestimates the benefit of the proposed restriction since the annual-average of 65 non-conforming operations occur over approximately 30 nights rather than 365 nights.

The total number of non-conforming departures is 65 per year or less than one every five nights. The reduction in awakenings that can be attributed to the proposed use restriction based on that annual average night is estimated to be 50 per night or 18,000 awakenings during 2018.

Data files containing specific information for each census block point used for the sleep disturbance analysis within the ANSA are provided on a separate CD. Included is a summary spreadsheet listing GEOID10, INM GRID_ID, total population and housing units for each census block as well as the percent awakened, population awakened and the CNEL level ≥ 65 dB at each of these grid points.

In addition to the cumulative values at each census grid point, detailed SEL values, 50 dB and above in 0.1 dB intervals, are included in twelve (12) dbf files described in Table 14. The INM GRID_ID can be used to compare the detailed SEL data to the cumulative results reported in the spread sheet.

A Noise Level Reduction (NLR) of 27.5 dB was assumed for all sleep disturbance calculations; therefore only outdoor SEL levels above 77.5 dB were ultimately used for the final calculations of sleep disturbance. A complete description of the ANSI percent awakening methodology can be found in Appendix K. The existing sound insulation program is limited to within the land use compatibility contour of CNEL 65 dB in which LAWA determined there is no change to the homes eligible for sound insulation with or without the proposed restriction. The ongoing and future residential sound insulation programs, which have been shown to remain unchanged with or without the proposed restriction, are provided in Section 6.2 and Figure 14.

Table 14 SEL Data Files for ANSI Sleep Disturbance Calculations

Source: HMMH

Year	Case	SEL Data File Names		
		Awakenings Period 1 (22:00:00-00:59:59)	**Awakenings Period 2 (01:00:00-03:59:59)**	**Awakenings Period 3 (04:00:00-06:59:59)**
2013	Status Quo	SN1_2013SQ_sum.dbf	SN2_2013SQ_sum.dbf	SN3_2013SQ_sum.dbf
	Proposed Restriction	SN1_2013ALT_sum.dbf	SN2_2013ALT_sum.dbf	SN3_2013ALT_sum.dbf
2018	Status Quo	SN1_2018SQ_sum.dbf	SN2_2018SQ_sum.dbf	SN3_2018SQ_sum.dbf
	Proposed Restriction	SN1_2018ALT_sum.dbf	SN2_2018ALT_sum.dbf	SN3_2018ALT_sum.dbf

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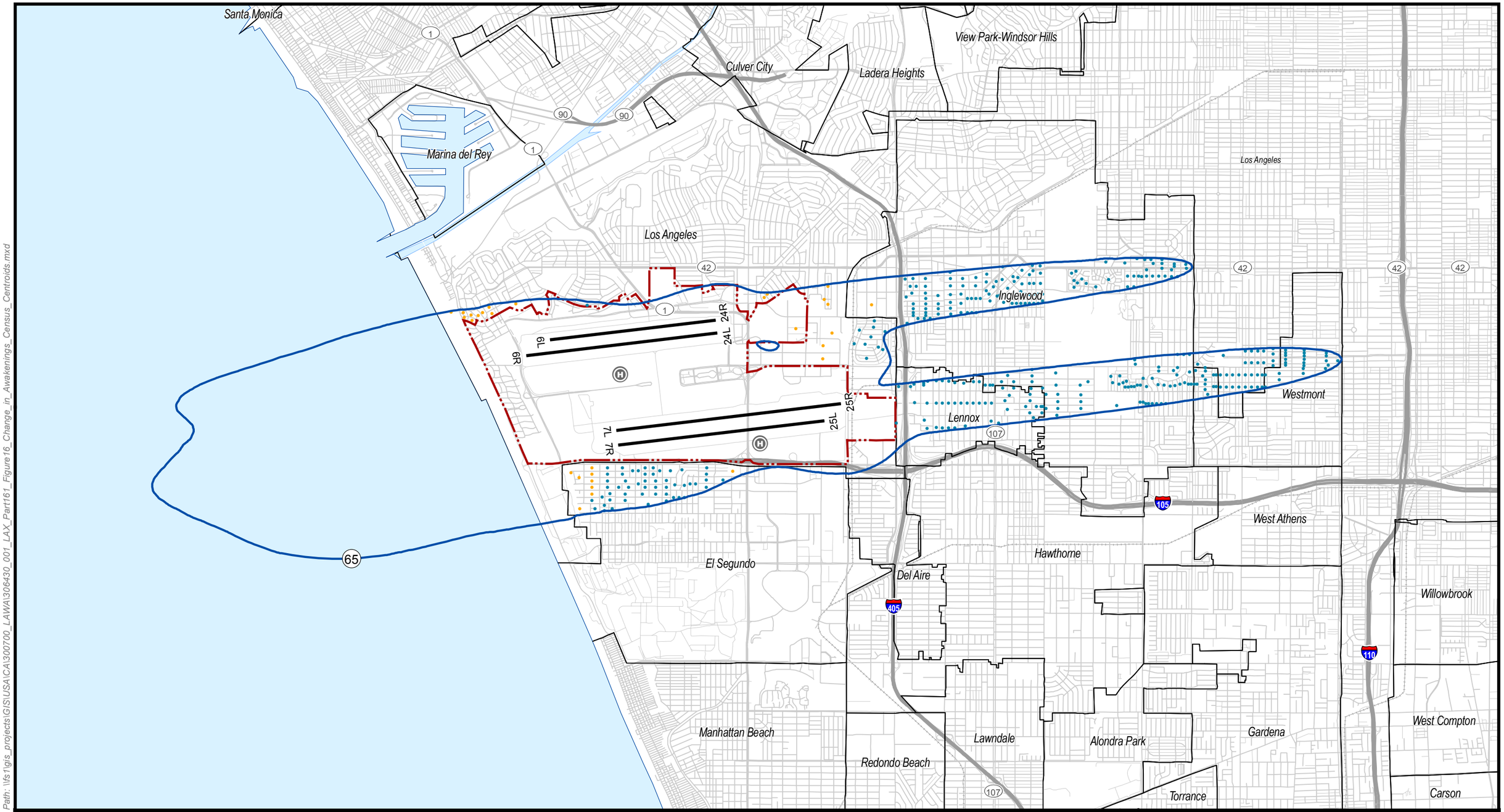

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Note: All area shown on this figure is within the jurisdictional boundaries of both the City of Los Angeles and Los Angeles County.

Basemap: Los Angeles World Airports (LAWA), Southern California Association of Governments (SCAG), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS)

N

0 5,000 10,000 Feet

- Airport Boundary
- Runway / Taxiway
- Helicopter Pad
- River / Streams
- Roads
- Railroad
- Jurisdictional Boundaries
- Population Centroids Experiencing Decreased Awakenings with Proposed Restriction
- Population Centroids Experiencing Increased Awakenings with Proposed Restriction
- Airport Noise Study Area

LAX
Los Angeles World Airports

Population Centroids Showing Change in Awakenings with the Proposed Restriction within the Airport Noise Study Area

Figure 16

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6.5 Environmental Justice Analysis

A 1994 Presidential Order directed every Federal agency to make environmental justice part of its mission.[51] According to the Environmental Protection Agency (EPA) , "Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies"[52]. EPA has this goal for all communities and persons across this Nation.

"Fair treatment means that no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental and commercial operations or policies"

"Meaningful Involvement means that:

1. people have an opportunity to participate in decisions about activities that may affect their environment and/or health
2. the public's contribution can influence the regulatory agency's decision
3. their concerns will be considered in the decision making process
4. the decision makers seek out and facilitate the involvement of those potentially affected"

"EPA's goal is to provide an environment where all people enjoy the same degree of protection from environmental and health hazards and equal access to the decision-making process to maintain a healthy environment in which to live, learn, and work."

Department of Transportation (DOT) Order 5610.2 defines a "disproportionately high and adverse effect on minority and low-income populations" as an adverse effect that "(1) is predominantly borne by a minority population and/or low income population; or (2) will be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the nonminority population and/or low-income population."[53]

To assess the Environmental Justice (EJ) impacts or benefits incurred with the proposed restriction, Census 2010 data along with the American Community Survey 2010 5-year Estimates data were used to define which census blocks should be evaluated.[54] Using Department of Transportation guidelines, criteria for evaluation of Environmental Justice are defined as a population meeting either Minority or Low-Income status, defined as follows:

- **Minority** means a person who is:
    1. Black (having origins in any of the black racial groups of Africa);
    2. Hispanic (of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race);

[51] Executive Order 12898, "Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations", 1994.

[52] http://www.epa.gov/environmentaljustice/

[53] Department of Transportation Order 5610.2, "Actions to Address Environmental Justice in Minority Populations and Low-Income Populations", April 15, 1997.

[54] http://www.census.gov/acs/www/, 2006-2010 estimated data, obtained January 25, 2012.

3. Asian American (having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent)

4. American Indian and Alaskan Native (having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition); or

5. Native Hawaiian or Other Pacific Islander (People having origins in any of the original peoples of Hawaii, Guam, Samoa or other Pacific Islands)

- **Low-Income** means a household income at or below the Department of Health and Human Services poverty guidelines;

Minority status is defined using the Census 2010 Summary File 1 (SF1) data where demographic information is defined at the census block group level. A minority census block group is defined as a group having a minority population percentage greater than the average minority population percentage of the entire sleep disturbance study area. Based on the 2010 Census data, the average percentage of minority population residing in this area was 79.9 percent. Therefore, every census block group with a percentage of minority population greater than 79.9 percent was identified as a census block group of environmental justice concern.

Low-Income status is determined by first identifying the distribution of number of people per household within each census block group from the Census 2010 SF1 data. The threshold of low income eligibility for each census block group is then defined by averaging the annual income per household using the 2012 Housing and Human Services (HHS) Poverty Guidelines listed Table 15.

A low-income population census block group is defined as a group having a low income population percentage greater than the average low income population percentage of the entire sleep disturbance study area. Based on the 2012 Poverty Guidelines identified by the HHS, and accounting for the average household size within each census block group, the average poverty threshold in the ANSA was $20,681 per household. In order to equate this to the low-income household counts available in $5000 intervals through the ACS 5-year dataset, a threshold of $20,000 was used for identifying low-income population census block groups. Based on this data, the average percentage of low income population residing in the sleep disturbance study area was 19.5 percent. Therefore, any census block group with a percentage of low-income population greater than 19.5 percent was identified as a census block group of environmental justice concern.

Table 15 2012 Poverty Guidelines for the 48 Contiguous States and the District of Columbia
Source: DHHS

Persons in Family Household	Poverty Guideline
1	$11,170
2	$15,130
3	$19,090
4	$23,050
5	$27,010
6	$30,970
7	$34,930
8	$38,890
For families/households with more than 8 persons, add $3,960 for each additional person.	

LAWA estimates that the adverse effect of the non-conforming operations at LAX will be 180,000 awakenings within the ANSA over the next ten years if the proposed restriction is not approved by the FAA and enforced by the City. The estimated numbers of awakenings among minority and low-income populations within the ANSA are summarized in Table 16. This table shows the estimated benefits that would accrue to each of the relevant Environmental Justice demographics for the 2018 conditions if the proposed restriction is put into effect.

Table 16 Estimated Change in Awakenings within the Airport Noise Study Area from Non-Conforming Operations on an Annual Average Day for 2018 by Demographics (-27.5 dB NLR, Windows Closed)
Source: Census 2010, ACS, INM, HMMH

Demographic	Estimated Change in Number of People Awakened In Airport Noise Study Area From Non-Conforming Operations on an Annual Average Day	2018 Demographic Change Percentage	Total Population In Airport Noise Study Area	Demographic Percentage of Total Population
Non Minority or Low Income	0	0%	10,526	16%
Minority	13	25%	17.158	27%
Low Income	0	0%	156	<1%
Minority and Low Income	38	75%	36,633	57%
Total Minority or Low Income	**51**	**100%**	**53,947**	**84%**
Total Population	51	100%	64,473	100%

7 BENEFIT-COST ANALYSIS OF RUNWAY USE RESTRICTION

Unlike many restrictions that have been analyzed under Part 161, the runway use restriction proposed by LAWA would not ban *any* flights from using LAX. The proposed restriction, if approved, would merely require that all operators conform to Over-Ocean Operations or Westerly Operations protocols when they are in effect at LAX between the hours of midnight and 6:30 a.m. Based on feedback during interviews, air carriers are unlikely to reschedule or cancel any flights as a result of the proposed restriction. Some carriers are likely to limit their payloads or occasionally delay individual flights until more favorable wind conditions exist, but the impacts on air carrier operations and associated costs are expected to be small.

There are, however, measurable benefits of the proposed restriction. Non-conforming flights are expected to cause an estimated 18,000 awakenings per year, disrupting the sleep of residents who live in nearby communities within the ANSA. Given the limited impact of the proposed restriction on air carrier operations, LAWA believes that the quality-of-life benefits from the restriction outweigh the estimated costs to air carriers.

In addition, non-conforming departures disrupt the use of the runways in a manner that increases the workload of air traffic control personnel by requiring that they take additional time to ensure that the runways and airspace are clear for the contra-flow operations. (See Section 7.5.)

The benefit-cost analysis of LAWA's proposed rule is based largely on information exchanges with eight airlines that accounted for 85% of the recent (46 of 54) non-conforming operations presented in Table 3. The airlines were asked:

- What is the largest tailwind component that is acceptable to take off on Runway 25R at maximum gross weight? Please provide information for all the aircraft/engine combinations that your airline uses for long-haul service at LAX.
- How large is the weight penalty for each knot of tailwind component up to 10 knots?
- How much cargo does your airline usually carry on its nighttime trans-Pacific departures from LAX? Please indicate if this varies by season.
- Does your airline ever need to restrict the sale of seats or bump passengers when westbound flights face unusually strong headwinds over the Pacific? If yes, please estimate the revenue impact of each restricted seat or bumped passenger.
- The European Aviation Safety Agency (EASA) recommends a planning weight of 105 kg per adult passenger on large aircraft, including 88 kg per person and 17 kg for bags. How does this compare with the passenger weight estimates your airline uses for flight planning purposes?
- If LAWA restricted east departures at LAX during over-ocean and west flow operations between the hours of midnight and 6:30 am, how would you accommodate the restriction?

The detailed information provided in response to these questions forms the basis of the estimates of airline responses to the proposed restriction. The consistent response from airlines to the last question was that they would "comply with the restriction" by offloading weight from the aircraft in the form of passengers and/or cargo. The following quotes in response to the last question are from airlines that provided written responses:

"If LAWA restricted east departures at LAX, [airline name] will ensure the flight regularity and safety by controlling the aircraft gross takeoff weight."

"There will be a MTOW deduction, which means passenger and/or cargo can not be accommodated to full capacity."

"Cargo will be adjusted to reduced weights when necessary"

"Off-load pass and/or cargo, or wait for favorable wind."

"There are a variety of strategies that may be imposed by [airline name] if they were not granted a non standard take-off direction including delaying the flight until the curfew was lifted or the weather conditions allowed a reduced tail wind component (to 5 kts). We may also conduct a "tech stop" enroute [destination] or offload prior to departure to allow a reduced take-off weight at LAX to a point that the pilot in command was satisfied to accept a larger tail wind component safely. [airline name] may also consider cancelling the flight."

"Difficult to determine potential response to this restriction."

7.1 Effect on Aircraft Operations and Passenger and Cargo Volume

The proposed restriction is not expected to cause substantial flight delays because airlines have the ability to plan in advance for circumstances that currently lead to non-conforming operations, and will have the ability to plan for and minimize the impacts of the proposed restriction.

Four primary factors lead to most non-conforming operations: local wind conditions, local temperature, the amount of fuel required (a function of en route winds and aircraft weight), and payload (passenger and/or cargo).[55] All four factors are predictable several hours before departure, but the only factor that airlines can influence is payload.

If the proposed restriction is enacted and weather conditions indicate that a flight may need to be payload-restricted, airlines can maximize revenues and minimize cargo handling costs by ensuring that the high priority cargo is loaded first and then either loading lower priority cargo so it can be quickly off-loaded or delaying loading lower priority cargo until a final decision about maximum safe aircraft takeoff weight is made. If cargo is loaded and subsequently off-loaded, an airline may incur additional cargo handling costs depending on the terms of the contract with its cargo handler.[56] Any additional costs would be minimal if the airline self-handles its cargo. Because it can be planned in advance, any cargo handling needed to comply with the proposed restriction is not expected to delay takeoff.

If passenger airlines find that they cannot reduce total aircraft weight sufficiently by off-loading cargo and also need to restrict the number of passengers, they will generally ask for volunteers before aircraft boarding begins, minimizing delays associated with locating and off-loading the volunteers' baggage. Airlines are usually able to get volunteers to accept compensation; denied boarding data for international flights is not publicly available, but data compiled by the USDOT Bureau of Transportation Statistics for domestic flights operated by U.S. airlines show that for the

[55] Pilots choosing to reduce taxi time cause a small percentage of non-conforming operations. Prohibiting these operations would have no cost impact on airlines since reducing taxi time and departing to the east leads to additional flight time.

[56] Five cents per kilogram represents a typical cargo handling cost.

first six months of 2012, volunteers accounted for 90.5% of all passengers denied boarding.[57] U.S. domestic airline passengers and outbound international passengers are entitled to 200% of their one-way fare, with a maximum of $650, if they are denied boarding involuntarily, have confirmed reservations, and have complied with airline check-in policies.[58] The average airline revenue impact of $500 to $800 per delayed international passenger presented in Appendix M is based on interviews conducted with airlines that are responsible for the majority of the non-conforming departures at LAX.

No costs to the airport associated with the proposed restriction have been identified. Enacting the proposed restriction is expected to reduce the air traffic control tower workload.

Passengers directly affected by the proposed restriction will be compensated for costs they incur. Passengers who volunteer to take later flights show that they value the compensation more highly than the delay and inconvenience they would experience by taking later flights. A few individuals may incur a net loss if occasionally there are not enough volunteers and some passengers are denied boarding involuntarily, but on the whole the total compensation that all affected passengers receive is expected to equal or exceed the total value of the delay and inconvenience they experience.

All airlines forecast to be affected by the proposed restriction, both passenger and all-cargo, primarily carry general cargo, most of which moves on a space-available basis.[59] As a result, there is no need to compensate general cargo shippers for short-term delays. Delays are expected to be limited because most of the airlines forecast to be affected offer daily or double-daily service to the relevant destination markets, providing ample cargo capacity.

The forecast of non-conforming operations was developed using a rigorous approach that recognizes the difficulties and potential pitfalls of forecasting events that are extremely variable and that result from the interaction of several complex causes.

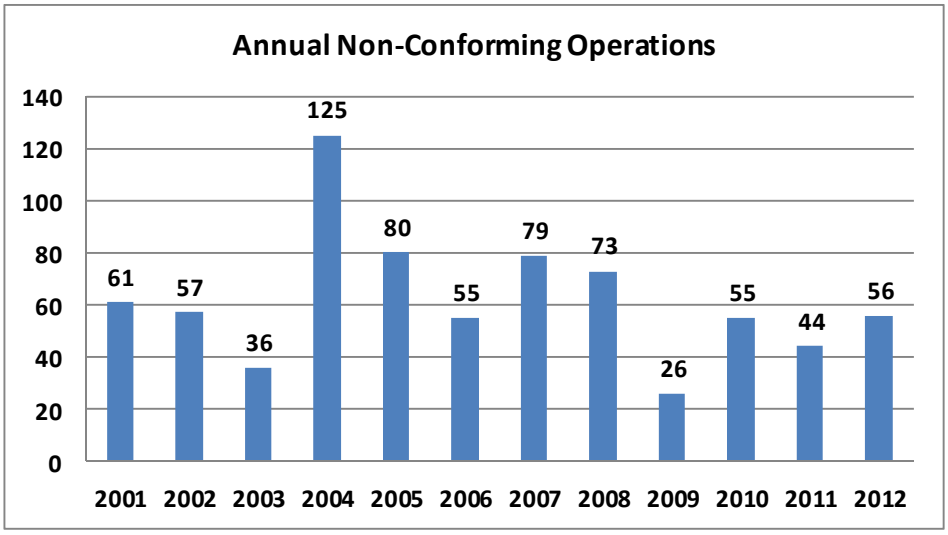
Figure 17 shows annual non-conforming operations from 2001 (the first full year for which data are available) through 2012. The number ranges from a high of 125 in 2004 to a low of 26 in 2009.

[57] Air Travel Consumer Report, USDOT, September 2012

[58] http://www.usa.gov/topics/travel/air/resolve-problems/flight.shtml

[59] This is not true of express all-cargo carriers like FedEx, UPS and DHL, but no flights by such carriers are forecast to be affected by the proposed restriction.

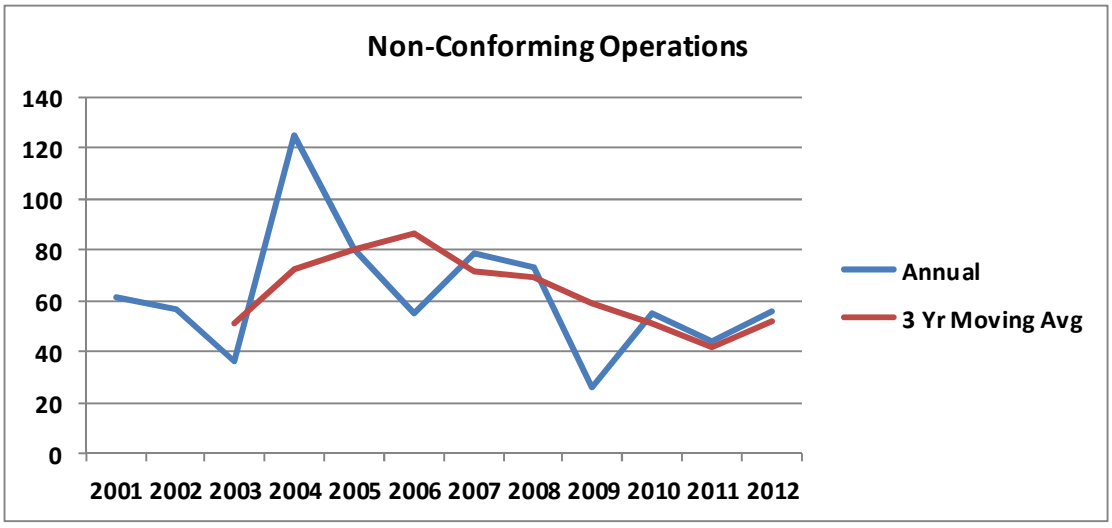
Figure 17 Non-Conforming Operations from Year 2001 through 2012
Source: LAWA



The forecast value of 65 per year is based on the average for the years 2001 to 2010, the data available when the forecast was prepared. Total non-conforming operations were below average in 2011 and 2012, while an unusually high number of 12 non-conforming departures were recorded in January 2013, possibly presaging an increase for the present year. The average for the 2001-2012 time periods is 62 per year, and the average for the series minus the high and low years of 2004 and 2009 is 60 per year.

Figure 18 compares annual non-conforming operations to a three-year moving average of operations. Smoothing the highs and lows, the chart shows a gently downward trend through 2011 followed by an uptick in 2012.

Figure 18 Comparison of Annual Non-Conforming Operations to 3-Year Moving Average
Source: LAWA, ICF-SH&E



The option of using regression analysis to prepare a forecast was explored but found not suitable for several reasons. As the charts above show, the number of non-conforming operations shows very large year-to-year changes, with the absolute value of year-to-year changes averaging 56.7% from 2001 to 2010. None of the logical explanatory variables such as total air carrier departures, heavy aircraft departures, or departures to Asia and Australia/New Zealand has comparable year-to-year changes. Any association between these variables and non-conforming operations would produce a misleading forecast model because it would indicate that a small change in one or more of these classes of departures would cause a very large change in non-conforming operations. In econometric terms, this type of finding would show correlation but would not indicate causation, and would be unsuitable for forecasting.

Using wind conditions as an explanatory variable makes intuitive sense, since we know that pilots consider wind conditions carefully when making most requests to perform non-conforming departures. However, wind presents difficulties for regression analysis. Wind is usually reported with two descriptors: wind speed and direction. In fact, wind is often subject to gusting, and wind speed several hundred feet above the runway can differ substantially from speeds reported by the control tower. Pilots use professional judgment regarding wind, and all the factors they consider would not be included in reported wind data. Similarly, air traffic controllers use judgment deciding when to switch the airport from Over-Ocean Operations to Easterly Operations, and the wind data associated with non-conforming operations show that controllers will sometimes continue Over-Ocean Operations when reported tail wind gusts exceed ten knots.

More importantly, our inability to produce long-term forecasts of wind speed and direction makes it impossible to use wind for forecasting purposes. Meteorologists produce short-term forecasts of wind speed and direction that airlines routinely use for flight planning, but they are not able to produce long-term wind forecasts that would enable us to use wind to help forecast non-conforming operations.

7.1.1 Projected Aircraft Flights Affected

Based on the historical experience discussed in Section 6.1 and Appendix M, 65 air carrier departures are projected to be affected annually in 2013 and through the forecast horizon; no other user class will be affected. Table 17 presents the anticipated breakdown of affected operations by airline, destination, flight type (cargo or passenger), and aircraft type. As required by Part 161, the information is provided for the projected year of implementation (2013) and the forecast timeframe (2018).

Table 17 Projected Aircraft Departures Affected in 2013 and 2018, by Airline, Destination, Cargo or Passenger Flight Type, and Aircraft Type
Source: HMMH and ICF-SH&E

Airline	Destination	Flight Type[1]	2013		2018	
			Aircraft Type	# Annual Departures	Aircraft Type	# Annual Departures
MAS Air	Mexico City	C	767-300F	1	767-300F	1
Korean Air	Tokyo (NRT)	C	747-400F	6	777-200F	6
Nippon Cargo Airlines	Tokyo (NRT)	C	747-400F	6	747-400F	6
China Airlines	Taipei	P	747-400	1	747-400	1
EVA Air	Taipei	P	777-300	8	777-300	8
Air China	Beijing	P	747-400	2	777-300	2
Cathay Pacific	Hong Kong	P	777-300	3	777-300	3
Korean Air	Seoul	P	777-200	6	777-200	6
All Nippon Airways	Tokyo (HND)	P	777-200	5	777-200	5
Asiana Airlines	Seoul	P	777-200	3	777-200	3
China Southern Airlines	Guangzhou	P	777-200	3	777-200	3
Delta Air Lines	Sydney	P	777-200	2	777-200	2
Air Pacific	Nadi, Fiji	P	747-400	1	747-400	1
Qantas	Brisbane	P	747-400	6	747-400	6
Qantas	Melbourne	P	A380-841	2	A380-841	2
Qantas	Sydney	P	747-400	5	A380-841	5
United Airlines	Sydney	P	747-400	2	747-400	2
Virgin Australia International	Brisbane	P	777-300	3	777-300	3
Total				**65**		**65**

Note 1: C-Cargo; P-Passenger

Section 5 and Appendix M present additional forecast detail on these operations, including the anticipated fleet mix changes from 2013 to 2018 that are associated with the replacement of some 747-400 service by Boeing 777 and Airbus A380 operations.

The following subsections describe how the affected air carriers are likely to adjust their operations to comply with the proposed restriction and the costs associated with their adjustments. The costs associated with the proposed restriction are small because the proposed restriction will affect a very small number of operations and the affected air carriers are expected to comply by slightly reducing their payloads.

7.1.2 Projected Volume of Passengers and Cargo Affected

As discussed in Appendix M, carriers are projected to respond to the proposed restriction on eastbound departures by limiting payload on each non-conforming departure, reducing take-off weight sufficiently to ensure safe operations to the west with a slight tailwind while maintaining their basic service schedules. Without more complete information on each affected flight – including the amount of tailwind, whether the wind is gusting, the strength and direction of headwinds, individual airline policies and other key factors – it is not possible to calculate the exact amount of weight reduction required, so a range of payload reduction weights was used to estimate the reduction in cargo and passengers that would be carried on each flight. Given the approximate – and conservatively high – estimates prepared, the same effects are assumed to apply in 2013 through 2018.

As discussed in detail in Appendix M, the projected average weight reductions range from 10,000 to 20,000 pounds per departure. The total annual weight of cargo affected could range from approximately 325 to 390 tons, and from zero to under 2,300 passengers could be affected.

Section 7.3 estimates the revenue associated with these affected shipments.

7.2 Cost of Continuing Aircraft Operations

This section addresses any additional cost of continuing aircraft operations under the restriction, including reasonably available information concerning any net capital costs of acquiring or retrofitting aircraft by aviation user class and any incremental recurring costs.

With regard to capital costs: No capital costs are projected because, as discussed in the preceding section, carriers are anticipated to accommodate the restriction by shifting cargo and passengers among flights to reduce aircraft take-off weight to ensure safe operations on potentially non-conforming departures, while maintaining their basic service schedules.

With regard to incremental recurring costs: Flight track analysis shows that departures to Asian, Australian, and Pacific markets that account for most non-conforming operations must fly *farther* when they depart to the east and circle back over the Pacific. As discussed in Section 5 of Appendix M, the non-conforming route *adds* an average of 3.5 minutes to these flights, increasing the amount of fuel consumed and also adding to the carbon dioxide that these aircraft emit. As a result, the proposed restriction is projected to *reduce* recurring costs, including fuel consumption, labor, maintenance, etc. Reduced fuel consumption is the largest source of cost savings associated with such relatively small variations in flight time. Table 18 presents the net present value (NPV) in 2013 dollars of the savings for five year (2013-2018), ten year (2013-2022), and twenty year (2013-2032) periods under two scenarios: (1) at the 2011 fuel price and (2) with a 50% fuel price increase, to reflect the potential volatility in fuel prices.

Table 18 Net Present Value in 2013 Dollars of Potential Reduction in Airline Fuel Consumption
Source: ICF-SH&E

Period Over Which Net Present Value is Calculated	Net Present Value in 2013 Dollars of Potential Reduction in Fuel Use	
	Fuel at 2011 Price	Fuel with 50% Price Increase
5 years	$136,000	$204,000
10 years	$233,000	$504,000
20 years	$352,000	$527,000

7.3 Cost of Altered or Discontinued Aircraft Operations

With respect to costs associated with altered or discontinued aircraft operations, the analysis indicates that enacting the proposed restriction will not cause airlines to discontinue or re-schedule any operations, and that any delays caused by the proposed restriction will be minimal and not affect flight crew duty time or rest requirements. The estimate of cargo and passenger revenue impacts provides a measure of the impact on operational efficiencies, although as noted in Appendix M, these cost estimates represent an upper bound on costs and the actual costs incurred by the airlines are likely to be lower.

Assuming international passengers who volunteer to take later flights value the compensation they are offered more than the delay and inconvenience they experience, enacting the proposed restriction will actually increase aggregate consumer surplus, partially offsetting the cost impact to the airlines associated with the compensation they provide.

Any changes in shipper consumer surplus are likely to be minimal. As discussed previously, the passenger and all-cargo airlines forecast to be affected by the proposed restriction carry mainly general cargo that moves on a space-available basis. To the extent that shipper consumer surplus reflects airline expectations, there will be little or no change in consumer surplus. For example, if shippers who now expect to receive goods in a two to three day window (including transit time, customs clearance, etc.) experience a 12 to 24 hour delay but still receive their goods within the expected window, there would be no change in their consumer surplus.

7.3.1 Effect on passenger flight operations

Our analysis indicates that passengers on affected flights could experience a modest loss in consumer surplus. Table 19 shows the passenger aircraft flights forecast to be affected in 2018. During that year 14 passenger flights by 12 different airlines are expected to account for 51 non-conforming departures. The estimate of average passengers per departure reflects actual airline performance for these flights during 2012 reported in the USDOT T-100 database. Based on these factors, the passenger aircraft forecast to perform non-conforming departures in 2018 are expected to carry a total of 13,331 total passengers. To put this in context, scheduled airlines at LAX enplaned over 8.5 million international passengers in 2012, and the delayed passengers represent 0.16% of total 2012 international enplanements.[60]

[60] http://www.lawa.org/uploadedfiles/LAX/statistics/voat-1212.pdf

Table 19 Passengers on Affected Flights
Source: ICF-SH&E, USDOT T-100

Airline	Flight Number	Destination	Average Passengers per Departure	Estimated 2018 Non-Conforming Departures	Estimated Total Passengers on Non-Conforming Departures in 2018
Air China	984	Beijing	261	2	522
All Nippon	1005	Tokyo	189	5	945
Asiana	203	Incheon	277	3	831
Cathay Pacific	881	Hong Kong	269	3	807
China Southern	328	Guangzhou	234	3	702
Delta	417	Sydney	221	2	442
EVA	15	Taipei	261	8	2,088
Fiji Airways	811	Nadi, Fiji	342	1	342
Korean Air	62	Incheon	199	6	1,194
Qantas	16	Brisbane	295	6	1,770
Qantas	94	Melbourne	381	2	762
Qantas	108	Sydney	292	5	1,460
United	839	Sydney	304	2	608
Virgin Australia	8	Brisbane	286	3	858
				51	**13,331**

The delay experienced by these passengers will be determined by several factors including the extent to which these flights already experience delays. Table 20 shows the delays that were incurred in October 2013 for the 14 flights forecast to have non-conforming departures in 2018.[61] (Several of the daily flights show 32 departures in October because their September 30 departures, scheduled to take place before midnight, were delayed past midnight, thus occurring on October 1st as a result).

Of the 390 departures performed by these 14 flights in October 2013, 67 or 17% left the gate on or before the scheduled departure time. A total of 105 departures (27%) left the gate less than 15 minutes after the scheduled departure time, conforming to the USDOT standard for "on time", while 218 or 56% experienced delays of 15 minutes or more.

[61] Delta flight 17 was renumbered as flight 417 in October, 2013.

Table 20 Delays in October, 2013 Departures on Affected Flights
Source: ICF-SH&E, FlightAware.com

Airline	Flight Number	On or before Schedule	"On Time"	Delayed	Total
Air China	984	9	15	7	31
All Nippon	1005		14	17	31
Asiana	203		8	23	31
Cathay Pacific	881	17	5	9	31
China Southern	328	1	9	20	30
Delta	417		1	30	31
EVA	15		14	17	31
Fiji Airways	811	17	4		21
Korean Air	62			13	13
Qantas	16	10	8	9	27
Qantas	94	7	14	11	32
Qantas	108	6	8	18	32
United	839		4	27	31
Virgin Australia	8		1	17	18
Total		**67**	**105**	**218**	**390**
		17%	**27%**	**56%**	**100%**

A key question regarding the loss of passenger consumer surplus is how much of the time required to offload cargo or passenger bags would occur while the aircraft is already delayed for other reasons. Offloading cargo or passenger bags is expected to take approximately 10 to 20 minutes, and passengers on flights that would otherwise have departed on schedule would experience a 10 to 20 minute delay. On flights that are already delayed, the additional delay caused by the proposed restriction is conservatively estimated to be less than 10 to 20 minutes, since offloading cargo and passengers could take place while the other issues causing delays are being addressed. Flight departure data from October 2013 indicate that over 80% of the affected flights were delayed, with 56% delayed 15 minutes or more. This suggests that in many instances the additional delay would be less than the 10 to 20 minutes needed to offload cargo and baggage.

Without knowing the specific cause of existing delays it is impossible to calculate the amount of additional delay that implementing the ban on non-conforming departures would cause. If the existing delay is caused by issues like late connecting passengers that involve baggage handling, the proposed restriction could lead to additional delay. If the exiting delay is caused by issues like late-arriving cabin service items, offloading passenger bags could take place while the cabin service issues are dealt with.

To help address this uncertainty, Table 21 provides a framework for evaluating the additional delay caused by the proposed restriction.

Table 21 Total Hours of 2018 Passenger Delay under Alternative Scenarios
Source: ICF-SH&E

Additional Delay per Flight	Total Hours of Passenger Delay		
	Share of Flights with Additional Delay		
	25%	50%	75%
0:10	555	1,111	1,666
0:15	833	1,666	2,500
0:20	1,111	2,222	3,333

Under the scenarios shown above, the 13,331 passengers on aircraft prohibited from making non-conforming departures would incur a total annual delay ranging from 555 to 3,333 hours. If offloading cargo and passenger bags takes an average of 10 minutes but can be done three quarters of the time while the aircraft is already delayed for other reasons, the total annual delay for all passengers would equal 555 hours. If instead, offloading passengers and bags takes an average of 20 minutes and can be done while the aircraft is already delayed only one quarter of the time, the total annual delay would equal 3,333 hours. The high estimate of 3,333 delay hours is presented as a worst case scenario; since most of the affected flights are already delayed for other reasons it is unlikely that the proposed restriction would cause that much additional delay.

Under guidelines issued by the USDOT in 2011, plausible ranges for the value of time for air and high speed rail passengers including business and personal travel fall between $34.80 and $52.20 in 2009 US dollars, with values to be inflated by 1.6% per year.[62] Following these guidelines, the air passenger value of time would be between $40.14 and $60.22 in 2018.

Table 22 Hourly Values of Air Passenger Travel Time Savings
Source: USDOT, ICF-SH&E

Year	Low	High
2009	$34.80	$52.20
2013	$37.08	$55.62
2018	$40.14	$60.22

Table 23 shows the annual value of passenger delays under four scenarios: 555 annual delay hours with low and high hourly values of delay time based on USDOT guidelines, and 3,333 annual delay hours using the same low and high values of time. The net present value of the five-year stream of values ranges from $88,000 to $796,000, using the standard OMB discount rate of 7%. The high estimate based on 3,333 delay hours times a high value of time represents a worst case scenario, and the value of the decrease in passenger consumer surplus is unlikely to be this large.

[62] Revised Departmental Guidance on Valuation of Travel Time in Economic Analysis, USDOT, September 28, 2011, Table 5 (Revision 2 – corrected)

Table 23 Value of Annual Air Passenger Delays
Source: ICF-SH&E

Year	Total Annual Delay Hours			
	555		3,333	
	Value of Time		Value of Time	
	Low	High	Low	High
2014	$20,909	$31,364	$125,569	$188,354
2015	$21,244	$31,866	$127,578	$191,367
2016	$21,584	$32,376	$129,620	$194,429
2017	$21,929	$32,894	$131,693	$197,540
2018	$22,280	$33,420	$133,801	$200,701
NPV	$88,331	$132,496	$530,461	$795,691

Regarding the chance of missed curfews at destination airports, all of the affected destination airports except Sydney have 24 hour operations, eliminating the possibility of missed curfews.[63] Sydney Airport has a curfew period from 11:00 p.m. to 6:00 a.m. with limited exceptions permitted for international passenger flights.[64] Flights from LAX to Sydney forecast to be affected by a prohibition on non-conforming departures include Delta 417, Qantas 108, and United 839. Their schedules are designed to provide early morning arrivals in Sydney, currently ranging from 6:20 a.m. to 9:40 a.m., indicating that possible delays due to the proposed restriction would most likely produce later morning arrivals and not cause any curfew violations at Sydney.

The factors that currently cause airlines to request non-conforming departures are predictable. Because airlines can plan in advance their responses to these factors, the proposed restriction will cause minimal delays.

Data compiled by the USDOT show that in most instances airlines can get enough passengers to volunteer to take later flights by offering them compensation, and that occasions where involuntary denied boarding is required are infrequent.[65] The fact that passengers volunteer to accept compensation in exchange for delay and inconvenience is evidence that these passengers value the compensation more highly than the delay and inconvenience. Adding the cost of disruption and value of passenger time for passengers who volunteer to take later flights to the airline cost of providing compensation would represent double-counting of costs from a benefit-cost perspective.

Currently, most of the gates used by trans-Pacific passenger flights, including 11 of 12 gates at Tom Bradley International Terminal and the 9 remote gates, provide 400 megahertz (MHz) electric power and pre-conditioned air. When aircraft are handled at gates equipped with Point of Use (POU) electric power and air conditioning systems, passenger airlines are not expected to incur any Auxiliary Power Unit (APU) fuel burn costs as a result of the proposed restriction because POU systems eliminate the need to operate aircraft APUs.

The number of gates equipped with 400 MHz power and pre-conditioned air is expected to increase because the LAWA Sustainable Planning and Design Guidelines and the LAX Master Plan Stipulated Settlement Agreement call for requiring 400 MHz and pre-conditioned air units in bid

[63] http://www.boeing.com/boeing/commercial/noise/list.page

[64] Sydney Airport Curfew Act 1995

[65] Ibid.

documents for terminal and gate design and renovation projects, and for establishing lease provisions that require preconditioned air units at gates with 400 MHz power for new terminal leases.[66] As a result, an increasing share of LAX gates will be equipped with POU power and air conditioning, minimizing passenger airline APU fuel burn costs associated with the proposed restriction All-cargo aircraft parked at stands without POU systems may have to operate their APUs for an additional period of time to off-load cargo, although pre-flight planning is expected to keep any delays to a minimum.

ACRP Report 64 – *Handbook for Evaluating Emissions and Costs of APUs and Alternative Systems* (2012) provides the most recent estimates of APU fuel consumption, with typical wide body aircraft APUs consuming .052 kg/s and jumbo wide body APUs consuming .061 kg/s when operating in environmental control systems (ECS) condition.[67] This is equivalent to approximately 61 gallons per hour for wide body APUs and 72 gallons per hour for jumbo wide body APUs based on an average fuel density of 6.75 pounds per gallon. In contrast, the main engines of a 747-400 freighter consume an average of 3,480 gallons per hour in flight.

7.3.2 Effect on cargo flight operations

Fourteen all-cargo flights per year are forecast to be affected by the proposed restriction, eight using wide body aircraft (767-300F, 747-400F) and six using jumbo wide body aircraft (747-8F). If each of these flights is delayed by 15 minutes due to the proposed restriction, the total additional APU fuel burn would equal approximately 230 gallons per year. Using a fuel price of $3.06 per gallon (the price used in Appendix M of the Application to estimate the savings from reduced flying time), the cost of additional APU fuel for all-cargo aircraft would equal $704 per year.

Regarding expedited time-definite cargo service, there is no evidence that the proposed restriction will affect this service. Shippers who require guaranteed time-definite service rely on carriers like FedEx, UPS and DHL who specialize in this type of service. The airlines that would be affected by this restriction specialize in large, general freight shipments where time is less critical than price. A restriction affecting their operations would have no appreciable impact on the guaranteed, time-definite segment of the cargo market.

A review of LAWA records of all non-conforming departures shows that time-definite specialists FedEx and DHL have each had only one non-conforming departure since 2005, while UPS has none. The FedEx comment to LAWA dated February 17, 2013 regarding the proposed restriction describes payload penalties if the restriction is adopted, but the FedEx estimates are based on the unrealistic assumption that airport temperatures will average 92 degrees Fahrenheit during Over-Ocean Operation hours. It is not clear that FedEx would face any payload penalties if its calculations were based on realistic assumptions.

7.3.3 Summary of costs associated with altered aircraft operations

Based on information provided by airlines that account for a substantial share of the historical non-conforming departures, there is no reason to expect that any aircraft operations will be discontinued

[66] LAWA Sustainable Airport Planning, Design and Construction Guidelines for Implementation on All Airport Projects, Version 5.0 • February 2010, page 4-78

[67] ACRP Report 64 – *Handbook for Evaluating Emissions and Costs of APUs and Alternative Systems,* Table 6. This report includes estimates of APU fuel burn for three operating conditions: no load, environmental control systems, and main engine start.

as a result of the proposed restriction[68]. As discussed previously, carriers are anticipated to accommodate the restriction by shifting cargo and passengers among flights to reduce aircraft take-off weight to ensure safe operations on non-conforming departures, while maintaining their basic service schedules.

Table 24 shows the NPV in 2013 dollars of the revenue associated with the affected payload reduction, for the same five, ten, and twenty year time periods addressed in the preceding discussion of fuel cost savings, under two scenarios: (1) a payload reduction of 10,000 pounds per departure achieved by off-loading cargo and excess baggage, and (2) a payload reduction of 20,000 pounds per departure achieved by off-loading passengers as well as cargo from passenger flights. As required by the FAA a discount rate of 7% is used for both scenarios.[69] Appendix M presents further detail on the development of these estimates.

Depending on the period over which the net present value of the revenue stream is considered and the size of the payload reduction, the estimated NPV (in constant 2013 dollars) of the revenue effect of the proposed restriction ranges from approximately $3 million (over five years) to $32 million (over twenty years).

Table 24 Net Present Value in 2013 Dollars of Revenue Associated with Affected Cargo
Source: SH&E

Assumption Regarding Annual Growth in Airline Yields	Period Over Which Net Present Value is Calculated	Revenue in 2013 Dollars Associated with:	
		Reducing Payload by 10,000 lbs.	Reducing Payload by 20,000 lbs.
No Increase In Yields	5 years	$3,249,000	$9,591,000
	10 years	$5,566,000	$16,430,000
	20 years	$8,395,000	$24,782,000
3% Annual Increase In Passenger and Cargo Yields	5 years	$3,539,000	$10,448,000
	10 years	$6,465,000	$19,084,000
	20 years	$10,881,000	$32,122,000

These figures represent an upper bound on the potential for lost revenue, since some or all of the affected cargo will be transferred to later flights operated by the same airline, with no net loss in revenue to the carrier. The airlines might face increased handling costs if cargo was loaded and then unloaded from the affected flights, but these costs would be avoided if the airlines decided to operate at a reduced take-off weight before cargo was loaded. Shippers could face some increased delays in getting shipments to their destination at peak shipping times, but there is generally excess westbound cargo capacity at LAX that would minimize delay under most circumstances.

[68] As part of the analysis, the study team talked with representatives of five airlines that have accounted for 40 percent of the non-conforming departures since June 2000.

[69] FAA standards call for a 7% discount rate for benefit-cost analysis: "FAA Airport Benefit-Cost Analysis Guidance," Office of Aviation Policy and Plans, Federal Aviation Administration, December 15, 1999, p. 77.

7.4 Costs Associated with Implementing Non-aircraft Restrictions or Nonaircraft Components of Restrictions

This section addresses costs associated with implementing non-aircraft restrictions or nonaircraft components of restrictions.

With regard to implementing nonaircraft restrictions: *The proposed ordinance contains no non-aircraft restrictions.*

With regard to non-aircraft components of restrictions: *The proposed restriction has no nonaircraft components.* Program administration costs (e.g., associated with monitoring, reporting, and enforcement) might be considered under this category. However, it is reasonable to assume LAWA can accommodate program administration requirements without increasing staff, because LAWA already identifies, reports on, and investigates each non-conforming operation, and also contacts the responsible operator to request compliance on a voluntary basis. These activities require a level of effort that is roughly equivalent to that which would be required to undertake the same actions on a formal, restrictive basis. The air carriers currently perform detailed analyses of aircraft weight and balance and fuel requirements as part of the flight planning process, so no increase in administrative costs is anticipated.

7.5 Estimated Benefits of the Proposed Restriction

This section addresses the estimated benefits of the proposed restriction, including improvements in quality of life, environmental justice, and operational benefits.

7.5.1 Quality of life improvements

Neither ANCA nor Part 161 mandates that an airport sponsor or FAA consider only the quantifiable or monetized benefits of a proposed restriction. In fact the FAA's own Part 161 regulations explicitly allow *qualitative* benefits, including "improvements in quality of life," to be considered.[70]

Using the FICAN-recommended approach to estimating awakenings, the non-conforming operations are predicted to cause an estimated 18,000 annual awakenings within the ANSA each year. As discussed in Section 6, the proposed restriction will eliminate all awakenings that may be caused by non-conforming operations. To put the estimated benefits on the same temporal footing as the estimated NPV costs associated with altered aircrafts operations described in Section 7.3, the proposed restriction would be expected to eliminate an estimated 90,000 awakenings over 5 years, 180,000 awakenings over 10 years and 360,000 awakenings over 20 years.

Based on U.S. DOT guidance, as many as 81% of the estimated awakenings that we predict would be avoided by the proposed restriction will otherwise occur within minority and/or low-income populations. The proposed restriction will reduce awakenings in these populations and support the goal of providing an environment where all people enjoy the same degree of protection.

7.5.2 Operational benefits

The restriction also will produce the following operational benefits:

- Reduced fuel consumption: As discussed in Section 7, the non-conforming route adds an average of 3.5 minutes to these flights, increasing the amount of fuel consumed and also

[70] Section 161.305(e)(2)(ii)(A)(1)(ii)(D).

adding to the carbon dioxide that these aircraft emit. The proposed restriction would save the carriers as much as $500,000 in fuel costs over 20 years in terms of net present value in 2013 dollars. By reducing aircraft fuel consumption, the restriction would also reduce carbon dioxide emissions by 219,000 pounds per year.

- Reduced FAA workload: To accommodate pilot requests to depart to the east when the airport is in Over-Ocean or Westerly Operations air traffic control personnel must rework the conforming operations and ensure clearance of the runway and airspace to allow for the non-conforming operations that are opposite to the flow of the airport.

7.6 Discretionary Benefit-Cost Information

The following section presents additional discretionary benefit-cost information.

7.6.1 Evidence That the Affected Carriers Have a Reasonable Chance to Continue Service at the Airport or At Other Points in the National Airport System

As discussed previously, carriers are projected to respond to the proposed restriction on eastbound departures by limiting cargo and in some cases passengers carried on each non-conforming departure, to reduce aircraft take-off weight so as to ensure safe operations to the west.

The total annual weight of cargo affected is likely to be less than 390 tons, and fewer than 2,300 passengers are likely to be affected over the course of an entire year. The affected operations and cargo represent a small fraction of the operations and cargo that affected air carriers conduct at LAX; therefore, it is unlikely that the proposed restriction would affect any carrier's ability to continue service at the airport.

Table 25 and Table 26 illustrate this situation. For carriers conducting the non-conforming departures, Table 25 shows each carrier's total annual seat and cargo capacity (in metric tonnes[71]) for all of its departures at LAX, and the amount and share that are contained on the 65 non-conforming departures. Table 26 presents this same information for all carriers serving the destinations of the non-conforming departures.

As these two tables show, the *total* seat and cargo capacities on the non-conforming departures represent small shares of the total departure capacity operated by these carriers and a small share of the total departure capacity for all carriers to the markets served.

In all cases, the seat capacity on the affected flights represent less than one percent of each carrier's capacity, and the cargo capacity represents more than one percent in only one case – Nippon Cargo Airlines. Overall, the seat and cargo capacity on all non-conforming departures represent 0.10% of all affected carriers' seat capacity and 0.33% of all affected carriers' cargo capacity.

The seat capacity on the affected flights represents more than one percent of the overall capacity to only one affected destination – Brisbane. The cargo capacity on the affected flights represents more than one percent of the overall capacity in two cases – Brisbane and Tokyo-Narita. Overall, the seat and cargo capacity on all non-conforming departures represent 0.38% of the seat capacity and 0.63% of the cargo capacity to the affected destinations.

[71] 1 metric tonne = 1,000 kilograms = ~2,200 pounds

Table 25 Estimated Amount and Share of Seats and Cargo Capacity on Non-Conforming Flights by Airline, Based on 2011 Operations

Source: SH&E

Airline	Annual Seats			Annual Cargo Capacity in Metric Tonnes		
	On All Flights	On Non-conforming Flights		On All Flights	On Non-conforming Flights	
		#	%		#	%
Air China	153,352	626	0.41%	41,245	46	0.11%
Air Pacific	61,268	458	0.75%	4,432	15	0.38%
All Nippon Airways	158,410	1,085	0.68%	12,410	85	0.68%
Asiana Airlines	244,185	930	0.38%	68,411	51	0.07%
Cathay Pacific	266,815	903	0.34%	69,194	69	0.10%
China Airlines	229,220	n.a.	n.a.	91,427	120	0.13%
China Southern	136,510	852	0.62%	23,464	51	0.22%
Delta Air Lines	5,530,324	546	0.01%	76,859	34	0.04%
EVA Air	298,466	2,544	0.85%	58,452	184	0.31%
Korean Air	514,181	1,566	0.30%	77,901	822	0.92%
MAS Air	n.a.	n.a.	n.a.	33,841	59	0.17%
Nippon Cargo	n.a.	n.a.	n.a.	42,705	720	1.64%
Qantas	786,940	5,208	0.66%	27,427	181	0.64%
United Airlines	7,288,737	538	0.01%	77,119	30	0.04%
Virgin Australia Int'l	302,846	1,089	0.36%	19,189	69	0.36%
Total	**15,971,254**	**16,345**	**0.10%**	**724,076**	**2,536**	**0.34%**

Table 26 Estimated Amount and Share of Seats and Cargo Capacity on Non-Conforming Flights by Destination, Based on 2011 Operations
Source: SH&E

Destination	Annual Seats			Annual Cargo Capacity in Metric Tonnes		
	On All Flights	On Non-conforming Flights		On All Flights	On Non-conforming Flights	
		#	%		#	%
Brisbane (BNE)	220,877	3,147	1.42%	13,453	159	1.40%
Guangzhou (CAN)	136,510	852	0.62%	8,082	51	0.63%
Hong Kong (HKG)	266,815	903	0.34%	26,489	69	0.26%
Tokyo (HND)	178,850	1,085	0.61%	12,410	85	0.68%
Seoul (ICN)	635,048	2,496	0.39%	76,389	153	0.20%
Melbourne (MEL)	221,034	900	0.41%	6,518	16	0.25%
Mexico City (MEX)	448,950	n.a.	n.a.	24,872	59	0.24%
Nadi, Fiji (NAN)	61,268	458	0.75%	4,432	15	0.38%
Tokyo (NRT)	665,395	n.a.	n.a.	64,657	1,440	2.23%
Beijing (PEK)	153,352	626	0.41%	41,245	46	0.11%
Sydney (SYD)	658,825	3,334	0.51%	25,915	139	0.40%
Taipei (TPE)	571,799	2,544	0.51%	79,069	304	0.26%
Total	**4,218,722**	**16,345**	**0.39%**	**383,532**	**2,536**	**0.60%**

7.6.2 Evidence That Other Air Carriers Are Able To Provide Adequate Service to the Airport and Other Points in the System without Diminishing Competition

Because no air carriers are expected to alter their scheduled service as a result of the proposed restriction, LAWA believes the proposed restriction will have no impact on competition.

7.6.3 Evidence That Comparable Services or Facilities Are Available At another Airport

Because little cargo and few passengers will be affected by the proposed restriction and the affected carriers are expected to be able to accommodate all displaced cargo or passengers on other flights out of LAX, there is no need to consider the availability of comparable services at other airports.

7.6.4 Evidence That Alternative Transportation Service Can Be Attained Through Other Means of Transportation

There is no reason to consider the availability of alternative transportation service because little cargo and few passengers will be affected by the proposed restriction and the affected carriers are expected to be able to accommodate all displaced cargo or passengers on other flights out of LAX.

7.6.5 Information on the Absence of Adverse Evidence or Adverse Comments With Respect To Undue Burden in the Notice Process

This type of information will be sought through the notice process that LAWA is undertaking pursuant to §161.303, as discussed in Section 2.

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8 REVIEW OF STATUTORY CONDITIONS FOR APPROVAL

The evidence compiled in this application shows that the runway use restriction that LAWA proposes to implement satisfies all six of the statutory conditions for approval created by ANCA[72].

1. the restriction is reasonable, non-arbitrary, and nondiscriminatory
2. the restriction does not create an unreasonable burden on interstate or foreign commerce
3. the proposed restriction maintains safe and efficient use of the navigable airspace
4. the proposed restriction does not conflict with any existing Federal statute or regulation
5. the applicant has provided adequate opportunity for public comment on the proposed restriction
6. the proposed restriction does not create an unreasonable burden on the national aviation system

This application also provides adequate information to support a categorical exclusion for the proposed restriction in accordance with FAA orders and procedures regarding compliance with the National Environmental Policy Act of 1969, 49 U.S.C § 4321 ("NEPA"), as required by 14 CFR § 161.305(c). Although the proposed restriction is expected to have little impact on the air carriers serving LAX, it will eliminate thousands of awakenings that might otherwise be caused by a small number of non-conforming operations; provide a measure of environmental justice to poor, minority communities near LAX; and simplify the FAA's management of air traffic at LAX. The FAA should, therefore, approve the proposed runway use restriction under ANCA and Part 161.

The following seven subsections summarize the substantial evidence provided in this application which demonstrates that each of the six statutory conditions is met and supports categorical exclusion from NEPA review.

8.1 The Restriction Is Reasonable, Non-Arbitrary, and Non-Discriminatory

The evidence compiled in this application shows that the proposed restriction would relieve a current and projected noise problem; that there are no other feasible, cost-effective remedies available; and that the restriction is the same for all aviation user classes, as required by Condition 1 and elaborated in § 161.305(e)(2)(i).

8.1.1 The Proposed Restriction Would Relieve a Current and Projected Noise Problem

This application addresses a very specific noise problem; i.e., nighttime noise associated with non-conforming operations that depart to the east when LAX is Over-Ocean Operations or Westerly Operations between midnight and 6:30 a.m.

Section 6.4 summarizes analyses concluding that non-conforming operations can reasonably be expected to cause approximately 18,000 awakenings within the ANSA over an entire year; and 90,000 awakenings over 5 years, 180,000 awakenings over 10 years and 360,000 awakenings over 20 years. In its October 30, 2009 decision ("*Burbank*") disapproving a proposed full nighttime curfew at Bob Hope Airport in Burbank, California ("BUR"), the FAA gave no weight to the analysis that was offered as evidence that a reduction in awakenings should be considered a

[72] 49 U.S.C. § 47524(c)(2), 14 CFR § 161.305(e).

significant benefit of the curfew. The FAA noted that the BUR curfew application conceded that "the methods for assessing and predicting" the impact of aircraft noise on sleep at that time were "not fully developed or understood" and could not provide "conclusive proof of a given number of awakenings caused by a specific noise pattern." *Burbank* at 9. The FAA also noted that it was in the process of studying the relationship of aircraft noise and sleep awakenings. *Id*.

In the intervening years, the understanding of the impact of aircraft noise on sleep has improved and FICAN has adopted a recommended approach for estimating awakenings from aircraft. Specifically, as discussed in Section 6.4 of this application, the American National Standards Institute, Inc. (ANSI) has developed a scientifically-based method for estimation of awakenings from outdoor noise events heard in homes.[73] Appendix K discusses the development of that methodology. The Federal Interagency Committee on Aviation Noise (FICAN), of which FAA is a member, recommends the use of this new estimation procedure for analyses of awakenings from aircraft noise.[74]

The analysis of reduced awakenings associated with the restriction of easterly nighttime departures presented in this application follows this FAA-endorsed approach and provides a reliable basis for presenting the substantial evidence required under Part 161 of the noise problem caused by the non-conforming operations.

The proposed restriction would relieve that noise problem by eliminating those non-conforming operations.

8.1.2 Other Available Remedies Are Infeasible or Would Be Less Cost Effective

Section 4 of this application describes the extensive efforts that the City has made and continues to make to address current and future noise problems at LAX, including the noise problem caused by the non-conforming easterly departures that are the focus of the proposed runway use restriction. These efforts have not prevented the continuing occurrence of the non-conforming operations that are the source of the specific noise problem that is the focus of this application.

As discussed in Section 4.5, the City has pursued several nonrestrictive approaches specifically designed to eliminate or reduce the number of non-conforming operations. These efforts have included continuous monitoring to identify non-conforming operations when they occur. This monitoring permits LAWA staff to contact the responsible operators in a timely manner and to work with the operators to educate them on the importance of conforming with prevailing flows, to understand the reasons for non-conforming operations, and to seek means for cooperatively increasing compliance. LAWA staff have expanded these nonrestrictive educational efforts over time to include detailed graphical and tabular feedback provided to each non-conforming operator on a flight-by-flight basis, as illustrated by the samples presented in Appendix D.

The voluntary approaches taken by the City have, unfortunately, failed to remedy the problem. While the number of non-conforming operations has varied from year to year, there is no evidence that the nonrestrictive measures implemented by the City have caused the operators conducting non-

[73] American National Standard, ANSI / ASA S12.9-2008 / Part 6, "Quantities and Procedures for Description and Measurement of Environmental Sound — Part 6: Methods for Estimation of Awakenings Associated with Outdoor Noise Events Heard in Homes." This Standard is available for purchase at: http://webstore.ansi.org/.
[74] Appendix L presents a copy of the FICAN recommendation. That recommendation notes that additional sleep disturbance research is underway by various research organizations, and results of that work may result in additional changes to FICAN's position. Until that time, FICAN recommends the use of the ANSI standard.

conforming departures to alter their behavior. As illustrated graphically in Figure 8 and Figure 9, which plot the numbers of annual non-conforming flights since June 2000, there is year-to-year variation in the numbers of non-conforming operations, but no clear evidence of a declining trend.

As discussed in Section 4.3.1, the City has pursued an aggressive sound insulation program to mitigate noise impacts on incompatible land uses within the CNEL 65 dB contour. Since the proposed restriction would have no significant effect on the size and shape of the CNEL 65 dB contour, LAWA does not expect to change its sound insulation programs if the proposed restriction is put into effect. Furthermore, as stated in Section 6.2.2, the sleep awakenings analysis conservatively assumed all homes within the ANSA are sound insulated.

In short, there is no feasible or cost-effective non-restrictive means to eliminate the awakenings within the ANSA that are associated with the non-conforming operations that are the target of the proposed restriction.

8.1.3 The Runway Use Restriction Is the Same for All User Classes

The proposed runway use restriction applies equally to departures by all aircraft operators and all aircraft types, with the following exceptions:

- Aircraft operated by the U.S. Armed Forces and any government-owned or operated aircraft involved in law enforcement, emergency, fire or search/rescue operations; and

- Aircraft engaged in a bona fide medical or life-saving emergency for which the Aircraft Operator provides acceptable evidence in writing to the General Manager within seventy-two (72) hours prior to or subsequent to said departure.[75]

Section 3 of this application includes a draft of the specific City of Los Angeles Ordinance that would implement the proposed restriction. The proposed ordinance explicitly provides in § 4 that the proposed runway use restriction "shall apply in all respects to each and every aircraft that now operates or in the future may operate at the airport." The proposed restriction does not discriminate in any way among airport users. It requires that all airport users conform to the same runway use rules when they depart from LAX, at night, when the Airport is in Over-Ocean Operations or Westerly Operations.

The FAA should find that the City has satisfied Condition 1.

8.2 The Restriction Would Not Create an Unreasonable Burden on Interstate or Foreign Commerce

The evidence offered by the City shows that the proposed restriction satisfies Condition 2 because it would create an incidental burden on interstate or foreign commerce while yielding important benefits to the local community.

[75] Exemptions of this kind have often been included in FAA-approved airport use restrictions at airports across the United States, including three LAWA-operated airports (LAX, Ontario International and Van Nuys). As discussed in Section 3, LAWA has no record of any aircraft or operators specifically covered by these exemptions ever conducting a non-conforming departure

The FAA has in the past, most notably in its *Burbank* decision, considered the application of Condition 2 to proposed local restrictions (such as the proposed full nighttime curfew at BUR) that would affect many flights every day; force air carriers to cancel scheduled operations; and cause air carriers to shift their flights to alternate airports. *The runway use restriction proposed by the City is nothing like that. No flights would be banned. As the evidence compiled by LAWA shows, very few flights would be expected to be affected by the proposed restriction; no air carrier is likely to cancel any flights; and no diversion of flights to alternate airports should be expected*.[76]

As discussed in Section 6.1, the affected operations represent a very small fraction of the operations that affected air carriers conduct at LAX; therefore, it is unlikely that the proposed restriction would affect any carrier's decision to continue service at the airport. Moreover, the total seat and cargo capacity on the non-conforming departures represent a small share of the total departure capacity operated by these carriers and a small share of the total departure capacity for all carriers to the markets served. Specifically:

- There is an average of 65 non-conforming operations each year.
- Nonconforming operations account for 0.01% of total operations at LAX; e.g., one operation in ten thousand.
- Nonconforming operations account for 0.1% of total *nighttime* operations at LAX; e.g., one operation in a thousand.
- Looking at the affected carriers, the seat and cargo capacity on all non-conforming departures represent 0.10% of the carriers' seat capacity and 0.32% of the carriers' cargo capacity at LAX.
- Looking at the affected destinations, the non-conforming departures represent 0.39% of the seat capacity and 0.60% of the cargo capacity to the affected destinations from LAX.

The proposed restriction would not ban *any* operations; it would require the operators of non-conforming flights to conform to prevailing flows when LAX is in Over-Ocean Operations or Westerly Operations between midnight and 6:30 a.m. The cost analyses presented in Section 7 and Appendix M show that the costs of compliance with the proposed restriction would be about $0.8 million to $4.2 million per year.

The benefits that the proposed restriction would yield include the likely elimination of thousands of annual awakenings caused by non-conforming operations, as discussed in Section 8.1.1, a reduction in the workload for the FAA's air traffic controllers at LAX, as described in Section 7.5.2, and small savings in airline fuel costs, as discussed in Sections 7.2 and 7.5.2.

Condition 2 does not require the City to demonstrate that the monetized benefits of the proposed restriction outweigh its monetized costs – although that is one way compliance with Condition 2 can be shown. When Congress established Condition 2 in ANCA, it imported the balancing test established by the Supreme Court under the "dormant" Commerce Clause: to be approved under ANCA, a restriction cannot "create an unreasonable burden on interstate or foreign commerce." 49 U.S.C. § 47524(c)(2)(B). Under the Commerce Clause, a municipal ordinance will be upheld if it "regulates even-handedly to effectuate a legitimate local public interest"; it has an "incidental" effect on interstate commerce; and the burden imposed on interstate commerce is not "*clearly excessive* in

[76] The kinds of concerns that motivated the Los Angeles International Airport Advisory Committee (LAXAAC) to oppose the full nighttime curfew proposed for BUR (see *Burbank* at 29) are not present here.

relation to the putative local benefits." *Pike* v. *Bruce Church, Inc.*, 397 U.S. 137, 142 (1970) (emphasis added).

The FAA's Part 161 regulations implementing ANCA deem a cost-benefit analysis to be "essential" to show that Condition 2 has been satisfied. See 14 CFR § 161.305(c)(ii)(A). But the FAA has recognized that in comparing the costs and benefits of a proposed restriction, an applicant can properly consider not only monetized, quantitative benefits, but also "*qualitative* benefits, including improvements in quality of life." § 161.305(e)(ii)(A)(1)(*ii)(D*). That is exactly what the City has done. The evidence compiled in this application warrants a finding that the impact of the proposed restriction on interstate or foreign commerce would be incidental and that any resulting costs would not be "clearly excessive" in relation to the local benefits the restriction would yield – including the elimination of thousands of awakenings in communities within the ANSA.

In its *Burbank* decision (at 27-29), the FAA canvassed what it called the "applicable case law." The FAA carefully reviewed how the "undue burden" test has been applied to noise restrictions imposed by local airport proprietors in the past. The cases, along with the *Burbank* Decision itself, can be grouped into two categories: restrictions found to violate the Commerce Clause and those that do not. The City's proposed restriction falls squarely into the category of those that do not.

In *Burbank* (at 27-28), the FAA first discussed cases in which courts invalidated a noise restriction because of Commerce Clause violations. The analysis began with the Concorde cases: two decisions issued in 1977 by the U.S. Court of Appeals for the Second Circuit concerning a ban on the operations of supersonic transport ("SST") aircraft at John F. Kennedy International Airport. In *British Airways Board* v. *Port Authority of New York*, 558 F.2d 75, 78 (2d Cir. 1977) ("*Concorde I*"), the SST ban was challenged on federal preemption grounds. The Second Circuit Court of Appeals affirmed the authority of airport proprietors to adopt "reasonable regulations to establish acceptable noise levels for the airfield and its environs." *Concorde I* at 78. With respect to interstate commerce, the court explained that "the Commerce Clause of its own force prohibits local regulations that exceed limits necessary to vindicate a recognized state interest. The law seems clear that any Port Authority regulation pertaining to the Concorde must reasonably and nondiscriminatorily advance the end of aircraft noise abatement for airport neighbors." *Concorde I* at 85, n.3.

The reasonableness of the ban was not at issue in *Concorde I*, but became the central focus of the subsequent case, *British Airways Board* v. *Port Authority of New York*, 564 F.2d 1002 (2d Cir. 1977) ("*Concorde II*"). In that case, the Second Circuit stated that while airport proprietors may enact "reasonable, nonarbitrary and nondiscriminatory rules defining the permissible level of noise which can be created by aircraft using the airport," those rules would be scrutinized "to insure that impermissible parochial considerations do not unconstitutionally burden interstate commerce or inhibit the accomplishment of legitimate national goals." *Concorde II* at 1011. The court went on to find that the ban on the Concorde impermissibly discriminated against a single class of aircraft, SST, without any evidence demonstrating that the noise impacts of SST were greater than the noise impacts of aircraft allowed to land at the airport. *Id.*

In the other case where a noise restriction was found to impermissibly burden interstate commerce, *U.S.* v. *Westchester County*, 571 F. Supp. 786 (S.D.N.Y. 1983) ("*Westchester*"), the noise restriction at issue was a total ban on flight operations at Westchester Airport, a major general aviation airport in the New York City metropolitan area, between midnight and 7:00 a.m. The ban was enacted without any noise analysis or studies and a post-ban study failed to demonstrate any correlation between night flights and the annoyance level of residents in the communities surrounding the

airport. *Westchester* at 794-95. By contrast, the effect of the ban on flight operations and congestion were severe. The court found that hundreds of take-offs and landings were affected by the ban and "the curfew has increased congestion and caused a loss of efficiency." *Id*. at 796. Based on this, the court found that the "curfew has an adverse impact on the flow of interstate air commerce in that it interferes with and prevents the efficient use of the navigable airspace" and permanently enjoined the ban. *Id*. at 797.

The FAA then turned in its *Burbank* decision (at 28-29) to two decisions in which courts upheld an airport proprietor's right to enact nondiscriminatory, reasonable noise restrictions. In *National Aviation* v. *City of Hayward*, 418 F. Supp. 417 (N.D. Cal. 1976) ("*Hayward*"), commercial airplane operators sought to invalidate a ban on all aircraft exceeding a noise level of 75 dBA from landing or taking off between 11:00 p.m. and 7:00 a.m. The airplane operators contended that the ban "burdens interstate commerce by forcing them to make their flights from Oakland Airport rather than Hayward Air Terminal, thereby impairing their ability to deliver the mail and newspapers to customers in California and other nearby states." *Hayward* at 427. The court found that some of the airplane operators could comply with limits and that the others "had little problem in successfully shifting their operations, where necessary, to the Oakland Airport and that they are still delivering the same newspapers and cargos out of state that they did before the ordinance was enacted." *Id.* Applying the *Pike* formulation, the court concluded that "any effect on interstate commerce produced by the ordinance seems to be incidental at best and clearly not excessive when weighed against the legitimate and concededly laudable goal of controlling the noise levels at the Hayward Air Terminal during late evening and morning hours." *Id*.

In *American Airlines, Inc.* v. *City of Long Beach*, 951 F.2d 977 (9th Cir. 1991) ("*Long Beach*"), the airport proprietor limited passenger carrier flights to 15 per day and a noise limit of CNEL 65 dB. In assessing the Commerce Clause challenge brought by passenger carriers, the Ninth Circuit Court of Appeals undertook a thorough analysis of Commerce Clause jurisprudence and concluded that: "For a facially neutral statute to violate the commerce clause, the burdens of the statute must so outweigh the putative benefits as to make the statute unreasonable or irrational. Such is the case where the asserted benefits of the statute are in fact illusory or relate to goals that evidence an impermissible favoritism of in-state industry over out-of-state industry."

Long Beach at 983. The court criticized the district court for overturning the ordinance based on "a quasi-legislative judgment about whether the ordinance's effects on interstate commerce were greater than its beneficial effects on the environment" and held that ordinance would violate the Commerce Clause "only if the particular means chosen to achieve its goals were irrational, arbitrary or unrelated to those goals." *Id*. at 984.

With these cases as a backdrop, the FAA turned in *Burbank* to the facts of the proposed restriction. The FAA found that a full nighttime curfew would force air carriers to re-route their early morning flights, require UPS to relocate sort centers and truck thousands of packages to Burbank, prevent passengers from flying to their preferred designation, and eliminate entirely passenger service from Columbus, Ohio. *Burbank* at 28-29. Accordingly, the FAA found that, like *Westchester*, Burbank's ordinance would have an "adverse impact on the flow of interstate air commerce in that it interferes with and prevents the efficient use of the navigable airspace." *Id.* at 28. Given the numerous flaws in Burbank's benefits analysis, the FAA concluded that the "burden the blanket curfew would impose on interstate commerce and UPS and other similar cargo haulers is not incidental and overrides the local interest in controlling noise levels at Burbank." *Id.*

That is not the case with the City's proposed restriction. Unlike the restriction at BUR and every restriction discussed by the FAA in its *Burbank* decision, *the City's proposed restriction would not ban any landings at or take-offs from LAX*. Aircraft will not be forced to land at or take off from a different airport or at a different time; passengers and shippers will not be denied their preferred departure airport; and no routes will be canceled as a result of the City's restriction. The City's proposal requires all flights to depart in the same direction under certain, limited circumstances. Such a requirement ensuring uniformity would enhance the flow of air traffic and the efficient use of navigable airspace around LAX. This alone puts the City's restriction on a fundamentally different footing than *Burbank* and *Westchester* and *Concorde II* and provides a strong justification for finding that it is not an undue burden on interstate commerce.

Moreover, unlike *Burbank*, the burdens on interstate commerce are incidental. Most aircraft operators already respect and follow the City's voluntary program. Because of this, the mandatory restrictions will affect about 65 flights per year – or about 1 out every 10,000 operations at LAX. There is no indication that any carrier will need to extensively overhaul its air or ground operations, as was the case in *Burbank*. To the extent that carriers shift a small volume of cargo or number of passengers to other flights, the burden is projected to be small, as in *Hayward*. In short, it is hard to imagine a noise restriction that would confer tangible benefits to the local community and yet have an impact on interstate or foreign commerce more "incidental" than the restriction proposed by the City.

Finally, it is unquestionable that the City's proposed restriction is nondiscriminatory (contrast *Concorde II*) and for a legitimate purpose, as evidenced by the extensive analysis demonstrating that it will likely prevent harm to neighboring communities from nonconforming flights (contrast *Westchester* and the FAA's own decision in *Burbank*). Given this "legitimate and concededly laudable goal of controlling the noise levels" and the even-handedness of the regulation, the City's requirement is ultimately subject to the commerce clause tests articulated in *Hayward* and *Long Beach*. As the *Long Beach* court made clear, airport proprietors need not show that benefits outweigh costs. See *Long Beach* at 984. To the contrary, the City need only show that the burdens on interstate commerce are not "clearly excessive" and do not "so outweigh the putative benefits as to make the statute unreasonable or irrational" – a test that is protective of airport proprietor's rights. While the outer limits of this test are debatable, the FAA need not explore them in this case where the evidence shows that:

- The restrictions would affect about 65 of the approximately 650,000 annual operations at the airport;
- The total annual costs range from $0.8 million to $4.2 million at an airport responsible for generating approximately $60 billion in commerce[77]; and
- An estimated 18,000 people per year in local communities within the ANSA surrounding LAX would no longer be awakened by non-conforming operations.

[77] In 1996, LAX generated $60,439 million according to the Economic Impacts of Los Angeles International Airport and the LAX Master Plan Alternatives on the Los Angeles Regional Economy, Hamilton, Rabinovitz & Aischuler, 2001.

8.3 The Proposed Restriction Maintains Safe and Efficient Use of the Navigable Airspace

The evidence shows that the proposed restriction satisfies Condition 3 as elaborated in § 161.305(e)(iii). Given the particular restriction proposed by the City, almost no proof should be required on this issue. The proposed restriction would not ban any aircraft from operating at LAX and, based upon the evidence compiled by LAWA, cannot reasonably be expected to cause any aircraft operators to divert their flights to other airports.

The purpose and effect of the proposed restriction is to eliminate *nonconforming* operations. The restriction, if approved, will compel all aircraft departing LAX between midnight and 6:30 a.m. to conform with the prevailing flow by departing to the west whenever the Airport is in Over-Ocean Operations or Westerly Operations. The evidence offered in Appendix M and Section 7.1 of this application shows that the air carriers that would otherwise engage in non-conforming operations will continue to operate at LAX by delaying the flight until unfavorable winds diminish and/or reducing their payloads on affected flights so they can safely depart to the west. The proposed restriction will, as a result, *improve* the safe and efficient use of the navigable airspace by eliminating nonconforming operations at LAX without causing any adverse impacts elsewhere.

The FAA should find that LAWA has satisfied Condition 3.

8.4 The Proposed Restriction Does Not Conflict with Any Existing Federal Statute or Regulation

The proposed restriction satisfies Condition 4 as elaborated in § 161.305(e)(2)(iv).

The proposed restriction would not grant any exclusive rights or impair competition. It would apply (subject to exemptions for government aircraft and medical emergencies) to all operators of aircraft at LAX and would require them to conform their departures to prevailing flows at the Airport. There is no known basis for finding that the proposed restriction would violate Grant Assurance 23 or 49 U.S.C. § 47103(e) (prohibiting a grant of exclusive rights).

The proposed ordinance would exempt government aircraft from the restriction and therefore comply with Grant Assurance 27.

The FAA should find that the proposed restriction does not conflict with any existing federal statute or regulation and satisfies Condition 4.

8.5 The Applicant Has Provided Adequate Opportunity for Public Comment on the Proposed Restriction

The notice process and comment opportunities provided by the City, as detailed in Section 2 of this application, meet or exceed the requirements of Part 161. The FAA should find that there has been adequate opportunity for comment on the proposed restriction and that the City has satisfied Condition 5.

8.6 The Proposed Restriction Does Not Create an Unreasonable Burden on the National Aviation System

The evidence shows that the proposed restriction would comply with Condition 6 as elaborated in § 161.305(e)(2)(vi).

8.6.1 There Would be No Adverse Effects on Airport System Capacity, Congestion or Delay, and the Proposed Restriction Would Reduce the FAA's Workload

The proposed restriction will not reduce the capacity of LAX in any way. It requires all aircraft to depart to the west when LAX is in Over-Ocean Operations or Westerly Operations during nighttime hours from midnight to 6:30 a.m. There is no reason to expect that requiring conformity would cause any congestion.

The FAA's workload will be reduced because pilot requests for non-conforming departures will be eliminated and all traffic at LAX will conform to prevailing Over-Ocean Operations or Westerly Operations when the restriction is in effect.

8.6.2 Alternative Non-Aircraft Measures are Inappropriate

As discussed in Section 4.3.1, the City has established a sound insulation program to address all non-compatible land uses within the CNEL 65 dB contour, to make them "compatible." It is impractical to adopt such an approach to address the *awakenings* caused by non-conforming operations. Non-conforming operations follow diverse flight paths and result in an estimated 18,000 awakenings per year within the designated ANSA. This estimate presumes that all the homes within the ANSA have already *been* sound insulated, and there is no practical means of improving the quality of sound insulation to eliminate interior levels that are loud enough to cause awakenings.

8.6.3 Absence of Comments with Regard to Unreasonable Burden on the National Aviation System

LAWA has not received any comments during the course of its development of the proposed restriction and its preparation of this Application that the proposed restriction would impose an unreasonable burden on the national aviation system. The notice and comment procedures described in Section 2 allow for comments of this type, and the City will provide the FAA with any comments that it receives.

The FAA should find that LAWA has satisfied Condition 6.

8.7 The Proposed Restriction Is Categorically Excluded From NEPA Review

FAA Order 1050.1E (Change 1, March 20, 2006), "Environmental Impacts: Policies and Procedures," provides in § 307 for the categorical exclusion of certain administrative actions from NEPA review. The FAA has explicitly recognized in § 307u that, absent extraordinary circumstances, an "[a]pproval under 14 C.F.R. part 161 of a restriction on the operations of Stage 3 aircraft that does not have the potential to significantly increase noise at the airport submitting the

restriction proposal or at other airports to which restricted aircraft may divert" meets applicable categorical exclusion criteria.[78]

The evidence offered in this application warrants categorical exclusion. The proposed restriction would *reduce* noise at LAX by compelling aircraft that would otherwise depart to the east, over heavily populated neighborhoods, to depart to the west, over the Pacific Ocean, when the Airport is in Over-Ocean Operations or Westerly Operations between midnight and 6:30 a.m. The proposed restriction will not increase noise at LAX.

There is also no reason to expect that the operators of rare non-conforming flights would divert these operations to any other airport. Based upon input from many of the affected air carriers, and as documented in Section 6.1, 7.1, and Appendix M, *operators of "restricted aircraft" can reasonably be expected to continue to operate at LAX*. The evidence shows that, rather than cancelling their operations or moving them elsewhere, these operators will conform to the over-ocean or westerly flows approved and implemented by the FAA as noise abatement measures by limiting their payload, to reduce takeoff weight and permit them to depart safely to the west when they are required to do so by the proposed restriction.

The FAA should, accordingly, find that LAWA has provided adequate information supporting a categorical exclusion.

[78] Here, there are no extraordinary circumstances (as enumerated in Order 1050.1E, § 304) that could reasonably give the FAA pause before categorically excluding the approval of LAWA's present Part 161 application.